INTERIM RESPONSE
CONSTRUCTION SUMMARY REPORT FOR THE
COAL DOCK BURN AREA

ABANDONED MINING WASTES – TORCH LAKE NON-SUPERFUND SITE
HOUGHTON COUNTY, MICHIGAN
SITE ID# 31000098





OCTOBER 2019

PREPARED FOR:

MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

REMEDIATION & REDEVELOPMENT DIVISION

CALUMET FIELD OFFICE

CALUMET, MICHIGAN

Mannik Smith GROUP

TABLE OF CONTENTS
Interim Response Construction Summary Report for the
Coal Dock Burn Area
Site ID: 31000098
Houghton County, Michigan

SECTION:		PAGE NO.:
1.0	INTRODUCTION	1
1.1	Project Location	1
1.2	Project Background	1
2.0	OBJECTIVE AND SCOPE OF WORK	3
3.0	INTERIM RESPONSE ACTIVITIES	3
4.0	SUMMARY AND CONCLUSIONS	5
5.0	RECOMMENDATIONS	5

FIGURES

Figure 1	Project Location Map
Figure 2	Drainage Improvements and Capped Area

APPENDICES

Appendix A	Bidding and Contract Document
Appendix B	Award and Notice to Proceed
Appendix C	Bulletins and Change Orders
Appendix D	Provisional Allowance Change Authorization Request Forms
Appendix E	Soil Erosion and Sedimentation Control Permits and Releases
Appendix F	MDOT Permits
Appendix G	Access Agreements
Appendix H	Notification of Intent to Renovate/Demolish Form
Appendix I	Submittals
Appendix J	Photographic Log
Appendix K	Waste Management Records
Appendix L	As-Built Survey
Appendix M	Air Monitoring Data
Appendix N	Substantial and Final Completion

1.0 INTRODUCTION

The Mannik & Smith Group, Inc. (MSG) has prepared this *Interim Response Construction Summary Report (CSR) for the Coal Dock Burn Area* as part of the Abandoned Mining Wastes – Torch Lake non-Superfund Site (Project) EGLE Abandoned Mining Waste (Site ID: 31000098). This CSR summarizes the interim response (IR) completed at the Calumet & Hecla Lake Linden Operations Area (CHLL) Hubbell Processing Area Coal Dock Burn Area in Hubbell, Houghton County, Michigan. The IR entailed the removal and disposal of asbestos containing building materials (ACBM) and residual process materials (RPM) containing polychlorinated biphenyls (PCBs) and asbestos, grading to promote and control drainage, capping PCB-contaminated soils, and armoring of drainage channels. The affected area had been contributing soils to runoff into Torch Lake coincident with where PCBs have been detected in lake sediments. This CSR was prepared in accordance with the *Indefinite Scope Indefinite Delivery (ISID) Discretionary Proposal for FS and Remedial Action Activities* (24 February 2016) prepared by MSG in response to a request from the Michigan Department of Environment, Great Lakes, and Energy (formerly the Department of Environmental Quality), Remediation and Redevelopment Division (RRD), Calumet Field Office under MSG's 2015 Environmental Services ISID Contract Number 00538 with the State of Michigan.

1.1 Project Location

The Project area is located along the shoreline and in Torch Lake, Houghton County, Michigan. Due to the complex nature and very large area RRD subdivided the Project into study areas based on past use and known issues. Depicted on ***Figure 1****, Project Location Map* are the CHLL and Calumet & Hecla Tamarack City (CHTC) Operations Areas and their respective former industrial operations.

Centralized around Calumet & Hecla's copper mining and processing operations near Lake Linden and Hubbell, Michigan, the CHLL consists of approximately 155 acres of land extending approximately two miles along the shoreline of Torch Lake and incorporates over 40 different parcels with multiple property owners.

The CHLL Hubbell Processing Area is located between Lake Linden and Hubbell along the southeast side of Highway M-26 and is comprised of three mining era industrial properties including the Hubbell Coal Dock and Mineral Building that are vacant, and the Hubbell Smelter that is the location of an operating industrial facility. The Hubbell Processing Area is bordered by residential (single-family residences and an apartment complex), commercial (restaurant and retail business), and industrial (sand and gravel pit, construction company, and manufacturing) land uses, and Torch Lake.

The Coal Dock Burn Area IR was limited to the southern portion of the Coal Dock property and northern portion of the Mineral Building property in the Hubbell Processing Area. ***Figure 2****, Drainage Improvements and Capped Area* depicts features and the limits of improvements to abate contaminated soil erosion into Torch Lake as part of this IR effort.

1.2 Project Background

Copper mining was extensive in the Keweenaw and formed the backbone of the regional economy and society. Copper ore milling and smelting operations conducted from the mid-1860s to the 1960s, included the importation, reprocessing, and smelting of various scrap metals in the later years of operation. Consistent with past industrial practices, Torch Lake served as dumping grounds for virtually all mining industry related waste products produced, including tailings, slag, and various chemicals. It is estimated that at least 20 percent of Torch Lake's volume was filled with tailings and other waste products.

The environmental legacy resulting from over 100 years of mining and reclamation led to Torch Lake and its western shoreline to be designated as a Superfund site by the United States Environmental Protection Agency (EPA) https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0503034 and a Great Lakes Area of Concern (AOC) under the U.S./Canada Great Lakes Water Quality Agreement https://www.epa.gov/torch-lake-aoc. The EPA undertook cleanup activities to address some of the

byproducts of the mining industry while others were not addressed or left to recover through natural processes.

Environmental impairments within Torch Lake and along the shoreline resulting from historical mining era industrial operations:

- Present potential exposure risk to human and ecological receptors;
- Limit the recovery of the Torch Lake ecosystem;
- Create uncertainty over safe and beneficial reuse of the land; and,
- Prevent delisting of Torch Lake as an AOC due to Beneficial Use Impairments (BUIs) related to restrictions on fish and wildlife consumption because of the on-going presence of PCBs in fish and degradation of benthos because of metals contaminated sediments.

PCBs are of particular concern in Torch Lake sediments, surface water, and submerged abandoned container contents, as well as in upland soil, waste, RPM, and abandoned container contents in former industrial areas along the shoreline as they serve as a continuing source of PCBs into the environment. Sediment samples collected from the CHLL contained multiple detections of PCBs that exceeded applicable regulatory criteria. Interpretation of these results clearly demonstrates that there are two distinct groupings of elevated PCB concentrations in sediment: The first located offshore in the Lake Linden Recreation Area and the second located offshore in the Hubbell Processing Area. These source areas, as confirmed by the results of the historical Semi-Permeable Membrane Device (SPMD) and fish tissue studies, are ongoing sources of PCBs that pose both ecological and potential human health risks and continued degradation of the benthos in Torch Lake. For additional detailed information on the condition of Torch Lake and upland areas specifically pertaining to PCBs, please refer to the May 2018 *Distribution of PCBs in the Torch Lake Environment Memorandum* available at https://www.michigan.gov/documents/deq/deq-rrd-amw-AMWPCBMemorandum5-15-18_625028_7.pdf.

The EGLE Project is addressing some of the remaining concerns in Houghton County not addressed by the EPA. The Project concerns involve groundwater, surface water, sediments, and "upland" media. Known or suspected problems which are being evaluated include: an unidentified, significant in-lake and/or terrestrial source of PCBs; uncharacterized waste deposits and >750 uncharacterized drums on the lake bottom; slag; landfills; industrial ruins; coal storage areas; underground storage tanks (USTs); RPM; asbestos containing materials (ACM); and any other waste materials identified during future investigations.

From 2014 through 2017, RRD conducted Site Investigation (SI) activities and confirmed the remaining concerns in the Project area involve groundwater, surface water, sediments, "upland" media, seeps, RPM, and abandoned containers. Priority concerns which were evaluated and deemed to require IRs include: significant terrestrial and in-lake sources of PCBs; ACM; RPM; abandoned mining era containers; seeps; limited areas of soil in which there are Direct Contact Criteria and Particulate Soil Inhalation Criteria exceedances; and, physical hazards.

In the case of the Hubbell Processing Area Coal Dock property, the identified risks posed potential threats to human and ecological receptors, including but not limited to human health risks in the event of direct contact with affected media and inhalation of particulates and asbestos; physical hazards; and, erosion and deposition of PCB-contaminated soils into Torch Lake. Blocked historic drainage pathways and uncontrolled runoff allowed for erosion of PCB-contaminated soils into Torch Lake. Just off shore of the Coal Dock property is an area of sediments that has been identified as an ongoing in-lake source of PCBs, contributing to the Michigan Department of Human Health Services (MDHHS) fish consumption guideline for total PCBs in Torch Lake fish.

Based on these conditions the Upper Peninsula RRD staff commissioned EGLE's Geological Services Unit (GSU) to conduct a topographic survey of the Hubbell Coal Dock and Mineral Building properties. EGLE also

commissioned MSG to prepare biddable specifications for drainage improvements and capping of the PCB-contaminated soils. After receiving competitive bids and securing a Trade Contractor (TC), RRD staff completed an IR that removed ACBM and PCB-containing RPM, improved drainage pathways, and capped PCB-contaminated soils to stop the erosion of PCBs into Torch Lake as part of the mitigation of risks to human health and the environment.

2.0 OBJECTIVE AND SCOPE OF WORK

The objective of the IR was to abate the erosion of PCB-contaminated soils into Torch Lake and mitigate risks to human health and the environment. The efforts focused on prevention of soil runoff and capping of soils affected by asbestos and/or PCB residuals which resulted from historic secondary copper recovery processes (i.e. burning of secondary waste materials, specifically the outer sheathings, insulation, and coatings on copper-rich materials, prior to treating the recovered copper in the smelter). This was accomplished by removing ACBM and PCB-containing RPM, improving and armoring drainage pathways, grading to promote positive drainage, and placing a soil cap over PCB-contaminated soils that met EPA capping standards. To meet this objective MSG developed a scope of work that was incorporated into a biddable specifications package to secure a TC. MSG then assisted EGLE with soliciting bids in accordance with EGLE and Michigan Department of Technology, Management and Budget procurement procedures. Refer to ***Appendix A****, Bidding and Contract Document*.

3.0 INTERIM RESPONSE ACTIVITIES

MSG supported the EGLE RRD in the procurement and oversight of a TC during implementation of the IR. The TC selected and retained by the State of Michigan was B&B Contracting, Calumet, Inc. (B&B) of Calumet, Michigan. Refer to ***Appendix B****, Award and Notice to Proceed.* B&B completed the work in accordance with the March 28, 2017 Bidding and Contract Document, as modified, as the work progressed. Refer to ***Appendix C****, Bulletins and Change Orders* for descriptions of changes made to the contract and the corresponding changes in contract value. Refer to ***Appendix D****, Provisional Allowance Change Authorization Request Forms* for changes made to the work that were addressed using the Provisional Allowance within the contract.

Due to the proximity of the work to Torch Lake, Part 91 Soil Erosion and Sedimentation Control (SESC) Permits were required for the earth change activities at the Coal Dock Burn Area and at the borrow pit where the sandy loam cap material was sourced. Refer to ***Appendix E****, Soil Erosion and Sedimentation Control Permits and Releases* for copies of the issued permits and correspondence verifying permit closures.

Permits were also required from the Michigan Department of Transportation (MDOT) to accommodate a new temporary driveway onto highway M-26, temporarily re-route a drainage ditch, and for traffic control during hauling operations. Copies of the issued permits are provided in ***Appendix F****, MDOT Permits*. ***Appendix G****, Access Agreements* contains copies of the access agreements between B&B and the property owners of the borrow pit and land where the temporary drainage ditch re-routing occurred. The *Notification of Intent to Renovate/Demolish* form submitted for the pick-up and removal of ACBM as part of the project is contained in ***Appendix H****, Notification of Intent to Renovate/Demolish Form*.

In accordance with the *Bidding and Contract Document*, B&B prepared and submitted a number of pre-work submittals along with additional submittals as the work progressed, including:

- Imported Cap Material Sampling Plan;
- Air Monitoring Plan;
- Project Schedule;
- Cap Material, Gravel, and Rip Rap Test Reports;
- Geotextiles Product Data;
- Submittal Register;
- Schedule of Values;

- Site-Specific Health and Safety Plan;
- Work Plan;
- Concrete Mix Design;
- Erosion Control Materials Product Data;
- Seed, Fertilizer, and Mulch Product Data;
- Imported Soil Lab Analytical Data;
- Culvert and End Section Product Data; and,
- Concrete Load Ticket.

Copies of the approved submittals as returned to B&B are provided in ***Appendix I****, Submittals*.

On-site work at the Coal Dock Burn Area commenced on July 6, 2017.

IR actions undertaken at the Hubbell Coal Dock property included:

- Improvement of existing internal roads to support truck traffic and limit dust generation;
- Construction and eventual removal of a temporary haul road entrance;
- Improvement and armoring of 750 feet of drainage ditch, including removal of trees and debris, grading, and placement of geotextile and rip rap;
- Plugging of a rectangular opening through the bulkhead with concrete to eliminate a migration pathway;
- Grading of the Coal Dock Burn Area to promote controlled positive drainage toward rip rap armored outlets to Torch Lake;
- Capping in accordance with EPA capping standards of 6.7-acres of PCB-contaminated soils in the Coal Dock Burn Area to stop water and wind erosion and inhibit direct contact;
- Replacement of approximately 170 feet of failing culverts;
- Removal and disposal of 320 pounds of ACBM and one drum of PCB-contaminated residual process materials (RPM) that were picked up as the work progressed;
- Removal and disposal of 117.9 tons of hazardous waste soil, identified as waste pile WP-11, contaminated with PCBs and lead. The PCB concentration in WP-11 was 100 parts per million (ppm), thus it required management as a Toxic Substances Control Act (TSCA) PCB remediation regulated waste. TSCA addresses the production, importation, use, and disposal of PCBs based on origin, date of generation, and concentration. In the case of WP-11, it was determined the PCBs were released prior to 1978 and were present at a concentration greater than 50 ppm, a regulatory trigger. Waste Pile WP-11 also required management as a Resource Conservation and Recovery Act (RCRA) hazardous waste due to the results of a Toxicity Characteristic Leaching Procedure (TCLP) test for lead. TCLP testing identifies wastes likely to leach concentrations of contaminants that may be harmful to human health or the environment. Thus WP-11 required disposal at a TSCA and RCRA hazardous waste regulated facility; and,
- Site restoration including application of seed, fertilizer, organic matter, and mulch atop the capped area.

Photographs of representative portions of the drainage improvements and capping activities are included in ***Appendix J****, Photographic Log.* Documentation for the disposal of ACBM, drum of PCB-contaminated RPM, and hazardous waste soils is included in ***Appendix K****, Waste Management Records*. The as-built survey, reduced to an 11x17 paper size for inclusion in this report, is provided in ***Appendix L****, As-Built Survey*.

Dust control was an important component of the completed activities and was primarily accomplished through the application of water to maintain a moist surface condition during earth-moving activities and while material was being transported on the haul road. In addition, vehicle speeds were managed. Air monitoring was conducted as the work progressed, including visual assessment for visible dust and monitoring using a Thermo DataRam pDR aerosol monitor. Any observances of visible dust were immediately reported to the TC for correction. Air sampling for asbestos fibers was also conducted, including personnel air sampling and sampling at upwind and downwind stations around the perimeter of the work area. Results are provided in ***Appendix M****, Air Monitoring Data*. The data indicates that dust

levels remained below the action level of 2.5 milligrams per cubic meter (mg/m^3). Similarly, the asbestos fiber count was below detection limits at the perimeter of the work area and the personnel monitoring results were below the action level of 0.05 fibers per cubic centimeter (f/cc), which was one-half of the Occupational Safety and Health Administration (OSHA) permissible exposure limit (PEL) of 0.1 f/cc as an 8-hour time weighted average.

The date of substantial completion for the work was November 14, 2017, which is when disposal documentation was received for the WP-11 materials. Refer to ***Appendix N,*** *Substantial and Final Completion* for a copy of the executed document. Work by the TC to complete the punch-list items identified at the time of Substantial Completion continued through 2018, with the following completed by October 2018:

- Silt fence removal along the drainage ditch;
- Adjustment of grades to improve water flow near the outlet of the drainage ditch;
- Placement of stone cover over most of the bare soil areas where standing water had previously been present near the outlet of the drainage ditch;
- Provision of documentation that the Houghton County Drain Commissioner accepted the borrow pit and site restoration; and,
- Filling and seeding of scattered bare spots within the capped area and re-seeding of one area outside of the capped area.

In 2019, the following was completed:

- Placement of additional soil and seed in scattered bare spots within the capped area;
- Ditch maintenance outside the capped area;
- Placement of crushed stone in areas that had eroded in the southern drainage swales; and,
- Final vegetation and project acceptance.

4.0 SUMMARY AND CONCLUSIONS

Completed IR operations at the CHLL Hubbell Processing Area Coal Dock Burn Area included removal of ACBM and PCB-containing RPM, improving and armoring drainage pathways, grading to promote positive drainage, placement of a soil cap meeting EPA capping standards for the Torch Lake Superfund site, and restoration to stabilize newly capped and disturbed areas.

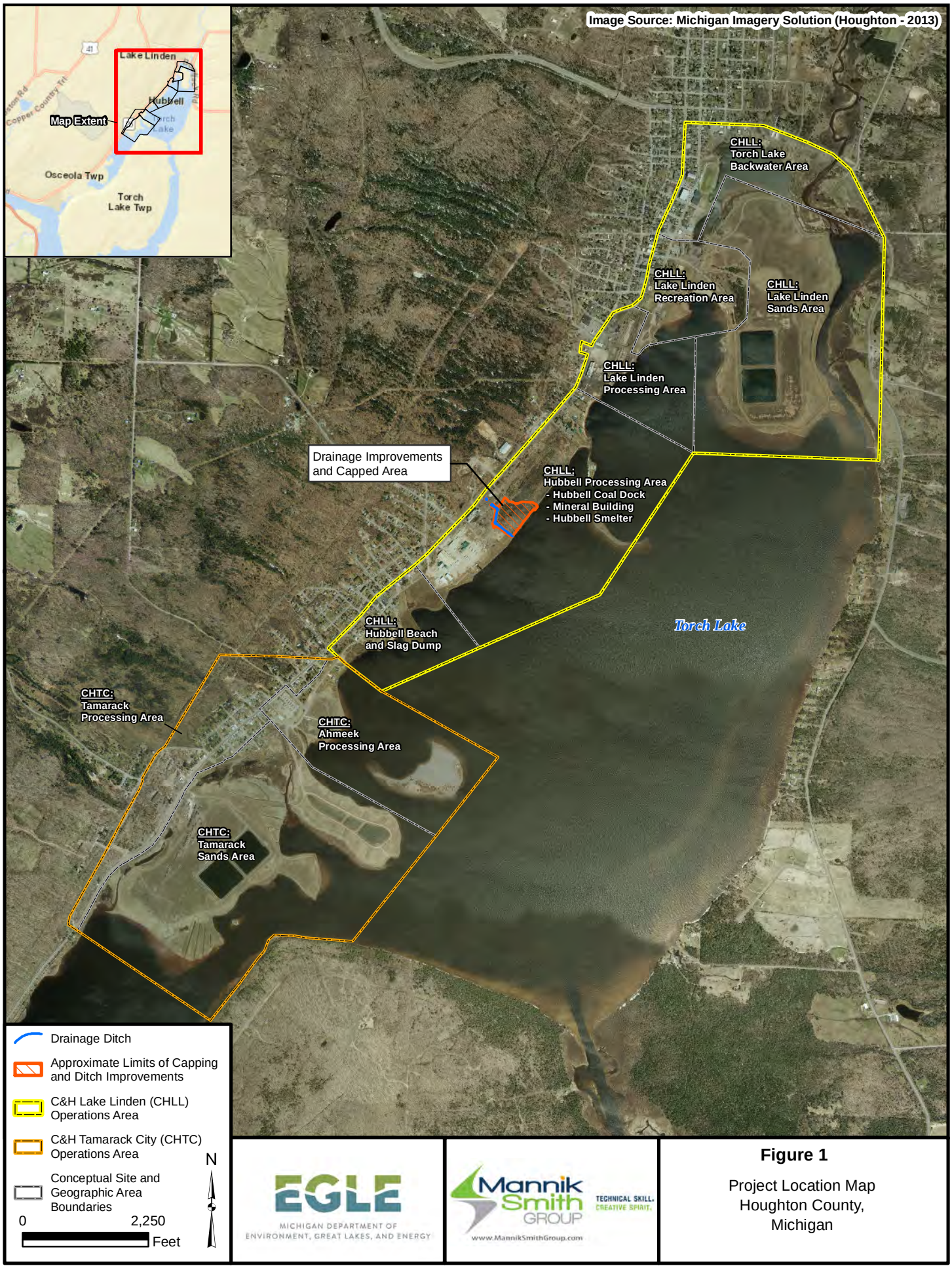
The completed IR operations met the objective of safely abating ACBM and the erosion of PCB-contaminated soils and RPM into Torch Lake and mitigating potential risks to human health and the environment.

5.0 RECOMMENDATIONS

MSG has the following recommendations:

- Implementation of the Operation and Maintenance (O&M) Plan is recommended to assess soil cover and structure conditions, along with vegetation establishment, drainage ditches, and other features and conditions in a repeatable, objective manner on a routine inspection basis. Based on the findings and recommendations from the inspections, necessary repairs and/or amendments can be performed to support their continued functioning as designed.

FIGURES



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EGLE
MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

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Figure 1

Project Location Map
Houghton County,
Michigan

Image Source: Michigan Imagery Solution (Houghton - 2013)

Basin-RipRap
0.03 Acres
(1,176 S.F.)

2'x2'x9' Corrugated Metal Pipes

146' - 24" Corrugated HDPE Pipe

Sedimentation Basin

Crushed Stone Cap
0.13 Acres

Bulkhead North-RipRap
0.01 Acres
(272 S.F.)

Concrete Pad

Bulkhead South-RipRap
0.01 Acres
(328 S.F.)

Concrete Crane Rail

Cap (North)
6.27 Acres

Cap (South)
0.43 Acres

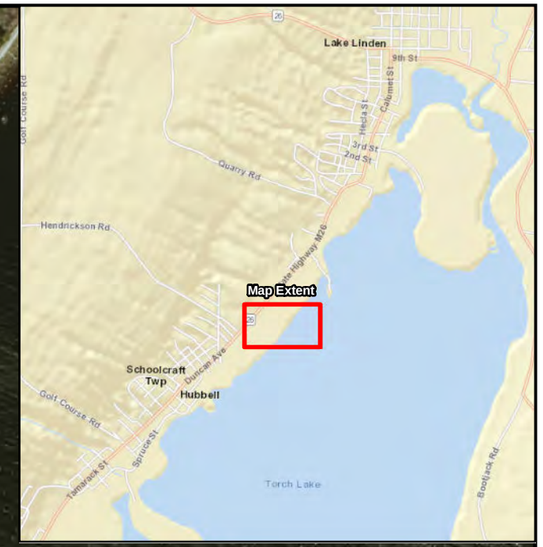
Concrete Pad

Concrete Bulkhead

Concrete Pad

Ditch-RipRap
0.29 Acres
(12,548 S.F.)

Repaired Hole in Bulkhead



Crushed Stone Cap
Rip Rap / Drainage Improvements
Sandy Loam / Seed / Mulch Cap
Pipes
Fenceline

N

0 125 Ft

Coordinate System: MI State Plane - North Zone

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Figure 2
Drainage Improvements and Capped Area
Hubbell Processing Area - Coal Dock
Calumet and Hecla Lake Linden Operations Area
Hubbell, Houghton County, Michigan

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APPENDIX A

Bidding and Contract Document

State of Michigan

Department of Technology, Management and Budget
State Facilities Administration
Design and Construction Division

DCSPEC
Bidding and Contract Document
Minor Projects

File No. 761/16108.SAR
Index No. 44251
Department of Environmental Quality / Remediation and Redevelopment Division

Abandoned Mining Wastes
Torch Lake Non-Superfund Site
Hubbell Processing Area
Hubbell, Michigan

March 28, 2017

TABLE OF CONTENTS

DIVISION 00 BIDDING REQUIREMENTS AND CONTRACT CONDITIONS

00010	PRE-BID INFORMATION	00-1
00100	INSTRUCTIONS TO BIDDERS	00-5 TO 00-8
00120	SUPPLEMENTARY INSTRUCTIONS	00-8
00200	INFORMATION TO BIDDERS	00-8 TO 00-9
00700	GENERAL CONDITIONS	00-9 TO 00-19
00750	SPECIAL WORKING CONDITIONS	00-19 TO 00-20
00800	SUPPLEMENTARY CONDITIONS	00-20
00850	WAGE DETERMINATION SCHEDULE	00-20
00900	ADDENDA	00-20

DIVISION 01 - GENERAL REQUIREMENTS

01 11 00	SUMMARY OF WORK	01-1 TO 01-6
01 21 00	ALLOWANCES	01-7
01 22 00	MEASUREMENT AND PAYMENT	01-8 TO 01-13
01 23 00	ALTERNATES	01-14
01 29 73	SCHEDULE OF VALUES	01-15 TO 01-16
01 31 19	PROJECT MEETINGS	01-17 TO 01-18
01 33 00	SUBMITTALS	01-19 TO 01-30
01 35 00	SPECIAL PROJECT PROCEDURES	01-31 TO 01-34
01 41 00	REGULATORY REQUIREMENTS	01-35 TO 01-37
01 42 00	REFERENCES	01-38
01 45 00	QUALITY CONTROL	01-39 TO 01-42
01 50 00	CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS	01-43 TO 01-46
01 60 00	MATERIAL AND EQUIPMENT	01-47 TO 01-48
01 70 00	CONTRACT CLOSE-OUT	01-49 TO 01-51

DIVISION 02 – EXISTING CONDITIONS

02 21 00	SURVEYS	02-1 TO 02-2
02 61 00	OFF-SITE TRANSPORTATION AND DISPOSAL	02-3 TO 02-6

DIVISION 03 – CONCRETE

03 30 00	CAST-IN-PLACE CONCRETE	03-1 TO 03-2

DIVISION 31 – EARTHWORK

31 11 00	CLEARING AND GRUBBING	31-1 TO 31-3
31 22 16	HAUL ROADS	31-4
31 22 23	EXCAVATION, GRADING, AND CAPPING	31-5 TO 31-10
31 22 28	SOLIDS AND WATER MANAGEMENT	31-11 TO 31-13
31 23 19	DEWATERING	31-14 TO 31-15

DIVISION 32 – EXTERIOR IMPROVEMENTS

32 29 30	EROSION AND SEDIMENT CONTROL	32-1 TO 32-4
32 92 00	SEEDING, FERTILIZING, AND MULCHING	32-5 TO 32-8

APPENDIX I – GLOSSARY
APPENDIX II – SPECIAL PROJECT PROCEDURES
APPENDIX III – SITE DATA
APPENDIX IV – PREVAILING WAGE RATES
APPENDIX V – CONTRACT FORMS
CONTRACT FORMS
BID SUMMARY FORM
BID SCHEDULE
QUALIFIED DISABLED VETERAN (QDV) BUSINESS REPRESENTATION
CERTIFICATION OF A MICHIGAN BASED BUSINESS
BID BOND
POST-BID SUBMITTALS
PERFORMANCE BOND
PAYMENT BOND

APPENDIX VI – PROVISIONAL ALLOWANCE CHANGE AUTHORIZATION REQUEST FORM
APPENDIX VII – WASTE PILE WP-11 INFORMATION

DRAWINGS - BOUND SEPARATELY	**SHEET NUMBER**
Hubbell Processing Area Plan Set A	
Title Sheet	**C-1**
Legend/General Notes	**C-2**
Existing Conditions	**C-3**
Site Preparation/SESC Measures	**C-4**
Grading Plan	**C-5**
Ditch Alignment Plan	**C-6**
Restoration Plan	**C-7**
Site Details	**C-8**

DIVISION 00

BIDDING REQUIREMENTS AND CONTRACT CONDITIONS

SECTION 00010 PRE-BID INFORMATION

1. I**nvitation to Bid (ITB)** – Your firm is invited to submit a Bid. The State of Michigan as the Owner will receive **bids electronically through the Buy4Michigan website at www.buy4michigan.com,** for the Hubbell Processing Area Project until 2:00 p.m., local time, on May 3, 2017. The State reserves the right to cancel this Invitation to Bid (ITB) or change the date and time for submitting Bids by announcing same at any time before the established date and time for Bid opening. Bids must remain open for acceptance by the Owner for no less than the Bid hold period. Contractor may agree to extend the Bid hold period. However, any such extension must be based upon no increase in the Bid Price and/or Contract Time.

2. **Work Description** – The Work, Interim Response Activities, Agency No. 761, Index No. 44251,

   DTMB File No. 761/16108.SAR includes, but is not necessarily limited to:

   - Planning, site preparation, site health and safety, clearing, and dewatering.
   - Grading and capping of soils containing polychlorinated biphenyls (PCBs), metals, and asbestos containing material (ACM) to eliminate impacted soil runoff into Torch Lake.
   - Drainage ditch improvement to restore channel capacity and prevent overflowing onto the newly placed cap.
   - Potential removal and disposal soils containing greater than 50 parts per million (ppm) PCBs.
   - Seeding, mulching, and site restoration.

   The site is located at 52634 Highway M-26 in Hubbell, Michigan, 49934 as shown on the Drawings.

3. **Bidding Documents** – Sets of Bidding Documents may be obtained at www.Buy4Michigan.com or from the Professional at JChrestensen@manniksmithgroup.com (906-487-7452).

4. **Bid Security** – Each Bid must enclose Bid Security, in the amount of five percent (5%) of the Bidder's Base Bid, paid to the "State of Michigan" in the form of a certified or cashier's check or money order drawn upon a bank insured by an agency of the Federal Government or a bid bond with an authorized surety company.

5. **Pre-Bid Conference** – A mandatory pre-bid conference will be held in Room 311 of the Jutila Center, 200 Michigan Street, Hancock, Michigan 49930 on April 19, 2017 at 10:00 am Local Time. A tour of the Hubbell Processing Area site will be held on the same day, starting at approximately 11:30 am local time (starting immediately after the pre-bid conference). All prospective Bidders are required to attend the tour. Other parties interested in the Work are encouraged to attend the tour. Addenda may be issued, in response to issues raised at the pre-bid conference and tour, or as the Owner and/or Professional may otherwise consider necessary.

   Attendees are encouraged to wear weather-appropriate garments and sturdy footwear appropriate for abandoned industrial sites. The project location is outside so attendees are encouraged to be prepared for inclement weather.

   The purpose of the pre-bid conference and inspection is to answer questions and provide an inspection tour of the Project site at the scheduled time on the day of the meeting. A representative will be available to assist the Contractors. Other inspection visits may be allowed if needed. Individuals needing special services to fully participate in the meeting due to a disability may contact Ms. Amy Keranen, MDEQ Project Manager at 906-337-0389.

6. **Equal Employment Opportunity** – Covenants to not discriminate in employment by Contractors, Subcontractors and Suppliers required by Law are contained in Instructions to Bidders and General Conditions and are applicable to the Work and any Sub-agreement under the Contract.

7. **Contract Times** – The Contract Times and the associated liquidated damages are specified in the Contract.

8. **Contact Person** – All requests or inquiries concerning the Bidding Documents or the Work must be addressed to: Jed Chrestensen, P.E., The Mannik & Smith Group, Inc., email: JChrestensen@manniksmithgroup.com.. Questions will be accepted until April 26, 2017 at 2:00 pm Local Time.

9. **Award** – Subject to any agreed extension of the period for holding Bids, Bids must remain valid for acceptance by the Owner for 60 Calendar Days after the date of Bid opening. In addition, the Owner expressly reserves the right, within the Owner's sole discretion, to reject any or all Bids, to waive any irregularities, to issue post-Bid Addenda and re-bid the Work without re-advertising, to re-advertise for Bids, to withhold the award for any reason the Owner determines and/or to take any other appropriate action.

10. **Performance and Payment Bonds** – A performance bond and a payment bond are required for all contracts over $50,000.00.

END OF SECTION 00010

SECTION 00100 INSTRUCTIONS TO BIDDERS

1. **PREPARATION OF BID:** Execute Bid fully and properly. Bid Summary Form (DTMB -0401D) and Bid Form Attachments must be used and completely filled out for the Bid to be considered responsive and meeting the requirements of the contract solicitation. All Bid prices must be printed or typed in both words and figures.

2. **BID CHECKLIST:** Submit Bid Summary Form with original signatures plus Bid Form Attachments in accordance with the electronic bidding procedures on the Buy4Michigan website.

A complete Bid will consist of the following forms, which are included immediately following the Bid Summary Form:

Bids	**SUBMIT THESE Bid Forms and Bid Form Attachments**
All Bids	☐ **Signed** and completed Bid Summary Form (DTMB-0401D);
	☐ Bid Schedule;
	☐ Schedule of Alternates;
	☐ Qualified Disabled Veteran (QDV) Business Representation;
	☐ Bid Security in the amount of 5% of Base Bid Price;
	☐ Signature Authorization or copy of the partnership agreement if signed by all partners;
Over $50K	☐ Forms listed under All Bids;
	☐ Payment and Performance Bond (upon issuing the Notice of Award).
Over $100K	☐ Forms listed under All Bids;
	☐ Certification of a Michigan Based Business;
	☐ Payment and Performance Bond (upon issuing the Notice of Award).
Over $250K	☐ Forms listed under All Bids;
	☐ Certification of a Michigan Based Business;
	☐ Payment and Performance Bond (upon issuing the Notice of Award).

Apparent Low Bidders ONLY (upon request from the Professional)

- ☐ Experience Modification Rating (EMR), or a letter stating why the Bidder does not have one.
- ☐ Identification of the proposed project superintendent, with a resume or list of similar projects handled by that individual.
- ☐ A list of at least three (3) projects completed by the Bidder, within the last three (3) years of similar size and complexity, with contact information for references for each.
- ☐ Proposed Project Schedule.
- ☐ List of subcontractors.

3. **BID SUBMISSION**: **Bids must be submitted electronically through the Buy4Michigan website at www.buy4michigan.com**.

4. **BID GUARANTEE:** Each proposal must be accompanied by either a bank certified or cashier's check on an open, solvent bank or a bid bond with an authorized surety company (the surety must be listed on the current U.S. Department of the Treasury Circular 570) in the amount of five percent of the base bid payable to the State of Michigan, as a guarantee of go7od faith. If the successful Bidder fails to furnish satisfactory bonds and insurance within fifteen Calendar Days after Notice of Award, such guarantee must be forfeited to the State as liquidated damages. The bid security, exclusive of bid bonds, of all unsuccessful Bidders will be returned when an award is made or upon substitution of a bid bond. The bid security of the successful Bidder will be returned when the performance bond and labor and material bond are approved.

5. **CERTIFICATE OF AWARDABILITY:** Not required.

6. **MICHIGAN BASED BUSINESS CERTIFICATION**: All Bidders submitting Bids in excess of $100,000.00 must complete the Certification of Michigan Based Business. This information will determine if a Bidder qualifies as a "Michigan" business for purposes of application of reciprocity where applicable.

7. **POST-BID SUBMITTAL: For projects over $250,000, the Professional will request a Post-Bid Submittal from the** Apparent Low Bidders. The Apparent Low Bidders must submit to the Professional, within **two** Business Days after receipt of the Professional's request,

   - Experience Modification Rating (EMR), or a letter stating why the Bidder does not have one.
   - Identification of the proposed project superintendent with a resume or list of similar projects managed by that individual.
   - A list of at least three (3) projects completed by the Bidder, within the last three (3) years of similar size and complexity, with contact information for references for each.

   Failure to provide the submittals may disqualify the Bid.

8. **SIGNATURES:** All Bids, notifications, claims, and statements must be signed as follows:

   (a) **Corporations:** Signature of official must be accompanied by a certified copy of the Resolution of the Board of Directors authorizing the individual signing to bind the corporation.
   (b) **Partnerships:** Signature of one partner must be accompanied by a signed copy of the legal document (e.g. Power of Attorney or partnering agreement) authorizing the individual signing to bind all partners. If Bid is signed by all partners, no authorization is required.
   (c) **Individual:** No authorization is needed. Each signature must be witnessed.

9. **BID PRICES:** The Bidder's Base Bid and Alternate Bid prices must include, and payment for completed Work will compensate in full for: all services, obligations, responsibilities, management, supervision, labor, materials, devices, equipment, construction equipment, general conditions, permits, patent fees and royalties, testing, inspection and approval responsibilities, warranties, temporary facilities, small tools, supplies, Bonds, insurance, taxes, mobilization, close-out, overhead and profit and all connections, appurtenances and any other incidental items of any kind or nature, as are necessary to complete the Work, in a neat, first quality, workmanlike and satisfactory manner in accordance with the Drawings and Specifications and as otherwise required to fulfill the requirements of the Bidding Documents. For each Cash Allowance item, the Bidder must include, within the Bid, all labor costs, construction equipment costs, insurance and Bond premiums and other general conditions costs and Fees (Bidder's and Subcontractors') to complete Work associated with the material, equipment or other designated item to be furnished under the Cash Allowance. For each Provisionary Allowance, the Bidder must include, within the Bid, insurance, premiums (not recoverable as labor burden) and Bond premiums required to complete Work that may be ordered under a Provisionary Allowance.

10. **INSPECTION OF BIDDING DOCUMENTS AND SITE CONDITIONS:** The Bidder must carefully review and inspect all documents referenced and made part of this ITB, site conditions, all applicable statutes, regulations, ordinances and resolutions addressing or relating to the goods and services under this contract. Failure to do so or failure to acquire clarifications and answers to any discovered conflicts, ambiguities, errors or omissions in the Bidding Documents will be at the Bidder's sole risk.

11. **SAFETY REQUIREMENTS AND LAWS:** The Bidder awarded the Contract must comply with all applicable federal, state and local Laws including health and safety regulations, environmental protection, permits and licensing.

12. **INTERPRETATIONS AND ALTERATIONS TO THE BID AND BIDDING DOCUMENTS:** All requests for clarification or interpretation of the Bidding Documents, all proposals for any modifications to the Bidding Documents, all requests for information and all other questions or inquiries about the Bidding Documents and/or the Work shall be submitted in writing to the Contact Person identified in the Bid Documents. Requests or inquiries received less than seven Calendar Days before the date of Bid opening will be answered only if (a) the response can be given through an Addendum made available at least seventy-two hours before Bid opening (counting Business Days only), (b) the Bid opening is postponed by Addendum, or (c) the Work is rebid without readvertising following the issuance of post-Bid Addenda.

    Bidders must not rely upon any oral statements or conversations regarding interpretations, clarifications, corrections, additions, deletions or other revisions or information to the Bidding Documents. Any addition, limitation or provision made with or attached to the Bid may render it non-responsive and/or irregular and be a cause for rejection. The Owner reserves the right to issue a post-Bid Addendum after opening the Bids and set a new date for the receipt and opening of sealed Bids. The Bidder acknowledges that any quantities of Unit Price Work given in this ITB are approximate only and payments will be made only for actual quantities of Unit Price Work completed in accordance with the Contract Documents.

13. **MODIFICATION OF BID:** The entire bid must be resubmitted on the Buy4Michigan website.

14. BID WITHDRAWAL: Except for timely filed claims of mathematical or clerical errors granted by the State, no Bid may be withdrawn within sixty Calendar Days after the Bid Opening time and date or before the Bid expiration date without forfeiting Bid security. The request to withdraw a Bid due to error must be submitted in writing along with the supporting documents within two Business Days after the date of Bid Opening. The claim must describe in detail the error(s), include a signed affidavit stating the facts of the alleged error(s) and request that the Bidder be released from its Bid. The review of the claim and its supporting documents by the State is only for the purpose of evaluating the Bidder's request and must not create duty or liability on the State to discover any other Bid error or mistake. The sole liability of any Bid error or mistake rests with Bidder.

15. OBJECTION TO THE AWARD: A Bidder may file a written protest with the Director-SFA to object to the Apparent Low Bidder. This objection must be filed within seven Calendar Days after the date of Bid opening and must describe in detail the basis for the protest and request a determination. The Director-SFA will either dismiss or uphold the protest and notify the protestor within ten Calendar Days after receipt of the written protest.

16. BID IRREGULARITIES: The following irregularities on any Bid Form or Bid Form Attachment must be resolved as follows:

(a) between words and figures, the words must be used;
(b) between any sum, computed by the Bidder, and the correct sum, the sum computed by the Bidder must be used;
(c) between the product, computed by the Bidder, of any quantity and Bid Unit Price and the correct product of the Unit Price and the quantity of Unit Price Work, the product extended by the Bidder must be used;
(d) between a stipulated Allowance and the amount entered, the Allowance must be used;
(e) any mobilization pay item exceeding the maximum specified must be ignored and the Bid must remain unchanged;
(f) if any Bidder fails or neglects to bid a Unit Price for an item of Unit Price Work but shows an "Bid Price" for that item, the missing unit price must be computed from the respective quantity and the Item Bid Price shown;
(g) if any Bidder fails or neglects to show a "Bid Price" for an item of Unit Price Work but bids a unit price, the missing Bid Price must remain as "zero"; and
(h) if any Bidder fails or neglects to enter a Bid Price in both words and figures, the Bid Price printed or typed, whether in words or figures, must be used.

17. CERTIFICATION: The bidder certifies to the best of its knowledge and belief that, within the past three (3) years, the bidder, an officer of the bidder, or an owner of a 25% or greater interest in the bidder:

(a) Has not been convicted of a criminal offense incident to the application for or performance of a contract or subcontract with the State of Michigan or any of its agencies, authorities, boards, commissions, or departments.
(b) Has not had a felony conviction in any state (including the State of Michigan).
(c) Has not been convicted of a criminal offense which negatively reflects on the bidder's business integrity, including but not limited to, embezzlement, theft, forgery, bribery, falsification or destruction of records, receiving stolen property, negligent misrepresentation, price-fixing, bid-rigging, or a violation of state or federal anti-trust statutes.
(d) Has not had a loss or suspension of a license or the right to do business or practice a profession, the loss or suspension of which indicates dishonesty, a lack of integrity, or a failure or refusal to perform in accordance with the ethical standards of the business or profession in question.
(e) Has not been terminated for cause by the Owner.
(f) Has not failed to pay any federal, state, or local taxes.
(g) Has not failed to comply with all requirements for foreign corporations.
(h) Has not been debarred from participation in the bid process pursuant to Section 264 of 1984 PA 431, as amended, MCL 18.1264, or debarred or suspended from consideration for award of contracts by any other State or any federal Agency.
(i) Has not been convicted of a criminal offense or other violation of other state or federal law, as determined by a court of competent jurisdiction or an administrative proceeding, that in the opinion of DTMB indicates that the bidder is unable to perform responsibly or which reflects a lack of integrity that could negatively impact or reflect upon the State of Michigan, including but not limited to, any of the following offenses under or violations of:
    1. The Natural Resources and Environmental Protection Act, 1994 PA 451, MCL 324.101 to 324.90106.
    2. A persistent and knowing violation of the Michigan Consumer Protection Act, 1976 PA 331, MCL 445.901 to 445.922.
    3. 1965 PA 166, MCL 408.551 to 408.558 (law relating to prevailing wages on state projects) and a finding that the bidder failed to pay the wages and/or fringe benefits due within the time period required.
    4. Repeated or flagrant violations of 1978 PA 390 MCL 408.471 to 408.490 (law relating to payment of wages and fringe benefits).
    5. A willful or persistent violation of the Michigan Occupational Health and Safety Act, 1974, PA 154, MCL 408.10001 to 408.1094, including: a criminal conviction, repeated willful violations that are final orders, repeated violations that are final orders, and failure to abate notices that are final orders.
    6. A violation of federal or state civil rights, equal rights, or non-discrimination laws, rules, or regulations.
    7. Been found in contempt of court by a Federal Court of Appeals for failure to correct an unfair labor practice as prohibited by Section 8 of Chapter 372 of the National Labor Relations Act, 29 U. s. C. 158 (1980 PA 278, as amended, MCL 423.321 et seq).
(j) Is not an Iran-Linked Business as defined in MCL 129.312.

A false statement, misrepresentation or concealment of material facts on this certification may be grounds for rejection of this proposal or termination of the award and may be grounds for debarment.

18. REJECTION OF BID: The Bidder acknowledges the right of the Owner to reject any Bids and to waive any informality, defects or irregularity in any Bid received. In addition, the Bidder recognizes the right of the Owner to reject a Bid if:

(a) the Bid is in any way incomplete or irregular;
(b) the Bidder, Subcontractor or Supplier is not responsible as determined by the Owner;
(c) the Bidder's performance as a Contractor was unsatisfactory under a prior Contract with the Owner for the construction, repair, modification or demolition of a facility with the Owner, or under any other Contract, which was funded, directly or indirectly, by the Owner;
(d) there are reasonable grounds for believing that collusion or unlawful agreements exists between any Bidders, that a Bidder is interested in more than one Bid, or that the Bid is not genuine;
(e) the Bid exceeds the funds available.

19. MATERIALS AND EQUIPMENT SUBSTITUTION: Any Bidder wishing to use manufacturers or materials other than those specified must submit a written request to the Professional not later than seven days before due date for Bids. Request must be accompanied by product data to permit evaluation and comparison with specified products or materials. The Person submitting the request will be responsible for its prompt delivery. The Professional and the Owner will examine and evaluate the product data and if found acceptable, an Addendum will be issued and mailed or delivered to each Person who has received a set of Drawings and Specifications. All Addenda issued must be made a part of the Contract requirements. Contractor will be responsible for any extra work and expense incurred to satisfactorily and completely incorporating each substitute product into the Project.

20. MICHIGAN PRODUCTS AND RECYCLED PRODUCTS: All Contractors and Suppliers are encouraged to provide Michigan-made products and/or recycled products and/or green products and/or environmentally-friendly products whenever possible where price, quality, and performance are equal to, or superior to, non-Michigan products and the requirements of the Contract Documents. A list of Michigan-made products is available at: www.michigan.gov/dcd. The Contractor will be required to use alternatives to landfills for waste disposal such as reuse or recycle of asphalt, bricks, concrete, masonry, plastics, paint, glass, carpet, metals, wood, drywall, insulation and any other waste materials to the extent practical.

21. PRE-AWARD PRODUCT SUBMITTALS: If requested, the Apparent Low Bidders must submit a summary of preliminary technical data on each product listed in NA. The Apparent Low Bidders will furnish this summary data to the Professional within forty-eight hours of the Bid Opening. These submittals will be used to evaluate the Bid before the award. Failure to provide the submittals may disqualify the Bid.

22. CONTRACT AND CONTRACT AWARD: The Owner intends to award a Contract to the responsive and responsible best value bidder, except as provided below relative to veteran's preference.

22.1 Determination of the lowest three Bidders shall be on the basis of the sum of the Base Bid and any additive and deductive Alternates the Owner accepts, in the order in which they are listed only. The Owner will accept an Alternate only if all other previously listed Alternates are also accepted, unless acceptance by the Owner of Alternates in a different order does not affect determination of the lowest three bidders in any way.

22.2 The bids will be evaluated for best value based on price and qualitative components by comparing the qualitative components of the three lowest responsive and responsible Bidders. The comparison may also include other Bidders whose bids are within 10% of the lowest responsive and responsible Bidder.

22.3 If a Qualified Disabled Veteran meets the requirements of the contract solicitation and with the veteran's preference is the lowest Bidder, the Owner will award the contract to the Qualified Disabled Veteran bidder. A determination as to whether the requirements of the bid solicitation have been met will be based solely on the Owner's and Professional's evaluation of the Bid Summary, Bid Attachments, Bidder-provided documents, and interview.

22.4 For the purpose of evaluating and determining the low responsive bid, 10% of the lowest responsive bid (the bid that would otherwise receive the contract award if the preference were not being considered) will be deducted from all QDV bids. If the low responsive QDV bid, less the 10% preference, is less than the lowest responsive bid, then the QDV bid will be declared the official low responsive bid. The original QDV bid amount will be the basis of the contract award.

Example:

Lowest Responsive Bid	$100,000
Lowest Responsive QDV Bid	$109,000
Preference (10% of the Lowest Responsive Bid)	$ 10,000
Lowest Responsive QDV Bid Less Preference	$ 99,000 ($109,000 - $10,000)
Official Low Responsive Bid	**$109,000**

22.5 The Apparent Low Bidders will be evaluated for responsiveness and responsibility based on the following:

- Compliance with the bid specifications and requirements.
- The Bidder's financial resources.
- The Bidder's technical capabilities.
- The Bidder's technical experience.
- The Bidder's past performance.
- The Bidder's insurance and bonding capacity.
- The Bidder's business integrity.

Some qualitative components that may be evaluated are:

- Technical approach.
- Quality of proposed personnel.
- Management plans.
- Schedule for commencing and completing the work.
- Proposed project team.

22.6 For contracts under $250,000, best value will primarily be based on the lowest responsive and responsible bid.

23. **CONTRACT TIME; LIQUIDATED DAMAGES:** Work of all trades as specified in the Contract Documents must be completed in 50 calendar days from the date of Notice-to-Proceed except for minor replacement, correction, or adjustment items which do not interfere with the complete operation and utilization of all parts of the Contract Work. This Contract Time is of the essence and liquidated damages for each Calendar Day that expires after this Substantial Completion of the entire Work must be in the amount of $ 1,000.00. Liquidated damages are not a penalty, are cumulative and represent a reasonable estimate of the Owner's extra costs and damages, which are difficult to estimate with accuracy in advance.

24. MOBILIZATION: If used in the Specifications/Bid schedule, all the up-front costs incurred by the Contractor must be covered by the mobilization. The costs to establish temporary site offices, to obtain required permits for commencing the Work and for bonds and insurance premiums are examples of costs to the Contractor that are covered by mobilization pay item. This cost must not exceed four percent (4%) of the Base Bid, unless otherwise expressly provided in the Bidding Documents.

25. SOIL EROSION AND SEDIMENTATION CONTROL: All Work under this Contract must meet the storm water management requirements of the Project and comply with the applicable Soil Erosion and Sedimentation Control (SESC) rules and regulations and specific provisions for same within the Contract Documents. SESC measures will be monitored and enforced by the State Facilities Administration, or another authorized enforcing agency if so delegated, through the review of the Contractor's implementation plans and site inspections. State Facilities Administration or the Professional will notify the Contractor in writing of any violation(s) of the applicable SESC statutes and/or the corrective action(s) undertaken by the Owner and may issue stop work orders. State Facilities Administration has the right to assess a fine to the Contractor for noncompliance with the provisions of the Contract Documents and/or SESC regulations applicable to this Work and fines must be in addition to any other remediation costs or liquidated damages applicable to the Project and may exceed the value of the Contract.

END OF SECTION 00100

SECTION 00120 SUPPLEMENTARY INSTRUCTIONS

The provisions of this Section amend or supplement Section 00100 Instructions to Bidders and those other provisions of the Bidding Requirements that are indicated below. All other Bidding Requirements that are not so amended or supplemented remain in full force and effect.

SI - 1. Delete the fourth sentence of Article 19 in its entirety and replace with the following: "The Professional and the Owner will examine and evaluate the product data and if found acceptable, an Addendum will be issued and posted to the Buy4Michigan website at www.buy4michigan.com."

SI - 2. Add the following language at the end of Paragraph 22.5 of Article 22 in Section 00100 Instructions to Bidders: "'Lack of adequate experience or demonstrated qualifications or capability to perform the trades or classifications of the Work specified shall be defined as any bidder who has not successfully completed at least two previous projects in similar size and scope as the Work specified in which they were the prime Contractor."

SI - 3. Add the following language in a Paragraph 22.7 of Article 22 of Section 00100 Instructions to Bidders: "The Apparent Low Bidder will be required to attend a Pre-Award conference(s)."

SI - 4. Revise Article 25 of Section 00100 Instructions to Bidders as follows: Replace all references to the "State Facilities Administration" with the "Houghton County Drain Commissioner".

END OF SECTION 00120

SECTION 00200 INFORMATION FOR BIDDERS

1. UNDERGROUND UTILITIES

Information or data about physical conditions of existing Underground Utilities, which have been used by the Professional in preparing the Bidding Documents, is shown or indicated in the Drawings and technical Specifications and those Underground Utility drawings itemized immediately below.

- None

2. PERMITS, APPROVALS, LICENSES AND FEES

2.1 If the Owner has secured or will secure any permits, approvals and licenses and has paid or will pay any associated charges and fees, any such permits, approvals and licenses are itemized in this paragraph: None

2.2 If any permits, approvals and licenses itemized above have been obtained by the Owner and the fees have been paid, copies of those permits, approvals, licenses and corresponding fee receipts, are attached to this Section 00200 Information for Bidders.

Except for any permits, approvals, licenses and fees identified above, the Contractor shall be responsible for all permits, approvals, licenses and fees applicable to Work.

3. SEQUENCING REQUIREMENTS

Refer to the technical Specifications, including, but not limited to the General Requirements, for information, data and criteria on sequences of Work restraints, construction and maintenance of service to existing facilities, which, if provided, must govern the selection of Work sequences. Each Bidder must be responsible for any conclusions or interpretations the Bidder makes related to the selection of sequences and Means and Methods, based on the technical data made available, and/or those additional investigations or studies made or obtained by that Bidder.

4. SUBSURFACE CONDITIONS

In preparing the bidding documents, the PSC used the reports of explorations and tests of subsurface conditions itemized immediately below. If those reports are listed and not attached to this Section, they are available at http://www.michigan.gov/deq/0,4561,7-135-3311_4109_9846_76560---,00.html.

- Site Inspection Report for C&H Lake Linden Operations, June 2014.
- Site Investigation Report for Abandoned Mining Waste Torch Lake Non-Superfund Site, Calumet and Hecla – Lake Linden Operations, Houghton County, Michigan, March 2016.

4.1 Information or data contained in those reports that may be properly considered Authorized Technical Data concerning subsurface conditions include (NOTE: All other information or data excluded from the list below represent Non-Technical Information or Data, interpretations or opinions):

- Laboratory analytical results.
- Boring logs.

4.2 In preparing the bidding documents, the PSC has not used the following reports of explorations and tests of subsurface conditions itemized immediately below. Those reports are available at the office of the Professional for review or purchase. Neither the Owner nor Professional warrants that this list identifies all existing relevant documents. NA

5. OTHER PHYSICAL CONDITIONS

5.1 The Drawings and technical Specifications and those drawings itemized immediately below contain information or data that have been used in the preparation of the Bidding Documents, and that may be properly considered Authorized Technical Data concerning physical conditions of existing surface and subsurface facilities. If those drawings and specifications are listed and not attached to this Section, they are available for purchase ($__50.00__ per copy) from the Professional. NA

5.2 The reference documents itemized immediately below have not been used in the preparation of the Bidding Documents, and are available for review or purchase. Information and data contained in those reference documents, including, but not limited to dimensions, locations and conditions of existing surface and subsurface structures, roadways, piping, raceways, equipment, etc. may not accurately or reliably reflect actual conditions. Neither the Owner nor Professional warrants that this list identifies all existing relevant documents. NA

END OF SECTION 00200

SECTION 00700 GENERAL CONDITIONS

1. Interpretations: Any requests for clarifications or interpretations of the Contract Documents must be in writing to the Professional, who will issue written clarifications or interpretations as appropriate. If the Contractor believes that such clarification or interpretation justifies an adjustment to the Contract Price/Time, the Contractor must promptly notify the Professional in writing before proceeding with the Work Involved.

1.1 **Standards**: The Contract Documents describe the entire Work. The provisions of the Contract Documents must govern over any standard specifications, manual or code of any technical society, organization or association but, if lower than the standards set by any Law applicable to the Work or the Project, the higher standards must govern. The Contractor's responsibilities extend to cover Subcontractors and Suppliers if liable as a result of their actions or obligations.

1.2 **Contract Time Computation**: The time to complete the Work must be made in Calendar Days and must include both the first and last day. The first day is established by the Notice-to-Proceed.

1.3 **Technical Specifications and Priority:** The following applies whenever priority is called for in Contract Documents: specifications must govern Drawings; figured dimensions must govern scaled dimensions; detail drawings must govern general drawings; Drawings must govern Submittals.

1.4 **Indemnification:** The Contractor is required to defend, indemnify and hold harmless the Owner and the Professional, their employees, agents, servants, and representatives from and against all claims, suits, demands, actions of whatever type and nature and all judgments, costs, losses and damages, whether direct, indirect or consequential including, but not limited to, charges of architects, engineers, attorneys and others and all court, hearing and any other dispute resolution costs arising from:

(a) any patent or copyright infringement by the Contractor;
(b) any damage to the premises or adjacent lands, areas, properties, facilities, rights-of-way and easements, including loss of use to the business and property of others as a result of Contractor's operations;
(c) any bodily injury, sickness, disease or death, or injury to or destruction of property, including loss of use due to or related to the Work and caused in whole or in part by the Contractor or Subcontractor or Supplier's negligence, omissions or failure to maintain the required insurance and coverage and;
(d) a failure by the Contractor to appropriately handle Hazardous Materials for the Work or the Contractor's operations in compliance with the Owner requirements and/or applicable Laws and regulations.

The indemnification obligations are not affected by the limitation on the amount and types of damages, compensation or benefits payable by or for the Contractor or Subcontractor or Supplier under worker's or workman's compensation acts, disability benefit acts or other employee benefit acts.

1.5 **Contract Documents Ownership:** The State is the owner of the Contract Documents. The Contractor, Subcontractor or Supplier must not reuse any of the documents on any other Project without prior consent of the State and Professional. The Professional will furnish on behalf of the Owner at no cost to the Contractor, up to ten copies of Drawings and Project Specifications.

2. GENERAL PROVISIONS

2.1 **Owner:** the Project Director and/or Owner Field Representative will represent the Owner. Neither the Project Director nor the Owner Field Representative has the authority to interpret the requirements of the Contract Documents or to authorize any changes in the Work or any adjustment in Contract Price/Time. The State will provide the necessary easements for permanent structure and permanent changes in existing lands, areas, properties and facilities. However, the Contractor must obtain, at no increase in Contract Price/Time, permits for any other lands, areas, properties, facilities, rights-of-way and easements required by the Contractor for temporary facilities, storage, disposal of soil or waste material or any other purpose. The Contractor must submit copies of the permits and written agreements to the Owner. The Contractor must engage a registered land surveyor to

establish the necessary reference points and/or base lines for construction and must be responsible for protecting them including benchmarks and Project elevations.

2.2 **Professional:** Acting as the Owner's representative during the Contract Time period, the Professional will endeavor to guard the Owner from Defective work and to keep the Owner informed of the progress of the Work. Unless delegated by specific written notice from the Owner, the Professional and the Professional's representatives do not have the authority to authorize any changes in the Work or any adjustment in Contract Price/Time. The On-site Inspections by the Owner Field Representative and/or the Professional do not relieve the Contractor from its obligation to provide the Work in accordance with the Contract Documents or represent acceptance of Defective Work.

2.3 **Contractor:** The Contractor must manage, supervise, and direct the Work competently, applying the management, supervision, skills, expertise, scheduling, coordination and attention necessary to provide the Work in accordance with the Contract Documents with a minimum disturbance to or interference to the business operations on site or adjacent properties. The Contractor must assign and maintain a competent full-time **superintendent** on the Work, as its representative, at all times while Work is being done on site and must not be replaced without the Owner's consent. The Contractor shall enforce good order among its employees and shall not employ on the work any disorderly, intemperate, or unfit persons, or not skilled in the work assigned to them. The Contractor is solely responsible for his Means and Methods, safety precautions and programs related to safety, the Contractor's failure to execute the Work in accordance with the Contract Documents and any act of omissions by the Contractor, Subcontractor or Supplier. The Contractor must **compare Contract Documents for conflicts**, unworkable or unsafe specified Means and Methods and verify against manufacturer's recommendations for installations and handling and must notify the Professional in writing of the discovery of any such conflicts or errors. The Contractor is required to furnish certifications that lines and grades for all concrete work were checked before and after placing concrete, and that final grades are as required by the Contractor Documents. Wherever required, the Contractor must be responsible for all cutting, fitting, drilling, fixing-up, and patching of concrete, masonry, gypsum board, piping and other materials that may be necessary to make in-place Work and dependent Work fit together properly. The Contractor must restore to pre-existing conditions all walks, roadways, paved or landscaped areas and other real and personal property not designated for alteration by the Contract Documents. The Contractor must maintain at the site one copy of material safety data sheets (MSDS) and one copy of all **as-built/Record Documents** in good order and annotated in a neat and legible manner to show:

(a) all revisions made,
(b) dimensions noted during the furnishing and performance of the Work, and
(c) all deviations between the as-built installation and the Contract Documents, all approved Submittals and all clarifications and interpretations.

The Contractor must maintain and furnish promptly to the Owner and the Professional upon their request **daily field reports** recording the on-site labor force and equipment (Contractor and Subcontractors); materials/equipment received; visits by Suppliers; significant in-progress and completed trade Work within major areas; and other pertinent information. The Contractor is obligated to act to prevent threatened damage, death, injury or loss without any special instruction in **emergencies** and must give the Owner prompt written notice of any changes in Work resulting from the action taken for review and approval.

2.4 **Subcontractors and Suppliers:** The Owner assumes no contractual obligations to anyone other than the Contractor. All trade construction Drawings must be field coordinated before fabrication and/or installation. The Owner reserves the right to reject or revoke, for its convenience, any approved Subcontractor/Supplier. Work performed by any Subcontractor or Supplier must be through an appropriate written agreement that:
(a) expressly binds the Subcontractor/Supplier to the requirements of the Contract Documents,
(b) requires such Subcontractor or Supplier to assume toward the Contractor all the obligations that the Contractor assumes toward the Owner and the Professional, and
(c) contains the waiver of rights and dispute resolution provisions.

2.5 **Access to Payroll Records:** The Contractor and its Subcontractors must comply with the Prevailing Wage Rates for the county where the Project is located, and must maintain and keep, in accordance with generally accepted accounting principles, records pertaining to the bidding, award and performance of the Work, including, but not limited to certified payroll, employment records and all data used in estimating the Contractor's prices for the Bid, Change Order, proposal or claim. The Owner or its representative must have access to those records, must have the right to interview the Contractor's employees and must be provided with appropriate facilities for the purpose of inspection, audit/review and copying for five years after final payment, termination or date of final resolution of any dispute, litigation, audit exception or appeal. The payroll and other employment records of workers assigned to the site must contain the name and address of each worker, correct wage classification, rate of pay, daily and weekly number of hours worked, deduction made and actual wages paid. The Contractor must maintain records that show: (a) the anticipated costs or actual costs incurred in providing such benefits, (b) that commitment to provide such benefits is enforceable, and (c) that the plan or program is financially responsible and has been communicated in writing to the workers affected.

3. Bonds and Insurance:

3.1 Both the Performance Bond and Payment Bond must remain in effect from the date of Contract Award until final completion of the Work or the end of Correction Period, whichever comes later. The surety bonds required for a Construction Contract will

not be accepted by SFA unless the surety bonding company is listed in the current United States Government, Department of Treasury's, Listing of approved sureties (bonding/insurance companies), Department Circular 570. Copies of the current Circular listing may be obtained through the internet web site at http://www.fms.treas.gov/c570/c570.html.

Insurers must have an "A-" A.M. Best Company Rating and a Class VII or better financial size category as shown in the most current A.M. Best Company ratings. Insurance must be provided by insurers authorized by the Department of Insurance and Financial Services (DIFS) to do business as an insurer in Michigan. The insurance company and must attach evidence of the authorization. These certificates must specify the Project File No., Index No., Project Title, and a description of the Project. The Contractor agrees that insurance coverage afforded under the policies as such coverage relate to the State under this Contract as determined by the Contractor will not be modified or canceled without at least thirty calendar days prior written notice to the State. The latest A.M. Best's Key Ratings Guide and the A.M. Best's Company Reports (which include the A.M. Best's Ratings) are found at: http://www.ambest.com. The Contractor must not perform any part of the Work unless the Contractor has all the required insurance in full force and effect.

3.2 The Contractor is required to provide proof of the minimum levels of insurance coverage as indicated below. The purpose of this coverage must be to protect the State from claims which may arise out of or result from the Contractor's performance of services under the terms of this Contract, whether such services are performed by the Contractor, or by any subcontractor, or by anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable.

The Contractor waives all rights against the State for recovery of damages to the extent these damages are covered by the insurance policies the Contractor is required to maintain pursuant to this Contract. The Contractor also agrees to provide evidence that all applicable insurance policies contain a waiver of subrogation by the insurance company.

All insurance coverages provided relative to this Contract/Purchase Order is PRIMARY and NON-CONTRIBUTING to any comparable liability insurance (including self-insurances) carried by the State.

The Insurance must be written for not less than any minimum coverage herein specified or required by law, whichever is greater. All deductible amounts for any of the required policies are subject to approval by the State.

The State reserves the right to reject insurance written by an insurer the State deems unacceptable.

BEFORE THE CONTRACT IS SIGNED BY BOTH PARTIES OR BEFORE THE PURCHASE ORDER IS ISSUED BY THE STATE, THE CONTRACTOR MUST FURNISH TO THE DIRECTOR-SFA CERTIFICATE(S) OF INSURANCE VERIFYING INSURANCE COVERAGE. THE CERTIFICATE MUST BE ON THE STANDARD "ACCORD" FORM. THE CONTRACT OR PURCHASE ORDER NUMBER MUST BE SHOWN ON THE CERTIFICATE OF INSURANCE TO ASSURE CORRECT FILING. All such Certificate(s) are to be prepared by the Insurance Provider and not by the Contractor. All such Certificate(s) must contain a provision indicating that coverages afforded under the policies WILL NOT BE CANCELLED, MATERIALLY CHANGED, OR NOT RENEWED without THIRTY days prior written notice, except for 10 days for non-payment of premium, having been given to the Director-SFA Such NOTICE must include the CONTRACT NUMBER affected and be mailed to the Project Director.

The Contractor is required to provide the type and amount of insurance below:

(a) Commercial General Liability Insurance with a limit of not less than $1,000,000 each occurrence. If such CGL insurance contains a general aggregate limit, it must apply separately to this project.

The Contractor must list the State, its departments, divisions, agencies, offices, commissions, officers, employees and agents as ADDITIONAL INSUREDS on the Commercial General Liability policy.

(b) Vehicle Liability Insurance for bodily injury and property damage as required by law on any auto including owned, hired and non-owed vehicles used in the Contractor's business.

The Contractor must list the State, its departments, divisions, agencies, offices, commissions, officers, employers and agents as ADDITIONAL INSUREDS on the vehicle liability policy.

(c) Worker's disability compensation, disability benefit or other similar employee benefit act with minimum statutory limits.

NOTE:

(i) If coverage is provided by a State fund or if Contractor has qualified as a self-insurer, separate certification must be furnished that coverage is in the state fund or that Contractor has approval to be a self-insurer;
(ii) Any citing of a policy of insurance must include a listing of the States where that policy's coverage is applicable; and
(iii) This provision must not be applicable where prohibited or limited by Michigan law.

(d) Employer's Liability Insurance with the following minimum limits:

$1,000,000 each accident

$1,000,000 each employee by disease
$1,000,000 aggregate disease

(e) Pollution Liability Insurance in the amounts of not less than $1,000,000 per occurrence is required.

3.3 **Liability Insurance:** Liability insurance must be endorsed to list as additional insureds the Professional's consultants and agents. Worker's Compensation, Employer's Liability Insurance and all other liability insurance policies must be endorsed to include a waiver of rights to recover from the Owner, Professional and the other additional insureds. The Contractor's liability insurance must remain in effect through the Correction Period and through any special correction periods. For any employee of the Contractor who is resident of and hired in Michigan, the Contractor must have insurance for benefits payable under Michigan's Worker's Compensation Law. For any other employee protected by Worker's Compensation Laws of any other state, the Contractor must have insurance or participate in a mandatory state fund, where applicable, to cover the benefits payable to any such employee. These requirements must not be construed to limit the liability of the Contractor or its insurers. The Owner does not represent that the specified coverage or limits of insurance are sufficient to protect the Contractor's interests or liabilities.

3.4 **Builder's Risk Insurance:** Unless indicated otherwise in the bid document, the Contractor will purchase and maintain property insurance for 100% of actual cash replacement value of the insurable Work while in the course of construction, including foundations, additions, attachments, and all fixtures, machinery and equipment belonging to and constituting a permanent part of the building structures. The property insurance also will cover temporary structures, materials and supplies to be used in completing the Work, only while on the building site premises or within five hundred feet of the site. The property insurance insures the interests of the Owner, Contractor and all Subcontractors and Suppliers at any tier as their interest may appear. The property insurance insures against "all risk" of physical loss or damage to the extent usually provided in policy forms of insurers authorized to transact this insurance in Michigan. A copy of the master insurance policy will be available for review by the State, upon request.

3.5 The Owner and Contractor intend that the required policies of property insurance must protect all the parties insured and provide primary coverage for all losses and damages caused by the perils covered. Accordingly, to the extent that the insurance company pays claims, the Owner and the Contractor and its Subcontractors/Suppliers waive all rights against each other for any such losses and damages and also waive all such rights against the Professional and all other persons named as insureds or additional insureds.

4. Prosecutions; Substantial Completion:

4.1 The Contractor must not start the Work at the site before the first day established by the Notice to Proceed and/or before all insurance is in effect. A pre-construction conference will be held with the Contractor to review its Progress Schedule, qualifications of its key personnel, its proposed access to the site, traffic and parking, procedures for submittal, change orders, etc., and to exchange emergency contact information. The Contractor must use its accepted Progress Schedule when making proposals or claims for adjustment in Contract Time/Price.

4.2 Except in an Emergency, all Work at the site must take place during normal working hours; 6:00 AM to 6:00 PM, during Business Days and in accordance with the special working conditions for the Agency. If the Contract Documents allow work outside the normal hours, the Contractor must provide a written notice to the Owner twenty-four hours before performing such Work and must reimburse the Owner any related increase in the costs incurred by the Owner such as overtime charges of the Professional and payments for custodial and security personnel.

4.3 If, upon inspection and completing all pre-requisite testing of the Work, the Contractor considers that a portion of the work or all of the Work is substantially completed, it must provide a list of items to be corrected or completed to the Owner and the Professional for joint inspection. Within ten Calendar Days of this joint inspection, the Professional will deliver to the Owner and Contractor a list of incomplete/Defective work or a Certificate of Substantial Completion with a Punch List. The certificate must:

(a) fix a reasonable date of Substantial Completion,
(b) fix a date for completion of the Punch List, and
(c) recommend the division of responsibilities between the Owner and Contractor for utilities, security, safety, insurance, maintenance, etc.

Upon issuing the Certificate of Substantial Completion, the Owner will pay for the completed Work subject to (a) withholding of two hundred percent of the value of any uncompleted Work, as determined by the Professional, and (b) any other deductions as the Professional may recommend or may withhold to cover Defective work, liquidated damages and the fair value of any other items entitling the Owner to a withholding. Prerequisites for Substantial Completion, over and above the extent of Work completion required, include (a) receipt by the **Owner** of operating and maintenance documentation, (b) all systems have been successfully tested and demonstrated by the **Contractor** for their intended use, and (c) the **Owner** having received all required certifications and/or occupancy approvals from the State and those Political Subdivisions having jurisdiction over the Work. Receipt of all certifications and/or occupancy approvals from those Political Subdivisions with jurisdiction in and of itself does not necessarily connote Substantial Completion. The Contractor must provide all related operating and maintenance (O&M) documentation to the Owner before training if training is required and not later than Substantial Completion otherwise. The

Contractor must give the Owner the final O&M documentation (with revisions made after Substantial Completion) before the request for final payment.

4.4 The Owner may decide to use, at its sole option, any functioning portion of the Work and will inform the Contractor in writing of the decision. The portion of Work to be used must be jointly inspected to determine the extent of completion if it has not undergone the inspection for Substantial Completion. The Professional must prepare a list of items to be corrected/completed and the Owner will allow the Contractor reasonable access to correct/complete the listed items and finish other work.

5. Warranty; Tests, Inspections and Approvals; Corrections of Work:

5.1 **Warranty:** The Contractor must furnish the State with a written guarantee to remedy any defects due to faulty materials or labor which appear in the Work within one year from the date of final acceptance by the State. This warranty excludes defect or damage caused by (a) abuse, modification by others, insufficient or improper operation or maintenance, or (b) normal wear and tear under normal usage. Manufacturer warranties for materials and equipment received by the Contractor must be assigned and promptly delivered to the Owner at Substantial Completion. The warranties period starts from the date of the substantial completion and must be in full force and effect for the entire duration of the Correction Period.

Roof Warranty: For roofing systems, the following warranties are required as minimum:

(a) A two-year contractors warranty against any defects due to faulty materials or labor;
(b) A fifteen-year manufacturer's total system warranty; and
(c) A twenty-year membrane/shingles/tiles warranty.

5.2 **Tests, Inspections and Approvals:** The Owner will perform or retain a professional/agency to perform inspections, tests or approvals for those materials required to meet quality control standards specified in the Contract Documents. However, the Contractor must assume full responsibility for any testing, inspection or approval
(a) required to meet code requirements, as promulgated by code inspecting authorities;
(b) required by Law;
(c) indicated or required by the Contract Documents;
(d) required for the Professional's acceptance of a Supplier, materials or equipment or mix designs submitted for prior approval by the Contractor; or
(e) Defective work, including an appropriate portion of the Delay and costs occasioned by discovery of Defective work. The Contractor must (a) pay all related costs; (b) schedule related activities; and (c) secure and furnish to the Professional the required certificates of inspection, testing or approval. The Contractor must provide proper and safe access to the site for inspection, testing or approval. The Contractor must provide the Professional a timely notice whenever any Work is ready for inspection, testing or approval. If the Contractor covers any Work without proper approval by the Professional as required by the Contract Documents, the Contractor must, at its own expense, uncover, expose or otherwise make available, when requested by the Professional or Owner, for testing, inspection or approval of the covered Work.

5.3 **Correction of Work:** If any testing, inspection or approval reveals Defective Work and the Work is rejected by the Professional, the Contractor, at its sole expense, must promptly, as directed, correct or remove the Defective Work from the site and replace it with non-Defective Work within the Correction Period. The Contractor must bear responsibility for its proportionate share of the Delay and costs resulting from the correction and/or removal and replacement of Defective Work. If the Contractor, within reasonable and agreed upon time after receipt of written notice, (a) fails to correct Defective Work or remove and replace rejected Work, or (b) fails to correct or complete items on any Punch List, or (c) fails to perform Work in accordance with the Contract Documents, or (d) fails to comply with any other provision of the Contract Documents, the Owner, directly or through others, after seven Calendar Days from the date of the written notice to the Contractor, may correct and remedy the Defective Work. To the extent necessary to correct and remedy such Defective Work, the Owner must be allowed to exclude the Contractor from all or part of the site; take possession of all or part of the Work and stop related operations of the Contractor; take possession of the Contractor's tools, plant and office and construction equipment at the site; and incorporate into the Work materials and equipment for which the Owner has paid the Contractor. The Contractor must allow the Owner and the Professional easy access to the site to correct such Defective Work. The Owner must be entitled to an appropriate decrease in Contract Price for all claims, costs, losses, damages and Delay incurred or sustained by the Owner which are attributable to the Contractor. Such costs may include, but not limited to, costs of correction or removal and replacement of Defective Work, costs of repair and replacement of other work destroyed or damaged by the action and related charges of the Professional. If the discovery of the Defective Work takes place after final payment and the Contractor fails to correct and pay the Owner any of these costs, the Owner must demand due performance under the Performance Bond. Until the period of limitation provided by Michigan Law, the Contractor must promptly, and upon receipt of written notice from the Owner, correct Defective Work. In the event of an Emergency or unacceptable risk of loss or damage or if appropriate under the circumstances, the Owner, directly or through others under contract with the Owner, may correct or remove and replace the Defective Work. The specified correction of Work requirements have no limitation on the rights of the Owner to have Defective Work corrected or removed and replaced, if rejected, except as otherwise provided by the Michigan Law.

5.4 **Special Correction Period Requirements:** Whenever the Owner undertakes any portion of the Work because the Contractor's act or omission Delays completion of the Work or it is eligible for Partial Use, the warranties for all materials and equipment incorporated into that portion of the Work must remain in full force and effect between the start of such Partial Use and the date when the Correction Period starts. The Correction Period for any Defective Work that is corrected or rejected and

replaced within the last three months of the Correction Period must be extended by an additional six months, starting on the date such Work was made non-Defective.

5.5 **Special Maintenance Requirements:** If the Contract Documents specify that the entire Work, or a portion of the Work, upon reaching Substantial Completion, must not be placed in use by the Owner, the Contractor must maintain the Work, or specified part of the Work, in good order and proper working condition and must take all other actions necessary for its protection between the certified date of Substantial Completion and the date when the Work, or designated part of the Work, is placed in use. If no separate price for such special maintenance period was requested and made part of the Contract Documents, the Owner will amend the Contract Documents to appropriately increase the Contract Price.

6. Changes:

6.1 **Changes in the Work:** The Owner may, at any time, without notice to sureties, make any changes bilaterally or unilaterally, by a written Change Order, in the Work within the general scope of the Contract, including but not limited to changes in the Specifications, materials, or Contract Time. In a bilateral change order, the Owner may direct the Professional to prepare a Bulletin describing the change being considered. Upon receiving the Bulletin, the Contractor establishes the cost and returns it to the Professional for review within 15 calendar days. The Contractor's proposal must be irrevocable for 60 Calendar Days after it is submitted to the Professional. If the Professional recommends acceptance of the Bulletin and the Owner agrees with the changes, the Owner issues a written bilateral Contract Change Order to amend the Contract Documents. However, the Owner may issue a unilateral Change Order if the Owner and Contractor are unable to agree on the adjustment in Contract Price or Time. If the Contractor disagrees with such unilateral Contract Change Order, the Contractor must complete the Work and may deliver notice of a claim in accordance with the claim submittal process.

6.2 Differing Site Condition: The Owner does not warrant that any technical data, including the Project reference points, provided by the Owner is necessarily sufficient and complete for the purpose of selecting Means and Methods, initiating, maintaining and supervising safety precautions and programs or discharging any other obligation assumed by the Contractor under the Contract Documents. If different or unknown site conditions are discovered, the Contractor must notify the Owner in writing before the conditions are disturbed or before proceeding with the affected Work. Upon review, if the Owner decides to agree with the differing site conditions, with the Professional's advice, the Owner may issue a written Contract Change Order to amend the Contract Price or Time through the Bulletin authorization process. If the Owner decides to disagree with the Contractor and the Contractor disagrees with the Owner's decision, the Contractor must complete the Work and may deliver notice of a claim in accordance with the claim submittal process. No proposal or claim by the Contractor due to differing site conditions will be allowed (a) if the Contractor knew of their existence before submitting its Bid or if those conditions could have been discovered by any reasonable examinations for which the Contractor, as Bidder, was made responsible under the Bidding Requirements and/or (b) unless the Contractor's notice is provided on a timely basis and gives the Owner adequate opportunity to investigate the asserted differing site conditions.

6.3 Responsibilities for Underground Utilities: The Contractor must comply with the 1974 PA 53, as amended, MCL 460.701 et seq., and all other Laws concerning Underground Utilities. Before performing site Work, all Underground Utilities, lines and cables (public and private) must be located and marked. The Contractor must notify MISS DIG to locate and mark utilities on properties that are not State properties. In addition, the Contractor must be responsible for immediately notifying the Owner of any contact with or damage to Underground Utilities, and for the safety, protection of and repairing any damage done to any Work, surface and subsurface facilities. If the Contractor encounters Underground Utilities that inaccurately located by the Contract Documents or not previously located/marked, which could not be reasonably have been seen, the Owner may issue a written Contract Change Order to amend the Contract Price or Time through the Bulletin authorization process.

6.4 Hazardous Material Conditions: If the Contractor encounters material reasonably believed to be Hazardous Material, which was not described in the Drawings and/or Specifications and was not generated or brought to the site by the Contractor, the Contractor shall immediately stop all affected work, give written notice to the Owner of the conditions encountered, and take appropriate health and safety precautions in accordance with all federal, State and local laws. Upon receipt of the notice, the Owner will investigate the conditions and (a) may stop the Work and terminate the affected Work or the Contract for convenience; (b) may contract others to have the Hazardous Material removed or rendered harmless or; (c) issue a written Contract Change Order to amend the Contract Price/Time through the Bulletin authorization process. If the Hazardous Material is brought to site by the Contractor or as a result in whole or in part from any of its violation of any Law covering the use, handling, storage, disposal of, processing, transport and transfer or from any other act or omission within its control, the Contractor is responsible for the Delay and costs to clean up the site, remove and render harmless the Hazardous Material to the satisfaction of the Owner, State and all Political Subdivisions with jurisdiction.

6.5 Incidents with Archaeological Features: The Contractor must immediately notify the Owner in writing of any Archeological Feature deposits encountered at the site and must protect the deposits in a satisfactory manner. If the Contractor encounters such features, which result in an anticipated change to the Contract Price/Time, the Owner may issue a written Contract Change Order through the Bulletin authorization process.

6.6 Unit Price Work: Quantities as listed have been carefully estimated but are not guaranteed. The Owner reserves the right to increase or decrease the quantities of the Work to be performed at the Unit Price by amounts up to 20 percent of the listed estimated quantities. For Unit Price Work, the Contractor must promptly inform the Professional in writing if actual quantities differ from the estimated quantities for any item. For quantities over 120% or below 80% of the estimated quantity, the Owner

may negotiate a Unit Price with the Contractor, or direct a unilateral change, or bid that Work under separate contract. Any adjusted Unit Price agreed upon by the Owner will only apply to the actual quantities above 120% or below 80% of the estimated quantity. No adjustment due to quantity variations must be allowed (a) unless the Contractor met the notice requirements, or (b) if any Unit Price increase results in whole or in part from any act or omission within the control of the Contractor (errors in the Contractor's Bid, unbalanced Unit Prices, etc.). If a dispute arise between the Owner and the Contractor on the adjusted Unit Price, the Contractor must carry on the Work with due diligence during the disputes/disagreements.

6.7 Cash Allowances; Provisionary Allowances: The Contractor must obtain the Professional's and Project Director's written acceptance before providing materials, equipment, or other items covered by Cash Allowance. Work authorized under any Provisionary Allowance may consist of (a) changes required by actual conditions, as determined by the **Professional**, and (b) any other Work authorized and completed under the pertinent provisions of the Contract Documents.

6.8 Changes in Contract Price:

6.8.1 The Contractor's proposals or claims for Work Involved must detail all affected items of Work, whether increased, revised, added or deleted, and must be fully documented and itemized as to (a) individual adds and deducts in Work quantities and labor man-hours; (b) corresponding itemized cost of Work Involved; (c) materials and equipment cost including transportation, storage and suppliers' field services; and (d) Fee.

6.8.2 For Contractor's proposals or claims for adjustments in Contract Price arising from Delays, the Contractor's estimates must be as comprehensive and detailed as may be appropriate to support the proposal or claim. Examples of related information include labor manpower levels, production data and Progress Schedule revision.

6.8.3 If the Contract Documents use lump sum or Unit Prices for the Work Involved, those prices must be used in estimating the price change. Otherwise, the Owner may direct the Contractor to proceed (a) on a negotiated lump sum; or (b) on an actual cost basis with or without a guaranteed maximum; or (c) through a unilateral Change Order on a lump sum basis or a not-to-exceed basis, based on the Professional's estimate of the anticipated Cost of the Work Involved and a fee. Items making-up the Cost of the Work Involved must be allowable to the extent (a) consistent with those prevailing in the Project locality, (b) necessary, reasonable and clearly allocable to the Work Involved, and (c) limited to labor costs, subcontract costs, material and equipment costs, construction equipment costs and general conditions costs.

6.8.4 In estimating any additional cost by the Contractor or its Subcontractor, the rates for the craft labor man-hour used in estimating changes in Contract Price must not exceed the rates in Means Cost Data (Means) or other cost guide acceptable to the Owner. If the rates exceed the acceptable cost guides, the Contractor must provide proper justifications acceptable to the Professional and the Owner. The payroll costs may be used to quote a Bulletin. However, the payroll costs must include wages, labor burdens and a factor for field supplies and purchase costs (less market values if not consumed) of tools not owned by the workers. Labor burdens must be certified by an authorized financial representative of the Contractor and may include social security, unemployment, taxes, workers' compensation, health and retirement benefits, vacation and holiday pay. The factor for field supplies and tools (individually valued at less than $1,000.00) must not exceed 4% of the wages without burdens, unless detailed data, which supports higher costs, is provided. Rates for owned, rented or leased construction equipment must be in accordance with the contract price rates. Otherwise, the appropriate hourly, daily, weekly or monthly rates listed in Means must be used. However, if the total rental or lease cost of an item to the Project exceeds the reasonable purchase price of the rented or leased item, the Owner reserves the right to pay only the purchase price of the item and take title to the item. Operating cost must not exceed the hourly operating rate in Means and for multiple shifts, rates must not exceed the shift work adjustments recommended in the cost guide.

6.8.5 The cost of any Work Involved may include necessary general conditions costs to the extent those costs increase or decrease on account of, or are directly attributable to, the performance of the furnishing and/or performance of the additional Work Involved, or are required due to an extension in Contract Times or Delays. Such costs may include payroll costs of personnel, temporary facilities at the site, liability insurance and bond premiums, Subcontractors, royalty payments and fees for permits and licenses and taxes on the Work Involved.

6.8.6 A contractor or subcontractor who performs the Work may charge a fee of up to 15% of the cost of Work involved for overhead and profit. Contractor may charge a mark-up fee of up to 5% of its Subcontractor's cost excluding fees if the Work is performed by the Subcontractor. If Work is to be performed by lower tier subcontractor(s), intermediate subcontractors must share a fee of up to 5% of the lowest tier subcontractor's cost excluding fees. The total mark-up fees for the Work must not exceed 25% of the lowest tier subcontractor's cost excluding fees. If the adjustment to the Contract Price incorporates a contractor reservation of rights to claim additional adjustments, the fees must be reduced by one-third. Contractor's administrative costs and home office overhead must be non-reimbursable expenses covered by the Fee for the Work.

6.9 Changes in Contract Time:

6.9.1 If a justified extension beyond the Contract Time is not reasonably anticipatable under the circumstances, the Owner may approve an extension to the Contract Time through the Bulletin authorization process at no additional cost to the Owner.

Examples of events that may justify an extension in the Contract Time include acts of God; acts of the public enemy; fires; floods; and strikes.

6.9.2 If, at any time during the life of this Contract, the Contractor finds that for reasons beyond its control, it will be impossible to complete the Work on or before the Contract completion date, a written request for a change to the Contract extending the time of completion must be submitted. Such a request must set forth in precise detail the reasons believed to justify an extension and must be in such format as the State may require.

6.9.3 When submitting a quotation for a Contract change authorization for extra work or change in plans, the Contractor must include as part of the quotation, a statement requesting any extra time necessary to complete the related Work. Lack of such a statement will serve as notification that the extra time will not be required to complete the Contract work and will waive the right to a later claim. The Owner will not pay additional compensation to the Contractor for performing Contract Work during any extension period granted.

6.9.4 If the Progress Schedule and the funding allow for an early completion date, the Contractor may submit to the Owner for approval, a request to shorten the Contract Time. If approved by the Owner, the new Contract Time applies to the Project and liquidated damages, if any, will be assessed for any delays after the new completion date.

6.10 Price Reduction for Defective Cost or Pricing Data: Whenever the Contractor signs a proposal for a change in the Contract or claim settlement, the Contractor will be deemed to have certified on behalf of itself, Subcontractors and Suppliers, to its best knowledge and belief that the proposal and its contents (a) were made in good faith and are consistent with the facts and the provisions of the Contract; and (b) are current, complete and accurate. If the Contract Price/Time is increased by any Change Order, claim or dispute settlement because the Contractor, Subcontractor or Supplier, at any tier, represented or furnished cost or pricing data of any kind that were false, contained math errors or were incomplete, the Contract Price must be correspondingly reduced by Change Order. If there is a good cause to doubt the Contractor's compliance with the Defective cost and pricing data requirements, the Owner must be entitled to make an appropriate withholding from any payment otherwise owed to the Contractor.

7. Payments

7.1 **Schedule of Values:** The Schedule of Values must be approved by the Professional and accepted by the Owner and must divide the Work into pay items for significant Sections and areas, facilities or structures, with subtotals for first tier Subcontractors. If required in Division 1, the accepted Schedule of Values must be supported by a more detailed breakdown allocating the pay items to the Progress Schedule Activities. It must tabulate labor costs, Subcontract costs and material and equipment costs. Labor costs must include appropriate sums for construction equipment costs, general conditions costs, administrative costs and profit, unless separate pay items are itemized for those costs. The Schedule of Values must include two percent of the Contract Price for each of the following close-out pay items: (a) fire safety inspection, certificate of occupancy and other code approvals, as specified in the Contract Documents, (b) manufacturer warranties, finalized operating and maintenance documentation, Owner training documentation, and test and balance reports, and (c) finalized as-built/Record Documents.

7.2 **Requests for Payment:** Not more than once every thirty Calendar Days, the Contractor may submit to the Professional a Request for Payment on the Owner's form signed by the Contractor certifying Work completed and enclosing all supporting documentation. A draft copy of the payment request may be submitted to the Owner Field Representative for review and comments. For projects under $50,000, the Contractor may not submit more than two requests in addition to the final payment request. Each Request for Payment must certify that all monies owed by the Contractor to Subcontractors and Suppliers for which payment previously has been sought has been paid from payments received. No Request for Payment must include amounts for a Subcontractor or Supplier if the Contractor does not intend to use the payments requested, when received, to reduce the Contractor's outstanding obligations on the Work. The Owner will pay the Contractor within thirty Calendar Days after the Owner receives and approves a certified Request for Payment from the Professional. The Contractor will provide a certification in writing that the payment request submittal is true and accurate. If payment is requested based on materials and equipment stored at the site or at another location agreed to in writing, the Request for Payment also must be accompanied by (a) consent of surety, (b) a bill of sale, invoice or other documentation warranting that the Owner has received the materials and equipment free and clear of all liens, and (c) evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect them and the Owner's interests. The Contractor warrants and guarantees that title to all Work, materials and equipment covered by any Request for Payment, whether incorporated in the Work or not, will pass to the Owner free and clear of all liens no later than at the time of payment by the Owner to the Contractor.

7.3 **Review of Request for Payment; Intent of Review:** Within ten Calendar Days after receipt of a Request for Payment, the Professional must certify to the Owner the amount the Professional determines to be due, or must return the Request for Payment to the Contractor indicating the reasons for withholding certification. The Professional's certification of any Request for Payment constitutes a representation to the Owner that the Work has progressed to the point indicated; that to the best of the Professional's knowledge, information and belief, the quality of the Work is in accordance with the Contract Documents; and that the Contractor is entitled to payment in the amount certified. In the case of final payment, the Professional's certification of final payment and recommendation that the Work is acceptable must be a further representation that conditions governing final payment to the Contractor have been met.

7.4 **Refusal to Make or to Recommend Payment:** The Owner may withhold from any payment an amount based on the (a) Professional's refusal to recommend payment or (b) Owner's estimate of the fair value of items included in the payment request. The Owner will give the Contractor reasonably prompt written notice supporting such action. The Professional may refuse to recommend any part of any payment, or because of subsequently discovered evidence, inspections or tests or the value of the Punch List, nullify all or any portion of any payment previously recommended, as the Professional may consider necessary to protect the Owner from loss because:

(a) the Work is Defective or completed Work has been damaged requiring correction or replacement,
(b) the Contract Price has been reduced by Change Order,
(c) it has been necessary that the Owner correct Defective Work or complete Work,
(d) reasonable evidence exists that all or a part of the Work will not be completed within the corresponding Contract Time,
(e) the Contractor failed to comply with any material requirements of the Contract, including, but not limited to the failure to submit Progress Schedule Submittals or as-built/Record Documents when due,
(f) stored materials for which payment has been made or is sought has been determined by the Professional or the Owner Field Representative to be damaged or missing, or
(g) the Professional reasonably believes or knows of the occurrence of an event justifying termination for cause.

7.5 **Request for Final Inspection:** The Contractor must complete the Substantial Completion Punch List within the Contract Time and date. The Contractor must assemble all required documentation before requesting final inspection in writing. The Contractor may request final inspection of the entire Work, or the part of the Work for which final payment is specified in the Contract Documents. Upon this written notice, and if deemed appropriate by the professional, the Professional will make a final completion inspection with the Owner and Contractor and notify the Contractor of all incomplete or Defective Work revealed by the Final Inspection. The Contractor must immediately correct and complete the Work.

7.6 **Close-out Documents:** The Contractor must prepare and submit the following documentation before requesting final inspection or final payment: final operating and maintenance documentation (with revisions made after Substantial Completion), warranties, inspection certificates, as-built/Record Documents, release of payment claim forms, and all other required documents.

7.7 **Request for Final Payment:** The Contractor may request final payment after correcting or completing the Work to the satisfaction of the Professional and delivering close-out documentation (7.6). The Contractor's request for final payment must also enclose:

(a) evidence of completed operations insurance and an affidavit certifying that the insurance coverage will not be canceled, materially changed, or renewal refused,
(b) an affidavit certifying that the surety agrees that final payment does not relieve the surety of any of its obligations under the Performance Bond and Payment Bond,
(c) a completed DTMB-0460 Form close out checklist,
(d) a list of all pending insurance claims rising out of or resulting from the Work being handled by the Contractor and/or its insurer
(e) Contractor's 'Guarantee and Statement' (DTMB-0437) containing a statement of guaranteed indebtedness acceptable to the Owner in the full amount of the Contract Price, or a release of payment claims in the form of a release of liens, or a Bond or other security acceptable to the Owner to indemnify the Owner against any payment claim.

7.8 **Final Payment and Acceptance:** If the Professional is satisfied that the entire Work, or the part of the Work for which final payment is specified in the Contract Documents, is complete and the Contractor's other obligations under the Contract Documents has been fulfilled, the Professional will furnish to the Owner and Contractor the Professional's certification of final payment and acceptance within thirty Calendar Days after receipt of the final payment request. If the Professional is not satisfied, the Professional will return the request to the Contractor indicating in writing the reasons for not certifying final payment. If the final payment request is returned, the Contractor must correct the deficiencies and re-request final payment. If the Owner concurs with the Professional's certification of final payment the Owner will, within thirty Calendar Days after receipt of the Professional's certification of final payment, pay the balance of the Contract Price subject to those provisions governing final payment specified in the Contract Documents. If the Owner does not concur with the Professional's determination, the Owner will return the request for final payment to the Contractor with written reasons for refusing final payment and acceptance.

7.9 **Contractor's Continuing Obligation:** The following does not constitute acceptance of the Work in the event the Work or any Work is not in accordance with the Contract Documents, and therefore does not release the Contractor from its obligation to perform and furnish the Work in accordance with the Contract Documents:

(a) a certification by the Professional of any Request for Payment or final payment;
(b) the issuance of a Substantial Completion certificate;
(c) any payment by the Owner to the Contractor;
(d) any Partial Use;
(e) any act of acceptance by the Owner or any failure to do so;
(f) any review and approval of a Shop Drawing, sample, test procedure or other Submittal;

(g) any review of a Progress Schedule;
(h) any On-Site Inspection;
(i) any inspection, test or approval;
(j) any issuance of a notice of acceptability by the Professional; or
(k) any correction of Defective Work or any completion of Work by the Owner.

7.10 **Waiver of Claims:** The making of final payment does not constitute a waiver by the Owner of any rights as to the Contractor's continuing obligations under the Contract Documents, nor will it constitute a waiver of any claims by the Owner against the Contractor still unsettled, or arising from unsettled payment claims, Defective Work appearing after final inspection or failure by the Contractor to comply with the Contract Documents or the terms of any special warranties provided by the Contract Documents or by Law. The acceptance of final payment will constitute a waiver of all claims by the Contractor against the Owner, other than those claims previously made in writing, on a timely basis.

8. Other Work: During the Contract Time, the Owner may self perform or Contract for other work at the site. By doing so, the Owner or its representative will coordinate the operations of the Contractor and the other work. Whenever the other work interfaces with the Contractor's Work on site, the Contractor must coordinate its activities with the interfacing work, inspect the other work and promptly report to the Professional in writing if the other work is unavailable or unsuitable. The Contractor's failure to do so will constitute an acceptance of such other work as fit and proper for integration with the Work except for latent or non-apparent defects and deficiencies in the other work. The Contractor must provide proper and safe access to the site for handling, unloading and storage of their materials and equipment and for the execution of the other work. The Contractor must do all cutting, fitting, patching and interfacing of the Work that may be required to make any part of the Work come together properly and integrate with other work. If the Contractor becomes party to a dispute or claim due to damages caused to its Work/property or other work/their property, the Contractor must promptly attempt, without involving the Owner or the Professional or their agents, to settle with the other party by agreement or otherwise resolve the claim. If the Owner determines that the other work resulted in a delay to the Work to be performed by the Contractor and such delay justifies a Change Order, the Owner will authorize the necessary adjustment in Contract Price and/or Time.

9. Stop Work Orders and Suspension of Work: The Owner may order the Contractor in writing to defer, stop, suspend or interrupt all or part of the Work, in the event any of the following situations:

(a) any Work is Defective,
(b) any Work, when completed, will not conform to the Contract Documents,
(c) any materials or equipment are unsuitable,
(d) any workers are insufficiently skilled,
(e) failure of the Contractor to implement appropriate measures for the SESC, or
(f) as the Owner may determine appropriate for its convenience. The Contractor is responsible for the Delays and any additional costs if at fault. Any justified increase in Contract Price/Time due to suspension of Work must be submitted within thirty Calendar Days of knowing the extent of Delays and before submitting the final payment.

10. Termination:

10.1 **Termination for Breach**: The Owner may elect to terminate all or any part of the Work if:

(a) the Contractor fails to complete the Work, or a specified part of the Work, within the corresponding Contract Time; fails or refuses to supply sufficient management, supervision, workers, materials or equipment; or otherwise fails to prosecute the Work, or any specified part of the Work, with the diligence required to comply with the Contract Time(s);
(b) the Contractor persistently disregards the authority of the Professional or violates or disregards a provision of the Contract Documents or the Laws of any Political Subdivision with jurisdiction;
(c) the Contractor admits in writing, or the Owner otherwise establishes, the Contractor's inability or refusal to pay the Contractor's debts generally as they become due;
(d) in response to the Owner's demand, the Contractor fails to provide adequate, written assurance that the Contractor has the financial resources necessary to complete the Work within the Contract Time;
(e) the Contractor fails to comply with the Michigan Residency requirements (1984 PA 431, as amended, MCL 18.1241a); or is found to be in violation of Section 4 of 1980 PA 278 concerning unfair labor practices, or any nondiscrimination requirements imposed by Law;
(f) at any time, the Contractor, Subcontractor or Supplier is in violation of unfair labor practices prohibited by Section 8 of Chapter 327 of the National Labor Relations Act, 29 U.S.C. 158; or
(g) the Contractor violates or breaches any material provision of the Contract Documents, which provides contractually for cause termination or rescission of the Contract or of the Contractor's right to complete the Work.

Within seven Calendar Days after the Contractor receives a notice requiring assurance of due performance for any of the above occurring non-conformances, the Contractor must meet with the Owner and present the Contractor's plan to correct the problems. If the Owner determines that the Contractor's plan provides adequate assurance of correction, that determination does not waive the Owner's right to subsequently default the Contractor or affect any rights or remedies of the Owner against the Contractor and/or surety then existing or that may accrue in the future. The Owner, after giving the Contractor and surety seven Calendar Days' written notice of intent to default, may declare the Contractor in default and terminate the services of the Contractor for cause. Unless otherwise agreed between the Owner and Contractor, at the expiration of the Seven-

Calendar Day (intent to default) period, the Contractor must immediately stop all Work and proceed in accordance with the Owner's instructions. Following the expiration of the Seven-Calendar Day (intent to default) notice, the Contractor will be sent a default letter – notice of termination for cause. The Owner will issue a Contract Change Order to revise the name of the contract party to the name of the surety company. The surety company must undertake to perform and complete the Work, in accordance with the Contract Documents, in place of the Contractor, either through the surety's agents or by executing agreements with qualified contractors (excluding the Contractor and any of the Contractor's affiliates), or both.

The Owner may issue a fifteen-Calendar Day notice of intent to default the surety company if they fail to execute in a timely manner the completion of the Contract Work. Without an adequate plan of correction, the Owner may issue a notice of termination for cause letter to the surety. If a termination of the contract with the surety occurs, the Owner reserves the right to complete the Work.

If the Owner has terminated the Contractor, any such termination will not affect any rights or remedies of the Owner against the Contractor or surety, or both, then existing or that may accrue after termination. All provisions of the Contract Documents that, by their nature, survive final acceptance of the Work must remain in full force and effect after a termination for cause of the Contractor or default of the surety, or both. The Owner may, in its sole discretion, permit the Contractor to continue to perform Work when the Contractor is in default or has been defaulted. Such decision by the Owner in no way operates as a waiver of any of the Owner's rights under the Contract Documents or Performance Bond, nor in the event of a subsequent default, entitle the Contractor or surety to continue to perform or prosecute the Work to completion.

10.2 **Termination on Non-Bonded Project**: For non-bonded projects, the Owner will follow the termination protocol in Paragraph 10.1 without involving a surety.

10.3 **Termination for Convenience of the Owner**: Upon fifteen Calendar Days' written notice to the Contractor and surety, or sooner if reasonable under the circumstances, the Owner may, without cause and without prejudice to any other right or remedy it may have, elect to terminate any part of the Work, or the Contract in whole or in part, as the Owner may deem appropriate for its convenience. Upon receipt of any such termination notice, the Contractor must immediately proceed in accordance with any specific instructions, protect and maintain the Work, and make reasonable and diligent efforts to mitigate costs associated with the termination. In such termination, the Contractor must be paid in accordance with the terms of this Contract for only services rendered before the effective date of termination. Upon termination for convenience, the Contractor must be released from any obligation to provide further services and the Owner must have full power and authority to take possession of the Work, assume any agreements with Subcontractors and Suppliers that the Owner selects, and prosecute the Work to completion by Contract or as the Owner may deem expedient.

10.4 **Termination for Lack of Funding:** If expected or actual funding is withdrawn, reduced or limited in any way before the completion date set forth in this Contract or in any amendment, the State may, upon written notice to the Contractor, terminate this Contract in whole or in part in accordance with Paragraph 10.3.

11. Disputes: All claims, counterclaims, disputes and other matters in question between the Owner and Contractor arising out of or relating to the Contract Documents must be submitted in writing to the Professional and otherwise processed and resolved as provided in this Article. The Contractor must carry on the Work with due diligence during all disputes or disagreements. Work must not be delayed or postponed pending resolution of any disputes or disagreements. The Contractor must exercise reasonable precautions, efforts and measures to avoid situations that would cause delay.

11.1 **Notice of Claim**: Except for Owner claims for liquidated damages, no claim is valid unless it is based upon written notice delivered by the claimant to the other party promptly, but in no event later than thirty Calendar Days after the Professional's or Project Director's determination giving rise to the claim. The notice must state the nature of the dispute, the amount involved, if any, and the remedy sought. The claim submittal with all supporting data must be delivered within sixty Calendar Days after the determination giving rise to the claim (unless the Professional allows an extension). The responsibility to substantiate claims rests with the claimant. A claim by the Contractor must be submitted to the Professional and Project Director for a recommendation or decision from the Professional. A claim by the Owner must be submitted to the Contractor and the Professional for a written recommendation or decision by the Professional. The Owner reserves the right to audit any Contractor claim (or claim package) that the Contractor values at more than $50,000.00. Pending final resolution of any claim under this Article, the Contractor must proceed diligently with the Work and comply with any decision of the Owner and/or Professional. For all Contractor claims seeking an increase in Contract Price or Contract Time, the Contractor must submit an affidavit, certifying that the amount claimed accurately reflects any Delay and all costs that the Contractor is entitled from the occurrence of the claimed event and that supporting cost and pricing data are current, accurate, complete and represent the Contractor's best knowledge and belief. The affidavit must be signed in the same manner as required in Item 6 of Section 00100.

11.2 **Recommendations or Decisions from the Professional:** For claims under $100,000.00, if requested in writing by the Contractor, the Professional will render a recommendation or decision within thirty Calendar Days after the request and the Owner will issue, if necessary, a determination within thirty Calendar Days after the Professional's recommendation or decision. For claims exceeding $100,000.00, the Professional will issue its recommendation or decision and the Owner, if necessary, will issue its determination, within sixty Calendar Days.

If the Professional denies a Contractor claim or agrees with an Owner claim, that decision must be final and binding on the Contractor, without any determination by the Owner, unless the Contractor files a request for a presentation with the Director-SFA within thirty Calendar Days. To the extent that any recommendation from the Professional is partly or wholly adverse to a claim from the Owner, that determination must be final and binding on both the Owner and Contractor unless either party files a request for a presentation with the Director-SFA within thirty Calendar Days. If the Professional recommends payment of any Contractor claim which increases the Contract Price, that recommendation is subject to the Owner's written approval. In the event any such determination from the Owner is partly or wholly adverse to the preceding recommendation from the Professional, that determination must be final and binding on the Contractor unless the Contractor files suit in the Michigan Court of Claims within thirty Calendar Days after receipt of such determination. The claim is waived if not made in accordance with these requirements.

If either the Contractor or Owner is not satisfied with any decision of the Professional on a claim, that party must, within thirty Calendar Days of receiving that decision, file a written appeal with complete supporting documentation with the Director-SFA.. The Director-SFA has discretion concerning the allowability of evidence submitted, and is not bound to any rules of evidence. If the right to a presentation is waived or if a presentation is conducted and the dispute remains unresolved, the Director-SFA, at the Director-SFA's sole option, must specify in which forum the dispute must be conducted by issuing a written determination to the Contractor that the dispute if the Contractor so elects, be submitted in writing to the Michigan Court of Claims. The Director-SFA's determination on the dispute is final and binding on the Contractor unless the Contractor files a lawful action in the Michigan Court of Claims within thirty Calendar Days after receiving the Director-SFA's determination. After settlement or final adjudication of any claim, if payment by the Contractor is not made to the Owner, the Owner may offset the appropriate amounts against (a) payments due to the Contractor under any other Contract between the Owner and the Contractor, or (b) any amounts for which the Owner may be obligated to the Contractor in any capacity. The Director-SFA may designate someone to fulfill the Director-SFA's duties under these terms and conditions.

END OF SECTION 00700

SECTION 00750 SPECIAL WORKING CONDITIONS

1. The Work is for the Department of Environmental Quality and their special working conditions are included in **Appendix II**. The Contractor must comply with all security regulations. Access to and egress from the buildings and State Agency grounds must be via routes specifically designated by the State Agency. Whenever the Contractor has caused an operating security or fire system to go out of service, or left unsecured openings in existing facilities or security fences, the Contractor must furnish a security guard or fire watch acceptable to the Owner to maintain security of the facility outside of normal working hours and will be held responsible for any losses from the facility.

2. The Contractor must maintain at all times dust control measures to the satisfaction of the Owner.

3. The Contractor shall coordinate site work and scheduling with the Professional.

END OF SECTION 00750

SECTION 00800 SUPPLEMENTARY CONDITIONS

1. The following conditions must supplement the general conditions:

SC-1 SUPPLEMENTARY CONDITIONS TO ARTICLE 1.5 - CONTRACT DOCUMENTS OWNERSHIP
SC-1.5 Delete the last sentence of Article 1.5 of **Section 00700** in its entirety and replace with the following: The **Professional** will furnish on behalf of the **Owner** at no cost to the **Contractor** up to three (3) copies of the Drawings and Project Specifications. Additional copies will be furnished, upon request, at the cost of reproduction.

SC-2 SUPPLEMENTARY CONDITIONS TO ARTICLE 3.3 – BONDS AND INSURANCE
SC-3.3 Delete the first sentence of Article 3.3 of **Section 00700** in its entirety and replace with the following: Liability insurance must be endorsed to list as additional insureds the Professional, the Professional's consultants and agents, the Property Owner(s), and the Property Owners' consultants and agents.

SC-3 SUPPLEMENTARY CONDITION TO ARTICLE 4- PROSECUTIONS; SUBSTANTIAL COMPLETION
SC-4.2 Delete the first sentence of Article 4.2 of Section 00700 in its entirety and replace with the following: Except in an Emergency, all Work at the site must take place during normal working hours; 7:00 AM to 7:00 PM, during Business Days and in accordance with the special working conditions for the Agency.

SC-4 SUPPLEMENTARY CONDITION TO ARTICLE 4- PROSECUTIONS; SUBSTANTIAL COMPLETION
SC-4.3 Add the following to the prerequisites of *Substantial Completion* - (d) all materials requiring removal have been properly disposed offsite, (e) all site restoration (grading, capping, compaction, seeding, and mulching) have been completed (f) **Contractor**

has demobilized all equipment and personnel from Site and (g) **Owner** has received all waste manifests and disposal documentation.

SC-5 SUPPLEMENTARY CONDITIONS TO ARTICLE 5.2 -TESTS, INSPECTIONS AND APPROVALS

SC-5.2 Delete the first sentence of Article 5.2 of **Section 00700** and replace with the following: "The **Owner** has not retained any testing agency for the work."

SC-6 SUPPLEMENTARY CONDITIONS TO ARTICLE 6.6 – UNIT PRICE WORK

SC-6.6 Delete Article 6.6 in its entirety and replace with the following: "Quantities as listed have been carefully estimated but are not guaranteed. The Owner reserves the right to increase or decrease the quantities of the Work to be performed at the Unit Price by amounts up to 30 percent of the listed estimated quantities. For Unit Price Work, the Contractor must promptly inform the Professional in writing if actual quantities differ from the estimated quantities for any item. For quantities over 130% or below 70% of the estimated quantity, the Owner may negotiate a Unit Price with the Contractor, or direct a unilateral change, or bid that Work under separate contract. Any adjusted Unit Price agreed upon by the Owner will only apply to the actual quantities above 130% or below 70% of the estimated quantity. No adjustment due to quantity variations must be allowed (a) unless the Contractor met the notice requirements, or (b) if any Unit Price increase results in whole or in part from any act or omission within the control of the Contractor (errors in the Contractor's Bid, unbalanced Unit Prices, etc.). If a dispute arise between the Owner and the Contractor on the adjusted Unit Price, the Contractor must carry on the Work with due diligence during the disputes/disagreements."

SC-7 SUPPLEMENTARY CONDITIONS TO ARTICLE 7.2 –REQUESTS FOR PAYMENT

SC-7.2 Add the following after the first sentence of Article 7.2 of **Section 00700**: To request payment, the Owner requires use of State of Michigan form DMB-440 and American Institute of Architects (AIA) Document G702™-1992 and Document G703™-1992 or Document G732™-2009."

END OF SECTION 00800

SECTION 00850 WAGE DETERMINATION SCHEDULE

The Contractor and all Subcontractors must comply with all Laws pertaining to occupational classifications and to the following requirements:

1. The rates of wages and fringe benefits to be paid to each class of construction mechanics must not be less than the wage and fringe benefit rates issued by the Michigan Department of Licensing and Regulatory Affairs (DLARA), Wage and Hour Division in its schedule of occupational classification and wage and fringe benefit for the locality in which the Work is to be performed. These prevailing wage rates are included in **Appendix IV**.

2. The Contractor must keep posted on the construction site, in a conspicuous place, a copy of all prevailing wage and fringe benefit rates as prescribed in the Contract and the address and telephone number of the DLARA's, Wage and Hour Division office responsible for enforcing these provisions, and must keep an accurate record showing the name and classification of each Person performing Work on the site, the dates on which Work was performed, the hours each Person worked on the site and the actual hourly wage and benefits paid to each Person. This record must be notarized by a Notary Public and must be available to DTMB-SFA and DLARA for an audit or inspection, at any time, upon their request. In addition, as per section 6.10 of this Document, the Contractor must have available to DTMB and DLARA, certified payroll of those working on the project.

3. If any trade is omitted from the schedule of wages and fringe benefit rates included in **Appendix IV**, the trades omitted must also be paid not less than the wage and fringe benefit rates prevailing in the locality in which the Work is to be performed.

4. The Contractor must keep posted on the construction site, in a conspicuous place, notice that construction mechanics, as the intended beneficiaries of 1965 PA 166, as amended, who have not been paid in accordance with the Act may file a claim with the LARA.

A finding by the DLARA that the Contractor or any Subcontractor is in violation of these requirements is final.

Prevailing Wage Rates for Houghton County will be distributed via Addendum to the Project Manual.

END OF SECTION 00850

SECTION 00900 ADDENDA

1. Each Bid submittal must include acknowledgement of receipt and review of all Addenda issued during the Bidding period.

END OF SECTION 00900

DIVISION 01

GENERAL REQUIREMENTS

SECTION 01 11 00

SUMMARY OF WORK

PART I - GENERAL

1.1. SITE BACKGROUND

1.1.1 Copper mining was extensive in the Keweenaw and formed the backbone of the regional economy and society. Copper ore milling and smelting operations were conducted from the mid-1860s to the 1960s, including the importation and reprocessing and smelting of various scrap metals in the later years of operation. Consistent with past industrial practices, Torch Lake served as dumping grounds for virtually all mining industry related waste products produced, including tailings, slag, and various chemicals.

The environmental legacy resulting from over 100 years of mining led to Torch Lake and its western shoreline to be designated as a Superfund site by the United States Environmental Protection Agency (EPA) https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0503034 and a Great Lakes Area of Concern by the U.S./Canada Great Lakes Water Quality Agreement https://www.epa.gov/torch-lake-aoc The EPA undertook cleanup activities to address some of the byproducts of the mining industry while others were not addressed or left to recover through natural processes.

The MDEQ Project is addressing some of the remaining concerns in Houghton County not addressed by the EPA. The Project concerns involve groundwater, surface water, sediments, and "upland" media. Known or suspected problems which are being evaluated include: an unidentified, significant in-lake and/or terrestrial source of PCBs, uncharacterized waste deposits, and >750 uncharacterized drums on the lake bottom, slag, landfills, industrial ruins, coal storage areas, underground storage tanks (USTs), RPM, asbestos containing materials (ACM), and any other waste materials identified in future investigations.

During 2014 and 2015 RRD conducted Site Investigation (SI) activities and confirmed the remaining concerns in the Project area involve groundwater, surface water, sediments, and "upland" media. Priority concerns which were evaluated and deemed to require Interim Responses (IRs) included: significant terrestrial source of PCBs; ACM; RPM; abandoned mining era containers; seeps; limited areas of soil in which there are Direct Contact Criteria (DCC) and Particulate Soil Inhalation Criteria (PSIC) exceedances; and, physical hazards.

The vast distribution of the former mining operations throughout the region (spanning multiple townships, villages and cities in Houghton County along the Portage Canal, Lake Superior, Slaughterhouse Creek, and Torch Lake) required that operational areas of the mining companies be divided into geographic areas. Dividing the regional operations into smaller manageable geographic areas allowed for prioritization of the proposed investigative approach, while also establishing a phased process for assessing environmental concerns regionally.

The Calumet & Hecla Lake Linden Operations Area (CHLL) is centralized around C&H's copper mining and processing operations in the vicinity of Lake Linden and Hubbell, Michigan. The CHLL consists of approximately 155 acres of land extending approximately two miles along the shoreline of Torch Lake and incorporates over 40 different parcels with multiple property owners. The CHLL was divided into six smaller

study areas based on the historical industrial operations in each area, including the following:

- Torch Lake Backwater Area;
- Lake Linden Sands Area;
- Lake Linden Recreation Area;
- Lake Linden Processing Area;
- Hubbell Processing Area; and,
- Hubbell Slag Dump and Beach Area.

The CHLL Hubbell Processing Area is located between Lake Linden and Hubbell along the southeast side of Highway M-26 and is comprised of mining era industrial properties including the Hubbell Coal Dock and Mineral Building that are vacant, and the Hubbell Smelter property which is the location of an operating industrial facility. The Hubbell Processing Area is bordered by residential (single family residences and an apartment complex), commercial (restaurant and retail business), and industrial (sand and gravel pit, construction company, and storage facility) properties, and Torch Lake.

1.2. SITE DESCRIPTION

1.2.1 The IR for the Hubbell Processing Area is limited to two properties within the Hubbell Processing Area; the Hubbell Coal Dock property and the Mineral Building property. Risks identified by the SI activities include potential threats to human and ecological receptors, including but not limited to human health risks in the event of direct contact with affected media and inhalation of particulates and ACM, runoff of PCB contaminated media into Torch Lake, and physical hazards. The limited scope of this IR allows for a focused and time critical response that mitigates PCB contaminated debris and soils exceeding select MDEQ exposure criteria protective of human health, manages and caps debris and waste piles, and eliminates PCB-impacted soil runoff into Torch Lake.

1.2.2 The Hubbell Coal Dock is located along the shoreline of Torch Lake, between the stamp mill complex (Lake Linden Processing Area) and the C&H Hubbell smelter complex. “The C&H Coal Dock featured a large coal shed, reportedly measuring approximately 650 ft by 400 ft. C&H maintained a large storage shed to allow coal to be stored over the winter and to protect against uncertainties associated with the coal industry. The coal dock featured massive shovel, boom, and rail systems that allowed for the unloading and storage of the bituminous coal and anthracite being shipped from Pennsylvania and West Virginia” (Kahn, 1898). The coal dock operations featured an electrical substation in the northern portion of the property.”

The coal dock property is privately owned and includes roughly 2,000 ft of Torch Lake shoreline. The property is bound to the west by Highway M-26. A chain link fence has been established along the western and northern property boundaries. The property is generally vacant and runoff into the lake has been observed during investigative mobilizations. During the fall of 2016, 66 abandoned drums were removed from the property and disposed. Erosion channels have developed in the south-central portion of the property. A breach in the side of the drainage ditch just south of the southern property boundary was plugged during 2016 to stop the uncontrolled flow of water out of the ditch and across the southern portion of the property, where material was likely historically burned for metals recovery and PCBs have been detected (the Hubbell Coal Dock Burn Area).

1.2.3 The Mineral Building, located on a separate property, is south of and adjacent to the Hubbell Coal Dock property. The Mineral Building would have received the processed copper ore from the stamp mills located in the Lake Linden Processing Area. The copper

ore was sorted and stored in the Mineral Building prior to transfer to the smelter for additional processing. A chain link fence has been established along the western and southern property boundaries. During the fall of 2016, 16 abandoned drums were removed from the property and disposed.

1.2.4 Historical research conducted by Michigan Technological University (Michigan Tech) concluded that the smelter yard as well as the neighboring mineral building and coal dock facilities were likely used in C&H's secondary copper recovery processes. As excerpted from Michigan Tech's report, C&H launched its "Secondary Metal Department" in 1945 — an indication that reclamation of copper from scrap metal and similar copper-containing wastes had become an important part of the company's operations. The July 1945 issue of *C&H News and Views*, an employee periodical, includes photographs of burning of secondary waste materials, specifically the outer sheathings, insulation, and coatings on copper-rich materials, prior to treating the recovered copper in the smelter. Materials including co-axial telephone cable, armored "Navy cable", and motor parts were common sources of copper, known to contain hydrocarbon-based oils and greases as well as PCBs. In addition to periodical documentation, Michigan Tech interviewed former employees who corroborated these activities, noting that the smelter yard was used as a site for burning copper wire to remove the insulation prior to smelting.

1.2.5 At a mean elevation of approximately 602 ft Above Mean Sea Level (AMSL) at the shoreline of Torch Lake, the land rises vertically to the west/northwest from the shoreline to an approximate elevation of 630 ft AMSL along Highway M-26.

1.2.6 The soil and fill encountered at the properties are largely sand, gravel, coal, stamp sand, slag, and burnt debris covering the ground surface. Underlying these near surface soils are native soils described in the Site Inspection Report for C&H Lake Linden Operations, Lake Linden, Michigan, 49945 - June 2014 prepared by the MDEQ-Remediation and Redevelopment Division (RRD), Superfund Section, Pre-remedial Group, Site Evaluation Unit (Pre-remedial Group) as "ground moraine with coarse-textured, reddish brown, sandy loam, glacial till. The deposits vary in composition and thickness and do not appear to be laterally extensive over the CHLL. The deposits range in thickness from approximately 11 to 50 ft below the ground surface (bgs), but have been observed in thicker deposits with interbedded clay, silt, and gravel units. The bedrock geology underlying the glacial deposits in the area is comprised of Jacobsville Sandstone."

1.2.7 Groundwater was encountered at the properties at varying depths. In the lower plateau along Torch Lake groundwater was encountered between 2-ft and 4.5-ft bgs.

1.3. OBJECTIVE

1.3.1. The objective of this contract is to conduct the following:

1.3.1.1. Cap the Coal Dock Burn Area to prevent direct contact with affected soil and eliminate impacted soil runoff into Torch Lake.

1.3.1.2. Improve the southern drainage ditch to restore channel capacity and prevent overflowing onto the newly placed cap.

1.3.1.3. On the Mineral Building property, address PCB contaminated debris.

1.3.2. The requirement of this Contract is to completely and safely execute the following project components in support of the MDEQ's current remedial goals for the Site. **Sheet C-3** in the drawing set depicts the current conditions within the work area.

1.3.2.1. The **Contractor** will be required to install soil erosion and sedimentation controls (SESC) as depicted on **Sheet C-4** setoff the Drawings. Following installation of SESC measures, the **Contractor** shall prepare the Site for access to the pile management, grading, and capping areas depicted on **Sheet C-4** through **C-7** in the Drawings, including improvement of existing and placement of new permanent haul/access roads, loading/unloading and staging areas, and decontamination areas as needed to execute the work.

1.3.2.2. The **Contractor** will be required to address PCB contaminated soil from the waste pile WP-11 limits depicted on the drawing in **Appendix VII**.

1.3.2.3. The **Contractor** will be required to improve the drainage ditch between the two work areas, including cutting off the existing culverts, brush and tree removal, excavation/grading, and geotextile fabric and rip-rap placement.

1.3.2.4. The **Contractor** will be required to grade the work area to promote positive drainage, including tree and brush removal as required. Refer to **Sheet C-5** in the Drawings for grading plans.

1.3.2.5. The **Contractor** will be required to place 6-inches of sandy loam soil as a cap over the areas depicted on **Sheet C-7** of the Drawings.

1.3.2.6. The **Contractor** will be required to restore all disturbed areas (within and outside of the work limits) to pre-work conditions including grading, topsoil (if topsoil is currently present), seeding, and mulch. Restoration work will occur in the capping areas depicted on **Sheet C-7** of the drawing set, and any other areas disturbed by the **Contractor**. The Contractor will be responsible for monitoring and maintaining the permanent SESC measures for up to one year until fully established and the SESC permit is released.

1.3.2.7. The **Contractor** will be required to perform the parts of the Work designated by the Alternates identified in the Schedule of Alternates, if any, if they are awarded by the **Owner**.

1.3.2.8 The **Contractor** will be required to sequence all parts of the Work awarded as defined by the Base Bid.

1.3.3. The Work to be completed under this Contract includes, but is not limited to, the following activities:

1.3.3.1. Review Contract Documents and prepare all required submittals including Permits. Prepare all required plans including Work Plan with a Site Access and Traffic Control Plan, Health and Safety Plan, Borrow Area Restoration Plan, and Soil Erosion and Sedimentation Control Implementation Plan.

1.3.3.2. Plan and implement Mobilization, Site Access, Site Security, Site Preparation, Temporary Utilities, and Temporary Facilities. Coordinate with the **Owner**, the **Professional**, and Federal, state and local agencies, and utilities to begin Work.

1.3.3.3. Plan, schedule, and implement all required Project Meetings.

1.3.3.4. Construct and improve existing Site Access and on-site haul roads as shown in the plans. On-site road(s), private roadways, and public roadways shall be surfaced or protected, as appropriate and as required during the Work to maintain a serviceable travel way.

1.3.3.5. Perform Dust Control, including routine watering during all material movement activities to prevent visible dust. Dust control also includes sweeping of public roadways and thoroughfares used during the construction

activities.

1.3.3.6. Perform all clearing necessary to complete the required Work. Install, maintain and improve, as required, all soil erosion and sedimentation controls to prevent transport and migration of soil(s) from the Work area.

1.3.3.7. Perform ditch improvement, waste pile WP-11 management, grading, and capping in accordance with the Contract Documents and as defined in the **Contractor's** Work Plan. Material movement shall proceed in an organized and timely manner.

1.3.3.8. Construct all decontamination pads necessary to complete the Work.

1.3.3.9. Any disposal facilities shall be approved by the **Owner** prior to the initiation of Work.

1.3.3.10. Perform surveying as required herein. This shall include a post-construction survey and all interim surveying on an as needed basis.

1.3.3.11. Restore private properties affected by construction activities to pre-construction conditions.

1.3.3.12. Restore the Site to its pre-construction condition by regrading, as needed, all areas disturbed by the Work. Imported fill used for haul roads shall remain at the Site unless specified otherwise on the drawings. Restoration includes seeding and mulching of all disturbed areas. This includes replacement or repair of any damaged items including but not limited to retaining walls, fences, gates, and roadways.

1.3.3.13. Perform demobilization and project closeout activities including complete removal of all temporary facilities, temporary utilities, signs, and all other materials and equipment provided by the **Contractor**. Deliver all required Project Record Documentation as described herein. Monitor and maintain the permanent SESC measures for up to one year until fully established and the SESC permit is released by the governing agency.

The layout of existing facilities and the proposed Work are depicted on the Drawings provided herein.

1.3.4. Work shall be conducted during daylight hours, Monday through Friday. No Work is to be performed on Saturday, Sunday, or on state and federal holidays without prior written approval by the **Owner**.

1.4. SEQUENCING

1.4.1. The **Contractor** shall sequence the Work in an efficient manner in order to meet the project schedule.

1.4.2. Prior to grading and capping, the **Contractor** shall complete the southern drainage ditch improvements and install SESC measures to protect the ditch from sedimentation from adjoining work.

1.4.3. Dewatering of the area west of the historic crane rail to facilitate grading and capping shall be completed prior to final grading and capping of the area east of the crane rail where the discharge occurs so that the dewatering discharge is only applied to the ground surface prior to cap placement.

1.5. CONTRACTS

1.5.1. The Work shall be completed under a single prime contract with the State of Michigan.

1.6. CONTRACTOR'S USE OF PREMISES

1.6.1. The **Contractor** shall:

1.6.1.1. Assume full responsibility for protecting and safekeeping of products, materials, and equipment stored on or off any of the premises. The **Contractor** shall also be responsible to safeguard the Site from unauthorized entry.

1.6.1.2. The **Contractor** shall be required to move stored materials and equipment that interfere with the operations of the private property owners.

1.6.1.3. The **Contractor** shall be required to obtain and pay for all additional storage or Work areas required for the **Contractor's** operations.

1.7. STATE SALVAGE

No items have been identified for State salvage. The State reserves the right to salvage certain items and equipment and those salvageable items will be identified to the Bidder at the time of their inspection of the proposed Work. The State will remove salvageable items before commencement of the Work.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

Not Used.

END OF SECTION 01 11 00

SECTION 01 21 00
ALLOWANCES

PART I - GENERAL

1.1 CASH ALLOWANCES:

1.1.1 Cash allowances are not included as part of this Contract.

1.2 PROVISIONAL/CONTINGENCY ALLOWANCES:

1.2.1 Provisional/Contingency allowances have been included in this contract to address items that are outside the scope of work that are in the best interest of the State of Michigan during performance of the contract.

1.2.2 Monies will be used in the contingency allowance only if directed in writing from the **Owner**.

1.2.3 This allowance includes **Contractor's** markups.

1.2.4 Unused allowances will be deducted from the contract amount through contract change order.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

Not Used.

END OF SECTION 01 21 00

SECTION 01 22 00

MEASUREMENT AND PAYMENT

PART 1 – GENERAL

1.1. GENERAL

1.1.1. The items listed in **Paragraph 1.5** refer to and are the same pay items listed in the Bid Schedule. They constitute all of the pay items for the completion of the Work. The items listed in **Paragraph 1.6** refer to and are the same Alternate pay items listed in the Schedule of Alternates. Alternates may be added to the Work in the order listed at the time of award. The **Owner** will accept an Alternate only if all other previously listed Alternates are also accepted, unless acceptance by the **Owner** of Alternates in a different order does not affect determination of the lowest Bidder in any way. No direct or separate payment will be made for providing miscellaneous temporary or accessory works, permits, plant services, job signs, sanitary requirements, testing, safety devices, water supplies, power, maintaining traffic, watchmen, bonds, insurance, and all other requirements or Conditions of the Contract. Compensation for all such services and materials shall be included in the prices stipulated for the lump sum and unit price pay items listed herein.

1.1.2. Each lump sum and unit bid price will be deemed to include an amount considered by the **Contractor** to be adequate to cover the **Contractor's** overhead and profit for each separately identified item.

1.1.3. Payment shall be for the pay items listed on the Bid Form. All other undefined work related to the pay items shall be incidental to the pay item.

1.1.4. Payments to the **Contractor** will be made in accordance with the General Conditions and Modifications to General Conditions of the Contract Documents.

1.1.5. Schedule of Values: **Contractor** shall submit a Schedule of Values in accordance with **Section 01 29 73**.

1.1.6. For lump sum items, the **Contractor** will be paid on the basis of actual work completed and accepted. One hundred percent of the contract price for the Work completed and accepted may be paid, subject to the limitations of the General Conditions or Modifications to General Conditions of the Contract Documents.

1.1.7. For unit price items, the **Contractor** will be paid for the actual amount of work accepted. The amount will be in accordance with prices submitted on the Bid Forms.

1.1.8. All units of measurement shall be standard United States convention as applied to the specific items of work as interpreted by the **Professional**.

1.1.9. The estimated quantities for unit price pay items, as listed in the Bid Form, are approximations only and are included solely for the purpose of comparison of Bids. The **Owner** and the **Professional** do not expressly or by implication agree that the actual quantities of material encountered or required, will correspond therewith and reserves the right to increase or decrease any quantity as they may deem necessary.

1.1.10. The **Contractor** shall accept compensation, as full payment to furnish all materials, labor, tools, equipment, and incidentals necessary to complete the Work; for performing all work contemplated and embraced by the Contract; for all loss or damage arising from the nature of the Work, or from action of the elements, or from any unforeseen difficulties which may be encountered during the execution of the Work and until its final acceptance by the **Owner**; for all risks of every description connected with the execution of the Work except as provided herein.

1.1.11. No extra payment will be made to the **Contractor** for any expenses or delays caused by revision of inadequate submittals, lack of progress, defective workmanship, or rescheduling of work by other contractors, subcontractors, or equipment and material suppliers.

1.1.12. Additional costs caused by ill-timed or defective work, or work not conforming to Contract Documents, shall be incurred solely by the **Contractor**.

1.2. ELIMINATED ITEMS

1.2.1. If any item or work, equipment or material is eliminated under a lump sum item, a change order shall be issued as stipulated in the General Conditions.

1.3. INCIDENTAL WORK

1.3.1. Incidental work items for which separate payment is not measured include, but are not limited to, the following items:

1. General Site cleanup and maintenance.
2. Project signage.
3. Restoration of areas used for material and equipment storage.
4. Cooperation and coordination with other contractors, municipalities, utility providers, property owners, and others.
5. Utility crossings and relocations, unless otherwise paid for.
6. Project record documents.
7. Health and safety requirements.
8. Site security.
9. Air monitoring.
10. Dust control.
11. Haul roads.
12. Project Meetings and administration.
13. Movement of surface obstructions to facilitate the work.
14. Protection or removal, maintenance, and reinstallation of existing fencing, signs, light poles, utility poles, retaining walls, and other surface features.

1.4. DESCRIPTION OF PAY ITEMS

1.4.1. The following pay items describe the measurement of payment for the Work to be done under the respective items listed in the Bid.

1.4.2. The following work descriptions summarize the Work to be included in each pay item and may describe all Work, such as Incidental Work described in **Paragraph 1.3**, included in each pay item.

1.4.3. Each unit or lump sum price stated in the Bid shall constitute full compensation, as herein specified, for each item of the Work completed.

1.5. BASE BID PAY ITEMS

1.5.1. Item 1 – Mobilization and Job Site Administration

1. Description: Item 1 includes the preparation and submittal of the required Work Plan, Access and Traffic Control Plan, Health and Safety Plan, Project Schedule, Borrow Area Restoration Plan, and other submittals as specified in **Section 01 33 00**. Item 1 also includes Bonds and Insurance, permits (except permits specifically identified in other Line Items), mobilization to the Site, project coordination, utility locating and protection as necessary, establishment of field office facilities as necessary, Site security, temporary controls and utilities, and all other non-incidental work not specifically included for payment under other items. Mobilization shall include all required mobilizations to facilitate the completion of the Work.

2. Measurement and Payment: Lump sum payment for Item 1 shall be full compensation for all labor, equipment, materials and incidentals necessary for the mobilization and jobsite administration activities identified above**. Lump sum costs will be limited to a maximum of five percent (5%) of the total contract amount.**

1.5.2. Item 2 –Site Preparation – Soil Erosion and Sedimentation Controls, Permits, and Access Improvements

1. Description: Item 2 includes the installation and removal of silt fence and other soil erosion and sedimentation control (SESC) measures described in the Drawings and as may be necessary during execution of the project. Item 2 also includes costs associated with obtaining, maintaining, and successfully closing the Houghton County Drain Commission Part 91 SESC permit and Notice of Coverage for Construction Storm Water. Costs associated with asbestos NESHAP renovation advance notification requirements shall be included in this line item. Site improvements (entrance improvement and haul route loop as contained in the contract documents) needed to facilitate truck access and movement around the Site shall also be included in this Line Item. Item 2 also includes concrete patching of the bulkhead where noted on Drawing C-5.

2. Measurement and Payment: Lump sum payment for Item 2 will be full compensation for all labor, equipment, materials, and incidentals necessary to conduct the above described work.

1.5.3. Item 3 – Tree Removal, Dewatering, and Grading

1. Description: Item 3 includes tree and brush removal and staging of uncontaminated woody debris outside the grading and cap placement area. Item 3 also includes costs to bury contaminated woody debris such as stumps in the specified areas. Item 3 includes consolidation of non-vegetative solid waste outside the grading area but does not include characterization and off-site disposal which is included in Line Item 10. Dewatering necessary to conduct grading and cap placement is included in Item 3. Item 3 also includes removal of any other obstructions and grading of the Coal Dock Burn Area to the specified slopes and as necessary to complete the required Work. Item 3 also includes all dust suppression needed to prevent visible dust and comply with NESHAP requirements, and all personnel and perimeter air monitoring necessary for regulatory compliance and as required by the contract documents during this portion of the Work. Item 3 does not include collection and consolidation of solid waste that will be recycled or disposed under Item 10.

2. Measurement and Payment: Lump sum payment for Item 3 will be full compensation for all labor, equipment, materials, and incidentals necessary to conduct the work described above.

1.5.4 **Item 4 – Drainage Ditch Improvement**

1. Description: Item 4 includes brush removal and excavation of the existing drainage ditch to the profile and grades indicated in the contract documents. Item 4 includes provision and placement of geotextile fabric, rip-rap, and erosion control blankets along the length of the improved ditch. Item 4 also includes cutting off the existing culverts at the upstream end of the ditch and filling the existing scour hole with rip rap. Item 4 also includes all dust suppression needed to prevent visible dust and comply with NESHAP requirements, and all personnel and perimeter air monitoring necessary for regulatory compliance and as required by the contract documents during this portion of the Work.

2. Measurement and Payment: Payment for Item 4 will be lump sum and shall be full compensation for providing all labor, equipment, materials, and incidentals necessary to perform and complete the ditch improvement activities.

1.5.5 **Item 5 – PCB Contaminated Soil and Debris Transport and Disposal**

1. Description: Item 5 includes profiling, manifesting, loading, transport, and proper disposal of waste pile WP-11 using laboratory characterization data provided to the Contractor.

2. Measurement and Payment: Unit rate payment for Item 5 will be based on the number of tons of material disposed and shall be full compensation for all labor, equipment, tools, and incidentals necessary to complete the work described above. Fully executed manifests and disposal receipts, delivery receipts, and weight tickets from a certified scale will be required for payment.

1.5.6. **Item 6 – Cap Installation**

1. Description: Item 6 includes the sourcing, approvals, permitting, preparation, provision, transportation, placement, and compaction of clean sandy loam cap material in the areas identified in the specifications. Item 6 shall also include restoration of the borrow area(s) upon the completion of cap placement.

2. Measurement and Payment: Unit rate payment for Item 6 will be based on the number of acres of clean sandy loam cap material placed at a 6-inch compacted thickness and shall be full compensation for all labor, equipment, materials, and incidentals necessary to complete the work outlined above. The number of acres of cap placed shall be determined by the as-built survey and shall be to the nearest 0.1 acres.

1.5.7 **Item 7 – North Boundary Road Installation**

1. Description: Item 7 includes the provision and placement of 6-inches compacted thickness of one to three-inch diameter crushed stone 8-feet wide along the north edge of the cap placement area at the Hubbell Coal Dock Burn Area. Note that the stone placed for Item 7 does not count in the acreage of cap placement for payment of Item 6.

2. Measurement and Payment: Lump sum payment for Item 7 will be full compensation for all labor, equipment, materials, and incidentals necessary to prepare for and initiate performance of dewatering activities throughout the course of the project.

1.5.8 **Item 8 – Seeding, Fertilizing, and Mulching**

1. Description: Item 8 includes provision and incorporation of the specified seed, fertilizer, and mulch atop the capped area. Item 8 includes the straw mulch blankets as noted on Sheet C-7 along the centerline of the drainage swales depicted by the dotted lines on Sheet C-5 of the Drawings. Item 8 does not include the erosion control blankets along the ditch which are included in Item 4. Seeding and mulching of disturbed areas outside the cap limits are not included in this Line Item; they are incidental to Line Item 11.

2. Measurement and Payment: Unit rate payment for Item 8 will be based on the number of acres of cap material placed and vegetated as determined by the as-built survey to the nearest 0.1 acres and shall be full compensation for all labor, equipment, tools, and incidentals necessary to complete the work described above.

1.5.9 **Item 9 – Final As-Built Survey**

1. Description: Item 9 includes the performance of surveying activities necessary for performance of the Work and determination of final Site conditions, including, but not limited to final topography, centerlines of drainage swales and ditches, limits of rip rap and cap placement, and the limits of access routes and haul roads.

2. Measurement and Payment: Lump sum payment for Item 9 will be full compensation for all labor, equipment, materials, and incidentals necessary for surveying activities.

1.5.10 **Item 10 – Provisionary Allowance**

1. Description: Item 10 is a provisional allowance for materials, equipment, labor, and incidentals not otherwise covered in other pay items to characterize and recycle and/or dispose of non-vegetative solid waste removed from the Hubbell Coal Dock Burn Area as part of the Work. Item 10 is also a provisional allowance for addressing other items that are in the best interest of the State of Michigan as they may be encountered during execution of the Work.

2. Measurement and Payment: Payment for Item 10 will be based on agreed upon costs as they are calculated in accordance with **Section 01 21 00**. As may be appropriate to the agreed upon work, fully executed manifests and disposal receipts, delivery receipts, and weight tickets from a certified scale will be required for payment. The **Contractor** shall be responsible for completion of the provisional allowance form (**Appendix VI**) prior to performing the work under the Provisional Allowance.

1.5.11 **Item 11 – Demobilization and Project Close Out**

1. Description: Item 11 includes the removal of all **Contractor** equipment and excess materials, incidental site restoration outside of the capped area, demobilization, and construction closeout activities as specified in **Section 01 70 00**.

2. Measurement and Payment: Payment for Item 11 will be lump sum and will be full compensation for all labor, materials, equipment, and incidentals necessary for construction demobilization and construction closeout activities. **A minimum of two percent (2%) of the subtotal contract amount shall be included for project closeout activities and will be due to the Contractor following acceptance of all work including vegetation establishment and release of**

the Soil Erosion and Sedimentation Control Permit(s) for the site and borrow area.

Part 2 – PRODUCTS

Not Used.

Part 3 – EXECUTION

Not Used.

END OF SECTION 01 22 00

SECTION 01 23 00

ALTERNATES

PART 1 – GENERAL

1.1. GENERAL

1.1.1 **Use of Alternates**: Determination of the lowest three Bidders shall be on the basis of the sum of the Base Bid and any additive and deductive Alternates the Owner accepts, in the order in which they are listed only. The Owner will accept an Alternate only if all other previously listed Alternates are also accepted, unless acceptance by the Owner of Alternates in a different order does not affect determination of the lowest three bidders in any way.

1.1.2 **Alternate Bid Item A1**: Alternate Bid Item A1 is a deductive alternate that would modify the scope of work contained in Base Bid Line Item 5 and includes the following modifications to the Base Bid scope of work:

1.1.2.1 Instead of loading, transporting, and disposing of waste pile WP-11, the material shall be transported to the Coal Dock Burn Area, spread, graded, and capped with the remainder of the area. No portion of the waste pile shall be left in-place on the Mineral Building property.

Part 2 – PRODUCTS

Not Used.

Part 3 – EXECUTION

3.1 GENERAL

3.1.1 Coordinate pertinent related Work and modify surrounding work as required to complete the Project for each alternate.

END OF SECTION 01 23 00

SECTION 01 29 73

SCHEDULE OF VALUES

PART 1 – GENERAL

1.1 REQUIREMENTS INCLUDED

1.1.1 The Schedule of Values is an itemized list that establishes the value or cost of each part of the Work. It shall be used as the basis for preparing progress payments and may be used as a basis for negotiations concerning additional work or credits, which may arise during the Work. Quantities and unit prices may be included in the schedule when approved by or required by the **Professional**.

1.2 PREPARATION

1.2.1 Schedule of Values shall be prepared on 8½-inch by 11-inch white paper. The schedule shall consist of columns titled Item Number, Description of Work, Quantity, Unit Cost and Scheduled Value.

Identify schedule with:

1. Title or Project and Location.
2. Index and File Number.
3. Name, Address, and Phone Number of **Contractor**.
4. Date of Submission.

The Schedule of Values shall show each task and the corresponding value of each task, including separate monies allocated for General Condition items.

1.2.1.1 Submit Schedule of Values to the **Professional** for review and approval within 14 days of Notice to Proceed or at the Pre-Construction Meeting, whichever occurs first. The Schedule of Values is not a re-submittal of the successful bidder's proposal. The Schedule of Values should be detailed enough to indicate how the unit price was derived. For each line item in the Bid Schedule list sub-values, including but not limited to major products, fees, equipment costs, transportation costs, disposal and recycling costs, labor costs, subcontractor costs for each tier 1 subcontractor, and material costs. The sum of the sub-value shall equal the cost for the line item. After review by the **Professional**, revise and resubmit as required until accepted. No partial payment requests will be entertained until the Schedule of Values has been accepted.

1.2.1.2 The Schedule of Values shall show a breakdown of costs for each pay item used in preparation of the Bid.

1.2.1.3 Breakdown shall be in sufficient detail to serve as a basis for computing values for progress payments during construction and shall indicate separate amounts for each section of the specifications.

1.2.1.4 Breakdown shall include a summary for each item including, but not limited to the anticipated type and number of equipment, machinery, and personnel specific to each line item.

1.2.1.5 For each line item, include a directly proportional amount of the **Contractor's** overhead and profit.

1.2.1.6 Upon request of the **Professional**, support the values with data that will substantiate their correctness.

1.2.1.7 Supporting data may include, but not be limited to, personnel and equipment summaries or delivery schedules for each task to corroborate requests for time extensions related to the Work.

1.2.1.8 The aggregate total for all of the individual values shown on the Schedule of Values must equal the Contract Price.

1.2.1.9 Schedule shall be prepared as specified and in accordance with Paragraph 7.1 of **Section 00700**.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

Not Used.

END OF SECTION 01 29 73

SECTION 01 31 19

PROJECT MEETINGS

PART 1 – GENERAL

1.1 PRE-CONSTRUCTION MEETING

1.1.1 The **Contractor** shall schedule an on-Site pre-construction meeting to be attended by the **Owner**, the **Professional**, and other personnel deemed necessary by the **Owner**. The **Contractor** shall be responsible for being available for a meeting within two weeks of Notification of Award. The pre-construction meeting is established to review, for all responsible parties, the following:

1.1.1.1 Partial payment request cutoff date that **Contractor** can submit to the **Owner** to receive monthly payment.

1.1.1.2 Discussion of Change Orders and Change Order Procedures.

1.1.1.3 Discussion of the **Professional** and **Contractor** responsibilities.

1.1.1.4 The **Contractor** shall distribute required Pre-Work submittals, if not already provided.

1.1.1.5 Discussion on prevailing wages, equal employment opportunity, and other human relations requirements.

1.1.1.6 Project Schedule

1.1.1.7 Specific items related to the staging and progression of Work at the Site, including access control, traffic management, and Work restrictions.

1.1.1.8 Other specific items relative to the project.

1.1.2 The **Professional** will be responsible for preparing a meeting agenda and recording meeting minutes for distribution to meeting attendees.

1.2 WEEKLY PROGRESS MEETINGS

1.2.1 Weekly job meetings shall be conducted with the **Professional** and **Contractor** to evaluate progress on the project to date. Weekly progress meetings will be held on-site.

1.2.1.1 The **Professional** will be responsible for preparing weekly progress meeting agenda.

1.2.1.2 The **Professional** will be responsible for preparing weekly progress meeting minutes for distribution to meeting attendees.

1.2.2 It may periodically become necessary to have special meetings to resolve project conflicts in which all parties shall be required to attend.

1.2.3 Items to be reviewed during weekly job meetings are:

1.2.3.1 Project schedule.

1.2.3.2 Project change orders, if any.

1.2.3.3 Coordinate construction activities with the **Professional**.

1.2.3.4 Coordinate projected progress with other contractors.

1.2.3.5 Review submittal schedules, expedite as required to maintain schedule.

1.2.3.6 Maintaining of quality and work standards.

1.2.3.7 Review changes proposed by the **Owner** for:

1.2.3.7.1 Effect on Construction Schedule.

1.2.3.7.2 Effect on Completion Date.

1.2.3.8 Complete other current business

1.2.3.9 Review next week's Work items.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

3.1 NON-COMPLIANCE

3.1.1 If the **Contractor** fails or refuses to attend or otherwise comply with the project meetings requirements, the **Owner** may issue an order to stop all or part of the Work until satisfactory progress has been make to correct such deficiencies. No part of the time lost due to any such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the **Contractor**.

END OF SECTION 01 31 19

SECTION 01 33 00

SUBMITTALS

PART 1 – GENERAL

1.1 APPLICABILITY

1.1.1 This section applies to all administrative and technical submittals described herein.

1.2 GENERAL PROCEDURES

1.2.1 Submittals may be provided to the **Professional** and **Owner** electronically in Adobe® portable document format (pdf) via electronic mail.

1.2.2 A letter of transmittal shall accompany each submittal. The letter shall be addressed to the following:

Jed Chrestensen, P.E.
The Mannik & Smith Group, Inc.
200 Michigan Street, Suite 705
Hancock, MI 49930

1.2.3 At the beginning of each letter of transmittal provide a reference heading indicating the following:

a. **Owner's** Name Michigan Department of Environmental Quality
b. Project Name Hubbell Processing Area
c. Contract No. _____
d. Transmittal No. _____
e. Description _____

1.2.4 If a submitted plan or schedule deviates from the requirements of the Contract Documents, the **Contractor** shall specifically note each variation in the letter of transmittal.

1.2.5 A number shall be assigned to each submittal by the **Contractor** starting with No. 001 and thence numbered consecutively. Resubmittals shall be identified by the original submittal number followed by the suffix "A" for the first resubmittal, the suffix "B" for the second resubmittal, etc.

1.2.6 The **Contractor** shall submit two copies of all submittals to the **Professional**. With prior approval from the **Professional**, submittals may be provided via electronic mail.

1.3 SUBMITTAL PROCESSING

1.3.1 After the **Professional** completes the concurrent review, each submittal will be marked with one of the following notations:

a. Approved
b. Approved as Corrected
c. Revise and Resubmit
d. Not Approved

1.3.2 If a submittal is acceptable, it will be marked "Approved" or "Approved as Corrected". One copy of the submittal will be returned to the **Contractor**.

1.3.3 Upon return of a submittal marked "Approved" or "Approved as Corrected", the **Contractor** may conduct work in accordance with the submitted plan, schedule, or form.

1.3.4 If a submittal marked "Approved as Corrected" has extensive corrections or corrections affecting other plans or work, the **Professional** may require that the **Contractor** make the corrections indicated thereon and resubmit the plans or schedules for record

purposes. Such submittals will have the notation, “Approved as Corrected - Resubmit.”

1.3.5 If a submittal is unacceptable, two copies will be returned to the **Contractor** with one of the following notations:

1. “Revise and Resubmit”
2. “Not Approved”

1.3.6 Upon return of a submittal marked “Revise and Resubmit”, the **Contractor** shall make the corrections indicated and repeat the initial approval procedure. The “Not Approved” notation is used to indicate a plan or schedule that is not acceptable. Upon return of a submittal so marked, the **Contractor** shall repeat the initial approval procedure to resubmit the appropriately revised schedule or plan.

1.3.7 Any work performed without the “Approved” or “Approved as Corrected” plans, schedules, and forms will be at the sole responsibility of the **Contractor**.

1.3.8 Submittals shall be provided to the **Professional** well in advance of the need to begin the Site work.

1.3.9 The **Professional** will review and process all submittals within 10 business days.

1.4 INCOMPLETE or INADEQUATE SUBMITTALS

1.4.1 It is the **Contractor’s** responsibility to review submittals made by his suppliers and Subcontractors before transmitting them to the **Professional** to assure proper coordination of the Work and to determine that each submittal is in accordance with the **Contractor’s** desires and that there is sufficient information for the **Professional** to determine compliance with the Contract Documents. Incomplete or inadequate submittals will be returned for revision without review.

1.4.2 The **Contractor** shall furnish required submittals with complete information and accuracy in order to achieve required approval of an item within three submittals. All costs to the **Professional** involved with subsequent submittals requiring approval, will be back charged to the **Contractor**, at the rate of 3.5 times direct technical labor cost, by deducting such costs from payments due to the **Contractor** for Work completed.

1.5 PRE-WORK SUBMITTALS

1.5.1 Within 10 working days following the Notice to Proceed, the **Contractor** shall submit two copies of the following administrative submittals. The **Contractor** shall not initiate field activities until all of these submittals have been reviewed and accepted by the **Owner**:

1.5.1.1 Work Plan (WP).

1.5.1.2 Soil Erosion and Sedimentation Control (SESC) Implementation Plan.

1.5.1.3 Health and Safety Plan (HASP).

1.5.1.4 Access and Traffic Control Plan.

1.5.1.5 Borrow Area Restoration Plan.

1.5.1.6 Project Schedule.

1.5.1.7 Submittal Register.

1.5.1.8 Sample Daily Progress and Daily Site Safety Forms.

1.5.2 A WP shall be completed by the **Contractor** to meet the following requirements:

1.5.2.1 The **Contractor** shall submit a WP, which will identify personnel, procedures, instructions, records, and forms to be used in carrying out the requirements of this project. The WP is the means by which the **Contractor** and the **Owner**

are assured that the Work complies with the requirements of the Contract drawings and specifications.

1.5.2.2 The plan shall be adequate to cover all Work operations and should consider each stage of the project, including but not limited to sections addressing access control, access improvements and haul roads, temporary facilities, dust control, perimeter air monitoring, site preparation, ditch improvement, waste removal and disposal, waste pile management, grading, capping, and restoration of the project areas.

1.5.2.2.1 The **Contractor's** project organization structure including the **Contractor's** staffing table with names, titles, and responsibilities of personnel assigned to the Project. The **Contractor**, prior to conducting Work, must submit necessary substitutions due to change of employment status and other unforeseen circumstances in writing for acceptance.

1.5.2.2.2 The WP shall identify the **Contractor's** Certified Construction Storm Water Operator that will be assigned to the project.

1.5.2.2.3 A list of the **Contractor's** permits required to successfully complete this Contract.

1.5.2.2.4 The WP shall include a detailed description of the methods, procedures, and equipment proposed for each of the major tasks covered under this contract, including but not limited to the tasks listed in paragraph 1.5.2.2 above.

1.5.2.2.5 The **Contractor** shall identify sources of off-site borrow and provide evidence of written access from each property owner for each borrow source if commercial sources are not used. The **Contractor** shall also provide a location map for the proposed borrow source.

1.5.2.2.6 The WP shall include locations and description of management practices that will be utilized as part of the soil erosion and sedimentation control program, both temporary and permanent measures.

1.5.2.2.7 The **Contractor** shall include emergency contacts and after hours phone numbers in the WP as well as provisions for a contingency plan to be implemented in the case of an emergency.

1.5.2.2.8 The WP shall include provisions for spill control, including locations and type of spill control equipment to be utilized.

1.5.2.2.9 The WP shall include provisions for the handling of contaminated soil, contaminated water generated from dewatering and decontamination, or other activities.

1.5.2.2.10 The names of the disposal facilities to be used as a result of these specifications shall be included in the WP. The **Contractor** shall provide all appropriate permits and licenses for review by the **Owner** and the **Professional**. If necessary, Site inspections may be requested to verify adequacy and compliance status.

1.5.2.2.11 **Contractor's** proof of waste acceptance from the **Owner** approved disposal facility.

1.5.2.2.12 The WP shall contain provisions to control surface water runoff and run on, regardless of whether or not a permit is required for the Site.

1.5.2.2.13 The WP shall include a Site Plan indicating the proposed location, dimensions, and specifications of any area to be used for employee and/or vehicle/equipment parking/storage, visitor parking, material storage/lay-down, temporary facilities, the avenues of ingress/egress to the construction area, vehicle and personnel decontamination units, equipment decontamination pads, storage pads, and primary roadways within the Site. In addition, the **Contractor** shall identify the location, size, and type of vehicle and personnel decontamination units. Access roadways for fire control shall remain open at all times.

1.5.2.2.14 The WP shall include provisions for air monitoring and dust control during the performance of the Work.

1.5.3 After acceptance of the WP, the **Contractor** shall notify the **Owner** in writing of any proposed change. Proposed changes are subject to **Owner** approval.

1.5.4 Project Organization

1.5.4.1 The **Contractor** shall designate a Site Manager, who shall be responsible for overall management of the Work and have authority to act for the **Contractor**.

1.5.4.2 The **Contractor** shall also provide a Certified Construction Storm Water Operator for the project. The Certified Operator shall be identified in the WP.

1.5.4.3 The Site Manager for this Contract shall be an individual experienced in remedial excavation, dewatering, backfilling, and compaction and whose responsibility is to insure compliance with the Contract plans and specifications.

1.5.4.4 The Site Manager shall be on-site whenever Work is in progress.

1.5.4.5 All on-site **Contractor** and subcontractor staff shall be under the direction of the Site Manager at all times.

1.5.4.6 The **Contractor's** personnel performing the Work shall be fully qualified by experience and technical training to perform their assigned responsibilities and shall be hired directly by and Work for the **Contractor**.

1.5.5 Air Monitoring Plan

1.5.5.1 The WP shall include as a separate appendix a project specific Air Monitoring Plan. The **Contractor's** air monitoring plan shall be submitted to the Professional and must be found acceptable.

1.5.5.2 The air-monitoring plan at a minimum shall include perimeter air monitoring including real-time particulate monitoring and dedicated portable air sampling pumps with cassettes for asbestos fiber sampling. A minimum of six locations shall be monitored daily when work activities are disturbing soil, debris, and waste piles, and when vehicles or equipment are driving across uncapped ground.

1.5.5.3 The air-monitoring plan shall include personnel monitoring for asbestos fibers as required for asbestos workers conducting renovation work.

1.5.5.4 Placement of air monitoring devices shall be along the property perimeter. Two permanent stations shall be established, with one being along the south fence

line adjacent to the neighboring business and one along the south portion of the west fence line closest to the nearby residence. The remaining four locations will be determined daily by the **Contractor** based on the prevailing wind direction and as approved by the **Professional**. At least one location shall be upwind of the daily work area.

1.5.5.5 Air monitoring for asbestos fibers shall include field blanks.

1.5.5.6 The real time particulate monitoring shall be completed on an as needed basis but not less than in one (1) hour intervals during the aforementioned activities. The real time monitoring shall include at a minimum, perimeter dust monitors with data logging capability. The air monitors shall be placed at representative upwind and downwind locations at the limits of Work. The real time monitoring data shall be used by the **Contractor's** Site Safety Manager to assist with evaluating on-site conditions as they relate to health and safety issues during construction efforts and to determine if migration of airborne contaminants is occurring.

1.5.5.7 The air monitoring data shall be submitted to the **Professional** on a daily basis and in accordance with the approved plan for review and comment. If the hourly data suggest dust is reaching the perimeter fence line the **Professional** shall be immediately notified and appropriate action shall be taken by the **Contractor** to mitigate dust commensurate with the readings obtained. Dust concentrations meeting or exceeding one-half of the OSHA permissible exposure limits or the action levels identified in the **Contractor's** HASP, whichever are lower, shall be grounds for a temporary work stoppage until the source of the dust is mitigated.

1.5.6 SESC Implementation Plan

1.5.6.1 The **Contractor** shall utilize the proposed Site Preparation and Restoration plans from the Drawing sets to prepare and submit a SESC Implementation Plan to the permit issuing agency in order to obtain a SESC permit for the project. The SESC Implementation Plan shall outline the **Contractor's** means and methods for implementing the SESC provisions prescribed in these specifications and as required by Part 91 of NREPA.

1.5.7 HASP

1.5.7.1 The **Contractor's** Site-specific HASP is provided for information only to the reviewers and for implementation by the **Contractor**. The **Owner** and the **Professional** may review for completeness. Comments will be provided to the **Contractor**, but no approval of the HASP will be granted. Following inclusion of the comments, the **Owner** will accept the HASP.

1.5.7.2 The Site-specific HASP shall meet the requirements, at a minimum, of the following:

1.5.7.2.1 29 CFR 1910: Safety and Health Regulations for General Industry, United States Occupational Safety and Health Administration (OSHA), as amended.

1.5.7.2.2 Standard Operating Safety Guides, U.S. EPA, November 1984.

1.5.7.2.3 Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, NIOSH Publication No. 85-115, October 1985.

1.5.7.2.4 29 CFR 1926: Safety and Health Regulations for Construction, OSHA, as amended.

1.5.7.3 The HASP is an enforceable document that shall guide the activities of the **Contractor's** personnel and all subcontractors' personnel. The HASP shall define Site-specific safety provisions necessitated by all project activities of the **Contractor** and subcontractors.

1.5.7.4 Hazard Communication Program: A hazard communication program shall be utilized in accordance with 29 CFR Part 1926.59.

1.5.7.5 The **Contractor** and **Contractor's** safety officer shall be solely responsible for the implementation and monitoring of the HASP. The HASP shall address, but not be limited to, the following items:

1.5.7.5.1 *Site Characterization*: Provide a description of past activities at the Site and planned construction activities, including specific tasks required to complete the Work.

1.5.7.5.2 *Hazards*: Provide a list and description of potential chemical, biological, and physical hazards associated with the Site, Site contaminants including asbestos, and construction activities to be conducted.

The groundwater and soil/debris encountered during the Work contains organic and inorganic contaminants that exceed select MDEQ Part 201 Criteria. Analytical results from samples collected from the Site are summarized and included **Attachment III**. These and other potential chemical, biological, and physical hazards associated with the Site shall be addressed in the **Contractor's** HASP.

1.5.7.5.3 *Planning*: Describe the proposed health and safety organization and procedures for continuous updating of the HASP based on actual Site conditions. The **Owner** shall be notified in writing of any proposed changes. This Section shall also identify Site operating procedures.

1.5.7.5.4 *Training*: Identify the types and level of training provided to all Site workers and other on-site personnel prior to their assignment to this project. Include a list of all personnel that meet the training and medical surveillance requirements of 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response (HAZWOPER). HAZWOPER training is required for all workers that may encounter hazardous substances at the site during remediation efforts. Provide the name, qualifications, and responsibilities of the Site Safety Officer and all health and safety staff. Provide copies of appropriate certifications for all individuals who will be involved in the Work. No **Contractor** personnel shall participate in activities that could potentially expose them to contaminants at the Site until proper and up-to-date training certification has been submitted to the **Owner**.

1.5.7.5.5 *Medical Monitoring*: All on-site personnel involved in waste removal work, handling and disposal of waste and contaminated materials, and any workers that may contact contaminated media shall be enrolled in an ongoing medical monitoring program as identified in 29 CFR 1910, as amended, and shall be appropriately certified for the Work. The HASP shall describe the details of the **Contractor's** medical monitoring program. Provide documentation of program participation by all appropriate personnel to the **Owner**.

This documentation shall include a copy of the physician's statement for each appropriate employee regarding any restrictions that the employee may have relative to the nature of the Work to be conducted at the Site.

1.5.7.5.6 *Personal Protective Equipment*: Identify the means of personnel protection, including use of engineering controls, to be utilized for each Site activity as defined in U.S. EPA Standard Operating Safety Guides. Identify conditions that would require increasing the level of protection during each activity. Procedures for protecting personnel from other physical hazards (i.e., heat stress, hypothermia, excessive noise, etc.) shall also be identified in this Section of these specifications.

1.5.7.5.7 *Site Emergencies*: Provide a Contingency Plan that sets forth policy and procedures for responding to emergency situations, such as fire, physical injury, release of toxic materials, etc.

1.5.7.5.8 *Waste Handling Procedures*: Identify procedures that will be used to ensure safe waste handling during the removal, transfer, dewatering, loading, transportation, grading, consolidation, and capping activities.

1.5.7.5.9 *Personnel Decontamination*: The **Contractor** shall provide an uncontaminated changing area for personnel. No person shall leave a contaminated Work area unless he or she has removed or decontaminated all protective clothing. No protective equipment (including boots) or tools shall be worn or carried out of the project area unless properly decontaminated. All personnel entering or leaving the contamination reduction zone shall pass through the decontamination area to don or remove protective equipment.

1.5.7.5.10 *Equipment Decontamination*: Any item taken into the exclusion zone shall be assumed to be contaminated and shall be decontaminated before the item leaves the contamination reduction zone. The **Contractor** shall set up controls to assure that contaminated items do not leave the contamination reduction zone. Personnel performing decontamination shall be dressed at the appropriate level of protection to avoid personal contamination.

1.5.7.5.11 *Hot Work – Welding and Cutting*: The **Contractor** shall establish procedures for performing hot work, including but not limited to riveting, welding, cutting, burning, and heating, or any other activity capable of providing a source of ignition. Additional requirements related to hot work are defined in 29 CFR 1926 Subpart J.

1.5.7.5.12 No vehicle shall leave the Work area with contaminated waste material clinging to the wheels or any part of the vehicle so that it has the potential for being deposited at any location other than a disposal facility. Decontamination of vehicles and equipment used in contaminated Work areas shall include, but not be limited to, the following procedures: physical removal of solid materials and a completed liquid wash. The decontamination area shall include a contaminated water collection system. Water generated as a result of decontamination activities that does not contain any additives will be allowed to be applied to the ground surface within the area of contamination. Decontamination water containing any additives or water that cannot be applied to the ground surface within the

area of contamination shall be contained, characterized, and properly disposed. Materials generated during decontamination shall be placed under the clean soil cap prior to placement or properly disposed. The disposal shall be manifested in accordance with these specifications. Disposal of water generated by decontamination activities shall be disposed of by the **Contractor** at no additional cost to the **Owner**.

1.5.7.5.13 The HASP shall specifically address the regulatory requirements for workers and activities at sites containing asbestos.

1.5.7.5.14 The **Professional** and **Owner** may require revisions to the HASP, however extensions to the time period of this Contract will not be granted if caused by delays in developing an acceptable HASP.

1.5.7.5.15 The **Contractor** shall conduct all operations in accordance with the HASP. Disregard for the provisions of the HASP shall be deemed just and sufficient cause for suspension of the Work and/or removal of **Contractor's** personnel without compromise or prejudice to the rights of the **Owner** or the **Professional**.

1.5.8 Access and Traffic Control Plan

1.5.8.1 The Access and Traffic Control plan shall outline details summarizing and provide drawings depicting the **Contractor's** plan for managing on and off-site traffic in addition to the requirements outlined in **Section 01 50 00**, Paragraph 1.5. The Traffic Control Plan shall incorporate text and drawings that detail the **Contractor's** means and methods for maintaining and protecting traffic on all affected roads during the construction period, including from the borrow source to the Site. The Traffic Control Plan shall describe the measures for the protection and diversion of traffic and identification of specific personnel to be used as watchman or flaggers. The Access and Traffic Control Plan may be included as a separate appendix to the project WP.

1.5.9 Borrow Area Restoration Plan

1.5.9.1 The **Contractor** shall provide a Borrow Area Restoration Plan that details the soil erosion and sedimentation control (SESC) measures and restoration plan for the clean sandy loam borrow area. The plan shall address at a minimum, in addition to the above items, clearing and grubbing, disposition of cleared and grubbed material, topsoil stripping and staging, final grading plans, re-spreading salvaged topsoil, and seeding and mulching or other permanent SESC measures. The plan shall include a copy of the SESC permit issued for the borrow source, if applicable. Incorporation of edits required by the **Professional** and/or the **Owner** to the plan does not relieve the **Contractor** of the responsibility for completing the specified work. The Borrow Area Restoration Plan may be included as a separate appendix to the project WP.

1.5.10 Project Schedule

1.5.10.1 The Project Schedule is intended to show: (a) the priority and sequencing by which the **Contractor** intends to execute the Work (or Work remaining) to comply with Contract Times, those sequences of Work indicated in or required by the Contract Documents; (b) how the **Contractor** anticipates foreseeable events, Site conditions and all other general, local and prevailing conditions that may in any manner affect cost, progress, schedule, performance and furnishing of the Work; and (c) how the Means and Methods chosen by the

Contractor translate into activities and sequencing; and (d) the actual timing and sequencing of completed Work.

Contractor must resolve the issues arising from the review by the **Professional** and/or the **Owner** and submit Project Schedule Revisions. The review of the Project Schedule by the **Professional** or the **Owner** does not create or impose on the **Owner** or the **Professional** any responsibility for the timing, planning, scheduling or execution of the Work or the correctness of any such Project Schedule detail. The **Contractor** must update the schedule a minimum of every two weeks. The correctness of Project Schedule remains the sole responsibility of the **Contractor**.

1.5.10.2 Provide a Project Schedule that conforms to the requirements below, unless otherwise approved by the **Owner**.

1.5.10.3 The schedule shall be formatted as a Gantt Chart and shall contain:

1.5.10.3.1 Administrative and technical submittal dates and required approval dates.

1.5.10.3.2 After starting Work, the **Contractor** shall continue the Work to completion unless delays are approved by the **Owner**.

1.5.10.3.3 Work activities and durations with expected start and finish dates for each phase of the Work on each property (at a minimum Submittals, Permitting, Site Preparation, Ditch Improvement, Waste Pile Management, Waste Characterization and Disposal, Grading, Capping, Seeding and Mulching, Site Restoration, Final As-Built Survey, Demobilization, SESC Maintenance, and Project Closeout Activities). If Alternate Work is accepted the **Contractor** shall update the Project Schedule.

1.5.10.3.4 Procedures for updating schedules include:

1.5.10.3.4.1 Update schedules a minimum of every two weeks unless otherwise specified or directed by the **Owner**.

1.5.10.3.4.2 Submit updated schedules at alternating progress meetings. If a schedule remains unchanged, submit a written notice to that effect.

1.5.11 Submittal Register

1.5.11.1 The **Contractor** shall submit a list of the submittals (Submittal Register) required in these specifications. The list shall include all submittals through project closeout. The frequency of the submittal or due date shall also be included.

1.5.12 Sample Daily Progress and Daily Site Safety Forms

1.5.12.1 The Daily Progress Forms shall outline the Work accomplished during the reporting period and Work to be accomplished during the subsequent reporting period; problems, real or anticipated, which should be brought to the attention of the **Professional**; and notification of any significant deviation from previously agreed upon WP.

1.6 OTHER SUBMITTALS

1.6.1 Reports/Forms

1.6.1.1 Daily Work Log: The **Contractor** shall maintain a daily log of Work activities, including the Work of suppliers and subcontractors. This log shall be in an acceptable form and indicate a description of trades working on the project, the number of personnel working, equipment, the weather conditions encountered, and any delays encountered, and acknowledgment of deficiencies noted along with the corrective actions taken on current and previous deficiencies. In addition, the log shall include factual evidence that required activities have been performed, including but not limited to the following:

1.6.1.1.1 Type and number of activities.

1.6.1.1.2 Nature of defects, causes for rejection, etc.

1.6.1.1.3 Corrective actions taken.

1.6.1.1.4 Proposed remedial action.

1.6.1.1.5 Any spills that occurred.

The log shall cover both conforming and defective or deficient features and shall include a statement that supplies and materials incorporated in the Work comply with the Contract. Legible copies of the log shall be furnished to the **Owner** or the **Professional** upon request. The **Contractor** shall keep records of the Pre-final and Final Inspections, including a "punch list" of items that do not conform to the approved plans and specifications. For each item on the list, the **Contractor** shall document corrective actions taken.

1.6.1.2 Waste Transportation/Disposal Manifests: Waste transportation and disposal will be fully manifested as outlined in **Section 02 61 00** of these specifications. The **Owner** or the **Professional** will verify and sign all waste profiles and manifests prior to transportation. The **Contractor** shall not sign waste profiles or manifests. No waste materials shall leave the Site unless they have been characterized, properly labeled and placarded, and are transported under manifest procedures en route to a proper disposal facility. All completed original manifests shall be returned to the **Professional** within five (5) working days of disposal of the individual loads at the licensed disposal facility. A Waste Manifest Log shall be maintained on-site, and shall include the following information for each load:

1.6.1.2.1 Date and time.

1.6.1.2.2 Material being transported off-site.

1.6.1.2.3 Appropriate cubic yards, tonnage, or gallons.

1.6.1.2.4 Destination.

1.6.1.2.5 Vehicle Number.

1.6.1.2.6 Driver.

1.6.1.2.7 Manifest Number.

1.6.1.2.8 Copy of delivery ticket from disposal facility.

At the conclusion of the project or at the request of the **Owner**, the waste manifest log shall be submitted to the **Owner** as part of the Project Record Documents.

1.6.2 The **Contractor** shall prepare and submit Technical Submittals as required by the Specifications.

1.6.2.1 **Shop Drawings, Sample and Technical: Contractor** must submit to the **Professional** (a) an electronic file(s) of the drawing(s) and mylar or sepia together with the blue line drawings of all Shop Drawings; (b) all required samples; and (c) all other technical submittals (test, results, test and safety procedures, etc.) that are required by the Contract Documents. Each submittal must be stamped/certified to indicate that the **Contractor** has satisfied the requirement of the Contract Documents and all trade construction Submittals must be coordinated, reviewed and stamped/approved by the **Contractor** before submission to the **Professional**.

1.6.2.2 Before each submission, the **Contractor** must (a) determine and verify all field measurements, quantities, dimensions, instructions for installation and handling of equipment and systems, installation requirements (including location, dimensions, access, fit, completeness, etc.), materials, color, catalog numbers and other similar data as to correctness and completeness, and (b) have reviewed and coordinated that technical Submittal with other technical submittals and the requirements of the Contract Documents.

1.6.2.3 The **Contractor** must give the **Professional** specific written notice of any variation from the requirements of the Contract Documents. Neither the **Owner**'s authority to review any of the Submittals by the **Contractor**, nor the **Owner**'s decision to raise or not to raise any objections about the Submittals, creates or imposes any duty or responsibility on the **Owner** to exercise any such authority or decision for the benefit of the **Contractor**/Subcontractor/Supplier, any surety to any of them or any other third party. The **Contractor** is not relieved of responsibility for errors or omissions in shop drawings, product data, samples, or similar submittals just because the **Professional** approved them.

1.7 AS-BUILT DOCUMENTS

1.7.1 The finalized As-Built/Record Documents and approved Submittals are required for processing final payment to the **Contractor**.

1.7.2 The **Contractor** shall maintain one current record copy of all specifications, drawings, addenda, change orders, and shop drawings at the Site. The documents shall be kept current, in good order, and annotated to show all changes made during the construction process. These As-Built Documents shall be available for review by the **Professional** during all normal working hours.

1.7.3 The **Contractor** shall submit to the **Owner** one set of prints of the drawings and specifications and one electronic copy of the drawings and specifications. Final surveying requirements are as indicated in **Section 02 21 00**. Drawings shall be in AutoCAD 2009 format or newer, which have been marked "As-Built Documents" and shall contain all changes, additions or deviations from the original set of Documents that have been incorporated into the Work. These changes shall be clearly marked on the "As-Built Documents." The **Contractor** is responsible for the accuracy of these As-Built Documents.

1.7.4 The **Contractor** shall include As-Built Documents in the submitted Schedule of Values.

1.7.5 The **Professional** will provide the **Contractor** with electronic versions of the existing Site layout at the start of project.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

3.1 NON-COMPLIANCE

3.1.1 If the **Contractor** fails or refuses to comply with the submittal procedures promptly, the **Owner** may issue an order to stop all or part of the Work until satisfactory progress has been make to correct such deficiencies. No part of the time lost due to any such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the **Contractor**.

END OF SECTION 01 33 00

SECTION 01 35 00

SPECIAL PROJECT PROCEDURES

PART 1 – GENERAL

1.1 SIGNAGE

1.1.1 The **Contractor** must post appropriate construction signs to advise the occupants and visitors of the limits of construction work areas, hardhat areas, excavations, construction parking and staging areas, one-lane traffic, etc. The **Contractor** must maintain safe and adequate pedestrian and vehicular access to fire hydrants, road shoulders, and neighboring residences and establishments.

1.2 BARRIERS AND ENCLOSURES

1.2.1 The **Contractor** must furnish, install and maintain as long as necessary and remove when no longer required adequate barriers, warning signs or lights at all dangerous points throughout the Work for protection of property, workers and the public. The **Contractor** must hold the State of Michigan harmless from damage or claims arising out of any injury or damage that may be sustained by any person or persons as a result of the Work under the Contract.

1.2.2 **Street Barricades**: The **Contractor** must erect and maintain all street barricades, signal lights and lane change markers during the periods that a traffic lane is closed or the road shoulder is closed for their operations. There must be full compliance with rules and ordinances respecting such street barricading and devices must be removed when hazard is no longer present.

1.3 CONSTRUCTION AID

1.3.1 **Utilities**: The **Contractor** is responsible for identifying and protecting utilities. The **Contractor** must provide adequate bracing and support for any excavated or under-mined utilities.

1.4 HAZARDOUS MATERIAL PROJECT PROCEDURES

1.4.1 The **Contractor** must use, handle, store, dispose of, process, transport and transfer any material considered a Hazardous Material in accordance with all Federal, State and local Laws. If the **Contractor** encounters material not previously identified in the contract documents that is reasonably believed to be a Hazardous Material and which may present a substantial danger, the **Contractor** must immediately stop all affected work, give written notice to the **Owner** of the conditions encountered, and take appropriate health and safety precautions.

1.4.2 This project has been identified as having a possibility of containing Hazardous Waste materials to be legally removed from the Project job site in order to complete the Work. Friable asbestos and non-friable asbestos that may become friable by the earth work operations may be encountered. The **Contractor** must contact the Air Quality Division, Department of Environmental Quality, for a permit as necessary and furnish all training, labor, materials, services, insurance, and equipment necessary to carry out the removal and/or renovation operations of all Hazardous Materials at the Project job site, as identified

by the Scope of Work, or encountered on the Project job site, in accordance with State and Federal Hazardous Waste Codes.

1.4.3 Environmental Hazards (air, water, land and liquid industrial) are handled by the Waste and Hazardous Materials Division, MDEQ in carrying out the requirements of the Federal Environmental Protection Agency (EPA). For general information and/or a copy of the latest regulations and publications call (517) 335-2690.

1.4.4 The Michigan Occupational Safety and Health Administration (MIOSHA) provides protection and regulations for the safety and health of workers. The Department of Energy, Labor and Economic Growth provides for the safety of workers. The Department of Community Health provides for the health of workers (517/373-3740) (TDD 517/373-3573)

1.4.4.1 The **Contractor** must post any applicable State and/or Federal government regulations at the job site in a prominent location.

1.4.4.2 The **Contractor** must be responsible for training their workers in safe work practices and in proper removal methods when coming in contact with hazardous materials and chemicals.

1.4.5 Applicable Regulations

1.4.5.1 Natural Resources and Environmental Protection Act – PA 451 of 1994, as amended, including Part 111 – Hazardous Waste Management, Part 121 – Liquid Industrial Waste and Part 147 – PCB compounds.

1.4.5.2 RCRA, 1976 - Resource Conservation and Recovery Act: This federal statute regulates generation, transportation, treatment, storage or disposal of hazardous wastes nationally.

1.4.5.3 TSCA, 1979 – Toxic Substances Control Act: This statute regulates the generation, transportation, storage and disposal of industrial chemicals such as PCBs.

1.4.6 Definitions: Hazardous substances are ignitable, corrosive, reactive, and/or toxic, based on their chemical characteristics.

1.4.6.1 Under Federal and Michigan Law, a Small Quantity Generator of hazardous waste provides from 220 to less than 2,000 lbs./month or never accumulates 2,200 lbs. or more.

1.4.6.2 A Large Quantity Generator of hazardous waste provides 2,200 lbs. or more/month or accumulates above 2,200 lbs.

1.4.7 Disposals: To use an off-site hazardous waste disposal facility, the **Contractor** must use the Uniform Hazardous Waste Manifest (shipping paper).

1.4.8 Small quantities of hazardous waste may not be disposed of in sanitary landfills used for solid waste.

1.4.9 Federal, State and local Laws and regulations may apply to the storage, handling and disposal of Hazardous Materials and wastes at each State Agency. Contact the **Environmental Assistance Center** of the MDEQ at **1-800-662-9278**, Fax to: 517-335-4729 or e-mail from the webpage http://www.deq.state.mi.us/eforms/deq-emailinquiry.html for general MDEQ information including direct and referral assistance on air, water and wetlands permits; contaminated site clean-ups; underground storage tank removals and remediation; hazardous and solid waste disposal; pollution prevention and recycling; and compliance-related assistance. The Center provides businesses, municipalities, and the general public with a single point of access to MDEQ's environmental programs.

Topic	Agency and Telephone Number
Small quantity hazardous waste	Waste Management and Radiological Protection Division, MDEQ Management (517) 335-2690 in Lansing, or District or Certified County Health Departments
Liquid industrial waste disposal	Waste Management and Radiological Protection Division, MDEQ (hazardous and non-hazardous) (517) 335-2690 in Lansing, or District Office
Disposal of wastewater into sewer	Contact the superintendent of your wastewater municipal sanitary sewers treatment plant for permission
Discharges to surface water such as through a drain pipe or wastewater discharge	Water Bureau, MDEQ (517) 241-1300 in Lansing, or District Office
Discharges to groundwater, including septic systems	Water Bureau, MDEQ (517) 241-1300 in Lansing, or District Office, or County Health Departments (if less than 10,000 gallons/day)
Material storage permits	Waste Management and Radiological Protection Division, MDEQ (517) 335-2690 in Lansing, or District Office
Pollution Incident Prevention Plans (PIPP Plans)	Water Bureau, MDEQ (517) 241-1300 in Lansing, or District Office County Health Departments assisting w/groundwater program administration
Hazard Communication Standards	Occupational Health Division, (for chemicals in the work place) Michigan Department of Community Health (517) 332-1608
Burning of waste oil and other discharges to the air	Air Quality Division, MDEQ (517) 335-6290 in Lansing, or District Office
Registration of underground fuel storage tanks	Dept. of Licensing & Regulatory Affairs (517) 335-7210
Installation, inventory, testing & other requirements for above ground and underground storage	Dept. of Licensing & Regulatory Affairs (517) 335-7210

Local fire prevention regulations and codes (including chemical storage requirements)	Local fire chief or fire marshal
Building and outdoor storage requirements (including setbacks)	Local government building or zoning official

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

Not Used.

END OF SECTION 01 35 00

SECTION 01 41 00

REGULATORY REQUIREMENTS

PART 1 – GENERAL

1.1 REGULATIONS:

1.1.1 **Laws:** The **Contractor** and its Subcontractors/Suppliers must comply with all Federal, State, and local Laws applicable to the Work and Site.

1.1.2 **Codes:** All Works must be provided in accordance with the State Construction Code Act, 1972 PA 230, as amended, MCL 125.1501 et seq,, International Building and Residential Codes and all applicable Michigan construction codes and fire safety including but not limited to: Michigan Building Code, Michigan Residential Code, Michigan Uniform Energy Code, Michigan Electrical Code, Michigan Rehabilitation Code for Existing Buildings, Michigan Mechanical Code, Michigan Elevator Code and Michigan Plumbing Code. If the **Contractor** observes that any Contract Document conflicts with any Laws or the State Construction Code or any permits in any respect, the **Contractor** must promptly notify the **Professional** in writing. If the **Contractor** provides any Work knowing or having to reason to know of such conflict, the **Contractor** must be responsible for that performance.

1.1.3 **Permits:** All required construction permits must be secured and their fees including inspection costs must be paid by the **Contractor**. The time incurred by the **Contractor** in obtaining construction permits must constitute time required to complete the Work and does not justify any increases to the Contract Time or Price, except when revisions to the Drawings and/or Specifications required by the permitting authority cause the Delays. The **Contractor** must pay all charges of Public Utilities.

1.1.4 **Taxes:** The **Contractor** must pay all Michigan sales and use taxes and any other similar taxes covering the Work that are currently imposed by legislative enactment and as administered by the Michigan Department of Treasury, Revenue Division. If the **Contractor** is not required to pay or bear the burden or obtains a refund of any taxes deemed to have been included in the Bid and Contract Price, the Contract Price must be reduced by a like amount and that amount, whether as a refund or otherwise, must ensure solely to the benefit of the State of Michigan.

1.1.5 **Safety and Protection:** The **Contractor** and its Subcontractors/Suppliers must comply with all applicable Federal, State and local Laws governing the safety and protection of persons or property, including, but not limited to the Michigan Occupational Safety and Health Act (MIOSHA), 1974 PA 154, as amended, MCL 408.1001 et seg., and all rules promulgated under the Act. The **Contractor** is responsible for all damages, injury or loss to the Work, materials, equipment, fines, penalties as a result of any violation of such Laws, except when it's due to the fault of the Drawings or Specifications or to the Act, error or omission of the **Owner** or **Professional**. The **Contractor** is solely responsible for initiating, maintaining, and supervising all safety precautions and programs and such responsibility must continue until such time as the **Professional** is satisfied that the Work, or Work inspected, is completed and ready for final payment. In doing the Work, the **Contractor** must take all necessary precautions for the safety of, and must erect and maintain all necessary safeguards and provide the necessary protection to prevent damage, injury or loss to: (a) all employees on the Work and other persons who may be affected by the Work, (b) all the Work and materials and equipment to be incorporated into the Work, whether stored on or off the Site, and (c) other property at or adjacent to the Site, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities,

and Underground Utilities not designated for removal, relocation, or replacement. In the event of severe weather, the **Contractor** must inspect the Work and the Site and take all reasonably necessary actions and precautions to protect the Work and ensure that public access and safety are maintained.

1.1.6 **Fire Hazard Conditions:**

1.1.6.1 The fire hazard classification of finish materials where used in the specification must be listed in the following table:

CLASS	FLAME SPREAD	FUEL CONTRIBUTION	SMOKE DEVELOPED
A	0-25	0-35	0-50
B	26-75	36-75	51-125
C	76-200	76-200	126-200

1.1.6.2 Classification must be determined by tunnel test in accordance with National Fire Protection Association NFPA-255), American Society for Testing Materials (ASTM-84) or Underwriters' Laboratories, Inc. (UL-723).

1.1.7 **Michigan Right-To-Know Law:** The **Contractor** and its Subcontractors/Suppliers must comply with MIOSHA, Michigan Right-to-Know Law, Public Act 80 of 1986 (Act) and the rules promulgated under it. The Act places certain requirements on employers to develop a communication program designed to safeguard the handling of hazardous chemicals through labeling of chemical containers and development and availability of Material Safety Data Sheets (MSDS), and to provide training for employees who work with these chemicals and develop a written hazard communications program. The Act also provides for specific employee rights, including the right to be notified of the location of MSDS and to be notified at the Site of new or revised MSDS within five Business Days after receipt and to request MSDS copies from their employers. The **Contractor**, employer or Subcontractor must post and update these notices at the Site.

1.1.8 **Environmental Requirements:** The **Contractor** and its Subcontractors/Suppliers must comply with all applicable Federal, State, and local environmental Laws, standards, orders or requirements including but not limited to the National Environmental Policy Act of 1969, as amended, Michigan Natural Resources and Environmental Protection Act, P.A. 451 of 1994, as amended, the Clean Air Act, as amended, the Clean Water Act, as amended, the Safe Drinking Water Act, as amended, Pollution Prevention Act, as amended, Resource Conservation and Recovery Act, as amended, Toxic Substances Control Act as amended, National Historic Preservation Act, as amended and Energy Policy and Conservation Act and Energy Standards for Buildings Except Low-Rise Residential Buildings, ANSI/ASHRAE/IESNA Standard 90.1-1999.

1.1.9 **Nondiscrimination:** For all State Contracts for goods or services in amount of $5,000 or more, or for Contracts entered into with parties employing three or more employees; in connection with the performance of Work under this Contract, the **Contractor** and its Subcontractors and Suppliers must comply with the following requirements:

1.1.9.1 Not to discriminate against any employee or applicant for employment because of race, color, religion, national origin, age, sex, height, weight or marital status and take affirmative action to ensure that applicants are employed and the employees are not subject to such discrimination. Such action must include, but is not be limited to, the following: employment, upgrading, demotion or transfer; recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training.

1.1.9.2 To state in all solicitations or advertisements for employees that all qualified applicants will receive consideration for employment without regard to race, color, religion, national origin, age, sex, height, weight or marital status.

1.1.9.3 To send, or have its collective bargaining representative send, each labor union or representative of workers with which there is a collective bargaining agreement or other contract or understanding, a notice advising the labor unions or workers' representative of the commitments under this provision.

1.1.9.4 To comply with the Elliot-Larsen Civil Rights Act, 1976 PA 453, as amended, MCL 37.2201 et seq.; the Michigan Persons With Disability Civil Rights Act, 1976 PA 220, as amended, MCL 37.1101 et Seq.; and all published rules, regulations, directives, and orders of the Michigan Civil Rights Commission (MCRC) which may be in effect on or before the date of Bid opening.

1.1.9.5 The **Contractor** must furnish and file compliance reports within the times, and using the forms prescribed by the MCRC. Compliance report forms may also elicit information as to the practices, policies, programs, and employment statistics of the **Contractor** and Subcontractors. The **Contractor** must permit access to Records by the MCRC and its agent for purposes of ascertaining compliance with the Contract and with rules, regulations, and orders of the MCRC.

1.1.9.6 If, after a hearing held under its rules, the MCRC finds that the **Contractor** has not complied with the nondiscrimination requirements of the Contract Documents, MCRC may, as part of its order, certify its findings to the Administrative Board of the State of Michigan, which may order the cancellation of the Contract and/or declare the **Contractor** ineligible for future contracts with the State until the **Contractor** complies with the MCRC's order.

1.1.10 **Michigan Residency for Employees:** Fifty percent of the persons employed on the Work by the **Contractor** must have been residents of the State of Michigan for not less than one year before beginning employment on the Work. This residency requirement may be reduced or waived to the extent that Michigan residents are not available or to the extent necessary to comply with the federal funds (if any) used for the Project. This requirement does not apply to employers who are signatories to collective bargaining agreements that allow for the portability of employees on an interstate basis.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

Not Used.

END OF SECTION 01 41 00

SECTION 01 42 00

REFERENCES

PART 1 – GENERAL

1.1 REFERENCES

1.1.1 References may be made in an abbreviated alpha numeric form to specific standard specifications, reference publications and building codes of federal or state agencies, manufacturers, associations or trade organizations. Such references will be identified by the alphabetic abbreviation which identifies the government agency, the association or organization followed by the rule, section or detail number that are to form a part of these specifications, the same as if fully set forth herein, and must be of latest issued date in effect three months before the Bid opening date shown on the Proposal and Contract. The abbreviations used are referred to as follows:

Abbreviation	Agency, Association or Organization
ACI	American Concrete Institute
AISC	American Institute of Steel Construction, Inc.
AMCA	Air Moving and Conditioning Association
ANSI	American National Standards Institute, Inc.
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASSE	American Society of Sanitary Engineering
ASTM	ASTM International
AWS	American Welding Society
AWWA	American Water Works Association
BOCA	Building Officials and Code
CLFMI	Chain Link Fence Manufacturer's Institute
CISPI	Cast Iron Soil Pipe Institute
CRSI	Concrete Reinforcing Steel Institute
CS	Commercial Standard
F/M	Factory Mutual Research Corporation
FS	Federal Specifications
HEW	United States Department of Health Education and Welfare
MDOT	Michigan Department of Transportation
NFPA	National Fire Protection Association
NSF	National Sanitation Foundation Testing Laboratory, Inc
NSWMA	National Solid Waste Management Association
PCA	Portland Cement Association
PDI	Plumbing and Drainage Institute
SMACNA	Sheet Metal & Air Conditioning Contractors
UL	Underwriters Laboratories, Inc
USDC	United States Department of Commerce

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

Not Used.

END OF SECTION 01 42 00

SECTION 01 45 00

QUALITY CONTROL

PART 1 – GENERAL

1.1 MATERIALS CERTIFICATION

1.1.1 For certain products, assemblies, and materials, in lieu of on-site sampling and testing procedures, the **Owner** will accept from the **Contractor** the manufacturer's certification, with respect to the product(s) involved, upon the conditions set forth in the following paragraphs:

1.1.1.1 Certification shall state that the named product conforms to the specifications and that representative samples have been sampled and tested as specified.

1.1.1.2 Certification shall be accompanied with a certified copy of the test results.

1.1.1.3 The certification shall give name and address of the manufacturer and the testing agency, the date of test, and shall set forth the means of identification which will permit field determination of the products delivered to the project as being one product covered by the certification.

1.1.1.4 The certification shall be duplicated with one (1) copy sent with shipment of the covered product to the **Contractor** and one (1) copy sent to the **Professional**.

1.1.1.5 The **Owner** will not be responsible for any additional costs for certification or for any costs of sampling and testing.

1.2 SUBMITTALS

1.2.1 The **Professional** and **Owner** shall be provided copies of all laboratory analytical and geotechnical analysis reports for review and rejection or approval in advance of when material is needed at the site. The **Contractor** shall plan accordingly, so as not to delay the project schedule.

1.3 TESTING LABORATORY AND FIELD SERVICES

1.3.1 All tests required by the **Owner** must fulfill ASTM, ANSI, Commercial and other Standards for testing. The **Contractor** must submit a minimum of two copies of each test report to the **Professional** for evaluation and subsequent distribution. The following general classifications of Work require submission of test reports and/or certificates of inspection. Additional submissions may be requested by the **Professional** at any time.

Item of Work	Test Type	Section Number
Imported Cap Material	Gradation	01 45 00 and 31 22 23
Imported Cap Material	Laboratory Analytical Testing	01 45 00 and 31 22 23
Haul Road Gravel	Gradation	01 45 00 and 31 22 23
1 to 3-Inch Crushed Stone	Gradation	01 45 00 and 31 22 23
Rip-Rap	Gradation	01 45 00 and 31 22 23

1.3.2 Costs for all required testing are the responsibility of the **Contractor**.

1.3.3 **Imported Fill – Laboratory Analytical Testing**: Before placement of any fill, certification that each off-site material to be used (cap material and roadway gravel) is uncontaminated and does not exceed MDEQ Part 201 Generic Residential Cleanup Criteria Requirements for Response Activity (December 30, 2013) or updated criteria in effect at the time the work occurs shall be provided. The following analytical tests will be required. Detection limits must meet MDEQ requirements for comparison to Part 201 Generic Residential Cleanup Criteria and Screening Levels and be in compliance with the most recent revision of MDEQ's Target Detection Limits and Designated Analytical Methods.

1.3.3.1 Michigan 10 metals via United States Environmental Protection Agency (USEPA) SW-846 6000 and 7000 Series Methods.

1.3.3.2 Target Compound List (TCL) parameters for volatile organic compounds (VOCs) via USEPA SW-846 Method 8260, semi-volatile organic compounds (SVOCs) via USEPA SW-846 Method 8270, pesticides, and polychlorinated biphenyls via USEPA SW-846 Method 8082.

1.3.3.3 Provide testing results and the source of the proposed fill material to the **Professional** and allow a minimum of 48-hours for review of the data.

1.3.3.4 If the proposed fill material exceeds the MDEQ Part 201 Generic Residential Cleanup Criteria Requirements for Response Activity the material will not be acceptable for backfill. The **Contractor** shall then propose a new source with appropriate testing data. The **Owner** will not accept additional costs for rejection of the proposed backfill or for the **Contractor** to locate a new source of backfill. The work shall not be allowed to remain unfilled/uncovered in order for the **Contractor** to obtain acceptable fill material. The **Contractor** shall plan accordingly, so as not to delay the project schedule.

1.3.4 **Imported Fill – Geotechnical Testing**: Test reports shall be submitted prior to and during construction.

1.3.4.1 One sample of all cap, haul road gravel, and coarse aggregate/crushed stone material types shall be collected and analyzed by a qualified, **Owner** approved, geotechnical laboratory for the following:

1.3.4.1.1 ASTM D421/422: Particle Size Analysis of Soils.

1.3.4.1.2 If a commercial supplier is used, the **Contractor** may supply a certification of gradation for haul road gravel and/or coarse aggregate/crushed stone in lieu of laboratory testing.

1.3.4.1.3 If the proposed fill material does not meet the gradation requirements the material will not be acceptable for use. The **Contractor** shall then propose a new source with appropriate testing data. The **Owner** will not accept additional costs for rejection of the proposed backfill or for the **Contractor** to locate a new source of backfill. The work shall not be allowed to remain unfilled/uncovered in order for the **Contractor** to obtain acceptable fill material. The **Contractor** shall plan accordingly, so as not to delay the project schedule.

1.3.4.2 Rip-rap: Appropriate NRCS Method or ASTM D5519-15: Standard Test Methods for Particle Size Analysis of Natural and Man-Made Riprap Materials. Per NRCS specifications:

1.3.4.2.1 “The Contractor shall furnish the personnel, scales and equipment necessary to extract a sample of riprap from the stockpile or supply operations, and determine the weight of each piece of stone that is sized larger than the smallest” size “listed in the gradation. Stone pieces smaller than the smallest size may be weighed together and their total weight determined. The minimum personnel, scales, and equipment are:

1.3.4.2.1.1 Personnel – Three or more workers to operate the scales and equipment, and to move and handle the stone to and from the scale.

1.3.4.2.1.2 Scales – At least two scales and test weights for checking the accuracy of the scales. Each scale shall be a direct registering type (not a balance beam type).

1.3.4.2.1.3 Equipment – At least one front end loader (or other Engineer approved machine) with a qualified operator."

1.3.4.2.2 "The samples to be tested shall be selected at random by the Engineer from the first 75 tons of riprap delivered to the site or from a stockpile at some other mutually agreeable location. The sample shall consist of at least 2 tons of riprap".

1.3.4.2.3 The Contractor shall set up the riprap gradation testing scales at a convenient location on the construction site or at another location that is acceptable to the Engineer. The Contractor shall extract the test samples of riprap from the stockpile or supply operation in a manner that does not lose any portion of the sample. The Contractor shall handle and weigh the stone pieces and compile a list of the weights of each stone piece and of the weight of material in pieces" 5 "inches and larger. Pieces smaller than" 5 "inches may be grouped by size and composite weighed. A copy of this list shall be given to the Engineer at the completion of the weighing operation. All weighing work shall be performed in the presence of the Engineer."

1.3.4.2.4 "Each test sample of riprap meeting the requirements of this specification shall be placed as a unit in a location that is roughly square in shape and where it can be used as a check section for visual comparison. The limits of this section shall be marked."

1.3.4.2.5 "If the first sample of riprap tested meets the required gradation, the Engineer may require that one additional sample of the same type – either from riprap in-place or from riprap in a stockpile – be tested as previously described. If any sample of riprap fails to meet the required gradation, sufficient – as determined by the Engineer – additional samples of riprap shall be tested to demonstrate that the riprap does or does not meet the required gradation."

1.3.4.2.6 If the proposed fill material does not meet the gradation requirements the material will not be acceptable for use. The **Contractor** shall then propose a new source with appropriate testing data. The **Owner** will not accept additional costs for rejection of the proposed backfill or for the **Contractor** to locate a new source of backfill. The work shall not be allowed to remain unfilled/uncovered in order for the **Contractor** to obtain acceptable fill material. The **Contractor** shall plan accordingly, so as not to delay the project schedule.

1.3.4.2.7 As previously identified by NRCS, acceptable sources for riprap, assuming gradation requirements are met, include the waste rock pile at the Baltic Mine, Baltic, Michigan, the waste rock pile at Dodgeville, Michigan, or the waste rock pile at Allouez, Michigan.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

3.1 Testing Frequency – Fill material brought to the site shall be tested at the frequencies specified below.

3.1.1 Cap Material – Gradation tests for the sandy loam cap material shall be completed at the rate of one test per 1,000 cubic yards of material brought to the site or when changes in texture occur or borrow pits change. The first set of acceptable test results shall be provided to and accepted by the **Owner** and **Professional** before any cap material is brought to the site. In addition, a ten-pound sample of the tested material shall be provided to the **Professional** to accompany each test result.

3.1.2 Cap Material – Laboratory Analytical tests shall be performed at the rate of one test per borrow pit.

3.1.3 Gravel – Gradation tests shall be completed once for each source of gravel. If a commercial supplier is used, the **Contractor** may supply a certification of gradation in lieu of laboratory testing.

3.1.4 1-3 Inch Crushed Stone – Gradation tests shall be completed once for each source of crushed stone.

3.1.5 Rip-Rap – An acceptable set of gradation tests shall be completed once for each source of rip-rap.

END OF SECTION 01 45 00

SECTION 01 50 00

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 – GENERAL

1.1 WATER SUPPLY

1.1.1 The **Contractor** as part of the Work, shall provide at the points of use all water necessary for the **Contractor's** operations, including but not limited to dust control and fire protection. The **Contractor** shall make all arrangements necessary to obtain water. Any water brought on-site to complete Work must have the prior approval of the **Professional**.

1.1.2 Torch Lake Township has advised that using their municipal water system as a water system, including use of the hydrants adjacent to the site, is not desirable. The **Contractor** should not plan to use the Torch Lake Township water supply.

1.1.3 A previous nearby demolition project reportedly used the Village of Laurium water system as a source of water for dust suppression. The **Contractor** shall be responsible for all arrangements that may be needed to use a municipal water source, including payment of fees.

1.1.4 The **Contractor** can use surface water from Torch Lake for dust suppression under the following conditions:

1.1.4.1 Under absolutely no circumstances shall the surface water withdrawal operations disturb lake bottom sediments. Any observation of sediments in the water stream or visible discoloration of the water stream due to sediments shall be grounds for immediate termination of the use of surface water until the sediments are eliminated from the intake. Sediments are known to be contaminated with PCBs and any equipment contacting lake bottom sediments shall be deemed PCB-contaminated until proven otherwise.

1.1.4.2 The withdrawal infrastructure shall not interfere with or impede fishing which occurs along the outside edge of the pilings.

1.1.4.3 The intake shall be suspended several feet above the bottom of the lake through the use of a secured float or direct attachment to pilings.

1.1.4.4 The withdrawal shall be discrete and shall not draw attention from lake users. In this regard, the withdrawal shall be placed in a location that minimizes its visibility, such as where the concrete bulkhead has already been breached.

1.2 ELECTRICAL ENERGY

1.2.1 The **Contractor** as part of the Work, shall provide suitable electrical power necessary to perform the Work. The use of each source must be approved by the **Owner** in advance.

1.2.2 The **Contractor** shall make arrangements with utility and property owners as needed, to obtain electrical power for performance of the work.

1.2.3 Electrical generators are not acceptable for use as an electrical power source without prior written approval from the **Owner** and/or the **Professional**.

1.2.4 The **Contractor** shall make all necessary applications, arrangements, and inspections and pay all fees and charges for electrical energy for power and light necessary for the proper completion of the Work during its entire progress. The **Contractor** shall provide and pay for all temporary wiring, switches, connections, and meters.

1.2.5 **Section 01 11 00**, Paragraph 1.3.4 requires that Work be performed during daylight hours. In the event that daily preparatory or completion activities are conducted during hours of

insufficient daylight, the **Contractor** shall provide sufficient electric lighting so that all Work may be properly and safely conducted in the Work area.

1.2.6 The **Contractor** shall assume all risks of loss or damage of any kind to any vehicles, machinery, equipment, materials or supplies, which it shall provide in doing the Work.

1.3 SANITARY FACILITIES

1.3.1 The **Contractor** shall provide adequate sanitary conveniences for the use of those performing Work on-site. Such conveniences shall be made available when the first employees arrive on-site and shall be properly secluded from public observation, and shall be constructed and maintained in suitable numbers and at such points and in such manner as may be required or approved.

1.3.2 The **Contractor** shall maintain the sanitary facilities in a satisfactory and sanitary condition at all times and shall enforce their use. The **Contractor** shall rigorously prohibit the committing of nuisances on the Site of the Work, on the lands of the **Owner** or Property Owner, or on adjacent property.

1.4 PROJECT SIGNAGE

1.4.1 General Awareness

The **Contractor** must post appropriate construction signs to advise the occupants and visitors of occupied facilities of the limits of construction work areas, hardhat areas, excavations, construction parking and staging areas, etc. Refer to **Section 01 35 00**.

1.4.2 Bulletin Board

Immediately upon the beginning of Work, the **Contractor** shall provide a weatherproof Plexiglas® covered bulletin board not less than 915 by 1220 mm (36 x 48 inches) in size for displaying the Equal Employment opportunity poster, and other information approved by the **Owner**. The bulletin board shall be located at the project Site in a conspicuous place easily accessible to all employees as approved by the **Owner**. Legible copies of the aforementioned data shall be displayed until Work is completed. Upon completion of Work the bulletin board shall be removed by and remain the property of the **Contractor**.

1.5 PROTECTION AND MAINTENANCE OF TRAFFIC

1.5.1 During construction, the **Contractor** shall maintain and protect traffic on all affected roads during the construction period. Measures for the protection and diversion of traffic, including the provision of watchman and flagman, erection of barricades, placing of lights around and in front of equipment and the Work, and the erection and maintenance of adequate warning, danger, and direction signs, shall be as required by the State and local authorities having jurisdiction. The traveling public shall be protected from damage to person and property. The **Contractor's** traffic on roads selected for hauling material to and from the Site shall interfere as little as possible with public and private traffic. The **Contractor** shall investigate the adequacy of existing roads and the allowable load limits on these roads. The **Contractor** shall be responsible for the repair of any damage to roads caused by construction operations.

1.5.2 Vehicle Contamination

The **Contractor** shall provide the means to decontaminate all construction equipment prior to removal from the Site. The decontamination process shall serve to remove soil and materials from vehicles before they exit the Site. All equipment that comes in contact with contaminated media on-site or as specified by the **Owner** and/or the **Professional** shall be decontaminated. Soils or contaminants shall be removed and properly handled by the **Contractor**. At a minimum, the **Contractor** shall provide high pressure water for decontamination.

1.5.3 Haul Roads

The **Contractor** shall construct access and haul roads/routes necessary for proper execution of the Work. Haul roads shall be constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided.

1.5.4 Barricades

The **Contractor** shall erect and maintain temporary barricades to limit public access to the construction areas. Such barricades shall be required whenever safe public access to paved areas such as roads, parking areas, shoulders, or sidewalks is prevented by construction activities or as otherwise necessary to ensure the safety of both pedestrian and vehicular traffic. Barricades shall be securely placed, and clearly visible with adequate illumination to provide sufficient visual warning of the hazard during both day and night.

1.5.5 Fence

The **Contractor** shall erect and maintain temporary fencing around the perimeter of the exclusion zone of the Work area to inhibit pedestrian access to the exclusion zone and asbestos working areas, if not already protected by permanent fencing. Fencing shall be 4-foot high plastic snow fencing or similar that provides adequate visual and physical warning, presents a neat appearance, and prevents errant entry into the exclusion zone or asbestos work areas until such time the hazards are mitigated.

1.6 PROTECTION OF EXISTING WELLS

1.6.1 There are no known water wells within the work area. If a well is encountered, the **Professional** shall be immediately notified and the **Contractor** shall avoid damaging the well. The **Owner** or **Professional** will evaluate the situation and then direct the **Contractor** to avoid the well or properly abandon the well under the Provisional Allowance.

1.7 CONTRACTOR'S TEMPORARY FACILITIES

1.7.1 The **Contractor** must furnish, install, and maintain as long as necessary and remove when no longer required adequate barriers, warning signs or lights at all dangerous points throughout the Work for protection of property, workers and the public. The **Contractor** must hold the State of Michigan harmless from damage or claims arising out of any injury or damage that may be sustained by any person or persons as a result of the Work under the Contract.

1.7.2 The **Contractor** shall provide such temporary enclosures and facilities as the Work may warrant. These facilities may include, but not be limited to, a **Contractor's** office and storage facility, a decontamination trailer or shelter for crews including sanitary facilities conforming to local codes and OSHA requirements, yard lighting, fire protection, safety equipment, construction warning, protection, and control devices for maintenance and safety of vehicular and pedestrian traffic, decontamination facilities, and trash receptacles.

1.7.3 The **Contractor** shall completely remove all temporary equipment and materials upon completion of the Work and repair all damage caused by the installation of any temporary facilities.

1.7.4 The **Contractor** shall make any necessary applications and arrangements for electric power, light, telephone, toilets, water, showers, and other utilities. The **Contractor** is to provide all facilities and utilities required for completion of Work.

1.7.5 The **Contractor** shall obtain permits as required by local governmental authorities, obtain any easements necessary for temporary power service, comply with the latest National Electrical Code, and comply with all local, State and Federal codes, laws, and regulations.

1.7.6 Appearance of Trailers

Trailers utilized by the **Contractor** for administrative or material storage purposes shall have a clean and neat exterior appearance and shall be in a state of good repair.

1.7.7 Maintenance of Construction Area

Should the **Contractor** elect to traverse with construction equipment or other vehicles on grassed or unpaved areas which are not established roadways, such areas shall be protected to prevent rutting and the tracking of mud onto paved or established roadways and restored to their original conditions upon completion of the Work.

1.7.8 Security Provisions

The **Contractor** shall be responsible for the security of its own equipment. Other security items, such as exterior lighting, shall be the responsibility of the **Contractor** including all fees.

1.7.9 Storage Facilities

The **Contractor** shall be responsible for providing and maintaining storage facilities for construction and storm water that comes into contact with contaminated materials, if necessary, and other project related items.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

Not Used.

END OF SECTION 01 50 00

SECTION 01 60 00

MATERIAL AND EQUIPMENT

PART 1 – GENERAL

1.1 The **Contractor** must furnish and be responsible for all materials, equipment, facilities, tools, supplies, and utilities necessary for completing the Work. All materials and equipment must be provided as described in the Contract Documents and of good quality, free of defect, and new and must be applied, installed, connected, erected, used, cleaned, and conditioned following the manufacturer's and suppliers' instructions.

1.2 **Delivery, Storage, and Handling**: All materials and equipment delivered to and used in the Work must be suitably stored and protected from the elements. The areas used for storage must only be those approved by the State Agency. The **Owner** and **Professional** assume no responsibility for stored material. The Ownership and title to materials will not be vested in the **Owner** before materials are incorporated in the Work, unless payment is made by the **Owner** for stored materials and equipment. After delivery, before and after installation, the **Contractor** must protect materials and equipment against theft, injury, or damage from all causes. For all materials and equipment, the **Contractor** must provide complete information on installation, operation, and preventive maintenance.

1.2.1 The **Contractor** must cover and protect bulk materials while in storage which are subject to deterioration because of dampness, the weather, or contamination. The **Contractor** must keep materials in their original sealed containers, unopened, with labels plainly indicating manufacturer's name, brand, type, and grade of material and must immediately remove from the Work site containers which are broken, opened, watermarked, and/or contain caked, lumpy, or otherwise damaged materials.

1.2.2 The **Contractor** must keep equipment stored outdoors from contact with the ground, away from areas subject to flooding, and covered with weatherproof plastic sheeting or tarpaulins.

1.2.3 The **Contractor** must certify that any materials stored off-site are:

a) Stored on property owned or leased by the **Contractor** or owned by the State agency.

b) Insured against loss by fire, theft, flood, or other hazards.

c) Properly stored and protected against loss or damage.

d) In compliance with the plans and specifications.

e) Specifically allotted, identified, and reserved for the project.

f) Itemized for tracking and payment.

g) Subject to these conditions until the items are delivered to the project site.

1.3 DOCUMENTATION

1.3.1 The **Contractor** shall furnish equipment and materials lists including manufacturer(s) specifications, installation requirements, operational instructions, maintenance procedures and warranties as part of the pre-construction submittals.

1.3.2 Post-construction submittals will include verification of materials, quantities, bills of lading, certifications, maintenance requirements, and warranties associated with the materials and equipment installed.

1.3.3 Documentation provided in submittals shall be in adequate detail regarding dimensions, materials, connections, and interface to confirm whether the work represented complies with the Contract Documents.

1.3.4 Documentation shall be organized to facilitate review and use. Reports and manuals shall have a table of contents in suitable detail for locating required topics and attachments.

1.3.5 Documentation shall be in proper form and format. For example, signed Certificates of Compliance shall be provided under the **Contractor's** or subcontractor's letterhead with the information requested.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

Not Used.

END OF SECTION 01 60 00

SECTION 01 70 00

CONTRACT CLOSE-OUT

PART 1 – GENERAL

1.1 SUBSTANTIAL COMPLETION

1.1.1 The **Contractor** shall submit written notification that:

1.1.1.1 Following inspection and any required testing, the Work has progressed to the point that construction and the Work is substantially complete in accordance with Contract Documents.

1.1.2 Within a reasonable time after receiving the **Contractor's** list of items to be completed or corrected, the **Owner**, **Professional,** and **Contractor** shall jointly conduct a Substantial Completion inspection. The **Contractor** must be represented at the time this inspection is made and thereafter must complete all Work by the date set for final acceptance by the **Owner**.

1.1.2.1 If the Work is deemed by the **Professional** to not be substantially complete:

1.1.2.1.1 The **Professional**, within three (3) Calendar Days after the inspection, will deliver to the **Owner** and **Contractor** a list of incomplete or Defective Work sufficient to demonstrate the basis for that determination.

1.1.2.1.2 The **Contractor** shall take immediate steps to remedy the stated deficiencies, and send second written notice to the **Owner** certifying that work is complete.

1.1.2.2 If the **Owner** and the **Professional** agree that the Work is substantially complete:

1.1.2.2.1 The **Professional** will deliver to the **Owner** and **Contractor** a certificate of Interim Substantial Completion with a Punch List.

1.1.2.2.2 Upon Substantial Completion of the Work, or designated part of the Work on which separate Substantial Completion and Contract Price are specified, payment may be made in full subject to (a) a withholding of two hundred percent (200%) of the value of any uncompleted Work, as determined by the **Professional**, and (b) any other deductions as the **Professional** may recommend or the **Owner** may withhold to cover Defective Work.

1.1.3 Neither the Work, nor any portion of the Work inspected, shall be substantially complete, unless the **Owner** can use the Work, or designated portion of the Work inspected, for the use intended.

1.2 CLEANING

1.2.1 **Regular Cleaning**: The **Contractor** must remove all scrap or removed material, debris or rubbish from the Project work site at the end of each working day and more frequently whenever the **Owner** Field Representative deems such material to be a hazard. The **Contractor** cannot discard materials on the grounds of the State Agency or property owners without the express permission of the Project Director or actions are part of the written scope of work. No salvage or surplus material may be sold on the premises of the State Agency or Site property owner. No burning of debris or rubbish is allowed. Any recyclable materials must be recycled.

1.2.2 **Final Cleaning**: Before final acceptance by the State, the **Contractor** must clean all of the Work and existing surfaces, building elements, and contents that were soiled by their operations and make repairs for any damage or blemish that was caused by the Work.

1.3 FINAL COMPLETION

1.3.1 The **Contractor** shall complete the Substantial Completion Punch List within the Contract Time and date fixed by the **Professional**. Following completion of the Punch List Items the **Contractor** shall submit written notification that the Work is ready for final completion inspection.

1.3.2 Upon written notice from the **Contractor** that the **Contractor** considers the entire Work, or a part of the Work for which final payment is specified in the Contract Documents, to be complete and ready for final payment, the **Professional** will make a final completion inspection with the **Owner** and **Contractor**

1.3.3 Should the **Owner** and the **Professional** agree that the Work is finally complete in accordance with the requirements of Contract Documents; the **Contractor** will be instructed to submit Project Closeout documents.

1.3.4 Should the **Owner** and **Contractor** agree that the Work is not finally complete in accordance with the requirements of Contract Documents; the **Contractor** will be notified in writing of all instances of incomplete or Defective Work revealed by the final completion inspection. The **Contractor** shall immediately undertake all necessary measures to complete Work in the final completion inspection.

1.4 FINAL REQUEST FOR PAYMENT

1.4.1 The **Contractor** may request final payment after completing the incomplete or Defective Work to the satisfaction of the **Professional** and delivering final operating and maintenance documentation (with revisions made after Substantial Completion), warranties, inspection certificates, Record Documents (with revisions made after Substantial Completion), release of payment claim forms, and all other required documents.

1.4.2 In addition to Application and Certification for payment, the **Contractor** shall submit the following documents to the **Owner** with the final Request for Payment:

1.4.2.1 Evidence of an affidavit certifying that the surety agrees that final payment shall not relieve the surety of any of its obligations under the Performance Bond and Payment Bond.

1.4.2.2 A **Contractor's** "Guarantee and Statement" (available from the **Owner**, form DMB-437) containing a statement of guaranteed indebtedness acceptable to the **Owner** in the full amount of the Contract Price, or a release of payment claims in the form of a release of liens, or a Bond or other security acceptable to the **Owner** to indemnify the **Owner** against any payment claim.

1.4.2.3 A disclosure of all pending insurance claims rising out of or resulting from the Work being handled by the **Contractor** and/or its insurer.

1.4.2.4 A Certificate of Substantial Completion form. This form must be dated to reflect the actual date of Substantial Completion and signed by an authorized representative of the **Contractor**.

1.4.2.5 A Final Bulletin/Change Order Request to adjust the Contract to coincide with actual Work performed.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

Not Used.

END OF SECTION 01 70 00

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DIVISION 02

EXISTING CONDITIONS

SECTION 02 21 00

SURVEYS

PART 1– GENERAL

1.1 DESCRIPTION OF WORK

1.1.1 The work to be performed under this section shall include:

1.1.1.1 Project as-built survey after the completion of the Work.

1.1.1.1.1 The survey work shall be performed under the direction of a Land Surveyor registered in the State of Michigan who shall be subcontracted by the **Contractor** to perform the survey work to be performed under this item.

1.1.1.1.2 Post-construction as-built survey of:

1.1.1.1.2.1 Edges and elevations of haul and access roadways.

1.1.1.1.2.2 Limits of decontamination pad(s)/area(s).

1.1.1.1.2.3 Southern drainage ditch floor and bank edges and elevations, final grades, and rip-rap limits.

1.1.1.1.2.4 Topography and limits of uncapped graded areas, if any.

1.1.1.1.2.5 Topography and limits of the capped areas including cap limits and elevations at a minimum of every 50 feet and at all grade breaks and changes in direction.

1.1.1.1.2.6 Drainage swale centerlines, bank tops, and final grades.

1.1.1.1.2.7 Limits of restoration (seeding and mulching) if not the same as the limits of cap placement.

1.1.1.1.2.8 Limits of restoration of disturbed areas outside of the cap limits.

1.1.1.1.2.9 Encountered utilities or utility locations not previously identified (if any).

1.1.1.1.2.10 Limits of vegetative debris burial.

1.1.1.1.2.11 Sufficient existing Site features to accurately locate the above features on the existing Site Plan, such as the established site benchmarks.

1.2 SUBMITTALS

Prior to commencement of Work under this item, the **Contractor** shall submit for approval the name, address, registration number, and telephone number of the Surveyor that will perform this work on the project.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

3.1 SURVEYING

3.1.1 Both horizontal and vertical control shall be provided and annotated on the final map as an individual layer. Unless qualified otherwise, vertical control for the survey is to be provided in North American Vertical Datum of 1988 (NAVD 88) and horizontal control shall be tied to the state plane coordinate system North American Datum of 1983 (NAD 83).

3.1.2 Tolerance on construction shall be ±0.10 foot horizontal and ±0.01 foot vertical every 100 feet with no compounding of tolerances.

3.1.3 Topographic survey shall be referenced to primary control on established benchmarks, unless otherwise noted.

3.1.3.1 All surface features described in Paragraph 1.1.1.1.2 of this Section to be surveyed shall be shown and identified on the 1 inch = 50 feet map. The surface features shall be overlain on the existing AutoCAD® map, which the **Professional** will provide to the **Contractor**. The **Contractor** shall contour the cap, swale, and ditch limits and provide the surface for use in AutoCAD®.

3.1.4 The **Contractor** shall maintain complete and accurate field notes for all control points and survey points as Work progresses

3.1.5 All point elevations shall be accurate to a tenth of a foot. Tie-ins to the benchmarks shall be accurate to a hundredth of a foot.

3.2 DELIVERABLES

3.2.1 All deliverables under this item shall be signed and sealed by the Surveyor.

3.2.2 All topographic survey plans shall be prepared at a scale of 1 inch = 50 feet, unless otherwise directed by the **Professional**.

3.2.3 For all work under this item, the **Contractor** shall submit CD copies of the topographic survey plans in Land Development Desktop/Autocad® 2009 format or newer with executable files along with two (2) prints for each survey plan required.

3.2.4 The **Professional** reserves the right to require the submittal of copies of any or all survey field notes from the **Contractor**.

3.2.5 Electronic files shall be provided on the following media:

3.2.5.1 CD-RW. Files may be compressed using WINZIP.

3.2.5.2 AutoCAD files shall contain topographic information in the following formats, in separate files:

3.2.5.2.1 Discrete 3-D data points.

3.2.5.2.2 Raw survey data shall be supplied electronically for use with Land Development Desktop/Autocad® 2009 or newer.

3.2.5.3 Layers for physical features shall be as follows:

3.2.5.3.1 Separate layers for:

3.2.5.3.1.1 Topography

3.2.5.3.1.2 Limits of swales, ditches, cap placement, and grading

3.2.5.3.1.3 Access and haul roads

3.2.5.3.1.4 Limits of restoration

3.2.5.3.1.5 Encountered or not previously identified utilities

END OF SECTION 02 21 00

SECTION 02 61 00

OFF-SITE TRANSPORTATION AND DISPOSAL

PART 1 – GENERAL

1.1 SUMMARY

1.1.1 The **Contractor** shall furnish all labor, materials, equipment, and related items required for the proper handling, transportation, and disposal of waste materials.

1.1.2 The **Contractor** is to determine the proper waste characterization and recycling or disposal methods to ensure that waste materials are disposed of according to procedures that are consistent with applicable regulations.

1.1.3 Payment shall be as specified by the **Contractor** on the Bid Form of these specifications.

1.1.4 Waste manifests and profiles shall be prepared by the **Contractor**. The **Owner** or the **Professional** only shall sign manifests or waste profiles on behalf of the State of Michigan (the generator). The **Contractor** and subcontractor shall not sign manifests as generator for any waste materials. The **Contractor** is responsible for providing 48 hours notice prior to the initiation of disposal activities. This notice will allow the **Professional** to ensure the appropriate parties are at the Site to sign the manifests.

1.1.5 No waste materials shall leave the Site unless they have been characterized, properly labeled and placarded, and are transported under manifest procedures en route to a proper disposal facility.

1.1.6 Waste materials to be removed and disposed off-site include the following:

1.1.6.1 Non-vegetative solid waste from the Hubbell Coal Dock Burn Area.

1.1.6.2 Culverts piled at the Hubbell Coal Dock Burn Area (for recycling).

1.1.6.3 Waste pile WP-11 from the Mineral Building property (if a representative sample contains PCBs at a concentration greater than 50 parts per million).

1.2 REGULATORY REQUIREMENTS

1.2.1 The **Contractor** shall comply with all Federal, State, and local regulations applicable to waste management, including MDEQ, MIOSHA, RCRA, and TSCA regulations.

1.2.2 The **Contractor** shall comply with 29 CFR 1910 and 1926.

1.3 SUBMITTAL AND PROJECT RECORD DOCUMENTS

1.3.1 The **Contractor** shall provide all required submittals as identified in **Section 01 33 00** including:

1.3.1.1 Waste profiles and characterization data.

1.3.1.2 Waste shipping papers and bills-of-lading.

1.3.1.3 Disposal receipts.

1.3.1.4 Manifests.

1.3.2 The **Professional** will provide available characterization data for WP-11 to the **Contractor**. The **Contractor** shall provide all additional waste characterization analytical data required for disposal acceptance. Analytical data shall be provided directly to the **Professional** from the Analytical Laboratory.

1.3.3 **Contractor** shall provide the intended disposal locations for **Owner** approval.

1.3.4 **Contractor** shall maintain a Waste Manifest Log in accordance with **Section 01 33 00.**

1.4 QUALIFICATIONS

1.4.1 The **Contractor** and subcontractors must have demonstrated experience with and certifications and licenses for transportation of waste materials.

1.5 SCHEDULING

1.5.1 The **Professional** shall be provided not less than three business days for review, editing, and approval of waste profiles.

1.5.2 The **Professional** shall be notified not less than 48 hours prior to the proposed time for transportation of inventoried materials/generated waste to the selected disposal facility. A properly completed manifest or bill-of-lading with the **Owner** or the **Professional** signature shall accompany each shipment to the selected disposal facility.

PART 2 – PRODUCTS

2.1 EQUIPMENT

2.1.1 The **Contractor** shall provide materials, equipment, personnel, and facilities necessary to load materials for transport and complete transportation to the appropriate disposal facility.

PART 3 – EXECUTION

3.1 SELECTION OF WASTE DISPOSAL METHOD(S)

3.1.1 All disposal and sampling arrangements shall be performed and/or coordinated by the **Contractor**. This will include waste characterization and approval as well as any permits required.

3.1.2 The **Contractor** may dispose of non-hazardous and non-recyclable solid waste at a Type II solid waste management facility subject to review by the **Owner**. The solid waste must comply with the facility operator's waste discharge requirements. The method of disposal must be approved by the **Owner**.

3.1.3 Contaminated material not classified as hazardous shall be disposed of in accordance with RCRA Subtitle D and Michigan Public Act No. 451, Parts 115 and 121.

3.1.4 PCB-contaminated soil and debris containing greater than 50 parts per million (ppm) PCBs shall be disposed as PCB remediation waste at an appropriate TSCA disposal facility.

3.1.5 Disposal of Wastewater – Decontamination water that does not contain any additives can be discharged to the ground surface in accordance with Rule 2210(u)(iii) of the Part 22 rules of Part 31 of NREPA. The discharge must be to the plume of groundwater contamination, including an area 100 ft hydraulically upgradient of the edge of the plume, and any additive used in the treatment process that is not part of the contamination plume meets the standards of Rule 2222. Any water from the decontamination of vehicles, equipment, and debris that does not meet the above requirement shall be collected in a contaminated water collection system. The decontamination operation and decontamination pad construction shall be sufficient to allow for the collection of the water and allow for transfer to a storage tank provided by the **Contractor** to await characterization and proper disposal. Any spillage of this water onto previously uncontaminated areas shall be cleaned up and decontaminated to the satisfaction of the **Owner** and the **Professional** at the **Contractor's** expense. The **Contractor** shall submit his/her proposed method for accomplishing this task in his/her Work Plan. Decontamination water supply and collection is the **Contractor's** responsibility and included as part of the Health and Safety activities.

3.1.6 No additives will be allowed to be mixed or added to the decontamination water. Materials generated during decontamination shall be placed beneath the capped area or properly disposed. The disposal shall be manifested in accordance with these specifications.

3.1.7 Dewatering Water – The **Contractor** shall pump dewatering water and discharge it outside of the immediate work area within the PCB-contaminated portion of the Hubbell Coal Dock Burn Area. The dewatering discharge shall be in accordance with Rule 2210(e) of the Part 22 rules of Part 31 of NREPA which allows an exemption from groundwater discharge permitting for "water from a well used temporarily for dewatering at a construction site if the water pumped does not create a site of environmental contamination under part 201."

3.2 SELECTION OF TRANSPORTER(S)

3.2.1 For all off-site disposal activities, **Contractor** is to utilize a licensed transporter or transporters, subject to the review of the **Owner**, and will be responsible for meeting the packaging and loading requirements stipulated by Federal, State, and local regulations. If a transporter is disapproved by the **Owner**, the **Contractor** shall select a new transporter at no additional cost to the Contract.

3.3 WEIGH TICKETS/MANIFESTS/DISPOSAL RECEIPTS

3.3.1 **Contractor** is required to provide, prepare, and track manifests, weigh tickets, and/or receipts for any waste removed from the Site. The **Contractor** is required to provide completed copies of manifests (with disposal facility signature) to the **Professional** within five (5) working days. If this is not possible, the **Contractor** shall submit verification in writing to the **Professional** and provide reasonable dates for submittal. Failure by the **Contractor** to submit completed manifests or an acceptable verification statement will result in nonpayment for any progress payment or final payment requests submitted by the **Contractor** until the submittals are in compliance.

3.3.2 The **Owner** or the **Professional** will sign manifests on behalf of the State of Michigan. The **Contractor** and subcontractor are not authorized to sign manifests as the generator.

3.4 LOADING AND HAULING

3.4.1 The **Contractor** shall inspect haul vehicles for soil adhesion to all parts of the trucks. These soils shall be removed and properly handled by the **Contractor** before leaving the Site. The decontamination procedures shall be carried out at the decontamination zone. The **Professional** shall approve all the vehicles before leaving the Site.

3.4.2 No transport vehicles shall be allowed to leave the Site that are leaking or spilling materials.

3.4.3 No materials shall leave the Site for disposal unless they are properly manifested, labeled, placarded, and en route to a licensed disposal facility.

3.4.4 The **Contractor** shall ensure tarpaulin covers are provided for open transport vehicles, which shall cover all contaminated materials during transport. Do not overfill vehicles.

3.4.5 All transport vehicles shall be in strict conformance with all the applicable Federal, State, and local laws.

3.4.6 The **Contractor** is responsible for any and all actions and costs necessary to remedy solid or liquid waste spilled in loading or transit at no additional cost to the **Owner**.

3.4.7 The **Contractor** shall keep accurate records for the type and quantity of materials and liquids removed from the Site and analytical testing results. The **Professional** approval is required before any liquid or material leaves the Site.

3.4.8 The **Contractor** shall provide the **Professional** with copies of the above records, all permits required, manifests, waste hauling permits, and necessary affidavit regarding the waste materials, including liquid disposal within five working days of removal from the Site.

3.5 DISPOSAL FACILITY

3.5.1 Contaminated materials shall be disposed of at an **Owner**-approved and licensed disposal facility.

3.5.2 Final arrangements for disposal shall be performed by the **Contractor** and approved by the **Owner**.

END OF SECTION 02 61 00

DIVISION 03

CONCRETE

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SCOPE

1.1.1 Provide cast-in-place concrete where shown on the drawings or otherwise necessitated by the execution of the work (bulkhead patching).

1.2 REFERENCES, ACI-301, 1.6

1.2.1 The **Contractor** shall be familiar with ACI-301, 1.6 and the references listed therein.

1.3 SUBMITTALS

1.3.1 Concrete mix design.

1.3.2 The **Contractor** must furnish to the **Professional** load tickets or sack-mix specifications showing mix formulation for each load or batch of concrete delivered and installed.

1.4 TESTING

1.4.1 The following testing shall be performed:

1.4.1.1 None required.

1.4.2 The **Professional** may require the **Contractor** to core drill questionable cast-in-place concrete for laboratory testing. Should the laboratory analysis indicate the concrete fails to meet specification requirements, the **Contractor** must pay all costs for core drilling and testing in the laboratory and replace the concrete found to fail specification requirements. Should the laboratory analysis confirm that the concrete meets specification requirements, the **Owner** will pay the **Contractor** for their costs for core drilling, concrete patching and the laboratory fee for testing of the concrete core samples.

PART 2 - PRODUCTS

2.1 CEMENT

2.1.1 ASTM C 150, meeting the requirements of Section 901 of MDOT 2012.

2.1.2 Use one brand and type of cement throughout the project.

2.2 CONCRETE ADMIXTURES

2.2.1 All admixtures shall comply with Section 903 of MDOT 2012.

2.2.2 Air entraining admixtures conforming to ASTM C260.

2.2.3 Low range water reducer conforming to ASTM C494 Type A.

2.2.4 Water reducing retarder conforming to ASTM C494 Type D.

2.2.5 High-range water reducer conforming to ASTM C494 Type F or G.

2.2.6 Non-chloride non-corrosive accelerator conforming to ASTM C494 Type C.

2.2.7 Prohibited admixtures include calcium chloride, thiocyanates and all admixtures that contribute free chloride ion in excess of 0.1% by weight of cement.

2.3 CONCRETE AGGREGATES

2.3.1 Aggregates for lightweight concrete shall only be used when lightweight concrete is specified on the project drawings.

2.3.2 Aggregates shall comply with Section 701 and Section 902 of MDOT 2012.

2.4 CONCRETE MIX PROPORTIONING

2.4.1 Strength requirements shall be based on 28-day compressive strength except for high early strength concrete which shall be based on a 21-day compressive strength.

2.4.2 Concrete Mix for Bulkhead Patching

2.4.2.1 Concrete grade shall be a minimum 3,500 psi air-entrained mix. High early strength concrete is also acceptable. The entrained air content shall be 5.0 to 8.0 percent.

2.5 REINFORCEMENT

2.5.1 Drill adjacent concrete on opposing sides of the rectangular opening and install reinforcing bars (two each side) such that they extend into the opening at least three inches.

2.5.2 Reinforcing bars shall be grade 60, number 4, unless otherwise specified on the project drawings.

PART 3 - EXECUTION

3.1 BASE PREPARATION

3.1.1 Remove debris from the rectangular opening prior to preparation and concrete placement.

3.1.2 Moisten adjacent concrete before placing concrete.

3.2 FORMWORK

3.2.1 Obtain the **Professional's** approval for forms and form placement before placing concrete.

3.2.2 Forms shall not be removed until the concrete has reached 75 percent of its average strength or 48 hours, whichever is longer.

3.3 PLACING CONCRETE

3.3.1 Notification of concrete placement 24 hours in advance after formwork and reinforcement are approved for placement of concrete.

3.3.2 Free drop of concrete more than five feet is not permitted.

3.3.3 Concrete shall not be placed in water unless approved.

3.3.4 When concrete temperatures exceed 80 degrees F, a set retarding admixture shall be used.

3.3.5 When ambient temperatures are less than 50 degrees F, all concrete shall contain an accelerating admixture.

3.3.6 Place concrete full depth of the bulkhead and spade or vibrate to ensure consolidation.

3.3.7 Finish exposed surfaces smooth and even.

3.3.8 Do not add water to the concrete surface to aid finishing.

3.4 CURING AND PROTECTION

3.4.1 Protect vertical edge with formwork until concrete has set.

END OF SECTION 03 30 00

DIVISION 31

EARTHWORK

SECTION 31 11 00

CLEARING AND GRUBBING

PART I - GENERAL

1.1 DESCRIPTION

1.1.1 The Work of this Section includes, but is not limited to:

1.1.1.1. Clearing

1.1.1.2. Grubbing

1.1.1.3. Vegetative debris disposal

1.1.2 Definitions:

1.1.2.1 Clearing is defined as the removal of trees, brush, shrubs, down timber, rotten wood, rubbish, any other vegetation and objectionable material at or above original ground elevation not designated to be saved. Clearing also includes removal of fences, walls, guard posts, guide rails, signs, debris, and other obstructions that obtrude, encroach upon, or otherwise interfere with the proposed Work.

1.1.2.2 Grubbing is defined as the removal from below the surface of the natural ground of stumps, roots and stubs, brush, organic materials and debris.

1.1.3 Job Conditions

1.1.3.1 As necessitated for execution and completion of the Work, the **Contractor** shall clear all obstructions within the limits of Work and as shown on the Drawings except for those trees at the Mineral Building identified to be saved. Non-contaminated cleared material shall be piled on-site at a mutually agreeable location determined during site preparation. Contaminated cleared material shall be buried as indicated in the drawings.

1.1.3.2 Grubbing shall only occur to the extent necessary for grading. Stumps shall remain in-place to the extent possible. Grubbed material shall be buried as indicated in the drawings.

1.1.3.3 Trees, cleared brush, stumps, and vegetative debris shall remain on the properties. The **Contractor**, with prior written approval from the **Professional** may not remove or sell cleared and grubbed material from the Site.

1.2 SUBMITTALS

1.2.1 Contractor shall submit the following in accordance with **Section 01 33 00**:

1.2.1.1 Proposed grubbed and cleared material burial limits in accordance with the burial locations identified in the drawings.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

3.1 PREPARATION

3.1.1 Notify the **Professional** at least 72 hours prior to beginning any clearing or grubbing work.

3.1.2 Protect permanent/temporary benchmarks, monitoring wells, signs, and utilities, and other structures with temporary fencing or barricades satisfactory to the **Professional**.

3.1.3 Before removing any of the above named articles, the **Contractor** shall notify the **Professional**, at least 72 hours in advance of the clearing/grubbing operations, so that a record can be made of the type or kind of such articles and their condition.

3.1.4 Where it is necessary to cut the branches of trees that are not to be removed, the cut shall be made flush with the tree trunk or larger branch, care being used to prevent tearing the bark beyond the cut. Cuts shall be painted with acceptable commercial tree wound dressing. The **Professional** must approve all tree trimming prior to it being conducted.

3.2 UTILITY RELOCATIONS

3.2.1 Inform all companies, individuals, and others owning or controlling facilities or structures within the limits of the Work which have to be relocated, adjusted, or reconstructed in sufficient time for the utility to organize and perform such Work in conjunction with or in advance of the **Contractor's** operations.

3.2.2 Comply with the provisions of Michigan Public Act (PA) 53 of 1974 “Protection of Underground Facilities.”

3.3 CLEARING

3.3.1 Solid waste including tires, metal, furniture, wood, culverts, and plastic debris within the grading and capping limits shall be collected and staged for recycling, if possible, or characterization and landfill disposal.

3.3.2 Clearing shall be performed as necessary to facilitate the completion of the Work and as otherwise directed by the **Professional**.

3.3.3 Fell trees in a manner that will avoid damage to trees, shrubs, and other installations which are to be retained. The **Contractor** shall replace trees and shrubs intended to remain that are damaged beyond repair or removed.

3.3.4 Remove guard posts, guide rails, signs, fences, and other interferences as necessary for performance of the Work. Protect and store the materials in secure locations approved by the **Owner** or the **Professional**.

3.3.5 All natural woody cleared material such as tree limbs and brush that are not in contact with the Site soils shall be piled at their respective properties at areas to be determined during Site preparation. Woody material that has not been contaminated by Site soils will be allowed to leave the Site for beneficial reuse, if available.

3.3.6 Woody material that is dragged through Site soils or ponded water areas, stumps, or brush containing site soils that may be contaminated shall be required to remain on-Site and shall be buried beneath the caps at locations that are adjacent to access roadways to facilitate cap mending if settlement occurs atop the burial areas.

3.4 GRUBBING

3.4.1 Grubbing shall only occur to the extent necessary for grading. Stumps shall remain in-place to the extent possible. Grubbed material shall be buried as indicated in the drawings.

3.5 DEBRIS DISPOSAL

3.5.1 No cleared or grubbed material shall leave the respective properties. Grubbed material and contaminated cleared material shall be buried as indicated in the drawings.

3.5.2 Non-contaminated cleared material shall be piled on-site at a mutually agreeable location determined during site preparation.

3.5.3 Burning of trees, logs, branches, brush, stumps, and debris is prohibited.

3.6 RESTORATION

3.6.1 The **Contractor** shall restore guard posts, guide rails, fences, signs, sidewalks, and other interferences removed or damaged by construction activities to the condition equal to that which existed before the construction operations or replace item in-kind.

3.6.2 The **Contractor** shall carefully replace pavement that was damaged during the construction. The replacement and or repair work shall be done without delay, as soon as the work immediately adjacent is completed.

END OF SECTION 31 11 00

SECTION 31 22 16

HAUL ROADS

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

1.1.1 The construction of on-site haul roads and improvement of site access as depicted on the Drawings. The construction and/or improvement of off-site haul roads/routes for supplying cap material is considered incidental to providing and placing cap material.

1.2 EXISTING CONDITIONS

1.2.1 Prior to construction, the **Contractor** shall consider haul routes on- and off-site, and shall assess conditions of adjacent construction, recording existing settlement or cracking of structures or roadways, and set benchmarks. The **Contractor** shall prepare a list of such damages, verified by dated photograph or video on CD and DVD, and submit for **Owner's** records.

1.3 SUBMITTALS

1.3.1 Layout drawings depicting the location of as-built on-site haul/access routes for the Work.

1.3.2 Project plan drawing depicting the off-site haul/access road route(s).

1.3.3 Work Plan with Traffic Control Plan as specified in **Section 01 33 00**.

PART 2 – MATERIALS

2.1 HAUL ROAD AND ACCESS ROUTES

2.1.1 MDOT 22A Gravel or equal as specified in the Drawings and specifications.

2.1.2 1 to 3-inch diameter crushed mine rock as specified in the Drawings and specifications.

2.1.3 1 to 3-inch diameter coarse aggregate as specified in the Drawings and specifications (for construction entrance improvement to limit sediment tracking).

PART 3 – EXECUTION

3.1 HAUL ROADS AND ACCESS ROUTES

3.1.1 The **Contractor** shall be responsible for protecting the existing roadways and structures and shall maintain all temporary haul/access roads in a condition acceptable to the **Professional** throughout the project. Should haul/access roads become defective and create an emergency, the **Contractor** shall commence repair to rectify the situation within 1 hour after notification by the **Professional**, or the **Professional** may arrange to have the Work performed by others and deduct the costs thereof from monies owed the **Contractor**.

3.1.2 At the completion of construction, the on-site haul roads/access routes can be left in-place with the exception of any haul roads on the Mineral Building property, which shall be removed and the area restored by grading, seeding, and mulching. All off-site haul roads/access routes shall be removed and restored to pre-existing conditions unless otherwise indicated in the **Contractor's** Borrow Area Restoration Plan.

3.1.3 The **Contractor** shall water and sweep roads traveled by construction traffic as necessitated by the Work to prevent dust generation, prevent material tracking on paved roads, and maintain safe transportation routes.

END OF SECTION 31 22 16

SECTION 31 22 23

EXCAVATION, GRADING, AND CAPPING

PART 1 – GENERAL

1.1 DESCRIPTION

1.1.1 The Work in this Section includes but is not limited to:

1.1.1.1 Haul roads and access improvements.

1.1.1.2 Ditch improvement excavation.

1.1.1.3 Grading of existing site soils and debris.

1.1.1.4 Management of waste piles.

1.1.1.5 Placement, grading, and compaction of cap material.

1.2 EXISTING CONDITIONS

1.2.1 Refer to the Drawings for existing conditions and the planned limits of excavation and grading.

1.3 FIELD MEASUREMENTS

1.3.1 Verify that specified grades shown on the Drawings are met to promote controlled, positive drainage, unless otherwise specified by the **Professional**.

1.3.2 Specified material thicknesses are compacted thicknesses unless otherwise specifically noted.

1.4 SUBMITTALS

1.4.1 **Contractor** shall submit to the **Owner** for approval a Work Plan defining the areas to be graded. The Work Plan shall define all locations in which activities will be performed for each phase of the Work. The Work Plan shall define specific procedures for implementing the clearing, ditch improvement, grading, and cap placement.

1.4.2 Delivery tickets shall be submitted for imported fill delivered to the Site. The delivery tickets shall, at a minimum, include the following:

1.4.2.1 Name and location of supplier.

1.4.2.2 Delivery date and time.

1.4.2.3 Fill type and tons or cubic yards delivered (note that payment for most fill materials is not based on delivered tonnage or cubic yards but on area of in-place compacted thickness).

1.4.3 Certification and laboratory analysis reports that each off-site material to be used as backfill or fill meets gradation requirements and is uncontaminated; refer to **Section 01 45 00 Quality Control**.

1.5 REFERENCES

1.5.1 MDOT 2012 Standard Specifications for Construction.

1.5.2 ASTM D421/422: Particle Size Analysis of Soils.

1.5.3 ASTM D2487: Test Methods for Classification of Soils for Engineering Purposes.

1.6 QUALITY ASSURANCE

1.6.1 Codes and Standards: The **Contractor** shall perform grading, excavation, and fill work in compliance with applicable requirements of governing authorities having jurisdiction.

1.6.2 Geotechnical Testing and Inspection Service: The **Contractor** shall employ a geotechnical consultant and testing laboratory acceptable to **Professional** to perform soil testing and inspection service for quality control testing during earthwork operations.

1.6.3 Environmental Testing Service: The **Contractor** shall employ an environmental testing laboratory acceptable to **Professional** to perform soil testing services for quality control testing during earthwork operations.

1.6.4 Density testing: Density testing is not required but compaction shall consist of routing the track or wheel of construction equipment over the fill material so that every point on the surface of each fill material is traversed by at least one tread track or wheel of the equipment.

1.6.5 Compacted Thickness: The **Contractor** shall ensure that all areas of placed fill material meet the required minimum compacted thicknesses identified in the Drawings. It is recommended that the **Contractor** employ a person to check compacted thicknesses as the work progresses to avoid re-work. The **Owner** and/or **Professional** will provide independent compacted thickness checks but this does not relieve the **Contractor** of the responsibility of meeting the contract requirements.

1.6.6 Test Reports: Submit copies of the following reports directly to the **Professional** from the testing services, with copy to the **Contractor**:

1.6.6.1 Gradation reports on borrow material (ASTM D422).

1.7 TRAFFIC CONTROL

1.7.1 The **Contractor** shall furnish and install traffic control signs and devices and provide flagmen when deemed necessary by the **Owner**. Traffic control devices shall conform to MDOT requirements.

1.7.2 Transport shall be by approved vehicles. All spills, drips, etc. from the vehicles shall be immediately cleaned by the **Contractor** at no cost to **Owner**.

1.7.3 The **Contractor** shall follow the procedures and operations defined in the Traffic Control Plan prepared for the Site.

1.7.4 When working within the Right-of-Way of a State highway, County road, or village street, the **Contractor** shall be bound by the conditions, restrictions, and regulations made by the appropriate body. All such regulations shall be in addition to those set down in the Specifications.

PART 2 – PRODUCTS

2.1 HAUL ROADS AND ACCESS ROUTES

2.1.1 Off-site Borrow Sources

2.1.1.1 Gravel base shall be MDOT 22A road gravel or other suitable material as approved by the **Professional**, and shall be placed and compacted to the thickness specified in the Drawings and as necessary to safely support truck and vehicular traffic and be maintained in a state of good repair without significant ruts or erosion.

2.1.1.2 1 to 3-inch diameter crushed mine rock similar to MDOT Class 4AA or other suitable locally available material as approved by the **Professional**, and shall be placed and compacted to the thickness specified in the Drawings. Acceptable material shall be evenly graded and have a minimum of fines.

2.1.1.3 1 to 3-inch diameter coarse aggregate such as MDOT Class 4AA or other suitable locally available material as approved by the **Professional**, and shall be placed and compacted to the thickness specified in the Drawings. Acceptable material shall be evenly graded and have a minimum of fines.

2.1.1.4 Acceptable soils shall be environmentally-clean, free of debris, snow, ice, free water, and not frozen to the extent practical; slag and ash will not be allowed for use.

2.1.1.5 Acceptable soil shall be substantially free of organic materials, loam, wood, trash, or other objectionable materials that may be decomposable, compressible, or that cannot be properly compacted.

2.2 RIP-RAP

2.2.1 Off-Site Borrow Source

2.2.1.1 Riprap shall have an average size (D50) of 10-inches and be angular to subrounded. It shall be free of dirt, clay, fines, slag, and vegetation. The least dimension of a rock shall not be less than one-third the largest dimension. Individual rocks shall be dense, sound, and free from cracks, seams, and other defects that could result in accelerated weathering.

2.2.1.2 The riprap shall have a gradation that falls within the following percentages:

Size	Percent of Total Weight Smaller than Given Size
15 – 20 inches	100
13 – 18 inches	85
10 – 15 inches	50
3 – 5 inches	15

(The size of rock pieces are based on 50% cubical and 50% spherical, with a specific gravity of 2.65.)

2.3 CAP MATERIAL

2.3.1 Off-Site Borrow Source

2.3.1.1 As determined by NRCS for other capped areas in the region, the cap material shall be USDA textural classification of sandy loam. The cap material shall be reasonably free of grass, roots, weeds, sticks, stones, or other foreign or objectionable material. The maximum allowed rock size shall be four inches. Hand picking of rocks prior to final grading may be required.

2.3.1.2 Acceptable soils shall be environmentally-clean, free of debris, snow, ice, or water, and not frozen to the extent practical; slag or ash will not be allowed for use.

2.3.1.3 The sandy loam criteria is:

2.3.1.3.1 Option 1

- Contains 20% or less clay;
- Combination of silt (%) plus twice the clay (%) is greater than 30;
- Contains 52% or more sand; and,
- Contains less than 15% gravel.

2.3.1.3.2 Option 2

- Contains less than 7% clay;
- Contains less than 50% silt;
- Contains 43% to 52% sand; and,
- Contains less than 15% gravel.

2.3.1.4 Cap material meeting these criteria may be obtained by the following methods as identified by NRCS:

2.3.1.4.1 Using a “pit-run” source that naturally meets these criteria.

2.3.1.4.2 Using mechanical or manual separation processes such as screening, hand or machine picking, removing undesirable soil layers to avoid mixing.

2.3.1.4.3 Using mechanical mixing processes to combine differing soil layers into an acceptable product. Mixing shall be sufficient such that when cover material is placed, patches and streaks of cap material that are sandier or more clayey than allowed by the USDA sandy loam classification shall comprise no more than 5% of the capped area.

PART 3 – EXECUTION

3.1 PREPARATION

3.1.1 Identify required lines, levels, contours, and datum locations.

3.1.2 Locate, identify, and protect utilities and historical features from damage.

3.1.3 Protect benchmarks, survey control points, property corners, fences, monitoring wells, sidewalks, signs, paving, utilities, curbs, and existing capped areas from excavating equipment and vehicular traffic.

3.1.4 Protect adjacent roads, utilities, structures, trees that must be preserved, and other permanent items against any undercutting resulting from sidewall slumping.

3.1.5 No construction equipment or vehicle traffic shall be allowed within the drip line of trees that are marked for preservation.

3.1.6 The **Contractor** shall identify a borrow source for the cap material that is approved by the **Owner** and **Professional** prior to bringing any cap material to the site.

3.2 GRADING

3.2.1. The **Contractor** shall not initiate any grading activities prior to submittal approval(s) by the **Professional**.

3.2.2. All grading shall be approved by the **Professional** prior to placement of cap material.

3.2.3. The **Contractor** shall take the necessary precautions to protect trees, retaining walls, historic structures, and such other landscaping and objects from damage, unless their removal is required by the Work.

3.2.4. Grade soils as necessary to accommodate temporary access roads, staging areas, dewatering areas, and decontamination pad(s).

3.2.5. Where lines and grades are not specified on the Drawings, the final topography shall be stable, smooth, and uniform and shall not contain gullies, rills, and shoulders prior to placement of cap material. Unless otherwise approved by the **Professional** or shown in the Drawings, slopes shall not exceed 4 horizontal to 1 vertical. Make gradual grade changes. Blend slopes into level areas.

3.2.6. The site shall be graded to promote positive drainage.

3.2.7. Grading shall proceed to the elevations specified in the Drawings or as directed by the **Professional**. The **Contractor** shall provide regular leveling checks utilizing established benchmarks to confirm that lines and grades are maintained at the specified elevation.

3.2.8. The elevations depicted on the Drawings shall be inferred to have gradual transitions in line and grade between each identified point.

3.2.9. Graded areas shall be compacted by routing wheeled or tracked construction equipment over the material such that every point on the surface of each layer not exceeding 12-inches in loose thickness is traversed not less than once.

3.2.10. All earthwork shall be completed in accordance with OSHA 29 CFR Part 1926.

3.2.11. Work specified under this section shall be satisfactorily executed, regardless of subsurface materials encountered at locations shown on the Drawings and/or as directed by the **Professional**.

3.2.12. Notify **Owner/Professional** of unexpected subsurface conditions and cease Work in area until notified to resume Work.

3.2.13. **Contractor** shall maintain specified grades during the performance of excavation operations. The **Contractor** will not be compensated for material moved from beyond the lateral or vertical limits specified.

3.2.14. **The Contractor shall assume the risks regarding the presence or proximity of overhead or underground utility and private lines, pipes, conduits and support work for same, existing structures, and property of whatever nature.** Responsibilities for damages and expenses for direct or indirect injury to such structures or to any person or property by reason of them or by reason of injury to them, whether such structures are or are not shown on the Drawings, by work of this contract, rest solely with the **Contractor**. The **Contractor** is encouraged to use a private utility locating service.

3.2.15. Dust control is a critical component of the grading operations and water sprays shall be used to pre-wet the material. The **Contractor** shall provide a water truck for wetting haul routes and grading areas and shall also provide a consistent flow of water of sufficient capacity for continuous wetting operations with mobile hoses.

3.3 DITCH IMPROVEMENT EXCAVATION

3.3.1 The **Contractor** shall excavate the drainage ditch to the lines, grades, and profile specified in the Drawings.

3.3.2 Where the ditch requires widening to meet the specifications, it shall be widened to the north.

3.3.3 Spoils from ditch excavation upstream of the Coal Dock Burn Area may be spread adjacent to the ditch. All spoils excavated adjacent to the Burn Area shall be spread and graded so that they are beneath the cap atop the Coal Dock Burn Area.

3.4 WASTE PILE MANAGEMENT

3.4.1 The **Contractor** shall not initiate any waste pile management activities prior to submittal approval(s) by the **Professional**.

3.4.2 Refer to **Section 31 22 28** for WP-11.

3.4.3 The Drawings depict and contain summary tables of the waste piles that are present at the Site. Each waste pile is labeled and approximate volumes and intended management methods are identified in tabular format.

3.4.4 In Plan Set A, all of the waste piles within the work area will be graded out and capped with the exception of WP-42 (rusted corrugated pipe) which shall be recycled and WP-43 (structural wood) which shall be moved to the north end of the Coal Dock property and combined with a large pile of wood beams and timbers.

3.4.5 Dust control is a critical component of the waste pile management operations and water sprays shall be used to pre-wet the material. Drop heights shall be minimized to the extent reasonably possible. The **Contractor** shall provide a water truck for wetting haul routes and grading areas and shall also provide a consistent flow of water of sufficient capacity for continuous wetting operations with mobile hoses.

3.5 CAP PLACEMENT

3.5.1 The **Contractor** shall not initiate any capping activities prior to submittal approval(s) by the **Professional**.

3.5.2 Prior to capping an area, the **Contractor** shall obtain the **Professional's** approval of the final grading for the area. This could include requiring the **Contractor** to demonstrate that the plan grades have been achieved.

3.5.3 The **Contractor** shall provide and place 6-inches compacted thickness of sandy loam soil over all graded areas and to the limits depicted in the Drawings.

3.5.4 Cap material shall be compacted. Compaction shall consist of routing the track or wheel of construction equipment over the fill material so that every point on the surface of the cap material is traversed by at least one tread track or wheel of the equipment.

3.5.5 For cap material placed on embankment slopes where the use of grain drill type equipment is not feasible for seeding, the Contractor shall use a bulldozer to drive up and down the slopes during final fine grading and shaping to orient tracks parallel to the slope to aid in seed catch.

3.5.6 If the existing capped area on the Mineral Building property is compromised by the work, the disturbed area shall similarly receive additional sandy loam soil such that the compacted cap thickness remains six-inches.

3.6 PROTECTION

3.6.1 Maintain and place additional silt fences and other engineering controls to minimize erosion as the work progresses.

3.6.2 Protect and maintain visibility of the historic crane rail and any other features noted for protection or visibility in the Drawings.

3.5 FIELD QUALITY CONTROL

3.5.2 Field inspection and testing to be performed by the **Contractor**.

3.5.3 Refer to **Section 01 45 00**.

END OF SECTION 31 22 23

SECTION 31 22 28

SOLIDS AND WATER MANAGEMENT

PART 1-GENERAL

1.1 DESCRIPTION

1.1.1 The work of this section includes, but is not limited to:

1.1.1.1 Collection, handling, and disposal of solid waste from the grading limits.

1.1.1.2 Excavation, handling, and staging of PCB contaminated soil and debris associated with waste pile WP-11.

1.1.1.3 Dewatering fluids.

1.1.1.4 Decontamination fluids

1.1.1.5 Storm water management.

1.2 JOB CONDITIONS

1.2.1 Contaminated Media:

1.2.1.1 Contaminated and Non-Contaminated Soil

1.2.1.1.2 Historical soil sampling results are contained in **Appendix III**. Site soils are affected by metals. Soils within the Hubbell Coal Dock Burn Area contain PCBs. Asbestos containing materials (ACM) are likely to be present in site soils within the Mineral Building property and Coal Dock Burn Area. ACM may also be present in the waste piles.

1.2.1.2 Waste Piles

1.2.1.1.1 Refer to **Appendix III** for available analysis results for the waste piles. ACM may also be present in the waste piles.

1.2.1.2 Groundwater:

1.2.1.2.1 Available groundwater sampling results are included in **Appendix III**. The depth to groundwater at the site varies from approximately one to four feet below the existing ground surface in the area of the coal Dock Burn Area.

1.2.1.3 Storm Water

1.2.1.3.1 Storm water currently flows across the site in the form of sheet flow and shallow channel flow. Some of these runoff pathways are within the work area and are the subject of remedial construction efforts to abate erosion and the transport of contaminated media directly into Torch Lake.

1.2 CONTRACTOR QUALIFICATIONS

1.2.2 **Contractor** shall have a Health and Safety Program in place that conforms to the requirements of 29 CFR 1910.120.

PART 2-PRODUCTS

Not Used.

PART 3-EXECUTION

3.1 SOLID WASTE

3.1.1 Solid waste including tires, metal, furniture, wood, culverts, and plastic debris within the grading and capping limits shall be collected and staged for recycling, if possible, or characterization and landfill disposal.

3.1.2 The **Contractor** shall conduct any required characterization and prepare all required profiles and manifests for **Owner** review, approval, and signatures. Refer to **Section 02 61 00** for additional details.

3.2 WASTE PILE WP-11

3.2.1 PCBs were detected in one of the samples (CHLL-WP01), from waste pile WP-11, at a concentration exceeding 50 parts per million (ppm). Unless directed otherwise by the **Owner** based on new characterization data (through the use of Alternate A1), the **Contractor** shall prepare a profile and manifest for proper transport and disposal of the WP-11 soil and debris as PCB remediation waste for **Owner** review, approval, and signatures. Refer to **Section 02 61 00** for additional details.

3.3 DEWATERING FLUIDS

3.3.1 Water generated from dewatering to facilitate grading and cap placement west of the historic crane rail shall be pumped and discharged to the ground surface to infiltrate east of the historic crane rail within the Coal Dock Burn Area in a manner that avoids spreading of contamination to other parts of the Site and erosion of soils into Torch Lake. The discharge shall be in accordance with the discharge exemption allowed under Rule 2210(e) of the Part 22 Rules. Refer to **Section 31 23 19**.

3.3.2 The discharge of dewatering water east of the historic crane rail will require that the dewatering, grading, and capping west of the historic crane rail occur prior to completing the capping of the remainder of the Coal Dock Burn Area.

3.4 DECONTAMINATION FLUIDS

3.4.1 Decontamination water without any additives shall be allowed to infiltrate into the ground. Any solids generated shall be placed beneath the proposed cap.

3.4.2 The discharge shall be in accordance with the discharge exemption allowed under Rule 2210(u)(iii) of the Part 22 Rules.

3.5 STORM WATER MANAGEMENT

3.5.1 The **Contractor** shall minimize, if applicable, the amount of water in the area of soil grading and capping by deploying pumps, diversion berms, and other applicable techniques. **Contractor** must ensure that minimal disturbance is caused by diversions and proper controls are employed to minimize erosion and sediment transport. Surface runoff, seepage, or groundwater shall be managed according to the reviewed and approved WP.

3.5.2 During improvement of the southern drainage ditch, the **Contactor** shall provide provisions to route storm water from the two 18-inch diameter culverts around the work area until such time that geotextile fabric, rip-rap, and erosion control materials are placed so that storm water does not erode ditch soils.

3.5.3 A Part 91, SESC permit from the Houghton County Drain Commissioner will be required prior to any earth change. A Part 91 SESC Permit is required for an earth change that is greater than or equal to one acre or within 500 feet of a lake or stream.

3.5.4 A Notice of Coverage for Construction Storm Water from MDEQ will also be required prior to earth disturbance since the earth change is planned to be greater than or equal to five acres in size. The **Contractor** must provide a Certified Construction Storm Water Operator for the project.

3.6 SPILL CONTROL

3.6.1 The **Contractor** shall be responsible for cleaning up all spills with no additional cost to the **Owner**. If a spill occurs, the **Contractor**, as necessary, shall take the following actions at a minimum:

3.6.1.1 Notify the **Professional**, **Owner**, and any other appropriate agencies immediately.

3.6.1.2 Take immediate measures to control and contain the spill within the Site boundaries. This shall include as a minimum the following actions (if these can be safely conducted):

3.6.1.2.1 Keep unnecessary personnel away, isolate hazardous areas, and deny entry.

3.6.1.2.2 Do not allow anyone to contact spilled material.

3.6.1.2.3 Stay upwind; keep out of low areas.

3.6.1.2.4 Keep combustibles away from the spilled material.

3.6.1.2.5 Use water spray to reduce vapors, as needed.

3.6.1.2.6 Isolate catch basins from spilled materials.

3.6.1.2.7 Other actions, as needed.

3.6.1.3 The **Contractor** shall implement general spill control actions as follows:

3.6.1.3.1 Solid Spills: Remove and place contaminated materials into appropriate staging areas and properly dispose of the material as soon as possible.

3.6.1.3.2 Liquid and Sludge Spills: Absorb with sand, clean fill, or other non-combustible absorbent material. Dispose of the absorbent/spill mixture in accordance with applicable regulations.

3.6.2 Decontamination procedures shall be required after cleanup to eliminate detectable concentrations of the substance spilled, or reduce it to an acceptable level as determined by the **Professional**. Decontamination associated with spills shall be completed at no additional cost to the **Owner**. Complete cleanup may require removal of contaminated soils. All contaminated materials including solvents, cloth, soil and wood that cannot be decontaminated must be properly containerized, labeled, and disposed of as soon as possible.

3.6.3 All spills shall be noted in the daily log. A spill report shall also be prepared by the **Contractor**, which includes final disposal location. A copy of the spill report shall be submitted to the **Professional** within five days of the spill event, unless the **Contractor** is otherwise directed. If this is not possible, the **Contractor** shall submit a written statement to this effect with an estimated date for completion of the spill report.

END OF SECTION 31 22 28

SECTION 31 23 19

DEWATERING

PART 1 – GENERAL

1.1 SCOPE

1.1.1 The **Contractor** shall furnish all tools, labor, equipment, and materials to remove and dispose of all liquids necessary to be removed from the ground throughout the course of the Work. The **Contractor** will be required to dewater contaminated soil and capture storm water to best facilitate grading and cap placement, ditch improvement, and maintain safe working conditions while minimizing the potential for erosion of soils into Torch Lake.

1.1.2 The **Contractor** shall maintain dewatering equipment and materials at the site until such time that their use is no longer necessitated by the Work.

1.2 GENERAL

1.2.1 **Contractor** shall submit for approval a detailed plan for the proposed dewatering operations as part of the WP. A detailed description of procedures to be followed (including manpower availability, equipment, and response times) shall be included in the WP.

1.2.2 The **Contractor** shall obtain all necessary permits required for dewatering activities.

1.3 UTILITIES

1.3.1 The **Contractor** shall be responsible for providing all electrical wire, hook-ups, temporary generation, and ancillary materials necessary to perform dewatering.

1.4 DITCH IMPROVEMENT

1.4.1 During improvement of the southern drainage ditch, the **Contactor** shall provide provisions to route storm water from the two 18-inch diameter culverts around the work area until such time that geotextile fabric, rip-rap, and erosion control materials are placed so that storm water does not erode ditch soils.

1.4.2 **Contractor** shall provide all necessary equipment and pumps to remove and dewater the ditch improvement work area. All equipment shall be steam cleaned prior to being moved to the Site. No soil or other residue from previous operations shall be visible.

1.4.3 **Under no circumstances shall work occur below the ordinary high water mark indicated on the Drawings adjacent to Torch Lake.**

1.5 GRADING AND CAPPING

1.5.1 Water generated from dewatering to facilitate grading and cap placement west of the historic crane rail shall be pumped and discharged to the ground surface to infiltrate east of the historic crane rail within the Coal Dock Burn Area. The discharge shall be located and operated in a manner that avoids spreading of contamination to other parts of the Site, avoids erosion of soils into Torch Lake, and does not allow water to flow directly into Torch Lake. The discharge shall be in accordance with the discharge exemption allowed under Rule 2210(e) of the Part 22 Rules. Refer to **Section 31 23 19**.

1.5.2 The discharge of dewatering water east of the historic crane rail will require that the dewatering, grading, and capping west of the historic crane rail occur prior to completing the capping of the remainder of the Coal Dock Burn Area.

1.5.3 The **Contractor** shall minimize the amount of time the excavation is left open and shall dewater the excavation using sumps and pumps, well points, or other approved methods to yield a suitable surface capable of supporting grading, cap placement, and compaction efforts.

1.5.4 **Contractor** shall provide all necessary equipment and pumps to dewater the required area prior to grading and cap placement. All equipment shall be steam cleaned prior to being moved to the Site. No soil or other residue from previous operations shall be visible.

1.6 CLEANUP

1.6.1 Upon completion of the Work, the **Contractor** shall remove all materials, tools, debris, and equipment, and restore the Site in a manner satisfactory to the **Owner**. Dewatering or treatment pads shall be deconstructed and the ground surface shall be restored to its original conditions.

1.6.2 Daily Site cleanup of dewatering operation areas shall be performed by the **Contractor**. The **Contractor** shall ensure that no contaminated soil or other materials are spilled on Site roads/parking areas, the designated haul routes, or other area roads. If an accidental liquid, semi-solid, or solid spill occurs, the **Contractor** shall be responsible for all costs associated with completing cleanup, characterization, and disposal as required by the **Professional** at no additional cost to the **Owner**.

1.6.3 All equipment shall be cleaned or disposed prior to leaving the site so that no site contaminants leave with the dewatering equipment.

1.6.4 All solid or semi-solid material resulting from cleaning operations to remove site media shall be disposed of beneath the cap or at an approved disposal facility. Manifests and certification of disposal shall be provided. Manifests and disposal certificates shall be to the satisfaction of the **Owner**. All materials stated above shall be collected and removed from the Site as required to maintain a clean, safe workplace. Under no circumstances will the **Contractor** be allowed to accumulate debris, etc. on the Site beyond the Contract time.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

3.1 GENERAL

3.1.1 The **Contractor** shall dewater the ditch improvement and grading and capping areas, as necessary, with temporary sumps and pumps or by any accepted standard practice within all safety requirements in 29 CFR 1926.

END OF SECTION 31 23 19

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DIVISION 32

EXTERIOR IMPROVEMENTS

SECTION 32 29 30

EROSION AND SEDIMENT CONTROL

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

1.1.1 The Work to be performed under this section includes but is not limited to furnishing all labor, materials, tools, and equipment needed to install, operate, and maintain erosion and sedimentation controls as required by the Soil Erosion and Sedimentation Control (SESC) permit and as shown on the Drawings and specified herein.

1.2 STORM WATER POLLUTION PREVENTION

1.2.1 Prior to initiating earth-moving activities, the **Contractor** shall prepare a SESC Implementation Plan, obtain a permit from the appropriate issuing agency, obtain a Notice of Coverage from MDEQ, and establish all required SESC controls.

1.2.1.1 All work under the Contract must meet the storm water management requirements of the Project and comply with the applicable SESC rules and regulations (Soil Erosion and Sedimentation Control – 1994 PA 451, Part 91, as amended, MCL 324.9101 et seq.) and specific provisions and regulations for same within the Contract Documents. The Department of Management and Budget, Facilities Administration, an Authorized Public Agency (APA), has promulgated standard procedures and specifications for erosion control that shall be considered a part of the Contract Documents. SESC measures will be monitored and enforced by the permit issuing agency through the review of the **Contractor's** implementation plans and Site inspections. The permit issuing agency or the **Professional** will notify the **Contractor** in writing of any violations of the SESC statutes and/or the corrective action(s) undertaken by the **Owner** and may issue stop work orders. The permit issuing agency has the right to assess a fine to the **Contractor** for noncompliance with the provisions of the Contract Documents and/or SESC regulations applicable to this work and fines shall be in addition to any other remediation costs or liquidated damages applicable to the project and may exceed the value of the Contract.

1.2.2 The **Contractor** shall implement the soil erosion and sedimentation controls as shown on the Drawings, specified in the Contract Documents, and as directed by the permit issuing authority.

1.2.3 Fines and related costs resulting from failure to provide adequate protection against soil erosion and sedimentation are the obligation of the **Contractor**.

1.2.3.1 Silt, sediment, sand, mud, coal, or other similar materials leaving the properties on which Work is being performed will be construed as damage to neighboring properties and evidence of negligence on the part of the **Contractor**.

1.2.3.2 Damages to neighboring properties shall be rectified and/or restitution shall be paid by the **Contractor**.

1.2.4 Soil erosion and sedimentation control measures employed will be subject to approval and inspection by governing agencies having jurisdiction over such work.

The temporary control provisions proposed shall be coordinated with the project schedule, sequence of construction, and temporary and permanent Site facilities to assure economical, effective, and continuous erosion control throughout the construction and post construction period with no violation of the Federal, State, and local regulations.

1.2.5 The **Owner** may limit the active area of earthwork and embankment operations in progress commensurate with the **Contractor's** capability in controlling erosion and sediment-laden run-off.

1.3 SUBMITTALS

1.3.1 Samples: Submit samples of materials being used when requested by the **Owner** including names, sources, and descriptions.

1.3.2 The **Contractor** shall prepare and submit a SESC Implementation Plan. The SESC Implementation Plan shall be developed utilizing the Site preparation and restoration plans herein.

1.3.3 The **Contractor** shall submit copies of the issued SESC Permit and Notice of Coverage.

1.3.4 The **Contractor** shall provide the name and certification number of the Certified Construction Storm Water Operator for the project.

1.4 QUALITY CONTROL

1.4.1 All erosion and sediment control work shall comply with applicable requirements of governing authorities having jurisdiction.

1.4.2 SESC measures shall be installed prior to any earth disturbance. Temporary controls must be regularly inspected and properly maintained until permanent controls are established. On-site areas that are subject to severe erosion and off-site areas that are especially vulnerable to damage from erosion and/or sedimentation are to be identified and receive special attention. Permanent controls are to be installed within five days of final grade. This is a requirement of Part 91 of PA 451 of 1994, the Soil Erosion and Sedimentation Control Act (R 323.1709 (5)).

1.4.3 All land-disturbing activities are to be planned and conducted to minimize the size of the area to be exposed at any one time and the length of the time of exposure.

1.4.4 Surface water run-off originating upgradient of exposed areas should be controlled to reduce erosion and sediment loss during the period of exposure.

1.4.5 All land disturbing activities are to be planned and conducted so as to prevent off-site sedimentation damage.

1.5 REFERENCES

1.5.1 The Department of Management and Budget's Soil Erosion and Sedimentation Control Guidebook (February 2005).

PART 2 – MATERIALS

2.1 SILT FENCE

2.1.1 Silt fence shall meet the following requirements:

2.1.1.1 Silt fences shall be prefabricated.

2.1.1.2 The geotextile for the fencing shall meet the following requirements:

Property	Test Value(1)	Test Method
Grab Tensile Strength	100 lbs	ASTM D4632
Burst Strength	190 psi	ASTM D3786
Puncture Resistance	40 lbs	ASTM D4833
Permittivity	>0.1 sec-1	ASTM D4491
AOS	>30 US sieve	ASTM D4751
UV Resistance (500 hr.)	70%	ASTM D4355

[1]Minimum average roll values

2.1.1.3 Posts shall be wood, galvanized or aluminum, 48 inches tall minimum, spaced at no further than 10 foot intervals.

2.1.2 The geotextile height shall be a minimum of 3 feet and shall be provided with a tensioning cord**.**

PART 3 – EXECUTION.

3.1 SILT FENCE

3.1.1 A narrow 6-inch deep trench shall be excavated along the alignment of the silt fence. Excavated material shall be stockpiled adjacent to the trench.

3.1.2 Fence posts shall be positioned on the downstream side of the fence and driven into the ground. Fence posts shall be spaced no more than ten (10) feet apart.

3.1.3 The fabric flap shall be laid in the trench and backfilled with material stockpiled from trench excavation. The backfill shall be tamped into place.

3.1.4 Fabric fence and support posts shall be connected.

3.1.5 The **Contractor** shall join fence sections together by overlapping adjoining fence with a minimum of two wraps or as recommended by the manufacturer and as approved by the **Owner** to prevent silt from escaping through the adjoining sections.

3.1.6 The **Contractor** shall maintain silt fences (removing and disposing of silt, repairing fence which falls down, and replacing damaged fence, etc.) throughout the duration of the Contract at no additional cost to the **Owner**.

3.2 TEMPORARY VEGETATIVE COVER

3.2.1 If used, spread the temporary seed mix and mulch uniformly at the specified rate in accordance with the manufacturer's specifications.

3.2.2 Anchor mulch during application or immediately after placement to avoid loss by wind and water.

3.3 PERMANENT VEGETATIVE COVER

3.3.1 Refer to **Section 32 92 00**.

3.3.2 Anchor mulch during application or immediately after placement to avoid loss by wind and water.

3.4 DUST CONTROL

3.4.1 The **Contractor** shall be aware that dust generated from the excavation, grading, handling, storage, transport, and treatment may contain asbestos and particulates that have ingestion and inhalation limit(s). Therefore, dust from all operations shall be avoided.

3.4.2 Dust generated from the **Contractor's** performance of the Work, either inside or outside the limit of work shall be controlled by the **Contractor** by applying water or other materials with the approval of the **Owner**.

3.4.3 The **Owner** has the right to stop construction activity if the excavation, grading, handling, backfilling, or restoration work is generating excessive amounts of dust as determined from observation.

3.4.4 Water shall be provided in plentiful amounts and sufficient locations to water all materials prior to and during movement. This includes prior to and during excavation, grading, and waste pile management, and as needed at all times and locations to prevent dust from vehicle and equipment traffic on and off haul roads.

3.4.5 Visible dust during the construction activities is prohibited.

3.5 MAINTENANCE

3.5.1 Inspection

3.5.1.1 Erosion and sediment control will be inspected weekly by the **Contractor** and after significant precipitation events resulting in runoff from the Site.

3.5.1.2 At a minimum the **Contractor** will perform weekly inspections of the soil erosion and sedimentation control system to assure the integrity of the system.

3.5.2 Repair

3.5.2.1 All erosion swales and gullies in excess of two inches deep shall be filled and compacted to their original condition and reseeded as required.

3.5.2.2 Erosion and sediment control structures (i.e., silt fencing) shall be replaced as required to assure the integrity of the system.

3.5.2.3 The **Contractor** shall complete SESC corrective actions within 48 hours of discovery of routine maintenance items, and within 24 hours if there is potential to impact Waters of the State.

3.5.3 Preventive Actions

3.5.3.1 The **Contractor** shall perform sweeping of applicable roadways and other preventive actions as required to minimize tracking and run off of soils.

3.5.3.2 The **Owner** will assume responsibility for permanent controls after project closeout.

3.5.4 Guarantee Period

3.5.4.1 The **Contractor** is responsible for repairing and maintaining the permanent SESC measures (vegetative cover) until such time that the governing agency releases the SESC permit. This includes supplying additional cap material, seed, mulch, or other erosion control measures where necessary to control erosion. A guarantee period of up to one year from the time of seed and mulch placement is included in the Contract.

3.6 SURPLUS MATERIALS

3.6.1 The **Contractor** shall provide a surplus inventory of erosion control materials for the duration of the project.

END OF SECTION 32 29 30

SECTION 32 92 00

SEEDING, FERTILIZING, AND MULCHING

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

1.1.1 The **Contractor** shall furnish all labor, materials, equipment, tools, and appurtenances required to seed, fertilize, and mulch all areas receiving a cover during the course of construction.

1.1.2 Spoils excavated from the southern drainage ditch upstream of the Coal Dock Burn Area shall be seeded, fertilized, and mulched if not placed beneath the cap similar to spoils from adjacent to the Burn Area.

1.1.3 The **Contractor** is required to apply seed and mulch to those areas disturbed by performance of the Work outside of the graded and capped areas that previously had vegetation present. These areas include, but may not be limited to, the uncovered edges of on-site access roads, material and equipment staging areas, and cleared areas required for the installation of temporary facilities and/or utility connections.

1.1.4 The **Contractor** shall comply with all applicable codes, ordinances, rules, regulations and laws of local, municipal, State, or Federal authorities having jurisdiction.

1.2 SUBMITTALS

1.2.1 A manufacturer's Certificate of Compliance for the components of the seed mixture shall be submitted by the manufacturer with each shipment of each type of seed. These certificates shall include the guaranteed percentages of purity, weed content and germination of the seed, net weight, and the date of shipment. No seed may be sown until the **Contractor** has submitted these certificates.

1.2.2 The **Contractor** shall submit to the **Professional** the seed certificates for approval at least seven (7) days prior to placement.

1.3 QUALITY ASSURANCE

1.3.1 A satisfactory stand of vegetation within the capped areas, as determined by the **Owner** and **Professional**, shall be required. To be acceptable, bare spots shall be scattered, there shall be no bare spots larger than one square foot, and the stand of vegetation shall consist of a uniform stand of at least 90 percent established permanent species by the time of the next seeding timeframe after the initial seeding. Refer to **Subsection 2.2** for seeding timeframes.

1.3.2 Maintain erosion and sedimentation controls in accordance with these Specifications throughout project and until permanent vegetation is established.

1.4 DEFINITIONS

1.4.1 Weeds include, but are not limited to, Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, and Broome Grass.

PART 2 - PRODUCTS

2.1 SEED MIXTURE FOR PERMANENT COVER

2.1.1 The following seed mixture shall be used for permanent cover, which was developed by NRCS for other similar capped areas along the Torch Lake shoreline. The minimum seed purity and germination percentages are also listed.

Seed	Pounds/Acre	Purity (%)	Germination (%)
Red Clover	10	98	80
Creeping Red Fescue	25	97	85
Vernal Alfalfa	5	99	85
White Dutch Clover	5	98	80
Perennial Rye Grass	10	97	85
Sweet Clover	5	98	80
Orchard Grass	15	98	90

2.1.2 Legume seed (alfalfa and clovers) shall be inoculated according to the specific requirements of each seed.

2.1.3 Seed shall be placed using a grain drill to improve soil contact and reduce seed consumption by birds.

2.1.4 The **Owner**, through the **Professional**, reserves the right to change the seed mixture and recommended seeding dates based upon the time of year in which the construction is performed (i.e., winter rye).

2.1.5 The **Owner** or **Professional** may also approve the use of dormant seed, if work is executed after the recommended seeding dates.

2.2 FERTILIZER

2.2.1 Following NRCS recommendations applied to other regional capping efforts, fertilizer shall be applied at the rate of 60 pounds of nitrogen, 60 pounds of phosphorous, and 300 pounds of potassium per acre.

2.2.2 Lime shall be applied at the rate of five tons per acre.

2.2.3 Manufactured fertilizer shall be a standard commercial fertilizer containing the specified percentages by weight of nitrogen, phosphoric acid, and potash. The fertilizer shall be furnished in standard containers with the name, weight, and guaranteed analysis of the contents clearly marked. The containers shall insure proper protection in handling and transporting the fertilizer. All commercial fertilizer shall comply with local, state and federal fertilizer laws.

2.3 MULCH

2.3.1 All seeded areas shall be mulched with three tons of straw per acre.

2.3.2 In the shallow drainage swales and on embankment slopes, 100% biodegradable straw blankets shall be used to help prevent erosion instead of loose mulch.

2.3.3 Mulch applied using hydroseeding techniques may be substituted for loose mulch and tackifier application but may not replace straw blankets or seed placement using a grain drill.

2.4 WATER

2.4.1 Water shall be clean, fresh, potable, and free of substances or matter that could inhibit vigorous growth of vegetation.

PART 3 - EXECUTION

3.1 INSPECTION

3.1.1 The **Contractor** shall verify that the prepared vegetative layer is ready to receive the Work of this Section.

3.1.2 Seed shall not be sown until the final condition of the cap in the area(s) to be seeded has been approved by the **Professional**.

3.2 DELIVERY, STORAGE, AND HANDLING

3.2.1 The **Contractor** shall deliver seed mixture in sealed containers showing weight, seed mix, year of production, date of packaging, and location of packaging. Seed in damaged packaging shall not be acceptable.

3.2.2 The **Contractor** shall deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer. Fertilizer in damaged packaging is not acceptable.

3.2.3 Lime may be delivered in bulk so long as it is protected from the weather prior to application.

3.2 SEEDBED PREPARATION

3.2.1 Areas to be seeded shall be fine graded, free of deleterious objects and stones greater than 3-inches in diameter. Where mechanized planting can occur, the seedbed shall be adequately loosened four to six inches deep and then smoothed, which may require disking and/or cultipacking to prepare the seedbed depending on soil and moisture conditions. Where mechanical planting is not feasible, hand preparation methods shall be used to roughen the soil surface so that broadcast seed will remain in-place. Soil preparation shall be suspended when moisture conditions are not amenable to satisfactory seedbed preparation.

3.3 FERTILIZING

3.3.1 Fertilizer and lime shall be incorporated into the soil either before or during final seedbed preparation.

3.3.2 The **Contractor** shall apply fertilizer in accordance with manufacturer's instructions.

3.3.3 The **Contractor** shall mix fertilizer thoroughly into upper 3 inches of the vegetative layer with a disc, spring-tooth harrow, or other suitable equipment.

3.3.4 The **Contractor** shall lightly water ground surface to aid the dissipation of fertilizer.

3.4 SEEDING

3.4.1 The **Contractor** shall apply seed at the rates shown in **PART 2** of this Section.

3.4.2 Do not seed area in excess of that which can be mulched on same day.

3.4.3 Planting season shall be as indicated in **PART 2** herein or as recommended by the local regulatory agency.

3.4.4 Water surfaces to ensure uniform seed germination and to keep surface of soil damp. Apply water slowly and in a fine spray to limit pooling.

3.4.5 The **Contractor** shall not sow immediately following rain, when ground is too dry, frozen, or during windy periods.

3.5 MULCHING

3.5.1 All seeded areas shall be mulched with three tons of straw per acre and anchored by knifing or the use of non-asphaltic tackifier.

3.5.2 This rate may be varied by the **Professional**, depending on the texture and condition of the mulch material and the characteristics of the area seeded.

3.5.3 Straw mulch shall be properly anchored to prevent removal by wind.

3.5.4 If non-asphaltic tackifier is used, the **Contractor** shall cover structures, sidewalks, slabs, retaining walls, signs and appurtenances, if the mulch binder is applied in such a way that it would come in contact with or discolor the structures.

3.5.5 Straw mulch blankets in drainage swales and along the berm edges, and coconut mulch

blankets along the top portion of the drainage ditch profile, shall be staked in-place using wood stakes. Metal stakes are not allowed.

3.6 RESEEDING

3.6.1 Where vegetative coverage is less than 90% by the time of the next seeding timeframe after initial seeding, the **Contractor** shall place additional seed.

3.7 MAINTENANCE

3.7.1 Begin maintenance activities after each area of Work has been reseeded.

3.7.2 Maintain seeded surfaces by supplying additional cap material, seed, mulch, or other erosion control measures where necessary to control erosion.

3.7.3 Water surfaces to ensure uniform seed germination and to keep surface of soil damp. Apply water slowly and in a fine spray to limit pooling.

3.7.4 Replant damaged areas showing root growth failure, deterioration, bare or thin spots, and eroded areas.

3.8 INSPECTION FOR ACCEPTANCE AND GUARANTEE PERIOD

3.8.1 Seeded areas shall be accepted by the **Professional** when a full uniform stand of vegetation has become established. A satisfactory stand of vegetation shall be defined as an area of 1,000 square feet or larger that has:

3.8.1.1 No bare spots larger than 1 square foot.

3.8.1.2 Not more than 10 percent of area with bare spots larger than 3-inches by 3-inches.

3.8.2 The **Contractor** is responsible for repairing and maintaining the permanent SESC measures (vegetative cover) until such time that the governing agency releases the SESC permit. This includes supplying additional cap material, seed, mulch, or other erosion control measures where necessary to control erosion. A guarantee period of up to one year from the time of seed and mulch placement is included in the Contract.

END OF SECTION 32 92 00

APPENDIX I

GLOSSARY

GLOSSARY

Activity–An element in the Progress Schedule establishing a requisite step, or the time and resources required, for completing the part of the Work associated with that Activity.

Addenda–Written instruments that are used by the Owner and/or Professional to incorporate interpretations or clarifications, modifications and other information into the Bidding Documents. An Addendum issued after Bid opening to those Bidders who actually submitted a Bid, for the purpose of re-bidding the Work without re-advertising, is referred to as a **post-Bid** Addendum.

Agency- Any unit, section, division, department or other instrumentality of the State that benefits from the Work.

Alternate–Refers to work specified in the Bidding Documents for which the Bidder must bid a Bid Price.

Apparent Low Bidders: Those Bidders whose Base Bid, when added to those specific Alternates the Owner intends to accept, yields the three lowest sums of Bid and Alternates. Additional Bidders may be considered Apparent Low Bidders if their Bid, when added to those specific Alternates the Owner intends to accept, yields a sum within 10% of the lowest of the Apparent Low Bidder's sum. If a qualified disabled veteran meets the requirements of the contract solicitation and with the veteran's preference is the lowest Bidder it is considered the Apparent Low Bidder.

Archaeological Feature–Any prehistoric or historic deposit of archaeological value, as determined by a representative of a State agency that is duly authorized to evaluate such findings and render such judgments. An Archaeological Feature deposit may include, but is not limited to Indian habitations, ceremonial sites, abandoned settlements, treasure trove, artifacts or other objects with intrinsic archaeological value and that relate to the history and culture of the State of Michigan. The Archaeological Features are listed under Section 00800 Supplementary Conditions.

Authorized Technical Data–Information and data contained in a report of exploration and tests of subsurface conditions. Also, any physical data (dimension, location, conditions, etc.) contained in those Drawings of physical conditions of existing surface and subsurface facilities.

Best Value-The bids will be evaluated for best value based on price and qualitative components that may include but are not limited to technical design, technical approach, quality of proposed personnel, and management plans, per PA 430 of 2012.

Bid–Written offer by a Bidder for the Work, as specified, which designates the Bidder's Base Bid and Bid Prices for all Alternates. The term *Bid* includes a *re-bid*.

Bidder–The Person acting directly, or through an authorized representative, who submits a Bid directly to the **Owner**.

Bidding Documents–The proposed Contract Documents as advertised, and all Addenda issued before execution of the Contract.

Bid Price– The Bidder's price for a lump sum item of work, or the product of the Bidder's unit price for an item of Unit Price Work times the quantity given on the Bid Form for that item.

Bid Security–Security serving as a guarantee that the Bidder will conform to all conditions.

Bidding Requirements–The Advertisement, Instructions to Bidders, Supplementary Instructions, Information for Bidders, Bid Form, Bid Form Attachments and qualification submittals, as advertised and as modified by Addenda, and any other Section included within Division 0 of the Bidding Documents for the purpose of governing bidding and award of the Contract.

Board–The Administrative Board of the State of Michigan.

Bond– Security furnished by the **Contractor**, as required by the Contract Documents.

Business Day–Any Day except Saturdays, Sundays and holidays observed by the **Owner.**

Bulletin–A request used by the **Owner** to describe a change in the Work under consideration by the **Owner** and to request the **Contractor** to submit a proposal for the corresponding adjustment in Contract Price and/or Contract Time, if any.

Calendar Day–Every day shown on the calendar, Saturdays, Sundays and holidays included.

Cash Allowance–An **Owner**-specified sum included within the Contract Price to reimburse the **Contractor** for the actual purchase/furnished cost of materials and/or equipment or other designated items, as specifically provided in the Contract Documents. Although the scope (e.g., the required quantity) of any Work covered by a Cash Allowance is sufficiently detailed in the

Contract Documents for the purposes of bidding the required labor costs, Subcontract costs, construction equipment costs and general conditions costs and Fee, it is understood that the required materials, equipment or other designated items are of uncertain purchase cost at the time of Bid or are yet to be specified in more detail by the **Professional** as to quality, appearance, durability, finish and such other necessary features affecting purchase price.

Change Order–A written order issued and signed by the **Owner**, which amends the Contract Documents for changes in the Work or an adjustment in Contract Price and/or Contract Time, or both.

Contract Award–The official action of the **Board** or the **Director-SFA** awarding the Contract to the **Contractor**.

Contract Documents–Written and graphic documents that form the legal agreement between the **Owner** and the **Contractor**, consisting of this document, completed Bid and Contract forms, terms and conditions of the contract, specifications, drawings, addenda, Notice of Award, Notice-to-Proceed and contract change orders.

Contract Price–The total compensation, including authorized adjustments, payable by the **Owner** to the **Contractor** (subject to provisions for Unit Price Work).

Contract Times–The Contract Times for the entire Work are the periods allowed, including authorized adjustments, for Substantial Completion and final completion of the Work. The Contract Times for a designated portion of the Work are the periods allowed for Substantial Completion and final completion of any such portion of the Work, as specified in the Contract Documents.

Contractor–Business enterprise with which the **Owner** has entered into the Contract.

Correction Period–Period during which the **Contractor** must, in accordance with the Contract Documents, (a) correct or, if rejected, remove and replace Defective Work, and (b) maintain warranties for materials and equipment in full force and effect.

Cost of the Work Involved–The sum of all costs that would be, or actually were, necessarily incurred by the **Contractor** in providing any Work Involved with the related change, less the costs that would be, or would have been, incurred by the **Contractor** to provide such Work without the related **change**.

Defective–As determined by the Professional, an adjective which when referring to or when applied to the term "Work" refers to (a) Work not conforming to the Contract Documents or not meeting the requirements of an inspection, test or approval, or (b) Work itemized in a Punch List which the **Contractor** fails to complete or correct within a reasonable time after issuance of the Punch List by the **Professional**.

Delay–Any act or omission or other event that in any manner adversely affects or alters the schedule, progress or completion of all or any part of the Work. Delay is a generic term intended to include deferral, stoppage, slow down, interruption and extended performance, and all related hindrance, rescheduling, disruption, interference, inefficiency and productivity and production losses.

Department (DTMB)–Department of Technology, Management and Budget of the State of Michigan.

Director is the Director of the **Department.**

Director-SFA is the Director of **DTMB** State Facilities Administration.

Division–Each of the numbered, distinct parts (starting with Division 0) into which the Specifications are divided.

Drawings–Part of the Contract Documents showing the Work. Drawings must neither serve nor be used as Shop Drawings.

Emergency–A condition affecting the safety or protection of persons, or the Work, or property at or adjacent to the site.

State Facilities Administration (SFA)-Entity in the **Department** responsible for design, construction, and operations and maintenance of facilities.

Fee for the Work Involved (Fee)–An established, percentage mark-up on the Cost of the Work Involved which is allowed to the **Contractor** for (a) reasonable administrative costs, and (b) negotiated, reasonable profit on the Cost of the Work Involved.

Hazardous Material–Asbestos containing materials (ACMs), Polychlorinated biphenyls (PCBs), petroleum products, such construction materials as paint thinners, solvents, gasoline, oil, etc., and any other like material the manufacture, use, treatment, storage, transportation or disposal of which is regulated by federal, State or local Laws governing the protection of public health, natural resources or the environment.

Invitation To Bid (ITB) -The solicitation document presenting the terms and conditions that will become part of the Contract when the Bid is accepted.

Law(s)–Means federal, State and local statutes, ordinances, orders, rules and/or regulations.

MCL–The Michigan Compiled Laws of the State of Michigan.

Means and Methods–Includes means, methods, techniques, sequences and/or procedures applicable to the Work.

Notice of Award–Written notice accepting the Bid to the lowest responsive, responsible Bidder and designating the Contract Price (and establishing the Alternates accepted by the **Owner**).

Notice-to-Proceed–Written notice issued by the Project Director directing the Contractor to commence the construction activities and establishing the start date of the Contract Time.

On-Site Inspection–The **Professional's** on-site examination of the **Contractor's** completed or in progress Work to determine and verify to the Project Director that the quantity and quality of all Work complies with the requirements of the Contract Documents.

Owner–The State of Michigan, with whom the **Contractor** has entered into the Contract and for whom the Work is to be provided.

Owner Field Representative–A State employee or consultant, acting under the direction of the Project Director, providing on-site, periodic observation and documentation of the Work for compliance with the Contract Documents.

Partial Use–Use by the **Owner** of a designated portion of the Work before accomplishing Substantial Completion of the entire Work. Partial Use does not mean Substantial Completion of the portion of the Work placed in use by the **Owner**.

Person–Individuals, partnerships, corporations, receivers, trustees, joint ventures or any other legal entity and any combinations of any of them.

Political Subdivision–Any county, city, village or other local unit of the State, including any agency, department or instrumentality of any such county, city, village or other local unit.

Post–Bid Submittal–A Qualification Submittal required of the Bidder selected under Section 00100 - 22 before Contract Award, and which is used by the Owner in the evaluation of the Bid of the selected Bidder.

Professional Services Contractor *(PSC or* ***Professional****)*–The individual or business entity who has the authority to practice the design disciplines required by the Contract Documents. An Agency with appropriate licensing may replace the PSC in their role if a consultant is not used.

Project–The total construction, which includes the Work and possibly other work completed by others, as indicated in the Contract Documents.

Project Director*-D*esignated State employee(s) (a) Responsible for directing and supervising the **Professional's** services during the period allowed for completion of the Work; and/or (b) Acting as representative for the **Owner** and for the enforcement of the Contract Documents, approving payment to the **Contractor** and coordinating the activities of the State, **Owner, Professional** and **Contractor.**

Project Schedule–Work Schedule that shows the **Contractor's** approach to planning, scheduling and execution of the Work and that accurately portrays completed Work as to sequencing and timing, as provided in the Contract Documents.

Project Specifications–The Contract Documents organized into Divisions. "Technical Specifications" means Divisions of the Specifications consisting of technical descriptions of materials, equipment, construction systems, standards and workmanship.

Provisionary Allowance–An amount included within the Contract Price to reimburse the **Contractor** for the cost to furnish and perform Work that is uncertain because, for example, it is indeterminate in scope and may not be shown or detailed in the Contract Documents.

Punch List–A list of minor items to be completed or corrected by the **Contractor,** any one of which do not materially impair the use of the Work for its intended purpose.

Qualified Disabled Veteran (QDV)-*QDV as defined by* Public Act 22 of 2010, MCL 18.1241.3 and supported by a DD214 Proof of Service and Discharge, a Veterans Administration rating decision letter, proof of disability (if the disability is not indicated on the DD214), and appropriate legal documents setting forth the 51% natural persons QDV ownership.

Record Documents–Drawings, Specifications, Addenda, Change Orders, Change Authorizations, Bulletins, inspection, test and approval reports, photographs, written clarifications and interpretations and all other documents recording, or annotated to show, all revisions and deviations between the as-built installation and the Contract Documents, all approved Submittals and all clarifications and interpretations.

Records–Books, reports, documents, electronic data, and other evidence relating to the bidding, award and furnishing and performance of the Work.

Recycled Material–Recycled paper products, structural materials made from recycled plastics, re-refined lubricating oils, reclaimed solvents, recycled asphalt and concrete, recycled glass products, re-treaded tires, ferrous metals containing recycled scrap metals and all other materials that contain (a) waste materials generated by a business or consumer, (b) materials that have served their intended purpose, and/or (c) materials that have been separated from solid waste for collection, recycling and disposition in the percentage determined by the State as provided by Law.

Request for Payment–The form provided by the **Owner** (Payment Request DTMB-0440) to be used by the **Contractor** in requesting payment for Work completed, which must enclose all supporting information required by the Contract Documents.

Schedule of Values–A schedule of pay items, which subdivides the Work into its various parts and which details, for each itemized part, cost and pricing information required for making payments for Work performed. The sum of all pay item costs in the Schedule of Values must equal the Contract Price for the Work.

Shop Drawings–Includes drawings, diagrams, illustrations, standard schedules, performance charts, instructions and other data prepared by or for the **Contractor** to illustrate some part of the Work, or by a Supplier and submitted by the **Contractor** to illustrate items of material or equipment.

Soil Erosion and Sedimentation Control–The planning, design and installation of appropriate Best Management Practices designed and engineered specifically to reduce or eliminate the off-site migration of soils via water runoff, wind, vehicle tracking, etc. Soil erosion and sedimentation control in the State of Michigan is regulated under The Natural Resources Environmental Protection Act; Soil Erosion and Sedimentation Control, 1994 PA 451, Part 91, as amended, MCL 324.9101 et seq. Soil erosion and sedimentation control associated with this Contract is monitored and enforced by the DTMB-SFA.

State–The State of Michigan in its governmental capacity, including its departments, divisions, agencies, boards, offices, commissions, officers, employees and agents. Non-capitalized references to a state refer to a state other than the State of Michigan.

State Construction Code–The Michigan State Construction Code Act, 1972 PA 230, as amended, MCL 125.1501 et seq.

Subcontractor–A Person having an agreement with the Contractor to provide labor at the site and furnishing materials and/or equipment for incorporation into the Work.

Submittals–Includes technical Submittals, Progress Schedules and those other documents required for submission by the Contract Documents. The term "technical Submittal" includes Shop Drawings, brochures, samples, Operation and Maintenance (O&M) Manuals, test procedures and any other Submittal the Contract Documents require the **Contractor** to submit to demonstrate how the items covered, after installation or incorporation into the Work, will conform to the information given in the Contract Documents and be compatible with the design of the completed Work as a functioning whole as indicated in the Contract Documents.

Substantial Completion–The Work, or a portion of the Work designated in the Contract Documents as eligible for separate Substantial Completion, has been completed in accordance with the Contract Documents as determined by the PSC, to the extent that the **Owner** can use or occupy the entire Work, or the designated portion of the Work, for the use intended without any outstanding, concurrent Work at the site, except as may be required to complete or correct Punch List items.

Supplier–A manufacturer or fabricator, or a distributor, material man or vendor representing a manufacturer or fabricator, who has an agreement with the Contractor to furnish materials and/or equipment.

Underground Utilities–Pipelines, piping, conduit, duct, cables, wells, tanks, tunnels and appurtenances, or other similar facilities, installed underground to convey or support conveyance of potable water, sprinkler or irrigation water, fire protection systems, electricity, gases, steam, petroleum products, sewerage and drainage removal, telephone, communications, cable TV, traffic or control systems.

Unit Price Work–Work involving specified quantities (i.e., related Work quantities) which when performed is measured by the **Professional** and paid using the measured quantities and unit prices contained in the Contract Documents. Performance of Unit Price Work for undefined quantities is contingent upon conditions encountered at the site, as determined and authorized by the **Professional**.

Unit Price Work, Specified–Work of specified and defined quantities (i.e., quantities are detailed in, and can be taken-off from, the Contract Documents) that when performed is measured by the **Professional** and paid based on the measured quantities and unit prices contained in the Contract Documents.

Work (as in *"the Work,"* "*the entire Work"*)–The entire *completed Construction* required by the Contract Documents. The Work results from furnishing and performing all services, obligations, responsibilities, management, supervision, labor, materials, equipment, construction equipment, general conditions, permits, taxes, patent fees and royalties, testing, inspection and approval responsibilities, warranties, temporary facilities, small tools, field supplies, Bonds, insurance, mobilization, close-out, overhead and all connections, devices and incidental items of any kind or nature required and/or made necessary by the Contract Documents.

Work Involved, any Work Involved–Existing or prospective Work (a) reflected in any notice, proposal or claim, or (b) reflected in changes ordered or in process, or (c) affected by Delay.

APPENDIX II

SPECIAL WORKING CONDITIONS AND SPECIAL PROJECT PROCEDURES

DEPARTMENT OF ENVIRONMENTAL QUALITY

The Work comprising this Project will be performed at a site of the Department of Environmental Quality. The **Contractor** must comply with all rules and regulations pertaining to such sites and must conform to the following rules:

1. The **Contractor** must provide a competent Superintendent satisfactory to the Department of Environmental Quality on the work site at all times during working hours with full authority to act for him or her. It must be the **Contractor**'s responsibility to furnish the Department of Environmental Quality with the name, address and telephone number of the responsible person to contact for Emergency during after hour, weekend and holiday periods.

2. Access to and egress from the site must be via routes specifically designated by the Department of Environmental Quality authorized representative.

3. No Work must be performed at the site on Saturdays, Sundays, holidays or during night hours without the written permission from the Department of Environmental Quality; and

4. Areas on the site for employee parking, tool boxes, material lay down, etc., must be assigned by the Department of Environmental Quality. All firearms, weapons, alcoholic beverages, or explosives must be removed from vehicles before entering the site.

5. Heavy equipment such as bulldozers and power shovels must be locked or immobilized in an acceptable manner when not in use. No tools, small pipe, copper or wire must remain on the site overnight, unless acceptably locked inside shanties or tool chests. There will be no exchange, loaning or borrowing of tools, equipment or manpower between the Department of Environmental Quality and the **Contractor**.

ASBESTOS ABATEMENT PROJECT PROCEDURES

This Work requires the movement of soil and debris that are known and/or may contain friable and/or non-friable asbestos, which is considered asbestos renovation work. The Contractor must plan his or her work to minimize disturbance of any known or assumed asbestos containing materials (ACM). The Contractor's On-Site Superintendent and all Subcontractor On-Site Superintendents for trades that could potentially disturb known or assumed ACM, must, as a minimum, have and provide documentation of current Asbestos Awareness Training.

Movement of ACM is required, and must be completed by a contractor currently licensed to remove asbestos by the State of Michigan, Department of Licensing and Regulatory Affairs (DLARA) Asbestos Program and abatement must be performed in accordance with all Federal, State and local Laws and Regulations. Prior to commencing any asbestos abatement activities, the licensed abatement contractor must submit, as required by Federal, State and Local Laws and Regulations, a "Notification of Intent to Renovate/Demolish" to both the State of Michigan, Department of Environmental Quality (DEQ), Air Quality Division and to the DLARA, Asbestos Program, to comply with National Emission Standards for Hazardous Air Pollutants (NESHAP), and the Clean Air Act (CAA). If ACM is to be removed from the site, all regulated ACM must be disposed of at an approved Type II (general refuse) landfill and must be in leak-tight wrapping or containers. ACM that is non friable and is not in poor condition or will not become regulated ACM at any time can be disposed of in a Type III (construction debris) landfill. Note as part of the proposed project no off-site disposal of ACM is planned.

At the completion of each abatement activity, the Contractor must perform clearance testing in accordance with National Institute for Occupational Safety and Health (NIOSH) 582 "Sampling and Evaluating Airborne Asbestos Dust". All air samples shall indicate concentrations of less than 0.01 fibers/cc for clearance to be met. Clearance testing shall be performed by a third party Asbestos Consultant. The Asbestos Consultant selected by the Contractor shall be experienced and knowledgeable about the methods for asbestos air sampling and be able to select representative numbers and locations of samples. It is mandatory that the Asbestos Consultant's on-site hygienist performing sampling and analysis have certification that he/she has passed a NIOSH 582 or equivalent course.

The NESHAP asbestos regulations, notification form, guidelines and fact sheets are available on DEQ's web site www.michigan.gov/deq under heading Air; then click on Asbestos NESHAP Program. For guidelines on submitting notifications pursuant to the Asbestos Contractors Licensing Act, contact the DLARA, Occupational Health Division, Asbestos Program at (517) 322-1320 or visit DLARA's web site www.michigan.gov/asbestos.

APPENDIX III

SITE DATA

Image Source: ESRI World Imagery (NAIP 2014)



M-26 52641 52679 52767 52899

SS-17 10/11/11

Depth	Parameter	Result	Units	[Criteria]
0-0.67	ARSENIC	134	mg/kg	[10,17]
0-0.67	COPPER	24500 J	mg/kg	[10]
0-0.67	CYANIDE	0.36 J	mg/kg	[2]

CHLL-SS06 10/15/14

Depth	Parameter	Result	Units	[Criteria]
0-0.5	ARSENIC	15	mg/kg	[10]

CHLL-SB92 08/20/14

Depth	Parameter	Result	Units	[Criteria]
0-0.5	TOTAL PCBS	7500 J	ug/kg	[10,17]

CHLL-SB146 05/12/15

Depth	Parameter	Result	Units	[Criteria]
0-0.5	TOTAL PCBS	2300 J	ug/kg	[10,17]

CHLL-SB88 08/20/14

Depth	Parameter	Result	Units	[Criteria]
0-0.5	TOTAL PCBS	9900 J	ug/kg	[10,17]

CHLL-SB148 05/12/15

Depth	Parameter	Result	Units	[Criteria]
0-0.5	TOTAL PCBS	5700 J	ug/kg	[10,17]

CHLL-ASBBLK23 10/14/2014
Brown exterior, orange interior, suspect circuit board waste

CHLL-SB85 08/20/14

Depth	Parameter	Result	Units	[Criteria]
0-0.5	TOTAL PCBS	3300 J	ug/kg	[10,17]

CHLL-SB151 05/12/15

Depth	Parameter	Result	Units	[Criteria]
0-0.5	TOTAL PCBS	7300 J	ug/kg	[10,17]

CHLL-SB86 08/20/14

Depth	Parameter	Result	Units	[Criteria]
0-0.5	TOTAL PCBS	6500 J	ug/kg	[10,17]

CHLL-SB155 05/12/15

Depth	Parameter	Result	Units	[Criteria]
0-0.5	TOTAL PCBS	1570 J	ug/kg	[10,17]

CHLL-SB32 06/11/14

Depth	Parameter	Result	Units	[Criteria]
0-0.5	ARSENIC	39	mg/kg	[10,17]
0-0.5	COPPER	33000	mg/kg	[10]
0-0.5	LEAD	8800	mg/kg	[10,17]
0-0.5	TOTAL PCBS	3300 J	ug/kg	[10,17]
0.5-4	ARSENIC	10	mg/kg	[10]
0.5-4	CYANIDE	0.17	mg/kg	[2]

CHLL-SS01 10/15/14

Depth	Parameter	Result	Units	[Criteria]
0-0.5	TOTAL PCBS	9100 J	ug/kg	[10,17]

CHLL-SB154 05/12/15

Depth	Parameter	Result	Units	[Criteria]
0-0.5	TOTAL PCBS	4300 J	ug/kg	[10,17]

CHLL-SB83 CHLL-SB87 CHLL-SB91 CHLL-SB95 CHLL-SB99 CHLL-SB103 CHLL-SB167 CHLL-SB168 CHLL-SS04 CHLL-SS05 CHLL-SB84 CHLL-SB150 CHLL-SB149 CHLL-SB156 CHLL-GW68 CHLL-SB89 CHLL-SB152 CHLL-GW19 CHLL-SS09

CHLL-ASBBLK16 10/14/2014
Black asphaltic roofing material

CHLL-ASBBLK15 10/14/2014
White corrugated paper insulation

CHLL-ASBBLK14 10/14/2014
White plaster, paper backing, 1/4"

CHLL-ASBBLK17 10/14/2014
Brittle black paper

SS-14 10/12/11

Depth	Parameter	Result	Units	[Criteria]
0-0.83	ARSENIC	31.4	mg/kg	[10]
0-0.83	LEAD	578	mg/kg	[10]

CHLL-ASBBLK18 10/14/2014
Black canvas material

CHLL-ASBBLK12 CHLL-SB96 CHLL-SB100 CHLL-SB104 CHLL-SB170 CHLL-SB171

CHLL-ASBBLK36 10/15/2014
Yellowish orange fire brick

CHLL-ASBBLK35 10/15/2014
Pink fire brick

CHLL-ASBBLK11 10/14/2014
White fibrous material

CHLL-ASBBLK12 10/14/2014
Black asphaltic roofing material

CHLL-ASBBLK13 10/14/2014
Gray plaster, 1/4" thick

CHLL-SB157 CHLL-GW69 CHLL-SB97 CHLL-SB101 CHLL-SB105

CHLL-SB93 08/20/14

Depth	Parameter	Result	Units	[Criteria]
0-0.5	TOTAL PCBS	1310 J	ug/kg	[10,17]

CHLL-SB147 05/12/15

Depth	Parameter	Result	Units	[Criteria]
0-0.5	TOTAL PCBS	1540 J	ug/kg	[10,17]

CHLL-GW18 CHLL-SB94 CHLL-GW41 CHLL-SB98 CHLL-SB102 CHLL-SB106

CHLL-SB31 06/11/14

Depth	Parameter	Result	Units	[Criteria]
0-0.5	ARSENIC	48	mg/kg	[10,17]
0-0.5	LEAD	440	mg/kg	[10]
0.5-4	ARSENIC	64	mg/kg	[10,17]

CHLL-SS02 CHLL-SS03

SS-16 10/11/11

Depth	Parameter	Result	Units	[Criteria]
0-0.17	ARSENIC	48.8	mg/kg	[10,17]
0-0.17	COPPER	37300 J	mg/kg	[10]
0-0.17	LEAD	3680	mg/kg	[10,17]
0-0.17	HEXACHLOROBENZENE	380	ug/kg	[2]

CHLL-SB153 05/12/15

Depth	Parameter	Result	Units	[Criteria]
0-0.5	TOTAL PCBS	15900 J	ug/kg	[10,17]

CHLL-SB90 08/20/14

Depth	Parameter	Result	Units	[Criteria]
0-0.5	TOTAL PCBS	8700 J	ug/kg	[10,17]

CHLL-SS07 10/15/14

Depth	Parameter	Result	Units	[Criteria]
0-0.5	ARSENIC	22	mg/kg	[10]
0-0.5	LEAD	410	mg/kg	[10]

CHLL-SB169 CHLL-SB140

CHLL-SB29 06/13/14

Depth	Parameter	Result	Units	[Criteria]
0-0.5	ARSENIC	11	mg/kg	[10]

CHLL-SB139 08/20/14

Depth	Parameter	Result	Units	[Criteria]
0-0.5	ARSENIC	9.3	mg/kg	[10]

CHLL-SB137 08/20/14

Depth	Parameter	Result	Units	[Criteria]
0-0.5	ARSENIC	18	mg/kg	[10]

CHLL-SB30 06/13/14

Depth	Parameter	Result	Units	[Criteria]
0-0.5	ARSENIC	32	mg/kg	[10]
0.5-1	ARSENIC	28	mg/kg	[10]

CHLL-SB138 08/20/14

Depth	Parameter	Result	Units	[Criteria]
0-0.5	ARSENIC	92	mg/kg	[10,17]

SS-15 10/11/11

Depth	Parameter	Result	Units	[Criteria]
0-0.5	ARSENIC	40.9	mg/kg	[10,17]

CHLL-SB141 08/20/14

Depth	Parameter	Result	Units	[Criteria]
0-0.5	ARSENIC	10	mg/kg	[10]

SS-13 10/12/11

Depth	Parameter	Result	Units	[Criteria]
0.08-0.83	ARSENIC	16	mg/kg	[10]

CHLL-SB28 06/13/14

Depth	Parameter	Result	Units	[Criteria]
0.5-4	CYANIDE	0.29	mg/kg	[2]
0.5-4	CYANIDE (DUP)	0.37	mg/kg	[2]

CHLL-ASBBLK10 10/14/2014
Cementitious material - gray/brown, plaster-like

CHLL-SS08 CHLL-SB26 06/13/14

Depth	Parameter	Result	Units	[Criteria]
0-0.5	ARSENIC	12	mg/kg	[10]

CHLL-SB27 CHLL-GW16 CHLL-GW15 CHLL-GW17

MDEQ Part 201 Cleanup Criteria for Response Action
1=Statewide Default Background Level
2*=Groundwater Surface Water Interface Protection Criteria
3=Soil Saturation Concentration Screening Levels
4*=Residential Drinking Water Protection Criteria
5=Residential Soil Volatilization to Indoor Air Inhalation Criteria (VSIC)
6=Residential Infinite Source Volatile Soil Inhalation Criteria
7=Residential Finite VSIC for 5 Meter Source Thickness
8=Residential Finite VSIC for 2 Meter Source Thickness
9=Residential Particulate Soil Inhalation Criteria
10=Residential Direct Contact Criteria
11*=Nonresidential Drinking Water Protection Criteria
12=Nonresidential Soil Volatilization to Indoor Air Inhalation
13=Nonresidential Infinite Source Volatile Soil Inhalation Criteria
14=Nonresidential Finite VSIC for 5 Meter Source Thickness
15=Nonresidential Finite VSIC for 2 Meter Source Thickness
16=Nonresidential Particulate Soil Inhalation Criteria
17=Nonresidential Direct Contact Criteria
18=Hazardous Waste Toxicity Screening Value
* Exceedances of criteria 2, 4, and 11 shown for organics and cyanide only

Sampling Location Type
- Bulk Asbestos+
- Soil
- Groundwater

- Sampling locations with at least one exceedance**
- Fence
- Property Boundary
- Conceptual Site and Geographic Area Boundaries

Notes:
+ Sample locations that have been remediated/removed in 2016 are not shown
** Exceedances of groundwater surface water interface criteria, residential and non-residential drinking water criteria, groundwater surface water interface protection criteria, and residential and non-residential drinking water protection criteria are shown for organics and cyanide only

0 150 Ft

Coordinate System: MIGeoRef(m)

Prepared for:
Michigan Department of Environmental Quality

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Figure 3a
Sampling Results Map
Hubbell Processing Area - Hubbell Coal Dock
Hubbell, Houghton County, Michigan

FILE: C:\temp\Projects\MDEQ0020\GIS\mxds\Planning\20170119-HPA_Preliminary\DesignReport\Draft\Fig3a_SampleResults_HubbelCoalDock_v20170124.mxd 11:17:18 AM 1/24/2017 KBrown

Image Source: ESRI World Imagery (NAIP 2014)

SS-19 10/11/11

Depth	Parameter	Result		Units	[Criteria]
0-0.33	ARSENIC	5600	J	mg/kg	[9,10,16,17]
0-0.33	COPPER	199000	J	mg/kg	[9,10,16,17]
0-0.33	CYANIDE	0.24	J	mg/kg	[2]
0-0.33	LEAD	1610		mg/kg	[10,17]
0-0.33	HEXACHLOROBENZENE	850		ug/kg	[2]

SS-20 10/11/11

Depth	Parameter	Result		Units	[Criteria]
0-0.06	ARSENIC	66.9	J	mg/kg	[10,17]
0-0.06	COPPER	20300	J	mg/kg	[10]
0-0.06	CYANIDE	0.14	J	mg/kg	[2]
0-0.06	LEAD	1010		mg/kg	[10,17]

CHLL-ASBBLK28 10/15/2014

White fire brick, some blue/green staining, "A.P. Green 5x6 Key"

CHLL-ASBBLK30 10/15/2014

Brick mortar

CHLL-ASBBLK06 07/31/14

Black weathered roofing material, tar paper

Parameter	Result	Units	[Criteria]
ASBESTOS	70	%	[1%]

CHLL-ASBBLK31 10/15/14

Black tar-like coating on concrete stack components

Parameter	Result	Units	[Criteria]
ASBESTOS	15	%	[1%]
ASBESTOS	15	%	[1%]
ASBESTOS	15	%	[1%]

CHLL-ASBBLK29 10/15/2014

Orange with black specs, "Webster" fire brick

CHLL-ASBBLK27 10/15/2014

Grayish brown fibrous insulating material (between brick and metal)

SB-11 10/11/11

Depth	Parameter	Result		Units	[Criteria]
0-1.33	ARSENIC	27.1	J-	mg/kg	[10]

CHLL-SB52 06/11/14

Depth	Parameter	Result	Units	[Criteria]
0-0.5	ARSENIC	120	mg/kg	[10,17]
0-0.5	COPPER	26000	mg/kg	[10]
0-0.5	LEAD	1700	mg/kg	[10,17]

SS-18 10/11/11

Depth	Parameter	Result		Units	[Criteria]
0-0.5	ARSENIC	1220		mg/kg	[9,10,16,17]
0-0.5	COPPER	26900	J	mg/kg	[10]
0-0.5	CYANIDE	1.9		mg/kg	[2]
0-0.5	PHENANTHRENE	4400		ug/kg	[2]

CHLL-ASBBLK25 10/14/2014

Tan/Brown, Corrugated paper, Found in multiple debris piles, Damaged.

CHLL-WP02 10/15/14

Depth	Parameter	Result	Units	[Criteria]
0-0.5	ARSENIC	92	mg/kg	[10,17]
0-0.5	COPPER	25000	mg/kg	[10]
0-0.5	CYANIDE	0.33	mg/kg	[2]
0-0.5	LEAD	1100	mg/kg	[10,17]

CHLL-ASBBLK05 07/31/14

Whitish gray transite in debris pile

Parameter	Result	Units	[Criteria]
ASBESTOS	15	%	[1%]

MineralB-6 09/07/07

Depth	Parameter	Result	Units	[Criteria]
0-0	ARSENIC	230	mg/kg	[10,17]
0-0	COPPER	44000	mg/kg	[10]
0-0	LEAD	1900	mg/kg	[10,17]

CHLL-ASBBLK04 7/31/2014

White cementitous material (possible pipe insulation) in debris pile

CHLL-WP03 10/15/14

Depth	Parameter	Result		Units	[Criteria]
0-0.5	ARSENIC	100		mg/kg	[10,17]
0-0.5	COPPER	22000		mg/kg	[10]
0-0.5	LEAD	2200		mg/kg	[10,17]
0-0.5	TOTAL PCBS	1570	J	ug/kg	[10,17]
0-0.5	FLUORANTHENE	8200		ug/kg	[2]
0-0.5	PHENANTHRENE	3100		ug/kg	[2]
0-0.5	1,2,4-TRIMETHYLBENZENE	610	J	ug/kg	[2]
0-0.5	BENZENE	240	J	ug/kg	[4,11]
0-0.5	NAPHTHALENE (VOC)	1500	J	ug/kg	[2]
0-0.5	XYLENE - TOTAL	2770	J	ug/kg	[2]

SB-14 10/11/11

Depth	Parameter	Result		Units	[Criteria]
0-1.17	ARSENIC	41.5	J	mg/kg	[10,17]
0-1.17	CYANIDE	0.15	J	mg/kg	[2]

MineralB-11 09/07/07

Depth	Parameter	Result	Units	[Criteria]
0-0	ARSENIC	52	mg/kg	[10,17]

CHLL-SB80 08/20/14

Depth	Parameter	Result	Units	[Criteria]
0-0.5	ARSENIC	45	mg/kg	[10,17]
0-0.5	ARSENIC (DUP)	37	mg/kg	[10]

CHLL-ASBBLK26 10/15/14

Grayish white, Transite, Found in multiple debris piles, Damaged

Parameter	Result	Units	[Criteria]
ASBESTOS	20	%	[1%]
ASBESTOS	20	%	[1%]
ASBESTOS	20	%	[1%]

CHLL-WP01 10/15/14

Depth	Parameter	Result	Units	[Criteria]
0-0.5	ARSENIC	77	mg/kg	[10,17]
0-0.5	LEAD	1800	mg/kg	[10,17]
0-0.5	TOTAL PCBS	72200 J	ug/kg	[10,17]

SB-12 10/11/11

Depth	Parameter	Result		Units	[Criteria]
0.5-1	ARSENIC	8.6	J-	mg/kg	[10]
0.5-1	CYANIDE	0.13	J	mg/kg	[2]

CHLL-ASBBLK34 10/15/2014

Yellowish orange, Molded block block material, Labeled "Duro 8759-15" Cone, rectangular, and cylinder shaped, Damaged

CHLL-RPM-04
CHLL-SB107
CHLL-SB108
CHLL-SB75
CHLL-SB79
CHLL-SB76
CHLL-GW37
CHLL-SB77
MW-11
CHLL-SB81
CHLL-SB78
CHLL-SB82
CHLL-GW40
CHLL-SB165
CHLL-SB166
MW-10



MDEQ Part 201 Cleanup Criteria for Response Action
1=Statewide Default Background Level
2*=Groundwater Surface Water Interface Protection Criteria
3=Soil Saturation Concentration Screening Levels
4*=Residential Drinking Water Protection Criteria
5=Residential Soil Volatilization to Indoor Air Inhalation Criteria (VSIC)
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13=Nonresidential Infinite Source Volatile Soil Inhalation Criteria
14=Nonresidential Finite VSIC for 5 Meter Source Thickness
15=Nonresidential Finite VSIC for 2 Meter Source Thickness
16=Nonresidential Particulate Soil Inhalation Criteria
17=Nonresidential Direct Contact Criteria
18=Hazardous Waste Toxicity Screening Value
* Exceedances of criteria 2, 4, and 11 shown for organics and cyanide only

Sampling Location Type

- Bulk Asbestos
- Soil
- Groundwater
- Residual Process Material
- Waste Pile

- Sampling locations with at least one exceedance**
- Fence
- Property Boundary
- Conceptual Site and Geographic Area Boundaries

Notes:

* Sample locations that have been remediated/removed in 2016 are not shown

** Exceedances of groundwater surface water interface criteria, residential and non-residential drinking water criteria, groundwater surface water interface protection criteria, and residential and non-residential drinking water protection criteria are shown for organics and cyanide only

0 125 Ft

Coordinate System: MIGeoRef(m)

Prepared for:
Michigan Department of Environmental Quality

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Figure 3b
Sampling Results Map
Hubbell Processing Area - Mineral Building
Hubbell, Houghton County, Michigan

FILE: C:\temp\Projects\MDEQ0007\GIS\mxds\Planning\20170119-HPA_PreliminaryDesignReport\Draft\Fig3b_SampleResults_Hubbell_MineralBuilding_v20170124.mxd 11:17:13 AM 1/24/2017 KBrown

Image Source: ESRI World Imagery (NAIP 2014)



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XRF148
XRF147

Locations Screened for Metals - At least one exceedance of:

- Residential Direct Contact Criteria
- Residential Particulate Soil Inhalation Criteria
- Non Residential Direct Contact Criteria
- Non Residential Particulate Soil Inhalation Criteria

- Screening locations with no exceedances
- Locations are included within a different geographical area boundary
- Fence
- Property Boundary
- Conceptual Site and Geographic Area Boundaries

Xray Fluorescence screening results are from surface soils unless otherwise specified.

N

0 250 Ft

Coordinate System: MIGeoRef(m)

Prepared for:
Michigan Department of Environmental Quality

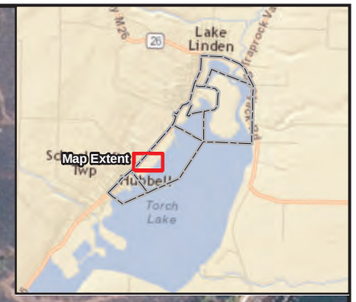
Mannik Smith GROUP
TECHNICAL SKILL. CREATIVE SPIRIT.
www.MannikSmithGroup.com

Figure 4a

Soil Screening Results Map - Soil
Hubbell Processing Area - Coal Dock
Hubbell, Houghton County, Michigan

FILE: C:\temp\Projects\MDEQ0007\GIS\mxds\Planning\20170119-HPA_PreliminaryDesignReport\DraftFig4a_Soil_Screening_Results_XRF_CoalDock_v20170124.mxd 11:54:57 AM 1/24/2017 KBrown

Image Source: ESRI World Imagery (NAIP 2014)



XRF108
MineralB-8
XRF143
MineralB-4
MineralB-9
XRF110
MineralB-6
MineralB-5
XRF122
XRF111
MineralB-13
MineralB-7
XRF136
XRF138
XRF137
MineralB-11
XRF119
XRF121
XRF123
MineralB-12
XRF139
XRF134
XRF120
XRF124
XRF125
XRF118
XRF135
XRF140
MineralB-10
XRF112
XRF116
XRF117
XRF126
XRF133
XRF113
XRF115
XRF132
XRF114
XRF131
XRF127
XRF128
XRF130
XRF129

Locations Screened for Metals - At least one exceedance of:

- Residential Direct Contact Criteria
- Residential Particulate Soil Inhalation Criteria
- Non Residential Direct Contact Criteria
- Non Residential Particulate Soil Inhalation Criteria
- Screening locations with no exceedances
- Locations are included within a different geographical area boundary
- Fence
- Property Boundary
- Conceptual Site and Geographic Area Boundaries

Xray Fluorescence screening results are from surface soils unless otherwise specified.

N

0 125 Ft

Coordinate System: MIGeoRef(m)

Prepared for:
Michigan Department of Environmental Quality

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Figure 4b

Soil Screening Results Map - Soil
Hubbell Processing Area - Mineral Building
Hubbell, Houghton County, Michigan

FILE: C:\temp\Projects\MDEQ0070\GIS\mxds\Planning\20170119-HPA_PreliminaryDesignReport\Draft\Fig4b_Soil_Screening_Results_XRF_MineralBuilding_v20170124.mxd 11:52:40 AM 1/24/2017 KBrown

APPENDIX IV

PREVAILING WAGE RATES

Prevailing wages will be provided via Addendum.

APPENDIX V

CONTRACT FORMS

DTMB-0401D (R 9/16)

BID SUMMARY

DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET

STATE FACILITIES ADMINISTRATION
DESIGN AND CONSTRUCTION DIVISION
3111 W. St. Joseph Street
Lansing, Michigan 48917

Bids must be submitted electronically through the Buy4Michigan website at www.buy4michigan.com

FILE NUMBER	INDEX NUMBER	DEPARTMENT/AGENCY
761/16108.SAR	44251	Department of Environmental Quality Remediation and Redevelopment Division

CONTRACT TIME(S)	PROJECT NAME	LOCATION
Refer to Article 23 of Section 00100	Torch Lake Non-Superfund Site, Hubbell Processing Area	Hubbell, Michigan

BID OPENING DATE	FOR AN EXAMINATION OF THE SITE CONTACT:
May 3, 2017 at 2:00 pm Local Time	Jed Chrestensen, The Mannik & Smith Group, Inc. 200 Michigan St., Ste 705, Hancock, MI 49930, 906-487-7452

SEE SECTION 00100 INSTRUCTIONS TO BIDDERS AND SECTION 00700 GENERAL CONDITIONS PROVIDED WITH THE BIDDING DOCUMENTS.
BID: WE PROPOSE TO FURNISH, PERFORM AND COMPLETE THE ENTIRE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS IN CONSIDERATION OF THE BID PRICE (S) STATED BELOW.

FIRM NAME AND COMPLETE ADDRESS	TELEPHONE NUMBER and E-MAIL ADDRESS
	FEDERAL I.D. NUMBER
☐ Qualified Disabled Veteran	(protected information required for processing payments)
BIDDER'S SIGNATURE AND TITLE DATE	WITNESS' SIGNATURE DATE

By signing this bid above, bidder certifies their enclosed Qualified Disabled Veteran and Michigan-Based Business Certifications.

BASE BID FROM BID SCHEDULE (Include specified Allowances):

_____ Dollars $_____
(use words) (in figures)

Alternate1: (Add/Subtract) _____ Dollars $ _____
(use words) (in figures)

A PERFORMANCE BOND AND A PAYMENT BOND ARE REQUIRED FOR ALL BIDS OVER $50,000.00. EACH BID MUST BE ACCOMPANIED BY A FIVE (5) PERCENT BID GUARANTEE.

BIDDERS ARE ALSO CAUTIONED TO FAMILIARIZE THEMSELVES WITH ALL OF THE OTHER CONDITIONS OF THE CONTRACT.

Project Scope of Work:

The Work, Interim Response Activities, includes, but is not necessarily limited to:

- Planning, site preparation, site health and safety, clearing, and dewatering.
- Grading and capping of soils containing polychlorinated biphenyls (PCBs), metals, and asbestos containing material (ACM) to eliminate impacted soil runoff into Torch Lake.
- Drainage ditch improvement to restore channel capacity and prevent overflowing onto the newly placed cap.
- Potential removal and disposal soils containing greater than 50 parts per million (ppm) PCBs.
- Seeding, mulching, and site restoration.

The Bidder must figure its Base Bid on the specified, or Addendum-approved, materials and equipment **only**. No “or equal” or substitution proposals will be permitted after Bid opening, except as provided in the General Conditions.

Addenda: Bidder acknowledges receipt of Addenda: No. ___ dated: _____, No. ___ dated: _____ No. ___ dated: _____

FIRM NAME	TELEPHONE NUMBER and E-MAIL ADDRESS

BID SCHEDULE

Base Bid Schedule - The Bidder will complete the Work and accept as full payment, for the Work items listed, the following Unit Prices and/or Item Bid Prices, as applicable:

Base Bid Item No.	Bid Quantity	Description (Bidder to write price in words)	Unit Price	Item Bid Price
1	1 LS	Mobilization and Job Site Administration		
2	1 LS	Site Preparation - Soil Erosion and Sedimentation Controls, Permits, and Access Improvements		
3	1 LS	Tree Removal, Dewatering, and Grading		
4	1 LS	Drainage Ditch Improvement		
5	140 Tons	PCB-Contaminated Soil and Debris Transport and Disposal		
6	6.5 Acres	Cap Installation		
7	1 LS	North Boundary Road Installation		
8	6.5 Acres	Seeding, Fertilizing, and Mulching		
9	1 LS	Final As-Built Survey		
10	NA	Provisionary Allowance Fifty Thousand Dollars and No Cents.	NA	$50,000.00
11	1 LS	Demobilization and Project Close Out		

Base Bid (Sum of Item Bid Prices for all Base Bid Items):

_____ Dollars $_____
(use words) (in figures)

Schedule of Alternates - The Bidder will complete (or deduct from the Contract) the parts of the Work designated by the Alternates that follow and accept in full payment (or allow in full credit) for those parts of the Work the following Item Bid Prices:

Alternate Item No.	Bid Quantity	Description (Bidder to write price in words)	Unit Price	Item Bid Price
A1	1 LS	WP-11 Grading and Capping	_____	_____

The Bidder further acknowledges and agrees that the separate prices bid on this "Schedule of Alternates," where they are applicable and deemed acceptable by the **Owner**, will be used if incorporated into the Contract when the **Owner** issues the Notice of Award.

DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
State Facilities Administration
Design & Construction Division

Qualified Disabled Veteran (QDV) Business Representation

'Qualified Disabled Veteran,' means a business entity that is 51% or more owned by one or more veterans with a service-connected disability.

'Qualified Disabled,' means a business entity that is 51% or more owned by one or more with a service-connected disability.

The vendor represents that it IS _____, a qualified disabled veteran.

The contractor represents and warrants that the company meets the above (when checked) and has attached supporting documentation per the following:

Each bid requesting the Qualified Disabled Veterans (QDV) preference, in accordance with Public Act 22 of 2010, MCL 18.1241.3 shall include a DD214 Proof of Service and Discharge, a Veterans Administration rating decision letter, proof of disability (if the disability is not indicated on the DD214), and appropriate legal documents setting forth the 51% natural persons QDV ownership.

Fraudulent Certification as a Qualified Disabled Veteran may result in debarment under MCL 18.264.

Certification of a Michigan Based Business

(Information Required Prior to Contract Award for Application of State Reciprocity Provisions)

To qualify as a Michigan Based Business:

Vendor must have, during the 12 months immediately preceding this bid deadline:
or
If the business is newly established, for the period the business has been in existence, it has:

(check all that apply):

- ☐ Filed a Michigan single business tax return showing a portion or all of the income tax base allocated or apportioned to the State of Michigan pursuant to the Michigan Single Business Tax Act, 1975 PA 228, MCL 208.1 – 208.145; or
- ☐ Filed a Michigan income tax return showing income generated in or attributed to the State of Michigan; or
- ☐ Withheld Michigan income tax from compensation paid to the bidder's owners and remitted the tax to the Department of Treasury; or

I certify that **I have personal knowledge** of such filing or withholding, that it was more than a nominal filing for the purpose of gaining the status of a Michigan business, and that it indicates a significant business presence in the state, considering the size of the business and the nature of its activities.

I authorize the Michigan Department of Treasury to verify that the business has or has not met the criteria for a Michigan business indicated above and to disclose the verifying information to the procuring agency.

Bidder shall also indicate one of the following:

- ☐ Bidder qualifies as a Michigan business (provide zip code: _____)
- ☐ Bidder does not qualify as a Michigan business (provide name of State: _____).
- ☐ Principal place of business is outside the State of Michigan, however service/commodity provided by a location within the State of Michigan (provide zip code: (_____).

Fraudulent Certification as a Michigan business is prohibited by MCL 18.1268 § 268. A BUSINESS THAT PURPOSELY OR WILLFULLY SUBMITS A FALSE CERTIFICATION THAT IT IS A MICHIGAN BUSINESS OR FALSELY INDICATES THE STATE IN WHICH IT HAS ITS PRINCIPAL PLACE OF BUSINESS IS GUILTY OF A FELONY, PUNISHABLE BY A FINE OF NOT LESS THAN $25,000 and subject to debarment under MCL 18.264.

BID BOND

BID SUBMITTED ON the _____ day of _____, 20____.

Bid Security **is in the form of: a Bid Bond _____ Bid Bond form has been duly executed _____; or**

A Bank Certified or Cashier's check ___ or Money Order ___ is attached to this page ____

If the Bidder is an Individual:

Name of Individual: _____

Name & Title of Person Authorized to sign: _____

Signature: _____
(If not the Individual, Attach Power of Attorney) Date

Doing Business as: _____

Business Address: _____

County of registration _____

Telephone: _____ FAX: _____

If the Bidder is a Partnership:

By: _____
(True Name of the Partnership)

_____
Partner Authorized to Sign Date

Signature: _____
(Attach evidence of Authority to sign) Date

Business Address: _____

County of registration _____

Telephone: _____ FAX _____

If the Bidder is a Corporation:

By: _____
(Legal Corporation Name)

Name & Title of Authorized Officer: _____

Signature: _____
(Attach evidence of Authority to sign) Date

Name & Title of Officer Attesting: _____

Signature: _____
Date

Business Address: _____

Telephone: _____ FAX _____

(State of Incorporation): _____

If The Bidder is A Joint Venture: JOINT VENTURE SIGNATURES MUST BE AS PROVIDED IN INSTRUCTIONS TO BIDDERS. EACH JOINT VENTURER SIGNING THE BID MUST SIGN IN THE MANNER INDICATED FOR AN INDIVIDUAL, A PARTNERSHIP OR A CORPORATION. IF MORE THAN TWO JOINT VENTURERS OF THE SAME TYPE ARE INCLUDED, USE ADDITIONAL PAGES. JOINT VENTURE STATE OF INCORPORATION _____ OR COUNTY OF REGISTRATION _____

POST-BID SUBMITTALS

The PSC will request this submittal after bid opening. Complete and submit these items within two business days after the request.

BIDDER'S EXPERIENCE MODIFICATION RATING (EMR) _____
Attach letter of explanation if the Bidder does not have an EMR.

PROPOSED PROJECT SUPERINTENDENT _____
Attach brief resume or list of similar successful projects.

PROPOSED PROJECT SCHEDULE
Please provide a proposed project schedule including proposed commencement date, major activities, and completion date.

LIST OF SIMILAR PROJECTS COMPLETED BY THE BIDDER
Please list at least three completed projects of similar size and complexity to the project being bid, with reference contact information

_____

REFERENCE #___

Owner: _____

Project/Contract Name: _____

Location of Project/Contract: _____

Contract Price: _____ Project/Contract Started: _____ Completed: _____

Owner's Representative (Name and Telephone): _____

_____

Scope of Project/Contract: _____

_____

REFERENCE #___

Owner: _____

Project/Contract Name: _____

Location of Project/Contract: _____

Contract Price: _____ Project/Contract Started: _____ Completed: _____

Owner's Representative (Name and Telephone): _____

_____

Scope of Project/Contract: _____

_____

REFERENCE #___

Owner: _____

Project/Contract Name: _____

Location of Project/Contract: _____

Contract Price: _____ Project/Contract Started: _____ Completed: _____

Owner's Representative (Name and Telephone): _____

_____

Scope of Project/Contract: _____

POST-BID SUBMITTALS (CONTINUED)

The PSC will request this submittal after bid opening. Complete and submit these items within two business days after the request.

LIST OF SUBCONTRACTORS

1. To enable the **Owner** and **Professional** to evaluate the Bidder's qualifications to perform the Work, for each Division of the Specifications, Section of the Specifications and/or trade itemized in this List of Subcontractors, the Bidder shall nominate the Subcontractor(s) to be awarded a Subagreement(s). To the extent a contractors' licensing is required for any such classification of Work, the Bidder shall provide the nominated Subcontractor's license number(s). If the Bidder intends to self-perform any of the listed classifications of Work, the Bidder shall nominate itself in the spaces provided for that purpose, and shall furnish the corresponding Bidder's license number(s). For each nominated Subcontractor, the Bidder shall enter, if applicable, whether the Subcontractor is a minority, woman or handicapped owned business in the spaces provided for that purpose. The Bidder also shall furnish the amount of the Subagreement that the Bidder, directly or through another higher tier Subcontractor, anticipates awarding to each nominated Subcontractor.

2. Should the Bidder fail to nominate Subcontractors, as required, or provide duplicate nominees for any Division, Specification or trade, or fail to enter the required licensing information, the Bidder shall clarify the omission or ambiguity within two (2) Business Days of the **Owner** or **Professional's** request. Failure by the Bidder to comply with this Subcontractor nominating requirement may render the Bid as not conforming in all material respects with the requirements of the Bidding Documents.

3. Pursuant to the Bidding Documents, the Bidder shall not remove, replace or add a nominated Subcontractor except for good cause. Before Contract Award, any removal, replacement or addition of a nominated Subcontractor shall be responsive to the requirements of the Bidding Documents only to the extent it permits the timely evaluation of the newly nominated Subcontractor. Since the requirement to nominate Subcontractors for the *listed* Divisions, Specification Sections and/or trades survives the award of the Contract, any Subcontractor nominated for any *listed* Division, Specification Section and/or trade *for the first time* after Contract Award and who is objected to by the **Owner**, for good cause, shall be replaced at no increase in Contract Price and/or Contract Time.

4. The requirement to make a definite nomination of Subcontractors or to state that the Bidder intends to self-perform that classification, and to clarify any omissions or ambiguities in this List of Subcontractors, applies to any Bidder remaining or wishing to remain in contention for the award.

5. This listing requirement is not intended to create any express or implied duty or obligation to the Bidder or the nominated Subcontractors by the **Owner** or **Professional**.

LIST OF SUBCONTRACTORS

Division, Specification Section and/or Trade	Nominated Subcontractor(s)	License Number(s) Classification	Amount of Subcontract	Minority, Woman, or Handicapped?
1. 01 30 00, Air Monitoring				
2. 02 21 00, Surveying Firm				
3. 02 61 00,Trucking Firm(s)				
4. 02 61 00, Solid Waste Disposal Facility				
5. 02 61 00, PCB Remediation Waste Disposal Facility				
6. 31 22 23, Excavation and Grading Firm(s)				
7. 31 22 23, Material Suppliers				
8. 01 45 00, Analytical Laboratory				
9. 01 45 00, Geotechnical Laboratory				
10. 32 29 30, Soil Erosion and Sedimentation Control				
11. 32 92 00, Seeding and Mulching				
12.				
13.				
14.				

PERFORMANCE BOND

SURETY COMPANY REFERENCE No. _____

That "the **Contractor**," _____, a corporation ___, individual ___, partnership ___, joint venture ___ of the State of _____, qualified to do business in the State of Michigan, as Principal, and "the Surety," _____, of the State of _____, as surety, are held and bound unto the State of Michigan, "the **Owner**," as Obligee, in the amount of _____ Dollars ($_____), for the payment of which the **Contractor** and Surety bind themselves, their respective heirs, successors, legal representatives and assigns, jointly and severally, in compliance with 1963 PA 213, as amended, MCL 129.201 et seq.

The **Contractor** has entered into "the Contract" with the **Owner** for interim response grading, capping, and site restoration, "the Work," covered by the Contract Documents, which are incorporated into this Performance Bond by this reference;

If the **Contractor** faithfully performs and fulfills all the undertakings, covenants, terms, conditions, warranties, indemnifications and agreements of the Contract Documents within the Contract Time (including any authorized changes, with or without notice to the Surety) and during the Correction Period, and if the **Contractor** also performs and fulfills all the undertakings, covenants, terms, conditions, warranties, indemnifications and agreements of any and all duly authorized modifications of the Contract Documents, then THIS OBLIGATION IS VOID, OTHERWISE TO REMAIN IN FULL FORCE AND EFFECT.

A. No change in Contract Price or Contract Time, "or equal" or substitution or modification of the Contract Documents (including addition, deletion or other revision) releases the Surety of its obligations under this Section 00610 Performance Bond. The Surety expressly waives notice of any such change in Contract Price or Contract Time, "or equal" or substitution or modification of the Contract Documents (including addition, deletion or other revision).

B. This Performance Bond must be solely for the protection of the **Owner** and its successors, legal representatives or assigns.

C. It is the intention of the **Contractor** and Surety that they must be bound by all terms and conditions of the Contract Documents (including, but not limited to General Conditions and this Performance Bond). However, this Performance Bond is executed pursuant to 1963 PA 213, as amended, MCL 129.201 et seq., and if any provision(s) of this Performance Bond is/are illegal, invalid or unenforceable, all other provisions of this Performance Bond must nevertheless remain in full force and effect, and the **Owner** must be protected to the full extent provided by 1963 PA 213, as amended, MCL 129.201 et seq.

IMPORTANT: The Surety must be authorized to do business in the State of Michigan by the Department of Licensing and Regulatory Affairs – Insurance Bureau, must be listed on the current U.S. Department of the Treasury Circular 570, and, unless otherwise authorized by the **Owner** in writing, must have at least an A– Best's rating and a Class VII or better financial size category per current A. M. Best Company ratings.

Name, Address and Telephone of the Surety:

Address and Telephone of Agent, who is either a resident of, or whose principal office is maintained in, the State of Michigan

Signed and sealed this _____ day of _____, 20_____.

THE **CONTRACTOR**: (Print Full Name and Sign) By:_____

WITNESS _____ Name & Title: _____

Telephone No. _____

THE SURETY: (Print Full Name and Sign) Agent: _____

WITNESS _____ Attorney-in-Fact: _____

Telephone No. _____

PAYMENT BOND

SURETY COMPANY REFERENCE No._____

"the **Contractor**," _____, a corporation ___, individual ___, partnership ___, joint venture ___ of the State of _____, qualified to do business in the State of Michigan, as Principal, and "the Surety," _____, of the State of _____, as surety, are held and bound unto the State of Michigan, "the **Owner**," as Obligee, in the amount of _____ Dollars ($_____), for the payment of which the **Contractor** and Surety bind themselves, their respective heirs, successors, legal representatives and assigns, jointly and severally, in compliance with 1963 PA 213, as amended, MCL 129.201 et seq.

The **Contractor** has entered into "the Contract" with the **Owner** for _interim response grading, capping, and site restoration _____, "the Work," covered by the Contract Documents, which are incorporated into this Payment Bond by this reference;

If the **Contractor** promptly pays all claimants supplying labor or materials to the **Contractor** or to the **Contractor's** Subcontractors in the prosecution of the Work, then THIS OBLIGATION IS VOID, OTHERWISE TO REMAIN IN FULL FORCE AND EFFECT.

A. All rights and remedies on this Payment Bond are solely for the protection of all claimants supplying labor and materials to the **Contractor** or the **Contractor's** Subcontractors in the prosecution of the Work, and must be determined in accordance with Michigan Law.

B. No change in Contract Price or Contract Time, "or equal" or substitution or modification of the Contract Documents (including addition, deletion or other revision) must release the Surety of its obligations under this Payment Bond. The Surety hereby expressly waives notice of any such change in Contract Price or Contract Time, "or equal" or substitution or modification of the Contract Documents (including addition, deletion or other revision).

C. It is the intention of the **Contractor** and Surety that they must be bound by all terms and conditions of the Contract Documents (including, but not limited to this Payment Bond). However, this Payment Bond is executed pursuant to 1963 PA 213, as amended, MCL 129.201 et seq., and if any provision(s) of this Payment Bond is/are illegal, invalid or unenforceable, all other provisions of this Payment Bond must nevertheless remain in full force and effect, and the **Owner** must be protected to the full extent provided by 1963 PA 213, as amended, MCL 129.201 et seq.

IMPORTANT: The Surety must be authorized to do business in the State of Michigan by the Department of Licensing and Regulatory Affairs – Insurance Bureau, must be listed on the current U.S. Department of the Treasury Circular 570, and, unless otherwise authorized by the **Owner** in writing, must have at least an A– Best's rating and a Class VII or better financial size category per current A. M. Best Company ratings.

Name, Address and Telephone of the Surety:

Address and Telephone of Agent, who is either a resident of, or whose principal office is maintained in, the State of Michigan

Signed and sealed this _____ day of _____, 20_____.

THE **CONTRACTOR**: (Print Full Name and Sign) By:_____

WITNESS _____ Name & Title: _____

Telephone No. _____

THE SURETY: (Print Full Name and Sign) Agent: _____

WITNESS _____ Attorney-in-Fact: _____

Telephone No. _____

APPENDIX VI

PROVISIONAL ALLOWANCE CHANGE AUTHORIZATION REQUEST FORM

PROVISIONAL ALLOWANCE
CHANGE AUTHORIZATION
REQUEST FORM

TO: Mr. Jed Chrestensen
The Mannik & Smith Group, Inc. DATE: mm/dd/yy

FROM: **Contractor**

SUBJECT: Department/Agency: Environmental Quality/Remediation and Redevelopment
Project Name and Location: Abandoned Mining Wastes Torch Lake Non-Superfund Site
Hubbell Processing Area
Hubbell, Michigan

INTENT: This is not a change order. This is a request to draw from the Provisional Allowances for Pay Item Number 9 or Pay Item Number 19. Upon acceptance and signature by all parties, this document shall serve as notice of an agreed allocation from the Provisional Allowances reserved for the Pay Items.

Pay Item No.	Description	Quantity	Unit	Unit Price	Total Price

Item No.___: $_____

Total Change: $_____

FOR THE CONTRACTOR:

_____
Signature Date

Contractor Name:

Contractor's Address:

FOR THE PROFESSIONAL:

_____
Signature Date

Professional:
The Mannik & Smith Group, Inc.

Professional's Address:
200 Michigan Street, Suite 705
Hancock, MI 49930

FOR THE OWNER:

_____
Signature Date

Owner:
State of Michigan

Owner's Address:
55195 US Highway 41
Calumet, MI 49913

APPENDIX VII

WASTE PILE WP-11 INFORMATION

Image Source: ESRI World Imagery (NAIP 2014)

M-26 52499 52599 52641

WP-30 WP-31 WP-32 WP-33 WP-27 WP-28 WP-26 WP-25 WP-29 WP-24 WP-23 WP-18 WP-22 WP-20 WP-19 WP-15 WP-46 WP-16 WP-21 WP-14 WP-17 WP-13 WP-11 WP-07 WP-12 WP-04 WP-02 WP-03 WP-10 WP-05 WP-08 WP-01 WP-06 WP-09 WP-45

Map Extent

Waste Pile Boundary
Fence
Property Boundary

N

0 100 Ft

Coordinate System: MIGeoRef(m)

Prepared for:
Michigan Department of Environmental Quality

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TECHNICAL SKILL. CREATIVE SPIRIT.
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Figure 5b
Waste Pile Locations
Hubbell Mineral Building
Hubbell, Houghton County, Michigan

FILE: C:\temp\Projects\MDEQ0020\GIS\mxds\Planning\20170119-HPA_Preliminary\DesignReport\Draft\Fig5b_HubbellMineralBuilding_WastePiles_v20170124.mxd 1/24/2017 10:42:36 AM KBrown

DRAWINGS (REDUCED SIZE)

MDEQ Upper Peninsula District
Abandoned Mining Wastes - Torch Lake Non - Superfund Site
Hubbell Processing Area Plan Set A

Grading and Capping Interim Response

IN

Hubbell, Michigan

March 2017



VICINITY MAP
NOT TO SCALE



LOCATION MAP
NOT TO SCALE

HUBBELL PROCESSING AREA
HUBBELL, MICHIGAN



AERIAL MAP
NOT TO SCALE

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
C-1	TITLE SHEET
C-2	LEGEND/ GENERAL NOTES
C-3	EXISTING CONDITIONS
C-4	SITE PREPARATION PLAN/SESC CONTROL MEASURES
C-5	GRADING PLAN - RIVERBEND SITE
C-6	DITCH ALIGNMENT
C-7	RESTORATION PLAN
C-8	SITE DETAILS

PLANS PREPARED BY:

Mannik Smith GROUP
TECHNICAL SKILL. CREATIVE SPIRIT.
www.MannikSmithGroup.com
200 MICHIGAN STREET, SUITE 705
HANCOCK, MI. 49930
TEL: 734-397-3100
FAX: 734-397-3131

3 FULL WORKING DAYS BEFORE YOU DIG CALL
MISS DIG System
1-800-482-7171 or 811
Design Ticket #: _____
Survey Ticket #: _____

BY: _____
TIMOTHY E. WALTHER, P.E.
PROFESSIONAL ENGINEER #43798
STATE OF MICHIGAN · TIMOTHY E. WALTHER · ENGINEER · No. 43798 · LICENSED PROFESSIONAL ENGINEER

DATE: 3/27/2017

SHEET:
C-1

W:\Projects\Projects K-O\MDEQ0070\CAD\SHEETS\COAL DOCK\MDEQ0070_1_COVER.dgn 3/27/2017 2:17:57 PM

GENERAL NOTES:

1. ALL CONSTRUCTION TO BE IN ACCORDANCE WITH THE MICHIGAN DEPARTMENT OF TRANSPORTATION 2012 STANDARD SPECIFICATIONS FOR CONSTRUCTION .
2. ALL MATERIALS TO BE REMOVED SHALL BE PROPERLY DISPOSED OR RECYCLED AS APPROPRIATE BY THE CONTRACTOR.
3. ALL NON HAZARDOUS MATERIALS ENCOUNTERED ARE TO REMAIN ON SITE AND BE BURIED UNDER THE 6" CAP. MOVE MATERIALS TO FILL LOCATIONS AND PROVIDE POSITIVE DRAINAGE.
4. ALL DISTURBED AREAS NOT SCHEDULED TO REMAIN AS IS SHALL BE FINE GRADED, AND SHALL RECIEVE 6" SANDY LOAM CAP SPECIFIED SEED MIX, AND MULCH SECURED IN-PLACE WITH NON-ASPHALTIC TACKIFIER. STRAW BLANKETS SHALL BE USED IN DITCH, SWALES AND ON SLOPES AS NOTED.
5. CONTRACTOR SHALL PERFORM DUST CONTROL PER MDEQ NESHAP STANDARDS FOR ASBESTOS. DUST SHALL BE KEPT TO A MINIMUM AND SHALL NOT LEAVE THE SITE.
6. CONTRACTOR TO GRADE, SEED AND MULCH ALL AREAS OUTSIDE THE CAP AND RIP RAP LIMITS DISTURBED BY THE WORK.
7. CONTRACTOR SHALL ROUTINELY SWEEP THE PAVED ENTRANCE AND HIGHWAY M-26 AS NEEDED TO REMOVE TRACKED SOILS.
8. ALL PERSONNEL, MATERIALS, EQUIPMENT THAT CONTACT CONTAMINATED MEDIA SHALL BE DECONTAMINATED PRIOR TO LEAVING THE SITE
9. ALL IMPROVEMENTS SHOWN ARE BASE BID ITEMS.
10. AT THE COMPLETION OF THE WORK LEAVE THE SITE CLEAN AND FREE OF ALL DEBRIS CAUSED BY CONSTRUCTION. SWEEP CLEAN ALL AREAS SOILED BY CONSTRUCTION.
11. ALL EARTH MOVEMENT IS CONSIDERED ASBESTOS RENOVATION WORK DUE TO THE POTENTIAL PRESENCE OF ASBESTOS CONTAINING MATERIALS AND BREAKDOWN OF NON-FRIABLE ASBESTOS BY EARTHWORK ACTIVITIES. APPROPRIATE NOTICES OF ASBESTOS ACTIVITIES SHALL BE PROVIDED TO THE MDEQ AND MICHIGAN DEPARTMENT OF LICENSING AND REGULATORY AFFAIRS. ALL WORK PRACTICES, EMPLOYEE TRAINING, DUST CONTROL, AND AIR MONITORING SHALL COMPLY WITH THE ASBESTOS NESHAP, OSHA, AND MIOSHA.

CONSTRUCTION SCHEDULE

1. WORKS DAYS ALLOWED ARE MONDAY THROUGH FRIDAY ONLY.
2. WORK HOURS ARE 7:00AM TO 7:00PM.
3. THE CONTRACTOR IS REQUIRED TO SECURE THE SITE DURING NON-WORKING HOURS. THIS WILL BE ACCOMPLISHED BY CLOSING GATES, UTILIZING TEMPORARY FENCE, OR OTHER MEANS APPROVED BY OWNER. ANY OPEN EXCAVATIONS MUST BE COVERED DURING THE AFOREMENTIONED TIMES TO THE SATISFACTION OF THE OWNER.

LEGEND:

EXISTING		PROPOSED
	CONTROL POINT	
	BENCH MARK	
	POST MOUNT SIGN	
	CATV MARKER	
	DECIDUOUS TREE	
	CATCH BASIN	
	LIGHT POLE	
	ELECTRIC MARKER	
	POST: METAL RND.	
	ELECTRIC PED.	
	ROUND HH	
	SQUARE HH	
	SANITARY MH	
	CONIFEROUS TREE	
	FIRE HYDRANT	
	GAS MH	
	NATURAL GAS VALVE	
	ELEC. TRANSFORMER	
	GAS MARKER	
	STORM MH	
×686.25	SPOT ELEVATION	39.50
677	CONTOURS	610
X X	FENCE	
	WASTE PILE	
	SILT FENCE	X X
	SLOPE ARROW	

3 FULL WORKING DAYS
BEFORE YOU DIG CALL
MISS DIG System
1-800-482-7171 or 811

Design Ticket #: _____
Survey Ticket #: _____

NO.	DATE	BY	DESCRIPTION
1	01/31/2017	WJK	90% REVIEW
2	03/02/2017	TJS	95% REVIEW
3	03/13/2017	TJS	98% REVIEW
4	03/27/2017	TJS	ISSUED FOR BIDS

PROJECT DATE: 1/31/2017
PROJECT NO.: MDEQ0070
DRAWN BY: WJK/TJS
CHECKED BY: TEW

TECHNICAL SKILL. CREATIVE SPIRIT.
Mannik Smith GROUP
www.MannikSmithGroup.com

PREPARED FOR:
MDEQ UPPER PENINSULA DISTRICT
HUBBELL, MICHIGAN

HUBBELL PROCESSING AREA, PLAN SET A

LEGEND/GENERAL NOTES

C-2 / C-8

3/27/2017
W:\Projects\Projects K-O\MDEQ0070\CAD\SHEETS\COAL DOCK\MDEQ0070_2_LEGEND.dgn



BENCHMARK TABLE (NAVD 29)

BM	NORTHING	EASTING	ELEVATION
BM1	876442.09	25893284.85	634.47
BM2	876628.36	25894273.55	608.00

NOTES

SEE SHEET C-2 FOR LEGEND AND GENERAL NOTES.

GRAPHIC SCALE
0' 25' 50' 100'

NO.	DATE	BY	DESCRIPTION
1	01/31/2017	WJK	90% REVIEW
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3	03/13/2017	TJS	98% REVIEW
4	03/27/2017	TJS	ISSUED FOR BIDS

PROJECT DATE: 1/31/2017
PROJECT NO.: MDEQ00070
DRAWN BY: WJK/TJS
CHECKED BY: TEW

Mannik Smith GROUP
TECHNICAL SKILL. CREATIVE SPIRIT.
www.MannikSmithGroup.com

PREPARED FOR:
MDEQ UPPER PENINSULA DISTRICT
HUBBELL, MICHIGAN

HUBBELL PROCESSING AREA, PLAN SET A

EXISTING CONDITIONS

C-3 / C-8

3/27/2017
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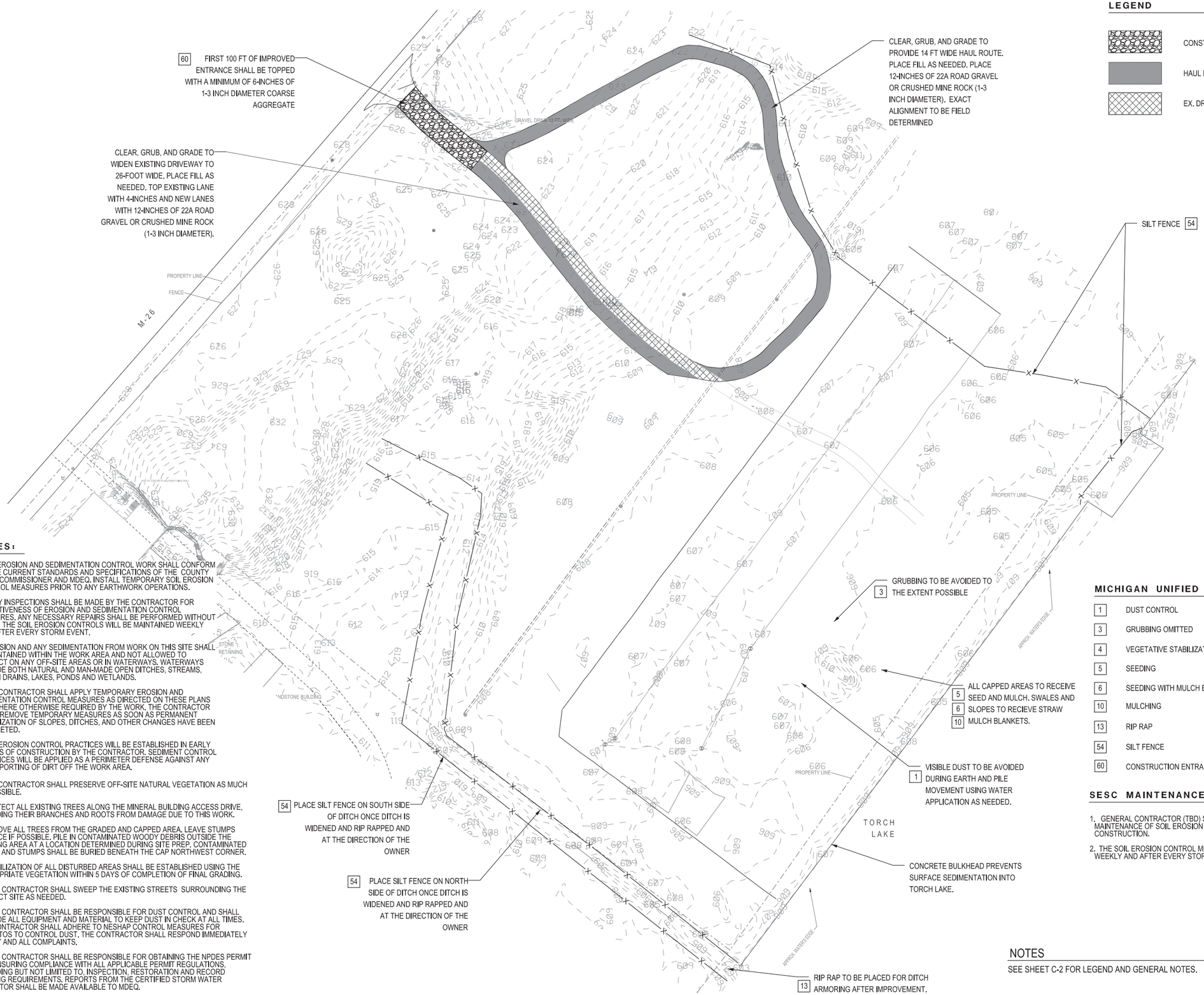

NOTES:

1. ALL EROSION AND SEDIMENTATION CONTROL WORK SHALL CONFORM TO THE CURRENT STANDARDS AND SPECIFICATIONS OF THE COUNTY DRAIN COMMISSIONER AND MDEQ. INSTALL TEMPORARY SOIL EROSION CONTROL MEASURES PRIOR TO ANY EARTHWORK OPERATIONS.
2. DAILY INSPECTIONS SHALL BE MADE BY THE CONTRACTOR FOR EFFECTIVENESS OF EROSION AND SEDIMENTATION CONTROL MEASURES. ANY NECESSARY REPAIRS SHALL BE PERFORMED WITHOUT DELAY. THE SOIL EROSION CONTROLS WILL BE MAINTAINED WEEKLY AND AFTER EVERY STORM EVENT.
3. EROSION AND ANY SEDIMENTATION FROM WORK ON THIS SITE SHALL BE CONTAINED WITHIN THE WORK AREA AND NOT ALLOWED TO COLLECT ON ANY OFF-SITE AREAS OR IN WATERWAYS. WATERWAYS INCLUDE BOTH NATURAL AND MAN-MADE OPEN DITCHES, STREAMS, STORM DRAINS, LAKES, PONDS AND WETLANDS.
4. THE CONTRACTOR SHALL APPLY TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES AS DIRECTED ON THESE PLANS AND WHERE OTHERWISE REQUIRED BY THE WORK. THE CONTRACTOR SHALL REMOVE TEMPORARY MEASURES AS SOON AS PERMANENT STABILIZATION OF SLOPES, DITCHES, AND OTHER CHANGES HAVE BEEN COMPLETED.
5. SOIL EROSION CONTROL PRACTICES WILL BE ESTABLISHED IN EARLY STAGES OF CONSTRUCTION BY THE CONTRACTOR. SEDIMENT CONTROL PRACTICES WILL BE APPLIED AS A PERIMETER DEFENSE AGAINST ANY TRANSPORTING OF DIRT OFF THE WORK AREA.
6. THE CONTRACTOR SHALL PRESERVE OFF-SITE NATURAL VEGETATION AS MUCH AS POSSIBLE.
7. PROTECT ALL EXISTING TREES ALONG THE MINERAL BUILDING ACCESS DRIVE, INCLUDING THEIR BRANCHES AND ROOTS FROM DAMAGE DUE TO THIS WORK.
8. REMOVE ALL TREES FROM THE GRADED AND CAPPED AREA. LEAVE STUMPS IN-PLACE IF POSSIBLE. PILE IN CONTAMINATED WOODY DEBRIS OUTSIDE THE GRADING AREA AT A LOCATION DETERMINED DURING SITE PREP. CONTAMINATED BRUSH AND STUMPS SHALL BE BURIED BENEATH THE CAP NORTHWEST CORNER.
9. STABILIZATION OF ALL DISTURBED AREAS SHALL BE ESTABLISHED USING THE APPROPRIATE VEGETATION WITHIN 5 DAYS OF COMPLETION OF FINAL GRADING.
10. THE CONTRACTOR SHALL SWEEP THE EXISTING STREETS SURROUNDING THE PROJECT SITE AS NEEDED.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DUST CONTROL AND SHALL PROVIDE ALL EQUIPMENT AND MATERIAL TO KEEP DUST IN CHECK AT ALL TIMES. THE CONTRACTOR SHALL ADHERE TO NESHAP CONTROL MEASURES FOR ASBESTOS TO CONTROL DUST. THE CONTRACTOR SHALL RESPOND IMMEDIATELY TO ANY AND ALL COMPLAINTS.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE NPDES PERMIT AND ENSURING COMPLIANCE WITH ALL APPLICABLE PERMIT REGULATIONS, INCLUDING BUT NOT LIMITED TO, INSPECTION, RESTORATION AND RECORD KEEPING REQUIREMENTS. REPORTS FROM THE CERTIFIED STORM WATER OPERATOR SHALL BE MADE AVAILABLE TO MDEQ.

MICHIGAN UNIFIED KEYING SYSTEM

1	DUST CONTROL
3	GRUBBING OMITTED
4	VEGETATIVE STABILIZATION
5	SEEDING
6	SEEDING WITH MULCH BLANKET AND/OR MATTING
10	MULCHING
13	RIP RAP
54	SILT FENCE
60	CONSTRUCTION ENTRANCE

SESC MAINTENANCE PROGRAM

1. GENERAL CONTRACTOR (TBD) SHALL BE RESPONSIBLE FOR MAINTENANCE OF SOIL EROSION CONTROL MEASURES DURING CONSTRUCTION.
2. THE SOIL EROSION CONTROL MEASURES WILL BE MAINTAINED WEEKLY AND AFTER EVERY STORM EVENT.

NOTES

SEE SHEET C-2 FOR LEGEND AND GENERAL NOTES.

GRAPHIC SCALE
0' 25' 50' 100'

NO.	DATE	BY	DESCRIPTION
1	01/31/2017	WJK	90% REVIEW
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3	03/13/2017	TJS	98% REVIEW
4	03/27/2017	TJS	ISSUED FOR BIDS

PROJECT DATE: 1/31/2017
PROJECT NO.: MDEQ00070
DRAWN BY: WJK/TJS
CHECKED BY: TEW

TECHNICAL SKILL. CREATIVE SPIRIT.
Mannik Smith GROUP
www.MannikSmithGroup.com

PREPARED FOR:
MDEQ UPPER PENINSULA DISTRICT
HUBBELL, MICHIGAN

HUBBELL PROCESSING AREA, PLAN SET A

SITE PREPARATION/SESC MEASURES

C-4 / C-8

3/27/2017
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PROTECT AND MAINTAIN VISIBILITY OF CRANE RAIL

GRAVEL DRIVE 12 FT. WIDE

CITY LINE

FENCE

MATCH ELEVATIONS UP WITH EXISTING AT HAUL ROAD

608.5 PEAK

LOCATION OF UPWELLING, 2 - 18" PIPES ASSUMED INVERT = 611.00

20.0'

SWALE CENTERLINE .70%

SWALE CENTERLINE .55%

SWALE CENTERLINE .6%

SWALE CENTERLINE .50%

PROPERTY LINE

APPROX. WATER'S EDGE

TOP

PATCH RECTANGULAR OPENING IN BULKHEAD FULL-DEPTH WITH CONCRETE TO STOP FLOW THROUGH THE BULKHEAD.

DITCH ENDING WATER LEVEL ELEVATION 602.60

NOTES:

1. INSTALL SOIL EROSION CONTROL MEASURES PRIOR TO EARTH WORK OPERATIONS.
2. PRIOR TO CONSTRUCTION VERIFY THAT PROPOSED GRADES OF IMPROVEMENTS AND EXISTING GRADES WILL PROVIDE POSITIVE DRAINAGE. VERIFY THAT NO AREAS WILL HOLD WATER. IMMEDIATELY CONTACT ENGINEER/ARCHITECT IF SUCH CONDITIONS EXIST.
3. CONTOURS REPRESENT ELEVATIONS BEFORE PLACING CAP IN CAPPED AREAS.
4. SEE ALIGNMENT SHEET (C-6) FOR EXACT DITCH PLACEMENT AND PROFILE. ALSO CHECK SHEET (C-8) FOR TYPICAL DITCH SECTION DETAIL.

NOTES

SEE SHEET C-2 FOR LEGEND AND GENERAL NOTES.

GRAPHIC SCALE

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3	03/13/2017	TJS	98% REVIEW
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PROJECT DATE: 1/31/2017
PROJECT NO.: MDEQ00070
DRAWN BY: WJK/TJS
CHECKED BY: TEW

TECHNICAL SKILL. CREATIVE SPIRIT.

Mannik Smith GROUP

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PREPARED FOR:
MDEQ UPPER PENINSULA DISTRICT
HUBBELL, MICHIGAN

HUBBELL PROCESSING AREA, PLAN SET A

GRADING PLAN

C-5 / C-8

3/27/2017
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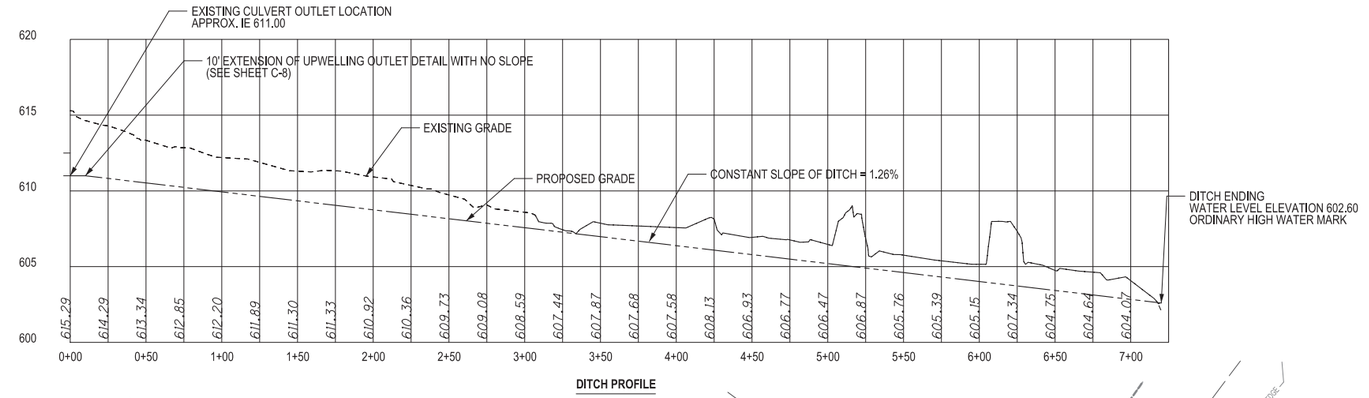

DITCH PROFILE

NOTES:

1. DITCH START LOCATION MAY NEED TO BE FIELD ADJUSTED BASED ON WHERE CULVERT INLET COMES INTO UPWELLING.

NOTES

SEE SHEET C-2 FOR LEGEND AND GENERAL NOTES.

GRAPHIC SCALE
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3	03/13/2017	TJS	98% REVIEW
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PROJECT DATE: 1/31/2017
PROJECT NO.: MDEQ00070
DRAWN BY: WJK/TJS
CHECKED BY: TEW

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PREPARED FOR:
MDEQ UPPER PENINSULA DISTRICT
HUBBELL, MICHIGAN

HUBBELL PROCESSING AREA, PLAN SET A

DITCH ALIGNMENT PLAN

C-6 / C-8

3/27/2017
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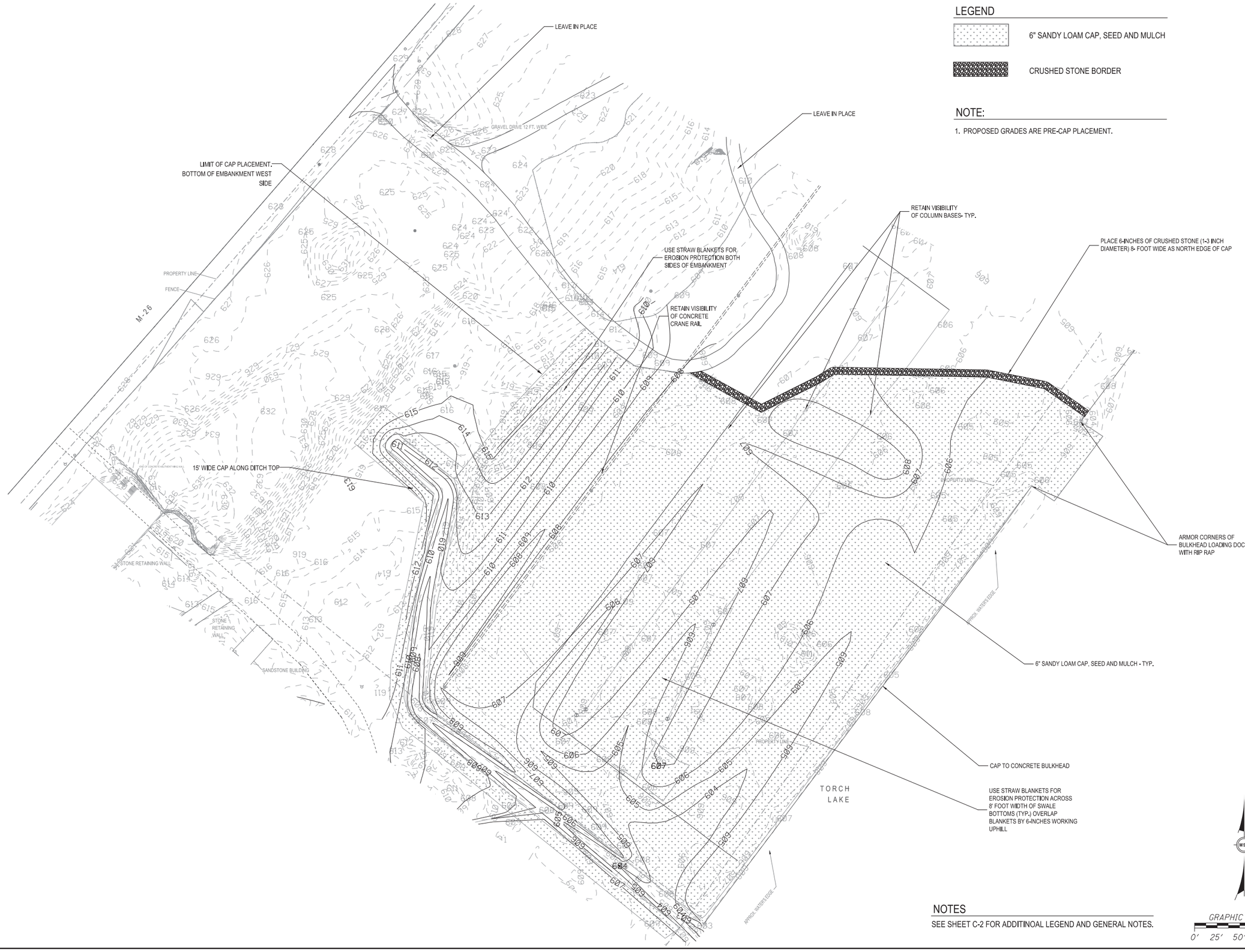

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2	03/02/2017	TJS	95% REVIEW
3	03/13/2017	TJS	98% REVIEW
4	03/27/2017	TJS	ISSUED FOR BIDS

PROJECT DATE: 1/31/2017
PROJECT NO.: MDEQ0070
DRAWN BY: WJK/TJS
CHECKED BY: TEW

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www.MannikSmithGroup.com

PREPARED FOR:
MDEQ UPPER PENINSULA DISTRICT
HUBBELL, MICHIGAN

HUBBELL PROCESSING AREA, PLAN SET A

RESTORATION PLAN

C-7 / C-8

3/27/2017
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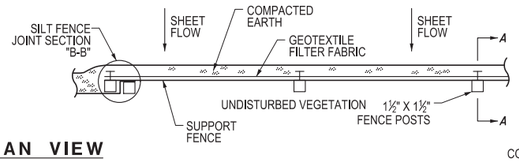
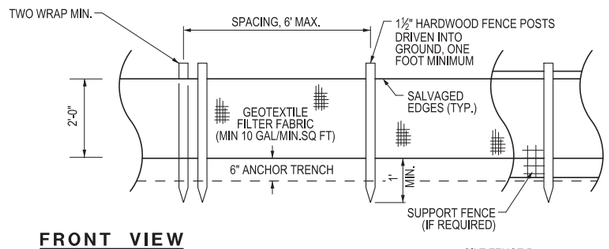
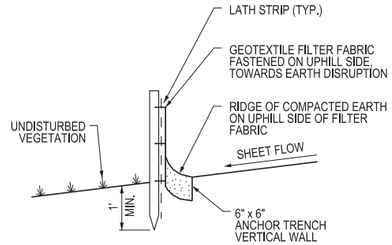
ARCH E1 - 30"x42" - 762mmx1067mm (rounded)



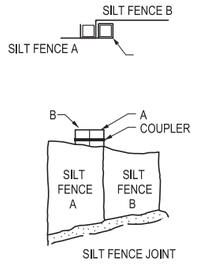
PLAN VIEW



FRONT VIEW



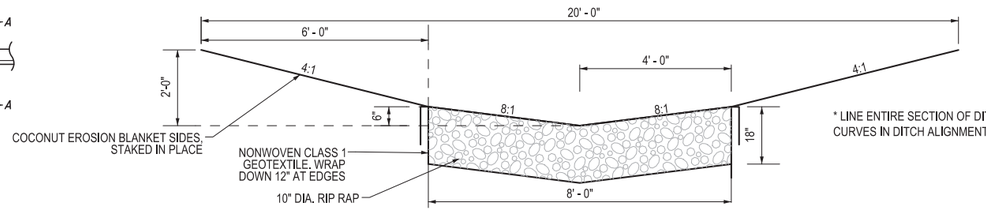
SECTION A-A



SECTION B-B

REFER TO MDOT STANDARD DETAILS

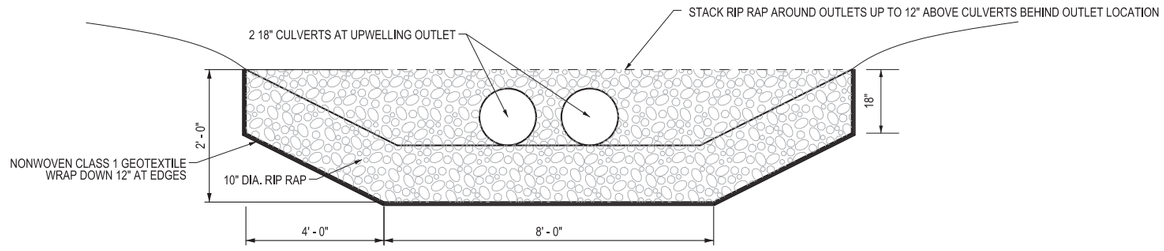
SILT FENCE
NO SCALE



DITCH DETAIL

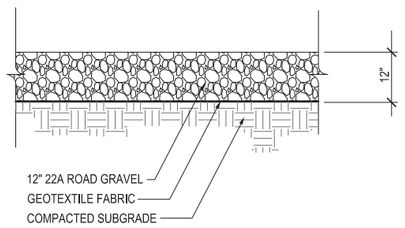
* LINE ENTIRE SECTION OF DITCH IN RIP RAP TO TOP OF DITCH DURING CURVES IN DITCH ALIGNMENT. (FROM STA 0+63.71 to STA 0+91.68 AND 3+07.34 TO STA 3+32.77)

THIS DITCH SECTION AT A SLOPE OF 1.165% HAS THE CAPACITY FOR 133.43 CFS. THE DITCH WAS SIZED TO HANDLE AN ESTIMATED 54.2 CFS FROM 2-18" CULVERTS CONTRIBUTING AT THE START OF THE DITCH, AS WELL AS THE 50 YEAR STORM OF THE CONTRIBUTING SITE (20.85 ACRES).



UPWELLING OUTLET DETAIL

EXTEND THIS SECTION FOR 10' AT NO SLOPE PAST EX CULVERT OUTLET LOCATION.



HAUL ROUTE
NO SCALE

NO.	DATE	BY	DESCRIPTION
1	01/31/2017	WJK	90% REVIEW
2	03/02/2017	TJS	95% REVIEW
3	03/13/2017	TJS	98% REVIEW
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PROJECT DATE: 1/31/2017
PROJECT NO.: MDEQ0070
DRAWN BY: WJK/TJS
CHECKED BY: TEW

TECHNICAL SKILL. CREATIVE SPIRIT.
Mannik Smith GROUP
www.MannikSmithGroup.com

PREPARED FOR:
MDEQ UPPER PENINSULA DISTRICT
HUBBELL, MICHIGAN

HUBBELL PROCESSING AREA, PLAN SET A

SITE DETAILS

C-8 / C-8

3/27/2017
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APPENDIX B

Award and Notice to Proceed

STATE OF MICHIGAN

RICK SNYDER
GOVERNOR

DEPARTMENT OF TECHNOLOGY, MANAGEMENT & BUDGET

LANSING

DAVID B. BEHEN
DIRECTOR

Approved/Mailed: 5/22/17

May 19, 2017

B & B Contracting, Calumet, Inc.
55670 Hwy. M-26
Calumet, MI 49913

Dear Sir/Madam:

SUBJECT: File No. 761/16108.SAR - Index No. 44251
Department of Environmental Quality
Torch Lake Non-Superfund Site
Hubbell Processing Area Remediation
Hubbell, Michigan

This is your official notice that the Director, Department of Technology, Management and Budget, on May 19, 2017, approved the acceptance of your bid summary for the subject work opened on May 3, 2017, in the amount of $430,170.00.

Before the state can formally execute the contract you must, within the next **15 calendar days** from the date the letter was mailed, submit the following to Ms. Linda Feldpausch, Department of Technology, Management and Budget, Design and Construction Division, P.O. Box 30026, Lansing, Michigan 48909, or overnight mail to 3111 W. St. Joseph Street, Lansing, Michigan 48917. **FAILURE TO SUBMIT THE REQUIRED INFORMATION WITHIN THE 15 CALENDAR DAYS MAY RESULT IN DISQUALIFICATION OF YOUR BID AND FORFEITURE OF YOUR BID BOND.**

1. A certified copy of a resolution adopted by your Board of Directors or a certified copy of the articles of your By-Laws authorizing signature of the contract on behalf of the corporation. If a partnership, it is necessary to submit a copy of the power of attorney which authorizes signature on behalf of the partnership. A power of attorney is not required if each of the partners sign the contract individually.

2. Completed, signed Certification Forms (blank forms attached). (Please disregard if you have already submitted the forms for this project.)

3. Three original, signed Contract pages (attached).

4. A Certificate of Insurance covering Public Liability, Property Damage, and Workers' Compensation. NOTE: ALL INSURANCE CERTIFICATES MUST SPECIFY THE ABOVE SUBJECT PROJECT IDENTIFICATION AND THE STATE OF MICHIGAN AS AN ADDITIONAL INSURED. THE INSURANCE MUST HAVE A RATING OF A- OR BETTER AS LISTED BY A.M. BEST COMPANY.

5. Performance and Labor and Material Bonds must be made in favor of the State of Michigan and bear the date of May 19, 2017. NOTE: BONDS WILL NOT BE ACCEPTED UNLESS THEY ARE ON THE STATE OF MICHIGAN FORM AND THE BONDING COMPANY IS LISTED IN THE DEPARTMENT OF TREASURY'S CIRCULAR #570.

FAXES OF THE REQUIRED ITEMS LISTED IN NOS. 4 AND 5 WILL NOT BE ACCEPTED, ONLY THE ORIGINAL DOCUMENTS ARE ACCEPTABLE. IF YOU HAVE QUESTIONS CALL STATE FACILITIES ADMINISTRATION, DESIGN AND CONSTRUCTION DIVISION, AT (517) 284-7902.

Please note that you are not to proceed with any work or on-site activities until the contract has been executed by both parties. At that time a pre-construction meeting will be arranged.

Sincerely,

Linda Feldpausch, Contract Specialist
Design and Construction Division
State Facilities Administration

c: The Mannik & Smith Group, Inc.
Bridget Walsh, DEQ
Sadi Rayyan, DTMB

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING

RICK SNYDER
GOVERNOR

C. HEIDI GRETHER
DIRECTOR

NOTICE TO PROCEED

Remediation and Redevelopment Division
Administration Section
Constitution Hall, Fifth Floor South
525 West Allegan Street
Lansing, Michigan 48933

DATE: July 6, 2017

TO: B&B Contracting, Calumet, Inc.
55670 Hwy. M-26
Calumet, MI 49913

SUBJECT: Hubbell Processing Area Remediation
Torch Lake Non-Superfund Site; Site ID# 31000098
File # 761/16108.SAR; Index No. 44251; Y17347

This is to give written notice that the Contract Time for work under the above-subject contract begins effective July 6, 2017. On that date, your organization is authorized to start furnishing and perform the work.

The date of Substantial Completion for the entire work is August 25, 2017.

ISSUED BY THE OWNER:

By: _____
Bridget Walsh, PE
Administration Section
Remediation and Redevelopment Division (RRD)

cc: Sadi Rayyan, Department of Technology, Management and Budget
Jed Chrestensen, The Mannik & Smith Group
Amy Keranen, RRD
Contract File, RRD

APPENDIX C

Bulletins and Change Orders

Form revision date: DMB-402 (R 10/06)
PIMS revision date: DMB-402 (R 05/08)

Contract Change Order

Department of Technology, Management and Budget, Facilities Adm

2nd Floor, Stevens T. Mason Building
P.O. Box 30026
Lansing, Michigan 48909

Construction CCO #: **0001** **Contract Order Number:** **Y17347**

Department
Enviromental Quality

Agency/Institution:
DEQ/Torch Lake Non-Superfund Site

Location:
Hubbell

File No: **761 / 16108 . SAR**

Project Name: **Hubbell Processing Area Remediation**

Project Scope:

Name and Address of Contractor

B & B Contracting, Calumet, Inc.
55670 Hwy. M-26
Calumet **MI** **49913**

Approval

JUL 28 2017

Facilities Administration **Date**

NOTICE TO CONTRACTOR: A. This CONTRACT serves as official notice that the State of Michigan will enter into a contract for the service or work described below and performed under the conditions of the respective CONTRACT. The order will not become effective until such a contract is executed. (AUTHORITY: 1984 PA31). B. The order number, account number, and name must be referenced when submitting billings for or correspondence about this order. C. A request for payment for service or work, either partial or final, must be submitted on a Payment Request form (DMB-440). The payment request must be appropriately supported in sufficient detail to explain and justify the amount requested. D. A CONTRACT CHANGE ORDER (DMB-403) must be approved and processed before payment will be made in excess of the amount(s) indicated. *No payment can be processed without federal identification or social security numbers.

This Change Order: **0001**

Total number of CCOs: **1**

Description of Service or Work

Original Contract Amount		Previous CCOs	CCO #		This CCO	CCO #
$430,170.00	+			+	$33,815.00	0001

Full Change Order

Increase the contract amount $33,815.00 in accordance with the contractor's quotation dated 7/14/17 to increase the cost for PCB contaminated soil and debris transport and disposal (Incr. $33,815.00), as described in the MDEQ's Bulletin No. 1 dated 7/14/17.

Reason For Change

The change is needed because resampling of the waste pile resulted in different waste characterization results than were previously obtained and as a result the disposal costs will increase due to the need to utilize a different disposal facility than originally planned.

Time Extension for this CCO 0001 0 **Days**

Approved by the **Director, Department of Management and Budget** **on** **7/28/2017**

Agency	Index #	Fund Src.	Arp. Year	Amount	PCA	Object Code			
761	44351	SWQIF	AY 14	$33,815.00	30872	6127	**Total Approved:**	$430,170.00	
			Total Index:	$33,815.00			**Total This CCO:**	$33,815.00	7.86%
							Revised Contract:	$463,985.00	7.86%

Copies to:
Company: **Contract Office, File**
Agency: **B & B Contracting, Calumet, Inc.**
Project Director: **Enviromental Quality**
Other: **Sadi Rayyan**

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING

RICK SNYDER
GOVERNOR

C. HEIDI GRETHER
DIRECTOR

TO: Sadi Rayyan, Project Director
Design and Construction Division
Facilities and Business Services Administration
Department of Technology, Management and Budget

FROM: Bridget Walsh, Licensed Environmental Engineer
Administration Section
Remediation and Redevelopment Division
Department of Environmental Quality

DATE: July 14, 2017

SUBJECT: B&B Contracting, Calumet, Inc.; File# 761/16108.SAR; Y17347
Hubbell Processing Area Remediation;
Torch Lake Non-Superfund Site; #31000098

The Department of Environmental Quality (DEQ), Remediation and Redevelopment Division (RRD), staff and The Mannik & Smith Group, Inc. have reviewed and approved the attached change order request to increase the B&B Contracting, Calumet, Inc. contract $33,815.00. All parties agreed to these changes.

Thank you for your assistance in this matter.

cc: Amy Keranen, RRD
Contract File, RRD

AY	INDEX	PCA	AOBJ	PROJECT/PHASE	FUNDING/SOURCE	AMOUNT
14	44351	30872	6127	456990-00	SW01F	#33,815.00

FUNDING APPROVED BY DEQ, RRD

SIGNED: _____ DATE: 7/17/17

DEPARTMENT OF ENVIRONMENTAL QUALITY (DEQ)
REMEDIATION AND REDEVELOPMENT DIVISION (RRD)
CALUMET FIELD OFFICE
55195 U.S. 41 NORTH
CALUMET, MICHIGAN 49913

BULLETIN NO. 1

TO: Mr. Brian Bonen, B&B Contracting, Calumet, Inc. Date: 14 July 2017

FROM: Mr. Jed Chrestensen, P.E., The Mannik & Smith Group, Inc.

SUBJECT:
Project Name: Abandoned Mining Wastes Torch Lake Non-Superfund Site Hubbell Processing Area
File Number: 761/16108.SAR
Index Number: 44251
Contract Number: Y17347
Department/Agency: DEQ/RRD

INTENT: This is not a change order. This is a request to the Contractor for price breakdown of changes in the work.

PROPOSED CHANGES IN CONTRACT TIME:

No changes to the Contract time are currently proposed as a result of the proposed changes in the work.

PROPOSED CHANGES IN THE WORK:

Item 1: Modify Pay Item 5 – PCB Contaminated Soil and Debris Transport and Disposal

Re-sampling of waste pile WP-11 subsequent to issuance of the March 28, 2017 Bidding and Contract Document has revealed different waste characterization results than previously provided in the Contract. Therefore, it will be necessary to use a different disposal facility than originally planned. To accommodate the change, additional funding must be added to the Contract. In addition, to screen out material that does not require off-site disposal, WP-11 will be screened to remove material larger than 6-inches in diameter.

Therefore, delete the existing description for Pay Item 5 listed in Paragraph 1.5.5 of Section 01 22 00 and replace with the following:

1.5.5 Item 5 – PCB Contaminated Soil and Debris Screening, Transport, and Disposal

1. Description: Item 5 includes profiling, manifesting, loading, transport, and disposal of the waste pile WP-11 material at an appropriate disposal facility agreed to by the Owner using laboratory characterization data provided to the Contractor. Item 5 also includes screening the WP-11 material to remove all items larger than 6-inches in diameter. Screened-out material shall be left in a pile outside the capped area adjacent to the current WP-11 location.

2. Measurement and Payment: Lump sum payment for Item 5 will be based on a maximum of up to 150 tons of material disposed per pricing schedule received by the Contractor from Waste Management and shall be full compensation for all labor, equipment, tools, incidentals and contracted services necessary to complete the work described above. Fully executed manifests, disposal receipts, and weight tickets from a certified scale will be required for payment.

Bulletin No. 1
Hubbell Processing Area
Contract Number: Y17347

14 July 2017

CHANGES IN THE CONTRACT AMOUNT TO REFLECT PROPOSED CHANGES IN WORK:

LINE ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	EXTENDED AMOUNT
5	PCB Contaminated Soil and Debris Screening, Transport, Disposal	1	Lump Sum	$33,815.00	$33,815.00

Total Change for Bulletin No. 1 = $33,815.00 ☒ ADD ☐ DEDUCT ☐ NONE

Please return this signed bulletin within two (2) working days from the date shown herein.

FOR THE CONTRACTOR:

Signature 7-14-17 Date

Contractor Name: B&B Contracting, Calumet, Inc.

Contractor Address: 55670 Hwy. M-26
Calumet, MI 49913

FOR THE LOE CONTRACTOR:

Signature 7-14-17 Date

LOE Contractor Name: The Mannik and Smith Group, Inc.

LOE Contractor Address: 200 Michigan Street
Suite 705
Hancock, MI 49930

FOR THE STATE:

State Project Manager (SPM) Signature 7-14-17 Date

SPM Name: Ms. Amy Keranen
SPM Address: DEQ-RRD
Calumet Field Office
55195 U.S. 41 North
Calumet, MI 49913

Form revision date: DMB-402 (R 10/06)
PIMS revision date: DMB-402 (R 05/08)

Contract Change Order

Department of Technology, Management and Budget, Facilities Adm

2nd Floor, Stevens T. Mason Building
P.O. Box 30026
Lansing, Michigan 48909

Construction CCO #: **0002** **Contract Order Number:** **Y17347**

Department **Enviromental Quality**	File No: **761 / 16108 . SAR**
Agency/Institution: **DEQ/Torch Lake Non-Superfund Site**	Project Name: **Hubbell Processing Area Remediation**
Location: **Hubbell**	Project Scope:

Name and Address of Contractor

B & B Contracting, Calumet, Inc.
55670 Hwy. M-26
Calumet **MI** **49913**

Approval

Facilities Administration 1.22.18 **Date**

NOTICE TO CONTRACTOR: A. This CONTRACT serves as official notice that the State of Michigan will enter into a contract for the service or work described below and performed under the conditions of the respective CONTRACT. The order will not become effective until such a contract is executed. (AUTHORITY: 1984 PA31). B. The order number, account number, and name must be referenced when submitting billings for or correspondence about this order. C. A request for payment for service or work, either partial or final, must be submitted on a Payment Request form (DMB-440). The payment request must be appropriately supported in sufficient detail to explain and justify the amount requested. D. A CONTRACT CHANGE ORDER (DMB-403) must be approved and processed before payment will be made in excess of the amount(s) indicated. *No payment can be processed without federal identification or social security numbers.

This Change Order: **0002**

Total number of CCOs: **2**

Description of Service or Work

Original Contract Amount		Previous CCOs	CCO #		This CCO	CCO #
$430,170.00	+	$33,815.00	0001	+	($6,526.94)	0002
		$33,815.00				

Full Change Order

Decrease the contract amount $6,526.94 in accordance with the contractor's quotation dated 12/11/2017 to:
Item 1: Decrease Item #5 - PCB Contaminated Soil and Debris Screening, Transport, Disposal (Decr. $6,526.94); and
Item 2: Extend the contract time to November 14, 2017, a total of 81 calendar days, due to no fault of the contractor, as described in the MDEQ's Bulletin No. 2 dated 12/11/2017.

Reason For Change

Items 1 and 2 are needed to complete the transportation and disposal of waste pile WP-11 due to delays caused by Waste Management. Waste Management adjusted their pricing schedule with a credit provided to the State.

Time Extension for this CCO **0002** 81 **Days**

Agency	Index #	Fund Src.	Arp. Year	Amount	PCA	Object Code			
761	44351	SWQIF	AY 14	($6,526.94)	30872	6127	**Total Approved:**	$463,985.00	
			Total Index:	($6,526.94)			**Total This CCO:**	($6,526.94)	-1.52%
							Revised Contract:	$457,458.06	6.34%

Copies to:
Company: **B & B Contracting, Calumet, Inc.**
Agency: **Enviromental Quality**
Project Director: **Sadi** **Rayyan**
Other:

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING

RICK SNYDER
GOVERNOR

C. HEIDI GRETHER
DIRECTOR

TO: Sadi Rayyan, Project Director
Design and Construction Division
Facilities and Business Services Administration
Department of Technology, Management and Budget

FROM: Bridget Walsh, Licensed Environmental Engineer
Administration Section
Remediation and Redevelopment Division
Department of Environmental Quality

DATE: January 16, 2018

SUBJECT: B&B Contracting, Calumet, Inc.; File# 761/16108.SAR; Y17347
Hubbell Processing Area Remediation;
Torch Lake Non-Superfund Site; #31000098

The Department of Environmental Quality (DEQ), Remediation and Redevelopment Division (RRD), staff and The Mannik & Smith Group, Inc. have reviewed and approved the attached change order request to decrease the B&B Contracting, Calumet, Inc. contract $6,526.94 and extend the end date to November 14, 2017. All parties agreed to these changes.

Thank you for your assistance in this matter.

cc: Amy Keranen, RRD
Jed Chrestensen, The Mannik & Smith Group
Contract File, RRD

DMB-429 (R 4/10)

CONTRACT CHANGE ORDER REQUEST

DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
FACILITIES ADMINISTRATION
DESIGN AND CONSTRUCTION DIVISION

This form is required for the issuance of a construction contract change order. Authority: 1984 PA 431.

DEPARTMENT/AGENCY					DATE
Environmental Quality					1/16/18
INDEX NUMBER (S)	FIELD CONDITION	DESIGN ERROR	DESIGN OMISSION	SCOPE CHANGE	FILE NUMBER
44251					761/16108.SAR
PROJECT NAME					CONTRACT NUMBER
Hubbell Processing Area Remediation / Torch Lake Non-Superfund Site					Y17347
CONTRACTOR NAME					BULLETIN NUMBER(S)
B&B Contracting, Calumet, Inc.					2
ORIGINAL CONTRACT AMOUNT			TOTAL CHANGES		PERCENTAGE OF CHANGE
$430,170.00			$27,288.06		6.3%

Increase X **Decrease** the contract amount $6,526.94 -1.5%

in accordance with the contractor's quotation(s) dated 12/11/17 to: (1) decrease line item #5 – PCB contaminated soil and debris screening, transport, disposal (-$6,526.94) and to (2) extend the contract time to November 14, 2017, a total of 81 calendar days.

as described in the bulletin #2_____ dated 12/11/17.

REASON FOR CHANGE

Items 1 and 2 are needed to complete the transportation and disposal of waste pile WP-11 due to delays caused by Waste Management, at no fault of the contractor. Waste Management adjusted their pricing schedule and as such a credit is being provided to the State.

APPROVALS

PREPARED BY	DATE	PROJECT MANAGER	DATE	SECTION MANAGER	DATE
[signature]	1/16/18	[signature]	1/18/18		

DEPARTMENT OF ENVIRONMENTAL QUALITY (DEQ)
REMEDIATION AND REDEVELOPMENT DIVISION (RRD)
CALUMET FIELD OFFICE
55195 U.S. 41 NORTH
CALUMET, MICHIGAN 49913

BULLETIN NO. 2

TO: Mr. Brian Bonen, B&B Contracting, Calumet, Inc. Date: 11 December 2017

FROM: Mr. Jed Chrestensen, P.E., The Mannik & Smith Group, Inc.

SUBJECT:
Project Name: Abandoned Mining Wastes Torch Lake Non-Superfund Site
Hubbell Processing Area
File Number: 761/16108.SAR
Index Number: 44251
Contract Number: Y17347
Department/Agency: DEQ/RRD

INTENT: This is not a change order. This is a request to the Contractor for price breakdown of changes in the work.

PROPOSED CHANGES IN CONTRACT TIME:

The Contract Times for substantial completion and final completion shall be modified to extend the Contract Time by an additional 81 days to November 14, 2017. This is the date on which a complete package of waste disposal documentation was received and the requirements were met for substantial completion as defined in Article 4.3 of Section 00700 and Supplementary Condition SC-4 of Section 00800 of the specifications. Accordingly, the following changes shall be made to Article 23 of Section 00100 on Page 00-6.

Delete Article 23 in its entirety and replace with the following:

23.CONTRACT TIME; LIQUIDATED DAMAGES: Work of all trades as specified in the Contract Documents must be completed in 131 calendar days from the date of Notice-to-Proceed except for minor replacement, correction, or adjustment items which do not interfere with the complete operation and utilization of all parts of the Contract Work. This Contract Time is of the essence and liquidated damages for each Calendar Day that expires after this Substantial Completion of the entire Work must be in the amount of $ 1,000.00. Liquidated damages are not a penalty, are cumulative and represent a reasonable estimate of the Owner's extra costs and damages, which are difficult to estimate with accuracy in advance.

REASONS FOR MODIFICATION OF CONTRACT TIME:

Additional Contract Time was needed to complete the transportation and disposal of waste pile WP-11 as modified by Change Order #1 and receive all disposal documentation.

PROPOSED CHANGES IN THE WORK:

Item 1: Modify Pay Item 5 – PCB Contaminated Soil and Debris Transport and Disposal

Due to delays and inconveniences caused by Waste Management during the waste pile WP-11 transportation and disposal (T&D) process, Waste Management has adjusted their previously provided pricing schedule to waive the 150-ton minimum fixed fee and instead invoice on a per-ton basis for T&D plus other fees. Since 117.9 tons of material were actually disposed, this has resulted in a reduction from an

anticipated charge of $74,700.00 to an actual Waste Management charge of $61,317.20, which is a $13,382.80 reduction.

The current value of Pay Item 5 after Change Order #1 is $84,215.00. Of this, $74,700.00 was expected to be Waste Management charges, the Contract allowed the Trade Contractor a 5% markup of $3,735.00, and the balance of $5,780.00 was budgeted for non-T&D efforts such as profiling, manifesting, loading, etc. The $5,780.00 was a decrease from the value of the Trade Contractor's originally budgeted (pre-Change Order #1) non-T&D effort since they expected to receive a $1,500.00 per container credit from Waste Management for all shipping containers not used out of the 10 that were included in the fixed fee. This credit from Waste Management to the Trade Contractor was expected to total $6,000.00 and would have provided the Trade Contractor compensation for the balance of non-T&D effort and the additional effort of screening WP-11 to remove objects larger than 6-inches in diameter per Change Order #1. Waste Management's revision in pricing structure changed the basis upon which the values in Change Order #1 were prepared.

Therefore, to fairly compensate the Trade Contractor while providing a credit back to the taxpayers of the State of Michigan reflective of Waste Management's revised pricing, the following description shall replace the existing description for Measurement and Payment for Pay Item 5 in Paragraph 1.5.5 of Section 01 22 00 as amended by Change Order #1:

2. Measurement and Payment: Lump sum payment for Item 5 will be based on the following price breakdown and shall be full compensation for all labor, equipment, tools, incidentals and contracted services necessary to complete the proper disposal of waste pile WP-11. Fully executed manifests, disposal receipts, and weight tickets from a certified scale will be required for payment.

   Price breakdown:

   $61,317.20 Actual charges from Waste Management.
   $3,065.86 Contract allowed 5% markup on Waste Management's invoice.
   $5,780.00 Trade Contractor cost for non-T&D effort from Change Order #1.
   $6,000.00 Trade Contractor cost for the balance of non-T&D effort and pile screening.
   $1,525.00 Trade Contractor additional costs due to Waste Management delays.

   $77,688.06 Total Payment to the Trade Contactor for Item 5.

CHANGES IN THE CONTRACT AMOUNT TO REFLECT PROPOSED CHANGES IN WORK:

LINE ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	EXTENDED AMOUNT
5	PCB Contaminated Soil and Debris Screening, Transport, Disposal	1	Lump Sum	$ (6,526.94)	$ (6,526.94)

Total Change for Bulletin No. 2 = $ 6,526.94 ☐ ADD ☒ DEDUCT ☐ NONE

11 December 2017

Please return this signed bulletin within two (2) working days from the date shown herein.

FOR THE CONTRACTOR:

12-11-17

Signature Date

Contractor Name: B&B Contracting, Calumet, Inc.

Contractor Address: 55670 Hwy. M-26
Calumet, MI 49913

FOR THE LOE CONTRACTOR:

12-11-17

Signature Date

LOE Contractor Name: The Mannik and Smith Group, Inc.

LOE Contractor Address: 200 Michigan Street
Suite 705
Hancock, MI 49930

FOR THE STATE:

12-11-17

State Project Manager (SPM) Signature Date

SPM Name: Ms. Amy Keranen
SPM Address: DEQ-RRD
Calumet Field Office
55195 U.S. 41 North
Calumet, MI 49913

DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY (EGLE)
REMEDIATION AND REDEVELOPMENT DIVISION (RRD)
CALUMET FIELD OFFICE
55195 U.S. 41 NORTH
CALUMET, MICHIGAN 49913

BULLETIN NO. 3
(FINAL ADJUSTING BULLETIN)

TO: Mr. Brian Bonen, B&B Contracting, Calumet, Inc. Date: 5 September 2019

FROM: Mr. Jed Chrestensen, P.E., The Mannik & Smith Group, Inc.

SUBJECT:
Project Name: Abandoned Mining Wastes Torch Lake Non-Superfund Site
Hubbell Processing Area
File Number: 761/16108.SAR
Index Number: 44251
Contract Number: Y17347
Department/Agency: EGLE/RRD

INTENT: This is not a change order. This is a request to the Contractor for a price breakdown of changes in the work to match final quantities.

REASONS FOR CHANGES:

Changes in the original scope of work and quantities were required to complete the project.

PROPOSED CHANGES IN FINAL QUANTITIES:

Item 1: Line Item No. 10 – Provisionary Allowance

The full value of the Provisionary Allowance was not needed to complete the Contract. A total of seven Provisionary Allowance Change Authorization Request Forms were executed to complete the Contract, with invoiced amounts totaling $45,307.00. Therefore, the final adjusted contract amount for Line Item No. 10 is as follows:

$50,000.00 – $45,307.00 = ($ 4,693.00) Credit

CHANGES IN THE CONTRACT AMOUNT TO REFLECT CHANGES IN WORK:

Total Change for Bulletin No. 3 = $ 4,693.00 ☐ ADD ☒ DEDUCT ☐ NONE

Please return this signed bulletin within three (3) working days from the date shown herein.

Bulletin No. 3
Hubbell Processing Area
Contract Number: Y17347

5 September 2019

FOR THE CONTRACTOR:

9/6/2019

Signature Date

Contractor Name: B&B Contracting, Calumet, Inc.

Contractor Address: 55670 Hwy. M-26
Calumet, MI 49913

FOR THE LOE CONTRACTOR:

9-11-19

Signature Date

LOE Contractor Name: The Mannik and Smith Group, Inc.

LOE Contractor Address: 200 Michigan Street
Suite 705
Hancock, MI 49930

FOR THE STATE:

A. Keranen, EGLE 9-11-19

State Project Manager (SPM) Signature Date

SPM Name: Ms. Amy Keranen

SPM Address: EGLE-RRD
Calumet Field Office
55195 U.S. 41 North
Calumet, MI 49913

APPENDIX D

Provisional Allowance Change Authorization Request Forms

PROVISIONAL ALLOWANCE
CHANGE AUTHORIZATION
REQUEST FORM 1

TO: Mr. Jed Chrestensen
The Mannik & Smith Group, Inc.

DATE: 7/17/17

FROM: B&B Contracting, Calumet, Inc.

SUBJECT: Department/Agency: Environmental Quality/Remediation and Redevelopment
Project Name and Location: Abandoned Mining Wastes Torch Lake Non-Superfund Site
Hubbell Processing Area
Hubbell, Michigan

INTENT: This is not a change order. This is a request to draw from the Provisional Allowance, Pay Item Number 10. Upon acceptance and signature by all parties, this document shall serve as notice of an agreed allocation from the Provisional Allowance reserved for the Pay Item.

Pay Item No.	Description	Quantity	Unit	Unit Price	Total Price
10	Extend the drainage ditch improvement an additional 38 feet westerly to the base of the upper railroad berm where the existing culverts shall be cut off at the new breech. All work for the additional ditch improvement shall be in accordance with the description for Pay Item 4 and the March 28, 2017 Bidding and Contract Document with the exception that to form a sedimentation basin at the outlet of the culverts, the rip rap outlet detail shown on Drawing C-8 shall be deepened by two feet and lengthened by 10 feet.	1	Lump Sum	$2,500.00	$2,500.00

Item No. 10 : $ 2,500.00

Total Change: $ 2,500.00

FOR THE CONTRACTOR:

Signature Date

Contractor Name:
B&B Contracting, Calumet, Inc.
Contractor's Address:
55670 Hwy M-26
Calumet, MI 49913

FOR THE PROFESSIONAL:

Signature 7-27-17
Date

Professional:
The Mannik & Smith Group, Inc.
Professional's Address:
200 Michigan Street, Suite 705
Hancock, MI 49930

FOR THE OWNER:

Signature 7-27-17
Date

Owner:
State of Michigan

Owner's Address:
55195 US Highway 41
Calumet, MI 49913

PROVISIONAL ALLOWANCE
CHANGE AUTHORIZATION
REQUEST FORM 2

TO: Mr. Jed Chrestensen
The Mannik & Smith Group, Inc.

DATE: 7/18/17

FROM: B&B Contracting, Calumet, Inc.

SUBJECT: Department/Agency: Environmental Quality/Remediation and Redevelopment
Project Name and Location: Abandoned Mining Wastes Torch Lake Non-Superfund Site
Hubbell Processing Area
Hubbell, Michigan

INTENT: This is not a change order. This is a request to draw from the Provisional Allowance, Pay Item Number 10. Upon acceptance and signature by all parties, this document shall serve as notice of an agreed allocation from the Provisional Allowance reserved for the Pay Item.

Pay Item No.	Description	Quantity	Unit	Unit Price	Total Price
10	Replace the existing failing 18-inch diameter culverts for a distance of 170 feet from the proposed end of pipe at the base of the upper railroad berm to the east edge of the tree line east of the property boundary fence. The western 20 feet shall be open ditch while the remaining 150 feet shall be 24-inch diameter culvert. The two existing 18-inch diameter culverts shall be cut off at the beginning of the open ditch. The open ditch slope shall match the culvert slope and shall have sides sloped at a 1:1 ratio or flatter, covered with nonwoven stabilization geotextile and 10-inch diameter rip rap. New culvert pipe shall be dual-wall (smooth-lined) corrugated plastic pipe with soil tight bell and spigot ends or galvanized corrugated steel pipe with soil-tight joints. Material choice is based on manufacturer's specific allowable maximum burial depth. Inlet protection (flared end section with trash bars) shall be provided for the entrance to the new culvert. Pipe shall be bedded in clean class II sand. Bedding and backfill compaction shall be a minimum of 90% of the Standard Proctor Test Density or greater if necessary to meet the manufacturer's recommended minimum compaction requirements based on a maximum burial depth of up to 16.7 feet. Density testing shall be provided by the contractor. Installation methods and materials shall comply with MDOT 2012 Standard Specifications for Construction. The upper one-foot of stamp sands and vegetation shall be scraped off the trenching area and stored to the side before trenching commences. During backfilling, the grade shall be restored to match existing conditions with the salvaged stamp sand and vegetation mix placed atop the disturbed area. Rip rap shall be used to stabilize the berm slope above the culvert outlet to the top of the berm. All other disturbed areas shall receive ~~coconut shell~~ STRAW erosion control blankets and allowed to naturally re-seed.	1	Lump Sum	$ 27,569.50 ~~$ 37,275.00~~	$ 27,569.50 ~~$ 37,275.00~~ $ 37,250.00

BB

SPREAD SPOILS TO NORTH OF DITCH. NO AIR MONITORING, NO VISIBLE DUST, PICK UP RECENT BEFORE STARTING EXCAVATION; ADD TO EXISTING COLLECTION.

Item No. 10 : $ ~~37,275.00~~ 27,569.50 BB

Total Change: $ ~~37,275.00~~ 27,569.50 BB

FOR THE CONTRACTOR:

Signature Date

Contractor Name:
B&B Contracting, Calumet, Inc.
Contractor's Address:
55670 Hwy M-26
Calumet, MI 49913

FOR THE PROFESSIONAL:

Signature 7-27-17
Date

Professional:
The Mannik & Smith Group, Inc.
Professional's Address:
200 Michigan Street, Suite 705
Hancock, MI 49930

FOR THE OWNER:

Signature 7-27-17
Date

Owner:
State of Michigan

Owner's Address:
55195 US Highway 41
Calumet, MI 49913

PROVISIONAL ALLOWANCE
CHANGE AUTHORIZATION
REQUEST FORM 3

TO: Mr. Jed Chrestensen
The Mannik & Smith Group, Inc.

DATE: 7/19/17

FROM: B&B Contracting, Calumet, Inc.

SUBJECT: Department/Agency: Environmental Quality/Remediation and Redevelopment
Project Name and Location: Abandoned Mining Wastes Torch Lake Non-Superfund Site
Hubbell Processing Area
Hubbell, Michigan

INTENT: This is not a change order. This is a request to draw from the Provisional Allowance, Pay Item Number 10. Upon acceptance and signature by all parties, this document shall serve as notice of an agreed allocation from the Provisional Allowance reserved for the Pay Item.

Pay Item No.	Description	Quantity	Unit	Unit Price	Total Price
10	Provide waste profiling, manifesting, transportation, and disposal for asbestos containing material (ACM), suspect ACM (SACM), PCB-containing residual process material (RPM), and suspect RPM that was collected and contained during the course of the project. This includes waste characterization using data provided to the contractor from prior sampling efforts. No waste shall leave the site until it has been profiled, manifested, properly labeled, and is on its way directly to the respective disposal facilities. Copies of fully executed manifests, weight tickets, and certificate of destruction for PCB waste from the final disposal facility will be required for payment. All manifests shall be provided to the Professional within 10 business days so that they can be timely filed with MDEQ.	1	Lump Sum	1,825.00	1,825.00

Item No. 10 : $ 1,825.00

Total Change: $ 1,825.00

PROVISIONAL ALLOWANCE
CHANGE AUTHORIZATION
REQUEST FORM 3 (CONTINUED)

FOR THE CONTRACTOR:

B~Ba , 8-3-17

Signature Date

Contractor Name:
B&B Contracting, Calumet, Inc.
Contractor's Address:
55670 Hwy M-26
Calumet, MI 49913

FOR THE PROFESSIONAL:

8-8-17

Signature Date

Professional:
The Mannik & Smith Group, Inc.
Professional's Address:
200 Michigan Street, Suite 705
Hancock, MI 49930

FOR THE OWNER:

8-8-17

Signature Date

Owner:
State of Michigan

Owner's Address:
55195 US Highway 41
Calumet, MI 49913

PROVISIONAL ALLOWANCE
CHANGE AUTHORIZATION
REQUEST FORM 4

TO: Mr. Jed Chrestensen
The Mannik & Smith Group, Inc.

DATE: 7/28/17

FROM: B&B Contracting, Calumet, Inc.

SUBJECT: Department/Agency: Environmental Quality/Remediation and Redevelopment
Project Name and Location: Abandoned Mining Wastes Torch Lake Non-Superfund Site
Hubbell Processing Area
Hubbell, Michigan

INTENT: This is not a change order. This is a request to draw from the Provisional Allowance, Pay Item Number 10. Upon acceptance and signature by all parties, this document shall serve as notice of an agreed allocation from the Provisional Allowance reserved for the Pay Item.

Pay Item No.	Description	Quantity	Unit	Unit Price	Total Price
10	Purchase and apply $3,600 of ProGanics Biotic Soil Media to cap soils per recommendation of G&J Site Solutions so that the application rate is a minimum of 1,000 pounds of ProGanics per acre.	1	Lump Sum	3,600.00	3,600.00

Item No. 10 : $ 3,600.00

Total Change: $ 3,600.00

FOR THE CONTRACTOR:

Signature 7-31-17 Date

Contractor Name:
B&B Contracting, Calumet, Inc.
Contractor's Address:
55670 Hwy M-26
Calumet, MI 49913

FOR THE PROFESSIONAL:

Signature 8-1-17 Date

Professional:
The Mannik & Smith Group, Inc.
Professional's Address:
200 Michigan Street, Suite 705
Hancock, MI 49930

FOR THE OWNER:

Signature 8-1-17 Date

Owner:
State of Michigan

Owner's Address:
55195 US Highway 41
Calumet, MI 49913

PROVISIONAL ALLOWANCE
CHANGE AUTHORIZATION
REQUEST FORM 5

TO: Mr. Jed Chrestensen
The Mannik & Smith Group, Inc.

DATE: 10/26/17

FROM: B&B Contracting, Calumet, Inc.

SUBJECT: Department/Agency: Environmental Quality/Remediation and Redevelopment
Project Name and Location: Abandoned Mining Wastes Torch Lake Non-Superfund Site
Hubbell Processing Area
Hubbell, Michigan

INTENT: This is not a change order. This is a request to draw from the Provisional Allowance, Pay Item Number 10. Upon acceptance and signature by all parties, this document shall serve as notice of an agreed allocation from the Provisional Allowance reserved for the Pay Item.

Pay Item No.	Description	Quantity	Unit	Unit Price	Total Price
10	Provision and placement of an additional 0.2 acres of cap material to cover areas identified during execution of the work (WP-11 footprint and additional berm area). The work shall be conducted in accordance with Pay Item 6 and the March 28, 2017 specifications, as amended.	0.2	Per Acre	$8,000.00	$1,600.00
10	Seeding, fertilizing, and mulching of 0.26 acres of ditch spoils outside the capped area (spoils from upstream of the Coal Dock Burn Area were spread atop the stamp sand ground cover) and 0.2 acres of additional cap. The work shall be conducted in accordance with Pay Item 8 and the March 28, 2017 specifications, as amended.	0.46	Per Acre	$4,400.00	$2,024.00

Item No. 10 : $ 3,624.00

Total Change: $ 3,624.00

FOR THE CONTRACTOR:

12-11-17

Signature Date

Contractor Name:
B&B Contracting, Calumet, Inc.
Contractor's Address:
55670 Hwy M-26
Calumet, MI 49913

FOR THE PROFESSIONAL:

10-26-17

Signature Date

Professional:
The Mannik & Smith Group, Inc.
Professional's Address:
200 Michigan Street, Suite 705
Hancock, MI 49930

FOR THE OWNER:

10-26-17

Signature Date

Owner:
State of Michigan
Owner's Address:
55195 US Highway 41
Calumet, MI 49913

PROVISIONAL ALLOWANCE
CHANGE AUTHORIZATION
REQUEST FORM 6

TO: Mr. Jed Chrestensen
The Mannik & Smith Group, Inc.

DATE: 6/8/18

FROM: B&B Contracting, Calumet, Inc.

SUBJECT: Department/Agency: Environmental Quality/Remediation and Redevelopment
Project Name and Location: Abandoned Mining Wastes Torch Lake Non-Superfund Site
Hubbell Processing Area
Hubbell, Michigan

INTENT: This is not a change order. This is a request to draw from the Provisional Allowance, Pay Item Number 10. Upon acceptance and signature by all parties, this document shall serve as notice of an agreed allocation from the Provisional Allowance reserved for the Pay Item.

Pay Item No.	Description	Quantity	Unit	Unit Price	Total Price
10	Provision of 25 tons of rip-rap, placed on the north and south sides of the outer corners of the dock area of the bulkhead to protect the slope and support the cap material from eroding into Torch Lake. The rip-rap shall be of the same specification or coarser than the rip-rap used for ditch improvement in the March 28, 2017 specifications, as amended. Also, unplug the culvert where the northern access driveway crosses the drainage ditch in the northern portion of the property.	1	Lump Sum	$3,875.00	$3,875.00

Item No. 10 : $ 3,875.00

Total Change: $ 3,875.00

FOR THE CONTRACTOR:

Signature 7/12/2018 Date

Contractor Name:
B&B Contracting, Calumet, Inc.
Contractor's Address:
55670 Hwy M-26
Calumet, MI 49913

FOR THE PROFESSIONAL:

Signature 8-3-18 Date

Professional:
The Mannik & Smith Group, Inc.
Professional's Address:
200 Michigan Street, Suite 705
Hancock, MI 49930

FOR THE OWNER:

Signature MDEQ 7-12-18 Date

Owner:
State of Michigan
Owner's Address:
55195 US Highway 41
Calumet, MI 49913

Provisional Allowance #7 was Not Executed.

PROVISIONAL ALLOWANCE
CHANGE AUTHORIZATION
REQUEST FORM 8

TO: Mr. Jed Chrestensen
The Mannik & Smith Group, Inc.

DATE: 7/1/19

FROM: B&B Contracting, Calumet, Inc.

SUBJECT: Department/Agency: Environmental, Great Lakes, and Energy / Remediation and Redevelopment

Project Name and Location: Abandoned Mining Wastes Torch Lake Non-Superfund Site
Hubbell Processing Area
Hubbell, Michigan

INTENT: This is not a change order. This is a request to draw from the Provisional Allowance, Pay Item Number 10. Upon acceptance and signature by all parties, this document shall serve as notice of an agreed allocation from the Provisional Allowance reserved for the Pay Item.

Pay Item No.	Description	Quantity	Unit	Unit Price	Total Price
10	Remove accumulated sediment and debris and restore drainage ditches as directed by MSG. All health and safety requirements shall be in accordance with the March 28, 2017 specifications, as amended.	1	Lump Sum	$2,314.00	$2,314.00

Item No. 10 : $ 2,314.00

Total Change: $ 2,314.00

FOR THE CONTRACTOR:

7/5/2019
Signature Date

Contractor Name:
B&B Contracting, Calumet, Inc.
Contractor's Address:
55670 Hwy M-26
Calumet, MI 49913

FOR THE PROFESSIONAL:

7-8-19
Signature Date

Professional:
The Mannik & Smith Group, Inc.
Professional's Address:
200 Michigan Street, Suite 705
Hancock, MI 49930

FOR THE OWNER:

, EGLE 7-11-19
Signature Date

Owner:
State of Michigan
Owner's Address:
55195 US Highway 41
Calumet, MI 49913

APPENDIX E

Soil Erosion and Sedimentation Control Permits and Releases

Jed Chrestensen

From: Hans Haapala <hanshaapala@gmail.com>
Sent: Monday, December 11, 2017 10:20 AM
To: Jed Chrestensen; Jeff Binkley; Amy Keranen
Subject: Fwd: Hubbell Coal Dock Borrow Pit

---------- Forwarded message ----------
From: "John Pekkala" <jpekkala@houghtoncounty.net>
Date: Sep 11, 2017 10:44 AM
Subject: Hubbell Coal Dock Borrow Pit
To: <babonen@hotmail.com>
Cc: "hanshaapala" <hanshaapala@gmail.com>

Hi Brian,

On September 8, 2017, I performed a SESC inspection of the borrow pit used for the 2017 Hubbell Coal Dock Project. No off-site sedimentation was observed. The majority of the exposed surface within the site drains internally to the center of the pit. A culvert has been installed below the crest of the pit to release water to a wooded upland area.

B&B Contracting has restored the borrow pit to an acceptable condition and should be released from any further SESC responsibilities.

Please contact me with any questions.
John

John Pekkala, Drain Commissioner
County Enforcing Agent for
Soil Erosion and Sedimentation Control
401 E. Houghton Avenue
Houghton, MI 49931
Phone: 906-482-4491
Fax: 906-482-7238

933

COUNTY OF HOUGHTON
SOIL EROSION AND SEDIMENTATION CONTROL PERMIT

(issued under the authority of part 91, Soil Erosion and Sedimentation Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended)

Permitee: Charlie Kiilunen

Address: 52705 State Highway M-26
Lake Linden, MI 49945

Permit No.: 16-933-SE
Issued: 11-14-16
Expires: 11-14-21
Extended:

On-Site Responsible Person: Name: Pat Ziemnick

Company: Ziemnick Excavating Telephone Number: (906) 296-9723 or 370-9723

Permitted Activity:

Sand Pit

Project Location: Town: 55N ; Range: 32W ; Section: 7

City or Township: Torch Lake Township
Address: same as above

Permit Conditions:

1. The permitted activity shall be completed in accordance with the approved plans and specifications and the attached general and specific conditions.
2. This permit does not waive the necessity for obtaining all other required federal, state, or local permits.
3. Permitee shall notify the permitting agency within one week after completing the permitted activity or one week prior to the permit expiration date, whichever comes first.

John Pekkala
Permitting Agent

(906) 482-4491
Telephone Number

THIS PERMIT MUST BE POSTED AT THE PROJECT SITE.

HOUGHTON COUNTY DRAIN COMMISSIONER
401 E. HOUGHTON AVENUE
HOUGHTON, MI 49931
Phone (906) 482-4491 FAX (906) 482-7238
jpekkala@houghtoncounty.net

November 14, 2016

Pat Ziemnick
Ziemnick Excavating
52655 M-26
Lake Linden, MI 49945

RE: Soil Erosion and Sedimentation Control Permit No. 16-933-SE

Dear Mr. Ziemnick:

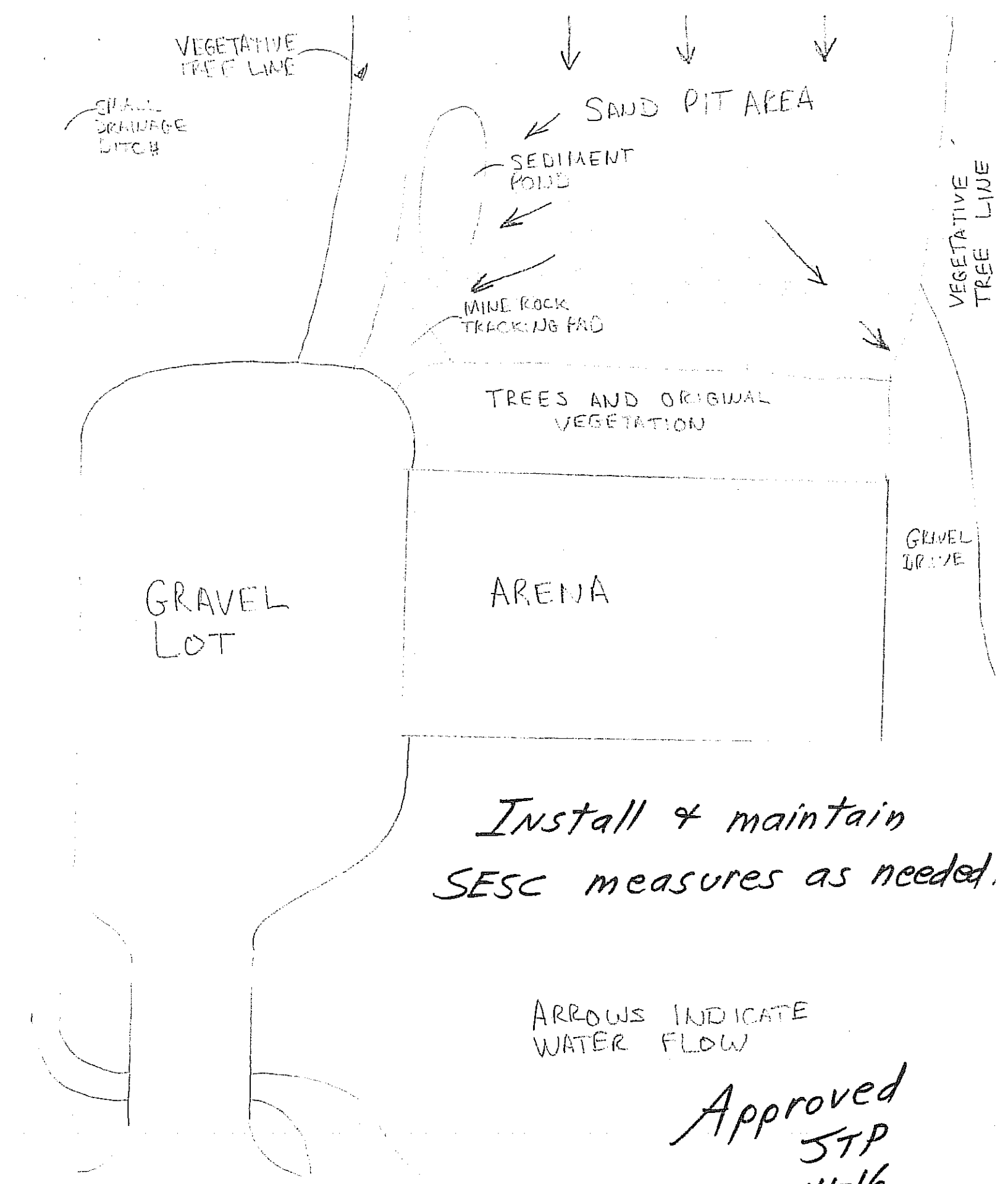
Enclosed, please find a Soil Erosion and Sedimentation Control (SESC) Permit and approved SESC Site Plan for the proposed earth change at the location specified on the permit. Please notify the Houghton County Drain Commissioner's Office 48 hours prior to commencing the earth change.

If you have any questions, please feel free to contact my office.

Sincerely,

John Pekkala

John Pekkala, Drain Commissioner
County Enforcing Agent for
Soil Erosion and Sedimentation Control



Install & maintain SESC measures as needed.

ARROWS INDICATE WATER FLOW

Approved
STP
11-14-16

SOIL EROSION AND SEDIMENTATION POLLUTION CONTROL APPLICATION

Part 91, P.A. 451 of 1994

Houghton County Drain Commissioner
401 E. Houghton Avenue
Houghton, MI 49931
(906) 482-4491

Permit Number	16-933-SE
Date Issued	11-14-16
Expiration Date	11-14-21
Permit Fee $	200.00

For Questions, please call: *John Pekkala -Office (906) 482-4491*
Home (906) 482-0765

Receipt # 663374

1. APPLICANT (Please check if the applicant is the landowner or designated agent*) ( ) Landowner (X) Designated Agent

Name	Address			
PAT Ziemnick	52655 M-26			
City	**State**	**Zip**	**Area Code/Telephone**	
Lake Linden MI	MI	49945	296-9723	

2. LOCATION	Section	Town	Range	Lot No(s)	Township	Street Address:
	7	55N.	32W		TORCH LAKE	52705 M-26

City/Village	Property ID # or Attach Property Legal Description:
Lake Linden MI	31-014-307-005-00

3. PROPOSED EARTH CHANGE **Project Type:** ( ) Residential ( ) Multi-Family (X) Commercial ( ) Industrial ( ) Land Balancing ( ) Other

Describe Project	Size of Earth Change (Acres or Square Feet)
SAND PIT	1 ACRE

Distance to Nearest Lake, Stream or Dam	Watercourse(s) Affected:	Project Start Date:	Project Complete Date:
125 ft.	NO	9-6-16	—

4. SOIL EROSION AND SEDIMENT POLLUTION CONTROL PLAN
(Note: Two (2) sets of complete plans must be attached.)

Estimated Cost of Erosion & Sedimentation Control $	Plan Preparer's Name and Telephone Number:	Area Code
500.00	PAT Ziemnick	(906) 296-9723

5. PARTIES RESPONSIBLE FOR EARTH CHANGE: Property Owner of Record (If not provided in Box No.1 above)
NAME: 52705 State Highway M-26 LLC

Address	City	State	Zip	Area Code/Telephone
52705 State Highway M-26	Lake Linden	MI	49945	906.296.9633

6. Name of Individual "On Site" Responsible for Earth Change	Company Name
PAT Ziemnick	ZIEMNICK Excavating

Address	City	State	Zip	Area Code/Telephone
52655 M-26	Lake Linden	MI	49945	906-296-9723

I (we) affirm that the above information is accurate and that I (we) will conduct the above described earth change in accordance with Part 91, Soil Erosion and Sedimentation Control, of the Natural Resource and Environmental Protection Act, 1994 PA 451, as amended, applicable local ordinances, and the documents accompanying this application.

Landowner's Signature [signature] **Date:** 9/7/16

Designated Agents Signature* [signature] **Date:** 8-31-16

*** Designated agent must have a written statement from landowner authorizing him/her to secure a permit in the landowner's name.**

HOUGHTON COUNTY DRAIN COMMISSIONER
SOIL EROSION/SEDIMENTATION CONTROL

401 E. Houghton Avenue
Houghton, MI 49931
Phone (906)482-4491 FAX (906)482-7238

LETTER OF AUTHORIZATION

(Note: Complete this form only if the permit applicant or primary contact person is not the landowner of record.)

Type of Project: SAND PIT

Location of Project: LAKE LINDEN MI 49945

Township/City: TORCH LAKE TWP.

Property Tax ID#: _____

As landowner of the property described above, I authorize the person indicated below to act on my behalf for the purposes of this application for a Soil Erosion and Sediment Control Permit pursuant to Part 91, Soil Erosion and Sedimentation Control, of the Natural Resources and Environmental Protection Act, Act No. 451 of the Public Acts of 1994, as amended. I understand that I am responsible for all earth changes related to this project and understand that Part 91, Act 451 may be enforced against me in the event of any violation of that Act.

LANDOWNER:

52705 State Highway M-26 LLC (Charles Kilunen)
(Please print or type)

CK
(Signature)

52705 State Highway M-26, Lake Linden, MI 49945 906-296-9633
(Address and Phone Number)

LANDOWNER'S AUTHORIZED AGENT:

PATRICK ZIEMNICK
(Please print or type)

Jed Chrestensen

From: John Pekkala <jpekkala@houghtoncounty.net>
Sent: Friday, June 08, 2018 8:07 AM
To: hanshaapala
Cc: Keranen, Amy (DEQ); Jed Chrestensen
Subject: Hubbell Processing Area

Good morning Hans,

I inspected the grading and capping of the Hubbell Processing Area on June 6th. The site has been adequately stabilized and all temporary SESC measures may be removed. I am closing out the SESC permit for the site. The permit number is 17-963-SE.

If you have any questions, please contact me.

Thanks,
John

John Pekkala, Drain Commissioner
County Enforcing Agent for
Soil Erosion and Sedimentation Control
401 E. Houghton Avenue
Houghton, MI 49931
Phone: 906-482-4491
Fax: 906-482-7238

HOUGHTON COUNTY DRAIN COMMISSIONER
401 E. HOUGHTON AVENUE
HOUGHTON, MI 49931
Phone (906) 482-4491 FAX (906) 482-7238
jpekkala@houghtoncounty.net

June 15, 2017

Brian Bonen
B&B Contracting, Calumet, Inc.
55670 Hwy M26
Calumet, MI 49913

RE: Soil Erosion and Sedimentation Control Permit No. 17-963-SE

Dear Mr. Bonen:

Enclosed is a Soil Erosion and Sedimentation Control (SESC) Permit for the proposed earth change at the location specified on the permit. The SESC Site Plan that was submitted has been approved and is on file at the Houghton County Drain Commissioner's Office. Please notify my office 48 hours prior to commencing the earth change.

If you have any questions, feel free to contact me.

Sincerely,

John Pekkala

John Pekkala, Drain Commissioner
County Enforcing Agent for
Soil Erosion and Sedimentation Control

COUNTY OF HOUGHTON
SOIL EROSION AND SEDIMENTATION CONTROL PERMIT

(issued under the authority of part 91, Soil Erosion and Sedimentation Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended)

Permitee: Houghton Forest Products

Address: Attn. Mr. Ken Buchanan
1174 Dawson Road
Thunder Bay, Ontario, Canada, P7G1H6

Permit No.:	17-963-SE
Issued:	06-15-17
Expires:	06-15-18
Extended:	

On-Site Responsible Person: Name: Brian Bonen

Company: B&B Contracting, Calumet, Inc. Telephone Number: (906) 337-0017 or 281-2587

Permitted Activity:

Cap Coal Dock burn area, improve southern drainage ditch, remove PCB contaminated soils, construct associated haul roads

Project Location: Town: 55N ; Range: 32W ; Section: 7

City or Township: Torch Lake Township
Address: 52634 Hwy M26

Permit Conditions:

1. The permitted activity shall be completed in accordance with the approved plans and specifications and the attached general and specific conditions.
2. This permit does not waive the necessity for obtaining all other required federal, state, or local permits.
3. Permitee shall notify the permitting agency within one week after completing the permitted activity or one week prior to the permit expiration date, whichever comes first.

John Pekkala
Permitting Agent

(906) 482-4491
Telephone Number

THIS PERMIT MUST BE POSTED AT THE PROJECT SITE.

Permit Number: 17-963-SE

General Conditions:

In accordance with rule 1709 promulgated under the authority of part 91, Soil Erosion and Sedimentation Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, and in addition to the information on the attached plan(s) and special conditions, the following general conditions apply to the earth change authorized by this permit:

- Design, construct, and complete the earth change in a manner that limits the exposed area of disturbed land for the shortest period of time.
- Remove sediment caused by accelerated soil erosion from runoff water before it leaves the site of the earth change.
- Temporary or permanent control measures shall be designed and installed to convey water around, through, or from the earth change at a non-erosive velocity.
- Install temporary soil erosion and sedimentation control measures before or upon commencement of the earth change activity and maintain the measures on a daily basis. Remove temporary soil erosion and sedimentation control measures after permanent soil erosion measures are in place and the area is stabilized. (Stabilized means the establishment of vegetation or the proper placement, grading; or covering of soil to ensure its resistance to soil erosion, sliding, or other earth movement.)
- Complete permanent soil erosion control measures for the earth change within five calendar days after final grading or upon completion of the final earth change. If it is not possible to permanently stabilize the earth changes, then maintain temporary soil erosion and sedimentation control measures until permanent soil erosion control measures are in place and the area is stabilized.

SPECIFIC CONDITIONS

48 hours notice prior to earth change

SOIL EROSION AND SEDIMENTATION POLLUTION CONTROL APPLICATION

Part 91, P.A. 451 of 1994

Houghton County Drain Commissioner
401 E. Houghton Avenue
Houghton, MI 49931
(906) 482-4491

Permit Number	17-963-SE
Date Issued	6-15-17
Expiration Date	6-15-18
Permit Fee $	480.00

For Questions, please call: *John Pekkala -Office (906) 482-4491*
Home (906) 482-0765

Receipt # 178478

1. APPLICANT (Please check if the applicant is the landowner or designated agent*) ( ) Landowner (X) Designated Agent

Name	Address		
B&B Contracting, Calumet, Inc.	55670 Hwy M26		
City	**State**	**Zip**	**Area Code/Telephone**
Calumet	MI	49913	(906)337-0017

2. LOCATION	Section	Town	Range	Lot No(s)	Township	Street Address:
	7	T55N	32W		Torch Lake	52634 Hwy M26

City/Village	Property ID # or Attach Property Legal Description:
Village of Hubbell	

3. PROPOSED EARTH CHANGE **Project Type:** ( ) Residential ( ) Multi-Family ( ) Commercial ( ) Industrial ( ) Land Balancing (X) Other

Describe Project	Size of Earth Change (Acres or Square Feet)
Cap Coal Dock burn area, improve southern drainage ditch, remove PCB contaminated soils, construct associated haul roads	8 acres

Distance to Nearest Lake, Stream or Dam	Watercourse(s) Affected:	Project Start Date:	Project Complete Date:
0 ft.	Torch Lake	6/19/2017	October 31, 2017

4. SOIL EROSION AND SEDIMENT POLLUTION CONTROL PLAN
(Note: Two (2) sets of complete plans must be attached.)

Estimated Cost of Erosion & Sedimentation Control $	Plan Preparer's Name and Telephone Number: Area Code
5,200	Mannik & Smith Group, Inc Jed Chrestensen(906)487-7452

5. PARTIES RESPONSIBLE FOR EARTH CHANGE: Property Owner of Record (If not provided in Box No.1 above)

NAME:	Houghton Forest Products		Siver Shores Enterprises, Inc.			
Address	Mr. Ken Buchanan 1174 Dawson Road Thunder Bay, ONT P7G1H6	City	Mr. William H. Siler 45505 Champion St South Range, MI 49963	State	Zip	Area Code/Telephone

6. Name of Individual "On Site" Responsible for Earth Change		Company Name		
Brian Bonen		B&B Contracting, Calumet, Inc		
Address	**City**	**State**	**Zip**	**Area Code/Telephone**
55670 Hwy M26	Calumet	MI	49913	(906)337-0017

I (we) affirm that the above information is accurate and that I (we) will conduct the above described earth change in accordance with Part 91, Soil Erosion and Sedimentation Control, of the Natural Resource and Environmental Protection Act, 1994 PA 451, as amended, applicable local ordinances, and the documents accompanying this application.

Landowner's Signature **Date:**

Designated Agents Signature* [signature] B&B Contracting, Calumet, Inc **Date:** 6/13/2017

*** Designated agent must have a written statement from landowner authorizing him/her to secure a permit in the landowner's name.**

APPENDIX F

MDOT Permits

MDOT
Michigan Department of Transportation

INDIVIDUAL CONSTRUCTION PERMIT

For Operations within State Highway Right-of-Way

Issued To:
B & B CONTRACTING, CALUMET, INC.

55670 STATE HIGHWAY M26
CALUMET MI 49913-2826

Contact:
Brian Bonen
906-337-0017(O) 906-281-2587(Cell)
babonen@hotmail.com

Permit Number: 31013-047791-17-071017
Permit Type: Individual Application
Permit Fee: $90.00
Effective Date: Jul 10, 2017 to Sep 22, 2017
Bond Numbers: EI4885
Liability Insurance Expiration Date: Jan 01, 2018

Contractor:
B & B Contracting, Calumet, Inc.

55670 Hwy M26
Calumet MI 49913

Contact:
Hans Haapala

906-337-0017(O) 906-281-6908(Cell)
hanshaapala@gmail.com

THIS PERMIT IS VALID ONLY FOR THE FOLLOWING PROPOSED OPERATIONS:

PURPOSE:

TEMPORARY CONSTRUCTION ACCESS DRIVEWAY, tO BE REMOVED AND RESTORED BY COMPLETION DATE. Also plan to place diversion ditch to allow for a dry area to remove contaminated material near outlet pipe.

STATE ROUTE: M-26 TOWNSHIP OF: Torch Lake COUNTY: Houghton County

TOWN	RANGE	SECTION
T 55 N	R 32 W	07

NEAREST INTERSECTION:	SIDE OF ROAD:	DISTANCE TO NEAREST INTERSECTION: (in feet)	DIRECTION TO NEAREST INTERECTION:
W 21ST STREET	E	1,450.00	North

CONTROL SECTION:	MILE POINT FROM:	MILE POINT TO:	LOCATION: LEFT	MEDIAN	RIGHT	TRANSVERSE
31013	9.250	9.250	☐	☐	☒	☐

REQUISITION NUMBER:	WORK ORDER NUMBER:	MDOT JOB NUMBER:	ORG JOB NUMBER:

31013-047791-17-071017 Issued To:B & B CONTRACTING, CALUMET, INC.

This permit is incomplete without "General Conditions and Supplemental Specifications"

I certify that I accept the following:

1. I am the legal owner of this property or facility, the owner's authorized representative, or have statutory authority to work within state highway Right-of-Way.
2. Commencement of work set forth in the permit application constitutes acceptance of the permit as issued.
3. Failure to object, ***within ten (10) days*** to the permit as issued constitutes acceptance of the permit as issued.
4. If this permit is accepted by either of the above methods, I will comply with the provisions of the permit.
5. I agree that Advance Notice for Permitted Activities for shall be submitted **5 days prior** to the commencement of the proposed work.

   I agree that Advance Notice for Permitted Utility Tree Trimming and Tree Removal Activities shall be submitted **15 days prior** to the commencement of the proposed work for an annual permit.

CAUTION

Work shall NOT begin until the Advance Notice has been approved.

Failure to submit the advance notice may result in a Stop Work Order.

B & B CONTRACTING, CALUMET, INC.	Joel Kauppila MDOT	July 10, 2017 Approved Date
TSC Contact Info	Ishpeming TSC	(906) 485-4270

THE STANDARD ATTACHMENTS, ATTACHMENTS AND SPECIAL CONDITIONS MARKED BELOW ARE A PART OF THIS PERMIT.

STANDARD ATTACHMENTS:

1 Special Conditions For Underground Construction (2205C)
2 General Conditions for Permit (General Conditions)
3 ENVIRONMENTAL REQUIREMENTS FOR ACTIVITIES WITHIN MDOT RIGHT-OF-WAY (2486)
4 The Northern Long Ear and Indiana Bat Advisory (Bat Advisory)
5 Historical and Archaeological Discoveries During Construction Operations (Const. Advisory Historical/Archae

31013-047791-17-071017 Issued To:B & B CONTRACTING, CALUMET, INC.

ADDITIONAL ATTACHMENTS

1 Hubbell_Temp_Access_Drive.pdf
2 standard conditions for driveway construction 8 10 10.pdf
3 ROW M26 HubbelSheet021.pdf
4 Flag Control short term stationary MD-21a.pdf
5 Work outside shoulder area RWA signs.pdf
6 Shoulder Closure Short Term No speed reduction.pdf
7 L D and B Valuesm0020a.pdf
8 ROW Sht21 Hubbell.pdf
9 m0170a_Haul Road_B&B MODIFIED.pdf
10 Hubbell B&B Ditch Diversion.pdf
11 ROW Sht21 Hubbell.pdf

AMENDMENT ATTACHMENTS:

SPECIAL CONDITIONS:

1 The Department of Transportation does not, by issuance of this permit, assume any liability claims or maintenance costs resulting from the Temporary Access Road and Diversion Ditch facility placed by this permit. The Department reserves the right to require removal of all or any portion of this facility as needed for highway maintenance or construction purposes without replacement or reimbursement of any costs incurred by the permitted or other party. The permitted will defend, indemnify and hold harmless the Department for any claims whatsoever resulting from the construction or the removal of the authorized by this permit.
2 All disturbed areas within the right of way shall be top-soiled, seeded and mulched to match existing areas per current MDOT standards and specifications.
3 Diversion dam shall only restrict 50% of depth of driveway cross culvert and will be removed prior to rain events.
4 Approval must be obtained by the DEQ, Torch Lake Township and adjacent property owners.

Michigan Department
Of Transportation
2205C (03/10)

SPECIAL CONDITIONS FOR UNDERGROUND CONSTRUCTION

The following special permit specifications shall apply when the permittee is excavating or performing any underground activity within trunkline right of way and discovers existing contaminated soil and/or an abandoned underground storage tank:

1. In the event the permittee encounters environmental contamination and/or an underground storage tank in the right of way, the Michigan Department of Transportation (MDOT) shall be immediately notified. All Michigan Department of Natural Resources and Environment (MDNRE) and Federal Environmental Protection Agency (EPA) environmental requirements shall be complied with by the permittee. Unless the Department agrees in writing the following steps are to be taken:

    a. The contaminated material that has been removed shall be temporarily stockpiled per MDNRE requirements. If stockpiled on the right of way, the site shall not interfere with MDOT operations or create a traffic safety problem. Also, the contaminated material shall be placed on plastic sheeting or tarp having a minimum thickness of 6 mils or in trucks, roll off boxes, or other containers, such that no liquid may escape from the containment. At the end of each work day, the contaminated material shall be covered securely with plastic sheeting of 6 mil thickness or greater.

    b. Upon completion of any testing deemed necessary by the Department or the MDNRE, the material shall be disposed of in an approved waste disposal site unless otherwise directed by the MDNRE.

    c. In no case shall the contaminated material be stockpiled for longer than 45 days prior to disposal.

2. The permittee shall cooperate with MDOT personnel and pertinent regulatory agencies in resolving the contamination problem as required by law.

    a. The manner in which the permittee manages and secures the site shall not interfere with the MDOT's interests.

    b. The permittee shall not excavate as part of any site management operation within the one-on-one slope from the edge of shoulder without the permission of MDOT.

3. MDOT shall not indemnify or compensate the permittee for any costs or damages of any kind that the permittee incurs as the result of contamination encountered within the right of way. It is understood that the possibility of encountering contamination and the damages which might be incurred by the permittee because of the contamination are business risks the permittee assumes in choosing to locate and maintain facilities within the Right-of-Way.

    The permittee is responsible for any costs that it incurs to secure the contaminated site in such a manner as to meet the requirements of the MDNRE and/or EPA and the requirements of MDOT.

4. The permittee, upon approval of MDOT, may continue to place its facility through the contaminated area providing remedial actions that meet the approval of MDOT and other enforcement agencies involved are followed.

    a. All additional costs the permittee incurs, as a result of continuing to place its facilities within the contaminated area, are the responsibility of the permittee.

    b. All contaminated material must be removed and properly disposed of as directed by MDOT and/or the MDNRE. All backfill material must be clean material, unless otherwise directed by the MDNRE. Excavation must be backfilled in a manner to prevent the creation of a pathway for migration of contamination off site.

5. The permittee is solely responsible to develop an alternate route for its facility in the event approval cannot be given to continue to place the facility within the contaminated area of the Right-of-Way. The permittee shall restore the original site as directed by MDOT.

Michigan Department
of Transportation
2486 (03/14)

ENVIRONMENTAL REQUIREMENTS FOR ACTIVITIES WITHIN MDOT RIGHT-OF-WAY

Issuance of a permit by MDOT does not relieve the permit applicant from meeting any and all requirements of law, or of other public bodies or agencies, including but not limited to the following:

1. Goemare-Anderson Wetland Protection Act, Part 303, P.A. 451 of 1994

   Any activity that involves excavation or fill, located within a regulated wetland, requires a Michigan Department of Environmental Quality (MDEQ) permit. Regulated wetlands are those systems that are contiguous to a lake or stream (within 500 feet) or greater than five (5) acres in size.

2. Inland Lakes and Streams Act, Part 301, P.A. 451 of 1994

   Any activity located within the ordinary high-water mark of a regulated body of water, i.e., lake, stream, drain, pond. etc., shall require a permit. There are no exemptions to this requirement. Permit applications and questions can be submitted to the MDEQ's Land and Water Management Division.

3. Soil Erosion and Sedimentation Control Act, Part 91, P.A. 451 1994

   Any land disturbance of one (1) acre or greater, or that is located within 500 feet of a lake or stream, requires a soil erosion permit. Municipalities who are classified as an Authorized Public Agency (APA) are exempt from permits, but must follow proper soil erosion practices as identified in their standard plan. Any construction activity located within MDOT Right-of-Way that is authorized by a MDOT permit is the responsibility of the permit applicant and is not covered under MDOT's APA authority.

   Soil erosion and sedimentation controls are required on all projects, even if a soil erosion permit is not required. Individuals performing work shall prevent sediment from entering any body of water or leaving the Right-of-Way. Permits can be obtained from the county/municipal agencies. Minor earth changes are exempted in this Act and are classified as normal maintenance and emergency repairs.

4. Clean Water Act: National Pollutant Discharge Elimination System (NPDES) Storm Water Discharge Requirements for Construction Activities

   Any land disturbance of five (5) acres or greater requires an NPDES Storm Water Discharge Permit. This can include any filling, excavating, grading, clearing, etc. Municipally-owned utilities who service a population of less than 100,000 are exempt from permit provisions, but not from environmental protection requirements. Permit applications require the Part 31, P.A. 451 permit number, or a declaration of APA status and the effective date. Permit applications and questions can be submitted to the MDEQ's Surface Water Quality Division.

5. Environmental Site Closures

   A procedure was developed by the MDEQ and MDOT which may allow a property owner, who is responsible for of these sites, to close an environmentally impacted site. Questions regarding this activity shall be addressed by contacting MDOT's Environmental Specialist at 517-335-2271.

6. The Land and Water Management Division of the MDEQ also administers the following environmental laws which may require review prior to construction:
   - Sand Dune Protection Act, Part 353, P.A. 451 of 1994.
   - Shore-lands Protection and Management, Part 323, P.A. 451 of 1994.
   - Great Lakes Submerged Lands Act, Part 325, and P.A. 451 of 1994.

7. The Wildlife Division of the MDNR also administers the following environmental laws which may require review prior to construction:
   - Endangered Species Act, Part 365, and P.A. 451 of 1994.

Questions regarding these permits may be addressed by contacting the nearest MDEQ district field office, or the MDEQ Land and Water Management Division at 517-373-1170.

Additional information is available in MDOT's Environmental Procedures Manual.

GENERAL CONDITIONS

This permit is issued subject to the following conditions:

1. This permit grants to the permittee only those rights specifically stated and no other. Maintenance work within the trunkline right of way may require a separate permit unless authorized within the scope of the annual permit.

2. Issuance of this permit does not relieve permittee from meeting any and all requirements of law, or of other public bodies or agencies. The permittee shall be responsible for securing including but not limited to any other permissions including or required by law including but not limited to cities, villages, townships, corporations, or individuals for the activities hereby permitted.

3. The permittee agrees as a condition of this permit to:

   a. Have in the permittee's or the permittee's representative's possession on the job site at all times the approved permit, advanced notice and any necessary plans or sketches.

   b. Submit Advance Notice through the online Construction Permit System (CPS) at least five (5) working days prior to commencement of any operations covered by this permit. No work shall start until an approved Advance Notice is e-mailed to the permittee.

   c. Perform no work except emergency work, unless authorized by the Department, on Saturdays, Sundays, or from 3:00 p.m. on the day proceeding until the normal starting time the day after the following holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day.

   d. Provide and maintain all necessary precautions to prevent injury or damage to persons and property from operations covered by this permit.

   e. Furnish, install and maintain all necessary traffic controls and protection during permittee's operations in accordance with the Michigan Manual of Uniform Traffic Control Devices and any supplemental specifications set forth herein.

   f. Notify the Department of completion of work authorized by this permit through CPS, so that final inspection may be made and surety deposit released (where applicable). Surety deposit will not be released until the work authorized by the permit has been completed and inspected, and all inspection charges billable to the permittee are paid.

4. Nothing in this permit shall be construed to grant any rights what so ever to any public utilities, except as to the consent herein specifically given, nor to impair any existing rights granted in accordance with the constitution or laws of this state.

5. Any operations in the trunkline right of way not covered by permit and the appropriate Department specifications are in violation of the jurisdictional authority of the Department, with respect to the control of the trunkline right of way, unless approved by the Department. Any change or alteration in the permit activities requires prior approval of the Department and may require a new permit.

6. Performance of the requirements of this permit is the responsibility of the permittee. The permittee shall complete all operations for which this permit is issued in accordance with the conditions of this permit, by the specified completion date. The permittee shall meet all requirements of the current Department Standard Specifications for Construction, and the Supplemental Specifications set forth on/or incorporated as a part of this permit.

7. The construction, operation and maintenance of the facility covered by this permit shall be performed without cost to the Department unless specified herein. The permittee shall be responsible for the cost of restoration of the state trunkline and right of way determined by the Department to be damaged as a result of the activities of the permittee.

8. Facilities allowed on state trunkline right of way shall be placed and maintained in a manner which will not impair the state trunkline or interfere with the reasonable safe and free flow of traffic. Failure of the permittee to maintain the facilities located within the State trunkline right of way so as not to interfere with the operation, maintenance or use of the state trunkline by the traveling public may result in revocation of the permit.

9. The permittee is solely and fully responsible for all activities undertaken pursuant to the permit. Any and all actions by the Department and those governmental bodies performing permit activities for the Department pursuant to a maintenance contract, including but not limited to any approved reviews and inspections of any nature, permit issuing, and final acceptance or rejection of the work or activity authorized by the permit shall not be construed as a warranty or assumption of liability on the part of the Department or those governmental bodies. It is expressly understood and agreed that any such actions are for the sole and exclusive purposes of the Department and the governmental bodies acting in a governmental capacity. Any such actions by the Department and governmental bodies will not relieve the permittee of its obligations hereunder, nor are such actions by the Department and the governmental bodies to be construed as a warranty as to the propriety of the permittee's performance. The permittee shall indemnify and save harmless the State of Michigan, Michigan Transportation Commission, the Department and all officers, agents and employees thereof, and those governmental bodies performing permit activities for the Department and all officers, agents and employees thereof, pursuant to a maintenance contract, against any and all claims for damages arising from operations covered by this permit except claims resulting from the sole negligence or willful acts or omissions of said indemnities, its agent, or employees. In addition, permittee upon request shall furnish proof of insurance coverage for the term of this permit in an amount pre-specified.

10. This permit is not assignable and not transferable unless specifically agreed to by the Department.

11. The permittee, upon request of the Department, shall immediately remove, cease operations, and surrender this permit, or alter or relocate, at the permittee's own expense, the facility for which this permit is granted. Upon failure to do so, the Department may take any necessary action to protect the trunkline interest and the permittee shall reimburse the Department for its costs in doing same. The permittee expressly waives any right to claim damages or compensation in the event this permit is revoked.

12. The permittee shall, upon request by the Department, furnish a performance surety deposit in the form of a bond, cash, certified check, or (when authorized by the Department) an irrevocable letter of credit in such amount as deemed necessary by the Department to guarantee restoration of the trunkline highway or performance under the conditions of the permit.

13. The permittee hereby acknowledges and agrees that the Department has the right to demand completion by the permittee, or the performance surety, or to complete any uncompleted activity authorized by this permit which adversely affects the operation and/or maintenance of the state trunkline highway, or which is not completed by the expiration date of the permit, including:

    a. Completion of construction of driveway and/or approach (not authorized by annual permit).
    b. Removal of materials.
    c. Restoration of the trunkline facilities and right of way as necessary for the reasonably safe and efficient operations of the trunkline highway.

    The permittee further agrees to immediately reimburse the Department in full for all such costs incurred by the Department upon receipt of billing, and that upon failure to pay, the Department may effect payment with the performance surety deposit. Should the surety deposit be insufficient to cover expenses incurred by the Department, the permittee shall pay such deficiency upon billing by the Department. If the surety deposit exceeds the expense incurred by the Department, any excess will be returned or released to the depositor upon completion of the work to the satisfaction of the Department.

14. The Department reserves the right during the time any or all of the work is being performed to assign an inspector to protect the trunkline interest, and to charge the permittee all such costs incurred. In addition, the permittee may be billed any engineering and review fees incurred by the Department or its agent in connection with the work covered by this permit.

15. Emergency Operations: In time of disaster or emergency, or when utility lines or facilities are so damaged as to constitute a danger to life and/or property of the public, access to the same may be had by the most expeditious route. Work is to be completed in a manner which will provide the traveling public with maximum possible safety and minimize traffic distribution. Notice of such situations shall be given to the nearest police authority and the department as soon as can reasonably be done under the circumstances. During normal Department work hours, the facility owner shall advise the Department of any operations within right of way which affect traffic operations or the highway structure or facilities prior to performance of the work. After normal Department work hours, the permittee, at the beginning of the first working day after the emergency operation, shall advise the Department of any operations which affect traffic operations or the highway structures and facilities. If determined necessary by the Department, the permittee shall secure an individual permit for such work after notification.

16. Upon the Department's request, as built drawings of work performed will be furnished to the Department within 30 days after completion of the work.

17. The permittee shall give notice to public utilities in accordance with Act 174 of 2013, as amended, and comply with all applicable requirements of this act. The permittee shall also comply with requirements of Act 451, P.A. of 1994, as amended.

18. The permittee acknowledges that the Department is without liability for the presence of the permittee's facility which is located within the trunkline right of way. Acceptance by the Department of work performed, and/or notice of termination of performance obligations for the surety and/or the permittee do not relieve the permittee of full responsibility for the permittee's work or for the presence of the permittee's facility in the trunkline right of way.

19. Where the Department has accepted an Indemnification Commitment in lieu of bond and/or insurance policies, such commitment is incorporated into this permit by reference.

20. It is illegal to discharge substances other than storm water into the Department's storm sewer system unless permission has been obtained in writing for other discharges.

21. The permittee shall be responsible for obtaining information on permitted environmental site closures within MDOT right of way. MDOT has implemented a program that allows environmental contamination to remain within the right of way by use of a permit. Issued permit information can be obtained from the Region/TSC in which the permit is issued. If the permittee will encounter a site area identified as a site closure permit area, the permittee shall follow instructions and conditions set forth in Supplemental Specifications #3 and specifications found in form 2205-C, "Special Conditions for Underground Construction".

SUPPLEMENTAL SPECIFICATIONS

1. Construction and Maintenance of Facilities – To construct and maintain utility crossings of limited access highways, access for the utility's service vehicles may be from county roads, service roads, and openings authorized in limited access right of way fences. The construction of utilities across limited access highways should be for the purpose of serving a general area rather than providing individual services, unless extenuating circumstances necessitate such crossings.

   Equipment, vehicles or personnel will not operate within a distance of 30 feet from the edge of the pavement of roadways or ramps on limited access highways. At locations where utilities have been constructed in medians having a width greater than 80 feet or have otherwise been allowed to remain or to be constructed in limited access right of way, ingress and egress shall be by such routes as specified by the Department, which may also specify additional safety provisions.

2. Restoration- Restoration of the trunkline highway and right of way will be such that it will provide a condition equal to or better than the original condition, in accordance with Michigan Department of Transportation Standard Specifications.

3. Excavation and Disposal of Excavated Material – The permittee shall provide and place the necessary sheeting, shoring and bracing required to prevent caving, loss or settlement of foundation material supporting the pavement, or any other highway installation such as sewers, culverts, etc. The permittee shall assume the full responsibility for this protection and shall not proceed in these areas before approval of the methods by the Department.

   Construction equipment and excavating material shall not be stocked in such locations that it creates a traffic hazard or interferes with the flow of traffic; and on limited access highways, shall be a minimum of 30 feet from the traveled way. Sod and topsoil shall be stacked separately from other excavated material. The permittee shall dispose of all surplus and unsuitable material outside of the limits of the highway, unless the permit provides for disposal at approved locations within right of way. In the latter case, the material shall be leveled and trimmed in an approved manner.

   When the permittee is excavating within trunkline right of way and discovers existing contaminated soil and/or an abandoned underground storage tank, special permit specifications entitled "Special Conditions for Underground Construction" (Form 2205-C) shall apply.

4. Utility Cuts, Trenches and Pavement Replacement – Utility crossing by pavement cutting and removal are generally prohibited. If extenuating circumstances make tunneling, boring and jacking impractical pavement cutting may be used with approval of the Department. All utility cuts, trenching and pavement replacement shall comply with the requirements of the Standard Specifications and the Standard Plan "Utility Cuts, Trenches and Pavement Replacement". Unless otherwise specified, cuts in concrete residential and commercial drives shall be as above; except that the patch width shall be a minimum of 3 feet and the remaining slab from patch to existing joint shall be a minimum of 3 feet. Backfill shall be made with sand-gravel as specified in the Standard Specifications, unless otherwise directed. After the backfill has been placed and compacted by controlled density method, the pavement shall be replaced with new pavement of the original type and quality, unless at the season of the year when it is not feasible to replace pavement in kind. In this case, a temporary surface of bituminous material shall be placed with Department approval and later replaced with pavement of the original type at the applicant's expense. Other pavement types may be allowed with prior approval of the Department.

5. Crossing Roadbed by Tunneling or Boring and Jacking – All crossing of roadbed operations involving tunneling, boring and jacking shall comply with the Department's special provisions for such work.

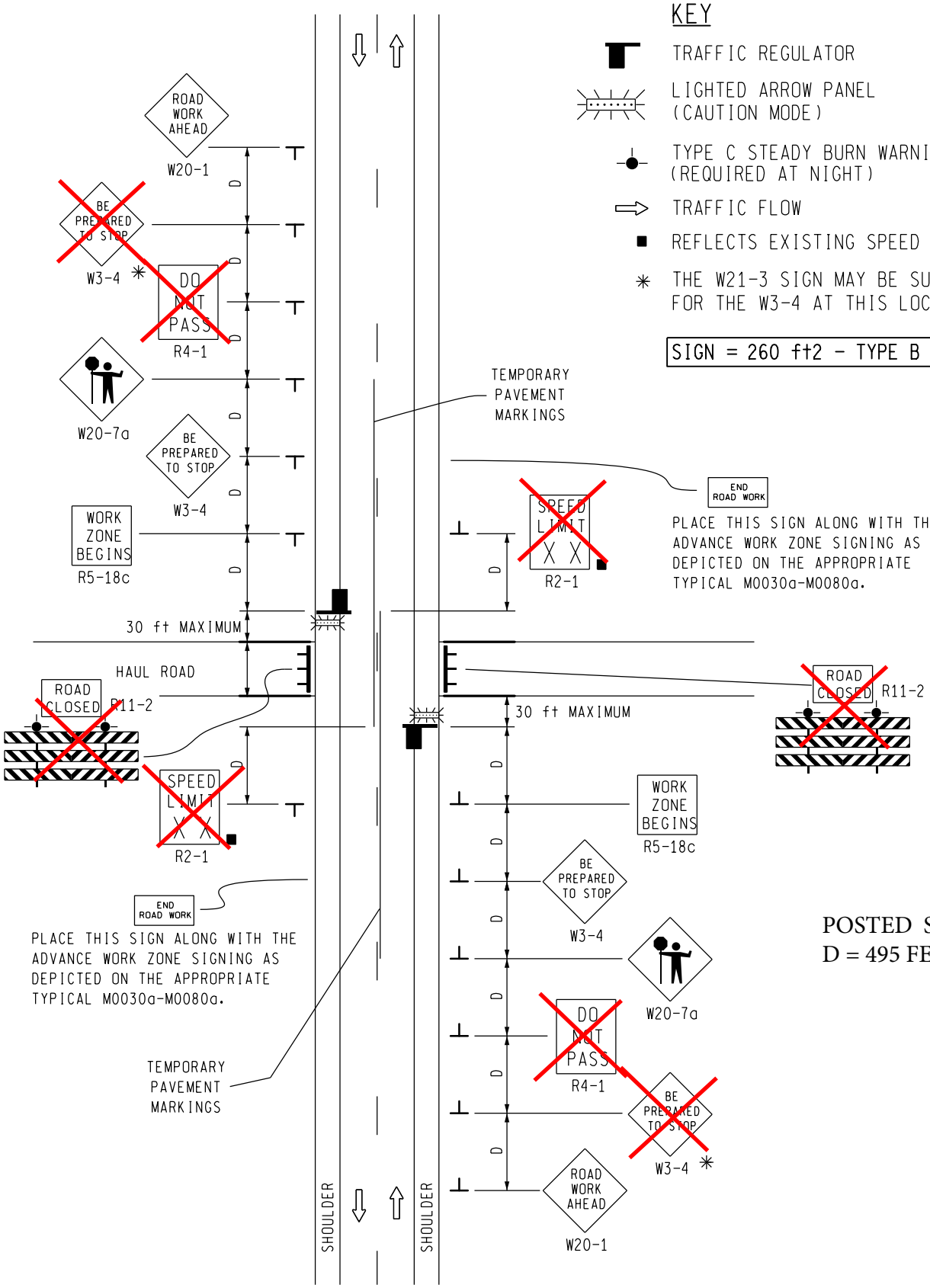
6. Backfilling and Compacting Backfill – Unless otherwise specified, all trenches, holes and pits shall be filled with sound earth or with sand-gravel if so provided, placed in successive layers not more than 9 inches in depth, loose measure, and each layer shall be thoroughly compacted by tamping. All backfill compaction will be subject to check by the controlled density method.

7. Depth of Cover Method- Unless otherwise authorized, pipes shall be placed to a depth that will provide not less than 4 feet of cover between the top of the roadway surface and the pipe, 3 feet cover below the ditch line and the pipe.

8. Trees:

   a. The permittee is responsible for obtaining permission from abutting owners when trimming or removing trees on easement right of way.
   b. Tree removal or trimming may be undertaken only after submission of an "Advance Notice" through CPS, a field review by the Region Resource Specialist and an approved copy of the advanced notice is e-mailed to the permittee.
   c. Limbs, logs, stumps and litter shall be disposed of in a manner acceptable to the Department.
   d. Tree roots shall be bored a distance of one foot for each one inch of trunk diameter for underground utility installations

9. Aerial Wire Crossings – Vertical clearance of wires, conductors and cables over state trunkline shall not be less than required by Section 232 of the National Electrical Safety Code, except in no case shall the under-clearance below any wire, conductor, or cable, under any temperature or loading condition, be less than eighteen feet (18').



POSTED SPEED = 55 MPH
D = 495 FEET

NOT TO SCALE

MDOT Michigan Department of Transportation TRAFFIC AND SAFETY MAINTAINING TRAFFIC TYPICAL	TYPICAL TEMPORARY TRAFFIC CONTROL FOR A HAUL ROAD ON A TWO-LANE TWO WAY ROADWAY WHERE A TOTAL TRAFFIC STOPPAGE IS REQUIRED UTILIZING TRAFFIC REGULATORS, NO SPEED REDUCTION		
DRAWN BY: CON:AE:djf CHECKED BY: BMM:CRB	OCTOBER 2011 PLAN DATE:	M0170a	SHEET 1OF 2
FILE: PW RD/TS/Typicals/Signs/MT NON FWY/M0170a.dgn REV. 10/06/2011			

NOTES

1A. SEE **M0020a** FOR "D" VALUES.

2. ALL NON-APPLICABLE SIGNING WITHIN THE CIA SHALL BE MODIFIED TO FIT CONDITIONS, COVERED OR REMOVED.

3. DISTANCES BETWEEN SIGNS, THE VALUES FOR WHICH ARE SHOWN IN TABLE D, ARE APPROXIMATE AND MAY NEED ADJUSTING AS DIRECTED BY THE ENGINEER.

3A. THE "WORK ZONE BEGINS" (R5-18c) SIGN SHALL BE USED ONLY IN THE INITIAL SIGNING SEQUENCE IN THE WORK ZONE. SUBSEQUENT SEQUENCES IN THE SAME WORK ZONE SHALL OMIT THIS SIGN AND THE QUANTITIES SHALL BE ADJUSTED APPROPRIATELY.

6. WHEN CALLED FOR IN THE FHWA ACCEPTANCE LETTER FOR THE SIGN SYSTEM SELECTED, THE TYPE A WARNING FLASHER, SHOWN ON THE WARNING SIGNS, SHALL BE POSITIONED ON THE SIDE OF THE SIGN NEAREST THE ROADWAY.

7. ALL TEMPORARY SIGNS, TYPE III BARRICADES, THEIR SUPPORT SYSTEMS AND LIGHTING REQUIREMENTS SHALL MEET NCHRP 350 CRASHWORTHLY REQUIREMENTS STIPULATED IN THE CURRENT EDITION OF THE MICHIGAN MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, THE CURRENT EDITION OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION, THE STANDARD PLANS AND APPLICABLE SPECIAL PROVISIONS. ONLY DESIGNS AND MATERIALS APPROVED BY MDOT WILL BE ALLOWED.

9. ALL TRAFFIC REGULATORS SHALL BE PROPERLY TRAINED AND SUPERVISED.

9A. IN ANY OPERATION INVOLVING MORE THAN ONE TRAFFIC REGULATOR, ONE PERSON SHOULD BE DESIGNATED AS HEAD TRAFFIC REGULATOR.

10. ALL TRAFFIC REGULATORS' CONDUCT, THEIR EQUIPMENT, AND TRAFFIC REGULATING PROCEDURES SHALL CONFORM TO THE CURRENT EDITION OF THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MMUTCD) AND THE CURRENT EDITION OF THE MDOT HANDBOOK ENTITLED "TRAFFIC REGULATORS INSTRUCTION MANUAL."

11. WHEN TRAFFIC REGULATING IS ALLOWED DURING THE HOURS OF DARKNESS, APPROPRIATE LIGHTING SHALL BE PROVIDED TO SUFFICIENTLY ILLUMINATE THE TRAFFIC REGULATOR'S STATIONS.

14. ADDITIONAL SIGNING AND/OR ELONGATED SIGNING SEQUENCES SHOULD BE USED WHEN TRAFFIC VOLUMES ARE SIGNIFICANT ENOUGH TO CREATE BACKUPS BEYOND THE W3-4 SIGNS.

15. THE HAND HELD (PADDLE) SIGNS REQUIRED BY THE MMUTCD TO CONTROL TRAFFIC WILL BE PAID FOR AS PART OF FLAG CONTROL.

17. THE HAND HELD (PADDLE) SIGNS USED FOR THIS SEQUENCE SHALL DISPLAY "STOP" ON BOTH SIDES. WHEN THE TRAFFIC REGULATOR IS RELEASING TRAFFIC, THE "STOP" PADDLE SHALL BE TURNED 1/4 TURN AWAY FROM TRAFFIC.

18. CARE SHOULD BE TAKEN IN THE SELECTION OF THE LOCATION FOR THE HAUL ROAD TO ASSURE GOOD SIGHT DISTANCE FOR THE MOTORIST. HORIZONTAL AND VERTICAL CURVES AND INTERSECTING ROADWAYS IN CLOSE PROXIMITY TO THE HAUL ROAD LOCATION SHOULD BE AVOIDED AS MUCH AS POSSIBLE. THE LOCATION AND WIDTH OF THE HAUL ROAD REQUIRES PRIOR APPROVAL OF THE ENGINEER.

19. ALL EQUIPMENT OPERATORS WHO USE THE HAUL ROAD SHALL STOP AND VERIFY THAT THE TRAFFIC REGULATORS HAVE TRAFFIC STOPPED AND UNDER CONTROL BEFORE ENTERING ONTO THE HIGHWAY.

20. WHEN THE HAUL ROAD IS NOT IN USE, LIGHT TYPE III BARRICADES WITH "ROAD CLOSED" SIGNS SHALL BE IN PLACE, AND SHALL EXTEND COMPLETELY ACROSS THE HAUL ROAD.

SIGN SIZES

DIAMOND WARNING	- 48" x 48"
R2-1 REGULATORY	- 48" x 60"
R4-1 REGULATORY	- 48" x 60"
R5-18c REGULATORY	- 48" x 48"
R11-2 REGULATORY	- 48" x 30"

NOT TO SCALE

MDOT Michigan Department of Transportation
TRAFFIC AND SAFETY
MAINTAINING TRAFFIC TYPICAL

TYPICAL TEMPORARY TRAFFIC CONTROL FOR A HAUL ROAD ON A TWO-LANE TWO WAY ROADWAY WHERE A TOTAL TRAFFIC STOPPAGE IS REQUIRED UTILIZING TRAFFIC REGULATORS, NO SPEED REDUCTION

DRAWN BY: CON:AE:djf	OCTOBER 2011	M0170a	SHEET 2 OF 2
CHECKED BY: BMM:CRB	PLAN DATE:		

FILE: PW RD/TS/Typicals/Signs/MT NON FWY/M0170a.dgn REV. 10/06/2011

MINIMUM MERGING TAPER LENGTH "L" (FEET)

OFFSET	POSTED SPEED LIMIT, MPH (PRIOR TO WORK AREA)										
FEET	25	30	35	40	45	50	55	60	65	70	
1	10	15	20	27	45	50	55	60	65	70	TAPER LENGTH "L" IN FEET
2	21	30	41	53	90	100	110	120	130	140	
3	31	45	61	80	135	150	165	180	195	210	
4	42	60	82	107	180	200	220	240	260	280	
5	52	75	102	133	225	250	275	300	325	350	
6	63	90	123	160	270	300	330	360	390	420	
7	73	105	143	187	315	350	385	420	455	490	
8	83	120	163	213	360	400	440	480	520	560	
9	94	135	184	240	405	450	495	540	585	630	
10	104	150	204	267	450	500	550	600	650	700	
11	115	165	225	293	495	550	605	660	715	770	
12	125	180	245	320	540	600	660	720	780	840	
13	135	195	266	347	585	650	715	780	845	910	
14	146	210	286	374	630	700	770	840	910	980	
15	157	225	307	400	675	750	825	900	975	1050	

THE FORMULAS FOR THE MINIMUM LENGTH OF A MERGING TAPER IN DERIVING THE "L" VALUES SHOWN IN THE ABOVE TABLES ARE AS FOLLOWS:

$$"L" = \frac{W \times S^2}{60}$$ WHERE POSTED SPEED PRIOR TO THE WORK AREA IS 40 MPH OR LESS

"L" = S x W WHERE POSTED SPEED PRIOR TO THE WORK AREA IS 45 MPH OR GREATER

L = MINIMUM LENGTH OF MERGING TAPER
S = POSTED SPEED LIMIT IN MPH PRIOR TO WORK AREA
W = WIDTH OF OFFSET

TYPES OF TAPERS	TAPER LENGTH
UPSTREAM TAPERS	
MERGING TAPER	L - MINIMUM
SHIFTING TAPER	1/2 L - MINIMUM
SHOULDER TAPER	1/3 L - MINIMUM
TWO-WAY TRAFFIC TAPER	100 ' - MAXIMUM
DOWNSTREAM TAPERS (USE IS OPTIONAL)	100 ' - MINIMUM (PER LANE)

MDOT Michigan Department of Transportation
TRAFFIC AND SAFETY
MAINTAINING TRAFFIC TYPICAL

TABLES FOR "L", "D" AND "B" VALUES

DRAWN BY: CON:AE:djf	JUNE 2006 PLAN DATE:	M0020a	SHEET 1 OF 2
CHECKED BY: BMM			
FILE: K:/DGN/TSR/STDS/ENGLISH/MNTTRF/M0020a.dgn	REV. 08/21/2006		

DISTANCE BETWEEN TRAFFIC CONTROL DEVICES "D" AND LENGTH OF LONGITUDINAL BUFFER SPACE ON "WHERE WORKERS PRESENT" SEQUENCES

"D" DISTANCES	POSTED SPEED LIMIT, MPH (PRIOR TO WORK AREA)									
	25	30	35	40	45	50	55	60	65	70
D (FEET)	250	300	350	400	450	500	550	600	650	700

GUIDELINES FOR LENGTH OF LONGITUDINAL BUFFER SPACE "B"

SPEED* MPH	LENGTH FEET
20	33
25	50
30	83
35	132
40	181
45	230
50	279
55	329
60	411
65	476
70	542

* POSTED SPEED, OFF PEAK 85TH PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED

1 BASED UPON AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) BRAKING DISTANCE PORTION OF STOPPING SIGHT DISTANCE FOR WET AND LEVEL PAVEMENTS (A POLICY ON GEOMETRIC DESIGN OF HIGHWAY AND STREETS), AASHTO. THIS AASHTO DOCUMENT ALSO RECOMMENDS ADJUSTMENTS FOR THE EFFECT OF GRADE ON STOPPING AND VARIATION FOR TRUCKS.

MDOT Michigan Department of Transportation

TRAFFIC AND SAFETY

MAINTAINING TRAFFIC TYPICAL

TABLES FOR "L", "D" AND "B" VALUES

DRAWN BY: CON:AE:djf	JUNE 2006	M0020a	SHEET 2 OF 2
CHECKED BY: BMM	PLAN DATE:		
FILE: K:/DGN/TSR/STDS/ENGLISH/MNTTRF/M0020a.dgn	REV. 08/21/2006		

ROUTE	COUNTY	PROJECT	CONTROL SECTION	SHEET NO.
M-26	HOUGHTON	31-21	31013	21

OPERATION	BY	DATE
DRAWN	R.DOLHOFF	3-75
POSTED	K.E.PETERSON	6-75
INKED	K.E.PETERSON	7-75
CHECKED	"	7-75
REVISED		
REVISED		
REVISED		

Gov't Lot 3
Sec. 12

Curve Data
Δ = 6°41' L
D = 3°00'
R = 1910.08'
T = 111.5'
L = 222.8'
PI = 448+26.1

APP E⅛ Line

S0°42'45"W

Gov't Lot 1
Sec. 12

TORCH LAKE TWP.
T55N-R33W

Curve Data
Δ = 8°47' L
D = 0°51'
R = 6760.96'
T = 517.7'
L = 1033.3'
PI = 466+80.8

TORCH LAKE TWP.
T55N-R32W

Gov't Lot 2
Sec. 7

"HUBBEL"

MINERAL RANGE R.R.
Now SOO LINE R.R.

PLAT OF MELLONSVILLE

TENTH ST.

PC 441+14.6

PI 448+26.1

PT 449+37.4

EAST ST.

Plat of TOWN of GROVER

GUCK ST.

MYRTLE ST.

MILDRED ST.

PC 461+63.1

DAISY ST.

PI 466+80.8

APP Sec Line
RANGE LINE

Gov't Lot 3
Sec. 7

APP E&W ¼ Line

PT 471+96.4

66' Ex. ROW

N43°59'E

G04 of 31013

66' Ded. ROW

N37°18'E

DUNCAN AVE.

N48°27'E

Ex. ROW

N39°40'E

CALUMET & HECLA R.R.

66' Ex. ROW

ARAGON ST.

GREGORY ST.

PC 452+96.2

PI 453+52.3

PT 454+07.8

APP S ¼ Line

Proj 31-21

Curve Data
Δ = 11°09' R
D = 10°00'
R = 573.67'
T = 56.0'
L = 111.5'
PI = 453+52.3

TORCH LAKE

SW-NW
Sec. 7

APP W ¼ Line

TORCH LAKE TWP.
T55N-R32W

Curve Data
Δ = 24°05' L
D = 4°00'
R = 1432.69'
T = 305.6'
L = 602.0
PI = 505+63.6

Defl. Data
Δ = 0°22' L
PI = 499+0

SE-SW
Sec. 6

CALUMET & HECLA R.R.

APP Sec Line

PT 508+60.0

APP N&S ¼ Line

G05 of 31013

MINERAL RANGE R.R.
Now SOO LINE R.R.

HOUGHTON Co. TRACTION CO.

N39°40'E

66' Ex. ROW

PI 499+0

G06 of 31013

PC 502+58.0

PI 505+63.6

N39°18'E

N15°13'E

66' Ex. ROW

Gov't Lot 4
Sec. 6

CALUMET & HECLA R.R.

Proj 31-21

Gov't Lot 2
Sec. 7

Gov't Lot 1
Sec. 7

FILE NO.	31-R-1	ROUTE	PROJECT	CONTROL SECTION	SHEET NO.
		M-26	31-21	31013	21

ROUTE	COUNTY	PROJECT	CONTROL SECTION	SHEET NO.
M-26	HOUGHTON	31-21	31013	21

OPERATION	BY	DATE
DRAWN	R.DOLHOFF	3-75
POSTED	K.E.PETERSON	6-75
INKED	K.E.PETERSON	7-75
CHECKED	"	7-75
REVISED		
REVISED		
REVISED		

Gov't Lot 3
Sec. 12

Curve Data
Δ = 6°41' L
D = 3°00'
R = 1910.08'
T = 111.5'
L = 222.8'
PI = 448+26.1

APP E⅛ Line

S0°42'45"W

Plat of TOWN of GROVER

EAST ST.

GUCK ST.

PLAT OF MELLONSVILLE

TENTH ST.

PC 447+14.6

PI 448+26.1

PT 449+37.4

N43°59'E

G04 of 31013

ARAGON ST.

GREGORY ST.

66' Ded. ROW

N37°18'E

DUNCAN AVE.

N48°27'E

PC 452+96.2

PI 453+52.3

PT 454+07.8

Gov't Lot 1
Sec. 12

"HUBBEL"

MINERAL RANGE R. R.
Now SOO LINE R.R.

MYRTLE ST.

MILDRED ST.

PC 461+63.1

DAISY ST.

TORCH LAKE TWP.
T55N-R33W

Curve Data
Δ = 8°47' L
D = 0°51'
R = 6760.96'
T = 517.7'
L = 1033.3'
PI = 466+80.8

PI 466+80.8

Ex. ROW

66' Ex. ROW

App Sec Line
RANGE LINE

Gov't Lot 3
Sec. 7

TORCH LAKE TWP.
T55N-R32W

Gov't Lot 2
Sec. 7

APP E&W ¼ Line

PT 471+96.4

Area to be ditched.

N39°40'E

CALUMET & HECLA R.R.

66' Ex. ROW

Proj 31-21

Gov't Lot 2
Sec. 12

Curve Data
Δ = 11°09' R
D = 10°00'
R = 573.67'
T = 56.0'
L = 111.5'
PI = 453+52.3

APP S¼ Line

TORCH LAKE

SW-NW
Sec. 7

APP W⅛ Line

TORCH LAKE TWP.
T55N-R32W

Curve Data
Δ = 24°05' L
D = 4°00'
R = 1432.69'
T = 305.6'
L = 602.0
PI = 505+63.6

Defl. Data
Δ = 0°22' L
PI = 499+0

SE-SW
Sec. 6

CALUMET & HECLA R.R.

APP Sec Line

PT 508+60.0

APP N&S ¼ Line

G05 of 31013

MINERAL RANGE R. R.
Now SOO LINE RR

HOUGHTON Co. TRACTION CO.

N39°40'E

66' Ex. ROW

PI 499+0

G06 of 31013

PC 502+58.0

PI 505+63.6

N39°18'E

N15°13'E

66' Ex. ROW

Gov't Lot 4
Sec. 6

Proj 31-21

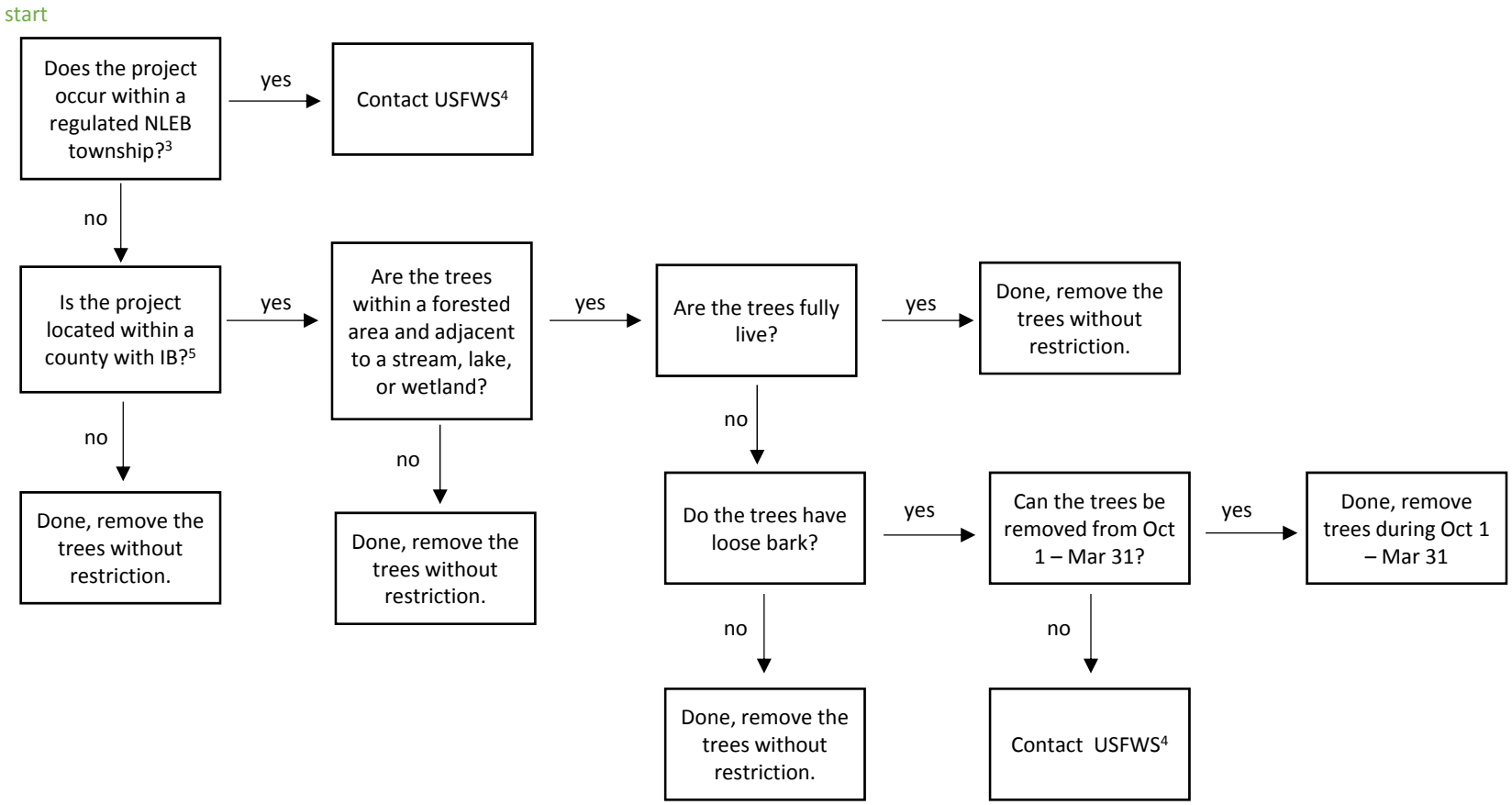
Gov't Lot 2
Sec. 7

Gov't Lot 1
Sec. 7

FILE NO.	31-R-1	ROUTE	PROJECT	CONTROL SECTION	SHEET NO.
		M-26	31-21	31013	21

Criteria for Determining Northern Long-Eared and Indiana Bat Habitat

NLEB[1]/IB[2] Non-Federal Decision Tree (last updated 8-9-2016)



[1] NLEB = Northern Long-Eared Bat

[2] IB = Indiana Bat

[3] See pages 3-5 here: https://www.fws.gov/midwest/eastlansing/te/nleb/pdf/MINLEBFactSheet22July2016.pdf

[4] USFWS = U.S. Fish and Wildlife Service, East Lansing Field Office, 2651 Coolidge Rd, East Lansing, MI (517)-351-2555

[5] See Michigan county map: http://www.fws.gov/Midwest/Endangered/section7/s7process/mammals/inba/inbaMIlifehist.html

Construction Advisory

CA 2013-03
May 1, 2013

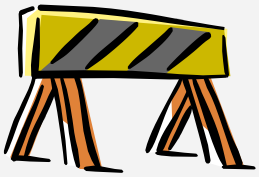
From Brenda O'Brien, Engineer of Construction Field Services

MDOT-Construction Field Services Division
P.O. Box 30049
Lansing, Michigan 48909
Phone/517-322-1087
Fax/517-322-5664
www.michigan.gov/mdot/

Index: Environment

Questions regarding this Construction Advisory should be directed to:

Jason Gutting, Engineer of Construction Operations at 517-636-6334 or guttingj@michigan.gov



BJO:JG

Historical and Archaeological Discoveries During Construction Operations

This construction advisory applies to all construction, maintenance, permits, and utility projects on MDOT right-of-way.

In the event that any staff (MDOT, consultant, local agency, contractor, etc.) encounter bones, artifacts, or buried features of possible historical or archaeological significance during construction operations on MDOT right-of-way, they must immediately cease operations in that location and notify the MDOT TSC construction engineer.

The MDOT TSC construction engineer must, immediately upon stopping work in the affected area, contact the MDOT archaeologist for consultation and direction. Communications are to be directed to the following individuals.

Primary Contact:
James A. Robertson, Ph.D.
MDOT Archaeologist
517-335-2637 (office)
Robertsonj3@michigan.gov

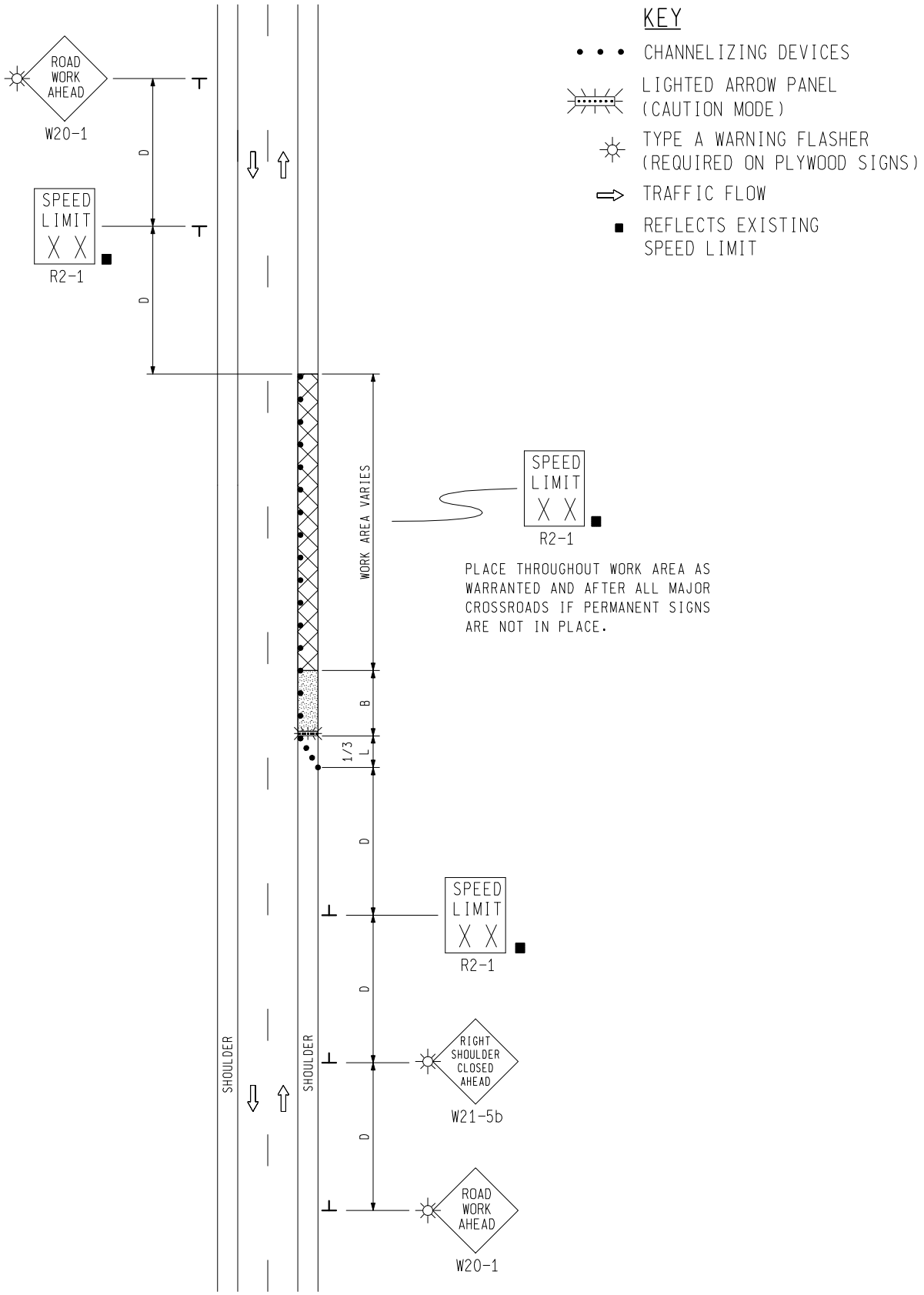
Secondary Contact (if primary is not available):
Christine N. Stephenson, M.A.
Staff Archaeologist
517-243-2818 (cell)
Stephensonc@michigan.gov

If bones are discovered and there is no reasonable doubt that they are human bones, the MDOT TSC construction engineer must immediately also contact the local law enforcement agency.

It should be noted that per Michigan law, any person who willfully digs up, disinters, or moves human remains from their place of burial, or who aids in such activities without being lawfully authorized to do so can be found guilty of a felony punishable by up to 10 years in prison and a fine of up to $5,000.

Construction Field Services is working with the Environmental Services Section to develop a Bureau of Highway Instructional Memorandum with additional details.

Please share this construction advisory with consultants, local agencies, maintenance supervisors/coordinators, and permit/utility staff in your area as well as TSC staff.



NOT TO SCALE

MDOT Michigan Department of Transportation OPERATIONS	SHOULDER CLOSURE ON A TWO-LANE, TWO-WAY ROADWAY NO SPEED REDUCTION	DURATION: SHORT-TERM STATIONARY 01/01/07 REV. DATE: | MD - 11a | PAGE A3

MDOT STANDARD CONDITIONS FOR DRIVEWAY CONSTRUCTION

REVISIONS: 8/10/10

GRADING AND SLOPES:

1. The driveway including the radii shall be located entirely within the area between the permittee's property lines as extended to the centerline of the highway.

2. The surfacing within the highway shoulder area must be sloped in such a manner that it corresponds to the slope of the existing shoulder (MDOT recommends a shoulder slope away from the traveled lane at a rate of ½" to ¾" per foot unless the driveway location is within the limits of a curve). The new surfacing shall match into the existing highway surfacing such that a snowplow removing snow along the shoulder does not encounter an obstruction as a result of this work.

3. Surface run-off water from this property shall **not** be drained directly into the highway right-of-way, unless approved by MDOT and field conditions warrant.

4. The trunkline foreslope (the area from the highway shoulder to the bottom of the ditchline) shall be graded to a slope of 1' vertical to 4' horizontal, unless permit conditions state otherwise.

5. Applicants may need to contact the Michigan Department of Natural Resources and Environment for additional permit requirements.

6. Side slopes from the edge of the new driveway to the existing ground shall be graded to 1' vertical to 6' horizontal slope. These side slopes shall be "blended" into the trunkline foreslope by constructing a suitable radius as determined by field conditions.

REGARDING CULVERTS

7. Headwalls are **not** allowed for culvert ends, nor shall any large rocks or decorative landscaping work be constructed that **may constitute a vertical obstruction**.

8. Culvert must be new, either corrugated metal or plastic, and a minimum of 18" diameter, unless field conditions warrant a smaller culvert (MDOT will determine the culvert size needed).

9. Corrugated metal and plastic culverts shall have standard metal flared end sections, unless location requires a special sloped end section (MDOT personnel will determine).

10. Plastic culverts shall conform to requirements of AASHTO M294 (verify through supplier).

11. Recommend backfill over the culvert pipe shall be granular material, Class III (clean sand), except that no stones larger than 1" in diameter shall be placed within 6" of the pipe. The backfill must be placed in layers of no more than ½ of the pipe diameter thickness, and compacted such that settlement does not occur within the highway right-of-way.

12. The entire length of pipe shall be covered with backfill (from end section to end section).

13. A sloped culvert end section may be required on the drive culvert if the proposed location is within MDOT's safety clear zone distance (30 feet out from white fog line). Please indicate the distance from the highway centerline to the proposed driveway culvert on Form PA-09 where requested. You will be notified in the contents of your approved permit if this item is required. (A detail of this requirement will also be included with the approved copy of your permit).

REGARDING CONSTRUCTION OPERATION

14. Highway pavement and shoulder areas are to be kept clear from excavated or imported material. The applicant is held responsible for any corrective action needed within this area.

15. Traffic control for permit work within the right-of-way is the responsibility of permittee and must be in accordance with the Michigan Manual of Uniform Traffic Control Devices (Work Zone Typical signing will be provided with your permit). Safety signing must be in place when work is being performed, and barricades placed around the work area. Flag control will be required if the operation uses any part of the trunkline thoroughfare. (Two flaggers are required, and they must have the proper clothing, protective equipment, and slow/stop paddle signs). There must be no work performed near the highway shoulder area following the sunset hour.

REGARDING RESTORATION

16. **All new slopes and disturbances within the highway right-of-way shall be restored using 3" of topsoil, seed, fertilizer, and mulch.** Turf re-establishment is required prior to release from the performance obligations. **MDOT requires that driveway side sloped be constructed to the required 1 on 6 slope, and that vegetation (not rock or timbers) be established on these slopes.**

17. Any disturbance caused to the existing ditch bottom shall be restored with mulch blanket or other MDOT approved restoration methods; this shall also apply to any steep slope which doesn't produce vegetation due to erosion. **The applicant is responsible for installing proper erosion control items within the construction influence area until such time that restoration has been established.** MDOT typically recommends silt fence or hay/straw bales to satisfy this requirement.

18. The applicant shall contact MDOT Permit Division (phone 906-485-4270) upon completion of all the work; a final inspection will be scheduled to verify compliance of permit conditions.

MISCELLANEOUS

19. All other items as specified by the attached General Conditions (form 2205-1) apply to these permit requirements as applicable.

20. If this driveway develops into service for some type of future business, you will be required to contact MDOT and upgrade this driveway in accordance with our current commercial driveway regulations.

21. The permit applicant is to ensure that all respective conditions that apply to this construction work be completed in accordance with the attached provisions.

22. Tree removal/brushing work done within the highway right-of-way is generally allowed **only as necessary to effectively construct the new driveway.** All logs, limbs, debris, (etc.) must be removed from within the highway right-of-way as part of the cleanup and restoration efforts.

23. The applicant is responsible for contacting "MISS DIG" (800-482-7171) prior to starting excavation work. **If any existing utilities are damaged during construction, the respective utility company must be contacted for repair.** If any known or unknown drainage piping is encountered and damaged, repair shall be made using manufacturer-type connectors of similar size and type, and the MDOT Permit Agent notified

NOTES

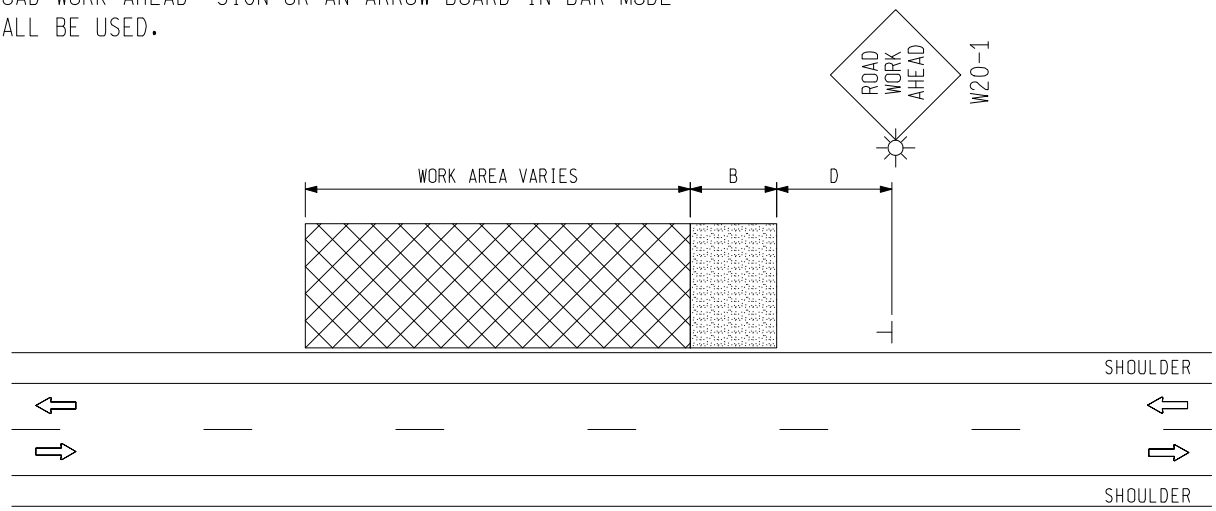
NO SIGNS ARE REQUIRED IF DURATION IS SHORT-DURATION OR MOBILE.

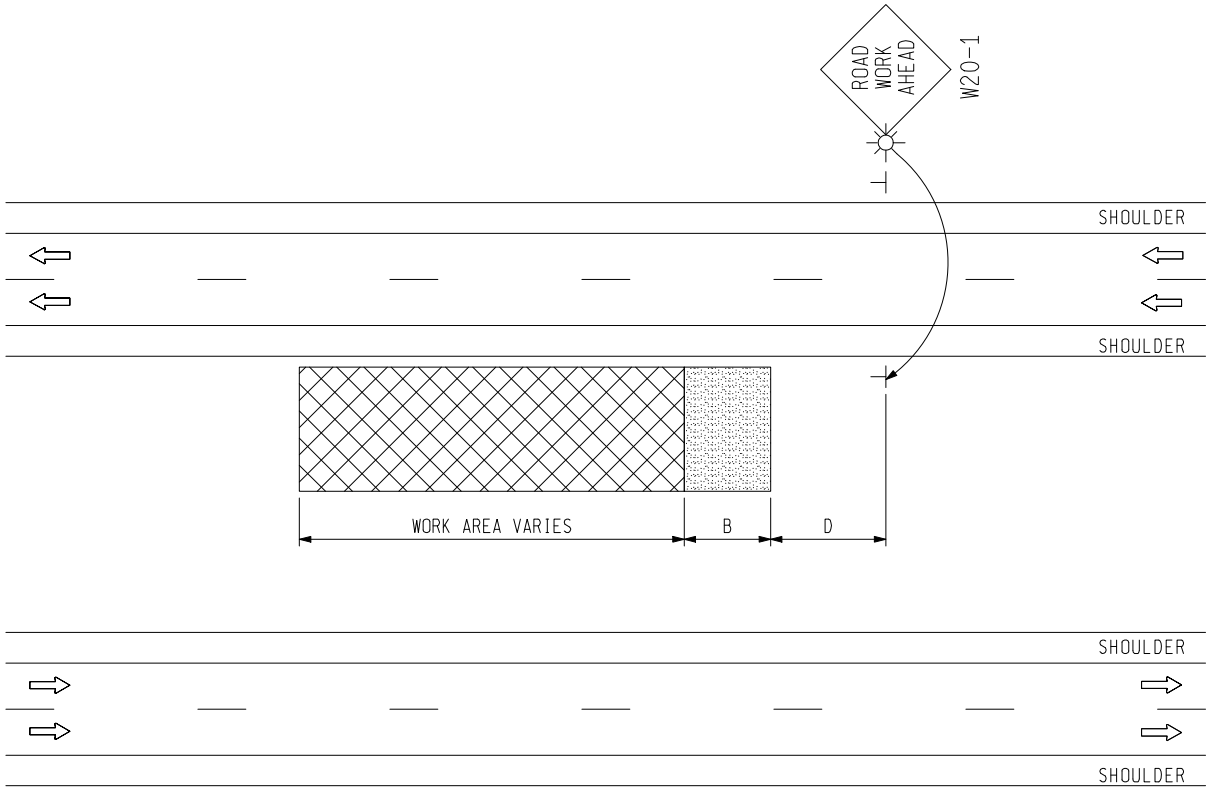
IF THE OPERATION HAS A VEHICLE(S) PARKED ON THE SHOULDER, OR VEHICLES ACCESSING THE WORK SITE VIA THE HIGHWAY OR CROSSING THE HIGHWAY TO PERFORM OPERATIONS, A "ROAD WORK AHEAD" SIGN OR AN ARROW BOARD IN BAR MODE SHALL BE USED.

KEY

TYPE A WARNING FLASHER (REQUIRED ON PLYWOOD SIGNS)

TRAFFIC FLOW





NOT TO SCALE

MDOT Michigan Department of Transportation OPERATIONS	WORK OUTSIDE SHOULDER	DURATION: APPLIES TO ALL DURATIONS	
		01/01/07 REV. DATE:	MD - 01 PAGE A2

MDOT
Michigan Department of Transportation

INDIVIDUAL CONSTRUCTION PERMIT

For Operations within State Highway Right-of-Way

Issued To:
B & B CONTRACTING, CALUMET, INC.

55670 STATE HIGHWAY M26
CALUMET MI 49913-2826

Contact:
Brian Bonen
906-337-0017(O) 906-281-2587(Cell)
babonen@hotmail.com

Permit Number: 31013-047793-17-071017
Permit Type: Individual Application
Permit Fee: $30.00
Effective Date: Jul 10, 2017 to Sep 22, 2017
Bond Numbers:
Liability Insurance Expiration Date: Jan 01, 2018

Contractor:
B & B CONTRACTING, CALUMET, INC.

55670 Hwy M26
Calumet MI 49913

Contact:
Hans Haapala

906-337-0017(O) 906-281-6908(Cell)
hanshaapala@gmail.com

THIS PERMIT IS VALID ONLY FOR THE FOLLOWING PROPOSED OPERATIONS:

PURPOSE:
TRAFFIC CONTROL SEQUENCE FOR HAUL TRUCKS

STATE ROUTE: M-26 TOWNSHIP OF: Torch Lake COUNTY: Houghton County

TOWN	RANGE	SECTION
T 55 N	R 32 W	07

NEAREST INTERSECTION:	SIDE OF ROAD:	DISTANCE TO NEAREST INTERSECTION: (in feet)	DIRECTION TO NEAREST INTERECTION:
W 21ST STREET	E W	1,450.00	South

CONTROL SECTION:	MILE POINT FROM:	MILE POINT TO:	LOCATION: LEFT	MEDIAN	RIGHT	TRANSVERSE
31013	8.500	9.500	X		X	

REQUISITION NUMBER: WORK ORDER NUMBER: MDOT JOB NUMBER: ORG JOB NUMBER:

31013-047793-17-071017 Issued To:B & B CONTRACTING, CALUMET, INC.

This permit is incomplete without "General Conditions and Supplemental Specifications"

I certify that I accept the following:

1. I am the legal owner of this property or facility, the owner's authorized representative, or have statutory authority to work within state highway Right-of-Way.
2. Commencement of work set forth in the permit application constitutes acceptance of the permit as issued.
3. Failure to object, ***within ten (10) days*** to the permit as issued constitutes acceptance of the permit as issued.
4. If this permit is accepted by either of the above methods, I will comply with the provisions of the permit.
5. I agree that Advance Notice for Permitted Activities for shall be submitted **5 days prior** to the commencement of the proposed work.

   I agree that Advance Notice for Permitted Utility Tree Trimming and Tree Removal Activities shall be submitted **15 days prior** to the commencement of the proposed work for an annual permit.

CAUTION

Work shall NOT begin until the Advance Notice has been approved.

Failure to submit the advance notice may result in a Stop Work Order.

B & B CONTRACTING, CALUMET, INC.	Joel Kauppila MDOT	July 10, 2017 Approved Date
TSC Contact Info	Ishpeming TSC	(906) 485-4270

THE STANDARD ATTACHMENTS, ATTACHMENTS AND SPECIAL CONDITIONS MARKED BELOW ARE A PART OF THIS PERMIT.

STANDARD ATTACHMENTS:

1 General Conditions for Permit (General Conditions)
2 ENVIRONMENTAL REQUIREMENTS FOR ACTIVITIES WITHIN MDOT RIGHT-OF-WAY (2486)
3 Historical and Archaeological Discoveries During Construction Operations (Const. Advisory Historical/Archae

ADDITIONAL ATTACHMENTS

1 L D and B Valuesm0020a.pdf
2 m0170a_Haul Road_B&B MODIFIED.pdf

AMENDMENT ATTACHMENTS:

31013-047793-17-071017 Issued To:B & B CONTRACTING, CALUMET, INC.

SPECIAL CONDITIONS:

1 The Department of Transportation does not, by issuance of this permit, assume any liability claims or maintenance costs resulting from the Haul Road with Traffic Control facility placed by this permit. The Department reserves the right to require removal of all or any portion of this facility as needed for highway maintenance or construction purposes without replacement or reimbursement of any costs incurred by the permitted or other party. The permitted will defend, indemnify and hold harmless the Department for any claims whatsoever resulting from the construction or the removal of the authorized by this permit.
2 All disturbed areas within the right of way shall be top-soiled, seeded and mulched to match existing areas per current MDOT standards and specifications.
3 Damage to any portion of M26 within the limits of this haul road shall be repaired by replacing that entire section of roadway.

Michigan Department
of Transportation
2486 (03/14)

ENVIRONMENTAL REQUIREMENTS FOR ACTIVITIES WITHIN MDOT RIGHT-OF-WAY

Issuance of a permit by MDOT does not relieve the permit applicant from meeting any and all requirements of law, or of other public bodies or agencies, including but not limited to the following:

1. Goemare-Anderson Wetland Protection Act, Part 303, P.A. 451 of 1994

   Any activity that involves excavation or fill, located within a regulated wetland, requires a Michigan Department of Environmental Quality (MDEQ) permit. Regulated wetlands are those systems that are contiguous to a lake or stream (within 500 feet) or greater than five (5) acres in size.

2. Inland Lakes and Streams Act, Part 301, P.A. 451 of 1994

   Any activity located within the ordinary high-water mark of a regulated body of water, i.e., lake, stream, drain, pond. etc., shall require a permit. There are no exemptions to this requirement. Permit applications and questions can be submitted to the MDEQ's Land and Water Management Division.

3. Soil Erosion and Sedimentation Control Act, Part 91, P.A. 451 1994

   Any land disturbance of one (1) acre or greater, or that is located within 500 feet of a lake or stream, requires a soil erosion permit. Municipalities who are classified as an Authorized Public Agency (APA) are exempt from permits, but must follow proper soil erosion practices as identified in their standard plan. Any construction activity located within MDOT Right-of-Way that is authorized by a MDOT permit is the responsibility of the permit applicant and is not covered under MDOT's APA authority.

   Soil erosion and sedimentation controls are required on all projects, even if a soil erosion permit is not required. Individuals performing work shall prevent sediment from entering any body of water or leaving the Right-of-Way. Permits can be obtained from the county/municipal agencies. Minor earth changes are exempted in this Act and are classified as normal maintenance and emergency repairs.

4. Clean Water Act: National Pollutant Discharge Elimination System (NPDES) Storm Water Discharge Requirements for Construction Activities

   Any land disturbance of five (5) acres or greater requires an NPDES Storm Water Discharge Permit. This can include any filling, excavating, grading, clearing, etc. Municipally-owned utilities who service a population of less than 100,000 are exempt from permit provisions, but not from environmental protection requirements. Permit applications require the Part 31, P.A. 451 permit number, or a declaration of APA status and the effective date. Permit applications and questions can be submitted to the MDEQ's Surface Water Quality Division.

5. Environmental Site Closures

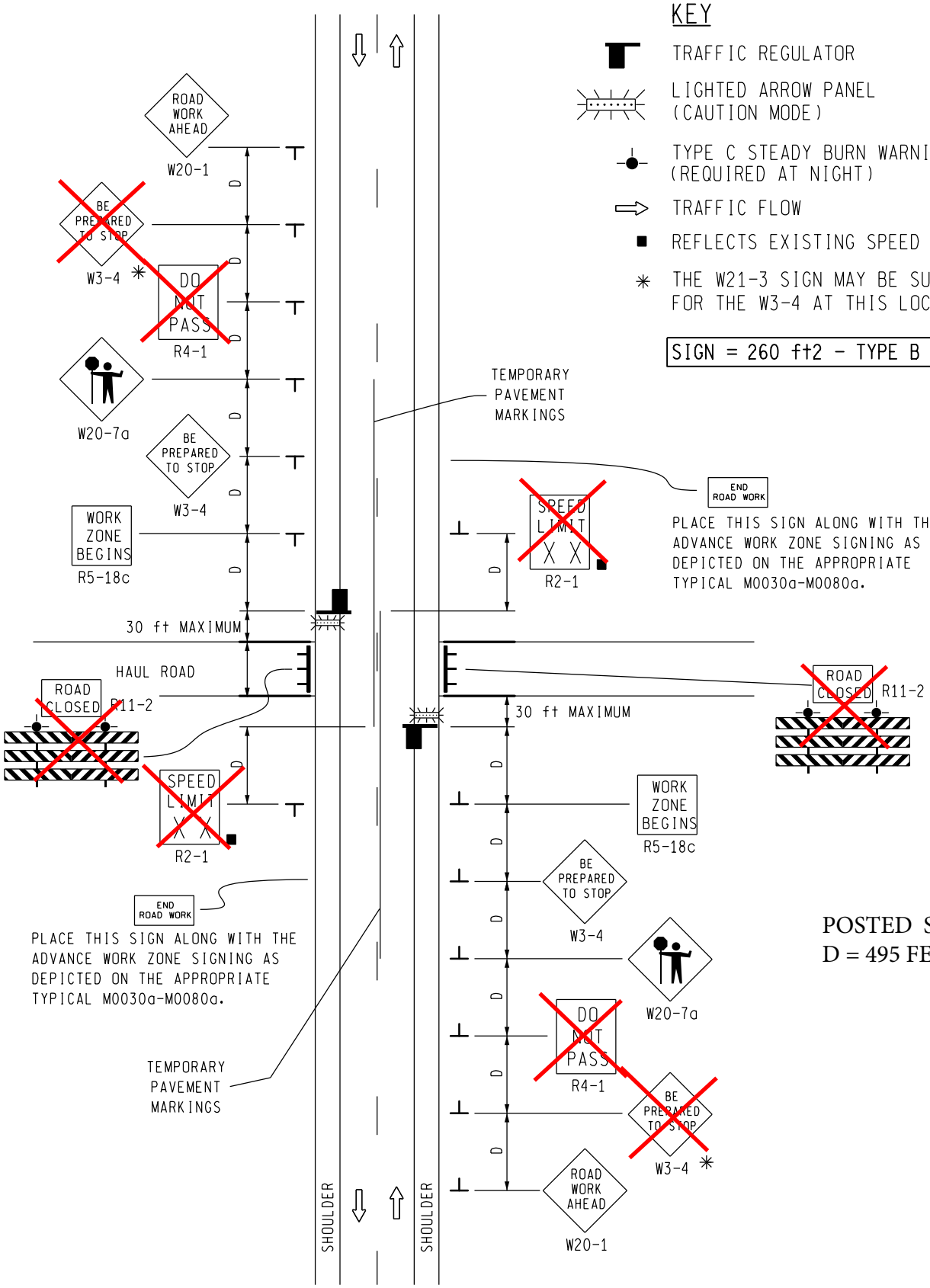
   A procedure was developed by the MDEQ and MDOT which may allow a property owner, who is responsible for of these sites, to close an environmentally impacted site. Questions regarding this activity shall be addressed by contacting MDOT's Environmental Specialist at 517-335-2271.

6. The Land and Water Management Division of the MDEQ also administers the following environmental laws which may require review prior to construction:
   - Sand Dune Protection Act, Part 353, P.A. 451 of 1994.
   - Shore-lands Protection and Management, Part 323, P.A. 451 of 1994.
   - Great Lakes Submerged Lands Act, Part 325, and P.A. 451 of 1994.

7. The Wildlife Division of the MDNR also administers the following environmental laws which may require review prior to construction:
   - Endangered Species Act, Part 365, and P.A. 451 of 1994.

Questions regarding these permits may be addressed by contacting the nearest MDEQ district field office, or the MDEQ Land and Water Management Division at 517-373-1170.

Additional information is available in MDOT's Environmental Procedures Manual.



POSTED SPEED = 55 MPH
D = 495 FEET

NOT TO SCALE

MDOT Michigan Department of Transportation TRAFFIC AND SAFETY MAINTAINING TRAFFIC TYPICAL	TYPICAL TEMPORARY TRAFFIC CONTROL FOR A HAUL ROAD ON A TWO-LANE TWO WAY ROADWAY WHERE A TOTAL TRAFFIC STOPPAGE IS REQUIRED UTILIZING TRAFFIC REGULATORS, NO SPEED REDUCTION		
DRAWN BY: CON:AE:djf CHECKED BY: BMM:CRB	OCTOBER 2011 PLAN DATE:	M0170a	SHEET 1OF 2
FILE: PW RD/TS/Typicals/Signs/MT NON FWY/M0170a.dgn REV. 10/06/2011			

NOTES

1A. SEE **M0020a** FOR "D" VALUES.

2. ALL NON-APPLICABLE SIGNING WITHIN THE CIA SHALL BE MODIFIED TO FIT CONDITIONS, COVERED OR REMOVED.

3. DISTANCES BETWEEN SIGNS, THE VALUES FOR WHICH ARE SHOWN IN TABLE D, ARE APPROXIMATE AND MAY NEED ADJUSTING AS DIRECTED BY THE ENGINEER.

3A. THE "WORK ZONE BEGINS" (R5-18c) SIGN SHALL BE USED ONLY IN THE INITIAL SIGNING SEQUENCE IN THE WORK ZONE. SUBSEQUENT SEQUENCES IN THE SAME WORK ZONE SHALL OMIT THIS SIGN AND THE QUANTITIES SHALL BE ADJUSTED APPROPRIATELY.

6. WHEN CALLED FOR IN THE FHWA ACCEPTANCE LETTER FOR THE SIGN SYSTEM SELECTED, THE TYPE A WARNING FLASHER, SHOWN ON THE WARNING SIGNS, SHALL BE POSITIONED ON THE SIDE OF THE SIGN NEAREST THE ROADWAY.

7. ALL TEMPORARY SIGNS, TYPE III BARRICADES, THEIR SUPPORT SYSTEMS AND LIGHTING REQUIREMENTS SHALL MEET NCHRP 350 CRASHWORTHLY REQUIREMENTS STIPULATED IN THE CURRENT EDITION OF THE MICHIGAN MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, THE CURRENT EDITION OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION, THE STANDARD PLANS AND APPLICABLE SPECIAL PROVISIONS. ONLY DESIGNS AND MATERIALS APPROVED BY MDOT WILL BE ALLOWED.

9. ALL TRAFFIC REGULATORS SHALL BE PROPERLY TRAINED AND SUPERVISED.

9A. IN ANY OPERATION INVOLVING MORE THAN ONE TRAFFIC REGULATOR, ONE PERSON SHOULD BE DESIGNATED AS HEAD TRAFFIC REGULATOR.

10. ALL TRAFFIC REGULATORS' CONDUCT, THEIR EQUIPMENT, AND TRAFFIC REGULATING PROCEDURES SHALL CONFORM TO THE CURRENT EDITION OF THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MMUTCD) AND THE CURRENT EDITION OF THE MDOT HANDBOOK ENTITLED "TRAFFIC REGULATORS INSTRUCTION MANUAL."

11. WHEN TRAFFIC REGULATING IS ALLOWED DURING THE HOURS OF DARKNESS, APPROPRIATE LIGHTING SHALL BE PROVIDED TO SUFFICIENTLY ILLUMINATE THE TRAFFIC REGULATOR'S STATIONS.

14. ADDITIONAL SIGNING AND/OR ELONGATED SIGNING SEQUENCES SHOULD BE USED WHEN TRAFFIC VOLUMES ARE SIGNIFICANT ENOUGH TO CREATE BACKUPS BEYOND THE W3-4 SIGNS.

15. THE HAND HELD (PADDLE) SIGNS REQUIRED BY THE MMUTCD TO CONTROL TRAFFIC WILL BE PAID FOR AS PART OF FLAG CONTROL.

17. THE HAND HELD (PADDLE) SIGNS USED FOR THIS SEQUENCE SHALL DISPLAY "STOP" ON BOTH SIDES. WHEN THE TRAFFIC REGULATOR IS RELEASING TRAFFIC, THE "STOP" PADDLE SHALL BE TURNED 1/4 TURN AWAY FROM TRAFFIC.

18. CARE SHOULD BE TAKEN IN THE SELECTION OF THE LOCATION FOR THE HAUL ROAD TO ASSURE GOOD SIGHT DISTANCE FOR THE MOTORIST. HORIZONTAL AND VERTICAL CURVES AND INTERSECTING ROADWAYS IN CLOSE PROXIMITY TO THE HAUL ROAD LOCATION SHOULD BE AVOIDED AS MUCH AS POSSIBLE. THE LOCATION AND WIDTH OF THE HAUL ROAD REQUIRES PRIOR APPROVAL OF THE ENGINEER.

19. ALL EQUIPMENT OPERATORS WHO USE THE HAUL ROAD SHALL STOP AND VERIFY THAT THE TRAFFIC REGULATORS HAVE TRAFFIC STOPPED AND UNDER CONTROL BEFORE ENTERING ONTO THE HIGHWAY.

20. WHEN THE HAUL ROAD IS NOT IN USE, LIGHT TYPE III BARRICADES WITH "ROAD CLOSED" SIGNS SHALL BE IN PLACE, AND SHALL EXTEND COMPLETELY ACROSS THE HAUL ROAD.

SIGN SIZES

DIAMOND WARNING	- 48" x 48"
R2-1 REGULATORY	- 48" x 60"
R4-1 REGULATORY	- 48" x 60"
R5-18c REGULATORY	- 48" x 48"
R11-2 REGULATORY	- 48" x 30"

NOT TO SCALE

MDOT Michigan Department of Transportation
TRAFFIC AND SAFETY
MAINTAINING TRAFFIC TYPICAL

TYPICAL TEMPORARY TRAFFIC CONTROL FOR A HAUL ROAD ON A TWO-LANE TWO WAY ROADWAY WHERE A TOTAL TRAFFIC STOPPAGE IS REQUIRED UTILIZING TRAFFIC REGULATORS, NO SPEED REDUCTION

DRAWN BY: CON:AE:djf	OCTOBER 2011	M0170a	SHEET 2 OF 2
CHECKED BY: BMM:CRB	PLAN DATE:		

FILE: PW RD/TS/Typicals/Signs/MT NON FWY/M0170a.dgn REV. 10/06/2011

MINIMUM MERGING TAPER LENGTH "L" (FEET)

OFFSET	POSTED SPEED LIMIT, MPH (PRIOR TO WORK AREA)										
FEET	25	30	35	40	45	50	55	60	65	70	
1	10	15	20	27	45	50	55	60	65	70	TAPER LENGTH "L" IN FEET
2	21	30	41	53	90	100	110	120	130	140	
3	31	45	61	80	135	150	165	180	195	210	
4	42	60	82	107	180	200	220	240	260	280	
5	52	75	102	133	225	250	275	300	325	350	
6	63	90	123	160	270	300	330	360	390	420	
7	73	105	143	187	315	350	385	420	455	490	
8	83	120	163	213	360	400	440	480	520	560	
9	94	135	184	240	405	450	495	540	585	630	
10	104	150	204	267	450	500	550	600	650	700	
11	115	165	225	293	495	550	605	660	715	770	
12	125	180	245	320	540	600	660	720	780	840	
13	135	195	266	347	585	650	715	780	845	910	
14	146	210	286	374	630	700	770	840	910	980	
15	157	225	307	400	675	750	825	900	975	1050	

THE FORMULAS FOR THE MINIMUM LENGTH OF A MERGING TAPER IN DERIVING THE "L" VALUES SHOWN IN THE ABOVE TABLES ARE AS FOLLOWS:

$$"L" = \frac{W \times S^2}{60}$$ WHERE POSTED SPEED PRIOR TO THE WORK AREA IS 40 MPH OR LESS

"L" = S x W WHERE POSTED SPEED PRIOR TO THE WORK AREA IS 45 MPH OR GREATER

L = MINIMUM LENGTH OF MERGING TAPER
S = POSTED SPEED LIMIT IN MPH PRIOR TO WORK AREA
W = WIDTH OF OFFSET

TYPES OF TAPERS	TAPER LENGTH
UPSTREAM TAPERS	
MERGING TAPER	L - MINIMUM
SHIFTING TAPER	1/2 L - MINIMUM
SHOULDER TAPER	1/3 L - MINIMUM
TWO-WAY TRAFFIC TAPER	100 ' - MAXIMUM
DOWNSTREAM TAPERS (USE IS OPTIONAL)	100 ' - MINIMUM (PER LANE)

MDOT Michigan Department of Transportation
TRAFFIC AND SAFETY
MAINTAINING TRAFFIC TYPICAL

TABLES FOR "L", "D" AND "B" VALUES

DRAWN BY: CON:AE:djf	JUNE 2006 PLAN DATE:	M0020a	SHEET 1 OF 2
CHECKED BY: BMM			
FILE: K:/DGN/TSR/STDS/ENGLISH/MNTTRF/M0020a.dgn	REV. 08/21/2006		

DISTANCE BETWEEN TRAFFIC CONTROL DEVICES "D" AND LENGTH OF LONGITUDINAL BUFFER SPACE ON "WHERE WORKERS PRESENT" SEQUENCES

"D" DISTANCES	POSTED SPEED LIMIT, MPH (PRIOR TO WORK AREA)									
	25	30	35	40	45	50	55	60	65	70
D (FEET)	250	300	350	400	450	500	550	600	650	700

GUIDELINES FOR LENGTH OF LONGITUDINAL BUFFER SPACE "B"

SPEED* MPH	LENGTH FEET
20	33
25	50
30	83
35	132
40	181
45	230
50	279
55	329
60	411
65	476
70	542

* POSTED SPEED, OFF PEAK 85TH PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED

1 BASED UPON AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) BRAKING DISTANCE PORTION OF STOPPING SIGHT DISTANCE FOR WET AND LEVEL PAVEMENTS (A POLICY ON GEOMETRIC DESIGN OF HIGHWAY AND STREETS), AASHTO. THIS AASHTO DOCUMENT ALSO RECOMMENDS ADJUSTMENTS FOR THE EFFECT OF GRADE ON STOPPING AND VARIATION FOR TRUCKS.

MDOT Michigan Department of Transportation

TRAFFIC AND SAFETY

MAINTAINING TRAFFIC TYPICAL

TABLES FOR "L", "D" AND "B" VALUES

DRAWN BY: CON:AE:djf	JUNE 2006	M0020a	SHEET 2 OF 2
CHECKED BY: BMM	PLAN DATE:		
FILE: K:/DGN/TSR/STDS/ENGLISH/MNTTRF/M0020a.dgn	REV. 08/21/2006		

GENERAL CONDITIONS

This permit is issued subject to the following conditions:

1. This permit grants to the permittee only those rights specifically stated and no other. Maintenance work within the trunkline right of way may require a separate permit unless authorized within the scope of the annual permit.

2. Issuance of this permit does not relieve permittee from meeting any and all requirements of law, or of other public bodies or agencies. The permittee shall be responsible for securing including but not limited to any other permissions including or required by law including but not limited to cities, villages, townships, corporations, or individuals for the activities hereby permitted.

3. The permittee agrees as a condition of this permit to:

   a. Have in the permittee's or the permittee's representative's possession on the job site at all times the approved permit, advanced notice and any necessary plans or sketches.

   b. Submit Advance Notice through the online Construction Permit System (CPS) at least five (5) working days prior to commencement of any operations covered by this permit. No work shall start until an approved Advance Notice is e-mailed to the permittee.

   c. Perform no work except emergency work, unless authorized by the Department, on Saturdays, Sundays, or from 3:00 p.m. on the day proceeding until the normal starting time the day after the following holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day.

   d. Provide and maintain all necessary precautions to prevent injury or damage to persons and property from operations covered by this permit.

   e. Furnish, install and maintain all necessary traffic controls and protection during permittee's operations in accordance with the Michigan Manual of Uniform Traffic Control Devices and any supplemental specifications set forth herein.

   f. Notify the Department of completion of work authorized by this permit through CPS, so that final inspection may be made and surety deposit released (where applicable). Surety deposit will not be released until the work authorized by the permit has been completed and inspected, and all inspection charges billable to the permittee are paid.

4. Nothing in this permit shall be construed to grant any rights what so ever to any public utilities, except as to the consent herein specifically given, nor to impair any existing rights granted in accordance with the constitution or laws of this state.

5. Any operations in the trunkline right of way not covered by permit and the appropriate Department specifications are in violation of the jurisdictional authority of the Department, with respect to the control of the trunkline right of way, unless approved by the Department. Any change or alteration in the permit activities requires prior approval of the Department and may require a new permit.

6. Performance of the requirements of this permit is the responsibility of the permittee. The permittee shall complete all operations for which this permit is issued in accordance with the conditions of this permit, by the specified completion date. The permittee shall meet all requirements of the current Department Standard Specifications for Construction, and the Supplemental Specifications set forth on/or incorporated as a part of this permit.

7. The construction, operation and maintenance of the facility covered by this permit shall be performed without cost to the Department unless specified herein. The permittee shall be responsible for the cost of restoration of the state trunkline and right of way determined by the Department to be damaged as a result of the activities of the permittee.

8. Facilities allowed on state trunkline right of way shall be placed and maintained in a manner which will not impair the state trunkline or interfere with the reasonable safe and free flow of traffic. Failure of the permittee to maintain the facilities located within the State trunkline right of way so as not to interfere with the operation, maintenance or use of the state trunkline by the traveling public may result in revocation of the permit.

9. The permittee is solely and fully responsible for all activities undertaken pursuant to the permit. Any and all actions by the Department and those governmental bodies performing permit activities for the Department pursuant to a maintenance contract, including but not limited to any approved reviews and inspections of any nature, permit issuing, and final acceptance or rejection of the work or activity authorized by the permit shall not be construed as a warranty or assumption of liability on the part of the Department or those governmental bodies. It is expressly understood and agreed that any such actions are for the sole and exclusive purposes of the Department and the governmental bodies acting in a governmental capacity. Any such actions by the Department and governmental bodies will not relieve the permittee of its obligations hereunder, nor are such actions by the Department and the governmental bodies to be construed as a warranty as to the propriety of the permittee's performance. The permittee shall indemnify and save harmless the State of Michigan, Michigan Transportation Commission, the Department and all officers, agents and employees thereof, and those governmental bodies performing permit activities for the Department and all officers, agents and employees thereof, pursuant to a maintenance contract, against any and all claims for damages arising from operations covered by this permit except claims resulting from the sole negligence or willful acts or omissions of said indemnities, its agent, or employees. In addition, permittee upon request shall furnish proof of insurance coverage for the term of this permit in an amount pre-specified.

10. This permit is not assignable and not transferable unless specifically agreed to by the Department.

11. The permittee, upon request of the Department, shall immediately remove, cease operations, and surrender this permit, or alter or relocate, at the permittee's own expense, the facility for which this permit is granted. Upon failure to do so, the Department may take any necessary action to protect the trunkline interest and the permittee shall reimburse the Department for its costs in doing same. The permittee expressly waives any right to claim damages or compensation in the event this permit is revoked.

12. The permittee shall, upon request by the Department, furnish a performance surety deposit in the form of a bond, cash, certified check, or (when authorized by the Department) an irrevocable letter of credit in such amount as deemed necessary by the Department to guarantee restoration of the trunkline highway or performance under the conditions of the permit.

13. The permittee hereby acknowledges and agrees that the Department has the right to demand completion by the permittee, or the performance surety, or to complete any uncompleted activity authorized by this permit which adversely affects the operation and/or maintenance of the state trunkline highway, or which is not completed by the expiration date of the permit, including:

    a. Completion of construction of driveway and/or approach (not authorized by annual permit).
    b. Removal of materials.
    c. Restoration of the trunkline facilities and right of way as necessary for the reasonably safe and efficient operations of the trunkline highway.

    The permittee further agrees to immediately reimburse the Department in full for all such costs incurred by the Department upon receipt of billing, and that upon failure to pay, the Department may effect payment with the performance surety deposit. Should the surety deposit be insufficient to cover expenses incurred by the Department, the permittee shall pay such deficiency upon billing by the Department. If the surety deposit exceeds the expense incurred by the Department, any excess will be returned or released to the depositor upon completion of the work to the satisfaction of the Department.

14. The Department reserves the right during the time any or all of the work is being performed to assign an inspector to protect the trunkline interest, and to charge the permittee all such costs incurred. In addition, the permittee may be billed any engineering and review fees incurred by the Department or its agent in connection with the work covered by this permit.

15. Emergency Operations: In time of disaster or emergency, or when utility lines or facilities are so damaged as to constitute a danger to life and/or property of the public, access to the same may be had by the most expeditious route. Work is to be completed in a manner which will provide the traveling public with maximum possible safety and minimize traffic distribution. Notice of such situations shall be given to the nearest police authority and the department as soon as can reasonably be done under the circumstances. During normal Department work hours, the facility owner shall advise the Department of any operations within right of way which affect traffic operations or the highway structure or facilities prior to performance of the work. After normal Department work hours, the permittee, at the beginning of the first working day after the emergency operation, shall advise the Department of any operations which affect traffic operations or the highway structures and facilities. If determined necessary by the Department, the permittee shall secure an individual permit for such work after notification.

16. Upon the Department's request, as built drawings of work performed will be furnished to the Department within 30 days after completion of the work.

17. The permittee shall give notice to public utilities in accordance with Act 174 of 2013, as amended, and comply with all applicable requirements of this act. The permittee shall also comply with requirements of Act 451, P.A. of 1994, as amended.

18. The permittee acknowledges that the Department is without liability for the presence of the permittee's facility which is located within the trunkline right of way. Acceptance by the Department of work performed, and/or notice of termination of performance obligations for the surety and/or the permittee do not relieve the permittee of full responsibility for the permittee's work or for the presence of the permittee's facility in the trunkline right of way.

19. Where the Department has accepted an Indemnification Commitment in lieu of bond and/or insurance policies, such commitment is incorporated into this permit by reference.

20. It is illegal to discharge substances other than storm water into the Department's storm sewer system unless permission has been obtained in writing for other discharges.

21. The permittee shall be responsible for obtaining information on permitted environmental site closures within MDOT right of way. MDOT has implemented a program that allows environmental contamination to remain within the right of way by use of a permit. Issued permit information can be obtained from the Region/TSC in which the permit is issued. If the permittee will encounter a site area identified as a site closure permit area, the permittee shall follow instructions and conditions set forth in Supplemental Specifications #3 and specifications found in form 2205-C, "Special Conditions for Underground Construction".

SUPPLEMENTAL SPECIFICATIONS

1. Construction and Maintenance of Facilities – To construct and maintain utility crossings of limited access highways, access for the utility's service vehicles may be from county roads, service roads, and openings authorized in limited access right of way fences. The construction of utilities across limited access highways should be for the purpose of serving a general area rather than providing individual services, unless extenuating circumstances necessitate such crossings.

   Equipment, vehicles or personnel will not operate within a distance of 30 feet from the edge of the pavement of roadways or ramps on limited access highways. At locations where utilities have been constructed in medians having a width greater than 80 feet or have otherwise been allowed to remain or to be constructed in limited access right of way, ingress and egress shall be by such routes as specified by the Department, which may also specify additional safety provisions.

2. Restoration- Restoration of the trunkline highway and right of way will be such that it will provide a condition equal to or better than the original condition, in accordance with Michigan Department of Transportation Standard Specifications.

3. Excavation and Disposal of Excavated Material – The permittee shall provide and place the necessary sheeting, shoring and bracing required to prevent caving, loss or settlement of foundation material supporting the pavement, or any other highway installation such as sewers, culverts, etc. The permittee shall assume the full responsibility for this protection and shall not proceed in these areas before approval of the methods by the Department.

   Construction equipment and excavating material shall not be stocked in such locations that it creates a traffic hazard or interferes with the flow of traffic; and on limited access highways, shall be a minimum of 30 feet from the traveled way. Sod and topsoil shall be stacked separately from other excavated material. The permittee shall dispose of all surplus and unsuitable material outside of the limits of the highway, unless the permit provides for disposal at approved locations within right of way. In the latter case, the material shall be leveled and trimmed in an approved manner.

   When the permittee is excavating within trunkline right of way and discovers existing contaminated soil and/or an abandoned underground storage tank, special permit specifications entitled "Special Conditions for Underground Construction" (Form 2205-C) shall apply.

4. Utility Cuts, Trenches and Pavement Replacement – Utility crossing by pavement cutting and removal are generally prohibited. If extenuating circumstances make tunneling, boring and jacking impractical pavement cutting may be used with approval of the Department. All utility cuts, trenching and pavement replacement shall comply with the requirements of the Standard Specifications and the Standard Plan "Utility Cuts, Trenches and Pavement Replacement". Unless otherwise specified, cuts in concrete residential and commercial drives shall be as above; except that the patch width shall be a minimum of 3 feet and the remaining slab from patch to existing joint shall be a minimum of 3 feet. Backfill shall be made with sand-gravel as specified in the Standard Specifications, unless otherwise directed. After the backfill has been placed and compacted by controlled density method, the pavement shall be replaced with new pavement of the original type and quality, unless at the season of the year when it is not feasible to replace pavement in kind. In this case, a temporary surface of bituminous material shall be placed with Department approval and later replaced with pavement of the original type at the applicant's expense. Other pavement types may be allowed with prior approval of the Department.

5. Crossing Roadbed by Tunneling or Boring and Jacking – All crossing of roadbed operations involving tunneling, boring and jacking shall comply with the Department's special provisions for such work.

6. Backfilling and Compacting Backfill – Unless otherwise specified, all trenches, holes and pits shall be filled with sound earth or with sand-gravel if so provided, placed in successive layers not more than 9 inches in depth, loose measure, and each layer shall be thoroughly compacted by tamping. All backfill compaction will be subject to check by the controlled density method.

7. Depth of Cover Method- Unless otherwise authorized, pipes shall be placed to a depth that will provide not less than 4 feet of cover between the top of the roadway surface and the pipe, 3 feet cover below the ditch line and the pipe.

8. Trees:

   a. The permittee is responsible for obtaining permission from abutting owners when trimming or removing trees on easement right of way.
   b. Tree removal or trimming may be undertaken only after submission of an "Advance Notice" through CPS, a field review by the Region Resource Specialist and an approved copy of the advanced notice is e-mailed to the permittee.
   c. Limbs, logs, stumps and litter shall be disposed of in a manner acceptable to the Department.
   d. Tree roots shall be bored a distance of one foot for each one inch of trunk diameter for underground utility installations

9. Aerial Wire Crossings – Vertical clearance of wires, conductors and cables over state trunkline shall not be less than required by Section 232 of the National Electrical Safety Code, except in no case shall the under-clearance below any wire, conductor, or cable, under any temperature or loading condition, be less than eighteen feet (18').

Construction Advisory

CA 2013-03
May 1, 2013

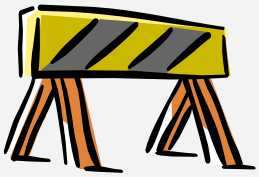
From Brenda O'Brien, Engineer of Construction Field Services

MDOT-Construction Field Services Division
P.O. Box 30049
Lansing, Michigan 48909
Phone/517-322-1087
Fax/517-322-5664
www.michigan.gov/mdot/

Index: Environment

Questions regarding this Construction Advisory should be directed to:

Jason Gutting, Engineer of Construction Operations at 517-636-6334 or guttingj@michigan.gov



BJO:JG

Historical and Archaeological Discoveries During Construction Operations

This construction advisory applies to all construction, maintenance, permits, and utility projects on MDOT right-of-way.

In the event that any staff (MDOT, consultant, local agency, contractor, etc.) encounter bones, artifacts, or buried features of possible historical or archaeological significance during construction operations on MDOT right-of-way, they must immediately cease operations in that location and notify the MDOT TSC construction engineer.

The MDOT TSC construction engineer must, immediately upon stopping work in the affected area, contact the MDOT archaeologist for consultation and direction. Communications are to be directed to the following individuals.

Primary Contact:
James A. Robertson, Ph.D.
MDOT Archaeologist
517-335-2637 (office)
Robertsonj3@michigan.gov

Secondary Contact (if primary is not available):
Christine N. Stephenson, M.A.
Staff Archaeologist
517-243-2818 (cell)
Stephensonc@michigan.gov

If bones are discovered and there is no reasonable doubt that they are human bones, the MDOT TSC construction engineer must immediately also contact the local law enforcement agency.

It should be noted that per Michigan law, any person who willfully digs up, disinters, or moves human remains from their place of burial, or who aids in such activities without being lawfully authorized to do so can be found guilty of a felony punishable by up to 10 years in prison and a fine of up to $5,000.

Construction Field Services is working with the Environmental Services Section to develop a Bureau of Highway Instructional Memorandum with additional details.

Please share this construction advisory with consultants, local agencies, maintenance supervisors/coordinators, and permit/utility staff in your area as well as TSC staff.

APPENDIX G

Access Agreements

An Equal Opportunity Employer
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913
Brian Bonen, Mobile: 906-281-2587
Hans Haapala, Mobile: 906-281-6908
Office: 906-337-0017
Fax: 906-934-2587

SOIL SUPPLY AGREEMENT

Submitted to Owner:

Date: May 11, 2017

Charlie Kiilunen
52705 State Hwy M-26
Lake Linden, MI 49945

B&B Contracting, Calumet, Inc. agrees to pay [redacted] per cubic yard (CYD) of clay or sand taken from borrow pit located at 52705 State Hwy M-26 for use at MDEQ-Hubbell Processing Area for Capping. This project is anticipated to need approximately 6000 CYD.

B&B Contracting will supply all necessary equipment for loading.

B&B will provide plan for and obtain soil erosion-sedimentation control (SESC) permit on behalf of owner with signed agreement.

Due to safety concerns, B&B will have exclusive access to pit and material during project.

B&B will install and maintain all necessary SESC measures until SESC permit is released.

B&B will provide borrow pit restoration, seed and mulch at completion of project.

Payment to be made as follows: B&B Contracting will keep track of totals by the truck load. The price above is inclusive of any applicable sales tax. Material will be paid for when B&B Contracting receives payment from project owner. This will be approximately 45 days from the material being loaded.

Owner to carry fire, tornado or other necessary property insurance. Our workers and equipment are fully covered by General Liability and Workmen's Compensation Insurance. Proof will be provided upon request.

This agreement is contingent on soil passing necessary testing.

Authorized signature_____ Date 5-12-17
Brian Bonen, President

Acceptance of Agreement

The above prices, specifications and conditions are satisfactory and are hereby accepted.

Signed_____ Date of acceptance 5/12/17

An Equal Opportunity Employer
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913
Brian Bonen, Mobile: 906-281-2587
Hans Haapala, Mobile: 906-281-6908
Office: 906-337-0017
Fax: 906-934-2587

ACCESS AGREEMENT

Land Owner:

Date: June 29, 2017

Pat Ziemnick
52569 State Hwy M-26
Lake Linden, MI 49945

The **Land Owner agrees** to allow **B&B Contracting, Calumet**, Inc. **to access the property at the above address** to install a diversion ditch between the current drainage ditch above the culvert crossing the Land Owner's private drive and the MDOT ditch along Hwy M-26. This is in conjunction with our work for the project: MDEQ-Hubbell Processing Area.

The diversion ditch is planned to be in place from July 10, 2017 to July 21, 2017.

B&B Contracting will supply all necessary equipment and labor to install the diversion ditch.

B&B will provide plan for and obtain MDOT Right of Way Construction permit as part of their work.

B&B will install and maintain all necessary SESC measures for project.

B&B will provide restoration, seed and mulch at completion of project.

There will be no payments by either party as part of this agreement.

Our workers and equipment are fully covered by General Liability and Workmen's Compensation Insurance. Proof will be provided upon request.

Authorized signature _____ Date 6-29-17
Brian Bonen, President

Acceptance of Agreement

The above specifications and conditions are satisfactory and are hereby accepted.

Signed _____ Date of acceptance 6-29-17

APPENDIX H

Notification of Intent to Renovate/Demolish Form

NOTIFICATION OF INTENT TO RENOVATE/DEMOLISH

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
(MDEQ) AIR QUALITY DIVISION
NESHAP, 40 CFR Part 61, Subpart M

MICHIGAN DEPARTMENT OF LICENSING AND
REGULATORY AFFAIRS (LARA), ASBESTOS PROGRAM,
P.A. 135 OF 1986, AS AMENDED, Section 220 (1-4) or (8)

1. NOTIFICATION:

Date of Notification: 06/27/2017 Document #: 0000099599
Date of Original: Original Document #:
Notification Type: ☑ Original ☐ Revised ☐ Canceled

Mark appropriate boxes: (both DEQ and LARA may apply):

DEQ (NESHAP) [*260 ln. ft./160 sq. ft. or more is threshold*]

☑ Planned Renovation - 10 **working** days notice
☐ Emergency Renovation
☐ Scheduled Demolition - 10 **working** days notice
☐ Intentional Burn - 10 **working** days notice
☐ Ordered Demolition

LARA (MIOSHA) [*Will not accept annual notifications*]

☐ Demo, Reno, Encap. (>10 ln. ft./15 sq. ft.) 10 **calendar** days notice
☐ Emergency Renovation/Encapsulation

Calculate LARA Asbestos Project Fee:(1% Project Fee) ☐ Time & material
Total Project Cost: $0.00 x 0.01 = $0.00
Type of Contractor: License No:
Licensing Authority:

2. PROJECT SCHEDULE:

☐ Check here if this is a multi-phased project, attach a schedule showing the start/end date of each phase.

	START DATE	END DATE
* Renovation:		
+ Asb. Removal:	07/11/2017	08/22/2017
+ Demolition:		
Encapsulation:		

* Includes setup, build enclosure, asbestos removal, demobilizing, etc.
+Include **only** those dates you are conducting asbestos removal/demo.

Work Schedule: Please indicate the anticipated days of the week and work hours for the purpose of scheduling a compliance inspection.

	Days of the Week	Work Hours
Asb. Removal:	M, Tu, W, Th, F	8 a.m. - 5 p.m.
Demolition:		
Encapsulation:		

☐ Check here if the work hours are not the same across the days of the week or vary from day to day and attach a document with Detailed Work Hours.

3. ABATEMENT CONTRACTOR: Internal Project #:
Name: Upper Peninsula Abatement Company, Inc.
Mailing Address: 349 East U. S. 41 Highway
City/State/Zip: Negaunee, MI 49866
E-mail: dale@upabatementco.com
Contact: Dale Carrier Phone: 906-475-4900

4. DEMOLITION CONTRACTOR: Internal Project #:
Name:
Mailing Address:
City/State/Zip:
E-mail:
Contact: Phone:

5. FACILITY OWNER: Internal Project #:
Name: State of Michigan
Mailing Address: 3111 W. St. Joseph Street 530 West Alle
City/State/Zip: Lansing, MI 48909
E-mail:
Contact: Hans Haapala Phone: 906-337-0017

6. FACILITY DESCRIPTION:
Facility Name: Hubbell Processing Area Project
Location Address: M26
City/State/Zip: Hubbell, MI 49934
County: Houghton Age: 0
No. of Floors: 0 If Apt. # of units:
Nearest Crossroad:
Size: (sq. ft.) 5000 Floor No.:
Present Use: Vacant industrial property
Prior Use: Industrial
Specific Location(s) in Facility: On the ground on property

7. DISPOSAL SITE:
Name: K & W Landfill
Location Address: 11877 State Highway M38
City/State/Zip: Ontonagon, MI 49953

8. WASTE TRANSPORTER(S):
Name: Upper Peninsula Abatement Company Incorporated
Location Address: 349 U. S. Highway 41 E.
City/State/Zip: Negaunee, MI 49866
Name:
Location Address:
City/State/Zip:

9. ORDERED DEMOLITIONS: (See NESHAP regulations for definition of "Ordered Demolition.") A copy of the official Order must accompany this notification.
Gov't Agency Ordering Demo:
Name/Title of Person Signing Order:
Date of Order: Date Ordered to Begin:

10. ASBESTOS INFORMATION

Is asbestos present? *(i.e. Assumed or identified in asbestos inspection report)* ☑ Yes ☐ No Will asbestos be removed prior to demolition? ☐ Yes ☐ No

Estimate the amount of asbestos: *Include RACM (Regulated Asbestos Containing Material) to be removed, encapsulated, etc. Also include the amount and type (floor tile, roofing, etc.) of non-friable Category I and/or Category II ACM that **will not** be removed prior to demolition. (**NOTE:** In a demolition, cementatious ACM **cannot** remain in a structure, as it is likely to become regulated in the demolition/handling process. It **must** be removed prior to demolition. Also, all asbestos must be removed prior to an intentional burn.)*

RACM/ACM to be removed	RACM to be Encapsulated	Non-friable ACM **not** removed prior to demo. Category I	Non-friable ACM **not** removed prior to demo. Category II	Units of Measure
				☐ Ln. Ft. ☐ Ln. M.
500				☑ Sq. Ft. ☐ Sq. M.
				☐ Cu. Ft.* ☐ Cu. M.*

*Volume (cubic ft./meters) should be used only if unable to measure by linear/square measure (example: asbestos has fallen off of surface).

NOTIFICATION OF INTENT TO RENOVATE/DEMOLISH (continued)

11. PROJECT DESCRIPTION: Complete **A) for Renovation** (asbestos removal/encapsulation) or **B) for Demolition:**

A) RENOVATION: Mark all surfaces/types of RACM to be removed:

☐ Piping ☐ Fittings ☐ Boiler(s) ☐ Tanks(s)
☐ Beam(s) ☐ Duct(s) ☐ Tunnel(s) ☐ Ceiling Tile(s)
☐ Mag Block ☑ Other (describe):
Off the ground

Encapsulation (for LARA): Mark surfaces/types to be encapsulated:

☐ Piping ☐ Fittings ☐ Boiler(s) ☐ Tanks(s)
☐ Beam(s) ☐ Duct(s) ☐ Tunnel(s) ☐ Ceiling Tile(s)
☐ Other (describe):

Method of removal: Describe how the asbestos will be removed:

☐ Glove Bag ☐ Neg. Pressure Cont. ☐ Cut into sections and remove ☐ Hand Scraping
☐ Dry Removal (please provide attachment with a description and explanation ☑ Other (describe):
Hand picking

B) DEMOLITION: Indicate if complete or partial demolition:

☐ **Complete** or ☐ **Partial** (describe part of facility to be demolished):

Method of Demolition: Describe the method of demolition of facility, bridge, etc.:

☐ Excavator or other heavy equipment ☐ Disassembly by hand ☐ Explosives ☐ Other (describe):

12. ENGINEERING CONTROLS: Describe work practices and engineering controls used to prevent visible emissions before, during, and after removal, and until proper disposal:

☑ Water spray to control dust ☐ Place in leak tight containers ☑ Adequately wet material ☐ Other (describe):

13. UNEXPECTED ASBESTOS: Describe the steps you intend to follow in the event that unexpected RACM is found or previously non-friable asbestos becomes friable (crumbled, pulverized, reduced to powder, etc.) and therefore regulated:

☐ Stop Work ☑ Wet material ☐ Contact DEQ and abatement contractor ☐ Revise notification ☐ Other (describe):

14. PROCEDURE(S) USED TO DETECT THE PRESENCE OF ASBESTOS:

A) Indicate how you determined whether or not asbestos is in the facility. If analytical sampling was used, describe method of analysis. (The determination of the presence or absence of asbestos must be made prior to submitting a renovation/demolition notification):

☑ All suspect materials sampled and analyzed using Polarized Light Microscopy (PLM) ☐ Other (describe):

B) Name, address, and phone number of company performing asbestos survey: Weston Solutions, Inc., 224-864-7200, 300 Plaza Circle Suite 202, Mundelein, IL 60060, MI,

C) Name, accreditation number of inspector, and date of inspection: Michael Castillo, A46183, 10/15/2014

15. EMERGENCY RENOVATIONS: Date/time of emergency:

Describe the sudden, unexpected event:

Explain how the event caused unsafe conditions, and/or would cause equipment damage and/or an unreasonable financial burden:

16. I certify that an individual trained in the provisions of 40 CFR Part 61, Subpart M, will be on-site during the renovation and during demolition involving RACM above the threshold and/or during an ordered demolition. Evidence that this person has completed the required training will be available for inspection at the renovation or demolition site.

Dale F. Carrier	06/27/2017
Signature of Owner or Abatement/Demolition Contractor	*Date*

17. Signature Requirements for Projects with Negative Pressure Enclosures: (required by LARA)

Per Section 221(1)(2) of P.A. 135 of 1986, as amended, clearance air monitoring is required for any asbestos abatement project involving 10 linear feet/15 square feet or more of friable material which is performed within a negative pressure enclosure. I (the building owner or lessee) have been advised by the contractor of my responsibility under Act 135 to have clearance air monitoring performed on this project.

Signature of Building Owner or Lessee	*Date*	*Signature of Asbestos Abatement Contractor Representative*	*Date*

NOTE: It is not mandatory that a signed copy be sent to LARA unless requested.

For affected projects, this section of the notification form must be completed, signed, and made part of **your** records before the project begins.

18. I certify that the above information is correct:

Dale F. Carrier	06/27/2017	Dale F. Carrier	06/27/2017
Printed Name of Owner/Operator	*Date*	*Signature of Owner/Operator*	*Date*

APPENDIX I

Submittals

200 Michigan Street, Suite 705, Hancock, MI 49930
906-487-7452
www.MannikSmithGroup.com

LETTER OF TRANSMITTAL

To: Mr. Hans Haapala
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913

Project #: MDEQ0070
Date: June 12, 2017

Re: Submittal #001
MDEQ Torch Lake Non-Superfund Site
Hubbell Processing Area

Enclosed are the following:

No. of Copies	Description
1	Approved Submittal #001

The above items are transmitted as checked below:

☐ For review and approval ☐ For review and comment ☐ Returned for corrections
☒ For your use ☒ Approved as submitted ☐ Approved as noted
☐ As requested ☐ Other:

Remarks:

Please refer to the comments written on the approved transmittal.

Copies To: MDEQ-RRD, Calumet District Office

File

Signed:

Printed: Jed Chrestensen
Project Engineer

This transmittal is subject to the following conditions to which you agree by accepting these terms on a reply to this message or using the information in any manner, including but not limited to, copying or using the information for reference.

1. Any work product of The Mannik & Smith Group, Inc. may not be altered in manner, form or content without our prior express written consent.
2. If you discover any errors and/or omissions in the attached information, you will promptly notify us so that we can make any necessary revisions.
3. For any electronic file(s) attached hereto, The Mannik & Smith Group, Inc. is not responsible for any errors caused by the transmission of said files, your software, or your computer systems.

SUBMITTAL# 001

DATE: June 7, 2017

Michigan Department of Environmental Quality
Torch Lake Non-Superfund Site
Hubbell Processing Area
Hubbell, MI
File No.: 761/16108.SAR Index No.44251

TO:
Jed Chrestensen
The Mannik & Smith Group, Inc
200 Michigan Street, Suite 705
Hancock, MI 49930

FROM:
Hans Haapala, Project Manager, 906-281-6908
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913

SUBMITTAL TYPE:

☐ Product Data	☐ Certificates	☐Record Documents	☐ Operation/Maintenance Manuals
☐Shop Drawings	☐Manufacturer's Instructions	☐Samples	☐ Contract Closeout
☐Test Reports	☐Construction Photographs	☒ Information	☐Other

SUPPLIER: None

SPECIFICATION NUMBER AND TITLE: 01 45 00 Imported Cap Material Sampling Plan

PART	TYPE	DESCRIPTION
3.1.1	ACTION	Proposed pit and sampling locations, in order to reduce potential delays while installing cap, B&B proposes to complete all sampling before transporting borrow soil according to the attached plan. This is a change from the specification that the soil be tested when brought on site.

B&B Contracting, Calumet, Inc. certifies that review, approval verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents.

Signed: Hans P. Haapala

Digitally signed by Hans P. Haapala
DN: cn=Hans P. Haapala, o=B&B Contracting, Calumet, Inc., ou=Project Engineer, email=hanshaapala@gmail.com, c=US
Date: 2017.06.07 15:50:53 -04'00'

Date: 6/7/17

APPROVED 6/12/17

REMINDER - SUBSECTION 3.1 OF SECTION 01 4500 REQUIRES THAT ACCEPTABLE TEST RESULTS BE PROVIDED AND ACCEPTED PRIOR TO ANY CAP MATERIAL BEING BROUGHT TO THE SITE. ALSO, A 10 LB SPLIT SAMPLE OF THE TESTED MATERIAL SHALL BE PROVIDED FOR EACH CAP MATERIAL TEST RESULT.

WILL THE REPRESENTATIVE SAMPLE FOR LABORATORY ANALYTICAL TESTING ALSO BE COLLECTED DURING THIS EFFORT?

An Equal Opportunity Employer
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913
Office: 906-337-0017
Fax: 906-934-2587

TRANSMITTAL

DATE:

June 7, 2017

FROM:

Hans Haapala (906)281-6908

ATTN:

Jed Chrestensen, P.E.

JOB NAME:

Torch Lake Non-Superfund Site
Hubbell Processing Area

ADDRESS:

The Mannik & Smith Group, Inc.
200 Michigan Street, Suite 705
Hancock, MI 49930

ATTACHED:

Submittal #001
Proposed Borrow Pit Sampling Locations

PHONE NUMBER:

(906)487-7451

RE:

Proposed Borrow Pit Location and Sampling Plan

O URGENT **X** FOR REVIEW **O** PLEASE COMMENT **O** PLEASE REPLY **O** PLEASE RECYCLE

Notes/Comments:

Please review the attached documents.

SUBMITTAL# 001

DATE: June 7, 2017

Michigan Department of Environmental Quality
Torch Lake Non-Superfund Site
Hubbell Processing Area
Hubbell, MI

File No.: 761/16108.SAR Index No.44251

TO:
Jed Chrestensen
The Mannik & Smith Group, Inc
200 Michigan Street, Suite 705
Hancock, MI 49930

FROM:
Hans Haapala, Project Manager, 906-281-6908
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913

SUBMITTAL TYPE:

☐ Product Data	☐ Certificates	☐Record Documents	☐ Operation/Maintenance Manuals
☐Shop Drawings	☐Manufacturer's Instructions	☐Samples	☐ Contract Closeout
☐Test Reports	☐Construction Photographs	☒ Information	☐Other

SUPPLIER: None

SPECIFICATION NUMBER AND TITLE: 01 45 00 Imported Cap Material Sampling Plan

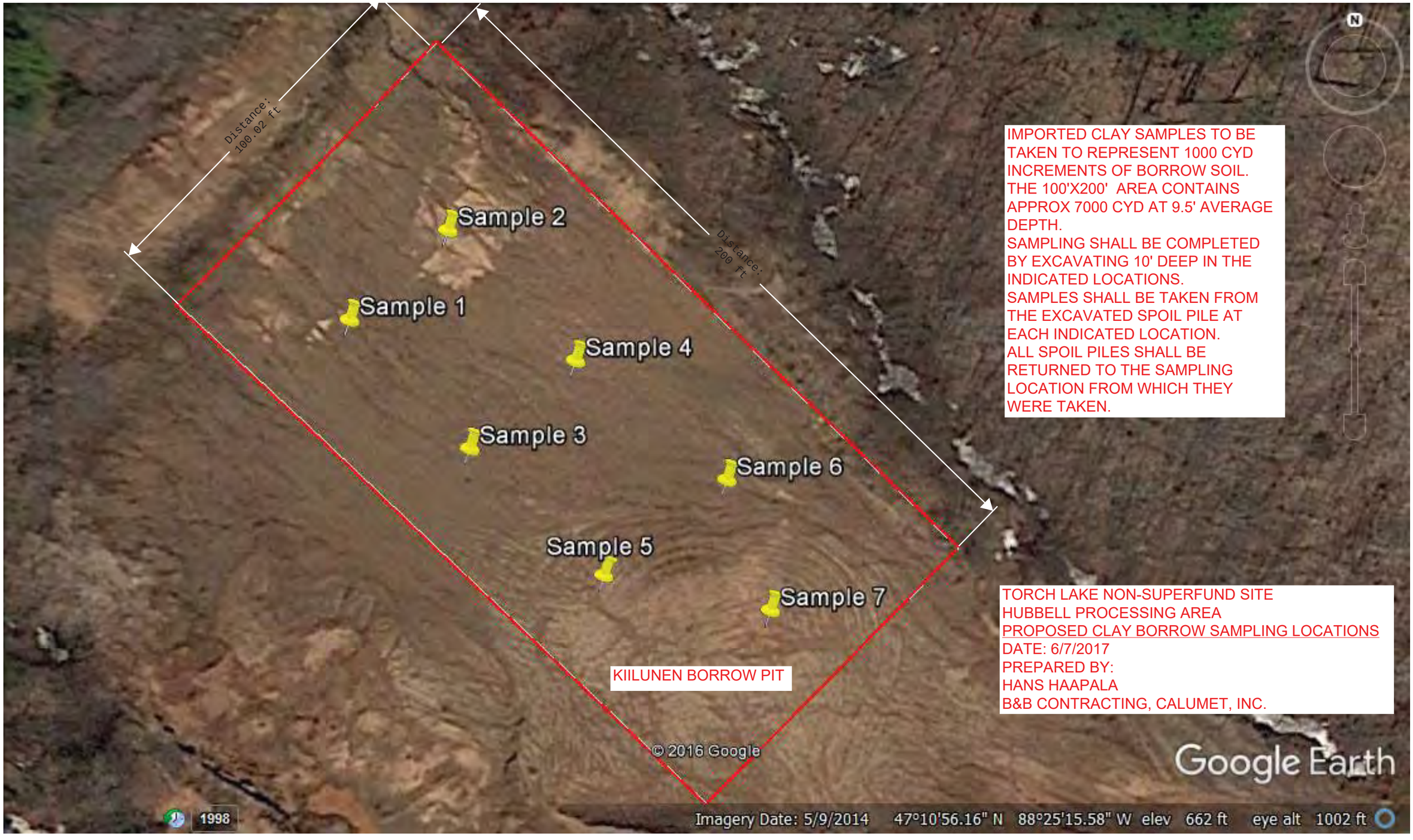
PART	TYPE	DESCRIPTION
3.1.1	ACTION	Proposed pit and sampling locations, in order to reduce potential delays while installing cap, B&B proposes to complete all sampling before transporting borrow soil according to the attached plan. This is a change from the specification that the soil be tested when brought on site.

B&B Contracting, Calumet, Inc. certifies that review, approval verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents.

Signed:_____

Date: 6/7/17


Proposed Clay Borrow Area approx. 100' x 200' with an avg depth of 9.5' = 7000 CYD
Borrow Pit Owner: Charles Kiilunen
Edgewood Dr
Lighthouse Point Dr
26
N
TORCH LAKE NON-SUPERFUND SITE
HUBBELL PROCESSING AREA REMEDIATION
PROPOSED BORROW PIT LOCATION
DATE: 6/7/2017
PREPARED BY:
HANS HAAPALA
B&B CONTRACTING, CALUMET, INC.
Hubbell Processing Area Project Site
Google Earth
1998
Imagery Date: 5/9/2014 47°10'51.91" N 88°25'06.30" W elev 623 ft eye alt 2863 ft


Distance:
100.02 ft
Distance:
200 ft
Sample 1
Sample 2
Sample 3
Sample 4
Sample 5
Sample 6
Sample 7
KIILUNEN BORROW PIT
© 2016 Google
Google Earth
1998
Imagery Date: 5/9/2014 47°10'56.16" N 88°25'15.58" W elev 662 ft eye alt 1002 ft
N
IMPORTED CLAY SAMPLES TO BE TAKEN TO REPRESENT 1000 CYD INCREMENTS OF BORROW SOIL.
THE 100'X200' AREA CONTAINS APPROX 7000 CYD AT 9.5' AVERAGE DEPTH.
SAMPLING SHALL BE COMPLETED BY EXCAVATING 10' DEEP IN THE INDICATED LOCATIONS.
SAMPLES SHALL BE TAKEN FROM THE EXCAVATED SPOIL PILE AT EACH INDICATED LOCATION.
ALL SPOIL PILES SHALL BE RETURNED TO THE SAMPLING LOCATION FROM WHICH THEY WERE TAKEN.
TORCH LAKE NON-SUPERFUND SITE
HUBBELL PROCESSING AREA
PROPOSED CLAY BORROW SAMPLING LOCATIONS
DATE: 6/7/2017
PREPARED BY:
HANS HAAPALA
B&B CONTRACTING, CALUMET, INC.

200 Michigan Street, Suite 705, Hancock, MI 49930
906-487-7452
www.MannikSmithGroup.com

LETTER OF TRANSMITTAL

To: Mr. Hans Haapala
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913

Project #: MDEQ0070
Date: June 15, 2017

Re: Submittal #002
MDEQ Torch Lake Non-Superfund Site
Hubbell Processing Area

Enclosed are the following:

No. of Copies	Description
1	Approved Submittal #002

The above items are transmitted as checked below:

☐ For review and approval ☐ For review and comment ☐ Returned for corrections
☒ For your use ☒ Approved as submitted ☐ Approved as noted
☐ As requested ☐ Other:

Remarks:

Replacement of UP Abatement Company Inc. with UP Engineers and Architects, Inc. for the air monitoring is acceptable.

Copies To: MDEQ-RRD, Calumet District Office

File

Signed:

Printed: Jed Chrestensen
Project Engineer

This transmittal is subject to the following conditions to which you agree by accepting these terms on a reply to this message or using the information in any manner, including but not limited to, copying or using the information for reference.

1. Any work product of The Mannik & Smith Group, Inc. may not be altered in manner, form or content without our prior express written consent.
2. If you discover any errors and/or omissions in the attached information, you will promptly notify us so that we can make any necessary revisions.
3. For any electronic file(s) attached hereto, The Mannik & Smith Group, Inc. is not responsible for any errors caused by the transmission of said files, your software, or your computer systems.

SUBMITTAL# 002

DATE: June 13, 2017

Michigan Department of Environmental Quality
Torch Lake Non-Superfund Site
Hubbell Processing Area
Hubbell, MI
File No.: 761/16108.SAR Index No.44251

TO:
Jed Chrestensen
The Mannik & Smith Group, Inc
200 Michigan Street, Suite 705
Hancock, MI 49930

FROM:
Hans Haapala, Project Manager, 906-281-6908
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913

SUBMITTAL TYPE:

☐ Product Data	☐ Certificates	☐Record Documents	☐ Operation/Maintenance Manuals
☐Shop Drawings	☐Manufacturer's Instructions	☐Samples	☐ Contract Closeout
☐Test Reports	☐Construction Photographs	☒ Administrative	☐Other

SUPPLIER: None

SPECIFICATION NUMBER AND TITLE: 01 33 00 Work Plan Submittals

PART	TYPE	DESCRIPTION
1.5.2	ADMINISTRATIVE	Air monitoring plan

B&B Contracting, Calumet, Inc. certifies that review, approval verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents.

Signed: Hans P. Haapala

Digitally signed by Hans P. Haapala
DN: cn=Hans P. Haapala, o=B&B Contracting, Calumet, Inc., ou=Project Engineer, email=hanshaapala@gmail.com, c=US
Date: 2017.06.13 12:03:27 -04'00'

Date: 6/13/17

APPROVED 6-15-17

REPLACEMENT OF UP ABATEMENT CO. WITH UPEA IS ACCEPTABLE FOR AIR MONITORING.

An Equal Opportunity Employer
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913
Office: 906-337-0017
Fax: 906-934-2587

TRANSMITTAL

DATE:	***FROM:***
June 13, 2017	Hans Haapala (906)281-6908
ATTN:	*JOB NAME:*
Jed Chrestensen, P.E.	Torch Lake Non-Superfund Site Hubbell Processing Area
ADDRESS:	*ATTACHED:*
The Mannik & Smith Group, Inc. 200 Michigan Street, Suite 705 Hancock, MI 49930	Submittal #002 Air Monitoring Plan
PHONE NUMBER:	
(906)487-7451	
RE:	
Air Monitoring Plan	

O URGENT **X** FOR REVIEW **O** PLEASE COMMENT **O** PLEASE REPLY **O** PLEASE RECYCLE

Notes/Comments:

Please review the attached submittal documents.

SUBMITTAL# 002

DATE: June 13, 2017

Michigan Department of Environmental Quality
Torch Lake Non-Superfund Site
Hubbell Processing Area
Hubbell, MI

File No.: 761/16108.SAR Index No.44251

TO:

Jed Chrestensen

The Mannik & Smith Group, Inc

200 Michigan Street, Suite 705

Hancock, MI 49930

FROM:

Hans Haapala, Project Manager, 906-281-6908

B&B Contracting, Calumet, Inc.

55670 Hwy M-26

Calumet, MI 49913

SUBMITTAL TYPE:

☐ Product Data	☐ Certificates	☐Record Documents	☐ Operation/Maintenance Manuals
☐Shop Drawings	☐Manufacturer's Instructions	☐Samples	☐ Contract Closeout
☐Test Reports	☐Construction Photographs	☒ Administrative	☐Other

SUPPLIER: None

SPECIFICATION NUMBER AND TITLE: 01 33 00 Work Plan Submittals

PART	TYPE	DESCRIPTION
1.5.2	ADMINISTRATIVE	Air monitoring plan

B&B Contracting, Calumet, Inc. certifies that review, approval verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents. Signed:_____ Date: 6/13/17	

An Equal Opportunity Employer
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913
Office: (906)337-0017
Fax: (906)934-2587

AIR MONITORING PLAN

PREPARED FOR:

PROJECT:

HUBBELL PROCESSING AREA REMEDIATION
FILE NO. 761/16108.SAR INDEX NO. 44521
TORCH LAKE NON-SUPERFUND SITE

LOCATION:

52634 STATE HWY M-26
HUBBELL, MI

OWNER:

STATE OF MICHIGAN, DEPARTMENT OF TECHNOLOGY, MANAGEMENT & BUDGET
DEPARTMENT OF ENVIRONMENTAL QUALITY

PROFESSIONAL:

THE MANNIK & SMITH GROUP, INC.

BY:

B&B CONTRACTING, CALUMET, INC.

AIR MONITORING FIRM:

U.P. ENGINEERS & ARCHITECTS, INC.

DATED:

JUNE 13, 2017

This plan was prepared using the project Contract Documents owned by the State and prepared by the Professional.

Table of Contents

1.0 INTRODUCTION 3
2.0 POSSIBLE AIRBORNE CONTAMINANTS 3
3.0 METHODS OF AIR MONITORING 3
DUST 3
ASBESTOS 4
4.0 ACTION LEVELS AND CONTROLS 4
DUST 4
ASBESTOS 4
5.0 REPORTING 5

1.0 INTRODUCTION

This Air Monitoring Plan is developed to provide site-specific procedures for monitoring and reporting of possible airborne contaminants before, during and following the completion of the Hubbell Processing Area Remediation. This remediation includes ditching and grading of asbestos contaminated soil.

The purpose of this air monitoring is to document airborne exposures to on site personnel and the surrounding public community. This monitoring will also provide early warning of potential exposures in order to implement additional engineering control for exposures.

2.0 POSSIBLE AIRBORNE CONTAMINANTS

Contaminants that are of the main concern to become airborne during ditching and grading are respirable particulate matter(PM10) and asbestos. The following table shows the compounds and their sources, action levels and engineering controls.

Target Compounds	**Source**	**Measurement Method**	**Action Level (1/2 OSHA PEL)**	**Engineering Controls**
Dust (PM10)	Disturbance of site soils	Visual monitoring	Visible dust	Water truck
		Thermo DataRam pDR-1200 aerosol monitor (or equivalent)	2.5 mg/m^3 Downwind value minus upwind value	
Asbestos	Disturbance of site soils	Air sampling (OSHA ID-160 Method)	TWA 0.05 fiber/cc Excursion Level (30 min) 0.5 fiber/cc	Water truck

3.0 METHODS OF AIR MONITORING

Air monitoring will be conducted at the personnel task locations and at six locations along the perimeter fence line. Two permanent monitoring locations will be established, with one being along the south fence line adjacent to the neighboring business (Koppers) and one along the south portion of the west fence line closest to the nearby residence. Four locations will be selected on a daily basis based on wind direction, work location, and nearby receptor(residence) locations. Regardless of the wind direction at least one monitoring location will be placed upwind of the daily work area.

DUST

Visual observation will be used to continuously monitor the active work area for visible emissions of dust. Observations will be logged on an hourly basis.

A Thermo DataRam pDR-1200 (or equivalent) aerosol monitor will be used at each of the two permanent monitoring locations. The monitors will be positioned approximately 5 feet above ground level. The monitors will continuously record dust concentrations and calculate a time weighted average concentration. The concentrations will be visually observed hourly and each day's recorded data will be downloaded, posted and submitted to the Professional daily. Monitoring at the two permanent locations will be collected for at least 3 days prior to active

work beginning on site.

Thermo DataRam pDR-1200 portable aerosol monitor will be used by the monitoring technician at the four daily chosen perimeter locations. While work is active in the exclusion zone, this monitor will be moved every 15 minutes to another location such that each location is sampled at least once per hour while the work area is active.

The monitoring technician shall immediately notify the Site Superintendent and Professional if the action level of 2.5 mg/m^3 is observed.

ASBESTOS

Air samples to measure asbestos fiber concentrations will be collected daily at all six perimeter locations while work is active in the exclusion zone. Air samples will be collected at the two permanent perimeter locations for at least 3 days prior to active work beginning on site.

Air samples will be collected daily by a personal air sampler on one worker involved in each work task. Two work tasks have been identified on this site, the first being an operator of heavy machinery; excavator, dozer or haul truck, the second being a laborer continuously in contact with site soils; picking ACM/RPM, placing silt fence, placing filter fabric, etc. Sampling shall occur for total concentration on a daily basis.

The airflow rate will be verified using a rotameter before and after sampling. The air samples will be analyzed by an accredited technician using Phase Contrast Microscopy. Sampling and analysis will be completed according to OSHA Method ID-160.

Air samples will be analyzed by a certified lab on a 96-hour basis and the results will be posted in the office trailer and submitted to the Professional as received.

4.0 ACTION LEVELS AND CONTROLS

DUST

If visible emissions are present, water spray or mist shall be used for dust suppression.

If the difference in the real-time readings on the aerosol monitors between the upwind and downwind monitors exceed the action level of 2.5 mg/m^3 then all work shall stop until emissions are controlled.

ASBESTOS

If visible emissions are present, water spray or mist shall be used for dust suppression.

If air sampling results show concentrations in excess of the action level of 0.05 fibers/cc then all work shall cease until additional engineering controls can be put in place. *(UPEA does not have this capability)*

5.0 REPORTING

Visual observations for dust and odors will be logged hourly or as observed, along with any responses taken. Daily logs will be posted in the office trailer and submitted to the Professional.

Data logs from the aerosol monitors will be downloaded at the conclusion of each work day and posted in the office trailer the next day and submitted to the Professional.

200 Michigan Street, Suite 705, Hancock, MI 49930
906-487-7452
www.MannikSmithGroup.com

LETTER OF TRANSMITTAL

To: Mr. Hans Haapala
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913

Project #: MDEQ0070
Date: June 19, 2017

Re: Submittal #003 – Project Schedule
MDEQ Torch Lake Non-Superfund Site
Hubbell Processing Area

Enclosed are the following:

No. of Copies	Description
1	Approved As Corrected Submittal #003

The above items are transmitted as checked below:

☐ For review and approval
☒ For your use
☐ As requested
☐ For review and comment
☐ Approved as submitted
☐ Other:
☐ Returned for corrections
☒ Approved as noted

Remarks:

Please let us know when you hear back from DTMB on the contract.

Copies To: MDEQ-RRD, Calumet District Office

File

Signed:

Printed: Jed Chrestensen
Project Engineer

This transmittal is subject to the following conditions to which you agree by accepting these terms on a reply to this message or using the information in any manner, including but not limited to, copying or using the information for reference.

1. Any work product of The Mannik & Smith Group, Inc. may not be altered in manner, form or content without our prior express written consent.
2. If you discover any errors and/or omissions in the attached information, you will promptly notify us so that we can make any necessary revisions.
3. For any electronic file(s) attached hereto, The Mannik & Smith Group, Inc. is not responsible for any errors caused by the transmission of said files, your software, or your computer systems.

SUBMITTAL# 003

DATE: June 16, 2017

Michigan Department of Environmental Quality
Torch Lake Non-Superfund Site
Hubbell Processing Area
Hubbell, MI
File No.: 761/16108.SAR Index No.44251

TO:
Jed Chrestensen
The Mannik & Smith Group, Inc
200 Michigan Street, Suite 705
Hancock, MI 49930

FROM:
Hans Haapala, Project Manager, 906-281-6908
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913

SUBMITTAL TYPE:

☐ Product Data	☐ Certificates	☐Record Documents	☐ Operation/Maintenance Manuals
☐Shop Drawings	☐Manufacturer's Instructions	☐Samples	☐ Contract Closeout
☐Test Reports	☐Construction Photographs	☒ Administrative	☐Other

SUPPLIER: None

SPECIFICATION NUMBER AND TITLE: 01 33 00 Submittals

PART	TYPE	DESCRIPTION
1.5.10	ADMINISTRATIVE	Project Schedule

B&B Contracting, Calumet, Inc. certifies that review, approval verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents.

Signed: Hans P. Haapala

Digitally signed by Hans P. Haapala
DN: cn=Hans P. Haapala, o=B&B Contracting, Calumet, Inc., ou=Project Engineer, email=hanshaapala@gmail.com, c=US
Date: 2017.06.16 11:10:33 -04'00'

Date: 6/16/17

APPROVED AS CORRECTED
6-19-17

ANY RESPONSE FROM DTMB YET?

An Equal Opportunity Employer
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913
Office: 906-337-0017
Fax: 906-934-2587

TRANSMITTAL

DATE:

June 16, 2017

FROM:

Hans Haapala (906)281-6908

ATTN:

Jed Chrestensen, P.E.

JOB NAME:

Torch Lake Non-Superfund Site
Hubbell Processing Area

ADDRESS:

The Mannik & Smith Group, Inc.
200 Michigan Street, Suite 705
Hancock, MI 49930

ATTACHED:

Submittal #003
Project Schedule

PHONE NUMBER:

(906)487-7451

RE:

Project Schedule

O URGENT **X** FOR REVIEW **O** PLEASE COMMENT **O** PLEASE REPLY **O** PLEASE RECYCLE

Notes/Comments:

Please review the attached submittal documents.

SUBMITTAL# 003

DATE: June 16, 2017

Michigan Department of Environmental Quality
Torch Lake Non-Superfund Site
Hubbell Processing Area
Hubbell, MI

File No.: 761/16108.SAR Index No.44251

TO:
Jed Chrestensen

The Mannik & Smith Group, Inc

200 Michigan Street, Suite 705

Hancock, MI 49930

FROM:
Hans Haapala, Project Manager, 906-281-6908

B&B Contracting, Calumet, Inc.

55670 Hwy M-26

Calumet, MI 49913

SUBMITTAL TYPE:

☐ Product Data	☐ Certificates	☐Record Documents	☐ Operation/Maintenance Manuals
☐Shop Drawings	☐Manufacturer's Instructions	☐Samples	☐ Contract Closeout
☐Test Reports	☐Construction Photographs	☒ Administrative	☐Other

SUPPLIER: None

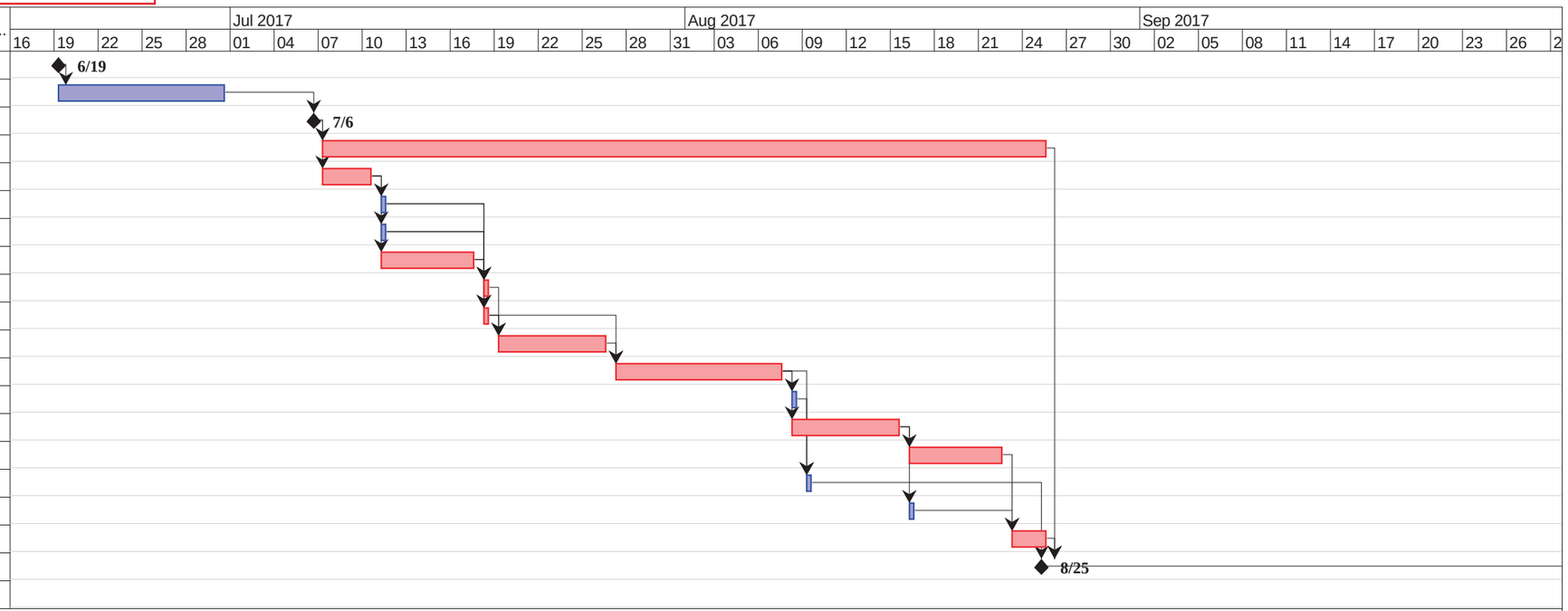
SPECIFICATION NUMBER AND TITLE: 01 33 00 Submittals

PART	TYPE	DESCRIPTION
1.5.10	ADMINISTRATIVE	Project Schedule

B&B Contracting, Calumet, Inc. certifies that review, approval verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents. Signed:_____ Date: 6/16/17	

Any response from DTMB yet?

		Task Name	Duration	Start	Finish	Pred...	R...
1		Receipt of Conformed Contract	0 days	6/19/17...	6/19/1...		
2		Material Testing/Submittals	10 days	6/19/17...	6/30/1...	1	
3		Precon/Notice to Proceed	0 days	7/6/17 ...	7/6/17 ...	2	
4		Air Monitoring	36 days	7/6/17 ...	8/24/1...	3	
5		Mobilization	2 days	7/7/17 ...	7/10/1...	3	
6		Temporary Facilities	1 day	7/11/17...	7/11/1...	5	
7		Temporary SESC	1 day	7/11/17...	7/11/1...	5	
8		Access/ Haul Road Improvements	5 days	7/11/17...	7/17/1...	5	
9		Tree and Brush Removal	1 day	7/18/17...	7/18/1...	6;7;8	
10		PCB Soils, Load and Dispose	1 day	7/18/17...	7/18/1...	6;7;8	
11		Drainage Ditch Improvements	6 days	7/19/17...	7/26/1...	10;9	
12		Site Grading	8 days	7/27/17...	8/7/17 ...	10;11	
13		North Boundary Road Installation	1 day	8/8/17 ...	8/8/17 ...	12	
14		Site Capping	6 days	8/8/17 ...	8/15/1...	12	
15		Seeding, Fertilizing, Mulching	5 days	8/16/17...	8/22/1...	14	
16		As Built Survey	1 day?	8/9/17 ...	8/9/17 ...	12;13	
17		Borrow Pit Restoration	1 day	8/16/17...	8/16/1...	14	
18		Demobilization	3 days	8/23/17...	8/25/1...	15;17	
19		Substantial Completion	0 days	8/25/17...	8/25/1...	4;1...	
20		Final SESC Closeout	0 days	10/30/1...	10/30/...	19	



Proposed Project Schedule
MDEQ
Torch Lake Non-Superfund Site
Hubbell Processing Area
Hubbell, MI

B&B Contracting, Calumet, Inc.

The As-Built Survey should not occur prior to the completion of capping, so no sooner than 8/16/17.

200 Michigan Street, Suite 705, Hancock, MI 49930
906-487-7452
www.MannikSmithGroup.com

LETTER OF TRANSMITTAL

To: Mr. Hans Haapala
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913

Project #: MDEQ0070
Date: June 23, 2017

Re: Submittal #004 – Cap Material, Gravel, and Rip Rap
MDEQ Torch Lake Non-Superfund Site
Hubbell Processing Area

Enclosed are the following:

No. of Copies	Description
1	Approved As Corrected Submittal #004

The above items are transmitted as checked below:

☐ For review and approval ☐ For review and comment ☐ Returned for corrections
☒ For your use ☐ Approved as submitted ☒ Approved as noted
☐ As requested ☐ Other:

Remarks:

Please note that NRCS/USDA uses a sand/gravel cutoff at the #10 sieve unlike USCS which is at the #4 sieve. The specifications for the cap material are based on the NRCS specifications. This adjustment changes the gravel and sand percentages (increases the gravel and lowers the sand percentage) but the samples still meet the specifications for Option 1 in subsection 2.3.1.3 of Section 31 22 23 and therefore are approved. The MDOT 23A gravel meets specifications and is approved. As previously communicated regarding the rip rap, the results are acceptable but if B&B can work some larger stone into the mix that would be good but not to exceed 18-inch stones.

Copies To: MDEQ-RRD, Calumet District Office

File

Signed:

Printed: Jed Chrestensen
Project Engineer

This transmittal is subject to the following conditions to which you agree by accepting these terms on a reply to this message or using the information in any manner, including but not limited to, copying or using the information for reference.

1. Any work product of The Mannik & Smith Group, Inc. may not be altered in manner, form or content without our prior express written consent.
2. If you discover any errors and/or omissions in the attached information, you will promptly notify us so that we can make any necessary revisions.
3. For any electronic file(s) attached hereto, The Mannik & Smith Group, Inc. is not responsible for any errors caused by the transmission of said files, your software, or your computer systems.

SUBMITTAL# 004

DATE: June 20, 2017

Michigan Department of Environmental Quality
Torch Lake Non-Superfund Site
Hubbell Processing Area
Hubbell, MI
File No.: 761/16108.SAR Index No.44251

TO:
Jed Chrestensen
The Mannik & Smith Group, Inc
200 Michigan Street, Suite 705
Hancock, MI 49930

FROM:
Hans Haapala, Project Manager, 906-281-6908
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913

SUBMITTAL TYPE:

☐ Product Data	☐ Certificates	☐Record Documents	☐ Operation/Maintenance Manuals
☐Shop Drawings	☐Manufacturer's Instructions	☐Samples	☐ Contract Closeout
☒Test Reports	☐Construction Photographs	☐ Administrative	☐Other

SUPPLIER: None

SPECIFICATION NUMBER AND TITLE: 01 45 00 Quality Control and 31 22 23 Excavation, Grading and Capping

PART	TYPE	DESCRIPTION
1.3.4.1	Geotechnical Test Reports	Imported Cap Material Gradations and Sample Locations
1.3.4.1	Geotechnical Test Reports	MDOT 23A – Haul Road Gravel
1.3.4.2	Geotechnical Test Reports	Riprap Gradation

B&B Contracting, Calumet, Inc. certifies that review, approval verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents.

Signed:_ Digitally signed by Hans P. Haapala DN: cn=Hans P. Haapala, o=B&B Contracting, Calumet, Inc., ou=Project Engineer, email=hanshaapala@gmail.com, c=US Date: 2017.06.20 14:16:39 -04'00'

Date: 6/20/17

APPROVED 6-23-17

NOTE THAT NRCS/USDA USES A SAND/GRAVEL CUTOFF AT THE #10 SIEVE UNLIKE USCS WHICH IS AT THE #4 SIEVE. THIS ADJUSTMENT CHANGES THE GRAVEL AND SAND PERCENTAGES BUT THE SAMPLES STILL MEET THE SPECIFICATIONS FOR OPTION 1 IN 2.3.1.3. OF SECTION 31 22 23.
THE RIP RAP GRADATION WAS PREVIOUSLY APPROVED.

An Equal Opportunity Employer
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913
Office: 906-337-0017
Fax: 906-934-2587

TRANSMITTAL

DATE:

June 20, 2017

FROM:

Hans Haapala (906)281-6908

ATTN:

Jed Chrestensen, P.E.

JOB NAME:

Torch Lake Non-Superfund Site
Hubbell Processing Area

ADDRESS:

The Mannik & Smith Group, Inc.
200 Michigan Street, Suite 705
Hancock, MI 49930

ATTACHED:

Submittal #004
Soil & Aggregate Gradations

PHONE NUMBER:

(906)487-7451

RE:

Soil & Aggregate Gradations

O URGENT **X** FOR REVIEW **O** PLEASE COMMENT **O** PLEASE REPLY **O** PLEASE RECYCLE

Notes/Comments:

Please review the attached submittal documents.

SUBMITTAL# 004

DATE: June 20, 2017

Michigan Department of Environmental Quality
Torch Lake Non-Superfund Site
Hubbell Processing Area
Hubbell, MI

File No.: 761/16108.SAR Index No.44251

TO:
Jed Chrestensen

The Mannik & Smith Group, Inc

200 Michigan Street, Suite 705

Hancock, MI 49930

FROM:
Hans Haapala, Project Manager, 906-281-6908

B&B Contracting, Calumet, Inc.

55670 Hwy M-26

Calumet, MI 49913

SUBMITTAL TYPE:

☐ Product Data	☐ Certificates	☐Record Documents	☐ Operation/Maintenance Manuals
☐Shop Drawings	☐Manufacturer's Instructions	☐Samples	☐ Contract Closeout
☒Test Reports	☐Construction Photographs	☐ Administrative	☐Other

SUPPLIER: None

SPECIFICATION NUMBER AND TITLE: 01 45 00 Quality Control and 31 22 23 Excavation, Grading and Capping

PART	TYPE	DESCRIPTION
1.3.4.1	Geotechnical Test Reports	Imported Cap Material Gradations and Sample Locations
1.3.4.1	Geotechnical Test Reports	MDOT 23A – Haul Road Gravel
1.3.4.2	Geotechnical Test Reports	Riprap Gradation

B&B Contracting, Calumet, Inc. certifies that review, approval verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents. Signed:_____ Date: 6/20/17	

IMPORTED CAP MATERIAL, SANDY LOAM – CHARLES KIILUNEN BORROW PIT
52705 STATE HWY M-26
LAKE LINDEN, MI 49945

HYDROMETER ANALYSIS - ASTM D422

HYDROMETER TYPE : ASTM 152 H

JOB # : 17-27
Sample ID : 5
DEPTH : 2.0-10.'

SPECIFIC GRAVITY OF SOIL, Gs = 2.65
Air DRY WEIGHT OF SOIL grams, Ws = 96
Hygroscopic Moisture Correction Factor= 0.9989
Weight of Oven Dried Soil Sample, WOD= 95.9

MENISCUS CORRECTION, Fm = 0
ZERO CORRECTION, Fz = 6
Weight of total Hydrometer sample, W= 102.6

SOIL DESCRIPTION : Reddish poorly graded silty/clayey fine sand with trace of rounded gravel
Rounded durable to friarable gravel
SM

TIME (MINUTES)	Hydrometer Reading, R	Rcp	% Finer	Rcl	L (cm)	k (ASTM D422, Table 3)	D (mm)	Temp (C)
0.25	25	18.65	19.4	25	12.2	0.01399	0.0977	18
0.50	25	18.65	19.4	25	12.2	0.01399	0.0691	18
1.00	25	18.65	19.4	25	12.2	0.01399	0.0489	18
2.00	25	18.65	19.4	25	12.2	0.01399	0.0346	18
5.00	23	16.65	17.3	23	12.5	0.01399	0.0221	18
8.00	22	15.65	16.3	22	12.7	0.01399	0.0176	18
15.00	21	14.65	15.3	21	12.9	0.01399	0.0130	18
30.00	18	11.65	12.1	18	13.3	0.01399	0.0093	18
60.00	15	9.40	9.8	15	13.8	0.01348	0.0067	21
120.00	14	8.40	8.8	14	14.0	0.01348	0.0048	21
240.00	13	7.40	7.7	13	14.2	0.01348	0.0034	21
480.00	12	6.40	6.7	12	14.3	0.01348	0.0024	21
1440.00	11	5.40	5.6	11	14.5	0.01348	0.0014	21
4320.00		-10.85	-11.3	0	16.3	0.01364	0.0009	
OTHER	ENTER	#VALUE!	#VALUE!	#VALUE!	#VALUE!		#VALUE!	
OTHER	ENTER	#VALUE!	#VALUE!	#VALUE!	#VALUE!		#VALUE!	

MECHANICAL ANALYSIS :

INITIAL WT g. = **1576**

	WEIGHT RETAINED g.	PERCENT PASSING		
1 1/2"	0.0	**100.0**		
1"	0.0	**100.0**	25.400	
3/4"	0.0	**100.0**	19.000	
1/2'	15.2	**99.0**	12.500	
3/8"	17.5	**97.9**	9.500	
#4	35.4	**95.7**	4.750	
#8	28.8	**93.9**	2.360	
#10	5.4	**93.5**	2.000	
#16	1.5	**92.0**	1.180	
#30	5.6	**86.6**	0.600	
#40	0.0	**86.6**	0.425	
#50	0.0	**86.6**	0.300	
#100	27.3	**60.0**	0.150	
#200	25.1	**35.5**	0.075	
TOTAL #10+ g.	**102.3**	**% R#10+**	**6.5**	
TOTAL P#10 g.	**1473.7**	**% P#10-**	**93.5**	
SIEVED TOTAL	**161.8**			

Ft = - 4.85 + .25T

Rcl = R + Fm

% Finer = [(a x Rcp)/ Ws] x 100
where a = Specific Gravity correction
(because hydrometer is calibrated to Gs= 2.65)
(see Fig 5-5, p30 Soils Lab Book)

(Table 1, ASTM D422, p14)

a = 1
= 1 + (2.65 - Gs)/ 5

L = see Fig 5-2
p25 Soil Lab Book
(Table 2, ASTM D422, p 15)
= .164 x (60 - R)+ 0.66+ 5.8

k = see Fige 5-3
p26 Soil Lab Book

(Table 3, ASTM D422, p16)

Procedure Notes:

- Soak in 125 mL of 4% solution for 16hrs minimum.
- Stir in mixer for 1 minute
- Agitate for 1 minute after transfer to 1000mL cylinder.
- Wash over #200 sieve when complete, dry & sieve.

COMBINED HYDROMETER AND SIEVE ANALYSIS

PROJECT: MDEQ-Hubble Processing Site PROJECT ID: **17-27** DATE: 06/16/17

Test Results: Material meets requirement of Option 1 of section 2.3.1.3.1 for the specification of Sandy Loam Criteria: Contains 20% less clay, combination of % silt plus twice % clay is great than 30; Contains 52% or more sand and less than 15% gravel.

IDENTIFICATION : Sample #5 Contractor : B&B Contracting

DATE SAMPLED : 6/9/2017 Engineer: Mannik Smith Group

DATE TESTED : 6/14/2017 Pit: Charles Kiilunen-Hubble, MI

SIEVE ANALYSIS

SIEVE SIZE		PERCENT PASSING
37.5 mm	(1 1/2")	100
25.0 mm	(1")	100
19.0 mm	(3/4")	100
9.5 mm	(3/8")	98
4.75 mm	(#4)	96
2.00 mm	(#10)	94
600 um	(#30)	87
75 um	(#200)	36

HYDROMETER ANALYSIS

SIEVE SIZE	PERCENT PASSING
Silts - 0.074 mm	27.0
Clay - 0.005 mm	9.0
Colloids - 0.001 mm	

SOIL DESCRIPTION :

Reddish poorly graded silty/clayey fine sand with trace of rounded gravel
Rounded durable to friarable gravel
SM

NOTES :

Gravel	2%
Sand	62%
Silt	27%
Clay	9%

Prepared By:
CSG Testing
Hancock, MI 49930
906.370.2987

csg.testing@outlook.com

Douglas Cooper

Project Technician

THE HYDROMETER ANALYSIS WAS PERFORMED IN GENERAL ACCORDANCE WITH ASTM D422.

HYDROMETER ANALYSIS - ASTM D422

HYDROMETER TYPE : ASTM 152 H

JOB # : 17-27
Sample ID : 6
DEPTH : 2.0-10.'

SPECIFIC GRAVITY OF SOIL, Gs = 2.65
Air DRY WEIGHT OF SOIL grams, Ws = 97.3
Hygroscopic Moisture Correction Factor= 0.9916
Weight of Oven Dried Soil Sample, WOD= 96.5

MENISCUS CORRECTION, Fm = 0
ZERO CORRECTION, Fz = 6
Weight of total Hydrometer sample, W= 102.1

SOIL DESCRIPTION : Reddish poorly graded silty/clayey fine sand with trace of rounded gravel
Rounded durable to friarable gravel
SM

TIME (MINUTES)	Hydrometer Reading, R	Rcp	% Finer	Rcl	L (cm)	k (ASTM D422, Table 3)	D (mm)	Temp (C)
0.25	25	19.40	19.9	25	12.2	0.01348	0.0942	21
0.50	25	19.40	19.9	25	12.2	0.01348	0.0666	21
1.00	25	19.40	19.9	25	12.2	0.01348	0.0471	21
2.00	25	19.40	19.9	25	12.2	0.01348	0.0333	21
5.00	21	15.40	15.8	21	12.9	0.01348	0.0216	21
8.00	20	14.40	14.8	20	13.0	0.01348	0.0172	21
15.00	18	12.40	12.7	18	13.3	0.01348	0.0127	21
30.00	17	11.40	11.7	17	13.5	0.01348	0.0090	21
60.00	16	10.40	10.7	16	13.7	0.01348	0.0064	21
120.00	15	9.40	9.7	15	13.8	0.01348	0.0046	21
240.00	14	8.40	8.6	14	14.0	0.01348	0.0033	21
480.00	13	7.40	7.6	13	14.2	0.01348	0.0023	21
1440.00	12	6.40	6.6	12	14.3	0.01348	0.0013	21
4320.00		-10.85	-11.2	0	16.3	0.01348	0.0008	
OTHER	ENTER	#VALUE!	#VALUE!	#VALUE!	#VALUE!		#VALUE!	
OTHER	ENTER	#VALUE!	#VALUE!	#VALUE!	#VALUE!		#VALUE!	

MECHANICAL ANALYSIS :

INITIAL WT g. = **1092**

	WEIGHT RETAINED g.	PERCENT PASSING		
1 1/2"	0.0	**100.0**		
1"	0.0	**100.0**		25.400
3/4"	0.0	**100.0**		19.000
1/2'	3.5	**99.7**		12.500
3/8"	10.5	**98.7**		9.500
#4	25.0	**96.4**		4.750
#8	17.8	**94.8**		2.360
#10	3.5	**94.5**		2.000
#16	1.7	**92.8**		1.180
#30	5.9	**87.0**		0.600
#40	0.0	**87.0**		0.425
#50	11.6	**75.7**		0.300
#100	17.4	**58.6**		0.150
#200	25.2	**34.0**		0.075
TOTAL #10+ g.	**60.3**	**% R#10+**	**5.5**	
TOTAL P#10 g.	**1031.7**	**% P#10-**	**94.5**	
SIEVED TOTAL	**122.1**			

Ft = - 4.85 + .25T

Rcl = R + Fm

% Finer = [(a x Rcp)/ Ws] x 100
where a = Specific Gravity correction
(because hydrometer is calibrated to Gs= 2.65)
(see Fig 5-5, p30 Soils Lab Book)

(Table 1, ASTM D422, p14)

a = 1
= 1 + (2.65 - Gs)/ 5

L = see Fig 5-2
p25 Soil Lab Book
(Table 2, ASTM D422, p 15)
= .164 x (60 - R)+ 0.66+ 5.8

k = see Fige 5-3
p26 Soil Lab Book

(Table 3, ASTM D422, p16)

Procedure Notes:

- Soak in 125 mL of 4% solution for 16hrs minimum.
- Stir in mixer for 1 minute
- Agitate for 1 minute after transfer to 1000mL cylinder.
- Wash over #200 sieve when complete, dry & sieve.

COMBINED HYDROMETER AND SIEVE ANALYSIS

PROJECT: MDEQ-Hubble Processing Site PROJECT ID: **17-27** DATE: 06/16/17

Test Results: Material meets requirement of Option 1 of section 2.3.1.3.1 for the specification of Sandy Loam Criteria: Contains 20% less clay, combination of % silt plus twice % clay is great than 30; Contains 52% or more sand and less than 15% gravel.

IDENTIFICATION : Sample #6 Contractor : B&B Contracting

DATE SAMPLED : 6/9/2017 Engineer: Mannik Smith Group

DATE TESTED : 6/14/2017 Pit: Charles Kiilunen-Hubble, MI

SIEVE ANALYSIS

SIEVE SIZE		PERCENT PASSING
37.5 mm	(1 1/2")	100
25.0 mm	(1")	100
19.0 mm	(3/4")	100
9.5 mm	(3/8")	99
4.75 mm	(#4)	96
2.00 mm	(#10)	94
600 um	(#30)	80
75 um	(#200)	31

HYDROMETER ANALYSIS

SIEVE SIZE	PERCENT PASSING
Silts - 0.074 mm	21.0
Clay - 0.005 mm	10.0
Colloids - 0.001 mm	

SOIL DESCRIPTION :

Reddish poorly graded silty/clayey fine sand with trace of rounded gravel
Rounded durable to friarable gravel
SM

NOTES :

Gravel	1%
Sand	68%
Silt	21%
Clay	10%

Prepared By:
CSG Testing
Hancock, MI 49930
906.370.2987

csg.testing@outlook.com

Douglas Cooper

Project Technician

THE HYDROMETER ANALYSIS WAS PERFORMED IN GENERAL ACCORDANCE WITH ASTM D422.

HYDROMETER ANALYSIS - ASTM D422

HYDROMETER TYPE : ASTM 152 H

JOB # : 17-27
Sample ID : 7
DEPTH : 2.0-10.'

SPECIFIC GRAVITY OF SOIL, Gs = 2.65
Air DRY WEIGHT OF SOIL grams, Ws = 110.9
Hygroscopic Moisture Correction Factor= 0.9916
Weight of Oven Dried Soil Sample, WOD= 110.0

MENISCUS CORRECTION, Fm = 0
ZERO CORRECTION, Fz = 6
Weight of total Hydrometer sample, W= 116.1

SOIL DESCRIPTION : Reddish poorly graded silty/clayey fine sand with trace of rounded gravel
Rounded durable to friarable gravel
SM

TIME (MINUTES)	Hydrometer Reading, R	Rcp	% Finer	Rcl	L (cm)	k (ASTM D422, Table 3)	D (mm)	Temp (C)
0.25	25	19.40	17.5	25	12.2	0.01348	0.0942	21
0.50	25	19.40	17.5	25	12.2	0.01348	0.0666	21
1.00	25	19.40	17.5	25	12.2	0.01348	0.0471	21
2.00	25	19.40	17.5	25	12.2	0.01348	0.0333	21
5.00	21	15.40	13.9	21	12.9	0.01348	0.0216	21
8.00	20	14.40	13.0	20	13.0	0.01348	0.0172	21
15.00	18	12.40	11.2	18	13.3	0.01348	0.0127	21
30.00	17	11.40	10.3	17	13.5	0.01348	0.0090	21
60.00	16	10.40	9.4	16	13.7	0.01348	0.0064	21
120.00	15	9.40	8.5	15	13.8	0.01348	0.0046	21
240.00	14	8.40	7.6	14	14.0	0.01348	0.0033	21
480.00	13	7.40	6.7	13	14.2	0.01348	0.0023	21
1440.00	12	6.40	5.8	12	14.3	0.01348	0.0013	21
4320.00		-10.85	-9.8	0	16.3	0.01348	0.0008	
OTHER	ENTER	#VALUE!	#VALUE!	#VALUE!	#VALUE!		#VALUE!	
OTHER	ENTER	#VALUE!	#VALUE!	#VALUE!	#VALUE!		#VALUE!	

MECHANICAL ANALYSIS :

INITIAL WT g. = **1941**

	WEIGHT RETAINED g.	PERCENT PASSING		
1 1/2"	0.0	**100.0**		
1"	0.0	**100.0**	25.400	
3/4"	0.0	**100.0**	19.000	
1/2'	14.6	**99.2**	12.500	
3/8"	15.1	**98.5**	9.500	
#4	32.4	**96.8**	4.750	
#8	34.5	**95.0**	2.360	
#10	6.3	**94.7**	2.000	
#16	1.6	**93.3**	1.180	
#30	4.6	**89.4**	0.600	
#40	0.0	**89.4**	0.425	
#50	14.3	**77.0**	0.300	
#100	24.7	**55.8**	0.150	
#200	28.8	**31.0**	0.075	
TOTAL #10+ g.	**102.9**	**% R#10+**	**5.3**	
TOTAL P#10 g.	**1838.1**	**% P#10-**	**94.7**	
SIEVED TOTAL	**176.9**			

Ft = - 4.85 + .25T

Rcl = R + Fm

% Finer = [(a x Rcp)/ Ws] x 100
where a = Specific Gravity correction
(because hydrometer is calibrated to Gs= 2.65)
(see Fig 5-5, p30 Soils Lab Book)

(Table 1, ASTM D422, p14)

a = 1
= 1 + (2.65 - Gs)/ 5

L = see Fig 5-2
p25 Soil Lab Book
(Table 2, ASTM D422, p 15)
= .164 x (60 - R)+ 0.66+ 5.8

k = see Fige 5-3
p26 Soil Lab Book

(Table 3, ASTM D422, p16)

Procedure Notes:

- Soak in 125 mL of 4% solution for 16hrs minimum.
- Stir in mixer for 1 minute
- Agitate for 1 minute after transfer to 1000mL cylinder.
- Wash over #200 sieve when complete, dry & sieve.

COMBINED HYDROMETER AND SIEVE ANALYSIS

PROJECT: MDEQ-Hubble Processing Site PROJECT ID: **17-27** DATE: 06/16/17

Test Results: Material meets requirement of Option 1 of section 2.3.1.3.1 for the specification of Sandy Loam Criteria: Contains 20% less clay, combination of % silt plus twice % clay is great than 30; Contains 52% or more sand and less than 15% gravel.

IDENTIFICATION : Sample #7 Contractor : B&B Contracting

DATE SAMPLED : 6/9/2017 Engineer: Mannik Smith Group

DATE TESTED : 6/17/2017 Pit: Charles Kiilunen-Hubble, MI

SIEVE ANALYSIS

SIEVE SIZE		PERCENT PASSING
37.5 mm	(1 1/2")	100
25.0 mm	(1")	100
19.0 mm	(3/4")	100
9.5 mm	(3/8")	98
4.75 mm	(#4)	97
2.00 mm	(#10)	95
600 um	(#50)	75
75 um	(#200)	30

HYDROMETER ANALYSIS

SIEVE SIZE	PERCENT PASSING
Silts - 0.074 mm	21.0
Clay - 0.005 mm	9.0
Colloids - 0.001 mm	

SOIL DESCRIPTION :

Reddish poorly graded silty/clayey fine sand with trace of rounded gravel
Rounded durable to friarable gravel
SM

NOTES :

Gravel	2%
Sand	68%
Silt	21%
Clay	9%

Prepared By:
CSG Testing
Hancock, MI 49930
906.370.2987

csg.testing@outlook.com

Douglas Cooper

Project Technician

THE HYDROMETER ANALYSIS WAS PERFORMED IN GENERAL ACCORDANCE WITH ASTM D422.

HYDROMETER ANALYSIS - ASTM D422

HYDROMETER TYPE : ASTM 152 H

JOB # : 17-27
Sample ID : 8
DEPTH : 2.0-10.'

SPECIFIC GRAVITY OF SOIL, Gs = 2.65
Air DRY WEIGHT OF SOIL grams, Ws = 100.3
Hygroscopic Moisture Correction Factor= 0.9916
Weight of Oven Dried Soil Sample, WOD= 99.5

MENISCUS CORRECTION, Fm = 0
ZERO CORRECTION, Fz = 6
Weight of total Hydrometer sample, W= 107.9

SOIL DESCRIPTION : Reddish poorly graded silty/clayey fine sand with trace of rounded gravel
Rounded durable to friarable gravel
SM

TIME (MINUTES)	Hydrometer Reading, R	Rcp	% Finer	Rcl	L (cm)	k (ASTM D422, Table 3)	D (mm)	Temp (C)
0.25	25	18.65	18.6	25	12.2	0.01399	0.0977	18
0.50	25	18.65	18.6	25	12.2	0.01399	0.0691	18
1.00	25	18.65	18.6	25	12.2	0.01399	0.0489	18
2.00	25	18.65	18.6	25	12.2	0.01399	0.0346	18
5.00	20	13.65	13.6	20	13.0	0.01399	0.0226	18
8.00	19	12.65	12.6	19	13.2	0.01399	0.0180	18
15.00	18	11.65	11.6	18	13.3	0.01399	0.0132	18
30.00	16	9.65	9.6	16	13.7	0.01399	0.0094	18
60.00	14	8.40	8.4	14	14.0	0.01348	0.0068	21
120.00	13	7.40	7.4	13	14.2	0.01348	0.0048	21
240.00	12	6.40	6.4	12	14.3	0.01348	0.0034	21
480.00	11	5.40	5.4	11	14.5	0.01348	0.0024	21
1440.00	10	4.40	4.4	10	14.7	0.01348	0.0014	21
4320.00		-10.85	-10.8	0	16.3	0.01364	0.0009	
OTHER	ENTER	#VALUE!	#VALUE!	#VALUE!	#VALUE!		#VALUE!	
OTHER	ENTER	#VALUE!	#VALUE!	#VALUE!	#VALUE!		#VALUE!	

MECHANICAL ANALYSIS :

INITIAL WT g. = **2480.5**

	WEIGHT RETAINED g.	PERCENT PASSING		
1 1/2"	0.0	**100.0**		
1"	0.0	**100.0**	25.400	
3/4"	42.5	**98.3**	19.000	
1/2'	31.2	**97.0**	12.500	
3/8"	16.6	**96.4**	9.500	
#4	50.6	**94.3**	4.750	
#8	43.5	**92.6**	2.360	
#10	8.8	**92.2**	2.000	
#16	0.8	**91.5**	1.180	
#30	4.9	**86.9**	0.600	
#40	0.0	**86.9**	0.425	
#50	0.0	**86.9**	0.300	
#100	32.8	**56.5**	0.150	
#200	26.9	**31.6**	0.075	
TOTAL #10+ g.	**193.2**	**% R#10+**	**7.8**	
TOTAL P#10 g.	**2287.3**	**% P#10-**	**92.2**	
SIEVED TOTAL	**258.6**			

Ft = - 4.85 + .25T

Rcl = R + Fm

% Finer = [(a x Rcp)/ Ws] x 100
where a = Specific Gravity correction
(because hydrometer is calibrated to Gs= 2.65)
(see Fig 5-5, p30 Soils Lab Book)

(Table 1, ASTM D422, p14)

a = 1 / = 1 + (2.65 - Gs)/ 5

L = see Fig 5-2
p25 Soil Lab Book
(Table 2, ASTM D422, p 15)
= .164 x (60 - R)+ 0.66+ 5.8

k = see Fige 5-3
p26 Soil Lab Book

(Table 3, ASTM D422, p16)

Procedure Notes:

- Soak in 125 mL of 4% solution for 16hrs minimum.
- Stir in mixer for 1 minute
- Agitate for 1 minute after transfer to 1000mL cylinder.
- Wash over #200 sieve when complete, dry & sieve.

COMBINED HYDROMETER AND SIEVE ANALYSIS

PROJECT: MDEQ-Hubble Processing Site PROJECT ID: **17-27** DATE: 06/16/17

Test Results: Material meets requirement of Option 1 of section 2.3.1.3.1 for the specification of Sandy Loam Criteria: Contains 20% less clay, combination of % silt plus twice % clay is great than 30; Contains 52% or more sand and less than 15% gravel.

IDENTIFICATION : Sample #8 Contractor : B&B Contracting

DATE SAMPLED : 6/9/2017 Engineer: Mannik Smith Group

DATE TESTED : 6/14/2017 Pit: Charles Kiilunen-Hubble, MI

SIEVE ANALYSIS

SIEVE SIZE		PERCENT PASSING
37.5 mm	(1 1/2")	100
25.0 mm	(1")	100
19.0 mm	(3/4")	98
9.5 mm	(3/8")	96
4.75 mm	(#4)	94
2.00 mm	(#10)	92
600 um	(#30)	87
75 um	(#200)	32

HYDROMETER ANALYSIS

SIEVE SIZE	PERCENT PASSING
Silts - 0.074 mm	27.0
Clay - 0.005 mm	8.0
Colloids - 0.001 mm	

SOIL DESCRIPTION :

Reddish poorly graded silty/clayey fine sand with trace of rounded gravel
Rounded durable to friarable gravel
SM

NOTES :

Gravel	4%
Sand	64%
Silt	27%
Clay	8%

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Douglas Cooper

Project Technician

THE HYDROMETER ANALYSIS WAS PERFORMED IN GENERAL ACCORDANCE WITH ASTM D422.

HYDROMETER ANALYSIS - ASTM D422

HYDROMETER TYPE : ASTM 152 H

JOB # : 17-27
Sample ID : 9
DEPTH : 2.0-10.'

SPECIFIC GRAVITY OF SOIL, Gs = 2.65
Air DRY WEIGHT OF SOIL grams, Ws = 100.5
Hygroscopic Moisture Correction Factor= 0.9916
Weight of Oven Dried Soil Sample, WOD= 99.7

MENISCUS CORRECTION, Fm = 0
ZERO CORRECTION, Fz = 6
Weight of total Hydrometer sample, W= 106.9

SOIL DESCRIPTION : Reddish poorly graded silty/clayey fine sand with trace of rounded gravel
Rounded durable to friarable gravel
SM

TIME (MINUTES)	Hydrometer Reading, R	Rcp	% Finer	Rcl	L (cm)	k (ASTM D422, Table 3)	D (mm)	Temp (C)
0.25	25	18.90	18.8	25	12.2	0.01382	0.0965	19
0.50	25	18.90	18.8	25	12.2	0.01382	0.0683	19
1.00	25	18.90	18.8	25	12.2	0.01382	0.0483	19
2.00	23	16.90	16.8	23	12.5	0.01382	0.0346	19
5.00	21	15.15	15.1	21	12.9	0.01365	0.0222	20
8.00	22	16.15	16.1	22	12.7	0.01365	0.0174	20
15.00	18	12.40	12.3	18	13.3	0.01348	0.0130	21
30.00	16	10.40	10.3	16	13.7	0.01348	0.0093	21
60.00	15	9.40	9.4	15	13.8	0.01348	0.0066	21
120.00	14	8.40	8.4	14	14.0	0.01348	0.0047	21
240.00	13	7.40	7.4	13	14.2	0.01348	0.0034	21
480.00	12	6.40	6.4	12	14.3	0.01348	0.0024	21
1440.00	12	6.40	6.4	12	14.3	0.01348	0.0014	21
4320.00		-10.85	-10.8	0	16.3	0.01364	0.0008	
OTHER	ENTER	#VALUE!	#VALUE!	#VALUE!	#VALUE!		#VALUE!	
OTHER	ENTER	#VALUE!	#VALUE!	#VALUE!	#VALUE!		#VALUE!	

MECHANICAL ANALYSIS :

INITIAL WT g. = **1980**

	WEIGHT RETAINED g.	PERCENT PASSING		
1 1/2"	0.0	**100.0**		
1"	0.0	**100.0**	25.400	
3/4"	0.0	**100.0**	19.000	
1/2'	26.7	**98.7**	12.500	
3/8"	22.7	**97.5**	9.500	
#4	42.2	**95.4**	4.750	
#8	35.4	**93.6**	2.360	
#10	7.5	**93.2**	2.000	
#16	1.4	**91.9**	1.180	
#30	0.0	**91.9**	0.600	
#40	0.0	**91.9**	0.425	
#50	17.4	**75.6**	0.300	
#100	18.4	**58.4**	0.150	
#200	26.5	**33.6**	0.075	
TOTAL #10+ g.	**134.5**	**% R#10+**	**6.8**	
TOTAL P#10 g.	**1845.5**	**% P#10-**	**93.2**	
SIEVED TOTAL	**198.2**			

Ft = - 4.85 + .25T

Rcl = R + Fm

% Finer = [(a x Rcp)/ Ws] x 100
where a = Specific Gravity correction
(because hydrometer is calibrated to Gs= 2.65)
(see Fig 5-5, p30 Soils Lab Book)

(Table 1, ASTM D422, p14)

a = 1 / = 1 + (2.65 - Gs)/ 5

L = see Fig 5-2
p25 Soil Lab Book
(Table 2, ASTM D422, p 15)
= .164 x (60 - R)+ 0.66+ 5.8

k = see Fige 5-3
p26 Soil Lab Book

(Table 3, ASTM D422, p16)

Procedure Notes:

- Soak in 125 mL of 4% solution for 16hrs minimum.
- Stir in mixer for 1 minute
- Agitate for 1 minute after transfer to 1000mL cylinder.
- Wash over #200 sieve when complete, dry & sieve.

COMBINED HYDROMETER AND SIEVE ANALYSIS

PROJECT: MDEQ-Hubble Processing Site PROJECT ID: **17-27** DATE: 06/16/17

Test Results: Material meets requirement of Option 1 of section 2.3.1.3.1 for the specification of Sandy Loam Criteria: Contains 20% less clay, combination of % silt plus twice % clay is great than 30; Contains 52% or more sand and less than 15% gravel.

IDENTIFICATION : Sample #9 Contractor : B&B Contracting

DATE SAMPLED : 6/9/2017 Engineer: Mannik Smith Group

DATE TESTED : 6/15/2017 Pit: Charles Kiilunen-Hubble, MI

SIEVE ANALYSIS

SIEVE SIZE		PERCENT PASSING
37.5 mm	(1 1/2")	100
25.0 mm	(1")	100
19.0 mm	(3/4")	100
9.5 mm	(3/8")	98
4.75 mm	(#4)	95
2.00 mm	(#10)	93
300 um	(#50)	75
75 um	(#200)	34

HYDROMETER ANALYSIS

SIEVE SIZE	PERCENT PASSING
Silts - 0.074 mm	21.0
Clay - 0.005 mm	10.0
Colloids - 0.001 mm	

SOIL DESCRIPTION :

Reddish poorly graded silty/clayey fine sand with trace of rounded gravel
Rounded durable to friarable gravel
SM

NOTES :

Gravel	2%
Sand	64%
Silt	25%
Clay	9%

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Project Technician

THE HYDROMETER ANALYSIS WAS PERFORMED IN GENERAL ACCORDANCE WITH ASTM D422.

HYDROMETER ANALYSIS - ASTM D422

HYDROMETER TYPE : ASTM 152 H

JOB # : 17-27
Sample ID : 10
DEPTH : 2.0-10.'

SPECIFIC GRAVITY OF SOIL, Gs = 2.65
Air DRY WEIGHT OF SOIL grams, Ws = 106.6
Hygroscopic Moisture Correction Factor= 0.9916
Weight of Oven Dried Soil Sample, WOD= 105.7

MENISCUS CORRECTION, Fm = 0
ZERO CORRECTION, Fz = 6
Weight of total Hydrometer sample, W= 113.7

SOIL DESCRIPTION : Reddish poorly graded silty/clayey fine sand with trace of rounded gravel
Rounded durable to friarable gravel
SM

TIME (MINUTES)	Hydrometer Reading, R	Rcp	% Finer	Rcl	L (cm)	k (ASTM D422, Table 3)	D (mm)	Temp (C)
0.25	25	18.90	17.7	25	12.2	0.01382	0.0965	19
0.50	25	18.90	17.7	25	12.2	0.01382	0.0683	19
1.00	25	18.90	17.7	25	12.2	0.01382	0.0483	19
2.00	23	16.90	15.9	23	12.5	0.01382	0.0346	19
5.00	21	15.15	14.2	21	12.9	0.01365	0.0222	20
8.00	22	16.15	15.2	22	12.7	0.01365	0.0174	20
15.00	18	12.40	11.6	18	13.3	0.01348	0.0130	21
30.00	16	10.40	9.8	16	13.7	0.01348	0.0093	21
60.00	15	9.40	8.8	15	13.8	0.01348	0.0066	21
120.00	14	8.40	7.9	14	14.0	0.01348	0.0047	21
240.00	13	7.40	6.9	13	14.2	0.01348	0.0034	21
480.00	12	6.40	6.0	12	14.3	0.01348	0.0024	21
1440.00	12	6.40	6.0	12	14.3	0.01348	0.0014	21
4320.00		-10.85	-10.2	0	16.3	0.01364	0.0008	
OTHER	ENTER	#VALUE!	#VALUE!	#VALUE!	#VALUE!		#VALUE!	
OTHER	ENTER	#VALUE!	#VALUE!	#VALUE!	#VALUE!		#VALUE!	

MECHANICAL ANALYSIS :

INITIAL WT g. = **2183**

	WEIGHT RETAINED g.	PERCENT PASSING		
1 1/2"	0.0	**100.0**		
1"	18.2	**99.2**	25.400	
3/4"	12.8	**98.6**	19.000	
1/2'	14.5	**97.9**	12.500	
3/8"	10.3	**97.4**	9.500	
#4	42.5	**95.5**	4.750	
#8	47.1	**93.3**	2.360	
#10	8.7	**92.9**	2.000	
#16	2.0	**91.2**	1.180	
#30	0.0	**91.2**	0.600	
#40	0.0	**91.2**	0.425	
#50	18.8	**74.7**	0.300	
#100	23.2	**54.3**	0.150	
#200	27.2	**30.3**	0.075	
TOTAL #10+ g.	**154.1**	**% R#10+**	**7**	
TOTAL P#10 g.	**2028.9**	**% P#10-**	**93**	
SIEVED TOTAL	**225.3**			

Ft = - 4.85 + .25T

Rcl = R + Fm

% Finer = [(a x Rcp)/ Ws] x 100
where a = Specific Gravity correction
(because hydrometer is calibrated to Gs= 2.65)
(see Fig 5-5, p30 Soils Lab Book)

(Table 1, ASTM D422, p14)

a = 1
= 1 + (2.65 - Gs)/ 5

L = see Fig 5-2
p25 Soil Lab Book
(Table 2, ASTM D422, p 15)
= .164 x (60 - R)+ 0.66+ 5.8

k = see Fige 5-3
p26 Soil Lab Book

(Table 3, ASTM D422, p16)

Procedure Notes:

- Soak in 125 mL of 4% solution for 16hrs minimum.
- Stir in mixer for 1 minute
- Agitate for 1 minute after transfer to 1000mL cylinder.
- Wash over #200 sieve when complete, dry & sieve.

COMBINED HYDROMETER AND SIEVE ANALYSIS

PROJECT: MDEQ-Hubble Processing Site PROJECT ID: **17-27** DATE: 06/16/17

Test Results: Material meets requirement of Option 1 of section 2.3.1.3.1 for the specification of Sandy Loam Criteria: Contains 20% less clay, combination of % silt plus twice % clay is great than 30; Contains 52% or more sand and less than 15% gravel.

IDENTIFICATION : Sample #10 Contractor : B&B Contracting

DATE SAMPLED : 6/9/2017 Engineer: Mannik Smith Group

DATE TESTED : 6/15/2017 Pit: Charles Kiilunen-Hubble, MI

SIEVE ANALYSIS

SIEVE SIZE		PERCENT PASSING
37.5 mm	(1 1/2")	100
25.0 mm	(1")	99
19.0 mm	(3/4")	99
9.5 mm	(3/8")	97
4.75 mm	(#4)	95
2.00 mm	(#10)	93
300 um	(#50)	75
75 um	(#200)	30

HYDROMETER ANALYSIS

SIEVE SIZE	PERCENT PASSING
Silts - 0.074 mm	21.0
Clay - 0.005 mm	9.0
Colloids - 0.001 mm	

SOIL DESCRIPTION :

Reddish poorly graded silty/clayey fine sand with trace of rounded gravel
Rounded durable to friarable gravel
SM

NOTES :

Gravel	**3%**
Sand	**67%**
Silt	**21%**
Clay	**9%**

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THE HYDROMETER ANALYSIS WAS PERFORMED IN GENERAL ACCORDANCE WITH ASTM D422.

HYDROMETER ANALYSIS - ASTM D422

HYDROMETER TYPE : ASTM 152 H

JOB # : 17-27
Sample ID : 11
DEPTH : 2.0-10.'

SPECIFIC GRAVITY OF SOIL, Gs = 2.65
Air DRY WEIGHT OF SOIL grams, Ws = 104.4
Hygroscopic Moisture Correction Factor= 0.9989
Weight of Oven Dried Soil Sample, WOD= 104.3

MENISCUS CORRECTION, Fm = 0
ZERO CORRECTION, Fz = 6
Weight of total Hydrometer sample, W= 115.5

SOIL DESCRIPTION : Reddish poorly graded silty/clayey fine sand with trace of rounded gravel
Rounded durable to friarable gravel
SM

TIME (MINUTES)	Hydrometer Reading, R	Rcp	% Finer	Rcl	L (cm)	k (ASTM D422, Table 3)	D (mm)	Temp (C)
0.25	29	22.65	21.7	29	11.5	0.01399	0.0951	18
0.50	29	22.65	21.7	29	11.5	0.01399	0.0672	18
1.00	29	22.65	21.7	29	11.5	0.01399	0.0475	18
2.00	29	22.65	21.7	29	11.5	0.01399	0.0336	18
5.00	25	18.65	17.9	25	12.2	0.01399	0.0219	18
8.00	24	17.65	16.9	24	12.4	0.01399	0.0174	18
15.00	22	15.65	15.0	22	12.7	0.01399	0.0129	18
30.00	19	12.65	12.1	19	13.2	0.01399	0.0093	18
60.00	16	10.40	10.0	16	13.7	0.01348	0.0067	21
120.00	14	8.40	8.0	14	14.0	0.01348	0.0048	21
240.00	13	7.40	7.1	13	14.2	0.01348	0.0034	21
480.00	12	6.40	6.1	12	14.3	0.01348	0.0024	21
1440.00	11	5.40	5.2	11	14.5	0.01348	0.0014	21
4320.00		-10.85	-10.4	0	16.3	0.01364	0.0009	
OTHER	ENTER	#VALUE!	#VALUE!	#VALUE!	#VALUE!		#VALUE!	
OTHER	ENTER	#VALUE!	#VALUE!	#VALUE!	#VALUE!		#VALUE!	

MECHANICAL ANALYSIS :

INITIAL WT g. = **2354**

	WEIGHT RETAINED g.	PERCENT PASSING		
1 1/2"	0.0	**100.0**		
1"	54.1	**97.7**	25.400	
3/4"	0.0	**97.7**	19.000	
1/2'	35.3	**96.2**	12.500	
3/8"	24.8	**95.1**	9.500	
#4	59.5	**92.6**	4.750	
#8	46.1	**90.7**	2.360	
#10	8.9	**90.3**	2.000	
#16	1.4	**89.1**	1.180	
#30	5.8	**84.1**	0.600	
#40	0.0	**84.1**	0.425	
#50	0.0	**84.1**	0.300	
#100	37.6	**51.5**	0.150	
#200	31.7	**24.1**	0.075	
TOTAL #10+ g.	**228.7**	**% R#10+**	**9.7**	
TOTAL P#10 g.	**2125.3**	**% P#10-**	**90.3**	
SIEVED TOTAL	**305.2**			

Ft = - 4.85 + .25T

Rcl = R + Fm

% Finer = [(a x Rcp)/ Ws] x 100
where a = Specific Gravity correction
(because hydrometer is calibrated to Gs= 2.65)
(see Fig 5-5, p30 Soils Lab Book)

(Table 1, ASTM D422, p14)

a = 1
= 1 + (2.65 - Gs)/ 5

L = see Fig 5-2
p25 Soil Lab Book
(Table 2, ASTM D422, p 15)
= .164 x (60 - R)+ 0.66+ 5.8

k = see Fige 5-3
p26 Soil Lab Book

(Table 3, ASTM D422, p16)

Procedure Notes:

- Soak in 125 mL of 4% solution for 16hrs minimum.
- Stir in mixer for 1 minute
- Agitate for 1 minute after transfer to 1000mL cylinder.
- Wash over #200 sieve when complete, dry & sieve.

COMBINED HYDROMETER AND SIEVE ANALYSIS

PROJECT: MDEQ-Hubble Processing Site PROJECT ID: **17-27** DATE: 06/16/17

Test Results: Material meets requirement of Option 1 of section 2.3.1.3.1 for the specification of Sandy Loam Criteria: Contains 20% less clay, combination of % silt plus twice % clay is great than 30; Contains 52% or more sand and less than 15% gravel.

IDENTIFICATION : Sample #11 Contractor : B&B Contracting

DATE SAMPLED : 6/9/2017 Engineer: Mannik Smith Group

DATE TESTED : 6/14/2017 Pit: Charles Kiilunen-Hubble, MI

SIEVE ANALYSIS

SIEVE SIZE		PERCENT PASSING
37.5 mm	(1 1/2")	100
25.0 mm	(1")	98
19.0 mm	(3/4")	98
9.5 mm	(3/8")	95
4.75 mm	(#4)	93
2.00 mm	(#10)	90
600 um	(#30)	85
75 um	(#200)	58

HYDROMETER ANALYSIS

SIEVE SIZE	PERCENT PASSING
Silts - 0.074 mm	17.0
Clay - 0.005 mm	7.0
Colloids - 0.001 mm	

SOIL DESCRIPTION :

Reddish poorly graded silty/clayey fine sand with trace of rounded gravel
Rounded durable to friarable gravel
SM

NOTES :

Gravel	5%
Sand	71%
Silt	17%
Clay	7%

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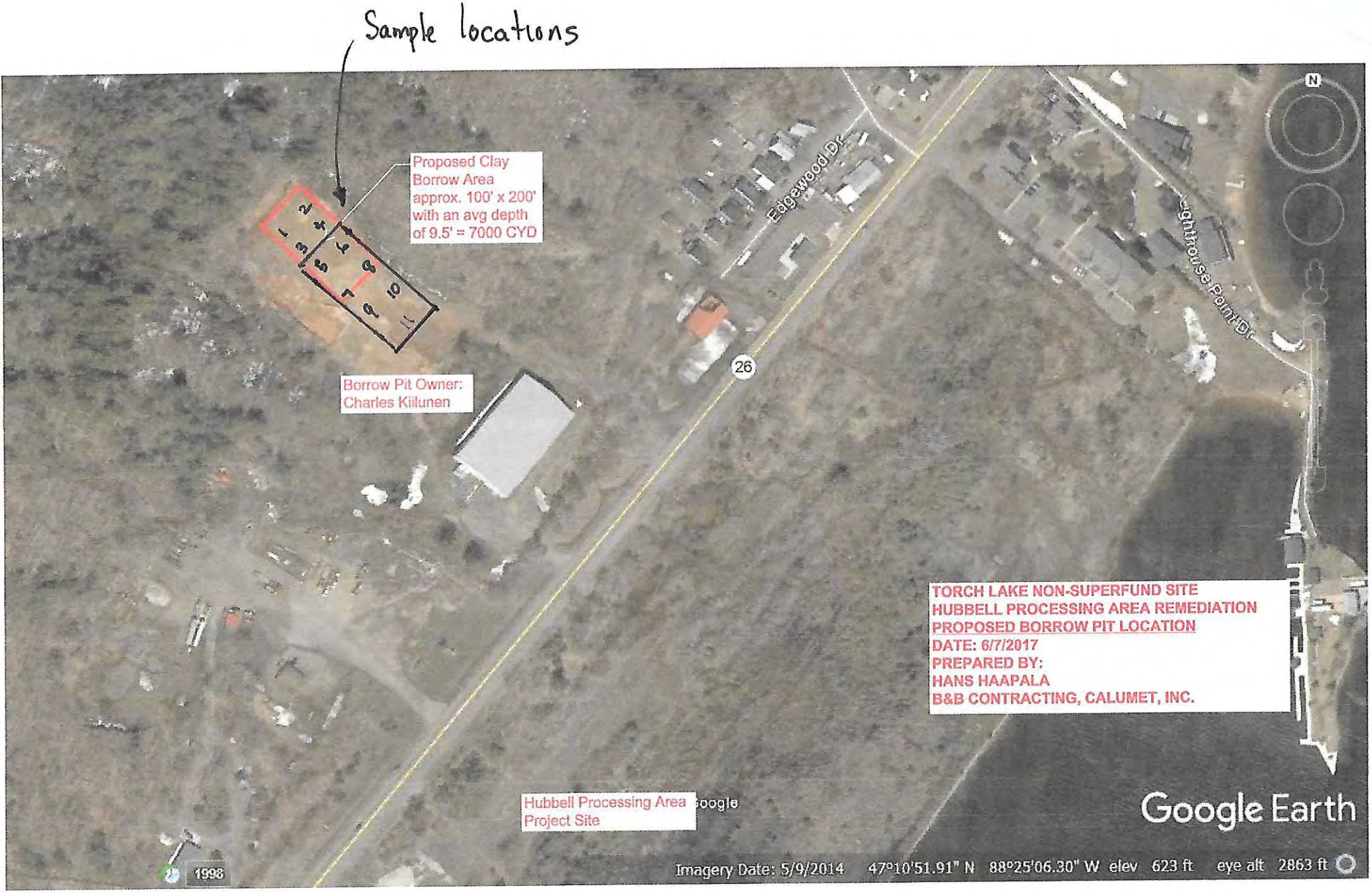
Project Technician

THE HYDROMETER ANALYSIS WAS PERFORMED IN GENERAL ACCORDANCE WITH ASTM D422.


Sample locations
Proposed Clay Borrow Area approx. 100' x 200' with an avg depth of 9.5' = 7000 CYD
1 2 3 4 5 6 7 8 9 10 11
Borrow Pit Owner: Charles Kiilunen
Edgewood Dr
26
TORCH LAKE NON-SUPERFUND SITE
HUBBELL PROCESSING AREA REMEDIATION
PROPOSED BORROW PIT LOCATION
DATE: 6/7/2017
PREPARED BY:
HANS HAAPALA
B&B CONTRACTING, CALUMET, INC.
Hubbell Processing Area Project Site
Google Earth
1998
Imagery Date: 5/9/2014 47°10'51.91" N 88°25'06.30" W elev 623 ft eye alt 2863 ft

HAUL ROAD GRAVEL, MDOT 23A –	MEN-CO PIT 54291 HWY US41 CALUMET, MI 49913

AGGREGATE ANALYSIS REPORT

C S G TESTING Hancock, MI

Project: Hubble Processing Site Reclaimation
Job No: 17-27
Location: Road agg base
Date: 6/17/2017
Client: B&B Contracting
Sample No: 614-1
Contractor: B&B Contracting
Intended Use: Agg Base
Architect/Engineer: Mannik Smith Group
Supplier: MenCo
Description of Material: Dense graded aggregate

U.S. Std. Sieve Opening	Individual Weight Retained (gm)	Percent Retained		Percent Passing	Specified Percent Passing	PHYSICAL DATA	
		Individual	Cumulative				
6 "	0	0.0	0.0	100		Initial Sample - Wet Weight (gm)	
3 "		0.0	0.0	100			
2-1/2 "		0.0	0.0	100		Initial Sample - Dry Weight (gm)	2670
2 "		0.0	0.0	100			
1-1/2 "		0.0	0.0	100		Weight After Washing (gm)	2347
1 "	0	0.0	0.0	100	100		
3/4 "	28	1.0	1.0	99		Loss by Washing (gm)	323
5/8 "		0.0	1.0	99			
1/2 "	381	14.3	15.3	85	65-85	% Loss by Washing	12.1
3/8 "	254	9.5	24.8	75		LBW Specification	9.0-16.0
# 4	459	17.2	42.0	58		Natural Moisture Content (%)	#DIV/0!
# 8	279	10.4	52.5	48	25-60		
# 10		0.0	52.5	48		Fineness Modulus (%)	1.00
# 16		0.0	52.5	48			
# 20		0.0	52.5	48		Crushed Content grams	663
# 30		0.0	52.5	48		Crushed Content %	100
# 40		0.0	52.5	48		Clay-Ironstone grams	0.0
# 50		0.0	52.5	48		Clay-Ironstone %	0.0
# 60		0.0	52.5	48		Soft Part w/C.I. grams	0.0
# 100		0.0	52.5	48		Soft Part w/C.I. %	0.0
# 200		0.0	52.5	48		Chert grams	0.0
Pan	946	35.4	87.9	12		Chert %	0.0
LBW	323	12.1	100.0	0		%Sum of Soft & Chert	0.0
Total	2670	100.0				Pick wt. grams	663.0

Material Classification: 23A

[X] Complies with project specifications

[ ] Does not comply with project specifications

Date Sampled: 6/14/2017
Sampled By: Douglas Cooper
Sampled From: Ministockpile
Sample Source: MenCo

Remarks:

Reported by: Douglas Cooper 200123
Tested by: Douglas Cooper 200123

RIP RAP – JOE ELLENICH PIT
CENTENNIAL HEIGHTS ROAD
CALUMET, MI 49913

Count		3-5" kg		5-10" kg		5-10" kg		10-15"kg		13-18"Kg		16-20" kg
1		3.14		10.88		6.00		19.16		49.26		
2		3.54		10.80		8.18		21.91		47.10		
3		4.18		5.95		2.98		9.58		35.65		
4		1.90		12.65		9.50		8.77		56.40		
5		2.10		12.46		3.17		15.05		23.36		
6		1.95		8.50		7.91		20.49		32.25		
7		1.84		10.50		9.08		24.98		57.20		
8		2.03		43.65		4.74		8.66				
9		1.62		12.25		6.90		14.70				
10		2.68		13.06		3.70		22.70				
11		1.40		6.34		4.22		12.66				
12		1.80		9.65		4.91		10.00				
13	m	68.75		5.96		2.63		22.24				
14	m	51.20		23.90		5.03		13.98				
15	m	27.25		4.72		3.68		19.30				
16		2.90		4.50		6.91		62.05				
17		7.56		6.10		4.22		29.90				
18		4.10		11.56		5.56		16.86				
19		2.70		6.20		3.24		8.60				
20		4.35		4.90		2.65		19.05				
21		2.94		6.35		5.46		21.10				
22		2.56		13.90		4.37		12.80				
23		3.23		6.40		9.34		36.30				
24		3.44		16.70		5.59		45.45				
25		2.20		5.75		5.65		13.80				
26		4.12		9.50		3.83		36.00				
27		4.50		13.05		2.57		15.96				
28		3.30		10.96		4.14		34.54				
29		1.32		11.86		4.65		35.54				
30		2.65		11.85		4.48		38.40				
31		2.16		11.88		11.65		24.78				
32		2.72		7.18		6.72		14.84				
32		2.35		2.86		6.35		19.40				
33		2.72		1.55		6.13		14.70				
34		2.60		1.84		6.28		9.46				
35		2.93		7.40		5.44		13.15				
36		3.48		8.20		4.96						
37		2.82		6.14		7.33						
28		2.66		5.50		4.04						
39		2.46		11.48		4.32						
40		2.57		4.52		9.80						
41		2.54		4.30		6.17						
42		2.43		15.96		3.28						
43		2.55		7.50		2.17						
44		2.22		16.35		2.97						
45		1.87		8.16		9.11						
46		2.77		8.45		2.92						
47	4	8.83		6.30		2.34						
48	6	9.41		10.98		1.97						
49	5	8.35		10.90		2.70						

50	9	9.46		11.65		2.26						
51	5	9.89		19.55		2.32						
52	7	14.91		8.95		2.49						
53	10	10.87		16.48		2.23						
54	8	11.48		8.04		5.17						
55		2.10		5.00		7.90						
56				7.06		11.50						
57				10.70		7.68						
58				6.88		6.59						
59				6.50		5.56						
60				6.46		6.14						
61				5.35		7.20						
62				4.96		5.09						
63				3.96		2.58						
64				2.80		5.04						
65				3.60		2.94						
66				3.30		4.44						
67				1.78		12.62						
68				2.80		7.11						
69				3.96		3.79						
70				3.90		7.49						
71				2.55		3.02						
72				1.92		2.09						
73				2.68		4.54						
74				3.65		5.10						
75				2.90		10.99						
76				4.40		4.93						
77				3.20		10.17						
78				2.32		4.77						
79				1.50		3.78						
80				1.70		4.73						
81				2.10		2.77						
82				3.52		3.87						
83				3.64		3.46						
84				3.73		4.28						
85				4.18		7.71						
86				3.49		3.80						
87				6.95		2.98						
88				4.15		2.98						
89				2.48		3.48						
90				2.44		10.34						
91				2.62		2.61						
92						3.21						
2608.27 kg		**356.4** kg				**1183.79** kg		**766.86** kg		**301.22** kg		
% Retained		13.7 %				45.4 %		29.4 %		11.5 %		
% passing		0.0 %				13.7 %		59.1 %		88.5 %		100
Spec						15.0		50.0		85.0		100

Hubbel Reclaimation Rip Rap weight testing performed June 14, 2017 Centenial Heights Pit . B&B Contracting, CSG Testing and Mannick Smith; Brian Bonnin, Hans Hapala, Doug Cooper, Jeb Chrestensen

Count		3-5" wt		10-15" wt		13-18" wt		16-20" wt	5-10" X
1	✓	3.14	✓	8.66	✓	49.26			10.39
2	✓	3.54	✓	14.70	✓	47.10			10.80
3	✓	4.18	✓	22.70	✓	35.65			5.95
4	✓	1.90	✓	12.66	✓	56.40			12.65
5	✓	2.10	✓	10.00	✓	23.36			9.46
6	✓	1.95	✓	22.24	✓	32.25			8.50
7	✓	1.84	✓	3.99	✓	57.20			10.50
8	✓	2.06	✓	19.30					13.65
9	✓	1.62	✓	62.05					12.25
10	✓	2.68	✓	29.90					13.06
11	✓	1.40	✓	1.85					6.34
12	✓	1.80	✓	2.60					9.65
13	Many	68.75	✓	19.05					5.90
14	M	51.20	✓	21.10					23.90
15	M	27.25	✓	12.80					1.72
16	Fine		✓	36.30					4.50
17			✓	45.45					6.10
18			✓	13.80					1.56
19			✓	36.00					6.20
20			✓	15.96					4.90
21			✓	34.54					6.35
22			✓	35.54					13.9
23			✓	38.40					6.40
24			✓	24.78					16.70
25			✓	14.84					5.75
26			✓	19.40					9.50
27			✓	14.70					13.05
28			✓	9.46					10.96
29			✓	13.15					11.86
30									11.85
31									11.88
32									7.18
32									2.86
33									1.55
34									1.84
35									
36									
37									
28									
39									
40									
41									
42									

Count		3-5" wt		10-15" wt		13-18" wt		16-20" wt
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
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28								
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40								
41								
42								

5-10

7.40
8.20
6.14
5.50
11.48
4.52
4.30
15.96
7.50
16.35
8.16
8.45
6.30
10.98
10.90
11.65
19.55
8.95
16.48
8.04
5.00
7.06
10.70
6.88
6.50
6.46
5.35
4.96
3.96
2.80
3.60
3.30
1.78
2.80
3.96
3.90
2.55
1.92
2.68
3.65
2.90
4.40
3.20
2.32
1.50
1.70
2.10

Count		3-5" wt	5-10" ✓	10-15" wt		13-18" wt		5-10" ~~15-20~~" wt
1	✓	2.90	6.00	~~6.00~~	✓		✓	5.17
2	✓	7.56	8.18	19.16	✓		✓	7.90
3	✓	4.10	2.98	21.91	✓		✓	11.50
4	✓	2.17	9.15	9.58	✓		✓	7.68
5	✓	4.35	3.17	8.77	✓		✓	6.59
6	✓	2.94	7.98	15.05	✓		✓	5.56
7	✓	2.56	9.08	20.49	✓		✓	6.14
8	✓	3.23	4.74	24.98	✓		✓	7.20
9	✓	3.44	6.90				✓	5.09
10	✓	2.20	3.75				✓	2.58
11	✓	4.12	4.22				✓	5.04
12	✓	4.50	4.91				✓	2.94
13	✓	3.30	2.63				✓	4.44
14	✓	1.32	5.03				✓	12.62
15	✓	2.65	3.68				✓	7.11
16	✓	2.16	6.91				✓	3.79
17	✓	2.72	4.22				✓	7.49
18	✓	2.35	5.56				✓	3.02
19	✓	2.72	3.24				✓	2.09
20	✓	2.60	2.65				✓	4.54
21	✓	2.93	5.46				✓	5.10
22	✓	3.48	4.37				✓	10.99
23	✓	2.82	9.34				✓	4.93
24	✓	2.66	5.89				✓	10.17
25	✓	2.46	5.65				✓	4.77
26	✓	2.57	3.83				✓	3.78
27	✓	2.52	2.57				✓	4.73
28	✓	2.43	4.14				✓	2.77
29	✓	2.55	4.65				✓	3.87
30	✓	2.22	4.48				✓	3.46
31	✓	1.87	11.65				✓	4.28
32	✓	2.77	6.72				✓	7.71
32	✓	8.83 (4)	6.35				✓	3.80
33	✓	9.41 (6)	6.13				✓	2.98
34	✓	8.35 (5)	6.28				✓	2.98
35	✓	9.46 (9)	5.44				✓	3.48
36	✓	9.89 (5)	4.96				✓	10.34
37	✓	14.91 (7)	7.33				✓	3.52
28	✓	10.87 (10)	4.04				✓	3.64
39	✓	11.48 (8)	4.32				✓	3.73
40	✓	2.11	9.80				✓	4.18
41			6.17				✓	3.49
42			3.28				✓	6.95
			2.17				✓	4.15
			2.97				✓	2.48
			9.11				✓	2.44
			2.92				✓	2.62
			2.34				✓	2.61
							✓	3.21

5-10" ✓

1.87
2.70
2.26
2.32
2.49
2.23

200 Michigan Street, Suite 705, Hancock, MI 49930
906-487-7452
www.MannikSmithGroup.com

LETTER OF TRANSMITTAL

To: Mr. Hans Haapala
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913

Project #: MDEQ0070
Date: June 23, 2017

Re: Submittal #005A – Geotextiles
MDEQ Torch Lake Non-Superfund Site
Hubbell Processing Area

Enclosed are the following:

No. of Copies	Description
1	Approved - Submittal #005A

The above items are transmitted as checked below:

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☐ Returned for corrections
☐ Approved as noted

Remarks:

Copies To: MDEQ-RRD, Calumet District Office

File

Signed:

Printed: Jed Chrestensen
Project Engineer

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1. Any work product of The Mannik & Smith Group, Inc. may not be altered in manner, form or content without our prior express written consent.
2. If you discover any errors and/or omissions in the attached information, you will promptly notify us so that we can make any necessary revisions.
3. For any electronic file(s) attached hereto, The Mannik & Smith Group, Inc. is not responsible for any errors caused by the transmission of said files, your software, or your computer systems.

SUBMITTAL# 005A

DATE: June 23, 2017

Michigan Department of Environmental Quality
Torch Lake Non-Superfund Site
Hubbell Processing Area
Hubbell, MI
File No.: 761/16108.SAR Index No.44251

TO:
Jed Chrestensen
The Mannik & Smith Group, Inc
200 Michigan Street, Suite 705
Hancock, MI 49930

FROM:
Hans Haapala, Project Manager, 906-281-6908
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913

SUBMITTAL TYPE:

☒ Product Data	☐ Certificates	☐Record Documents	☐ Operation/Maintenance Manuals
☐Shop Drawings	☐Manufacturer's Instructions	☐Samples	☐ Contract Closeout
☐Test Reports	☐Construction Photographs	☐ Administrative	☐Other

SUPPLIER: Miller Products, Iron Mountain

SPECIFICATION NUMBER AND TITLE: 31 22 23 Excavation, Grading and Capping

PART	TYPE	DESCRIPTION
Drawing C-8_Rev 4/28/2017	Product Data	Under Haul Roads, Nonwoven ~~Heavy~~ Stabilization Geotextile ~~Liner~~, US Fabrics 250NW
Drawing C-8_Rev 4/28/2017	Product Data	Under Riprap, Nonwoven Heavy Geotextile Liner, US Fabrics 250NW

B&B Contracting, Calumet, Inc. certifies that review, approval verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents.

Signed: Digitally signed by Hans P. Haapala DN: cn=Hans P. Haapala, o=B&B Contracting, Calumet, Inc., ou=Project Engineer, email=hanshaapala@gmail.com, c=US Date: 2017.06.23 13:42:24 -04'00'

Date: 6/23/17

APPROVED 6-23-17

An Equal Opportunity Employer
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913
Office: 906-337-0017
Fax: 906-934-2587

TRANSMITTAL

DATE:	***FROM:***
June 23, 2017	Hans Haapala (906)281-6908
ATTN:	*JOB NAME:*
Jed Chrestensen, P.E.	Torch Lake Non-Superfund Site Hubbell Processing Area
ADDRESS:	*ATTACHED:*
The Mannik & Smith Group, Inc. 200 Michigan Street, Suite 705 Hancock, MI 49930	Submittal #005A Geotextiles
PHONE NUMBER:	
(906)487-7451	
RE:	
Geotextiles	

O URGENT **X** FOR REVIEW **O** PLEASE COMMENT **O** PLEASE REPLY **O** PLEASE RECYCLE

Notes/Comments:

Please review the attached revised submittal documents.

SUBMITTAL#___005A

DATE: June 23, 2017

Michigan Department of Environmental Quality
Torch Lake Non-Superfund Site
Hubbell Processing Area
Hubbell, MI

File No.: 761/16108.SAR Index No.44251

TO:

Jed Chrestensen

The Mannik & Smith Group, Inc

200 Michigan Street, Suite 705

Hancock, MI 49930

FROM:

Hans Haapala, Project Manager, 906-281-6908

B&B Contracting, Calumet, Inc.

55670 Hwy M-26

Calumet, MI 49913

SUBMITTAL TYPE:

☒ Product Data	☐ Certificates	☐Record Documents	☐ Operation/Maintenance Manuals
☐Shop Drawings	☐Manufacturer's Instructions	☐Samples	☐ Contract Closeout
☐Test Reports	☐Construction Photographs	☐ Administrative	☐Other

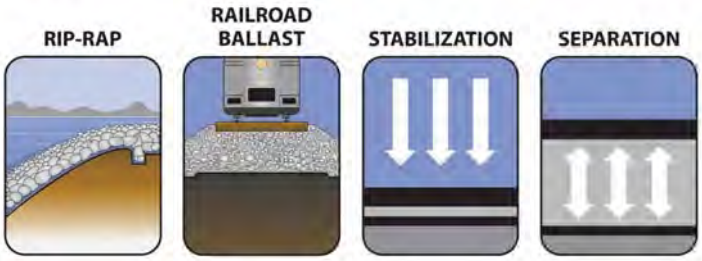
SUPPLIER: Miller Products, Iron Mountain

SPECIFICATION NUMBER AND TITLE: 31 22 23 Excavation, Grading and Capping

PART	TYPE	DESCRIPTION
Drawing C-8_Rev 4/28/2017	Product Data	Under Haul Roads, Nonwoven Heavy Geotextile Liner, US Fabrics 250NW
Drawing C-8_Rev 4/28/2017	Product Data	Under Riprap, Nonwoven Heavy Geotextile Liner, US Fabrics 250NW

B&B Contracting, Calumet, Inc. certifies that review, approval verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents. Signed:_____ Date: 6/23/17	

Construction Geosynthetics



US 250NW

NTPEP APPROVED - GTX-2016-01-101. US 250NW is a nonwoven needlepunched geotextile made of 100% polypropylene staple filaments. US 250NW resists ultraviolet and biological deterioration, rotting, naturally encountered basics and acids. Polypropylene is stable within a pH range of 2 to 13. US 250NW meets the following M.A.R.V. values except where noted:

Property	Test Method	English	Metric
Weight - Typical	ASTM D-5261	10 oz/sy	339 g/sm
Tensile Strength	ASTM D-4632	250 lbs	1,112 N
Elongation @ Break	ASTM D-4632	50%	50%
Mullen Burst*	ASTM D-3786*	500 psi	3,447 kPa
Puncture Strength*	ASTM D-4833*	155 lbs	690 N
CBR Puncture	ASTM D-6241	700 lbs	3,115 N
Trapezoidal Tear	ASTM D-4533	100 lbs	444 N
Apparent Opening Size	ASTM D-4751	100 US Sieve	0.150 mm
Permittivity	ASTM D-4491	1.20 Sec-1	1.20 Sec-1
Water Flow Rate	ASTM D-4491	80 g/min/sf	3,251 l/min/sm
UV Resistance @ 500 Hours	ASTM D-4355	70%	70%

Roll Size	Roll Diameter	Area	Weight
~~12.5' x 360'~~	~~21.0 in~~	~~500 sys~~	~~340 lbs~~
15' x 300'	21.0 in	500 sys	340 lbs

* Historical averages (current values not available): Mullen Burst Strength ASTM D3786 is no longer recognized by ASTM D-35 on Geosynthetics as an acceptable test method. Puncture Strength ASTM D4833 is not recognized by AASHTO M288 and has been replaced with CBR Puncture ASTM D6241.

This information is provided for reference only and is not intended as a warranty or guarantee. US Fabrics assumes no liability in connection with the use of this information (1/2017).
US Fabrics, Inc. | 3904 Virginia Avenue | Cincinnati, OH 45227

Phone: (800) 518-2290 | Fax: (513) 217-4420 | email: info@usfabrics.com

200 Michigan Street, Suite 705, Hancock, MI 49930
906-487-7452
www.MannikSmithGroup.com

LETTER OF TRANSMITTAL

To: Mr. Hans Haapala
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913

Project #: MDEQ0070
Date: June 27, 2017

Re: Submittal #006 – Submittal Register
MDEQ Torch Lake Non-Superfund Site
Hubbell Processing Area

Enclosed are the following:

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☐ Returned for corrections
☒ Approved as noted

Remarks:

Copies To: MDEQ-RRD, Calumet District Office

File

Signed:

Printed: Jed Chrestensen
Project Engineer

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1. Any work product of The Mannik & Smith Group, Inc. may not be altered in manner, form or content without our prior express written consent.
2. If you discover any errors and/or omissions in the attached information, you will promptly notify us so that we can make any necessary revisions.
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SUBMITTAL# 006

DATE: June 26, 2017

Michigan Department of Environmental Quality
Torch Lake Non-Superfund Site
Hubbell Processing Area
Hubbell, MI
File No.: 761/16108.SAR Index No.44251

TO:
Jed Chrestensen
The Mannik & Smith Group, Inc
200 Michigan Street, Suite 705
Hancock, MI 49930

FROM:
Hans Haapala, Project Manager, 906-281-6908
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913

SUBMITTAL TYPE:

☐ Product Data	☐ Certificates	☐Record Documents	☐ Operation/Maintenance Manuals
☐Shop Drawings	☐Manufacturer's Instructions	☐Samples	☐ Contract Closeout
☐Test Reports	☐Construction Photographs	☒ Administrative	☐Other

SUPPLIER: None

SPECIFICATION NUMBER AND TITLE: 01 33 00 Submittals

PART	TYPE	DESCRIPTION
1.5.11	Administrative	Submittal Register

B&B Contracting, Calumet, Inc. certifies that review, approval verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents.

Signed:_____

Date: 6/26/17

APPROVED
AS CORRECTED 6-27-17

An Equal Opportunity Employer
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913
Office: 906-337-0017
Fax: 906-934-2587

TRANSMITTAL

DATE:

June 26, 2017

FROM:

Hans Haapala (906)281-6908

ATTN:

Jed Chrestensen, P.E.

JOB NAME:

Torch Lake Non-Superfund Site
Hubbell Processing Area

ADDRESS:

The Mannik & Smith Group, Inc.
200 Michigan Street, Suite 705
Hancock, MI 49930

ATTACHED:

Submittal #006
Schedule of Submittals

PHONE NUMBER:

(906)487-7451

RE:

Schedule of Submittals

O URGENT **X** FOR REVIEW **O** PLEASE COMMENT **O** PLEASE REPLY **O** PLEASE RECYCLE

Notes/Comments:

Please review the attached Schedule of Submittals. This will be revised periodically to reflect approvals.

SUBMITTAL# 006

DATE: June 26, 2017

Michigan Department of Environmental Quality
Torch Lake Non-Superfund Site
Hubbell Processing Area
Hubbell, MI

File No.: 761/16108.SAR Index No.44251

TO:

Jed Chrestensen

The Mannik & Smith Group, Inc

200 Michigan Street, Suite 705

Hancock, MI 49930

FROM:

Hans Haapala, Project Manager, 906-281-6908

B&B Contracting, Calumet, Inc.

55670 Hwy M-26

Calumet, MI 49913

SUBMITTAL TYPE:

☐ Product Data	☐ Certificates	☐Record Documents	☐ Operation/Maintenance Manuals
☐Shop Drawings	☐Manufacturer's Instructions	☐Samples	☐ Contract Closeout
☐Test Reports	☐Construction Photographs	☒ Administrative	☐Other

SUPPLIER: None

SPECIFICATION NUMBER AND TITLE: 01 33 00 Submittals

PART	TYPE	DESCRIPTION
1.5.11	Administrative	Submittal Register

B&B Contracting, Calumet, Inc. certifies that review, approval verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents. Signed:_____ Date: 6/26/17	

SCHEDULE OF SUBMITTALS

Torch Lake Non Superfund Site, Hubbell Processing Area

UPDATED 6/26/2017

SUBMITTAL				TYPE				SUBMISSION DATE			
DIVISION	SECTION	PART	DESCRIPTION	ADMINISTRATIVE	MATERIAL	PRODUCT CERTIFICATES	SAMPLE	NOTICE TO PROCEED	ONGOING DURING PROJECT	CLOSEOUT	APPROVAL DATE
01			**GENERAL REQUIREMENTS**								
	29 73	1.1	Schedule of Values	X				X			
	33 00		**Submittals**								
		1.5.2	Work Plan including the following:	X				X			
			Project Organization					X			
			Tasks, Equipment, Personnel					X			
			Certified Storm Water Operator					X			
			~~MDOT ROW Permits~~					X			
			rce Owner Permission					X			
			Emergency Contacts					X			
			Spill Control Plan					X			
			Disposal Facilities					X			
			Site Plan					X			
		1.5.3	Air Monitoring Plan	X							6/15/2017
		1.5.6	Soil Erosion Sedimentation Control Plan	X				X			
			SESC Permit					X			
			Notice of Coverage for Stormwater					X			
		1.5.7	Health and Safety Plan	X				X			
		1.5.8	Access and Traffic Control Plan	X				X			
		1.5.9	Borrow Area Restoration Plan	X				X			
		1.5.1.	Project Schedule	X				X			6/19/2017
		1.5.11	Submittal Register	X				X			
		1.5.12	Sample Daily Progress and Daily Site Safety Forms	X				X			
		1.6.1.1	Daily Work Log	X					X	X	
		1.6.1.2	Waste Transportation/Disposal Manifests	X					X	X	
	45 00		**Quality Control**								
			Imported Cap Material Sampling Plan	X				X			6/12/2017
		1.3.1	Imported Cap Material Gradation		X			X			6/23/2017
		1.3.1	Imported Cap Material Laboratory Analytical Testing		X			X			
		1.3.1	Haul Road Gravel		X			X			6/23/2017
		1.3.1	1 to 3 inch Crushed Stone		X			X			Visual 6/14
		1.3.1	Rip-Rap		X			X			6/23/2017
	70 00		**Contract Closeout**								
			As-Built Survey	X						X	
		1.1.1.1	Substantial Completion Notice	X						X	
02			**EXISTING CONDITIONS**								
	21 00	1.2	Surveyor Information	X				X			
	61 00	1.3.1	Waste profiles and characterization data	X					X		
		1.3.1.2	Waste shipping papers and bills-of-lading	X					X	X	
		1.3.1.3	Disposal receipts	X					X	X	
		1.3.1.4	Manifests	X					X	X	
03			**CONCRETE**								
		1.3.1	Concrete Mix Design		X			X			
		1.3.2	Concrete load tickets	X					X		

Permits not submitted in other plans

or sack mix specifications

1.3.3 Intended disposal locations

SCHEDULE OF SUBMITTALS

Torch Lake Non Superfund Site, Hubbell Processing Area

UPDATED 6/26/2017

SUBMITTAL				TYPE				SUBMISSION DATE			
DIVISION	SECTION	PART	DESCRIPTION	ADMINISTRATIVE	MATERIAL	PRODUCT CERTIFICATES	SAMPLE	NOTICE TO PROCEED	ONGOING DURING PROJECT	CLOSEOUT	APPROVAL DATE
31			**EARTHWORK**								
	11 00	1.2.1.1	Proposed grubbed and cleared material burial limits	X				X			
	22 16	1.3.1	On-site Haul Road Layout drawings	X				X			
		1.3.2	Off-site Haul Road Layout drawings	X				X			
		1.3.3	Traffic Control Plan	X				X			
	22 23	1.4.1	Grading Area plan	X				X			
		1.4.2	Imported Fill Delivery Tickets	X					X		
			Geotextile Liner		X			X			6/23/2017
			Geotextile Stabilization Fabric		X			X			6/23/2017
	23 19	1.2.1	Dewatering plan	X				X			
32			**EXTERIOR IMPROVEMENTS**								
	29 30	1.3.1	Material Samples (if requested)		X		X	X			
	92 00	1.2.1	Manufacturer's Certificate of Compliance for seed		X	X		X			

200 Michigan Street, Suite 705, Hancock, MI 49930
906-487-7452
www.MannikSmithGroup.com

LETTER OF TRANSMITTAL

To: Mr. Hans Haapala
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913

Project #: MDEQ0070
Date: June 30, 2017

Re: Submittal #007A – Schedule of Values
MDEQ Torch Lake Non-Superfund Site
Hubbell Processing Area

Enclosed are the following:

No. of Copies	Description
1	Approval of Submittal #007A

The above items are transmitted as checked below:

☐ For review and approval ☐ For review and comment ☐ Returned for corrections
☒ For your use ☒ Approved as submitted ☐ Approved as noted
☐ As requested ☐ Other:

Remarks:

Copies To: MDEQ-RRD, Calumet District Office

File

Signed:

Printed: Jed Chrestensen
Project Engineer

This transmittal is subject to the following conditions to which you agree by accepting these terms on a reply to this message or using the information in any manner, including but not limited to, copying or using the information for reference.

1. Any work product of The Mannik & Smith Group, Inc. may not be altered in manner, form or content without our prior express written consent.
2. If you discover any errors and/or omissions in the attached information, you will promptly notify us so that we can make any necessary revisions.
3. For any electronic file(s) attached hereto, The Mannik & Smith Group, Inc. is not responsible for any errors caused by the transmission of said files, your software, or your computer systems.

SUBMITTAL# 007A

DATE: June 30, 2017

Michigan Department of Environmental Quality
Torch Lake Non-Superfund Site
Hubbell Processing Area
Hubbell, MI
File No.: 761/16108.SAR Index No.44251

TO:
Jed Chrestensen
The Mannik & Smith Group, Inc
200 Michigan Street, Suite 705
Hancock, MI 49930

FROM:
Hans Haapala, Project Manager, 906-281-6908
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913

SUBMITTAL TYPE:

☐ Product Data	☐ Certificates	☐Record Documents	☐ Operation/Maintenance Manuals
☐Shop Drawings	☐Manufacturer's Instructions	☐Samples	☐ Contract Closeout
☐Test Reports	☐Construction Photographs	☒ Administrative	☐Other

SUPPLIER: None

SPECIFICATION NUMBER AND TITLE: 01 29 73 Schedule of Values

PART	TYPE	DESCRIPTION
1.1	Administrative	Schedule of Values as revised

B&B Contracting, Calumet, Inc. certifies that review, approval verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents.

Signed: Digitally signed by Hans P. Haapala DN: cn=Hans P. Haapala, o=B&B Contracting, Calumet, Inc., ou=Project Engineer, email=hanshaapala@gmail.com, c=US Date: 2017.06.30 11:20:50 -04'00'

Date: 6/30/17

APPROVED 6-30-17

An Equal Opportunity Employer
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913
Office: 906-337-0017
Fax: 906-934-2587

TRANSMITTAL

DATE:	***FROM:***
June 30, 2017	Hans Haapala (906)281-6908
ATTN:	*JOB NAME:*
Jed Chrestensen, P.E.	Torch Lake Non-Superfund Site Hubbell Processing Area
ADDRESS:	*ATTACHED:*
The Mannik & Smith Group, Inc. 200 Michigan Street, Suite 705 Hancock, MI 49930	Submittal #007A Schedule of Values
PHONE NUMBER:	
(906)487-7451	
RE:	
Schedule of Values	

O URGENT **X** FOR REVIEW **O** PLEASE COMMENT **O** PLEASE REPLY **O** PLEASE RECYCLE

Notes/Comments:

Please review the attached submittal.

SUBMITTAL# 007A

DATE: June 30, 2017

Michigan Department of Environmental Quality
Torch Lake Non-Superfund Site
Hubbell Processing Area
Hubbell, MI

File No.: 761/16108.SAR Index No.44251

TO:
Jed Chrestensen

The Mannik & Smith Group, Inc

200 Michigan Street, Suite 705

Hancock, MI 49930

FROM:
Hans Haapala, Project Manager, 906-281-6908

B&B Contracting, Calumet, Inc.

55670 Hwy M-26

Calumet, MI 49913

SUBMITTAL TYPE:

☐ Product Data	☐ Certificates	☐Record Documents	☐ Operation/Maintenance Manuals
☐Shop Drawings	☐Manufacturer's Instructions	☐Samples	☐ Contract Closeout
☐Test Reports	☐Construction Photographs	☒ Administrative	☐Other

SUPPLIER: None

SPECIFICATION NUMBER AND TITLE: 01 29 73 Schedule of Values

PART	TYPE	DESCRIPTION
1.1	Administrative	Schedule of Values as revised

B&B Contracting, Calumet, Inc. certifies that review, approval verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents. Signed:_____ Date: 6/30/17	

SCHEDULE OF VALUES

Owner: State of Michigan, DTMB, SFA, Design and Construction Division
3111 W. St. Joseph Street
Lansing, MI 48917
File No: 761/16108.SAR Index No. 44251

Project: Department of Environmental Quality
Torch Lake Non-Superfund Site
Hubbell Processing Area

Contractor: B&B Contracting, Calumet, Inc.
55670 Hwy M26
Calumet, MI 49913

Date: 6/30/2017

Base Bid Item	DESCRIPTION	B&B RESOURCES	UM	QTY	Labor Costs	Equipment Costs	Material Costs	Fees	Subcontractor Costs	BARE SUBTOTAL	OVERHEAD AND PROFIT	UNIT PRICE	SCHEDULED VALUE (QTY x UNIT PRICE)
1	**Mobilization and Site Administration**												
	Preparation of Submittals	Project superintendent and manager			$ 2,272.73		$ 454.55						
	Bonds and Insurance	None					$ 8,090.91						
	Site Security	Project superintendent and manager			$ 454.55		$ 454.55						
	Temporary Controls and Utilities	Project superintendent and manager			$ 454.55	$ 454.55							
	Equipment Mobilization	Driver , tractor and lowboy			$ 454.55	$ 1,545.45							
	Subcontractor Mobilization	None							$ 2,863.64				
		ITEM 1 SUBTOTALS	**LS**	**1**	**$ 3,636.36**	**$ 2,000.00**	**$ 9,000.00**	**$ -**	**$ 2,863.64**	**$ 17,500.00**	**$ 1,750.00**	**$ 19,250.00**	**$ 19,250.00**
2	**Site Preparation - Soil Erosion And Sedimentation Controls, Permits, and Access Improvements**												
	Aggregate Testing	Subcontractor			$ 363.64				$ 545.45				
	Off-Site Training	All personnel			$ 13,236.36				$ 8,363.64				
	Office Trailer	Project superintendent and manager				$ 545.45							
	Portable Toilet	None					$ 363.64						
	Exclusion Zone, Decon Area Setup	2 laborers			$ 3,636.36	$ 1,090.91	$ 2,454.55						
	Silt Fence Installation/Removal	2 laborers, excavator			$ 1,822.73	$ 940.91	$ 1,963.64						
	SESC Permits	Project manager			$ 636.36			$ 800.00					
	NESHAP Renovation Notice	U.P. Abatement Company			$ 136.36			$ 227.27					
	Entrance Improvements	1 operator, 2 laborers, haul truck, excavator, dozer			$ 454.55	$ 3,181.82	$ 3,818.18						
	Haul Road Construction	1 operator, 2 laborers, haul truck, excavator, dozer			$ 909.09	$ 13,636.36	$ 12,100.00						
	Concrete Bulkhead Patching	1 operator, 2 laborers, excavator, loader			$ 545.45	$ 1,236.36	$ 545.45						
		ITEM 2 SUBTOTALS	**LS**	**1**	**$ 21,740.91**	**$ 20,631.82**	**$ 21,245.45**	**$ 1,027.27**	**$ 8,909.09**	**$ 73,554.55**	**$ 7,355.45**	**$ 80,910.00**	**$ 80,910.00**
3	**Tree Removal, Dewatering, and Grading**												
	Tree and Brush Removal	Excavator w/ brush hog attachment			$ 3,709.09	$ 7,363.64							
	Solid waste consolidation	2 laborers, loader, excavator				$ 1,363.64							
	Dewatering	2 laborers, pumps and generator			$ 1,272.73	$ 454.55	$ 454.55						
	Grading contaminated soils	Excavator, haul truck, dozer			$ 1,209.09	$ 18,763.64							
	Dust suppresion	Water truck			$ 3,636.36	$ 909.09	$ 454.55						
	Air monitoring	Subcontractor			$ 2,272.73				$ 4,545.45				
	Decontamination	Plastic, disposal bags, wipes, fresh water			$ 963.64	$ 1,363.64	$ 1,363.64						
		ITEM 3 SUBTOTALS	**LS**	**1**	**$ 13,063.64**	**$ 30,218.18**	**$ 2,272.73**	**$ -**	**$ 4,545.45**	**$ 50,100.00**	**$ 5,010.00**	**$ 55,110.00**	**$ 55,110.00**
4	**Drainage Ditch Improvement**												
	Rip Rap Testing	2 laborers, loader, subcontractor			$ 1,436.36	$ 909.09			$ 318.18				
	Water Diversion , Pumping	Excavator, 2 laborers, pumps			$ 2,727.27	$ 4,545.45							
	Excavation, Liner, Riprap	1 operator, 2 laborers, excavator, haul truck, loader			$ 4,181.82	$ 6,954.55	$ 9,090.91						
	Coconut Erosion Blankets	2 laborers, loader, excavator			$ 1,245.45	$ 909.09	$ 1,136.36						
		ITEM 4 SUBTOTALS	**LS**	**1**	**$ 9,590.91**	**$ 13,318.18**	**$ 10,227.27**	**$ -**	**$ 318.18**	**$ 33,454.55**	**$ 3,345.45**	**$ 36,800.00**	**$ 36,800.00**
5	**PCB-Contaminated Soil and Debris Transport and Disposal**												
	Profiling, Manifesting and Loading	Project Manager, 1 operator, loader			$ 19.21	$ 32.02	$ 7.07						
	Transporting	Subcontractor							$ 75.62				
	Disposal	Subcontractor						$ 193.35					
		ITEM 5 SUBTOTALS	**TON**	**140**	**$ 19.21**	**$ 32.02**	**$ 7.07**	**$ 193.35**	**$ 75.62**	**$ 327.27**	**$ 32.73**	**$ 360.00**	**$ 50,400.00**
6	**Cap Installation**												
	Imported Soil Gradation	Subcontractor			$ 69.93				$ 419.58				
	Imported Soil Laboratory Analytical	Subcontractor			$ 69.93				$ 139.86				
	Traffic Control	2 flag persons, arrow boards and signs			$ 302.10	$ 69.93							
	Borrow Pit Haul Road	Dozer, quad			$ 100.70	$ 279.72	$ 279.72						
	Load and haul clay borrow soil	Excavator, 3 haul trucks				$ 2,595.80	$ 1,468.53						
	Spread and grade borrow soil	Dozer, loader			$ 109.09	$ 783.22							
	Borrow Pit Restoration	Dozer, subcontractor				$ 151.05			$ 433.57				
		ITEM 6 SUBTOTALS	**ACRE**	**6.5**	**$ 651.75**	**$ 3,879.72**	**$ 1,748.25**	**$ -**	**$ 993.01**	**$ 7,272.73**	**$ 727.27**	**$ 8,000.00**	**$ 52,000.00**
7	**North Boundary Road Installation**												
	Stabil. fabric, 1-3" Agg, Grading	Dozer, loader, 2 laborers			$ 636.36	$ 3,136.36	$ 1,727.27						
	Loading dock riprap	Loader, 2 laborers			$ 636.36	$ 954.55	$ 1,090.91						
		ITEM 7 SUBTOTALS	**LS**	**1**	**$ 1,272.73**	**$ 4,090.91**	**$ 2,818.18**	**$ -**	**$ -**	**$ 8,181.82**	**$ 818.18**	**$ 9,000.00**	**$ 9,000.00**
8	**Seeding, Fertilizing, and Mulching**												
	Submittals	Project Manager			$ 69.93				$ 69.93				
	Seed, fertilize and mulch capped area	Subcontractor							$ 3,860.14				
		ITEM 8 SUBTOTALS	**ACRE**	**6.5**	**$ 69.93**	**$ -**	**$ -**	**$ -**	**$ 3,930.07**	**$ 4,000.00**	**$ 400.00**	**$ 4,400.00**	**$ 28,600.00**
9	**Final As-Built Survey**												
	Submittals	Project Manager, Subcontractor			$ 5,454.55				$ 1,818.18				
		ITEM 9 SUBTOTALS	**LS**	**1**	**$ 5,454.55**	**$ -**	**$ -**	**$ -**	**$ 1,818.18**	**$ 7,272.73**	**$ 727.27**	**$ 8,000.00**	**$ 8,000.00**
10	**Provisionary Allowance**											**$ 50,000.00**	**$ 50,000.00**

Base Bid Item	DESCRIPTION	B&B RESOURCES	UM	QTY	Labor Costs	Equipment Costs	Material Costs	Fees	Subcontractor Costs	BARE SUBTOTAL	OVERHEAD AND PROFIT	UNIT PRICE	SCHEDULED VALUE (QTY x UNIT PRICE)
11	**Demobilization and Project Closeout**												
	Inspection and Submittals	Project Manager			$ 2,545.45								
	Equipment demobilization	2 laborers, tractor and lowboy				$ 5,272.73							
		ITEM 11 SUBTOTALS	**LS**	**1**	**$ 2,545.45**	**$ 5,272.73**	**$ -**	**$ -**	**$ -**	**$ 7,818.18**	**$ 781.82**	**$ 8,600.00**	**$ 8,600.00**
12	**RACM/ACM and RPM Pickup and Containment**												
	Training	All personnel			$ 4,090.91								
	Pickup and consolidation	3 laborers, loader			$ 14,090.91	$ 1,363.64	$ 5,000.00						
	Final inspection	Project manager			$ 4,090.91								
		ITEM 12 SUBTOTALS	**LS**	**1**	**$ 22,272.73**	**$ 1,363.64**	**$ 5,000.00**	**$ -**	**$ -**	**$ 28,636.36**	**$ 2,863.64**	**$ 31,500.00**	**$ 31,500.00**
												TOTAL	**$ 430,170.00**

200 Michigan Street, Suite 705, Hancock, MI 49930
906-487-7452
www.MannikSmithGroup.com

LETTER OF TRANSMITTAL

To: Mr. Hans Haapala
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913

Project #: MDEQ0070
Date: June 30, 2017

Re: Submittal #008 – Site-Specific HASP
MDEQ Torch Lake Non-Superfund Site
Hubbell Processing Area

Enclosed are the following:

No. of Copies	Description
1	Comments on Submittal #008

The above items are transmitted as checked below:

☐ For review and approval ☐ For review and comment ☐ Returned for corrections
☒ For your use ☐ Approved as submitted ☐ Approved as noted
☐ As requested ☐ Other:

Remarks:

Please note that comments included in the attached submittal are only suggestions for your consideration. We do not approve health and safety plans. If you edit the document now or over the course of the project, please send us updates as they occur for the project record. Thank you.

Copies To: MDEQ-RRD, Calumet District Office

File

Signed:

Printed: Jed Chrestensen
Project Engineer

This transmittal is subject to the following conditions to which you agree by accepting these terms on a reply to this message or using the information in any manner, including but not limited to, copying or using the information for reference.

1. Any work product of The Mannik & Smith Group, Inc. may not be altered in manner, form or content without our prior express written consent.
2. If you discover any errors and/or omissions in the attached information, you will promptly notify us so that we can make any necessary revisions.
3. For any electronic file(s) attached hereto, The Mannik & Smith Group, Inc. is not responsible for any errors caused by the transmission of said files, your software, or your computer systems.

An Equal Opportunity Employer
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913
Office: 906-337-0017
Fax: 906-934-2587

TRANSMITTAL

DATE:

June 28, 2017

FROM:

Hans Haapala (906)281-6908

ATTN:

Jed Chrestensen, P.E.

JOB NAME:

Torch Lake Non-Superfund Site
Hubbell Processing Area

ADDRESS:

The Mannik & Smith Group, Inc.
200 Michigan Street, Suite 705
Hancock, MI 49930

ATTACHED:

Submittal #008
Site-Specific Health and Safety Plan

PHONE NUMBER:

(906)487-7451

RE:

Site-Specific Health and Safety Plan

O URGENT **X** FOR REVIEW **O** PLEASE COMMENT **O** PLEASE REPLY **O** PLEASE RECYCLE

Notes/Comments:

Please review the attached submittal.

SUBMITTAL# 008

DATE: June 28, 2017

Michigan Department of Environmental Quality
Torch Lake Non-Superfund Site
Hubbell Processing Area
Hubbell, MI

File No.: 761/16108.SAR Index No.44251

TO:

Jed Chrestensen

The Mannik & Smith Group, Inc

200 Michigan Street, Suite 705

Hancock, MI 49930

FROM:

Hans Haapala, Project Manager, 906-281-6908

B&B Contracting, Calumet, Inc.

55670 Hwy M-26

Calumet, MI 49913

SUBMITTAL TYPE:

☐ Product Data	☐ Certificates	☐Record Documents	☐ Operation/Maintenance Manuals
☐Shop Drawings	☐Manufacturer's Instructions	☐Samples	☐ Contract Closeout
☐Test Reports	☐Construction Photographs	☒ Administrative	☐Other

SUPPLIER: None

SPECIFICATION NUMBER AND TITLE: 01 33 00 Health and Safety Plan

PART	TYPE	DESCRIPTION
1.5.7	Administrative	Site-Specific Health and Safety Plan

B&B Contracting, Calumet, Inc. certifies that review, approval verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents. Signed:_____ Date: 6/28/17	

An Equal Opportunity Employer
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913
Office: (906)337-0017
Fax: (906)934-2587

SITE-SPECIFIC HEALTH AND SAFETY PLAN (HASP)

PREPARED FOR:

PROJECT:

FILE NO. 761/16108.SAR INDEX NO. 44521

TORCH LAKE NON-SUPERFUND SITE
DEPARTMENT OF ENVIRONMENTAL QUALITY
HUBBELL PROCESSING AREA REMEDIATION
HUBBELL, MI

OWNER:

STATE OF MICHIGAN, DEPARTMENT OF TECHNOLOGY, MANAGEMENT & BUDGET

PROFESSIONAL:

THE MANNIK & SMITH GROUP, INC.

BY:

B&B CONTRACTING, CALUMET, INC.

DATED:

JUNE 28, 2017

This plan was prepared using the project Contract Documents owned by the State and prepared by the Professional. It also borrows extensively from the Professional's Site-Specific Health and Safety Plan.

Table of Contents

1.0 EMERGENCY CONTACTS/SITE PERSONNEL: 3
1.1. Emergency Telephone Numbers: 3
1.2. B&B Contracting Health & Safety Personnel 3
1.3. Regulatory Agency/Consultant Contacts: 3
2.0 TRAINING 4
3.0 MEDICAL SURVEILLANCE 5
3.1. Baseline Monitoring 5
3.2. Periodic Monitoring 5
3.3. Exit Physical 5
4.0 INTRODUCTION AND BACKGROUND INFORMATION 5
4.1. Applicability 5
5.0 SITE ACCESS PROCEDURE 6
5.1. Access Points 6
5.2. Access 6
6.0 SITE CHARACTERIZATION INFORMATION: 6
Table 1 – Chemical Hazard Evaluation 6
7.0 WORK TASKS 13
8.0 HEALTH AND SAFETY RISK ANALYSIS 13
9.0 PERSONAL PROTECTIVE EQUIPMENT 13
10.0 AIR MONITORING 14
11.0 SITE CONTROL MEASURES AND WORK PRACTICES 14
11.1. General Requirements 14
11.2. Buddy System 14
11.3. Heat Related Stress 14
11.4. Exclusion Zone 15
11.5. Decontamination Zone 15
11.6. Support Zone 16
12.0 DECONTAMINATION PROCEDURES 16
13.0 EMERGENCY RESPONSE PLAN 16

Attachments

Attachment 1 – Site Location and Site Plan, Sheets C-1 and C-4
Attachment 2 – B&B Contracting Certifications
Attachment 3 – Physician's Statements for Medical Surveillance Program
Attachment 4 – Hubbell Processing Area – Hubbell Coal Docks – Mineral Building Figs. 3a & 3bSoil Sampling Results Map, Figs. 4a & 4b Soil Screening Results Map, Per Contract Documents Appendix III
Attachment 5 – B&B Contracting Respiratory Protection Program
Attachment 6- Air Monitoring Plan
Attachment 7- Hospital Location Map
Attachment 8 – Site Specific HASP Acceptance Form

1.0 EMERGENCY CONTACTS/SITE PERSONNEL:

1.1. Emergency Telephone Numbers:

Police/ Fire/ Ambulance **911**

1.2. B&B Contracting Health & Safety Personnel

B & B Contracting, Calumet, Inc.
55670 M-26
Calumet, MI 49913
(906)337-0017 -Office

Site Superintendent: Brian Bonen
(906)281-2587

Site Health and Safety Officer: Hans Haapala
(906)281-6908

Health & Safety Consultant:

TEOC - Tillotson Environmental/Occupational Consulting
Michael R. Tillotson, CIH, CHMM
Highway101 W. Cass Ste. C
St. Johns, MI 48879
(989)227-2000
(517)420-1371 - cell

1.3. Regulatory Agency/Consultant Contacts:

Michigan Department of Environmental Quality, Remediation and Redevelopment Division (DEQ)
Project Manager
Amy Keranen
(906)337-0389 - office

The Mannik & Smith Group, Inc. (MSG)
(906)487-7451 - office
Jeffrey Binkley, Project Manager
(906)281-3404
Jed Chrestensen, Field Engineer
(906)281-4726

2.0 TRAINING

All B&B Contracting personnel who enter the site must have received a minimum of 40-hour HAZWOPER training meeting the requirements of 29 CFR 1910.120(e)(3)(ii). 8-hour annual refreshers must have been completed. 40 Hour Asbestos Worker/Supervisor training must also be completed for employees working within the Exclusion Zone.

Prior to entering the site, each employee shall review this site safety and health plan and document on the attached log that they have received the initial 40-hour training, have a current refresher, have reviewed and understand this site-specific HASP and agree to follow it. The following B&B personnel have been adequately trained and certified. Certifications are included in Attachment 2.

NAME	TITLE	Certifications
Brian Bonen (906)281-2587	Site Superintendent	40-Hour Asbestos Abatement Contractor/Supervisor 48-Hour HAZWOPER Supervisor w/refresher OSHA 29 CFR 1926.2 Lead Exposure OSHA 29 CFR 1910.1200 Hazard Communication
Hans Haapala (906)281-6908	Site Health and Safety Officer	40-Hour Asbestos Abatement Contractor/Supervisor 48-Hour HAZWOPER Supervisor w/refresher OSHA 29 CFR 1926.2 Lead Exposure OSHA 29 CFR 1910.1200 Hazard Communication
Wayne Bourdeau (906)231-3170	Operator/Driver	40-Hour Asbestos Abatement Contractor/Supervisor 40-Hour HAZWOPER w/refresher OSHA 29 CFR 1926.2 Lead Exposure OSHA 29 CFR 1910.1200 Hazard Communication
Greg Tchida (906)231-4752	Operator/Driver	40-Hour Asbestos Abatement Contractor/Supervisor 40-Hour HAZWOPER w/refresher OSHA 29 CFR 1926.2 Lead Exposure OSHA 29 CFR 1910.1200 Hazard Communication
Danny Erkkila	Mechanic/Laborer	40-Hour Asbestos Abatement Contractor/Supervisor 40-Hour HAZWOPER w/refresher OSHA 29 CFR 1926.2 Lead Exposure OSHA 29 CFR 1910.1200 Hazard Communication
Bill Chevalier (906)370-4047	Driver/Laborer	40-Hour Asbestos Abatement Contractor/Supervisor 40-Hour HAZWOPER w/refresher OSHA 29 CFR 1926.2 Lead Exposure OSHA 29 CFR 1910.1200 Hazard Communication
Joe Lampinen	Laborer	40-Hour Asbestos Abatement Contractor/Supervisor 40-Hour HAZWOPER w/refresher OSHA 29 CFR 1926.2 Lead Exposure OSHA 29 CFR 1910.1200 Hazard Communication
Bruce Kesti	Laborer	40-Hour Asbestos Abatement Contractor/Supervisor 40-Hour HAZWOPER w/refresher OSHA 29 CFR 1926.2 Lead Exposure OSHA 29 CFR 1910.1200 Hazard Communication
Mitchel Large	Laborer	40-Hour Asbestos Abatement Contractor/Supervisor 40-Hour HAZWOPER w/refresher OSHA 29 CFR 1926.2 Lead Exposure OSHA 29 CFR 1910.1200 Hazard Communication

3.0 MEDICAL SURVEILLANCE

The following are minimum medical surveillance requirements for on-site personnel

3.1. Baseline Monitoring

Prior to beginning hazardous or potentially hazardous work activities involving exposure to toxic materials, employees will receive a baseline physical. Each subcontractor will be responsible for medical evaluation of their employees.

3.2. Periodic Monitoring

Following initial baseline monitoring all employees will require an annual physical exam, unless the advising physician believes a shorter interval in necessary. The employer's physician should prescribe an adequate medical exam that fulfills the requirements of OSHA 29 CFR 1910.120.

3.3. Exit Physical

At the termination of employment or reassignment that does not involve hazardous activities an employee will undergo an exit physical exam, unless deemed unnecessary by the advising physician.

3.4. Current Medical Monitoring

Documentation of participation in the medical surveillance program for each employee is included as the physician statement in Attachment 3.

4.0 INTRODUCTION AND BACKGROUND INFORMATION

B&B Contracting, Calumet, Inc.(B&B) has contracted with the Michigan Department of Environmental Quality, Remediation and Redevelopment Division(DEQ) to perform Interim Environmental Response Activities at the Hubbell Processing Area(Site) in Hubbell, MI. The Mannik & Smith Group, Inc.(MSG) has prepared the Contract Documents which detail the objective of B&B's work onsite. The history and background information for this Site are included in the Contract Documents and B&B's Work Plan.

As the site contains both known and unknown contamination risks from abandoned mining waste, B&B Contracting, Calumet, Inc. has prepared this site-specific Health and Safety Plan(HASP) for completion of the work. All of the information regarding the Site and the known health hazards have been provided to B&B by the DEQ and MSG.

The Site is located at 52634 Hwy M26, Hubbell, MI.

The Location Map Sheet C-1 and Site Plan C-4 are included as Attachment 1.

4.1. Applicability

This HASP applies to all personnel working onsite who are or may be exposed to the hazards listed in this plan. Visitors to the site are also required to review this HASP. Prior to entering the Site, all B&B personnel, subcontractors and visitors shall sign the attached Plan Acceptance Form (Attachment 8) documenting that they have reviewed and understand the provisions of this HASP.

5.0 SITE ACCESS PROCEDURE

5.1. Access Points

In Attachment 1, Plan Sheet C-4 has been edited to show the access points. The entire site is bounded by chain link fence. An Exclusion Zone will be established to include the areas within contaminated soil will be disturbed. The boundaries of this zone are shown in Attachment 1 sheet C-4. Access to the Exclusion Zone shall only be through the Decontamination Areas.

5.2. Access

MSG is not in charge of security.

The property's security is managed by The Mannik & Smith Group, Inc. Authorized access can only be obtained by contacting the below-listed individual.

The Mannik & Smith Group, Inc.
Jed Chrestensen, Field Engineer
906-281-4726

Upon completion of each work day, the Site Superintendent will inspect and assure that the site is secure before leaving.

6.0 SITE CHARACTERIZATION INFORMATION:

The DEQ and MSG have identified the presence of hazardous substances and health hazards including heavy metals, PCBs and asbestos. The analytical results are displayed on Figures 3a, 3b, 4a and 4b in Attachment 4. These hazards have been identified in multiple areas within the work area and are listed in Table 1.

Table 1 – Chemical Hazard Evaluation

This table covers all of the Abandoned Mining Waste project. It should be adjusted to just the Hubbell Processing Area or caveat the above text to say something like "known and/or possible chemical hazards".

Compound	OSHA PEL*	NIOSH REL*	Ionization Potential (eV)	Route of Entry	Symptoms of Overexposure
Benzene	1 ppm	0.1 ppm	9.24	Inhalation, Ingestion, Skin absorption, Contact	Irritated eyes, nose, respiratory system; dizziness, headaches, nausea; fatigue, anorexia, dermatitis, lassitude, bone marrow depression (Carcinogen)
Carbon disulfide	20 ppm	1 ppm	10.08	Inhalation, skin absorption, ingestion, skin and/or eye contact	Dizziness, headache, poor sleep, lassitude (weakness, exhaustion), anxiety, anorexia, weight loss; psychosis; polyneuropathy; Parkinson-like syndrome; ocular changes; coronary heart disease; gastritis; kidney, liver injury; eye, skin burns; dermatitis; reproductive effects

Compound	OSHA PEL*	NIOSH REL*	Ionization Potential (eV)	Route of Entry	Symptoms of Overexposure
Chlorobenzene	75 ppm	***	9.07	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose; drowsiness, incoordination; central nervous system depression; in animals: liver, lung, kidney in-
Chloroethene	1000 ppm	***	10.97	Inhalation, skin absorption (liquid), ingestion (liquid), skin and/or eye contact	Incoordination, inebriation; abdominal cramps; cardiac arrhythmias, cardiac arrest; liver, kidney damage
Chloromethane	100 ppm	***	11.28	Inhalation, skin and/or eye contact (liquid)	Dizziness, nausea, vomiting; visual disturbance, stagger, slurred speech, convulsions, coma; liver, kidney damage; liquid: frostbite; reproductive, teratogenic effects; [potential occupational carcinogen]
Cyclohexane	300 ppm	300 ppm	9.88	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, respiratory system; drowsiness; dermatitis; narcosis, coma
1,4-Dichlorobenzene	75 ppm	***	8.98	Inhalation, skin absorption, ingestion, skin and/or eye contact	Eye irritation, swelling periorbital (situated around the eye); profuse rhinitis; headache, anorexia, nausea, vomiting; weight loss, jaundice, cirrhosis; in animals: liver, kidney injury; [potential occupational carcinogen]
Dichlorodifluoromethane (CFC-12)	1000 ppm	1000 ppm	11.75	Inhalation, skin and/or eye contact (liquid)	Dizziness, tremor, asphyxia, unconsciousness, cardiac arrhythmias, cardiac arrest; liquid: frostbite
1,1-Dichloroethylene	***	***	10.00	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, throat; dizziness, headache, nausea, dyspnea (breathing difficulty); liver, kidney disturbance; pneumonitis; [potential occupational carcinogen]
Isopropyl benzene	50 ppm	50 ppm	8.75	Inhalation, Skin absorption, Ingestion, Skin and/oreye contact	Irritated eyes, skin, mucous membrane; dermatitis; headache, narcosis, coma
Toluene	200 ppm	100 ppm	8.82	Inhalation, Ingestion, Skin absorption, Contact	Irritated eyes, nose; fatigue, weakness, confusion, euphoria, dizziness, headaches; dilated pupils, tearing; nervousness, muscle fatigue, insomnia; paresthesia; dermatitis; liver, kidney damage
Ethylbenzene	100 ppm	100 ppm	8.76	Inhalation, Ingestion, Contact	Irritated eyes, skin, mucous membranes; headaches; dermatitis; narcosis, coma
Xylenes	100 ppm	100 ppm	8.56	Inhalation, Ingestion, Skin absorption, Contact	Irritated eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoherence, staggering gait; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis
Naphthalene	10 ppm	10 ppm	8.12	Inhalation, Ingestion, Skin absorption, Contact	Irritated eyes; headache, confusion, excitement, malaise; nausea, vomiting, abdominal pain; irritated bladder; profuse sweating; jaundice; hematuria, renal shutdown; dermatitis, optical neuritis, corneal damage
2-Methylnaphthalene	**				

Compound	OSHA PEL*	NIOSH REL*	Ionization Potential (eV)	Route of Entry	Symptoms of Overexposure
n-Butylbenzene	**				
n-Propyl benzene	**				
1,2,3-Trimethylbenzene	None	25 ppm	8.48	Inhalation, Ingestion, Skin and/or eye contact	Irritated eyes, skin, nose, throat, respiratory system; bronchitis; hypochromic anemia; headache, drowsiness, lassitude, dizziness, nausea, incoordination; vomiting, confusion; chemical pneumonitis
1,2,4-Trimethylbenzene	None	25 ppm	8.27	Inhalation, Ingestion, Skin absorption, Contact	Irritated eyes, skin, nose, throat, respiratory system; bronchitis; hypochromic anemia; headache, drowsiness, fatigue, dizziness, nausea, incoordination; vomiting, confusion; chemical pneumonitis
1,3,5-Trimethylbenzene	None	25 ppm	8.39	Inhalation, Ingestion, Skin absorption, Contact	Irritated eyes, skin, nose, throat, respiratory system; bronchitis; hypochromic anemia; headache, drowsiness, lassitude, dizziness, nausea, incoordination; vomiting, confusion; chemical pneumonitis
Ammonia	50 ppm	25 ppm	10.18	Inhalation, ingestion (solution), skin and/or eye contact (solution/liquid)	Irritation eyes, nose, throat; dyspnea (breathing difficulty), wheezing, chest pain; pulmonary edema; pink frothy sputum; skin burns, vesiculation; liquid: frostbite
Cyanide	10 ppm (HCN)	***	13.60	Inhalation, skin absorption, ingestion, skin and/or eye contact	Asphyxia; lassitude (weakness, exhaustion), headache, confusion; nausea, vomiting; increased rate and depth of respiration or respiration slow and gasping; thyroid, blood changes
Aluminum	15 mg/m3	10 mg/m3	NA	Inhalation, Skin and/or eye contact	Irritation eyes, skin, respiratory system
Antimony	0.5 mg/m3	0.6 mg/m3	NA	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat, mouth; cough; dizziness; headache; nausea, vomiting, diarrhea; stomach cramps; insomnia; anorexia; unable to smell properly
Arsenic	0.010 mg/m3	0.002 mg/m3 (15 min)	NA	Inhalation, Ingestion, Skin and/or eye contact	Ulceration of nasal septum, dermatitis, gastrointestinal disturbances, peripheral neuropathy, respiratory irritation, hyperpigmentation of skin, potential occupational carcinogen
Asbestos	0.010 mg/m3	0.1 fiber/cm^3	NA	Inhalation, Ingestion, Skin and/or eye contact	Asbestosis (chronic exposure), dyspnea, interstitial fibrillation, restricted pulmonary function, finger clubbing, irritated eyes, potential occupational carcinogen
Barium	0.5 mg/m3	0.5 mg/m3	NA	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, upper respiratory system; skin burns; gastroenteritis; muscle spasm; slow pulse, extra systoles; hypokalemia
Beryllium	0.002 mg/m3	0.0005 mg/m3	NA	Inhalation, skin and/or eye contact	Berylliosis (chronic exposure): anorexia, weight loss, lassitude (weakness, exhaustion), chest pain, cough, clubbing of fingers, cyanosis, pulmonary insufficiency; irritation eyes; dermatitis; [potential occupational carcinogen]
Boron	15 mg/m3 (Boron Oxide)	10 mg/m3	13.50	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, respiratory system; cough; conjunctivitis; skin erythema (skin redness)

Compound	OSHA PEL*	NIOSH REL*	Ionization Potential (eV)	Route of Entry	Symptoms of Overexposure
Cadmium	0.005 mg/m3	**	NA	Inhalation, Ingestion	Pulmonary edema, dyspnea (breathing difficulty), cough, chest tightness, substernal (occurring beneath the sternum) pain; headache; chills, muscle aches; nausea, vomiting, diarrhea; anosmia (loss of the sense of smell), emphysema, proteinuria, mild anemia
Calcium	5 mg/m3 (Calcium Oxide)	2 mg/m3	NA	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, upper respiratory tract; ulcer, perforation nasal septum; pneumonitis; dermatitis
Chromium	0.5 mg/m3	0.5 mg/m3	NA	Inhalation, Ingestion, Skin and/or eye contact	Irritated eyes; sensitization dermatitis
Cobalt	0.1 mg/m3	0.05 mg/m3	NA	Inhalation, ingestion, skin and/or eye contact	Cough, dyspnea (breathing difficulty), wheezing, decreased pulmonary function; weight loss; dermatitis; diffuse nodular fibrosis; resp hypersensitivity, asthma
Copper	1 mg/m3	1 mg/m3	NA	Inhalation, Ingestion, Skin and/or eye contact	Irritated eyes, nose, pharynx; nasal septum perforation; metallic taste; dermatitis
Iron	10 mg/m3 (Iron Oxide)	5 mg/m3	NA	Inhalation	Benign pneumoconiosis with X-ray shadows indistinguishable from fibrotic pneumoconiosis (siderosis)
Lead	0.050 mg/m3	0.050 mg/m3	NA	Inhalation, Ingestion, Skin and/or eye contact	Weakness, exhaustion, insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; kidney disease; irritation eyes; hypotension
Lithium	**				
Manganese	5 mg/m3	1 mg/m3	NA	Inhalation, ingestion	Manganism; asthenia, insomnia, mental confusion; metal fume fever; dry throat, cough, chest tightness, breathing difficulty, rales, flu-like fever; low back pain; vomiting; malaise; weakness, exhaustion; kidney damage
Magnesium	15 mg/m3 (Mg Oxide Fume)	***	NA	Inhalation, skin and/or eye contact	Irritation eyes, nose; metal fume fever: cough, chest pain, flu-like fever
Mercury	0.1 mg/m3	0.05 mg/m3	NA	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; cough, chest pain, dyspnea (breathing difficulty), bronchitis, pneumonitis; tremor, insomnia, irritability, indecision, headache, lassitude (weakness, exhaustion); stomatitis, salivation; gastrointestinal disturbance, anorexia, weight loss; proteinuria
Nickel	1 mg/m3	0.015 mg/m3	NA	Inhalation, ingestion, skin and/or eye contact	Sensitization dermatitis, allergic asthma, pneumonitis; [potential occupational carcinogen]
Potassium	*** (KOH)	2 mg/m3	NA	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, respiratory system; cough, sneezing; eye, skin burns; vomiting, diarrhea

Compound	OSHA PEL*	NIOSH REL*	Ionization Potential (eV)	Route of Entry	Symptoms of Overexposure
Selenium	0.2 mg/m3	0.2 mg/m3	NA	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat; visual disturbance; headache; chills, fever; dyspnea (breathing difficulty), bronchitis; metallic taste, garlic breath, gastrointestinal disturbance; dermatitis; eye, skin burns; in animals: anemia; liver necrosis, cirrhosis; kidney, spleen damage
Silver	0.01 mg/m3	0.01 mg/m3	NA	Inhalation, ingestion, skin and/or eye contact	Blue-gray eyes, nasal septum, throat, skin; irritation, ulceration skin; gastrointestinal disturbance
Sodium	**				
Strontium	**				
Titanium	15 mg/m3 (Titanium Dioxide)	***	NA	Inhalation	Lung fibrosis; [potential occupational carcinogen]
Vanadium	0.5 mg V2O5/m3	0.05 mg V/m3	NA	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, throat; green tongue, metallic taste, eczema; cough; fine rales, wheezing, bronchitis, dyspnea (breathing difficulty)
Zinc	15 mg/m3 total dust 5 mg/m3 respirable	5 mg/m3	NA	Inhalation	Metal fume fever: chills, muscle ache, nausea, fever, dry throat, cough; lassitude (weakness, exhaustion); metallic taste; headache; blurred vision; low back pain; vomiting; malaise (vague feeling of discomfort); chest tightness; dyspnea (breathing difficulty), rales, decreased pulmonary function
Acenaphthene	0.2 mg/m3	0.1 mg/m3	***	Inhalation, Skin and/or eye contact	Dermatitis, bronchitis
Acenaphthylene	**				
Acetophenone	**				
Anthracene	0.2 mg/m3	0.1 mg/m3	***	Inhalation, Skin and/or eye contact	Dermatitis, bronchitis
Benzaldehyde	**				
Benzo(a)anthracene	0.2 mg/m3	0.1 mg/m3	***	Inhalation, Skin and/or eye contact	Dermatitis, bronchitis
Benzo(a)pyrene	0.2 mg/m3	0.1 mg/m3	***	Inhalation, Skin and/or eye contact	Dermatitis, bronchitis
Benzo(b)fluoranthene	0.2 mg/m3	0.1 mg/m3	***	Inhalation, Skin and/or eye contact	Dermatitis, bronchitis

Compound	OSHA PEL*	NIOSH REL*	Ionization Potential (eV)	Route of Entry	Symptoms of Overexposure
Benzo(g,h,i)perylene	**				
Benzo(k)fluoranthene	0.2 mg/m3	0.1 mg/m3	***	Inhalation, Skin and/or eye contact	Dermatitis, bronchitis
Bis (2- ethylhexyl) phthalate	5 mg/m3	5 mg/m3	NA	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, mucous membrane; in animals: liver damage; teratogenic effects; [potential occupational carcinogen]
Carbazole	**				
Cholestane	**				
Chrysene	0.2 mg/m3	0.1 mg/m3	***	Inhalation, Skin and/or eye contact	Dermatitis, bronchitis
Dibenzo(a,h,) anthracene	**				
Dibenzofuran	**				
Docosane	**				
Eicosane	**				
Fluoranthene	0.2 mg/m3	0.1 mg/m3	***	Inhalation, Skin and/or eye contact	Dermatitis, bronchitis
Fluorene	**				
Heptadecane	**				
Heptyl-pentadecane	**				

Compound	OSHA PEL*	NIOSH REL*	Ionization Potential (eV)	Route of Entry	Symptoms of Overexposure
Hexadecane	**				
Hexachlorobenzene	**				
Hexacosane	**				
Indeno(1,2,3-cd)pyrene	**				
Methyl-tridecane	**				
Phenanthrene	0.2 mg/m3	0.1 mg/m3	***	Inhalation, Skin and/or eye contact	Dermatitis, bronchitis
Pyrene	0.2 mg/m3	0.1 mg/m3	***	Inhalation, Skin and/or eye contact	Dermatitis, bronchitis
1,2,4,5-Tetrachlorobenzene	**				
Tetramethyl-pentadecane	**				
Polychlorinated biphenyls (PCBs)	0.5 mg/m3	0.001 mg/m3	NA	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation eyes, chloracne; liver damage; reproductive effects; [potential occupational carcinogen]

* Exposure limits are in time weighted average (TWA)

** Indicates the chemical was not listed in the NIOSH Pocket Guide

*** Indicates parameter was not listed in the NIOSH Pocket Guide

containing material

The Material Data Sheets or Safety Data Sheets (MSDS/SDS) for the materials/chemicals that will be used on site will be maintained on site by the Site Health and Safety Officer.

Based on this evaluation the major routes of entry for site chemicals include inhalation due to volatilization or disturbance and direct contact/ingestion. Asbestos is present within the site soils and as such PPE will be needed as described in 29 CFR 1926.1101 (Asbestos Construction Standard).

Due to the fact all work will occur outdoors and the relatively low concentrations it is not anticipated that the organic chemicals will volatize in large enough concentrations to pose a hazard. If site conditions indicate a need, a photoionization detector(PID) will be used to monitor the conditions.

Since VOC monitoring is mentioned here, should also mention dust and asbestos monitoring.

7.0 WORK TASKS

Following is a brief description of tasks which may be performed on the site by B & B Contracting personnel. These tasks are more fully detailed in the Work Plan.

- Excavation of sediments and soils from the southern drainage ditch both with heavy equipment and by hand.
- Cutting and mulching trees and brush that are growing in contaminated soil.
- Grading and capping contaminated soils.
- Picking, containing and disposing of visible Regulated Asbestos Containing Materials(RACM) and suspect RACM.
- Picking, containing and disposing of residual process material(RPM) such as wire wrap materials that could contain asbestos as well as poly-chlorinated biphenyls (PCBs).
- Loading and disposal of PCB and lead contaminated soil.

The complete scope of work is detailed in the Work Plan developed for this project.

8.0 HEALTH AND SAFETY RISK ANALYSIS

and inhalation

Due to the nature of the tasks being performed by B & B Contracting, the following hazards have been identified:

- Inhalation of asbestos fibers
- Direct contact and ingestion of hazardous chemicals
- Loud noise from heavy machinery
- Slips, trips and falls due to debris and uneven ground
- Moving and operating heavy equipment
- Working in excavations

9.0 PERSONAL PROTECTIVE EQUIPMENT

The PPE program is designed to protect site workers from chemical exposures. The Site Health and Safety Officer is responsible for the proper selection of PPE for the known chemical hazards and planned work activities. The SHSO will be responsible for having the correct PPE available on site and being worn properly by the workers involved in each task. Personnel performing tasks which could involve contact with the asbestos contaminated soil within the Exclusion Zone shall utilize Level C PPE including:

- Half or full-face respirator
- Full body Tyvek suit
- Steel-toed safety boots
- Rubber over-boots
- Chemically resistant nitrile inner gloves
- Leather or cloth outer gloves
- Safety glasses
- Hard hat
- Hearing Protection as necessary

- Chainsaw chaps will be worn by any personnel operating a chain saw

Respirators will be utilized according to the B&B Contracting Respiratory Protection Program in Attachment 3.

In work areas outside of the Exclusion Zone, Level D PPE will be worn including the following:

- Steel-toed safety boots
- Rubber over-boots
- Leather or cloth outer gloves
- Safety glasses
- Hard hat
- High visibility safety vest
- Hearing Protection as necessary
- Chainsaw chaps will be worn by any personnel operating a chain saw

As warranted by site conditions?

10.0 AIR MONITORING

Perimeter and personal air monitoring will be performed according to the Air Monitoring Plan included in Attachment 6.

11.0 SITE CONTROL MEASURES AND WORK PRACTICES

11.1. General Requirements

Eating, drinking, chewing tobacco, smoking and carrying lighters or matches will be allowed only in area designated. No drugs or alcohol are allowed on site. Workers must try to avoid contact with potentially contaminated surfaces. When possible, workers should not walk or travel through puddles, pools, mud or standing water. Care must be taken to avoid placing equipment on or in contaminated surfaces. All workers should make use of their senses and remain alert for changing work conditions. If strong or irritating odors, dust clouds, etc. are present, immediately stop work and move away from the area. Notify the Site Superintendent and reassess the conditions.
Avoid unnecessary disturbance of site soils. Immediately wet any soils that appear dry enough to create dust. The water truck will be used to apply water to soils that are being disturbed. Use either the spray bar or the hose as needed.

11.2. Buddy System

The buddy system will be used when workers are in Level C PPE. Buddies are to provide each other with assistance perform work tasks, observe each other for signs of chemical or heat exposure, check each other's PPE and to notify the Site Superintendent if an emergency arises.

11.3. Heat Related Stress

All employees shall be trained in the recognition of the symptoms and effects of heat cramps, heat exhaustion and heat stroke. Drinking adequate water and maintaining electrolyte levels is also important.

HEAT EXHAUSTION – Core body temperature is 100-102 °F

Symptoms: Fatigue; weakness; profuse sweating; normal temperature; pale, clammy, moist skin; headache; cramps; vomiting; fainting.
Treatment:

- Alert Site Superintendent
- Remove worker from regulated area, lay down and remove their clothing
- Allow small sips of water or Gatorade if victim is not vomiting

Prevention

- Frequent breaks/fluids
- Acclimate workers to heat
- Use ice vest

Causes

- High temperature/humidity/hard work/ unacclimated
- Not enough breaks from the heat
- Insufficient fluid intake
- Full body clothing (Tyvek suits)

HEAT STROKE – Core body temperature is 105 -106 °F

Symptoms: Dizziness, nausea, severe headache, hot dry skin, confusion, collapse, delirious, coma and death

Treatment:

- MEDICAL EMERGENCY
- Remove the worker from the regulated area/lay down/remove clothing
- Begin immediate cooling, do not immerse, use shower or wet cloths

Causes:

- High temperature/humidity/hard work/ unacclimated
- Not enough breaks from the heat, ignoring heat exhaustion symptoms
- Insufficient fluid intake
- Full body clothing (Tyvek suits)

11.4. Exclusion Zone

The Exclusion Zone will be demarcated along the lines shown on the Site Plan. The demarcation will include orange snow fencing on posts, orange cones with warning tape and appropriate signage. Entry and exit from the Exclusion Zone will only occur through the Decontamination Zone.

11.5. Decontamination Zone

Entrance and exit from the Exclusion Zone is through the Decontamination Zone. There will be separate Personnel and Equipment Decontamination Zones.

The Equipment Decontamination Zone will be located as noted on the Site Plan and detailed in the Work Plan. A pressure washer with water tank on a trailer will be present here.

The Personnel Decontamination Zone will be located outdoors and as such will include the following "rooms" proceed from outside to inside of Exclusion Zone:

- Clean Room – Area with storage box for cleaned personal PPE(respirators and safety glasses, new Tyvek suits, tape, booties, hearing protection. This area will have benches or chairs for sitting to don PPE.
- "Shower" Room – Area for removing disposable PPE. Includes proper disposal bags and drum.
- Equipment Room- Area for donning or removing with for reused PPE, rubber booties, outer gloves, hard hats, etc. A storage box will be provided for storage of these items.

11.6. Support Zone

The Support Zone will be located near the main entrance of the Site as shown on the Site Plan. Within the Support Zone will be the office trailer, electric power, potable water, temporary toilets and a cellular phone for emergency contact and off-site communications.

12.0 DECONTAMINATION PROCEDURES

Equipment and PPE used by site workers must be decontaminated or disposed of to prevent the movement of contaminants within or off of the site.

Excavation and hauling equipment will be decontaminated by pressure washing within the Equipment Decontamination Zone. Decontamination water without any soap or cleaners will be absorbed by on site soils. All equipment will also be pressure washed before entry to site.

Worker decontamination will occur within the Personnel Decontamination Zone. Personal decontamination will be accomplished by the following steps:

- Brush off any visible soils or dust from Tyvek suit directly before entering Decontamination Area
- Remove outer gloves and rubber boots to be reused and place in storage container.
- Remove removing booties and pants, if used, and placing them in a trash bag for proper disposal. Turn the booties/pants inside out while removing them. Personal PPE (respirators) will be rinsed with water if to be reused, then wiped with decon rinse can be absorbed by onsite soils.

13.0 EMERGENCY RESPONSE PLAN

An emergency alarm is to be sounded by three short blasts of a car horn or air horn.

An emergency exists if one of the following conditions develops:

- A worker experiences any adverse symptoms of exposure
- A discovery is made of a condition that is more hazardous than expected
- Any accident

If an incident/emergency occurs, evacuate the excavation area and gather in a safe area upwind of the work. Once all workers are accounted for proceed through the Decontamination Area and gather within the Support Zone. Any unusual exposure incidents will be evaluated/handled by the Site Superintendent.

SEE HOSPITAL LOCATION MAP (Attachment 7)

ATTACHMENT 1

Site Location and Site Plan, Sheets C-1 and C-4

MDEQ Upper Peninsula District
Abandoned Mining Wastes - Torch Lake Non - Superfund Site
Hubbell Processing Area Plan Set A

EDITED BY: B & B CONTRACTING,
CALUMET, INC FOR USE IN WORK PLAN

Grading and Capping Interim Response

IN

Hubbell, Michigan

March 2017



VICINITY MAP
NOT TO SCALE



LOCATION MAP
NOT TO SCALE

HUBBELL PROCESSING AREA
HUBBELL, MICHIGAN



AERIAL MAP
NOT TO SCALE

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
C-1	TITLE SHEET
C-2	LEGEND/ GENERAL NOTES
C-3	EXISTING CONDITIONS
C-4	SITE PREPARATION PLAN/SESC CONTROL MEASURES
C-5	GRADING PLAN - RIVERBEND SITE
C-6	DITCH ALIGNMENT
C-7	RESTORATION PLAN
C-8	SITE DETAILS

PLANS PREPARED BY:

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HANCOCK, MI. 49930
TEL: 734-397-3100
FAX: 734-397-3131

3 FULL WORKING DAYS
BEFORE YOU DIG CALL
MISS DIG System
1-800-482-7171 or 811
Design Ticket #: _____
Survey Ticket #: _____

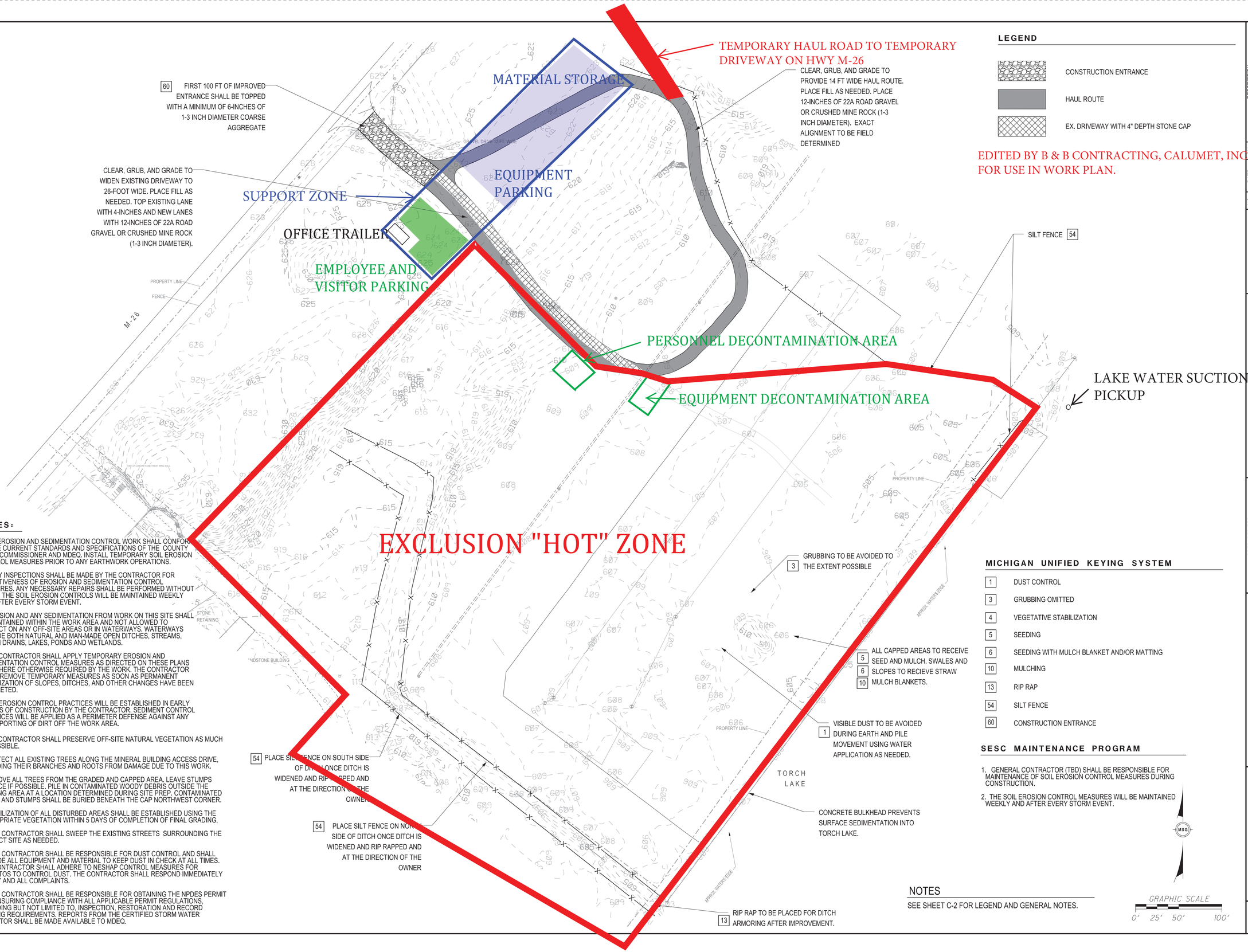
BY: _____
TIMOTHY E. WALTHER, P.E.
PROFESSIONAL ENGINEER #43798

STATE OF MICHIGAN · TIMOTHY E. WALTHER · ENGINEER · No. 43798 · REGISTERED PROFESSIONAL ENGINEER

DATE: 3/27/2017

SHEET:
C-1

W:\Projects\Projects K-O\MDEQ0070\CAD\SHEETS\COAL DOCK\MDEQ0070_1_COVER.dgn 3/27/2017 2:17:57 PM



NOTES:

1. ALL EROSION AND SEDIMENTATION CONTROL WORK SHALL CONFORM TO THE CURRENT STANDARDS AND SPECIFICATIONS OF THE COUNTY DRAIN COMMISSIONER AND MDEQ. INSTALL TEMPORARY SOIL EROSION CONTROL MEASURES PRIOR TO ANY EARTHWORK OPERATIONS.
2. DAILY INSPECTIONS SHALL BE MADE BY THE CONTRACTOR FOR EFFECTIVENESS OF EROSION AND SEDIMENTATION CONTROL MEASURES. ANY NECESSARY REPAIRS SHALL BE PERFORMED WITHOUT DELAY. THE SOIL EROSION CONTROLS WILL BE MAINTAINED WEEKLY AND AFTER EVERY STORM EVENT.
3. EROSION AND ANY SEDIMENTATION FROM WORK ON THIS SITE SHALL BE CONTAINED WITHIN THE WORK AREA AND NOT ALLOWED TO COLLECT ON ANY OFF-SITE AREAS OR IN WATERWAYS. WATERWAYS INCLUDE BOTH NATURAL AND MAN-MADE OPEN DITCHES, STREAMS, STORM DRAINS, LAKES, PONDS AND WETLANDS.
4. THE CONTRACTOR SHALL APPLY TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES AS DIRECTED ON THESE PLANS AND WHERE OTHERWISE REQUIRED BY THE WORK. THE CONTRACTOR SHALL REMOVE TEMPORARY MEASURES AS SOON AS PERMANENT STABILIZATION OF SLOPES, DITCHES, AND OTHER CHANGES HAVE BEEN COMPLETED.
5. SOIL EROSION CONTROL PRACTICES WILL BE ESTABLISHED IN EARLY STAGES OF CONSTRUCTION BY THE CONTRACTOR. SEDIMENT CONTROL PRACTICES WILL BE APPLIED AS A PERIMETER DEFENSE AGAINST ANY TRANSPORTING OF DIRT OFF THE WORK AREA.
6. THE CONTRACTOR SHALL PRESERVE OFF-SITE NATURAL VEGETATION AS MUCH AS POSSIBLE.
7. PROTECT ALL EXISTING TREES ALONG THE MINERAL BUILDING ACCESS DRIVE, INCLUDING THEIR BRANCHES AND ROOTS FROM DAMAGE DUE TO THIS WORK.
8. REMOVE ALL TREES FROM THE GRADED AND CAPPED AREA. LEAVE STUMPS IN-PLACE IF POSSIBLE. PILE IN CONTAMINATED WOODY DEBRIS OUTSIDE THE GRADING AREA AT A LOCATION DETERMINED DURING SITE PREP. CONTAMINATED BRUSH AND STUMPS SHALL BE BURIED BENEATH THE CAP NORTHWEST CORNER.
9. STABILIZATION OF ALL DISTURBED AREAS SHALL BE ESTABLISHED USING THE APPROPRIATE VEGETATION WITHIN 5 DAYS OF COMPLETION OF FINAL GRADING.
10. THE CONTRACTOR SHALL SWEEP THE EXISTING STREETS SURROUNDING THE PROJECT SITE AS NEEDED.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DUST CONTROL AND SHALL PROVIDE ALL EQUIPMENT AND MATERIAL TO KEEP DUST IN CHECK AT ALL TIMES. THE CONTRACTOR SHALL ADHERE TO NESHAP CONTROL MEASURES FOR ASBESTOS TO CONTROL DUST. THE CONTRACTOR SHALL RESPOND IMMEDIATELY TO ANY AND ALL COMPLAINTS.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE NPDES PERMIT AND ENSURING COMPLIANCE WITH ALL APPLICABLE PERMIT REGULATIONS, INCLUDING BUT NOT LIMITED TO, INSPECTION, RESTORATION AND RECORD KEEPING REQUIREMENTS. REPORTS FROM THE CERTIFIED STORM WATER OPERATOR SHALL BE MADE AVAILABLE TO MDEQ.

MICHIGAN UNIFIED KEYING SYSTEM

1	DUST CONTROL
3	GRUBBING OMITTED
4	VEGETATIVE STABILIZATION
5	SEEDING
6	SEEDING WITH MULCH BLANKET AND/OR MATTING
10	MULCHING
13	RIP RAP
54	SILT FENCE
60	CONSTRUCTION ENTRANCE

SESC MAINTENANCE PROGRAM

1. GENERAL CONTRACTOR (TBD) SHALL BE RESPONSIBLE FOR MAINTENANCE OF SOIL EROSION CONTROL MEASURES DURING CONSTRUCTION.
2. THE SOIL EROSION CONTROL MEASURES WILL BE MAINTAINED WEEKLY AND AFTER EVERY STORM EVENT.

NOTES

SEE SHEET C-2 FOR LEGEND AND GENERAL NOTES.

GRAPHIC SCALE
0' 25' 50' 100'

NO.	DATE	BY	DESCRIPTION
1	01/31/2017	WJK	90% REVIEW
2	03/02/2017	TJS	95% REVIEW
3	03/13/2017	TJS	98% REVIEW
4	03/27/2017	TJS	ISSUED FOR BIDS

PROJECT DATE: 1/31/2017
PROJECT NO.: MDEQ00070
DRAWN BY: WJK/TJS
CHECKED BY: TEW

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PREPARED FOR:
MDEQ UPPER PENINSULA DISTRICT
HUBBELL, MICHIGAN

HUBBELL PROCESSING AREA, PLAN SET A

SITE PREPARATION/SESC MEASURES

C-4 / C-8

3/27/2017
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ATTACHMENT 4

Hubbell Processing Area – Hubbell Coal Docks – Mineral Building Figs. 3a & 3bSoil Sampling Results Map, Figs. 4a & 4b Soil Screening Results Map, Per Contract Documents Appendix III



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Michigan Department of Environmental Quality

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Figure 3a
Sampling Results Map
Hubbell Processing Area - Hubbell Coal Dock
Hubbell, Houghton County, Michigan

Image Source: ESRI World Imagery (NAIP 2014)

SS-19 10/11/11

Depth	Parameter	Result		Units	[Criteria]
0-0.33	ARSENIC	5600	J	mg/kg	[9,10,16,17]
0-0.33	COPPER	199000	J	mg/kg	[9,10,16,17]
0-0.33	CYANIDE	0.24	J	mg/kg	[2]
0-0.33	LEAD	1610		mg/kg	[10,17]
0-0.33	HEXACHLOROBENZENE	850		ug/kg	[2]

SS-20 10/11/11

Depth	Parameter	Result		Units	[Criteria]
0-0.06	ARSENIC	66.9	J	mg/kg	[10,17]
0-0.06	COPPER	20300	J	mg/kg	[10]
0-0.06	CYANIDE	0.14	J	mg/kg	[2]
0-0.06	LEAD	1010		mg/kg	[10,17]

CHLL-ASBBLK28 10/15/2014

White fire brick, some blue/green staining, "A.P. Green 5x6 Key"

CHLL-ASBBLK30 10/15/2014

Brick mortar

CHLL-ASBBLK06 07/31/14

Black weathered roofing material, tar paper

Parameter	Result	Units	[Criteria]
ASBESTOS	70	%	[1%]

CHLL-ASBBLK31 10/15/14

Black tar-like coating on concrete stack components

Parameter	Result	Units	[Criteria]
ASBESTOS	15	%	[1%]
ASBESTOS	15	%	[1%]
ASBESTOS	15	%	[1%]

CHLL-ASBBLK29 10/15/2014

Orange with black specs, "Webster" fire brick

CHLL-ASBBLK27 10/15/2014

Grayish brown fibrous insulating material (between brick and metal)

SB-11 10/11/11

Depth	Parameter	Result		Units	[Criteria]
0-1.33	ARSENIC	27.1	J-	mg/kg	[10]

CHLL-SB52 06/11/14

Depth	Parameter	Result	Units	[Criteria]
0-0.5	ARSENIC	120	mg/kg	[10,17]
0-0.5	COPPER	26000	mg/kg	[10]
0-0.5	LEAD	1700	mg/kg	[10,17]

SS-18 10/11/11

Depth	Parameter	Result	Units	[Criteria]
0-0.5	ARSENIC	1220	mg/kg	[9,10,16,17]
0-0.5	COPPER	26900 J	mg/kg	[10]
0-0.5	CYANIDE	1.9	mg/kg	[2]
0-0.5	PHENANTHRENE	4400	ug/kg	[2]

CHLL-ASBBLK25 10/14/2014

Tan/Brown, Corrugated paper, Found in multiple debris piles, Damaged.

CHLL-WP02 10/15/14

Depth	Parameter	Result	Units	[Criteria]
0-0.5	ARSENIC	92	mg/kg	[10,17]
0-0.5	COPPER	25000	mg/kg	[10]
0-0.5	CYANIDE	0.33	mg/kg	[2]
0-0.5	LEAD	1100	mg/kg	[10,17]

CHLL-ASBBLK05 07/31/14

Whitish gray transite in debris pile

Parameter	Result	Units	[Criteria]
ASBESTOS	15	%	[1%]

MineralB-6 09/07/07

Depth	Parameter	Result	Units	[Criteria]
0-0	ARSENIC	230	mg/kg	[10,17]
0-0	COPPER	44000	mg/kg	[10]
0-0	LEAD	1900	mg/kg	[10,17]

CHLL-ASBBLK04 7/31/2014

White cementitous material (possible pipe insulation) in debris pile

CHLL-WP03 10/15/14

Depth	Parameter	Result		Units	[Criteria]
0-0.5	ARSENIC	100		mg/kg	[10,17]
0-0.5	COPPER	22000		mg/kg	[10]
0-0.5	LEAD	2200		mg/kg	[10,17]
0-0.5	TOTAL PCBS	1570	J	ug/kg	[10,17]
0-0.5	FLUORANTHENE	8200		ug/kg	[2]
0-0.5	PHENANTHRENE	3100		ug/kg	[2]
0-0.5	1,2,4-TRIMETHYLBENZENE	610	J	ug/kg	[2]
0-0.5	BENZENE	240	J	ug/kg	[4,11]
0-0.5	NAPHTHALENE (VOC)	1500	J	ug/kg	[2]
0-0.5	XYLENE - TOTAL	2770	J	ug/kg	[2]

SB-14 10/11/11

Depth	Parameter	Result		Units	[Criteria]
0-1.17	ARSENIC	41.5	J	mg/kg	[10,17]
0-1.17	CYANIDE	0.15	J	mg/kg	[2]

MineralB-11 09/07/07

Depth	Parameter	Result	Units	[Criteria]
0-0	ARSENIC	52	mg/kg	[10,17]

CHLL-SB80 08/20/14

Depth	Parameter	Result	Units	[Criteria]
0-0.5	ARSENIC	45	mg/kg	[10,17]
0-0.5	ARSENIC (DUP)	37	mg/kg	[10]

CHLL-ASBBLK26 10/15/14

Grayish white, Transite, Found in multiple debris piles, Damaged

Parameter	Result	Units	[Criteria]
ASBESTOS	20	%	[1%]
ASBESTOS	20	%	[1%]
ASBESTOS	20	%	[1%]

CHLL-WP01 10/15/14

Depth	Parameter	Result		Units	[Criteria]
0-0.5	ARSENIC	77		mg/kg	[10,17]
0-0.5	LEAD	1800		mg/kg	[10,17]
0-0.5	TOTAL PCBS	72200	J	ug/kg	[10,17]

SB-12 10/11/11

Depth	Parameter	Result		Units	[Criteria]
0.5-1	ARSENIC	8.6	J-	mg/kg	[10]
0.5-1	CYANIDE	0.13	J	mg/kg	[2]

CHLL-ASBBLK34 10/15/2014

Yellowish orange, Molded block block material, Labeled "Duro 8759-15" Cone, rectangular, and cylinder shaped, Damaged

CHLL-RPM-04
CHLL-SB107
CHLL-SB108
CHLL-SB75
CHLL-SB79
CHLL-SB76
CHLL-GW37
CHLL-SB77
MW-10
MW-11
CHLL-SB81
CHLL-SB78
CHLL-SB82
CHLL-GW40
CHLL-SB165
CHLL-SB166

MDEQ Part 201 Cleanup Criteria for Response Action
1=Statewide Default Background Level
2*=Groundwater Surface Water Interface Protection Criteria
3=Soil Saturation Concentration Screening Levels
4*=Residential Drinking Water Protection Criteria
5=Residential Soil Volatilization to Indoor Air Inhalation Criteria (VSIC)
6=Residential Infinite Source Volatile Soil Inhalation Criteria
7=Residential Finite VSIC for 5 Meter Source Thickness
8=Residential Finite VSIC for 2 Meter Source Thickness
9=Residential Particulate Soil Inhalation Criteria
10=Residential Direct Contact Criteria
11*=Nonresidential Drinking Water Protection Criteria
12=Nonresidential Soil Volatilization to Indoor Air Inhalation
13=Nonresidential Infinite Source Volatile Soil Inhalation Criteria
14=Nonresidential Finite VSIC for 5 Meter Source Thickness
15=Nonresidential Finite VSIC for 2 Meter Source Thickness
16=Nonresidential Particulate Soil Inhalation Criteria
17=Nonresidential Direct Contact Criteria
18=Hazardous Waste Toxicity Screening Value
* Exceedances of criteria 2, 4, and 11 shown for organics and cyanide only



Sampling Location Type

- Bulk Asbestos
- Soil
- Groundwater
- Residual Process Material
- Waste Pile

- Sampling locations with at least one exceedance**
- Fence
- Property Boundary
- Conceptual Site and Geographic Area Boundaries

Notes:

* Sample locations that have been remediated/removed in 2016 are not shown

** Exceedances of groundwater surface water interface criteria, residential and non-residential drinking water criteria, groundwater surface water interface protection criteria, and residential and non-residential drinking water protection criteria are shown for organics and cyanide only

0 125 Ft

Coordinate System: MIGeoRef(m)

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Figure 3b
Sampling Results Map
Hubbell Processing Area - Mineral Building
Hubbell, Houghton County, Michigan

FILE: C:\temp\Projects\MDEQ0007\GIS\mxds\Planning\20170119-HPA_PreliminaryDesignReport\Draft\Fig3b_SampleResults_HubbellMineralBuilding_v20170124.mxd 11:17:13 AM 1/24/2017 KBrown

Image Source: ESRI World Imagery (NAIP 2014)



XRF206
XRF204
XRF203
XRF207
XRF202
XRF205
XRF199
XRF163
XRF208
XRF200
XRF198
XRF201
XRF164
XRF161
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XRF107
XRF105
XRF151
XRF188
XRF154
XRF142
XRF150
XRF144
XRF141
XRF145
XRF149
XRF146
XRF148
XRF147

Locations Screened for Metals - At least one exceedance of:

- Residential Direct Contact Criteria
- Residential Particulate Soil Inhalation Criteria
- Non Residential Direct Contact Criteria
- Non Residential Particulate Soil Inhalation Criteria

- Screening locations with no exceedances
- Locations are included within a different geographical area boundary
- Fence
- Property Boundary
- Conceptual Site and Geographic Area Boundaries

Xray Fluorescence screening results are from surface soils unless otherwise specified.

N

0 250 Ft

Coordinate System: MIGeoRef(m)

Prepared for:
Michigan Department of Environmental Quality

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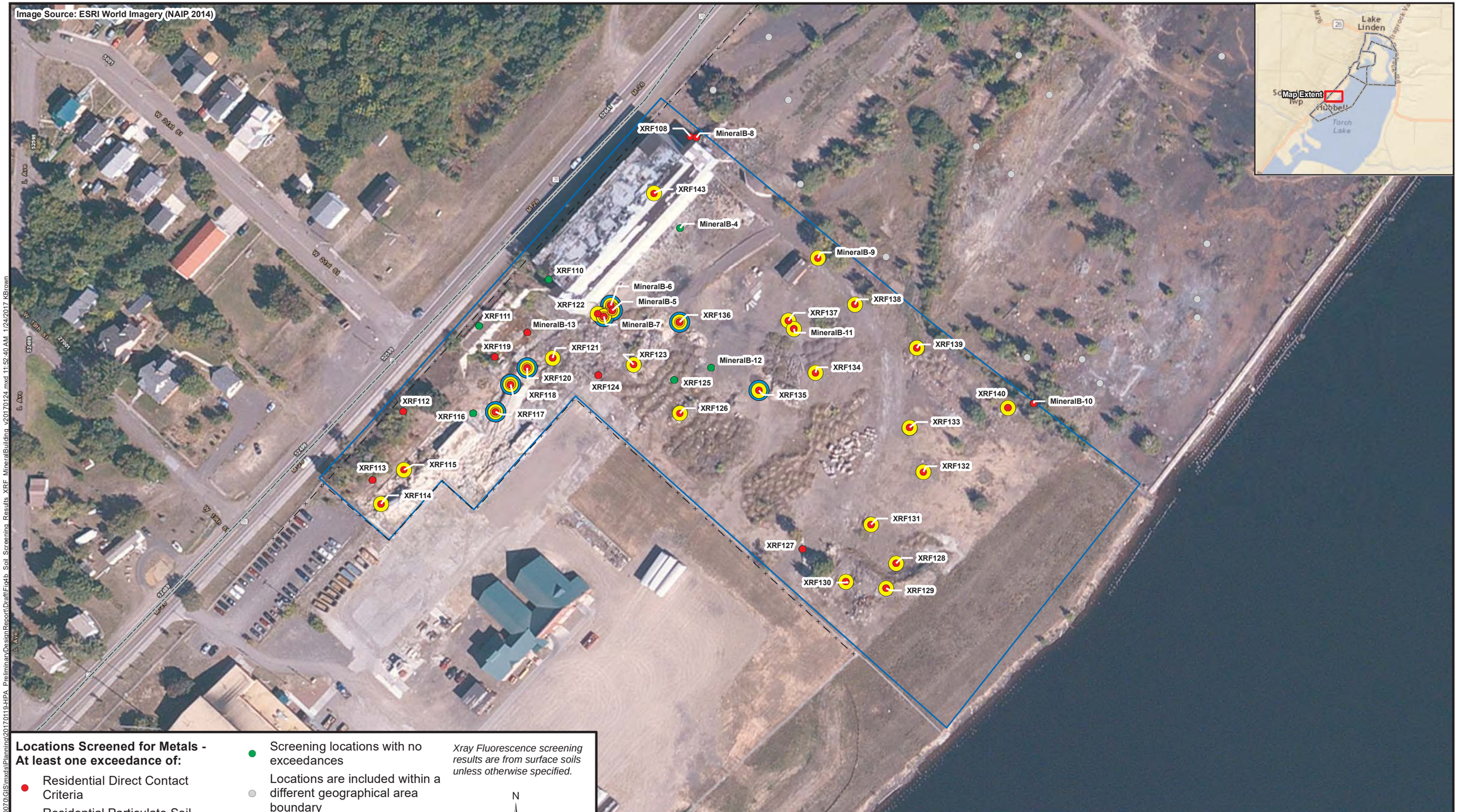
Figure 4a
Soil Screening Results Map - Soil
Hubbell Processing Area - Coal Dock
Hubbell, Houghton County, Michigan

FILE: C:\temp\Projects\MDEQ0070\GIS\mxds\Planning\20170119-HPA_PreliminaryDesignReport\Draft\Fig4a_Soil_Screening_Results_XRF_CoalDock_v20170124.mxd 11:54:57 AM 1/24/2017 KBrown



Locations Screened for Metals - At least one exceedance of:

- Residential Direct Contact Criteria
- Residential Particulate Soil Inhalation Criteria
- Non Residential Direct Contact Criteria
- Non Residential Particulate Soil Inhalation Criteria
- Screening locations with no exceedances
- Locations are included within a different geographical area boundary
- Fence
- Property Boundary
- Conceptual Site and Geographic Area Boundaries

Xray Fluorescence screening results are from surface soils unless otherwise specified.

N

0 125 Ft

Coordinate System: MIGeoRef(m)

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Figure 4b
Soil Screening Results Map - Soil
Hubbell Processing Area - Mineral Building
Hubbell, Houghton County, Michigan

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ATTACHMENT 5

B&B Contracting Respiratory Protection Program

B & B EXCAVATING

RESPIRATORY PROTECTION PROGRAM

MEETING OSHA 1910.134 REQUIREMENTS

Prepared by: Michael R. Tillotson, CIH, CHMM

Table of Contents **Page**

Introduction 1

Responsibilities 2

Respirator Selection 3

Respirator Maintenance 4

Work Area Surveillance 5

Medical Surveillance 5

Program Surveillance and Evaluation 6

Program Administration and Recordkeeping 7

Training 8

Limitations of Respirators 9

Respirator Use 10

APPENDICES

Appendix A - Types of Hazards

Appendix B - Types of Respirators

Appendix C - Fit-Test Record/Procedure

Appendix D - Respirator Inspection, Cleaning, Maintenance and Storage Checklist

Appendix E - Respirator Program Evaluation Checklist

INTRODUCTION

The Occupational Safety and Health Administration (OSHA) requires that air contamination levels be reduced to the lowest feasible level by engineering control and process design. When this is not possible or while such controls are being implemented, appropriate respirators shall be used to protect employees. To comply with the OSHA Standard, B&B Excavating, Inc. will provide adequate respiratory protection, as required. B&B Excavating Inc. has established a written program to define and monitor the use of respiratory protection equipment.

This Respiratory Protection Program is written to ensure compliance with 29 CFR 1910.134 "Respiratory Protection"; 29 CFR 1910.120 Hazardous Waste Operations; 29 CFR 1926.1101 "Construction Industry Standards"; as well as other applicable OSHA Standards.

I. RESPONSIBILITIES

A. Respiratory Protection Program Coordinator/General Manager - Hans Haapala

1. The General Manager is designated as the administrator of and is responsible for coordinating the Respiratory Protection Program.

2. The Program Administration and Recordkeeping section outlines the administrator's recordkeeping responsibilities.

3. The General Manager will be responsible for conducting initial and annual training.

4. Responsibilities for training records are outlined in the Program Administration and Recordkeeping section.

5. The General Manager shall select the appropriate air sampling method for a contaminant of concern.

6. The General Manager will schedule initial and annual medical evaluations where job assignment requires/may require the use of respiratory protection.

7. Recordkeeping responsibilities are outlined in the Program Administration and Recordkeeping section.

8. The General Manager is responsible to conduct and document random inspections to determine proper respirator selection, use and condition.

9. He shall conduct the initial respirator qualitative fit-test for wearing a full-face respirator.

10. Recordkeeping requirements are outlined in the Program Administration and Recordkeeping Section.

11. The General Manager shall order and maintain an adequate supply of respirators, filters, cartridges and replacement parts.

12. The General Manager is responsible for repairs other than routine part replacement (e.g. valves, headstraps, etc.).

13. The General Manager shall return a respirator to the supplier for those repairs specified by the manufacturer.

14. Recordkeeping requirements are outlined in the Program Administration and Recordkeeping section.

B. Employee

1. Employees of B&B Excavating shall comply with all requirements of this program and support the General Manager.

II. RESPIRATOR SELECTION

A. Overview

1. Respirators will be selected on the basis of the hazard(s) (Appendix A).
2. The following selection considerations will help determine the correct respirator for the particular hazard(s).
3. The NIOSH decision logic document can be utilized to select the appropriate respirator.

B. Respirator Selection Decision Logic

1. Is the contaminant a gas, vapor, mist, dust or fume?
2. What is the permissible exposure limit (PEL), threshold limit value (TLV) and short-term exposure limit (STEL)?
3. What is the estimated contaminant concentration where the respirator will be used, as determined by representative air sampling?
4. Can the contaminant concentration(s) be determined immediately dangerous to life and health (IDLH)?
5. If the contaminant is flammable, is the estimated concentration near the lower explosive limit (LEL) or if the contaminant is a dust, will the concentration create an explosion hazard?
6. Does the contaminant have adequate warning properties?
   a. Cartridges shall be changed when the wearer smells the contaminant or is irritated by it.
   b. Adequate warning properties mean that odor perception or irritation occurs at less than 3 times the PEL without causing serious or irreversible health effects.
   c. If there is evidence that vapor breakthrough occurs in less than 3 minutes at or below IDLH concentrations, air purifying respirators shall not be allowed.
7. Does the contaminant cause eye irritation at the estimated concentration?
8. Can the contaminant be absorbed through the skin adding to employee exposure?
9. Has the operation and/or process characteristics been reviewed?
   a. Work area characteristics?
   b. Materials, including raw materials, end products and by-products?
   c. Worker activities?
   d. Existing controls adequacy?
10. How long will the respirator be worn?
11. What are the wearer's activities and locations in the hazardous area? (for example, is the wearer in the hazardous area continuously or intermittently during the work shift and is the work rate is light, medium or heavy?)
12. What are the physical characteristics, functional capabilities and performance limitations of the respirator. (for example, respirators for oxygen deficient atmospheres, IDLH atmospheres, non-IDLH atmospheres)
13. Are respirators available which will give the necessary protection?
14. Has the wearer been fit tested for the particular respirator selected?

C. Respirator Assignment

1. Respirators will be assigned on an individual basis, as needed..
2. The date of respirator issuance shall be recorded by the General Manager.

D. Selection of Respirators for Routine Use

1. When selecting a respirator which will have daily or frequent use, the following areas shall be considered:
   a. cost
   b. maintenance level
   c. level of wearer discomfort
   d. breathing resistance
   e. weight and compactness of construction.

E. Selection of Respirators for Emergency Use

1. B&B Excavating will not participate in emergency use situations. Evacuation of the work area shall occur.

F. Approved Equipment

1. The respiratory protection equipment supplied shall meet the standards set by NIOSH.
   a. North 76008 dual filter/cartridges, full-face, negative pressure respirator.
2. If the employee cannot be fit tested for the above respirator, an appropriate respirator will be provided.

III. RESPIRATOR MAINTENANCE

A. A program for respirator maintenance shall include the following:

1. cleaning
2. inspection
3. repair
4. storage

B. Respirator Cleaning

1. The following cleaning procedures shall be followed.
   a. The respirator shall be thoroughly cleaned with soap and water, rinsed after each use, and air dried and inspected for defects.
   b. The respirator shall be thoroughly cleaned with soap and water, rinsed, air dried, and inspected at the end of the day.

C. Respirator Inspection

1. Respirators shall be inspected routinely before and after each use, and immediately prior to each use to ensure it is in proper working condition.
2. The respirator shall be inspected to determine if it needs part replacement or repair, or if it should be discarded.
3. Inspection Frequency
   a. Routinely used respirators - before and after each use.

D. Procedures for Inspection

1. Air Purifying Respirators
   a. Examine the facepiece for:
      (i) excessive dirt
      (ii) cracks, tears, holes, or physical distortion
      (iii) inflexibility of the facepiece sealing surface
      (iv) cracked or scratched lenses
      (v) incorrectly mounted and/or broken or missing clips
      (vi) cracked or broken element holders, worn threads, or missing gaskets

   b. Examine the exhalation valve after removing the cover for:
      (i) foreign material such as dust, dirt, hair
      (ii) cracks, tears, or distortion of the valve material
      (iii) improper seating of the valve body in the facepiece
      (iv) cracks, breaks, and/or chips in the valve body, particularly in the sealing surface
      (v) missing or defective valve covers
      (vi) improper installation of the valve in the valve body

   c. Examine the head straps or head harness for:
      (i) breaks and/or loss of elasticity
      (ii) broken or malfunctioning buckles and attachments
      (iii) excessive wear on the serrations of the head straps

   d. Examine the air-purifying element for:
      (i) incorrect filter for the hazard
      (ii) incorrect installation, loose connections, missing or worn gaskets or cross threading
      (iii) expired shelf life on the cartridge
      (iv) cracks or dents in the outside case of the filter
      (v) absence of sealing material over the inlet

E. Defects Found During Inspection Procedures

1. If minor, repair and/or adjustment may be made immediately.
2. If major, the device shall be removed from service until repair and reinspection is done by qualified personnel.
3. In either case, contact the supplier for parts and/or replacement respirators.

F. Respirator Repair

1. Routine part replacement or repair (e.g. valves, headstraps) of devices shall be done with parts designed for the device.
   a. Warning: Substitution of parts from a different brand or type of respirator invalidates the NIOSH approval of the device.
2. Other than routine part replacement/repair (e.g. motor problems, switch, etc) shall be done by the supplier.
3. An adequate supply of spare (replacement) parts shall be maintained.

G. Respirator Storage

1. Respirators shall be stored in a manner to protect from:
   a. dust
   b. sunlight
   c. temperature extremes (heat, extreme cold)
   d. excessive moisture
   e. damaging chemicals
   f. mechanical damage
2. Cleaned respirators shall be stored in a clean, reusable plastic bag.
3. Respirators shall be stored in a single layer with the facepiece and exhalation valve in an undistorted position.
4. Respirators shall not be stored in an area where high concentrations of contaminants could occur.

IV. WORK AREA SURVEILLANCE

Work area monitoring of the respiratory hazard shall be conducted periodically.

V. MEDICAL SURVEILLANCE

A. If a job assignment requires the use of a respirator, the person must be able to perform under such conditions.

B. A written opinion from the examining physician must be obtained before job assignment.

1. The General Manager shall document the date of the written opinion and ensure placement of the documentation in the file.

C. Once it has been determined that the person is physically able to wear a respirator and perform the job assignment, an annual physical will be scheduled.

D. Initial and annual physicals and related health monitoring shall be provided by licensed clinics or other health care facilities.

1. A physician with knowledge of pulmonary disease and respiratory protection practices shall make the evaluation as to whether or not the person is medically capable of wearing a respirator.

E. A copy of the physician's written opinion shall be given to the person within 30 days of receipt by B&B Excavating.

VI. PROGRAM SURVEILLANCE AND EVALUATION

A. An annual evaluation of respiratory protection program effectiveness will be conducted by the Respiratory Protection Program Administrator to ensure adequate protection is being provided. Written operating procedures shall be modified to reflect the results of the evaluation, if necessary.

B. The following areas shall be reviewed during the program evaluation:

1. Surveillance of work area conditions exposures.
2. Wearer acceptance of the provided respirators.
3. Initial and annual medical surveillance.
4. Respirator Program operation details;
   a. respirator selection
   b. training
   c. correct respirators issued and used
   d. respirators worn properly and in good operating condition
   e. respirators inspected, maintained and stored properly
5. Results of the evaluation will be detailed in a written report that list the deficiencies, the methods of correction and compliance times.

VII. PROGRAM ADMINISTRATION AND RECORDKEEPING

A. The Respirator Program Administrator is directly responsible for the following program elements:

1. Review records and follow-up if necessary.
2. Assuring the Respiratory Protection Program is in compliance with OSHA/MIDLARA standards
3. Obtaining appropriate records to conduct the annual review and revision (if necessary) of the Respiratory Protection Program
4. Maintaining medical surveillance data, written opinions, and resulting job placement.
5. Conducting initial and annual training
6. Maintenance of the following records:
   a. training
   b. respirator issuance
   c. emergency equipment inspection and maintenance data
   d. respirator fit-test records.
7. Surveillance of work area conditions and resulting air sampling data
8. Documenting respirator issuance
9. Coordinating equipment purchasing, maintenance, cleaning, storage
10. Administer the initial/annual fit test and record the results.

VIII. TRAINING

A. Proper use of respirators can be ensured by training in the selection, use and maintenance of respirators. Training shall include:

1. Opportunity to handle the respirator.
   a. instruction, training and actual use of respirators
2. Proper fit-test procedures:
   a. including demonstrations and practice in wearing, adjusting and determining the fit of the respirator
   b. testing the face to facepiece seal
   c. familiarization of the fit and feel in normal air
   d. wearing the respirator in a test atmosphere

3. Respirator selection procedures:

   a. for situations known to require respiratory protection, an explanation of why a particular type of respirator has been selected.
   b. selection and use procedures for protection against the hazard(s) of the work place which require respiratory protection.
   c. instruction about the nature and extent of the hazard(s) which might be encountered and the effects if the respirator is not used or is used improperly.
   d. explanation of why a particular respirator is used for a particular hazard.
   e. a discussion of protection factors and maximum use concentrations.

4. Discussion of the engineering and administrative controls in place and why respirators may be needed.

   a. Explanation of why engineering controls are not feasible in a given situation (if applicable).

5. Emergency procedures:

   a. discussion of how to recognize and handle emergencies.
   b. classroom training in recognizing and reacting to emergencies.

6. The structure and operation of the respiratory protection program, with understanding of individual participant responsibilities.

7. A discussion of the legal requirements pertinent to the use of respirators.

8. An explanation of the respirator limitations and capabilities.

9. Any other training required.

IX. LIMITATIONS OF RESPIRATORS

A. General Limitations

1. Respirators shall not be worn when facial hair in the form of beards, stubble, mustaches or sideburns if the hair comes between the sealing surface of the respirator and the face.
2. Eyeglass temple bars or straps interfere with the face to facepiece seal of a full facepiece respirator.
   a. Since an effective seal cannot be obtained under these conditions, a full facepiece respirator shall not be worn.
   b. Short temple bars taped to the person's head or permanently mounted corrective lenses shall be used and installed by a qualified person.
   c. If eyeglasses interfere with the proper use of a disposable or half-mask respirator, a full facepiece respirator with the above modifications shall be used.
3. Facial deformities may preclude the wearing of a respirator if an adequate face seal cannot be obtained.
4. Medical examinations determine if an individual is physically able to wear respiratory protective devices during on site work conditions.
5. Respirator use in temperature extremes may cause fogging of the full facepiece lens and mechanical problems may develop.
   a. These problems should be attended to and any potential problems should be addressed.
6. Voice communications may need to be installed in the respirator.
   a. If alteration is necessary, the manufacturer must be contacted to determine if the NIOSH approval will be voided.
7. All respirators must be approved by NIOSH.
8. Components of respirators shall not be interchanged with parts of another brand of respirator.

B. Limitations of Properly Fitted and Qualitatively Tested Full Facepiece Particulate Filter Respirators

1. Protection is provided against permissible exposure levels for organic vapors, asbestos containing dusts and nuisance dusts.
2. High efficiency filters must be used when exposed toasbestos containing dusts.
3. Shall not be used in IDLH or in oxygen deficient atmospheres.
4. If gases and/or vapors are also present, a combination particulate-gas/vapor cartridge shall be used.

X. RESPIRATOR USE

A. Persons who require/may require respiratory protection shall be trained in the respirator selection decision logic so they may choose the appropriate respirator for a particular situation.

B. Respirator Issue

1. Dispense the proper respirator and replacement parts documenting:
   a. the type of respirator issued
   b. replacement parts issued
   c. date of issuance
   d. the name and social security number.

2. Respirators shall be assigned to the individual for their exclusive use.

C. Supervision of Respirator Use

1. The Program Coordinator will conduct and document random inspections of respirator selection, use and maintenance records. Any problems discovered must be documented and corrected.
2. Inspection shall include:
   a. determine if proper respirators are being worn.
   b. determine if respirators are worn properly.
   c. consult with user regarding:
      (i) confidence in the respirator
      (ii) discomfort
      (iii) breathing resistance
      (iv) vision problems
      (v) fatigue
      (vi) communication problems
      (vii) movement restrictions
      (viii)job performance hindrances
3. Personal requirements:
   a. Use the respirator as instructed
   b. Prevent damage to the respirator
   c. If the respirator fails to provide protection, go immediately to the nearest area of respirable air.
   d. Report respirator malfunction to the General Manager.

D. Dangerous Atmospheres

1. B&B Excavating will not participate in any dangerous/IDLH atmospheric potential.

APPENDIX A

Types of Hazards - Potential Exposure

Gases or Vapors

Inert - Gases or vapors that do not react with other substances under most conditions; simple asphyxiants (methane).

Acidic - Gases or vapors that react with water to provide an acid. They taste sour and corrode tissue, especially mucous membranes. (hydrogen chloride, hydrogen cyanide)

Alkaline - Gases or vapors that react with water to produce an alkali. They taste bitter and corrode tissue, especially mucous membranes. (ammonia, chlorine)

Organic - Compounds of carbon. (aliphatic, aromatic chlorinated solvents, alcohols)

Particulate

Dust - Solid, mechanically produced particles varying in size from submicron to visible.

Mist - Suspended liquid droplets generated by condensation or splashing, atomizing or foaming of a liquid. Size ranges from submicron to visible.

Smoke - Products of incomplete combustion composed of liquid and solid particles. Size is usually less than one micron.

APPENDIX B

Types of Respirators

Air Purifying - Particulate Filter

Provides protection against airborne particulate matter, including dust, mist, fume, smoke or combinations of these. May be specific for a certain type of material.

- Disposable: Completely covers the mouth and nose. Disposed of after use, if resistance becomes excessive, or if unit is damaged.
- Half-Face Facepiece: Covers the face from the bridge of the nose to under the chin.
- Full Facepiece: Covers the face from hairline to under the chin. Provides the best seal and protection.

Air Purifying - Chemical Cartridge

Provides protection against gases or vapors. May be specific for a certain type of material.

- Disposable: Completely covers the mouth and nose. Disposed of after use; if resistance becomes excessive; or if unit is damaged.
- Half-Face Facepiece: Covers the face from the bridge of the nose to under the chin. Provides protection from gases and/or vapors depending on the cartridge/canister used. May also incorporate particulate filter for protection against particulate matter.
- Full-Face Facepiece: Covers the face from hairline to under the chin. Provides the best seal and protection from gases and or vapors depending on the cartridge/canister being used. May also incorporate particulate filter for protection against particulate matter.

APPENDIX C

RESPIRATOR FIT TESTING PROCEDURE

TEOC

Tillotson Environmental Occupational Consulting

101 W. Cass Suite C
St. Johns, MI 48879
(989) 227-2000
Fax (989) 227-2005

TEOC QUALITATIVE FIT TEST RECORD & PROCEDURE

NAME _____

SOCIAL SECURITY NO. _____ DATE _____

EMPLOYER _____

ADDRESS _____

CITY _____ STATE _____ ZIP CODE _____

RESPIRATOR(S) NAME AND MODEL NUMBER _____

_____

_____

1. Physician's Written Opinion Approval for respirator use? YES_____(No approval - no fit test!)
2. Have you had any respiratory problems in the last week? YES _____ NO _____

   If so, specify _____

   _____
3. Testing agent used _____
4. Testee sensitive? PRE: YES ___ NO ___ POST: YES ___ NO ___
5. Positive - Negative fit check OK? YES ___ NO ___
6. Qualitative fit test performed as per procedure and passed? YES ___ NO ___
7. Remarks of testor: _____

   _____

Testor: _____

Approved respirator(s) for above testee:

1. _____
2. _____
3. _____

(SEE REVERSE SIDE FOR TEST PROCEDURE TO BE USED FOR IRRITANT SMOKE)

IRRITANT FUME TEST FOR AIR PURIFYING NEGATIVE PRESSURE RESPIRATORS

(Summary of 29 CFR 1910.134 Appendix A - Part 1;B;5 - Irritant Smoke Protocol)

1. Test requires the use of an air purifying, HEPA filtered respirator or P100 series filter, as a minimum.

2. Person must be able to detect a weak concentration of irritant smoke. If they are not sensitive, irritant smoke cannot be used. Use minimum amount to determine sensitivity! Adequate ventilation in area must be provided.

3. No facial hair or other interferences with the facepiece to face seal are allowed.

4. Don the respirator without assistance, perform required user seal checks. If seal is not good, readjust and retest.

5. Only stannic chloride smoke tubes shall be used for this protocol.

6. Protect eyes to prevent eye irritation during test. DO NOT USE AN ENCLOSURE!!

7. Start the test at about 12" away from the respirator and work towards the respirator. Move to within 6" of the perimeter of the mask and smoke test all edges of the sealing edge. Test the exhalation valve and where the filters screw into the facepiece also.

8. If detection of the smoke occurs at any time during the test STOP THE TEST--ADJUST THE RESPIRATOR--RESUME TESTING. If detection continues to occur, respirator may not be suitable for the person--try another.

9. Activities to be done during the test(one minute each):

   A. Normal breathing;
   B. Deep breathing;
   C. Turning head side to side;
   D. Moving head up and down;
   E. Talking - have person repeat the following Rainbow Passage:

   " When sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to a legend, a boiling pot of gold at one end. People look, but none ever find it. When a man looks for something beyond reach, his friends say he is looking for a pot of gold at the end of the rainbow."

   F. Bending over.(Jogging to be used if in a shroud test device)
   G. Normal breathing.

10. If testing is satisfactory - have person take respirator off and give second sensitivity check.

11. If satisfactory fit cannot be achieved - person must use a different respirator.

12. Person must be retested every year or must be retested when any change in employee's physical condition might affect respirator fit. Such conditions include, but are not limited to:

    A. An obvious change in body weight;
    B. Facial scarring or cosmetic surgery of the face occurs;
    C. Dental changes occur;
    D. Any condition that interferes with the facepiece to face seal of the respirator.

13. Document the test results on the front of this form.

APPENDIX D

RESPIRATOR INSPECTION, CLEANING, MAINTENANCE AND STORAGE CHECKLIST

Inspection

before	after	
___	___	facepiece/if applicable
___	___	exhalation valve(s)
___	___	head straps/harness
___	___	air purifying filter/cartridge
___	___	inhalation valve(s)
___	___	facepiece fit check

Cleaning/Disinfection

___ disassembly done
___ cleaning- 120°F-soap and water
___ rinsing - 120°F-water only
___ rinse and dry 120°F water only; air dry preferred

Reassembly

___ reassembled properly
___ reinspected-new filters/cartridges

Maintenance Done
Explain: _____

Storage

_____ Sealed in ziplock bag
_____ Isolated from environment and contamination
_____ clean, dry area

APPENDIX E

RESPIRATOR PROGRAM EVALUATION CHECKLIST

The Respirator Protection Program shall be evaluated by the Respiratory Protection Program Coordinator at least annually, with program adjustments ,as appropriate, made to reflect the evaluation results. Program function can be separated into administration and operation.

WRITTEN RESPIRATORY PROTECTION PROGRAM EVALUATION

The Respiratory Protection Program must be evaluated at least annually by the Program Administrator with program adjustments, as appropriate, made to reflect the evaluation results. Program function can be separated into administration and operation.

A. Program Administration

_____ 1. Is there a written policy which acknowledges employers' responsibility for providing a safe and healthful workplace and assigns program responsibility, accountability, and authority?

_____ 2. Is program responsibility vested in one individual who is knowledgeable and who can coordinate all aspects of the program at the job site?

_____ 3. Can feasible engineering controls or work practices eliminate need for respirators?

4. Are there written procedures/statements covering the various aspects of the respirator program, including:

_____ Designation of an program administrator;
_____ Respirator selection and use;
_____ Purchase of NIOSH only approved respirators;
_____ Medical evaluation program acceptable;
_____ Issuance of respirators to approved personnel;
_____ Fit testing program;
_____ Training program;
_____ Cleaning, disinfecting, maintenance, storing, inspection. discarding, and repair;
_____ Emergency situations;
_____ Worksite surveillance?

B. Program Operation

1. Respiratory protective equipment selection and assignment:

_____ Are worksite conditions and employee exposures properly surveyed?
_____ Are respirators selected on the basis of hazards to which the employee is exposed?
_____ Are selections made by individuals knowledgeable of proper selection procedures?
_____ Are only NIOSH approved respirators purchased and used? Do they provide adequate protection for the specific hazard and concentration of the contaminant?
_____ Has a medical evaluation of the prospective user been made to determine physical and psychological abilities to wear the selected respiratory protective equipment?
_____ Where practical, have respirators been issued to the users for their exclusive use, and are there records covering issuance?

2. Respirator fitting:

_____ Are the users given the opportunity to try on several respirators to determine whether the respirator they will subsequently be wearing is the best fitting one?
_____ Is the fit test done annually?
_____ Are those users who require corrective lenses properly fitted?
_____ Are contact lenses used?
_____ Is a user seal check and fit test done properly?
_____ Are workers prohibited from entering contaminated regulated areas when they have facial hair or other characteristics which prohibit the use of tight-fitting facepieces?

3. Respirator use:

_____ Are respirators being worn correctly (i.e., head coverings over respirator straps)?
_____ Are workers keeping respirators on all the time when necessary?

4. Maintenance of respiratory protective equipment:

A. Cleaning and Disinfecting:

_____ If needed, are respirators cleaned and disinfected after each use?
_____ Are proper methods of cleaning and disinfecting utilized?

B. Storage:

_____ Are respirators stored in a manner so as to protect them from dust, sunlight, heat, excessive cold or moisture, or damaging chemicals?
_____ Are respirators stored properly in a storage facility so as to prevent them from deforming?
_____ Is storage in lockers and tool boxes permitted only if the respirator is in a carrying case or carton?

C. Inspection:

_____ Are respirators inspected before and after each use and during cleaning?
_____ Are qualified individuals/users instructed in inspection techniques?
_____ Is respiratory protective equipment designated as "emergency use" inspected at least monthly (checked for proper function before and after each use)?
_____ Is a record kept of the inspection of "emergency use"?

D. Repair:

_____ Are replacement parts used in repair those of the manufacturer of the respirator?

5. Special use/Emergency conditions:

_____ Is a procedure developed for respiratory protective equipment usage in atmospheres immediately dangerous to life or health?
_____ Is a procedure developed for equipment usage for entry into confined spaces?
_____ Atmosphere supplying respirators procedures, air quality acceptable?

6. Training:

_____ Hazards during use and emergencies discussed?
_____ Are limitations of respirators discussed?
_____ Are users trained in proper respirator use, donning, doffing, cleaning, discard and inspection?
_____ Are users trained in the selection of respirators?
_____ Are users evaluated, using competency-based evaluation, before and after training?

ATTACHMENT 6

Air Monitoring Plan

An Equal Opportunity Employer
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913
Office: (906)337-0017
Fax: (906)934-2587

AIR MONITORING PLAN

PREPARED FOR:

PROJECT:

HUBBELL PROCESSING AREA REMEDIATION
FILE NO. 761/16108.SAR INDEX NO. 44521
TORCH LAKE NON-SUPERFUND SITE

LOCATION:

52634 STATE HWY M-26
HUBBELL, MI

OWNER:

STATE OF MICHIGAN, DEPARTMENT OF TECHNOLOGY, MANAGEMENT & BUDGET
DEPARTMENT OF ENVIRONMENTAL QUALITY

PROFESSIONAL:

THE MANNIK & SMITH GROUP, INC.

BY:

B&B CONTRACTING, CALUMET, INC.

AIR MONITORING FIRM:

U.P. ENGINEERS & ARCHITECTS, INC.

DATED:

JUNE 13, 2017

This plan was prepared using the project Contract Documents owned by the State and prepared by the Professional.

Table of Contents

1.0 INTRODUCTION 3
2.0 POSSIBLE AIRBORNE CONTAMINANTS 3
3.0 METHODS OF AIR MONITORING 3
DUST 3
ASBESTOS 4
4.0 ACTION LEVELS AND CONTROLS 4
DUST 4
ASBESTOS 4
5.0 REPORTING 5

1.0 INTRODUCTION

This Air Monitoring Plan is developed to provide site-specific procedures for monitoring and reporting of possible airborne contaminants before, during and following the completion of the Hubbell Processing Area Remediation. This remediation includes ditching and grading of asbestos contaminated soil.

The purpose of this air monitoring is to document airborne exposures to on site personnel and the surrounding public community. This monitoring will also provide early warning of potential exposures in order to implement additional engineering control for exposures.

2.0 POSSIBLE AIRBORNE CONTAMINANTS

Contaminants that are of the main concern to become airborne during ditching and grading are respirable particulate matter(PM10) and asbestos. The following table shows the compounds and their sources, action levels and engineering controls.

Target Compounds	**Source**	**Measurement Method**	**Action Level (1/2 OSHA PEL)**	**Engineering Controls**
Dust (PM10)	Disturbance of site soils	Visual monitoring	Visible dust	Water truck
		Thermo DataRam pDR-1200 aerosol monitor (or equivalent)	2.5 mg/m^3 Downwind value minus upwind value	
Asbestos	Disturbance of site soils	Air sampling (OSHA ID-160 Method)	TWA 0.05 fiber/cc Excursion Level (30 min) 0.5 fiber/cc	Water truck

3.0 METHODS OF AIR MONITORING

Air monitoring will be conducted at the personnel task locations and at six locations along the perimeter fence line. Two permanent monitoring locations will be established, with one being along the south fence line adjacent to the neighboring business (Koppers) and one along the south portion of the west fence line closest to the nearby residence. Four locations will be selected on a daily basis based on wind direction, work location, and nearby receptor(residence) locations. Regardless of the wind direction at least one monitoring location will be placed upwind of the daily work area.

DUST

Visual observation will be used to continuously monitor the active work area for visible emissions of dust. Observations will be logged on an hourly basis.

A Thermo DataRam pDR-1200 (or equivalent) aerosol monitor will be used at each of the two permanent monitoring locations. The monitors will be positioned approximately 5 feet above ground level. The monitors will continuously record dust concentrations and calculate a time weighted average concentration. The concentrations will be visually observed hourly and each day's recorded data will be downloaded, posted and submitted to the Professional daily. Monitoring at the two permanent locations will be collected for at least 3 days prior to active

work beginning on site.

Thermo DataRam pDR-1200 portable aerosol monitor will be used by the monitoring technician at the four daily chosen perimeter locations. While work is active in the exclusion zone, this monitor will be moved every 15 minutes to another location such that each location is sampled at least once per hour while the work area is active.

The monitoring technician shall immediately notify the Site Superintendent and Professional if the action level of 2.5 mg/m^3 is observed.

ASBESTOS

Air samples to measure asbestos fiber concentrations will be collected daily at all six perimeter locations while work is active in the exclusion zone. Air samples will be collected at the two permanent perimeter locations for at least 3 days prior to active work beginning on site.

Air samples will be collected daily by a personal air sampler on one worker involved in each work task. Two work tasks have been identified on this site, the first being an operator of heavy machinery; excavator, dozer or haul truck, the second being a laborer continuously in contact with site soils; picking ACM/RPM, placing silt fence, placing filter fabric, etc. Sampling shall occur for total concentration on a daily basis.

The airflow rate will be verified using a rotameter before and after sampling. The air samples will be analyzed by an accredited technician using Phase Contrast Microscopy. Sampling and analysis will be completed according to OSHA Method ID-160.

Air samples will be analyzed by a certified lab on a 96-hour basis and the results will be posted in the office trailer and submitted to the Professional as received.

4.0 ACTION LEVELS AND CONTROLS

DUST

If visible emissions are present, water spray or mist shall be used for dust suppression.

If the difference in the real-time readings on the aerosol monitors between the upwind and downwind monitors exceed the action level of 2.5 mg/m^3 then all work shall stop until emissions are controlled.

ASBESTOS

If visible emissions are present, water spray or mist shall be used for dust suppression.

If air sampling results show concentrations in excess of the action level of 0.05 fibers/cc then all work shall cease until additional engineering controls can be put in place. *(UPEA does not have this capability)*

5.0 REPORTING

Visual observations for dust and odors will be logged hourly or as observed, along with any responses taken. Daily logs will be posted in the office trailer and submitted to the Professional.

Data logs from the aerosol monitors will be downloaded at the conclusion of each work day and posted in the office trailer the next day and submitted to the Professional.

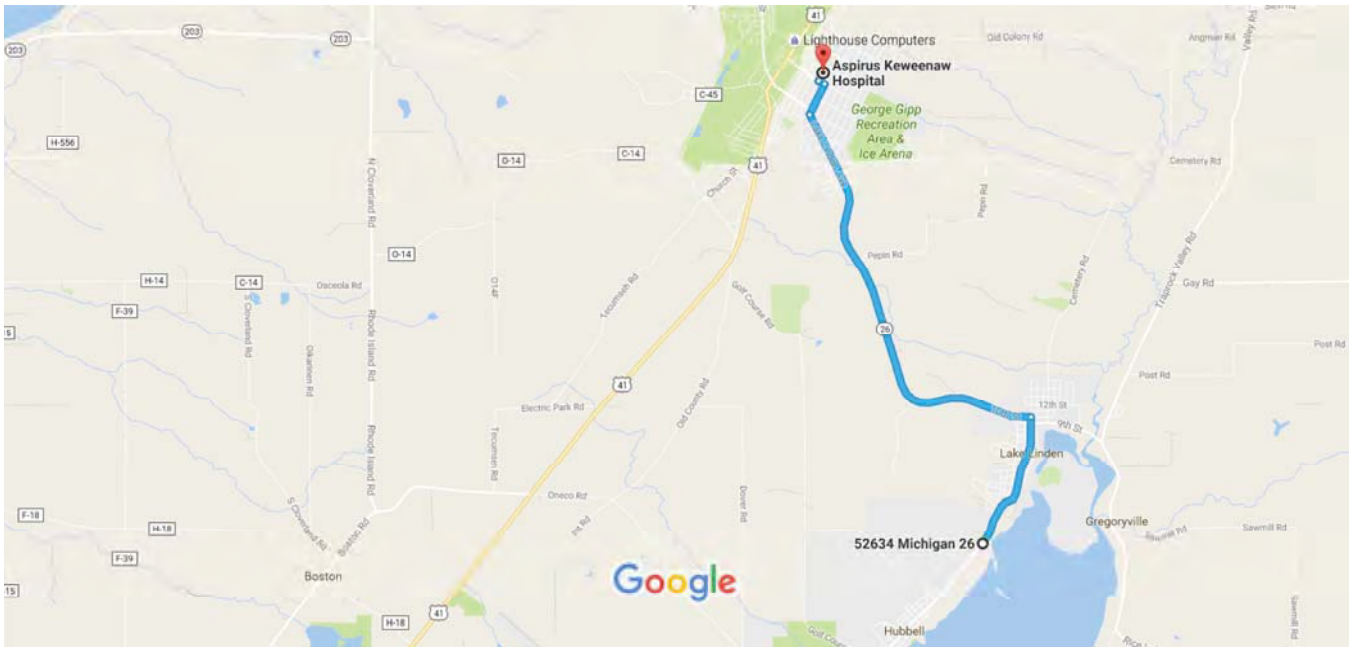
ATTACHMENT 7

Hospital Location Map

Google Maps

52634 Michigan 26, Lake Linden, MI 49945 to Aspirus Keweenaw Hospital

Drive 5.1 miles, 9 min



Map data ©2016 Google 2000 ft

52634 Michigan 26

Lake Linden, MI 49945

1. Head northeast on M-26 N toward W 27th St — 1.1 mi
2. Turn left onto M-26 N/State Hwy 26/10th St — 3.5 mi
   Continue to follow M-26 N/State Hwy 26
3. Turn right onto Hecla St — 0.3 mi
4. Turn left onto 3rd St — 295 ft
5. Turn right at the 1st cross street onto Osceola St — 423 ft

Aspirus Keweenaw Hospital

205 Osceola Street, Laurium, MI 49913

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

ATTACHMENT 8

Site Specific HASP Acceptance Form

SITE NAME: HUBBELL PROCESSING AREA DATE: _____

REVIEW OF AND COMPLIANCE WITH THE SITE-SPECIFIC HEALTH AND SAFETY PLAN

All persons entering this site must sign below that they have read, understand and will agree to comply with all provisions of the site-specific safety and health plan.

NAME (PRINT)	SIGNATURE	SS NO. (last 4)	DATE

200 Michigan Street, Suite 705, Hancock, MI 49930
906-487-7452
www.MannikSmithGroup.com

LETTER OF TRANSMITTAL

To: Mr. Hans Haapala
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913

Project #: MDEQ0070
Date: July 6, 2017

Re: Submittal #009 – Work Plan
MDEQ Torch Lake Non-Superfund Site
Hubbell Processing Area

Enclosed are the following:

No. of Copies	Description
1	Approval as Corrected - Submittal #009

The above items are transmitted as checked below:

☐ For review and approval
☒ For your use
☐ As requested
☐ For review and comment
☐ Approved as submitted
☐ Other:
☐ Returned for corrections
☒ Approved as corrected

Remarks:

The Work Plan is approved as corrected. Comments/edits were added on page 8, page 9, in Sheet C-8 of Appendix A, and in Appendix D of the Adobe .pdf file.

Copies To: MDEQ-RRD, Calumet District Office

File

Signed:

Printed: Jed Chrestensen
Project Engineer

This transmittal is subject to the following conditions to which you agree by accepting these terms on a reply to this message or using the information in any manner, including but not limited to, copying or using the information for reference.

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2. If you discover any errors and/or omissions in the attached information, you will promptly notify us so that we can make any necessary revisions.
3. For any electronic file(s) attached hereto, The Mannik & Smith Group, Inc. is not responsible for any errors caused by the transmission of said files, your software, or your computer systems.

SUBMITTAL# 009

DATE: June 29, 2017

Michigan Department of Environmental Quality
Torch Lake Non-Superfund Site
Hubbell Processing Area
Hubbell, MI
File No.: 761/16108.SAR Index No.44251

TO:
Jed Chrestensen
The Mannik & Smith Group, Inc
200 Michigan Street, Suite 705
Hancock, MI 49930

FROM:
Hans Haapala, Project Manager, 906-281-6908
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913

SUBMITTAL TYPE:

☐ Product Data	☐ Certificates	☐Record Documents	☐ Operation/Maintenance Manuals
☐Shop Drawings	☐Manufacturer's Instructions	☐Samples	☐ Contract Closeout
☐Test Reports	☐Construction Photographs	☒ Administrative	☐Other

SUPPLIER: None

SPECIFICATION NUMBER AND TITLE: 01 33 00 Work Plan

PART	TYPE	DESCRIPTION
1.5.7	Administrative	Work Plan

B&B Contracting, Calumet, Inc. certifies that review, approval verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents.

Signed: _____

Digitally signed by Hans P. Haapala
DN: cn=Hans P. Haapala, o=B&B Contracting, Calumet, Inc., ou=Project Engineer, email=hanshaapala@gmail.com, c=US
Date: 2017.06.29 13:14:59 -04'00'

Date: 6/29/17

APPROVED AS CORRECTED JC 7/6/17

COMMENTS/CORRECTIONS ADDED TO PG 8, PG 9, SHEET C-8 IN APPENDIX A, AND TO BORROW AREA DIMENSIONS IN APPENDIX D.

An Equal Opportunity Employer
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913
Office: 906-337-0017
Fax: 906-934-2587

TRANSMITTAL

DATE:	***FROM:***
June 29, 2017	Hans Haapala (906)281-6908
ATTN:	*JOB NAME:*
Jed Chrestensen, P.E.	Torch Lake Non-Superfund Site Hubbell Processing Area
ADDRESS:	*ATTACHED:*
The Mannik & Smith Group, Inc. 200 Michigan Street, Suite 705 Hancock, MI 49930	Submittal #009 Work Plan
PHONE NUMBER:	
(906)487-7451	
RE:	
Work Plan	

O URGENT **X** FOR REVIEW **O** PLEASE COMMENT **O** PLEASE REPLY **O** PLEASE RECYCLE

Notes/Comments:

Please review the attached submittal.

The following items referenced in the Work Plan will be submitted as received:

- Certified Storm Water Operator Certification for Hans Haapala
- MDOT Right of Way Construction Permit
- Notice of Coverage
- Land Owner Access Agreement for Diversion Ditch– Pat Ziemnick

SUBMITTAL# 009

DATE: June 29, 2017

Michigan Department of Environmental Quality
Torch Lake Non-Superfund Site
Hubbell Processing Area
Hubbell, MI

File No.: 761/16108.SAR Index No.44251

TO:

Jed Chrestensen

The Mannik & Smith Group, Inc

200 Michigan Street, Suite 705

Hancock, MI 49930

FROM:

Hans Haapala, Project Manager, 906-281-6908

B&B Contracting, Calumet, Inc.

55670 Hwy M-26

Calumet, MI 49913

SUBMITTAL TYPE:

☐ Product Data	☐ Certificates	☐Record Documents	☐ Operation/Maintenance Manuals
☐Shop Drawings	☐Manufacturer's Instructions	☐Samples	☐ Contract Closeout
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SUPPLIER: None

SPECIFICATION NUMBER AND TITLE: 01 33 00 Work Plan

PART	TYPE	DESCRIPTION
1.5.7	Administrative	Work Plan

B&B Contracting, Calumet, Inc. certifies that review, approval verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents. Signed: _____ Date: 6/29/17	

An Equal Opportunity Employer
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913
Office: (906)337-0017
Fax: (906)934-2587

WORK PLAN

PREPARED FOR:

PROJECT:

FILE NO. 761/16108.SAR INDEX NO. 44521

TORCH LAKE NON-SUPERFUND SITE
DEPARTMENT OF ENVIRONMENTAL QUALITY
HUBBELL PROCESSING AREA REMEDIATION
HUBBELL, MI

OWNER:

STATE OF MICHIGAN, DEPARTMENT OF TECHNOLOGY, MANAGEMENT & BUDGET

PROFESSIONAL:

THE MANNIK & SMITH GROUP, INC.

BY:

B&B CONTRACTING, CALUMET, INC.

DATED:

JUNE 29, 2017

This plan was prepared using the project Contract Documents owned by the State and prepared by the Professional.

Table of Contents

1.0 SITE BACKGROUND 3

2.0 SITE DESCRIPTION 4

3.0 B&B CONTRACTING, CALUMET, INC. PROJECT ORGANIZATION 6

4.0 PERSONNEL TRAINING 7

5.0 EMERGENCY CONTACTS 7

6.0 SITE PLAN (CONTRACT DRAWINGS WITH EDITS AND ADDITIONS) 7

7.0 RESOURCES AND EQUIPMENT 7

8.0 WORK TASKS 8

8.1. SUBMITTALS 8
8.2. MOBILIZATION 8
8.3. ESTABLISH EXCLUSION ZONE AND DECONTAMINATION ZONE 8
8.4. CONSTRUCT TEMPORARY ACCESS DRIVEWAY AND HAUL ROADS 9
8.5. MULCH TREES AND BRUSH 9
8.6. DEWATER DITCH 9
8.7. IMPROVE DRAINAGE DITCH 9
8.8. GRADE CONTAMINATED SOILS 9
8.9. HAUL OUT PCB CONTAMINATED SOILS 10
8.10. PICK ACM AND RPM 10
8.11. INSTALL CAP 10
8.12. NORTH BOUNDARY ROAD 10
8.13. FERTILIZE, SEED AND MULCH 10
8.14. AS-BUILT SURVEY 10
8.15. REMOVE TEMPORARY ACCESS DRIVEWAY 10
8.16. DEMOBILIZATION 10
8.17. PROJECT CLOSEOUT 11

9.0 PERMITS (APPENDIX D) 11

9.1. MDOT Right of Way 11
9.2. Soil Erosion, Notice of Coverage 11
9.3. NESHAP 11

10.0 BORROW AREA 11

10.1. Borrow Area Haul Road Plan 11
10.2. Borrow Area Restoration Plan 11
10.3. Borrow Area SESC Permit 11

11.0 SOIL EROSION AND SEDIMENTATION PLAN 11

12.0 SPILL CONTROL 11

13.0 CONTAMINATED MATERIAL HANDLING 12

14.0 AIR MONITORING & DUST CONTROL 12

APPENDIX A: SITE PLAN 13

APPENDIX B: AIR MONITORING PLAN 14

APPENDIX C: ACCESS AND TRAFFIC CONTROL PLAN 15

APPENDIX D: BORROW AREA PLAN 16

APPENDIX E: PERMITS 17

1.0SITE BACKGROUND

Copper mining was extensive in the Keweenaw and formed the backbone of the regional economy and society. Copper ore milling and smelting operations were conducted from the mid-1860s to the 1960s, including the importation and reprocessing and smelting of various scrap metals in the later years of operation. Consistent with past industrial practices, Torch Lake served as dumping grounds for virtually all mining industry related waste products produced, including tailings, slag, and various chemicals.

The environmental legacy resulting from over 100 years of mining led to Torch Lake and its western shoreline to be designated as a Superfund site by the United States Environmental Protection Agency (EPA)https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0503034 and a Great Lakes Area of Concern by the U.S./Canada Great Lakes Water Quality Agreement https://www.epa.gov/torch-lake-aoc The EPA undertook cleanup activities to address some of the byproducts of the mining industry while others were not addressed or left to recover through natural processes.

The MDEQ Project is addressing some of the remaining concerns in Houghton County not addressed by the EPA. The Project concerns involve groundwater, surface water, sediments, and "upland" media. Known or suspected problems which are being evaluated include: an unidentified, significant in-lake and/or terrestrial source of PCBs, uncharacterized waste deposits, and >750 uncharacterized drums on the lake bottom, slag, landfills, industrial ruins, coal storage areas, underground storage tanks (USTs), RPM, asbestos containing materials (ACM), and any other waste materials identified in future investigations.

During 2014 and 2015 RRD conducted Site Investigation (SI) activities and confirmed the remaining concerns in the Project area involve groundwater, surface water, sediments, and "upland" media. Priority concerns which were evaluated and deemed to require Interim Responses (IRs) included: significant terrestrial source of PCBs; ACM; RPM; abandoned mining era containers; seeps; limited areas of soil in which there are Direct Contact Criteria (DCC) and Particulate Soil Inhalation Criteria (PSIC) exceedances; and, physical hazards.

The vast distribution of the former mining operations throughout the region (spanning multiple townships, villages and cities in Houghton County along the Portage Canal, Lake Superior, Slaughterhouse Creek, and Torch Lake) required that operational areas of the mining companies be divided into geographic areas. Dividing the regional operations into smaller manageable geographic areas allowed for prioritization of the proposed investigative approach, while also establishing a phased process for assessing environmental concerns regionally.

The Calumet & Hecla Lake Linden Operations Area (CHLL) is centralized around C&H's copper mining and processing operations in the vicinity of Lake Linden and Hubbell, Michigan. The CHLL consists of approximately 155 acres of land extending approximately two miles along the shoreline of Torch Lake and incorporates over 40 different parcels

with multiple property owners. The CHLL was divided into six smaller study areas based on the historical industrial operations in each area, including the following:

- Torch Lake Backwater Area;
- Lake Linden Sands Area;
- Lake Linden Recreation Area;
- Lake Linden Processing Area;
- Hubbell Processing Area; and,
- Hubbell Slag Dump and Beach Area.

The CHLL Hubbell Processing Area is located between Lake Linden and Hubbell along the southeast side of Highway M-26 and is comprised of mining era industrial properties including the Hubbell Coal Dock and Mineral Building that are vacant, and the Hubbell Smelter property which is the location of an operating industrial facility. The Hubbell Processing Area is bordered by residential (single family residences and an apartment complex), commercial (restaurant and retail business), and industrial (sand and gravel pit, construction company, and storage facility) properties, and Torch Lake.

2.0 SITE DESCRIPTION

2.1 The IR for the Hubbell Processing Area is limited to two properties within the Hubbell Processing Area; the Hubbell Coal Dock property and the Mineral Building property. Risks identified by the SI activities include potential threats to human and ecological receptors, including but not limited to human health risks in the event of direct contact with affected media and inhalation of particulates and ACM, runoff of PCB contaminated media into Torch Lake, and physical hazards. The limited scope of this IR allows for a focused and time critical response that mitigates PCB contaminated debris and soils exceeding select MDEQ exposure criteria protective of human health, manages and caps debris and waste piles, and eliminates PCB-impacted soil runoff into Torch Lake.

2.2 The Hubbell Coal Dock is located along the shoreline of Torch Lake, between the stamp mill complex (Lake Linden Processing Area) and the C&H Hubbell smelter complex. "The C&H Coal Dock featured a large coal shed, reportedly measuring approximately 650 ft by 400 ft. C&H maintained a large storage shed to allow coal to be stored over the winter and to protect against uncertainties associated with the coal industry. The coal dock featured massive shovel, boom, and rail systems that allowed for the unloading and storage of the bituminous coal and anthracite being shipped from Pennsylvania and West Virginia" (Kahn, 1898). The coal dock operations featured an electrical substation in the northern portion of the property."

The coal dock property is privately owned and includes roughly 2,000 ft of Torch Lake shoreline. The property is bound to the west by Highway M-26. A chain link fence has been established along the western and northern property boundaries. The property is generally vacant and runoff into the lake has been observed during investigative mobilizations. During the fall of 2016, 66 abandoned drums were removed from the property and disposed. Erosion channels have developed in the south-central portion of the property. A breach in the side of the drainage ditch just south of the southern property boundary was plugged during 2016 to stop the uncontrolled flow of water out of the ditch and across the southern portion of the property, where material was likely historically burned for metals recovery and PCBs have been detected (the Hubbell Coal Dock Burn Area).

2.3 The Mineral Building, located on a separate property, is south of and adjacent to the Hubbell Coal Dock property. The Mineral Building would have received the processed copper ore from the stamp mills located in the Lake Linden Processing Area. The copper ore was sorted and stored in the Mineral Building prior to transfer to the smelter for additional processing. A chain link fence has been established along the western and southern property boundaries. During the fall of 2016, 16 abandoned drums were removed from the property and disposed.

2.4 Historical research conducted by Michigan Technological University (Michigan Tech) concluded that the smelter yard as well as the neighboring mineral building and coal dock facilities were likely used in C&H's secondary copper recovery processes. As excerpted from Michigan Tech's report, C&H launched its "Secondary Metal Department" in 1945 — an indication that reclamation of copper from scrap metal and similar copper-containing wastes had become an important part of the company's operations. The July 1945 issue of *C&H News and Views*, an employee periodical, includes photographs of burning of secondary waste materials, specifically the outer sheathings, insulation, and coatings on copper-rich materials, prior to treating the recovered copper in the smelter. Materials including co-axial telephone cable, armored "Navy cable", and motor parts were common sources of copper, known to contain hydrocarbon-based oils and greases as well as PCBs. In addition to periodical documentation, Michigan Tech interviewed former employees who corroborated these activities, noting that the smelter yard was used as a site for burning copper wire to remove the insulation prior to smelting.

2.5 At a mean elevation of approximately 602 ft Above Mean Sea Level (AMSL) at the shoreline of Torch Lake, the land rises vertically to the west/northwest from the shoreline to an approximate elevation of 630 ft AMSL along Highway M-26.

2.6 The soil and fill encountered at the properties are largely sand, gravel, coal, stamp sand, slag, and burnt debris covering the ground surface. Underlying these near surface soils are native soils described in the Site Inspection Report for C&H Lake Linden Operations, Lake Linden, Michigan, 49945 - June 2014 prepared by the MDEQ-Remediation and Redevelopment Division (RRD), Superfund Section, Pre-remedial Group, Site Evaluation Unit (Pre-remedial Group) as "ground moraine with coarse-textured, reddish brown, sandy loam, glacial till. The deposits vary in composition and thickness and do not appear to be laterally extensive over the CHLL. The deposits range in thickness from approximately 11 to 50 ft below the ground surface (bgs), but have been observed in thicker deposits with interbedded clay, silt, and gravel units. The bedrock geology underlying the glacial deposits in the area is comprised of Jacobsville Sandstone."

2.7 Groundwater was encountered at the properties at varying depths. In the lower plateau along Torch Lake groundwater was encountered between 2-ft and 4.5-ft bgs.

3.0 B&B CONTRACTING, CALUMET, INC. PROJECT ORGANIZATION

NAME	TITLE	RESPONSIBLITIES
Brian Bonen (906)281-2587	Project/Site Superintendent	All onsite direct supervision of safety and work tasks
Hans Haapala (906)281-6908	Project Manager, Site Health and Safety Officer, Certified Storm Water Operator	Development and supervision of safety and work tasks, complete SESC inspections
Wayne Bourdeau (906)231-3170	Operator/Driver	Operator of any onsite equipment, delivery of material
Greg Tchida (906)231-4752	Operator/Driver	Operator of any onsite equipment, delivery of materials
Danny Erkkila	Mechanic/Laborer	Equipment maintenance, labor
Bill Chevalier (906)370-4047	Driver/Laborer	Delivery of materials, labor
Joe Lampinen	Laborer	Labor
Bruce Kesti	Laborer	Labor
Mitchel Large	Laborer	Labor
SUBCONTRACTORS		
NAME AND CONTACT INFO		**RESPONSIBLITIES**
CSG TESTING, INC. Douglas Cooper (906)370-2987 csg.testing@outlook.com		Aggregate and Soil Testing
U.P. ENGINEERS & ARCHITECTS, INC. Bill Griffin (906)250-4942 bgriffin@upea.com		Air Monitoring
U.P ABATEMENT COMPANY INC. Dale Carrier (906)250-6710		Asbestos Abatement Contractor/Supervisor
LECLAIRE SURVEYING SERVICE, LLC Steve LeClaire (906)370-7564 steve@leclairegeoservices.com		Machine Control File As-Built Survey
US ECOLOGY MICHIGAN Robert Beckman (734)634-6776 robert.beckman@usecology.com		Hazardous Soil Transport and Disposal
G&J SITE SOLUTIONS, INC. Geoff Cutsy (906)369-3455 gcutsy@gjsitesolutions.com		Soil Erosion Material Supply Seed, Fertilize, Mulch

4.0 PERSONNEL TRAINING

All workers on site shall be adequately training as described in the Site-Specific Health and Safety Program. This training may include the following:

- Hazardous Waste Operations and Emergency Response(HAZWOPER)
- Asbestos Abatement Worker
- Asbestos Awareness
- Lead Awareness

Certificates of completion of the necessary training for each worker will be submitted prior to working on site.

5.0 EMERGENCY CONTACTS

CALL 911

Emergency and after-hours contact:
BRIAN BONEN, MOBILE PHONE # (906)281-2587

6.0 SITE PLAN (Contract Drawings with edits and additions)

The eight (8) pages found in Appendix A visually describe the work to be completed on-site. The following edits have been made to describe B&B Contracting's Site Plan for:
-Support Zone
-Office trailer and temporary facilities
-Employee and visitor parking
-Equipment parking and material laydown area
-Haul roads, avenues of ingress and egress
-Exclusion area, personnel and equipment decontamination area

7.0 RESOURCES AND EQUIPMENT

The personnel listed in Section 3 are available for the completion of this project.
The following equipment is available for use as needed:

-Trucks
- 2016 Kenworth T-800 tractor with lowboy, lead and pup trailers
- 1996 Kenworth T-800 tractor with lead and pup trailers
- 1996 Peterbilt Quad Dump Truck

-Excavators
- Cat 345B
- Cat 330D
- Cat 315B
- Cat 308
- Cat 303
- John Deere 790DLC

-Wheel Loaders
- Komatsu WA480-5L
- John Deere 644G
- Michigan L70

-Bulldozers
- Komatsu D51PX
- Cat D3

-Off Road Dumps
- (2) 1997 Bell B25B

-Water truck
-Sweeper

8.0 WORK TASKS

8.1. SUBMITTALS

Administrative and material submittals are to be submitted according to the approved Schedule of Submittals. The Project Manager will develop and submit according to the Contract Documents. This task will be ongoing from Contract award to project closeout.

8.2. MOBILIZATION

8.2.1. AIR MONITORING

This task is to begin 3 days prior to active work tasks onsite to establish baseline levels. The approved Air Monitoring Plan is attached as Appendix B.

8.2.2. SITE SECURITY

The entire outer perimeter of the site is currently fenced and gated. Security of the work site will be established by closing the gates at the end of each work day. All equipment shall have attachments lowered to the ground, keys removed from the ignition and doors locked.

8.2.3. TEMPORARY FACILITIES

No temporary water or sewer facilities will be connected for this project. Drinking water and hand wash station will be provided at the office trailer. A portable toilet will be provided near the office trailer. Electricity will be provided by through a temporary service panel at the pole near the office trailer.

8.2.4. EQUIPMENT MOBILIZATION

Equipment will be mobilized to site and stored in Equipment Parking Area.

8.2.5. ACCESS AND TRAFFIC CONTROL

Site access will be through the existing driveway for employees, visitors and other project personnel. All personal vehicles must be parked near the office trailer.

When construction traffic deems it necessary, traffic control on the temporary haul road crossing will be instituted as shown in Appendix C: Access and Traffic Control Plan. All signage will be per MDOT permit. Traffic regulators (flag persons to trained per MDOT Traffic Regulators Instruction Manual.

8.3. ESTABLISH EXCLUSION ZONE AND DECONTAMINATION ZONE

The Exclusion Zone will be demarcated along boundaries as shown in the Site Plan Drawing C-4. The demarcation will consist of orange snow fencing along ~~west~~ east and northern boundaries. The southern boundary along the lake will be defined by the concrete break wall with sign placed along. The western boundary on the Mineral Building will be defined with red asbestos tape. Signage will be placed every 50ft along entire Exclusion Zone boundary.

The Personnel and Equipment Decontamination Areas will be established in the locations shown on the Drawings.

The Personnel Decontamination Area will consist of an orange fenced area with a 6mil plastic ground cover where PPE can be removed. A sitting bench with a 6mil cover will be provided. Asbestos disposal bags will be provided to place contaminated PPE in. All plastic will be gathered into disposal bags of at the end of each work day. A clean table

and wash area will be provided for handwashing and respirator maintenance. All washing will be done with clean water without soap or detergents and as such can be disposed of directly to the surface of the contaminated area.
The Equipment Decontamination Area will consist of an 8" thick 20'x30' level area of 4-6" crushed rock. All equipment will be pressure washed while on the crushed rock area and the wash water will be allowed to flow onto the contaminated soil before cap placement.

8.4. CONSTRUCT TEMPORARY ACCESS DRIVEWAY AND HAUL ROADS

The temporary access driveway and haul roads will be constructed as noted on the edited Drawings. This will require disassembly of the existing chain link fence, removal of brush and trees, installing sand fill as necessary, placing ¼" thick steel plates over the water main crossing and covering with 100 feet of 4-6" crushed stone 16' wide to minimize tracking onto M-26.

8.5. MULCH TREES AND BRUSH

All trees and brush within the grading and drainage ditch area will be cut down and chipped using an excavator with a brush hog mulching attachment. All mulch will be left on site and graded below the imported soil cap. Mulch may also be placed on the Mineral Building property between the ditch and the driveway. No persons are allowed within 300-foot radius of the machine while actively working. from upstream/northwest of the burn area
Care will be taken to protect the historic maple trees along the Mineral Building drive.

8.6. DEWATER DITCH

Prior to improving the southern drainage ditch, the constant flow of water will be redirected along the north side of M-26 to the south. This work will be in accordance to the MDOT Right of Way permit and access agreement with the affected land owner. Residual water near the culvert upwelling at the start of the ditch will be pumped using 2" electric trash pumps. This water will be allowed to infiltrate onto the contaminated soil area within the Exclusion Zone. Care will be taken to prevent this water from causing sediment and silt to leave the site.

8.7. IMPROVE DRAINAGE DITCH

Ditch grading and rip rap installation will be completed as shown on the Drawings. Excavated soils are assumed to be contaminated and as such must stay within the Exclusion Zone and be placed beneath the cap. Necessary resources include an excavator and off-road dump truck. 2 laborers will be required to lay fabric and hand set riprap.

8.8. GRADE CONTAMINATED SOILS

Pick up and consolidate any solid waste ~~near~~ from the ~~edge of the~~ Exclusion Zone for characterization and disposal.
Existing soils will be graded to lines and contours as shown on the Drawings. The grades may be adjusted to balance the cuts and fills and to provide positive drainage. All soils are assumed to be contaminated and as such must not be spread beyond the capped area. Necessary resources include an excavator, off road dump truck and dozer. The dozer will be equipped with GPS machine control.

8.9. HAUL OUT PCB CONTAMINATED SOILS

Waste Pile -11 will be loaded into US Ecology trucks for disposal. Necessary resources include a loader.

8.10. PICK ACM AND RPM

Visible Regulated Asbestos Containing material(RACM) and residual process material(RPM) will be picked up and contained of during ditching and grading activities. A final inspection of the graded area will be completed before placement of the cap.

The Professional and B&B Contracting must agree on the definition of "visible" ACM and RPM prior to pick up commencing. Laborers and operators within the Exclusion Zone will pick up ACM/RPM noticed during the completion of the drainage ditch improvements and grading of the contaminated soils.

Separate disposal drums for RACM and RPM will be placed within the Exclusion Zone and covered when there are no active work tasks.

The picked material will be disposed of at the appropriate facilities.

8.11. INSTALL CAP

Approximately 6.5 acres of graded contaminated soils will be capped with 6" of sandy loam soil. The sandy loam soil will be excavated and loaded by an excavator in the Charlie Kiilunen Borrow Pit located on the north side of M26. These soils will be hauled using off road dump trucks. The trucks will dump onto the contaminated soil area beginning at the Equipment Decontamination Area. The trucks will not track onto the contaminated soil. The imported soil piles will then be spread using the bulldozer equipped with GPS control.

A written access agreement between B&B and Charlie Kiilunen is included in Appendix C.

8.12. NORTH BOUNDARY ROAD

The North Boundary Road will be constructed as noted on the Drawings.

8.13. FERTILIZE, SEED AND MULCH

The capped area will be fertilized, seeded and mulched as required by the Contract Documents. G&J Site Solutions is responsible for completion.

8.14. AS-BUILT SURVEY

LeClaire Geoservices will complete the final as-built survey and provide all deliverables per the Contract Documents.

8.15. REMOVE TEMPORARY ACCESS DRIVEWAY

The temporary haul road between the project site and the Borrow Pit will be removed. All fill and gravel materials will be removed to return the affected area to its original grade. The area will then be seeded and mulched. The removed fence will be returned to its original position.

8.16. DEMOBILIZATION

Demobilization requires that all B&B Contracting equipment and supplies be removed from the site.

8.17. PROJECT CLOSEOUT

Project closeout requires that all as-built documents, manifests, haul slips will be submitted. SESC permit to be released and all silt fence will be removed following the establishment of vegetation and release of the SESC Permit.

9.0 PERMITS (APPENDIX E)

9.1. MDOT Right of Way

An MDOT Right of Way Construction permit will be obtained for the Hwy M-26 diversion ditch, the temporary access driveway and placing traffic control devices and flag persons on Hwy M-26 to control traffic. An access agreement with property owner Pat Ziemnick will be obtained to construct the portion of diversion ditch that is on his property. These items will be submitted when received.

9.2. Soil Erosion, Notice of Coverage

The Houghton County Soil Erosion and Sedimentation Control permit is attached. A Notice of Coverage will be filed and provided when received.

9.3. NESHAP

The NESHAP Notice of Intent to Renovate/Demolish was filed by Dale Carrier of U.P. Abatement Company and is included in Appendix E.

10.0 BORROW AREA

10.1. Borrow Area Haul Road Plan

Existing haul roads will be utilized in the borrow area as shown in the Borrow Area Plan as shown in Appendix D.

10.2. Borrow Area Restoration Plan

The borrow area will be graded for positive drainage to the northern ditch line. The area will then be fertilized, seeded and mulched.

10.3. Borrow Area SESC Permit

The borrow area SESC Permit is included in Appendix D.

11.0 SOIL EROSION AND SEDIMENTATION PLAN

Soil erosion and sedimentation controls will be installed according to the SESC plan approved with the permit. The SESC Plan is on Sheet C-4 of Appendix A.

12.0 SPILL CONTROL

Any spills or leaks occurring onsite will require the immediate notification of the Site Superintendent, Brian Bonen.

Spill control equipment will be stored in the job site equipment trailer. This equipment includes a 55-gallon plastic drum with a variety of oil and solvent absorbent pads, tarps, socks and booms. This spill kit will be sufficient to control and absorb any leak from equipment on site. All equipment will have absorbent pads in the cab for immediate deployment.

If a spill or leak occurs all work onsite will cease until the spill has been contained and cleaned up.

13.0 CONTAMINATED MATERIAL HANDLING

Contaminated materials will be contained and stored on site until properly characterized. Once characterized, proper disposal method will be chosen from those described in Sec 02 61 00 Part 3.1 of the Contract Specifications.

14.0 AIR MONITORING & DUST CONTROL

Air monitoring and dust control will be completed as described in the Air Monitoring Plan.

Dust control will be accomplished using a water truck during excavating and grading activities. The water spray bar on the rear of the truck will be used in most areas. In areas inaccessible by driving, a 200-ft hose will be used to deliver water.

Water for dust control will be obtained through a suction pipe from Torch Lake. This suction pipe will be temporarily secured to a piling near the eastern corner of the Exclusion Zone. Care will be taken to not disturb sediments at the bottom of lake or water users on the surface of the lake.

APPENDIX A: SITE PLAN

MDEQ Upper Peninsula District
Abandoned Mining Wastes - Torch Lake Non - Superfund Site
Hubbell Processing Area Plan Set A

EDITED BY: B & B CONTRACTING,
CALUMET, INC FOR USE IN WORK PLAN

Grading and Capping Interim Response

IN

Hubbell, Michigan

March 2017



VICINITY MAP
NOT TO SCALE



LOCATION MAP
NOT TO SCALE

HUBBELL PROCESSING AREA
HUBBELL, MICHIGAN



AERIAL MAP
NOT TO SCALE

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
C-1	TITLE SHEET
C-2	LEGEND/ GENERAL NOTES
C-3	EXISTING CONDITIONS
C-4	SITE PREPARATION PLAN/SESC CONTROL MEASURES
C-5	GRADING PLAN - RIVERBEND SITE
C-6	DITCH ALIGNMENT
C-7	RESTORATION PLAN
C-8	SITE DETAILS

PLANS PREPARED BY:

Mannik Smith GROUP
TECHNICAL SKILL. CREATIVE SPIRIT.
www.MannikSmithGroup.com
200 MICHIGAN STREET, SUITE 705
HANCOCK, MI. 49930
TEL: 734-397-3100
FAX: 734-397-3131

3 FULL WORKING DAYS
BEFORE YOU DIG CALL
MISS DIG System
1-800-482-7171 or 811
Design Ticket #: _____
Survey Ticket #: _____

BY: _____
TIMOTHY E. WALTHER, P.E.
PROFESSIONAL ENGINEER #43798

STATE OF MICHIGAN · TIMOTHY E. WALTHER · ENGINEER · No. 43798 · REGISTERED PROFESSIONAL ENGINEER

DATE: 3/27/2017

SHEET:
C-1

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FOR USE IN WORK PLAN.

GENERAL NOTES:

1. ALL CONSTRUCTION TO BE IN ACCORDANCE WITH THE MICHIGAN DEPARTMENT OF TRANSPORTATION 2012 STANDARD SPECIFICATIONS FOR CONSTRUCTION .
2. ALL MATERIALS TO BE REMOVED SHALL BE PROPERLY DISPOSED OR RECYCLED AS APPROPRIATE BY THE CONTRACTOR.
3. ALL NON HAZARDOUS MATERIALS ENCOUNTERED ARE TO REMAIN ON SITE AND BE BURIED UNDER THE 6" CAP. MOVE MATERIALS TO FILL LOCATIONS AND PROVIDE POSITIVE DRAINAGE.
4. ALL DISTURBED AREAS NOT SCHEDULED TO REMAIN AS IS SHALL BE FINE GRADED, AND SHALL RECIEVE 6" SANDY LOAM CAP SPECIFIED SEED MIX, AND MULCH SECURED IN-PLACE WITH NON-ASPHALTIC TACKIFIER. STRAW BLANKETS SHALL BE USED IN DITCH, SWALES AND ON SLOPES AS NOTED.
5. CONTRACTOR SHALL PERFORM DUST CONTROL PER MDEQ NESHAP STANDARDS FOR ASBESTOS. DUST SHALL BE KEPT TO A MINIMUM AND SHALL NOT LEAVE THE SITE.
6. CONTRACTOR TO GRADE, SEED AND MULCH ALL AREAS OUTSIDE THE CAP AND RIP RAP LIMITS DISTURBED BY THE WORK.
7. CONTRACTOR SHALL ROUTINELY SWEEP THE PAVED ENTRANCE AND HIGHWAY M-26 AS NEEDED TO REMOVE TRACKED SOILS.
8. ALL PERSONNEL, MATERIALS, EQUIPMENT THAT CONTACT CONTAMINATED MEDIA SHALL BE DECONTAMINATED PRIOR TO LEAVING THE SITE
9. ALL IMPROVEMENTS SHOWN ARE BASE BID ITEMS.
10. AT THE COMPLETION OF THE WORK LEAVE THE SITE CLEAN AND FREE OF ALL DEBRIS CAUSED BY CONSTRUCTION. SWEEP CLEAN ALL AREAS SOILED BY CONSTRUCTION.
11. ALL EARTH MOVEMENT IS CONSIDERED ASBESTOS RENOVATION WORK DUE TO THE POTENTIAL PRESENCE OF ASBESTOS CONTAINING MATERIALS AND BREAKDOWN OF NON-FRIABLE ASBESTOS BY EARTHWORK ACTIVITIES. APPROPRIATE NOTICES OF ASBESTOS ACTIVITIES SHALL BE PROVIDED TO THE MDEQ AND MICHIGAN DEPARTMENT OF LICENSING AND REGULATORY AFFAIRS. ALL WORK PRACTICES, EMPLOYEE TRAINING, DUST CONTROL, AND AIR MONITORING SHALL COMPLY WITH THE ASBESTOS NESHAP, OSHA, AND MIOSHA.

CONSTRUCTION SCHEDULE

1. WORKS DAYS ALLOWED ARE MONDAY THROUGH FRIDAY ONLY.
2. WORK HOURS ARE 7:00AM TO 7:00PM.
3. THE CONTRACTOR IS REQUIRED TO SECURE THE SITE DURING NON-WORKING HOURS. THIS WILL BE ACCOMPLISHED BY CLOSING GATES, UTILIZING TEMPORARY FENCE, OR OTHER MEANS APPROVED BY OWNER. ANY OPEN EXCAVATIONS MUST BE COVERED DURING THE AFOREMENTIONED TIMES TO THE SATISFACTION OF THE OWNER.

LEGEND:

EXISTING		PROPOSED
	CONTROL POINT	
	BENCH MARK	
	POST MOUNT SIGN	
	CATV MARKER	
	DECIDUOUS TREE	
	CATCH BASIN	
	LIGHT POLE	
	ELECTRIC MARKER	
	POST: METAL RND.	
	ELECTRIC PED.	
	ROUND HH	
	SQUARE HH	
	SANITARY MH	
	CONIFEROUS TREE	
	FIRE HYDRANT	
	GAS MH	
	NATURAL GAS VALVE	
	ELEC. TRANSFORMER	
	GAS MARKER	
	STORM MH	
×686.25	SPOT ELEVATION	39.50
677	CONTOURS	610
X X	FENCE	
	WASTE PILE	
	SILT FENCE	X X
	SLOPE ARROW	

3 FULL WORKING DAYS
BEFORE YOU DIG CALL
MISS DIG System
1-800-482-7171 or 811
Design Ticket #: _____
Survey Ticket #: _____

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1	01/31/2017	WJK	90% REVIEW
2	03/02/2017	TJS	95% REVIEW
3	03/13/2017	TJS	98% REVIEW
4	03/27/2017	TJS	ISSUED FOR BIDS

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PROJECT NO.: MDEQ0070
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MDEQ UPPER PENINSULA DISTRICT
HUBBELL, MICHIGAN

HUBBELL PROCESSING AREA, PLAN SET A

LEGEND/GENERAL NOTES

C-2 / C-8

3/27/2017
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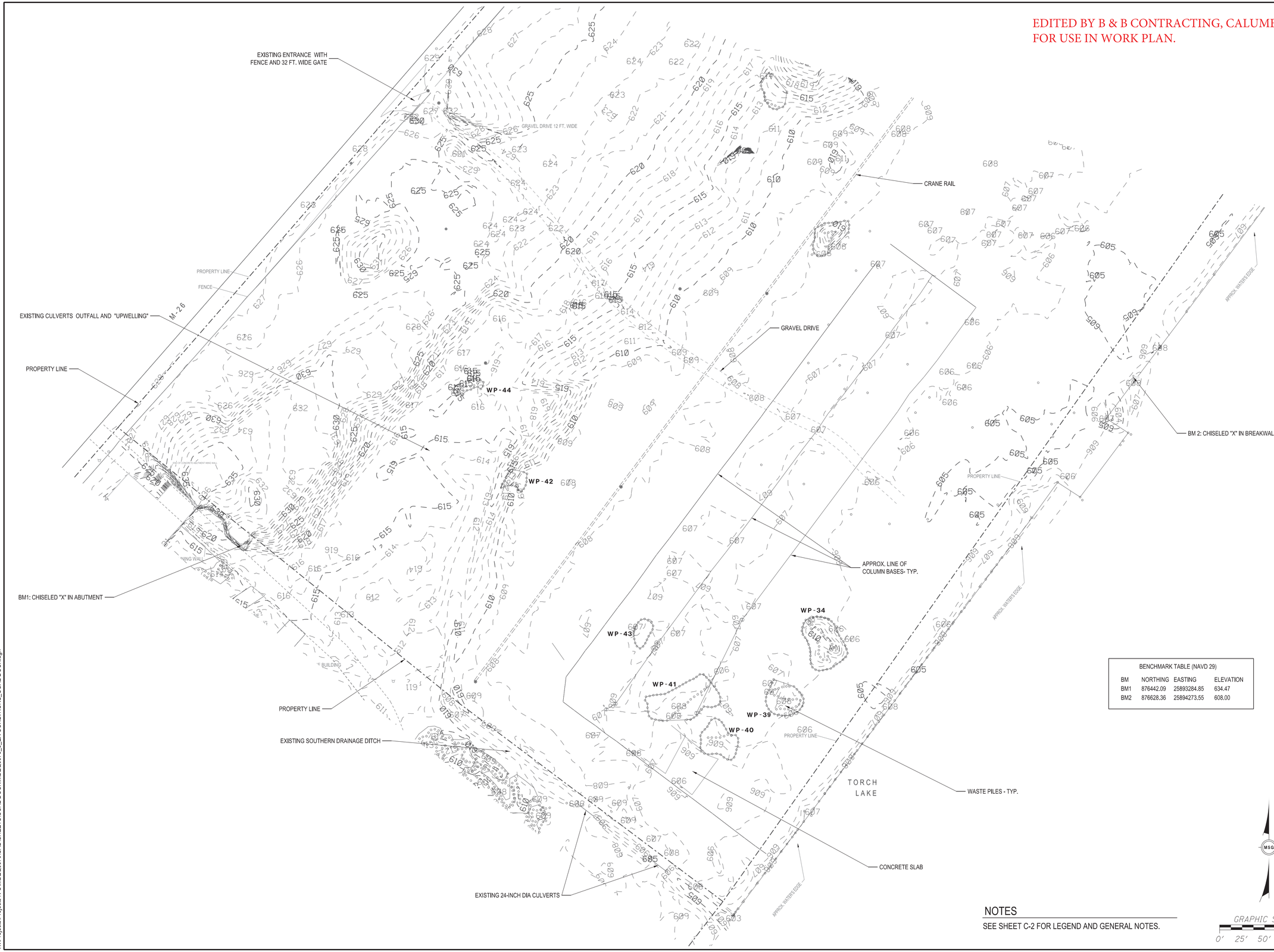

BENCHMARK TABLE (NAVD 29)

BM	NORTHING	EASTING	ELEVATION
BM1	876442.09	25893284.85	634.47
BM2	876628.36	25894273.55	608.00

NOTES

SEE SHEET C-2 FOR LEGEND AND GENERAL NOTES.

GRAPHIC SCALE
0′ 25′ 50′ 100′

NO.	DATE	BY	DESCRIPTION
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2	03/02/2017	TJS	95% REVIEW
3	03/13/2017	TJS	98% REVIEW
4	03/27/2017	TJS	ISSUED FOR BIDS

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PROJECT NO.: MDEQ00070
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HUBBELL, MICHIGAN

HUBBELL PROCESSING AREA, PLAN SET A

EXISTING CONDITIONS

C-3 / C-8

3/27/2017
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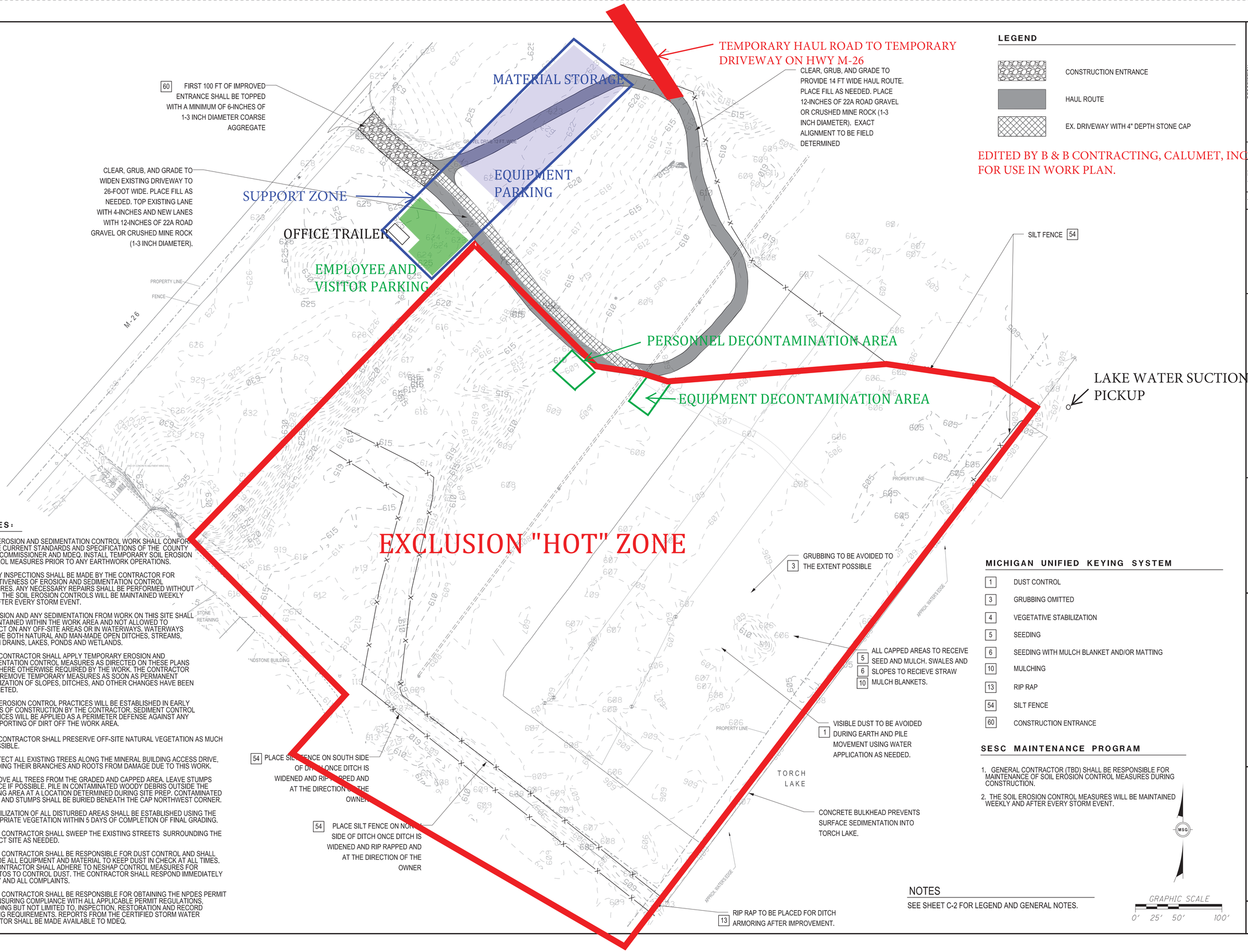

NOTES:

1. ALL EROSION AND SEDIMENTATION CONTROL WORK SHALL CONFORM TO THE CURRENT STANDARDS AND SPECIFICATIONS OF THE COUNTY DRAIN COMMISSIONER AND MDEQ. INSTALL TEMPORARY SOIL EROSION CONTROL MEASURES PRIOR TO ANY EARTHWORK OPERATIONS.
2. DAILY INSPECTIONS SHALL BE MADE BY THE CONTRACTOR FOR EFFECTIVENESS OF EROSION AND SEDIMENTATION CONTROL MEASURES. ANY NECESSARY REPAIRS SHALL BE PERFORMED WITHOUT DELAY. THE SOIL EROSION CONTROLS WILL BE MAINTAINED WEEKLY AND AFTER EVERY STORM EVENT.
3. EROSION AND ANY SEDIMENTATION FROM WORK ON THIS SITE SHALL BE CONTAINED WITHIN THE WORK AREA AND NOT ALLOWED TO COLLECT ON ANY OFF-SITE AREAS OR IN WATERWAYS. WATERWAYS INCLUDE BOTH NATURAL AND MAN-MADE OPEN DITCHES, STREAMS, STORM DRAINS, LAKES, PONDS AND WETLANDS.
4. THE CONTRACTOR SHALL APPLY TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES AS DIRECTED ON THESE PLANS AND WHERE OTHERWISE REQUIRED BY THE WORK. THE CONTRACTOR SHALL REMOVE TEMPORARY MEASURES AS SOON AS PERMANENT STABILIZATION OF SLOPES, DITCHES, AND OTHER CHANGES HAVE BEEN COMPLETED.
5. SOIL EROSION CONTROL PRACTICES WILL BE ESTABLISHED IN EARLY STAGES OF CONSTRUCTION BY THE CONTRACTOR. SEDIMENT CONTROL PRACTICES WILL BE APPLIED AS A PERIMETER DEFENSE AGAINST ANY TRANSPORTING OF DIRT OFF THE WORK AREA.
6. THE CONTRACTOR SHALL PRESERVE OFF-SITE NATURAL VEGETATION AS MUCH AS POSSIBLE.
7. PROTECT ALL EXISTING TREES ALONG THE MINERAL BUILDING ACCESS DRIVE, INCLUDING THEIR BRANCHES AND ROOTS FROM DAMAGE DUE TO THIS WORK.
8. REMOVE ALL TREES FROM THE GRADED AND CAPPED AREA. LEAVE STUMPS IN-PLACE IF POSSIBLE. PILE IN CONTAMINATED WOODY DEBRIS OUTSIDE THE GRADING AREA AT A LOCATION DETERMINED DURING SITE PREP. CONTAMINATED BRUSH AND STUMPS SHALL BE BURIED BENEATH THE CAP NORTHWEST CORNER.
9. STABILIZATION OF ALL DISTURBED AREAS SHALL BE ESTABLISHED USING THE APPROPRIATE VEGETATION WITHIN 5 DAYS OF COMPLETION OF FINAL GRADING.
10. THE CONTRACTOR SHALL SWEEP THE EXISTING STREETS SURROUNDING THE PROJECT SITE AS NEEDED.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DUST CONTROL AND SHALL PROVIDE ALL EQUIPMENT AND MATERIAL TO KEEP DUST IN CHECK AT ALL TIMES. THE CONTRACTOR SHALL ADHERE TO NESHAP CONTROL MEASURES FOR ASBESTOS TO CONTROL DUST. THE CONTRACTOR SHALL RESPOND IMMEDIATELY TO ANY AND ALL COMPLAINTS.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE NPDES PERMIT AND ENSURING COMPLIANCE WITH ALL APPLICABLE PERMIT REGULATIONS, INCLUDING BUT NOT LIMITED TO, INSPECTION, RESTORATION AND RECORD KEEPING REQUIREMENTS. REPORTS FROM THE CERTIFIED STORM WATER OPERATOR SHALL BE MADE AVAILABLE TO MDEQ.

MICHIGAN UNIFIED KEYING SYSTEM

1	DUST CONTROL
3	GRUBBING OMITTED
4	VEGETATIVE STABILIZATION
5	SEEDING
6	SEEDING WITH MULCH BLANKET AND/OR MATTING
10	MULCHING
13	RIP RAP
54	SILT FENCE
60	CONSTRUCTION ENTRANCE

SESC MAINTENANCE PROGRAM

1. GENERAL CONTRACTOR (TBD) SHALL BE RESPONSIBLE FOR MAINTENANCE OF SOIL EROSION CONTROL MEASURES DURING CONSTRUCTION.
2. THE SOIL EROSION CONTROL MEASURES WILL BE MAINTAINED WEEKLY AND AFTER EVERY STORM EVENT.

NOTES

SEE SHEET C-2 FOR LEGEND AND GENERAL NOTES.

GRAPHIC SCALE
0' 25' 50' 100'

NO.	DATE	BY	DESCRIPTION
1	01/31/2017	WJK	90% REVIEW
2	03/02/2017	TJS	95% REVIEW
3	03/13/2017	TJS	98% REVIEW
4	03/27/2017	TJS	ISSUED FOR BIDS

PROJECT DATE: 1/31/2017
PROJECT NO.: MDEQ00070
DRAWN BY: WJK/TJS
CHECKED BY: TEW

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HUBBELL, MICHIGAN

HUBBELL PROCESSING AREA, PLAN SET A

SITE PREPARATION/SESC MEASURES

C-4 / C-8

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PROTECT AND MAINTAIN
VISIBILITY OF CRANE RAIL

GRAVEL DRIVE 12 FT. WIDE

CITY LINE

FENCE

MATCH ELEVATIONS UP WITH
EXISTING AT HAUL ROAD

LOCATION OF UPWELLING,
2 - 18" PIPES
ASSUMED INVERT = 611.00

20.0'

608.5 PEAK

PROPERTY LINE

APPROX. WATER'S EDGE

SWALE CENTERLINE .70%

SWALE CENTERLINE .55%

SWALE CENTERLINE .6%

SWALE CENTERLINE .50%

TOP

PATCH RECTANGULAR OPENING IN BULKHEAD
FULL-DEPTH WITH CONCRETE TO STOP FLOW
THROUGH THE BULKHEAD.

DITCH ENDING
WATER LEVEL ELEVATION 602.60

NOTES:

1. INSTALL SOIL EROSION CONTROL MEASURES PRIOR TO EARTH WORK OPERATIONS.
2. PRIOR TO CONSTRUCTION VERIFY THAT PROPOSED GRADES OF IMPROVEMENTS AND EXISTING GRADES WILL PROVIDE POSITIVE DRAINAGE. VERIFY THAT NO AREAS WILL HOLD WATER. IMMEDIATELY CONTACT ENGINEER/ARCHITECT IF SUCH CONDITIONS EXIST.
3. CONTOURS REPRESENT ELEVATIONS BEFORE PLACING CAP IN CAPPED AREAS.
4. SEE ALIGNMENT SHEET (C-6) FOR EXACT DITCH PLACEMENT AND PROFILE. ALSO CHECK SHEET (C-8) FOR TYPICAL DITCH SECTION DETAIL.

NOTES

SEE SHEET C-2 FOR LEGEND AND GENERAL NOTES.

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HUBBELL, MICHIGAN

HUBBELL
PROCESSING AREA,
PLAN SET A

GRADING PLAN

C-5 / C-8

3/27/2017
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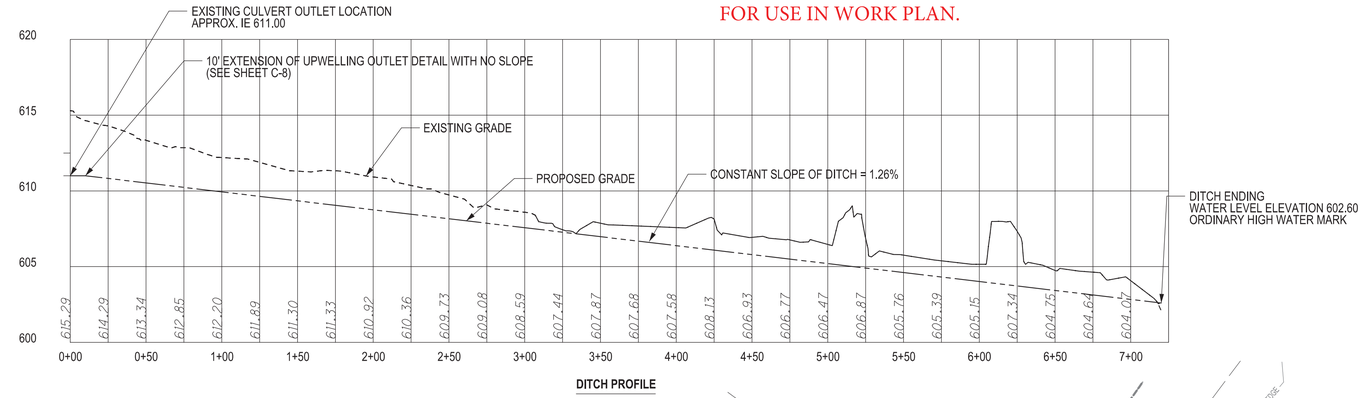
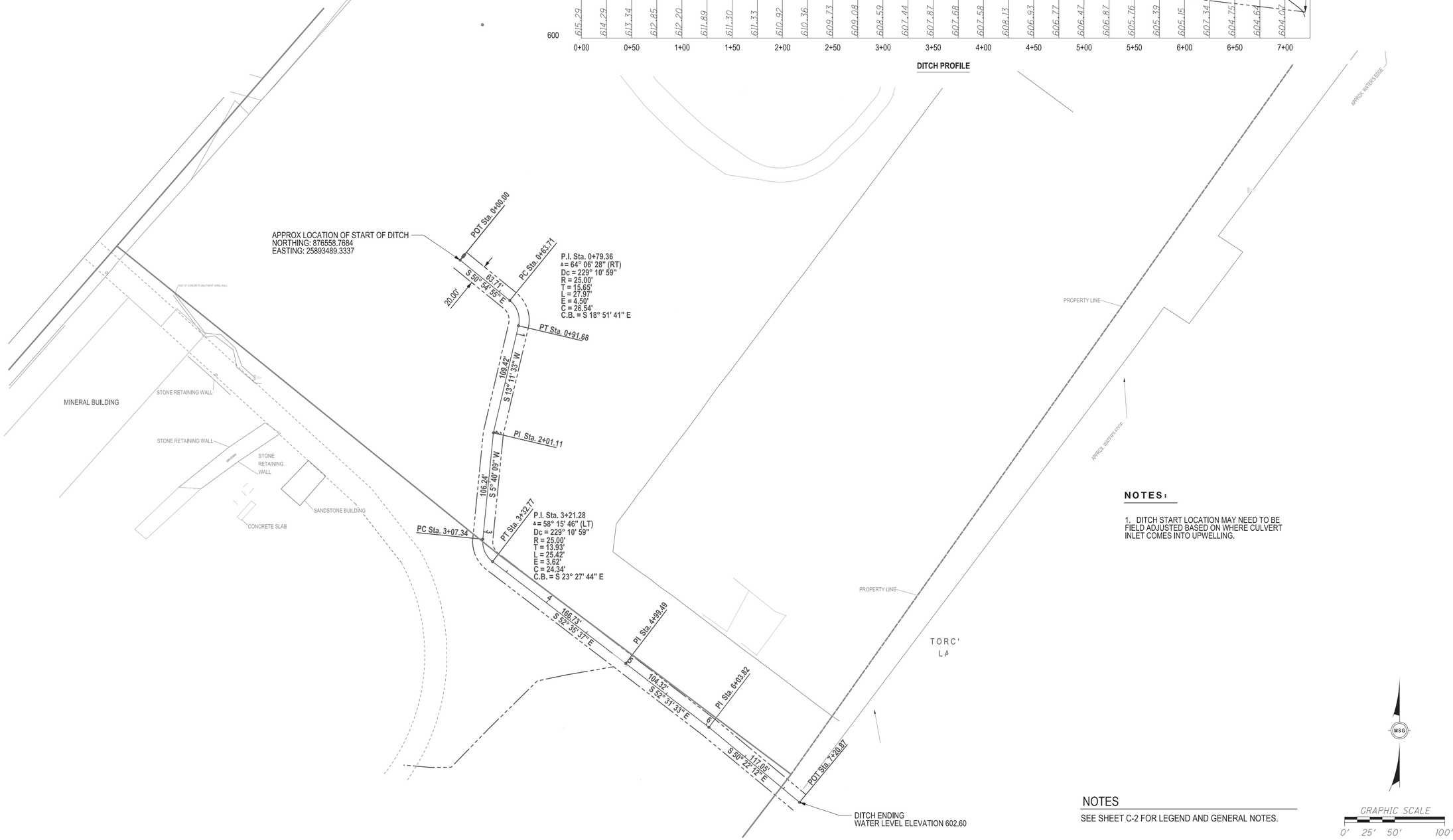


DITCH PROFILE



NOTES:

1. DITCH START LOCATION MAY NEED TO BE FIELD ADJUSTED BASED ON WHERE CULVERT INLET COMES INTO UPWELLING.

NOTES

SEE SHEET C-2 FOR LEGEND AND GENERAL NOTES.

GRAPHIC SCALE
0' 25' 50' 100'

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HUBBELL, MICHIGAN

HUBBELL PROCESSING AREA, PLAN SET A

DITCH ALIGNMENT PLAN

C-6 / C-8

3/27/2017
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LEGEND

6" SANDY LOAM CAP, SEED AND MULCH

CRUSHED STONE BORDER

NOTE:

1. PROPOSED GRADES ARE PRE-CAP PLACEMENT.

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LEAVE IN PLACE

LIMIT OF CAP PLACEMENT. BOTTOM OF EMBANKMENT WEST SIDE

GRAVEL DRIVE 12 FT. WIDE

LEAVE IN PLACE

PROPERTY LINE

FENCE

M-26

USE STRAW BLANKETS FOR EROSION PROTECTION BOTH SIDES OF EMBANKMENT

RETAIN VISIBILITY OF CONCRETE CRANE RAIL

RETAIN VISIBILITY OF COLUMN BASES- TYP.

PLACE 6-INCHES OF CRUSHED STONE (1-3 INCH DIAMETER) 8- FOOT WIDE AS NORTH EDGE OF CAP

15' WIDE CAP ALONG DITCH TOP

END OF CONCRETE MUTMENT WING WALL

STONE RETAINING WALL

STONE RETAINING WALL

SANDSTONE BUILDING

PROPERTY LINE

ARMOR CORNERS OF BULKHEAD LOADING DOCK WITH RIP RAP

APPROX. WATER'S EDGE

6" SANDY LOAM CAP, SEED AND MULCH - TYP.

CAP TO CONCRETE BULKHEAD

USE STRAW BLANKETS FOR EROSION PROTECTION ACROSS 8' FOOT WIDTH OF SWALE BOTTOMS (TYP.) OVERLAP BLANKETS BY 6-INCHES WORKING UPHILL

TORCH LAKE

APPROX. WATER'S EDGE

NOTES

SEE SHEET C-2 FOR ADDITINOAL LEGEND AND GENERAL NOTES.

GRAPHIC SCALE

0' 25' 50' 100'

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MDEQ UPPER PENINSULA DISTRICT

HUBBELL, MICHIGAN

HUBBELL PROCESSING AREA, PLAN SET A

RESTORATION PLAN

C-7 / C-8

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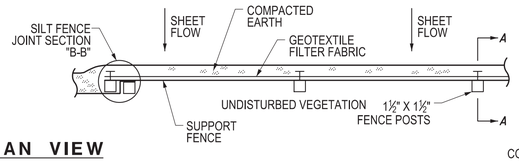
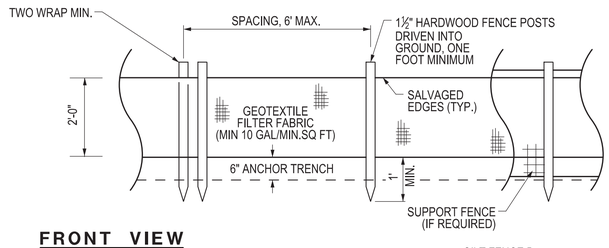
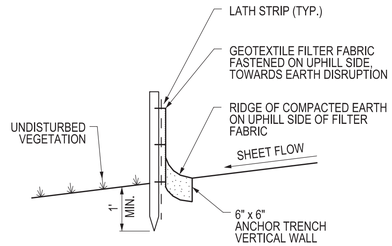
ARCH E1 - 30"x42" - 762mmx1067mm (rounded)



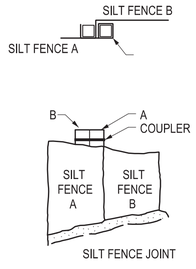
PLAN VIEW



FRONT VIEW



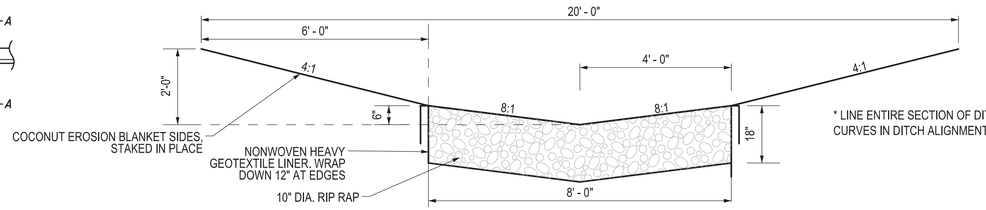
SECTION A-A



SECTION B-B

REFER TO MDOT STANDARD DETAILS

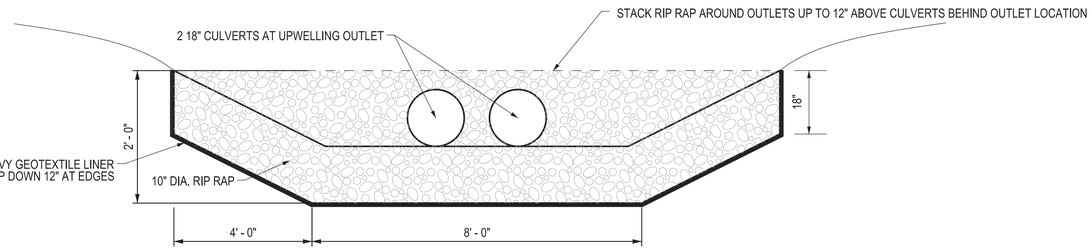
SILT FENCE
NO SCALE



DITCH DETAIL

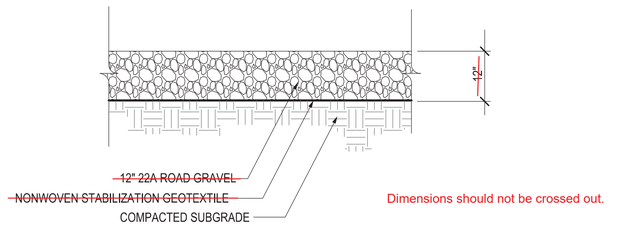
* LINE ENTIRE SECTION OF DITCH IN RIP RAP TO TOP OF DITCH DURING CURVES IN DITCH ALIGNMENT. (FROM STA 0+63.71 to STA 0+91.68 AND 3+07.34 TO STA 3+32.77)

THIS DITCH SECTION AT A SLOPE OF 1.165% HAS THE CAPACITY FOR 133.43 CFS. THE DITCH WAS SIZED TO HANDLE AN ESTIMATED 54.2 CFS FROM 2-18" CULVERTS CONTRIBUTING AT THE START OF THE DITCH, AS WELL AS THE 50 YEAR STORM OF THE CONTRIBUTING SITE (20.85 ACRES).



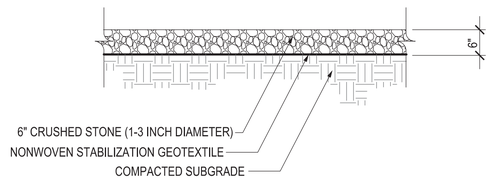
UPWELLING OUTLET DETAIL

EXTEND THIS SECTION FOR 10' AT NO SLOPE PAST EX CULVERT OUTLET LOCATION.



HAUL ROUTE
NO SCALE

HAUL ROUTES WILL BE CONSTRUCTED AS DEEMED NECESSARY BY PROJECT SUPERINTENDENT



NORTH EDGE OF CAP
NO SCALE

NOTE: GEOTEXTILE SPECIFICATIONS SHALL MEET THE REQUIREMENTS IN SECTION 910 OF THE MICHIGAN DEPARTMENT OF TRANSPORTATION 2012 STANDARD SPECIFICATIONS FOR CONSTRUCTION.

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4	03/27/2017	TJS	ISSUED FOR BIDS
5	4/26/2017	TJS	GEOTEXTILE AND N. EDGE OF CAP CLARIFICATIONS

PROJECT DATE: 1/31/2017
PROJECT NO.: MDEQ0070
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HUBBELL, MICHIGAN

HUBBELL PROCESSING AREA, PLAN SET A

SITE DETAILS

C-8 / C-8

4/26/2017
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APPENDIX B: AIR MONITORING PLAN

An Equal Opportunity Employer
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913
Office: (906)337-0017
Fax: (906)934-2587

AIR MONITORING PLAN

PREPARED FOR:

PROJECT:

HUBBELL PROCESSING AREA REMEDIATION
FILE NO. 761/16108.SAR INDEX NO. 44521
TORCH LAKE NON-SUPERFUND SITE

LOCATION:

52634 STATE HWY M-26
HUBBELL, MI

OWNER:

STATE OF MICHIGAN, DEPARTMENT OF TECHNOLOGY, MANAGEMENT & BUDGET
DEPARTMENT OF ENVIRONMENTAL QUALITY

PROFESSIONAL:

THE MANNIK & SMITH GROUP, INC.

BY:

B&B CONTRACTING, CALUMET, INC.

AIR MONITORING FIRM:

U.P. ENGINEERS & ARCHITECTS, INC.

DATED:

JUNE 13, 2017

This plan was prepared using the project Contract Documents owned by the State and prepared by the Professional.

Table of Contents

1.0 INTRODUCTION 3
2.0 POSSIBLE AIRBORNE CONTAMINANTS 3
3.0 METHODS OF AIR MONITORING 3
DUST 3
ASBESTOS 4
4.0 ACTION LEVELS AND CONTROLS 4
DUST 4
ASBESTOS 4
5.0 REPORTING 5

1.0 INTRODUCTION

This Air Monitoring Plan is developed to provide site-specific procedures for monitoring and reporting of possible airborne contaminants before, during and following the completion of the Hubbell Processing Area Remediation. This remediation includes ditching and grading of asbestos contaminated soil.

The purpose of this air monitoring is to document airborne exposures to on site personnel and the surrounding public community. This monitoring will also provide early warning of potential exposures in order to implement additional engineering control for exposures.

2.0 POSSIBLE AIRBORNE CONTAMINANTS

Contaminants that are of the main concern to become airborne during ditching and grading are respirable particulate matter(PM10) and asbestos. The following table shows the compounds and their sources, action levels and engineering controls.

Target Compounds	**Source**	**Measurement Method**	**Action Level (1/2 OSHA PEL)**	**Engineering Controls**
Dust (PM10)	Disturbance of site soils	Visual monitoring	Visible dust	Water truck
		Thermo DataRam pDR-1200 aerosol monitor (or equivalent)	2.5 mg/m^3 Downwind value minus upwind value	
Asbestos	Disturbance of site soils	Air sampling (OSHA ID-160 Method)	TWA 0.05 fiber/cc Excursion Level (30 min) 0.5 fiber/cc	Water truck

3.0 METHODS OF AIR MONITORING

Air monitoring will be conducted at the personnel task locations and at six locations along the perimeter fence line. Two permanent monitoring locations will be established, with one being along the south fence line adjacent to the neighboring business (Koppers) and one along the south portion of the west fence line closest to the nearby residence. Four locations will be selected on a daily basis based on wind direction, work location, and nearby receptor(residence) locations. Regardless of the wind direction at least one monitoring location will be placed upwind of the daily work area.

DUST

Visual observation will be used to continuously monitor the active work area for visible emissions of dust. Observations will be logged on an hourly basis.

A Thermo DataRam pDR-1200 (or equivalent) aerosol monitor will be used at each of the two permanent monitoring locations. The monitors will be positioned approximately 5 feet above ground level. The monitors will continuously record dust concentrations and calculate a time weighted average concentration. The concentrations will be visually observed hourly and each day's recorded data will be downloaded, posted and submitted to the Professional daily. Monitoring at the two permanent locations will be collected for at least 3 days prior to active

work beginning on site.

Thermo DataRam pDR-1200 portable aerosol monitor will be used by the monitoring technician at the four daily chosen perimeter locations. While work is active in the exclusion zone, this monitor will be moved every 15 minutes to another location such that each location is sampled at least once per hour while the work area is active.

The monitoring technician shall immediately notify the Site Superintendent and Professional if the action level of 2.5 mg/m^3 is observed.

ASBESTOS

Air samples to measure asbestos fiber concentrations will be collected daily at all six perimeter locations while work is active in the exclusion zone. Air samples will be collected at the two permanent perimeter locations for at least 3 days prior to active work beginning on site.

Air samples will be collected daily by a personal air sampler on one worker involved in each work task. Two work tasks have been identified on this site, the first being an operator of heavy machinery; excavator, dozer or haul truck, the second being a laborer continuously in contact with site soils; picking ACM/RPM, placing silt fence, placing filter fabric, etc. Sampling shall occur for total concentration on a daily basis.

The airflow rate will be verified using a rotameter before and after sampling. The air samples will be analyzed by an accredited technician using Phase Contrast Microscopy. Sampling and analysis will be completed according to OSHA Method ID-160.

Air samples will be analyzed by a certified lab on a 96-hour basis and the results will be posted in the office trailer and submitted to the Professional as received.

4.0 ACTION LEVELS AND CONTROLS

DUST

If visible emissions are present, water spray or mist shall be used for dust suppression.

If the difference in the real-time readings on the aerosol monitors between the upwind and downwind monitors exceed the action level of 2.5 mg/m^3 then all work shall stop until emissions are controlled.

ASBESTOS

If visible emissions are present, water spray or mist shall be used for dust suppression.

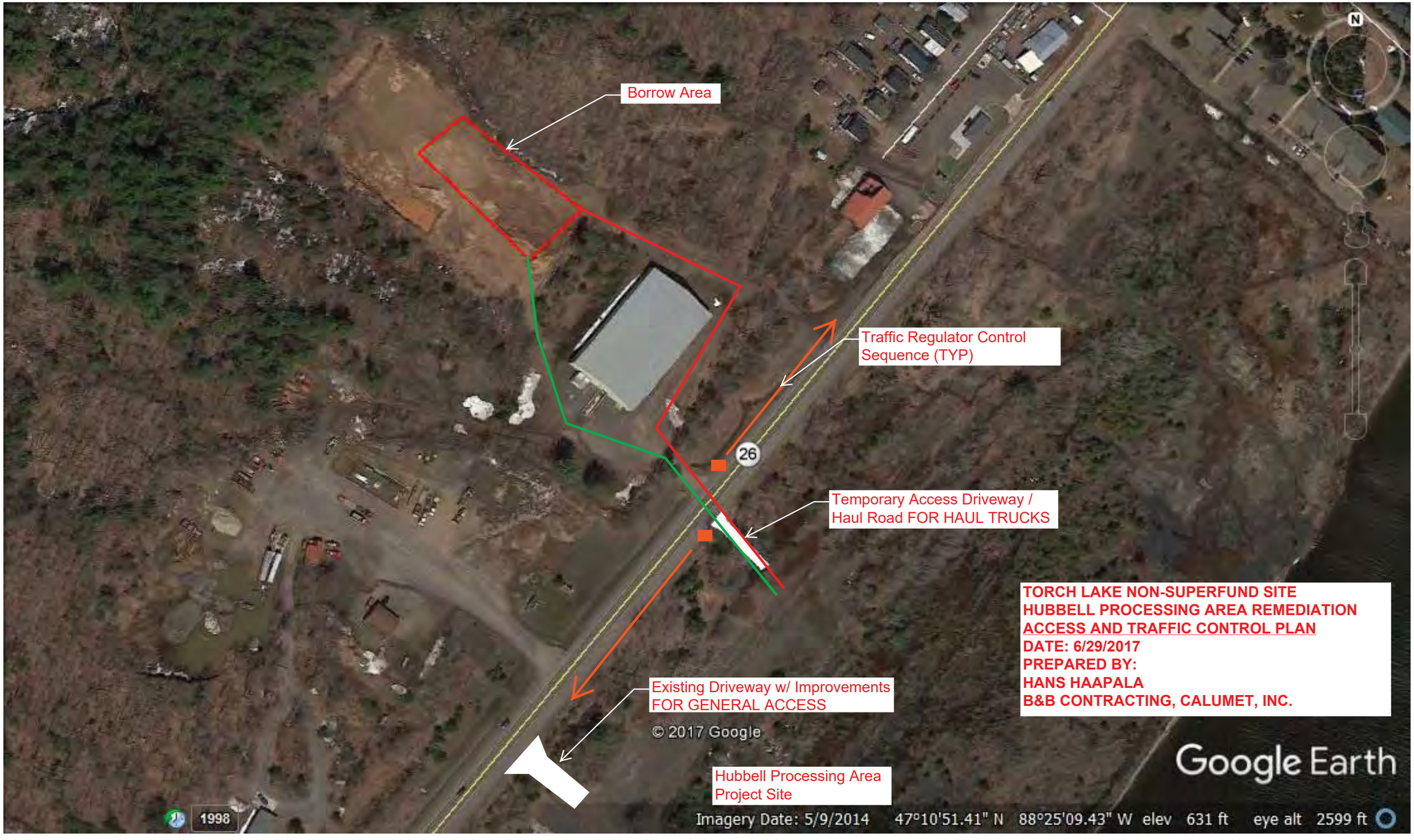
If air sampling results show concentrations in excess of the action level of 0.05 fibers/cc then all work shall cease until additional engineering controls can be put in place. *(UPEA does not have this capability)*

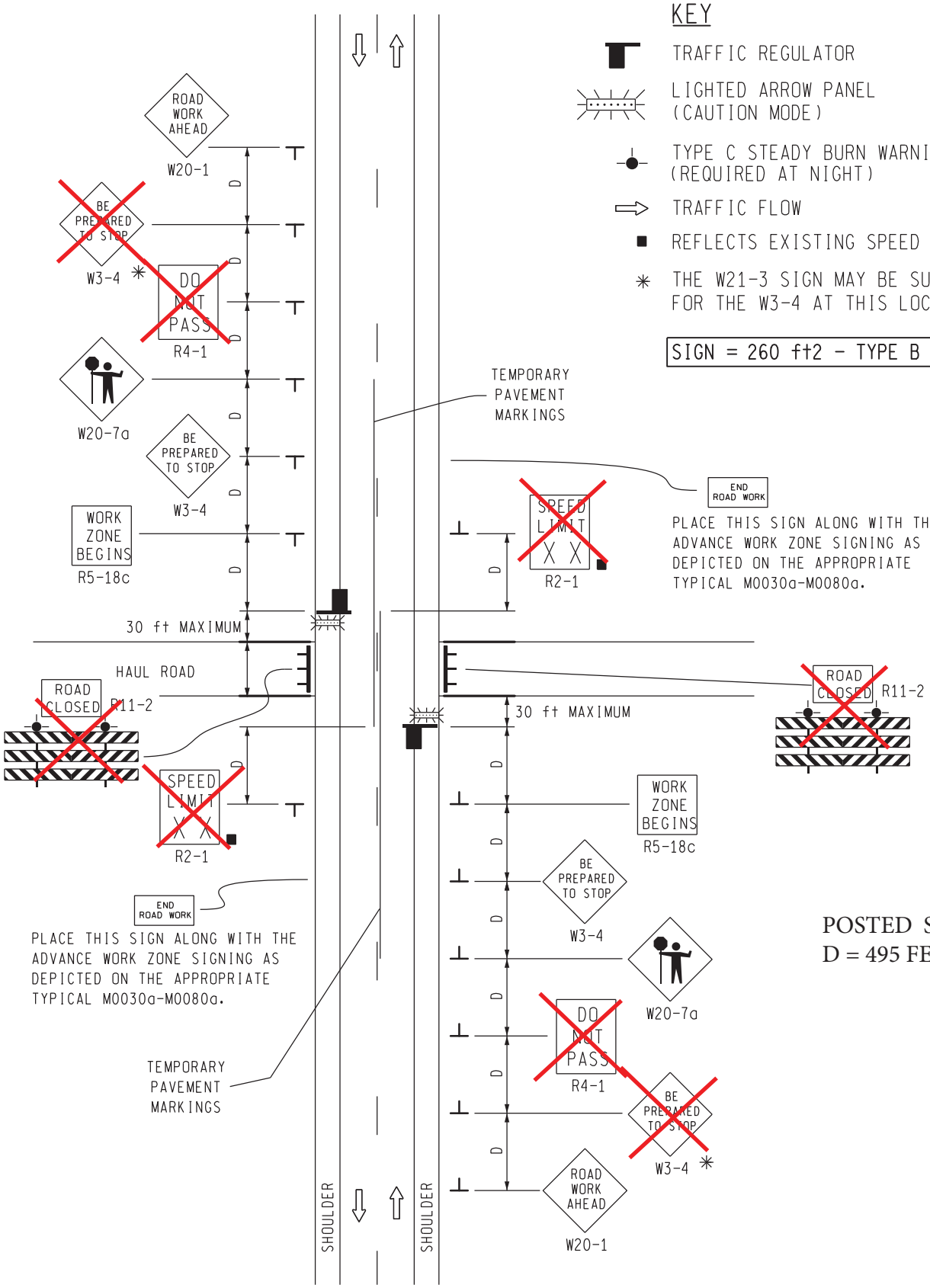
5.0 REPORTING

Visual observations for dust and odors will be logged hourly or as observed, along with any responses taken. Daily logs will be posted in the office trailer and submitted to the Professional.

Data logs from the aerosol monitors will be downloaded at the conclusion of each work day and posted in the office trailer the next day and submitted to the Professional.

APPENDIX C: ACCESS AND TRAFFIC CONTROL PLAN


Borrow Area
Traffic Regulator Control Sequence (TYP)
26
Temporary Access Driveway / Haul Road FOR HAUL TRUCKS
Existing Driveway w/ Improvements FOR GENERAL ACCESS
Hubbell Processing Area Project Site
TORCH LAKE NON-SUPERFUND SITE
HUBBELL PROCESSING AREA REMEDIATION
ACCESS AND TRAFFIC CONTROL PLAN
DATE: 6/29/2017
PREPARED BY:
HANS HAAPALA
B&B CONTRACTING, CALUMET, INC.
© 2017 Google
Google Earth
1998
Imagery Date: 5/9/2014 47°10'51.41" N 88°25'09.43" W elev 631 ft eye alt 2599 ft
N



POSTED SPEED = 55 MPH
D = 495 FEET

NOT TO SCALE

MDOT Michigan Department of Transportation
TRAFFIC AND SAFETY
MAINTAINING TRAFFIC TYPICAL

TYPICAL TEMPORARY TRAFFIC CONTROL FOR A HAUL ROAD ON A TWO-LANE TWO WAY ROADWAY WHERE A TOTAL TRAFFIC STOPPAGE IS REQUIRED UTILIZING TRAFFIC REGULATORS, NO SPEED REDUCTION

DRAWN BY: CON:AE:djf	OCTOBER 2011	M0170a	SHEET 1OF 2
CHECKED BY: BMM:CRB	PLAN DATE:		
FILE: PW RD/TS/Typicals/Signs/MT NON FWY/M0170a.dgn REV. 10/06/2011			

NOTES

1A. SEE M0020a FOR "D" VALUES.

2. ALL NON-APPLICABLE SIGNING WITHIN THE CIA SHALL BE MODIFIED TO FIT CONDITIONS, COVERED OR REMOVED.

3. DISTANCES BETWEEN SIGNS, THE VALUES FOR WHICH ARE SHOWN IN TABLE D, ARE APPROXIMATE AND MAY NEED ADJUSTING AS DIRECTED BY THE ENGINEER.

3A. THE "WORK ZONE BEGINS" (R5-18c) SIGN SHALL BE USED ONLY IN THE INITIAL SIGNING SEQUENCE IN THE WORK ZONE. SUBSEQUENT SEQUENCES IN THE SAME WORK ZONE SHALL OMIT THIS SIGN AND THE QUANTITIES SHALL BE ADJUSTED APPROPRIATELY.

6. WHEN CALLED FOR IN THE FHWA ACCEPTANCE LETTER FOR THE SIGN SYSTEM SELECTED, THE TYPE A WARNING FLASHER, SHOWN ON THE WARNING SIGNS, SHALL BE POSITIONED ON THE SIDE OF THE SIGN NEAREST THE ROADWAY.

7. ALL TEMPORARY SIGNS, TYPE III BARRICADES, THEIR SUPPORT SYSTEMS AND LIGHTING REQUIREMENTS SHALL MEET NCHRP 350 CRASHWORTHLY REQUIREMENTS STIPULATED IN THE CURRENT EDITION OF THE MICHIGAN MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, THE CURRENT EDITION OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION, THE STANDARD PLANS AND APPLICABLE SPECIAL PROVISIONS. ONLY DESIGNS AND MATERIALS APPROVED BY MDOT WILL BE ALLOWED.

9. ALL TRAFFIC REGULATORS SHALL BE PROPERLY TRAINED AND SUPERVISED.

9A. IN ANY OPERATION INVOLVING MORE THAN ONE TRAFFIC REGULATOR, ONE PERSON SHOULD BE DESIGNATED AS HEAD TRAFFIC REGULATOR.

10. ALL TRAFFIC REGULATORS' CONDUCT, THEIR EQUIPMENT, AND TRAFFIC REGULATING PROCEDURES SHALL CONFORM TO THE CURRENT EDITION OF THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MMUTCD) AND THE CURRENT EDITION OF THE MDOT HANDBOOK ENTITLED "TRAFFIC REGULATORS INSTRUCTION MANUAL."

11. WHEN TRAFFIC REGULATING IS ALLOWED DURING THE HOURS OF DARKNESS, APPROPRIATE LIGHTING SHALL BE PROVIDED TO SUFFICIENTLY ILLUMINATE THE TRAFFIC REGULATOR'S STATIONS.

14. ADDITIONAL SIGNING AND/OR ELONGATED SIGNING SEQUENCES SHOULD BE USED WHEN TRAFFIC VOLUMES ARE SIGNIFICANT ENOUGH TO CREATE BACKUPS BEYOND THE W3-4 SIGNS.

15. THE HAND HELD (PADDLE) SIGNS REQUIRED BY THE MMUTCD TO CONTROL TRAFFIC WILL BE PAID FOR AS PART OF FLAG CONTROL.

17. THE HAND HELD (PADDLE) SIGNS USED FOR THIS SEQUENCE SHALL DISPLAY "STOP" ON BOTH SIDES. WHEN THE TRAFFIC REGULATOR IS RELEASING TRAFFIC, THE "STOP" PADDLE SHALL BE TURNED 1/4 TURN AWAY FROM TRAFFIC.

18. CARE SHOULD BE TAKEN IN THE SELECTION OF THE LOCATION FOR THE HAUL ROAD TO ASSURE GOOD SIGHT DISTANCE FOR THE MOTORIST. HORIZONTAL AND VERTICAL CURVES AND INTERSECTING ROADWAYS IN CLOSE PROXIMITY TO THE HAUL ROAD LOCATION SHOULD BE AVOIDED AS MUCH AS POSSIBLE. THE LOCATION AND WIDTH OF THE HAUL ROAD REQUIRES PRIOR APPROVAL OF THE ENGINEER.

19. ALL EQUIPMENT OPERATORS WHO USE THE HAUL ROAD SHALL STOP AND VERIFY THAT THE TRAFFIC REGULATORS HAVE TRAFFIC STOPPED AND UNDER CONTROL BEFORE ENTERING ONTO THE HIGHWAY.

20. WHEN THE HAUL ROAD IS NOT IN USE, LIGHT TYPE III BARRICADES WITH "ROAD CLOSED" SIGNS SHALL BE IN PLACE, AND SHALL EXTEND COMPLETELY ACROSS THE HAUL ROAD.

SIGN SIZES

DIAMOND WARNING	- 48" x 48"
R2-1 REGULATORY	- 48" x 60"
R4-1 REGULATORY	- 48" x 60"
R5-18c REGULATORY	- 48" x 48"
R11-2 REGULATORY	- 48" x 30"

NOT TO SCALE

MDOT Michigan Department of Transportation
TRAFFIC AND SAFETY
MAINTAINING TRAFFIC TYPICAL

TYPICAL TEMPORARY TRAFFIC CONTROL FOR A HAUL ROAD ON A TWO-LANE TWO WAY ROADWAY WHERE A TOTAL TRAFFIC STOPPAGE IS REQUIRED UTILIZING TRAFFIC REGULATORS, NO SPEED REDUCTION

DRAWN BY: CON:AE:djf	OCTOBER 2011	M0170a	SHEET 2 OF 2
CHECKED BY: BMM:CRB	PLAN DATE:		
FILE: PW RD/TS/Typicals/Signs/MT NON FWY/M0170a.dgn REV. 10/06/2011			

APPENDIX D: BORROW AREA PLAN


Sandy Loam
Borrow Area
~~approx. 125' x 225'~~
~~with an avg depth~~
~~of 7' = 7000 CYD~~
Approx. 100' x 200' with an avg depth of 9.5' = 7000 CYD to match Submittal 004.
Loaded haul truck route
Empty haul truck route
26
Temporary Access Driveway / Haul Road
Borrow Pit Owner: Charles Kiilunen
TORCH LAKE NON-SUPERFUND SITE
HUBBELL PROCESSING AREA REMEDIATION
BORROW AREA PLAN
DATE: 6/29/2017
PREPARED BY:
HANS HAAPALA
B&B CONTRACTING, CALUMET, INC.
© 2017 Google
Google Earth
Hubbell Processing Area Project Site
1998
Imagery Date: 5/9/2014 47°10'51.41" N 88°25'09.43" W elev 631 ft eye alt 2599 ft

An Equal Opportunity Employer
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913
Brian Bonen, Mobile: 906-281-2587
Hans Haapala, Mobile: 906-281-6908
Office: 906-337-0017
Fax: 906-934-2587

SOIL SUPPLY AGREEMENT

Submitted to Owner:

Date: May 11, 2017

Charlie Kiilunen
52705 State Hwy M-26
Lake Linden, MI 49945

B&B Contracting, Calumet, Inc. agrees to pay [redacted] per cubic yard (CYD) of clay or sand taken from borrow pit located at 52705 State Hwy M-26 for use at MDEQ-Hubbell Processing Area for Capping. This project is anticipated to need approximately 6000 CYD.

B&B Contracting will supply all necessary equipment for loading.

B&B will provide plan for and obtain soil erosion-sedimentation control (SESC) permit on behalf of owner with signed agreement.

Due to safety concerns, B&B will have exclusive access to pit and material during project.

B&B will install and maintain all necessary SESC measures until SESC permit is released.

B&B will provide borrow pit restoration, seed and mulch at completion of project.

Payment to be made as follows: B&B Contracting will keep track of totals by the truck load. The price above is inclusive of any applicable sales tax. Material will be paid for when B&B Contracting receives payment from project owner. This will be approximately 45 days from the material being loaded.

Owner to carry fire, tornado or other necessary property insurance. Our workers and equipment are fully covered by General Liability and Workmen's Compensation Insurance. Proof will be provided upon request.

This agreement is contingent on soil passing necessary testing.

Authorized signature_____ Date 5-12-17
Brian Bonen, President

Acceptance of Agreement

The above prices, specifications and conditions are satisfactory and are hereby accepted.

Signed_____ Date of acceptance 5/12/17

933

COUNTY OF HOUGHTON
SOIL EROSION AND SEDIMENTATION CONTROL PERMIT

(issued under the authority of part 91, Soil Erosion and Sedimentation Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended)

Permitee: Charlie Kiilunen

Address: 52705 State Highway M-26
Lake Linden, MI 49945

Permit No.:	16-933-SE
Issued:	11-14-16
Expires:	11-14-21
Extended:	

On-Site Responsible Person: Name: Pat Ziemnick

Company: Ziemnick Excavating Telephone Number: (906) 296-9723 or 370-9723

Permitted Activity:

Sand Pit

Project Location: Town: 55N ; Range: 32W ; Section: 7

City or Township: Torch Lake Township

Address: same as above

Permit Conditions:

1. The permitted activity shall be completed in accordance with the approved plans and specifications and the attached general and specific conditions.
2. This permit does not waive the necessity for obtaining all other required federal, state, or local permits.
3. Permitee shall notify the permitting agency within one week after completing the permitted activity or one week prior to the permit expiration date, whichever comes first.

John Pekkala
Permitting Agent

(906) 482-4491
Telephone Number

THIS PERMIT MUST BE POSTED AT THE PROJECT SITE.

HOUGHTON COUNTY DRAIN COMMISSIONER

401 E. HOUGHTON AVENUE
HOUGHTON, MI 49931
Phone (906) 482-4491 FAX (906) 482-7238
jpekkala@houghtoncounty.net

November 14, 2016

Pat Ziemnick
Ziemnick Excavating
52655 M-26
Lake Linden, MI 49945

RE: Soil Erosion and Sedimentation Control Permit No. 16-933-SE

Dear Mr. Ziemnick:

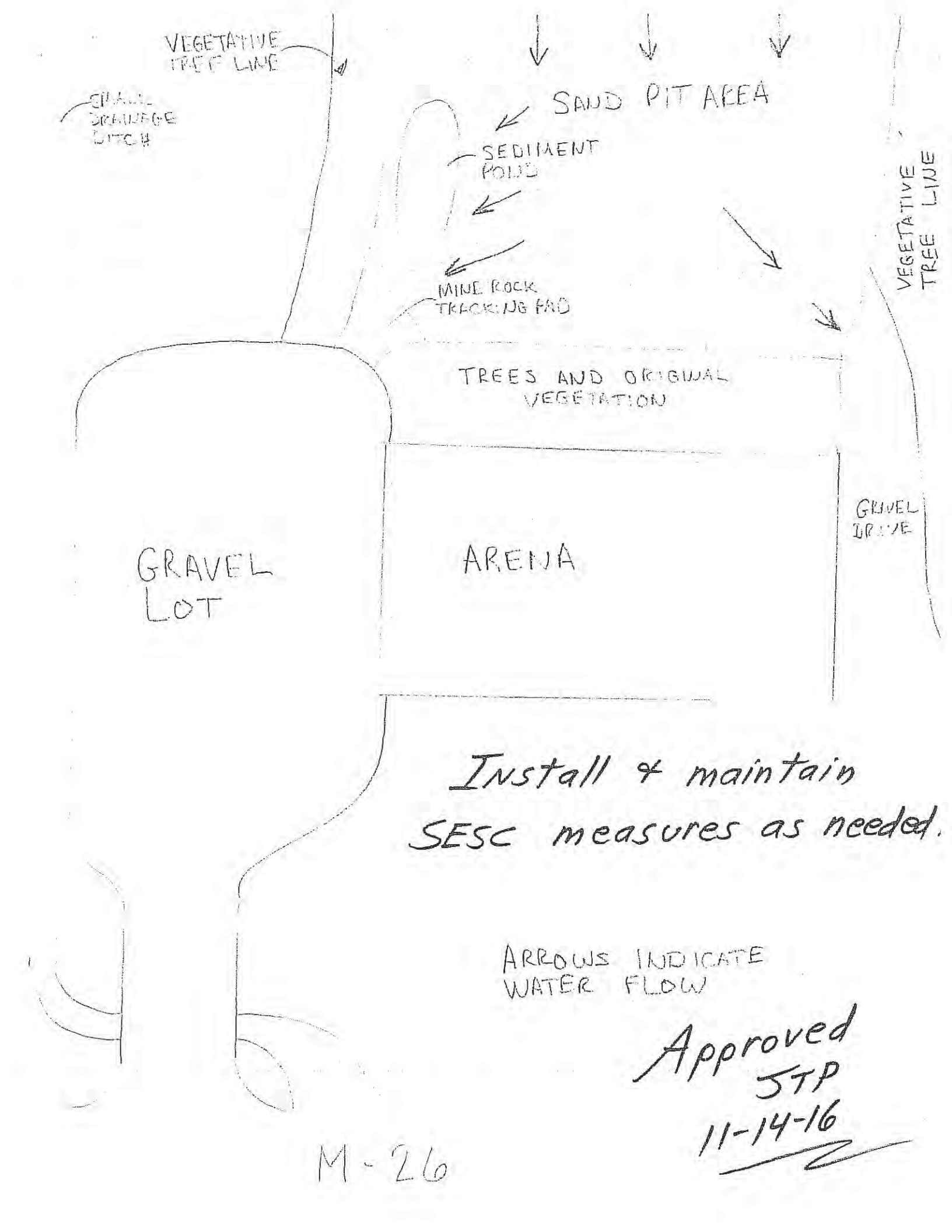
Enclosed, please find a Soil Erosion and Sedimentation Control (SESC) Permit and approved SESC Site Plan for the proposed earth change at the location specified on the permit. Please notify the Houghton County Drain Commissioner's Office 48 hours prior to commencing the earth change.

If you have any questions, please feel free to contact my office.

Sincerely,

John Pekkala

John Pekkala, Drain Commissioner
County Enforcing Agent for
Soil Erosion and Sedimentation Control


VEGETATIVE TREE LINE
SMALL DRAINAGE DITCH
SAND PIT AREA
SEDIMENT POND
MINE ROCK TRACKING PAD
VEGETATIVE TREE LINE
TREES AND ORIGINAL VEGETATION
GRAVEL DRIVE
GRAVEL LOT
ARENA
Install & maintain SESC measures as needed.
ARROWS INDICATE WATER FLOW
Approved STP 11-14-16

M-26

SOIL EROSION AND SEDIMENTATION POLLUTION CONTROL APPLICATION

Part 91, P.A. 451 of 1994

Houghton County Drain Commissioner
401 E. Houghton Avenue
Houghton, MI 49931
(906) 482-4491

Permit Number	16-933-SE
Date Issued	11-14-16
Expiration Date	11-14-21
Permit Fee $	200.00

For Questions, please call: *John Pekkala -Office (906) 482-4491*
Home (906) 482-0765

Receipt # 663374

1. APPLICANT (Please check if the applicant is the landowner or designated agent*) ( ) Landowner (X) Designated Agent

Name	Address			
PAT Ziemnick	52655 M-26			
City	**State**	**Zip**	**Area Code/Telephone**	
Lake Linden MI	MI	49945	296-9723	

2. LOCATION	Section	Town	Range	Lot No(s)	Township	Street Address:
	7	55N.	32W		TORCH LAKE	52705 M-26

City/Village	Property ID # or Attach Property Legal Description:
Lake Linden MI	31-014-307-005-00

3. PROPOSED EARTH CHANGE **Project Type:** ( ) Residential ( ) Multi-Family (X) Commercial ( ) Industrial ( ) Land Balancing ( ) Other

Describe Project	Size of Earth Change (Acres or Square Feet)
SAND PIT	1 ACRE

Distance to Nearest Lake, Stream or Dam	Watercourse(s) Affected:	Project Start Date:	Project Complete Date:
125 ft.	NO	9-6-16	—

4. SOIL EROSION AND SEDIMENT POLLUTION CONTROL PLAN
(Note: Two (2) sets of complete plans must be attached.)

Estimated Cost of Erosion & Sedimentation Control $	Plan Preparer's Name and Telephone Number:	Area Code
500.00	PAT Ziemnick	(906) 296-9723

5. PARTIES RESPONSIBLE FOR EARTH CHANGE: Property Owner of Record (If not provided in Box No.1 above)
NAME: 52705 State Highway M-26 LLC

Address	City	State	Zip	Area Code/Telephone
52705 State Highway M-26	Lake Linden	MI	49945	906.296.9633

6. Name of Individual "On Site" Responsible for Earth Change	Company Name
PAT Ziemnick	ZIEMNICK Excavating

Address	City	State	Zip	Area Code/Telephone
52655 M-26	Lake Linden	MI	49945	906-296-9723

I (we) affirm that the above information is accurate and that I (we) will conduct the above described earth change in accordance with Part 91, Soil Erosion and Sedimentation Control, of the Natural Resource and Environmental Protection Act, 1994 PA 451, as amended, applicable local ordinances, and the documents accompanying this application.

Landowner's Signature [signature] **Date:** 9/7/16

Designated Agents Signature* [signature] **Date:** 8-31-16

*** Designated agent must have a written statement from landowner authorizing him/her to secure a permit in the landowner's name.**

HOUGHTON COUNTY DRAIN COMMISSIONER
SOIL EROSION/SEDIMENTATION CONTROL

401 E. Houghton Avenue
Houghton, MI 49931
Phone (906)482-4491 FAX (906)482-7238

LETTER OF AUTHORIZATION

(Note: Complete this form only if the permit applicant or primary contact person is not the landowner of record.)

Type of Project: SAND PIT

Location of Project: LAKE LINDEN MI 49945

Township/City: TORCH LAKE TWP.

Property Tax ID#: _____

As landowner of the property described above, I authorize the person indicated below to act on my behalf for the purposes of this application for a Soil Erosion and Sediment Control Permit pursuant to Part 91, Soil Erosion and Sedimentation Control, of the Natural Resources and Environmental Protection Act, Act No. 451 of the Public Acts of 1994, as amended. I understand that I am responsible for all earth changes related to this project and understand that Part 91, Act 451 may be enforced against me in the event of any violation of that Act.

LANDOWNER:

52705 State Highway M-26 LLC (Charles Kilunen)
(Please print or type)

CK
(Signature)

52705 State Highway M-26, Lake Linden, MI 49945 906-296-9633
(Address and Phone Number)

LANDOWNER'S AUTHORIZED AGENT:

PATRICK ZIEMNICK
(Please print or type)

APPENDIX E: PERMITS

HOUGHTON COUNTY DRAIN COMMISSIONER
401 E. HOUGHTON AVENUE
HOUGHTON, MI 49931
Phone (906) 482-4491 FAX (906) 482-7238
jpekkala@houghtoncounty.net

June 15, 2017

Brian Bonen
B&B Contracting, Calumet, Inc.
55670 Hwy M26
Calumet, MI 49913

RE: Soil Erosion and Sedimentation Control Permit No. 17-963-SE

Dear Mr. Bonen:

Enclosed is a Soil Erosion and Sedimentation Control (SESC) Permit for the proposed earth change at the location specified on the permit. The SESC Site Plan that was submitted has been approved and is on file at the Houghton County Drain Commissioner's Office. Please notify my office 48 hours prior to commencing the earth change.

If you have any questions, feel free to contact me.

Sincerely,

John Pekkala

John Pekkala, Drain Commissioner
County Enforcing Agent for
Soil Erosion and Sedimentation Control

COUNTY OF HOUGHTON
SOIL EROSION AND SEDIMENTATION CONTROL PERMIT

(issued under the authority of part 91, Soil Erosion and Sedimentation Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended)

Permitee: Houghton Forest Products

Address: Attn. Mr. Ken Buchanan
1174 Dawson Road
Thunder Bay, Ontario, Canada, P7G1H6

Permit No.:	17-963-SE
Issued:	06-15-17
Expires:	06-15-18
Extended:	

On-Site Responsible Person: Name: Brian Bonen

Company: B&B Contracting, Calumet, Inc. Telephone Number: (906) 337-0017 or 281-2587

Permitted Activity:

Cap Coal Dock burn area, improve southern drainage ditch, remove PCB contaminated soils, construct associated haul roads

Project Location: Town: 55N ; Range: 32W ; Section: 7

City or Township: Torch Lake Township
Address: 52634 Hwy M26

Permit Conditions:

1. The permitted activity shall be completed in accordance with the approved plans and specifications and the attached general and specific conditions.
2. This permit does not waive the necessity for obtaining all other required federal, state, or local permits.
3. Permitee shall notify the permitting agency within one week after completing the permitted activity or one week prior to the permit expiration date, whichever comes first.

John Pekkala
Permitting Agent

(906) 482-4491
Telephone Number

THIS PERMIT MUST BE POSTED AT THE PROJECT SITE.

Permit Number: 17-963-SE

General Conditions:

In accordance with rule 1709 promulgated under the authority of part 91, Soil Erosion and Sedimentation Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, and in addition to the information on the attached plan(s) and special conditions, the following general conditions apply to the earth change authorized by this permit:

- Design, construct, and complete the earth change in a manner that limits the exposed area of disturbed land for the shortest period of time.
- Remove sediment caused by accelerated soil erosion from runoff water before it leaves the site of the earth change.
- Temporary or permanent control measures shall be designed and installed to convey water around, through, or from the earth change at a non-erosive velocity.
- Install temporary soil erosion and sedimentation control measures before or upon commencement of the earth change activity and maintain the measures on a daily basis. Remove temporary soil erosion and sedimentation control measures after permanent soil erosion measures are in place and the area is stabilized. (Stabilized means the establishment of vegetation or the proper placement, grading; or covering of soil to ensure its resistance to soil erosion, sliding, or other earth movement.)
- Complete permanent soil erosion control measures for the earth change within five calendar days after final grading or upon completion of the final earth change. If it is not possible to permanently stabilize the earth changes, then maintain temporary soil erosion and sedimentation control measures until permanent soil erosion control measures are in place and the area is stabilized.

SPECIFIC CONDITIONS

48 hours notice prior to earth change

SOIL EROSION AND SEDIMENTATION POLLUTION CONTROL APPLICATION

Part 91, P.A. 451 of 1994

Houghton County Drain Commissioner
401 E. Houghton Avenue
Houghton, MI 49931
(906) 482-4491

Permit Number	17-963-SE
Date Issued	6-15-17
Expiration Date	6-15-18
Permit Fee $	480.00

For Questions, please call: *John Pekkala -Office (906) 482-4491*
Home (906) 482-0765

Receipt # 178478

1. APPLICANT (Please check if the applicant is the landowner or designated agent*) ( ) Landowner (X) Designated Agent

Name B&B Contracting, Calumet, Inc.	Address 55670 Hwy M26		
City Calumet	State MI	Zip 49913	Area Code/Telephone (906)337-0017

2. LOCATION	Section 7	Town T55N	Range 32W	Lot No(s)	Township Torch Lake	Street Address: 52634 Hwy M26
City/Village Village of Hubbell					Property ID # or Attach Property Legal Description:	

3. PROPOSED EARTH CHANGE — **Project Type:** ( ) Residential ( ) Multi-Family ( ) Commercial ( ) Industrial ( ) Land Balancing (X) Other

Describe Project: Cap Coal Dock burn area, improve southern drainage ditch, remove PCB contaminated soils, construct associated haul roads			Size of Earth Change (Acres or Square Feet) 8 acres
Distance to Nearest Lake, Stream or Dam 0 ft.	Watercourse(s) Affected: Torch Lake	Project Start Date: 6/19/2017	Project Complete Date: October 31, 2017

4. SOIL EROSION AND SEDIMENT POLLUTION CONTROL PLAN
(Note: Two (2) sets of complete plans must be attached.)

Estimated Cost of Erosion & Sedimentation Control $ 5,200	Plan Preparer's Name and Telephone Number: Area Code Mannik & Smith Group, Inc Jed Chrestensen(906)487-7452

5. PARTIES RESPONSIBLE FOR EARTH CHANGE: Property Owner of Record (If not provided in Box No.1 above)

NAME: Houghton Forest Products		Siver Shores Enterprises, Inc.			
Address: Mr. Ken Buchanan 1174 Dawson Road Thunder Bay, ONT P7G1H6	City: Mr. William H. Siler 45505 Champion St South Range, MI 49963	State	Zip	Area Code/Telephone	

6. Name of Individual "On Site" Responsible for Earth Change Brian Bonen		Company Name B&B Contracting, Calumet, Inc		
Address 55670 Hwy M26	City Calumet	State MI	Zip 49913	Area Code/Telephone (906)337-0017

I (we) affirm that the above information is accurate and that I (we) will conduct the above described earth change in accordance with Part 91, Soil Erosion and Sedimentation Control, of the Natural Resource and Environmental Protection Act, 1994 PA 451, as amended, applicable local ordinances, and the documents accompanying this application.

Landowner's Signature **Date:**

Designated Agents Signature* [signature] B&B Contracting, Calumet, Inc **Date:** 6/13/2017

*** Designated agent must have a written statement from landowner authorizing him/her to secure a permit in the landowner's name.**

NOTIFICATION OF INTENT TO RENOVATE/DEMOLISH

ĀÄ !Ä"#$%&'(#)*Ā'$*%+,%'$-Ä)+$Ā'$*#.%/0#.Ä*1%
2Ā&'/3%#Ä)%/0#.Ä*1%&Ä-Ä4Ä+$
$'4!#(5%67% ,)%(89:%5%4=?89:%Ā

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)'"0.#*+)1%#,,#Ä)4%2.#)#35%#4@'4*+4%()+")#Ā5%
(A#A%<BC%+,%<DE,4%#Ā'$&'& 5%4FG:HIJ%KLM8%I9E3

1. NOTIFICATION:

&8:F%IM%$I:HMHG8:HIJ%*S?FN 7YK[YK7<[&IG=QFJ:%RN%% 77777DDCDD
&8:F%IM%+9HOHJ8PN +9HOHJ8P%&IG=QFJ:%RN%
$I:HMHG8:HIJ%*S?FN ☑ +9HOHJ8P ☐)FUHVFT%%% ☐ 8JGFPFT

Mark appropriate boxes: (both DEQ and LARA may apply):

DEQ (NESHAP) [*260 ln. ft./160 sq. ft. or more is threshold*]

☑ (P8JJFT%)FJIU8:HIJ%L%%working%T8SV%JI:HGF
☐ 'QF9OFJGS%)FJIU8:HIJ
☐ 4GWFT=PFT%&FQIPH:HIJ%working%T8SV%JI:HGF
☐ ĀJ:FJ:HIJ8P%@=9J%working%T8SV%JI:HGF
☐ +9TF9FT%&FQIPH:HIJ

LARA (MIOSHA) [*Will not accept annual notifications*]

☐ &FQI5%)FJI5%'JG8?A%2X<7%PJA%M:AY<Calendar%T8SV%JI:HGF
☐ 'QF9OFJGS%)FJIU8:HIJY'JG8?V=P8:HIJ

4. DEMOLITION CONTRACTOR: ĀJ:F9J8P%(9I\FG:%RN

$8QFN%
Ā8HPHJO%#TT9FVVN%%%%
H:SY4:8:FY]H?N%%%
'LQ8HPN%%
IJ:8G:N% (WIJFN%%%%

5. FACILITY OWNER: ĀJ:F9J8P%(9I\FG:%RN

$8QFN%4:8:F%IM%ĀHGWHO8J
Ā8HPHJO%#TT9FVVN%%%% B<<%%A%4:A%_IVF?W%4:9FF:%%CB7%^FV:%#PPF
H:SY4:8:FY]H?N%%% 8JVJO5%ĀÄ%%6ED7D
'LQ8HPN%%
IJ:8G:N%!8JV%!88?8P8 (WIJFN%%%% D?LQ8B[L77<[

Calculate LARA Asbestos Project Fee:2<d%(9I\FG:%,FF3%% ☐ *HQF%c%Q8:F9H8P

*I:8P%(9I\FG:% IV:N% `7A77 a%7A7<%7A77
*S?F%IM% IJ:98G:I9N% .HGFJVF%$IN%
.HGFJVHJO%#=:WI9H:SN%

2. PROJECT SCHEDULE:

☐ WFGe%WF9F%HM%:WHV%HV%8%Q=P:HL?W8VFT%?9IV%FGV5%8J8%WF8%V%8%WFTFIPF
T8:F%IM%F8GW8VFA

	START DATE	END DATE
g)FJIU8:HIJN		
i #V>A%)FQIU8PN	7[Y<<YK7<[	7EYKKYK7<[
i &FQIPH:HIJN		
'JG8?V=P8:HIJN		

g%ĀJGP=TFV%VF:=?5%>=HPT%FJGPIV=9F5%8V>FV:IV%9FQIU8PYTFQI>HPHhH
iĀJGP=T5%V%:WIVF%T8SV%89F%GIJT=GH8V>FV:IV%9FQIU8PYTFQIA

Work Schedule: (PF8VF%HJTHG8:F%:WF%8J:HGH?8:FT%T8SV%IM%:WF%fI9e%WI=9V%89F%JT%fI9e%WI=9V
MI9%:WF%?=9?IVF%IM%VGWFT=PHJO%8%GIQ?PH8JGF%HJV?FG:HIJA

	Days of the Week	Work Hours
#V>A%)FQIU8PN	Ā5%*=5%^5%*W5%,	E%8AQA%L%C%?AQA
&FQIPH:HIJN		
'JG8?V=P8:HIJN		

☐ WFGe%WF9F%HM%:WF%fI9e%WI=9V%89F%JI:%:WF%V8QF%8V%FVF%aWI9%T8S%M9IQ%T8S%:I
T8S%8JT%8::8GW%8%TIG=QFJ:%fH:W%&F:8HPFT%^I9e%!I=9VA%%%

7. DISPOSAL SITE:

$8QFN%j%c%^%.8JTMHPP
.IG8:HIJ%#TT9FVVN%%%%%%. <<FI%4:8:F%!HOWf8S%ĀBE
H:SY4:8:FY]H?N%%% !JV8OIJ5%ĀÄ%%6DDCB

8. WASTE TRANSPORTER(S):

$8QFN% 0??F9%(FJHJV=P8%#>8:FQFJ:% IQ?8JS%ĀJGI9?I98:FT
.IG8:HIJ%#TT9FVVN%%%%% B6D%0A%4A%!HOWf8S%6<%'A
H:SY4:8:FY]H?N%%% $F08=JFF5%ĀÄ%%6DE;;
$8QFN%
.IG8:HIJ%#TT9FVVN%%%%%
H:SY4:8:FY]H?N%%%

3. ABATEMENT CONTRACTOR: ĀJ:F9J8P%(9I\FG:%RN

$8QFN% 0??F9%(FJHJV=P8%#>8:FQFJ:% IQ?8JS5%ĀJGA
Ā8HPHJO%#TT9FVVN%%%% B0D%0A%4A%6<%!HOWf8S
H:SY4:8:FY]H?N%%% $F08=JFF5%ĀÄ%%6DE;;
'LQ8HPN%% T8PFk=?8>8:FQFJ:GIAGIQ
IJ:8G:N% &8PF% 899HF9 (WIJFN%%%% D?1Q6[CL6D77

9. ORDERED DEMOLITIONS: %24FF%$'4!#(%9FO=P8:HIJV%MI9%TFMHJH:HIJ%IM%I+9TF9FT%
%%%%%%&FQIPH:HIJAm3%#%GI?S%IM%:WF%IMMHGH8P%V%H9T5%8J%HV%8GW%8%TIG=QFJ:%fH:W%&F:8HPFT%^I9e%!I=9VA%%%

"IUn:%#OFJGS%+9TF9HJO%&FQIN
$8QFY*H:PF%IM%(F9VIJ%4HOJHJO%+9TF9N
&8:F%IM%+9TF9N &8:F%+9TF9FT%:I%@FOHJN

10. ASBESTOS INFORMATION

ĀV%8V>FV:IV%?9FVIFa%% *(Fa% assumed or identified in asbestos inspection report)* ☑ 1FV ☐ $I ^HPP%8V>FV:IV%>F%9FQIUFT%?9HI9%:I%TFQIA ☐ HFJV6 ☐ $I

Estimate the amount of asbestos: *Include RACM (Regulated Asbestos Containing Material) to be removed, encapsulated, etc. Also include the amount and type (floor tile, roofing, etc.) of non-friable Category I and/or Category II ACM that **will not** be removed prior to demolition. (**NOTE:** In a demolition, cementatious ACM **cannot** remain in a structure, as it is likely to become regulated in the demolition/handling process. It **must** be removed prior to demolition. Also, all asbestos must be removed prior to an intentional burn.)*

)# ĀY# Ā :I%>F%9FQIUFT)# Ā%:I%>F 'JG8?V=P8:FT $IJLM9H8>PF%#not9FQIUFT%?9HI9%:I%TFQIA 8:FOI9S%Ā 8:FOI9S%ĀÄ 0JH:V%IM%ĀF8V=9F

				☐ .JA%,:A ☐ .JA%ĀA
C77				☑ 4ZA%,:A ☐ 4ZA%ĀA
				☐ =A%,:Ag ☐ =A%ĀAg

g-IP=QF%2G=>HG%M:AYQF:F9V3%VWI=PT%>F%=VFT%IJ%S%F%M%:WF%HF8GW%8%TIG=QF8V=9F%2Fa8Q?PFN%8V>FV:IV%%W8%GW%8%TIG=QFJ%IMM

NOTIFICATION OF INTENT TO RENOVATE/DEMOLISH (continued)

11. PROJECT DESCRIPTION: IQ?PF:F%**A) for Renovation**%28V>FV:IV%9FQIU8PYFJG8?V=P8:FTN **B) for Demolition:**

A) RENOVATION: Ā89e%8PP%V=9M8GFVY:S?FV%IM%)# Ā%:I%>F%9FQIUFTN **Encapsulation (for LARA):** Ā89e%V=9M8GFVY:S?FV%:I%>F%FJG8?V=P8:FTN

☐ (H?HJO ☐ ,H::HJOV ☐ @IHPF92V3 ☐ *8JeV2V3 ☐ (H?HJO ☐ ,H::HJOV ☐ @IHPF92V3 ☐ *8JeV2V3
☐ @F8Q2V3 ☐ &=G:2V3 ☐ *=JJFP2V3 ☐ FHPHJO%*HPF2V3 ☐ @F8Q2V3 ☐ &=G:2V3 ☐ *=JJFP2V3 ☐ FHPHJO%*HPF2V3
☐ Ā8O%@PIG☑ +:WF9%2TFVG9H>F3N ☐ +:WF9%2TFVG9H>F3N
+MM%:WF%O9I=JT

Method of removal:%&FVG9H>F%WIf%:WF%8V>FV:IV%fHPP%>F%9FQIUFTN%%%%%%%%%%%%%%

☐ "PIUF%@8O% ☐ $FOA%(9FVV=9F% IJ:A% ☑ =:%HJ:I%VFG:HIJV%8JT%9FQIUF ☐ !8JT%4G98?HJO%
☐ &9S%)FQIU8P%2?PF8VF%?9IUHTF%8::8GWQFJ:%fH:W%8% ☐ +:WF9%2TFVG9H>F3N
!8JT%?HGeHJO

B) DEMOLITION:%ĀJTHG8:F%HM%GIQ?PF:F%I9%?89:H8P%TFQIPH:HIJN

☐ **Complete** I9 ☐ **Partial**%2TFVG9H>F%?89:%IM%M8GHPH:S%:I%>F%TFQIPHVWFT3N

Method of Demolition:%%&FVG9H>F%:WF%QF:WIT%IM%TFQIPH:HIJ%IM%M8GHPH:S5%>9HTOF5%F:GAN

☐ 'aG8U8:I9%I9%I:WF9%WF8US%FZ=H?QFJ:% ☑ &HV8VVFQ>PS%>S%W8JT ☐ %'a?PIVIFV ☐ +:WF9%2TFVG9H>F3N

12. ENGINEERING CONTROLS:%&FVG9H>F%fI9e%?98G:HGFV%8JT%FJOHJFF9HJO%GIJ:9 JF%V%+VH>F%:%?FQFJV>HIJV%>FMI9F5%T=9HJO5%8JT%8M HP%9F:GU9FPS%2V8?N:
☑ ^8:F9%V?98S%:I%GIJ:9IP%T=V ☐ %(P8GF%HJ%PF8e%:HOW:%GI ☒ #JF9%8:FPS%fF:%Q8:F9H8P ☐ +:WF9%2TVG9H>F3N

13. UNEXPECTED ASBESTOS: &FVG9H>F%:WF%V:F?V%SI=%HJ:FJT%:I%MIPPIf%HJ%:WF%FJT%#Ā%8I%WF2T%I9%?9FUHI=VPS%JIJLM9H8>PF%8 M9H8>PF%FQF%%%%%
2G9=Q>PFT5%?=PUF9HhFT5%9FT=GFT%:I%?IfTF95%F:GA 8FTF%W F9FMI9F%9
☐ %4:I?%^I9e% ☑ ^F:%Q8:F9H8P% ☐ IJ:8G:%&'/%8JT%8>8:FQFJ:%GIJ:98G:I9 ☐ %)FUHVF%JI:HMHG8:HIJ ☐ +:WF9%2TFVG9H>F3N

14. PROCEDURE(S) USED TO DETECT THE PRESENCE OF ASBESTOS:

#3%ĀJTHG8:F%WIf%SI=%TF:F9QHJFT%fWF:WF9%I9%JI:%8 F%HM8 H\SA%ĀM%8J8PS:HG8P%V8Q?PHJO%f8V%=V F8 8F%FSV%G9A%2*%QF%MTF%MQHJ8:HIJ%IM%:WF%?9
%%%%%I9%8>VFJGF%IM%8V>FV:IV%Q=V:%>F%Q8TF%?9F JI9%:H\V=FQIPHJO%%:HMHG8:HIJ3N%%%%%%%%%%%%%%
☑ #PP%V=V?FG:%Q8:F9H8PV%V8Q?PFT%8JT%8J8PShFT%=V %Ā%G%fP%QHF5%2(ĀJW ☐ %+:WF9%2TFVG9H>F3N

@3%$8QF5%8TT9FVV5%8JT%?WIJF%J=Q>F9%IM%GIQ?8JS%?F %M%9%HJ%F%V:IJ%4IP=:HIJV5%ĀJGA5%KK6LE;6L[K77 8%B7%4%(P F%M%K5%
Ā=JTFPFH%Ā.%%%;%%%
3%$8QF5%8GG9FTH:8:HIJ%J=Q>F9%IM%HJV?FG:I95%8JT%IJ8I%%MHGW8:PF% 8V:HPPI5%#6;<EB5%<7Y<CYK7<6

15. EMERGENCY RENOVATIONS: &8:FY:HQF%IM%FQF9OFJGSN
&FVG9H>F%:WF%V%F JFG:FT%FUFJ:N

'a ?P8HJ%WIf%:WF%FUFJ:%G8=VFT%=JV8M %%8JTI9%IHJ8JT%G8=Z=FQF J:%T8Q8F%8JTYI9%8J%=J9F8VIJ8>PF%MHJ8JGH8P%>=9TFJN

16. Ā%GF9:HMS%:W8:%8J%HJTHUHT=8P%:98HJFT%HJ%)%(8%?I5%#HJ%?%8M%A57%HPP%>F%IJLVH:F%T=9HJO%:W F%9F JI9%TFQI%8J:HIJ%HJUIPUHJO%)# Ā%8>IUF%:WF
%%%%%%:W9FVWIPT%8JTYI9%T=9HJO%8J%I9TF9FT%W %?:W:HV%A?FUVIJF%VBV%GIQ?PF:FT%:WF%9FZ=H9FT%H98+HJ%M%9HR%?F%8U8%8:%:WF%9FJIU8:HIJ%I9%TFQ
%%%%%%

&8PF%,A% 899HF9 7;YK[YK7<[
Signature of Owner or Abatement/Demolition Contractor *Date*

17. Signature Requirements for Projects with Negative Pressure Enclosures: (required by LARA)

Per Section 221(1)(2) of P.A. 135 of 1986, as amended, clearance air monitoring is required for any asbestos abatement project involving 10 linear feet/15 square feet or more of friable material which is performed within a negative pressure enclosure. I (the building owner or lessee) have been advised by the contractor of my responsibility under Act 135 to have clearance air monitoring performed on this project.

Signature of Building Owner or Lessee *Date* *Signature of Asbestos Abatement Contractor Representative*% *Date*

NOTE: **It is not mandatory that a signed copy be sent to LARA unless requested.**

,I9%8MMFG:FT%?9I\FG:V5%:WHV%VFG:HIJ%IM%:WF%J:%MFGSI%?%H %OJFT5%8JT%Q %our%%%%%>FMI9F%:WF%?9I\FG:%>FOHJVA

18. I certify that the above information is correct:

&8PF%,A% 899HF9 7;YK[YK7<[&8PF%,A% 899HF9 7;YK[YK7<[
Printed Name of Owner/Operator *Date* *Signature of Owner/Operator* *Date*

200 Michigan Street, Suite 705, Hancock, MI 49930
906-487-7452
www.MannikSmithGroup.com

LETTER OF TRANSMITTAL

To: Mr. Hans Haapala
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913

Project #: MDEQ0070
Date: June 30, 2017

Re: Submittal #010 – Concrete Mix Design
MDEQ Torch Lake Non-Superfund Site
Hubbell Processing Area

Enclosed are the following:

No. of Copies	Description
1	Approval of Submittal #010

The above items are transmitted as checked below:

☐ For review and approval ☐ For review and comment ☐ Returned for corrections
☒ For your use ☒ Approved as submitted ☐ Approved as noted
☐ As requested ☐ Other:

Remarks:

Copies To: MDEQ-RRD, Calumet District Office

File

Signed:

Printed: Jed Chrestensen
Project Engineer

This transmittal is subject to the following conditions to which you agree by accepting these terms on a reply to this message or using the information in any manner, including but not limited to, copying or using the information for reference.

1. Any work product of The Mannik & Smith Group, Inc. may not be altered in manner, form or content without our prior express written consent.
2. If you discover any errors and/or omissions in the attached information, you will promptly notify us so that we can make any necessary revisions.
3. For any electronic file(s) attached hereto, The Mannik & Smith Group, Inc. is not responsible for any errors caused by the transmission of said files, your software, or your computer systems.

SUBMITTAL# 010

DATE: June 29, 2017

Michigan Department of Environmental Quality
Torch Lake Non-Superfund Site
Hubbell Processing Area
Hubbell, MI
File No.: 761/16108.SAR Index No.44251

TO:
Jed Chrestensen
The Mannik & Smith Group, Inc
200 Michigan Street, Suite 705
Hancock, MI 49930

FROM:
Hans Haapala, Project Manager, 906-281-6908
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913

SUBMITTAL TYPE:

☒ Product Data	☐ Certificates	☐Record Documents	☐ Operation/Maintenance Manuals
☐Shop Drawings	☐Manufacturer's Instructions	☐Samples	☐ Contract Closeout
☐Test Reports	☐Construction Photographs	☐ Administrative	☐Other

SUPPLIER: Superior Sand & Gravel, Inc.

SPECIFICATION NUMBER AND TITLE: 03 Concrete

PART	TYPE	DESCRIPTION
1.3.1	Product Data	Concrete Mix Design

B&B Contracting, Calumet, Inc. certifies that review, approval verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents.

Signed: _____

Digitally signed by Hans P. Haapala
DN: cn=Hans P. Haapala, o=B&B Contracting, Calumet, Inc., ou=Project Engineer, email=hanshaapala@gmail.com, c=US
Date: 2017.06.29 13:28:28 -04'00'

Date: 6/29/17

APPROVED
6-30-17

An Equal Opportunity Employer
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913
Office: 906-337-0017
Fax: 906-934-2587

TRANSMITTAL

DATE:

June 29, 2017

FROM:

Hans Haapala (906)281-6908

ATTN:

Jed Chrestensen, P.E.

JOB NAME:

Torch Lake Non-Superfund Site
Hubbell Processing Area

ADDRESS:

The Mannik & Smith Group, Inc.
200 Michigan Street, Suite 705
Hancock, MI 49930

ATTACHED:

Submittal #010
Concrete Mix Design

PHONE NUMBER:

(906)487-7451

RE:

Concrete Mix Design

O URGENT **X** FOR REVIEW **O** PLEASE COMMENT **O** PLEASE REPLY **O** PLEASE RECYCLE

Notes/Comments:

Please review the attached submittal.

SUBMITTAL#___010

DATE: June 29, 2017

Michigan Department of Environmental Quality
Torch Lake Non-Superfund Site
Hubbell Processing Area
Hubbell, MI
File No.: 761/16108.SAR Index No.44251

TO:
Jed Chrestensen
The Mannik & Smith Group, Inc
200 Michigan Street, Suite 705
Hancock, MI 49930

FROM:
Hans Haapala, Project Manager, 906-281-6908
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913

SUBMITTAL TYPE:

☒ Product Data	☐ Certificates	☐Record Documents	☐ Operation/Maintenance Manuals
☐Shop Drawings	☐Manufacturer's Instructions	☐Samples	☐ Contract Closeout
☐Test Reports	☐Construction Photographs	☐ Administrative	☐Other

SUPPLIER: Superior Sand & Gravel, Inc.

SPECIFICATION NUMBER AND TITLE: 03 Concrete

PART	TYPE	DESCRIPTION
1.3.1	Product Data	Concrete Mix Design

B&B Contracting, Calumet, Inc. certifies that review, approval verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents. Signed: _____ Date: 6/29/17	

Superior Sand & Gravel, Inc.

PO Box 300

Hancock, Michigan 49930

Ph: (906) 482-3130 Fax: (906) 482-2340

517 lbs Cementitious
15% Fly Ash
0% NewCem

Design: Wall Mix
Job: Hubbell Processing Area
PSI: 3,500 SSG Mix # 21

MATERIAL	SPG	LBS/CFT	WEIGHT	MOISTURE	LB/CFT	Volume	MATERIAL
Type I Cement	3.150	62.40	439 lbs	0.00%	196.56	2.23	Type I Cement
Fly Ash	2.640	62.40	78 lbs	0.00%	164.74	0.47	Fly Ash
Crushed Slag	2.980	62.40	0 lbs	0.00%	185.95	0.00	Crushed Slag
Silica Fume	2.170	62.40	0 lbs	0.00%	135.41	0.00	Silica Fume
6-A (normal)	2.670	62.40	1,470 lbs	0.00%	166.61	8.82	6-A
28-B [34R]	2.670	62.40	250 lbs	0.00%	166.61	1.50	28-B [34R]
3/4" Nominal Stone	2.670	62.40	0 lbs	0.50%	166.61	0.00	3/4" Nominal Stone
2-NS (normal)	2.650	62.40	1,430 lbs	3.50%	165.36	8.35	2-NS (normal)
W/C Ratio 0.50	1.000	62.40	259 lbs		62.40	4.15	62.4
Entrapped Air	2.00%					0.54	Entrapped Air
Added Air	4.00%					1.08	Added Air
Total Air	6.00%		3,926 lbs Total weight			27.14	Cubic Feet

Admixture	OZ/cwt	SPG	OUNCES
Micro-Air	0.40	0.00	2.1
Rheobuild 1000		0.00	0.0
Polyheed 997 MRWR	9.00	0.00	46.5
Pozzutec 20+		0.00	0.0
Glenium 7500 or 7700		0.00	0.0
100-XR		0.00	0.0
122-HE	12.00	0.00	62.0
Delvo Stabilizer		0.00	0.0
Rheomac SF 100		lbs/cyd	
Rheocrete CNI		Gal/cyd	
Concrete Dye (DCS)			
		Total Ounces	110.6
		Total Gallons	0.86

Total Water:	31.1	Gallons
6-A	- 0.0	"
28-B	- 0.0	
LWA	- 0.0	"
2-NS	- 6.0	"
Added Water	25.1	Gallons

Admixture dosage rates are approximate. Dosage rates may be adjusted during manufacture to achieve desired mix characteristics at job site.

200 Michigan Street, Suite 705, Hancock, MI 49930
906-487-7452
www.MannikSmithGroup.com

LETTER OF TRANSMITTAL

To: Mr. Hans Haapala
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913

Project #: MDEQ0070
Date: July 5, 2017

Re: Submittal #011 – Erosion Control
MDEQ Torch Lake Non-Superfund Site
Hubbell Processing Area

Enclosed are the following:

No. of Copies	Description
1	Approval of Submittal #011

The above items are transmitted as checked below:

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☐ For review and comment
☒ Approved as submitted
☐ Other:
☐ Returned for corrections
☐ Approved as noted

Remarks:

Copies To: MDEQ-RRD, Calumet District Office

File

Signed:

Printed: Jed Chrestensen
Project Engineer

This transmittal is subject to the following conditions to which you agree by accepting these terms on a reply to this message or using the information in any manner, including but not limited to, copying or using the information for reference.

1. Any work product of The Mannik & Smith Group, Inc. may not be altered in manner, form or content without our prior express written consent.
2. If you discover any errors and/or omissions in the attached information, you will promptly notify us so that we can make any necessary revisions.
3. For any electronic file(s) attached hereto, The Mannik & Smith Group, Inc. is not responsible for any errors caused by the transmission of said files, your software, or your computer systems.

SUBMITTAL# 011

DATE: June 30, 2017

Michigan Department of Environmental Quality
Torch Lake Non-Superfund Site
Hubbell Processing Area
Hubbell, MI
File No.: 761/16108.SAR Index No.44251

TO:
Jed Chrestensen
The Mannik & Smith Group, Inc
200 Michigan Street, Suite 705
Hancock, MI 49930

FROM:
Hans Haapala, Project Manager, 906-281-6908
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913

SUBMITTAL TYPE:

☒ Product Data	☐ Certificates	☐Record Documents	☐ Operation/Maintenance Manuals
☐Shop Drawings	☐Manufacturer's Instructions	☐Samples	☐ Contract Closeout
☐Test Reports	☐Construction Photographs	☐ Administrative	☐Other

SUPPLIER: G & J Site Solutions, Inc.

SPECIFICATION NUMBER AND TITLE: 32 29 30 Erosion and Sediment Control

PART	TYPE	DESCRIPTION
2.1	Product Data	Silt Fence S2140 – CSI GeoTurf, Highland, MI
Drawing C-7	Product Data	Straw Mulch Blanket S75BN – North American Green – Poseyville, IN
Drawing C-8 rev 4/26/17	Product Data	Coconut Blanket C32 – Erosion Control Blanket – Riverton, MB, Canada

B&B Contracting, Calumet, Inc. certifies that review, approval verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents.

Signed: _____

Digitally signed by Hans P. Haapala
DN: cn=Hans P. Haapala, o=B&B Contracting, Calumet, Inc., ou=Project Engineer, email=hanshaapala@gmail.com, c=US
Date: 2017.06.30 15:46:59 -04'00'

Date: 6/30/17

APPROVED
7/5/17

An Equal Opportunity Employer
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913
Office: 906-337-0017
Fax: 906-934-2587

TRANSMITTAL

DATE:	***FROM:***
June 30, 2017	Hans Haapala (906)281-6908
ATTN:	*JOB NAME:*
Jed Chrestensen, P.E.	Torch Lake Non-Superfund Site Hubbell Processing Area
ADDRESS:	*ATTACHED:*
The Mannik & Smith Group, Inc. 200 Michigan Street, Suite 705 Hancock, MI 49930	Submittal #011 Erosion Control
PHONE NUMBER:	
(906)487-7451	
RE:	
Erosion Control	

O URGENT **X** FOR REVIEW **O** PLEASE COMMENT **O** PLEASE REPLY **O** PLEASE RECYCLE

Notes/Comments:

Please review the attached submittal.

SUBMITTAL#___011

DATE: June 30, 2017

Michigan Department of Environmental Quality
Torch Lake Non-Superfund Site
Hubbell Processing Area
Hubbell, MI

File No.: 761/16108.SAR Index No.44251

TO:

Jed Chrestensen

The Mannik & Smith Group, Inc

200 Michigan Street, Suite 705

Hancock, MI 49930

FROM:

Hans Haapala, Project Manager, 906-281-6908

B&B Contracting, Calumet, Inc.

55670 Hwy M-26

Calumet, MI 49913

SUBMITTAL TYPE:

☒ Product Data	☐ Certificates	☐Record Documents	☐ Operation/Maintenance Manuals
☐Shop Drawings	☐Manufacturer's Instructions	☐Samples	☐ Contract Closeout
☐Test Reports	☐Construction Photographs	☐ Administrative	☐Other

SUPPLIER: G & J Site Solutions, Inc.

SPECIFICATION NUMBER AND TITLE: 32 29 30 Erosion and Sediment Control

PART	TYPE	DESCRIPTION
2.1	Product Data	Silt Fence S2140 – CSI GeoTurf, Highland, MI
Drawing C-7	Product Data	Straw Mulch Blanket S75BN – North American Green – Poseyville, IN
Drawing C-8 rev 4/26/17	Product Data	Coconut Blanket C32 – Erosion Control Blanket – Riverton, MB, Canada

B&B Contracting, Calumet, Inc. certifies that review, approval verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents. Signed: _____ Date: 6/30/17	

Geoturf® S1240 - 36" MDOT

Woven Silt Fence Geotextile

Geoturf S1240 is a polypropylene black woven silt fence fabric. It is non-biodegradable and resistant to most soil chemicals, acids, and alkali with PH range of 3 to 12 and is manufactured to meet or exceed the following values:

October 2014

Property	Test Method	Minimum Average Roll Value* ENGLISH	
Grab Tensile Strength	ASTM D-4632	124 x 110	lbs.
Grab Elongation	ASTM D-4632	15 x 15	%
Mullen Burst	ASTM D-3786	200	psi
Puncture	ASTM D-4833	60	lbs.
Trapezoid Tear	ASTM D-4533	50	lbs.
UV Stability (500 hrs)	ASTM D-4355	70	%
A.O.S.	ASTM D-4751	30	U.S. Sieve
Permittivity	ASTM D-4491	0.1	sec^{-1}
Water Flow Rate	ASTM D-4491	8.0	gpm/ft^2

This information is to the best of our knowledge and belief accurate as of the date compiled. However no guarantee is made as to its accuracy reliability or completeness. It is the user's responsibility to satisfy his/her self as to the suitability and completeness of such information for his or her own particular use. We do not accept liability for any loss or damage that may occur from the use of this information nor do we offer any warranty against infringement.

ROLLMAX™
ROLLED EROSION CONTROL

Specification Sheet – BioNet® S75BN™ Erosion Control Blanket

DESCRIPTION

The short-term single net erosion control blanket shall be a machine-produced mat of 100% agricultural straw with a functional longevity of up to 12 months. (NOTE: functional longevity may vary depending upon climatic conditions, soil, geographical location, and elevation). The blanket shall be of consistent thickness with the straw evenly distributed over the entire area of the mat. The blanket shall be covered on the top side with a 100% biodegradable woven natural organic fiber net. The netting shall consist of machine directional strands formed from two intertwined yarns with across directional strands interwoven through the twisted machine strands (commonly referred to as a Leno weave) to form approximate 0.50 x 1.0 in. (1.27 x 2.54 cm) mesh. The blanket shall be sewn together on 1.50 inch (3.81 cm) centers with degradable thread. The blanket shall be manufactured with a colored thread stitched along both outer edges (approximately 2-5 inches [5-12.5 cm] from the edge) as an overlap guide for adjacent mats.

The S75BN shall meet Type 2.C specification requirements established by the Erosion Control Technology Council (ECTC) and Federal Highway Administration's (FHWA) FP-03 Section 713.17

Material Content		
Matrix	100% straw fiber	0.5 lbs/sq yd (0.27 kg/sm)
Netting	Top side only: Leno woven 100% biodegradable natural organic fiber	9.3 lbs/1000 sq ft (4.5 kg/100 sm)
Thread	Biodegradable	

Standard Roll Size	
Width	6.67 ft (2.0 m)
Length	108 ft (32.92 m)
Weight ± 10%	46.4 lbs (21.05 kg)
Area	80 sq yd (66.9 sm)

Design Permissible Shear Stress	
Unvegetated Shear Stress	1.60 psf (76 Pa)
Unvegetated Velocity	5.00 fps (1.52 m/s)

Index Property	Test Method	Typical
Thickness	ASTM D6525	0.29 in. (7.37 mm)
Resiliency	ECTC Guidelines	81.4%
Water Absorbency	ASTM D1117	440%
Mass/Unit Area	ASTM D6475	9.12 oz/sy (310 g/sm)
Swell	ECTC Guidelines	15.7%
Smolder Resistance	ECTC Guidelines	Yes
Stiffness	ASTM D1388	6.92 oz-in
Light Penetration	ASTM D6567	9.1%
Tensile Strength - MD	ASTM D6818	146.4 lbs/ft (2.17 kN/m)
Elongation - MD	ASTM D6818	10.9%
Tensile Strength - TD	ASTM D6818	109.2 lbs/ft (1.62 kN/m)
Elongation - TD	ASTM D6818	14.3%
Biomass Improvement	ASTM D7322	398%

Slope Design Data: C Factors			
	Slope Gradients (S)		
Slope Length (L)	≤ 3:1	3:1 – 2:1	≥ 2:1
≤ 20 ft (6 m)	0.029	N/A	N/A
20-50 ft	0.11	N/A	N/A
≥ 50 ft (15.2 m)	0.19	N/A	N/A

Roughness Coefficients – Unveg.	
Flow Depth	Manning's n
≤ 0.50 ft (0.15 m)	0.055
0.50 – 2.0 ft	0.055-0.021
≥ 2.0 ft (0.60 m)	0.021

Tensar

NORTH AMERICAN GREEN®

Tensar International Corporation
2500 Northwinds Parkway
Suite 500
Alpharetta, GA 30009
800-TENSAR-1
tensarcorp.com

Tensar International Corporation warrants that at the time of delivery the product furnished hereunder shall conform to the specification stated herein. Any other warranty including merchantability and fitness for a particular purpose, are hereby excluded. If the product does not meet specifications on this page and Tensar is notified prior to installation, Tensar will replace the product at no cost to the customer. **This product specification supersedes all prior specifications for the product described above and is not applicable to any products shipped prior to January 1, 2012.**

©2013 Tensar International Corporation

Erosion Control BLANKET

C32

Specification Sheet

The ErosionControlBlanket C32 is a long-term double net 100% coconut fiber erosion control blanket designed for use on extreme slope and channel applications requiring erosion control for up to 36 months depending on moisture, light, and environmental conditions. The blanket is sewn together on 1.5 inch (38.1 mm) centers. The C32 meets all requirements established in the FHWA FP-03 as a Type 4 erosion control blanket for use on slopes with gradients not exceeding 1:1 (h:v) and has been tested by the National Transportation Product Evaluation Program (NTPEP). The C32 comes packaged in clear shrink-wrap and includes installation instructions.

Product Nomenclature & Properties

C = 100% coconut fiber matrix
3 = coconut fiber matrix applied at a rate of 0.5 lbs/yd^2 (270 g/m^2)
2 = top & bottom stabilized photodegradable black net with a mesh size of 0.626 x 0.626 in (1.59 x 1.59 cm)
= UV stabilized photodegradable thread to ensure consistent functional longevity

Index & Bench Scale Testing

Test Description	Test Method	Test Results
Mass per Unit Area	ASTM D6475	7.31 oz/yd^2
Tensile Strength	ASTM D6818	24.0 lbs/in @ 22.1% MD 17.3 lbs/in @ 35.3% TD
Thickness	ASTM D6525	0.268 in
Light Penetration / Ground Cover	ASTM D6567	15.9% / 84.1%
Water Absorption	ASTM D 1117 & ECTCTASC 00197	199%
Unvegetated Bench-Scale Rain Splash and Runoff (not to be used as a design value)	ASTM D7101	Soil Loss Ratio* = 13.54 Soil Loss Ratio*= 18.69 Soil Loss Ratio*= 25.80
Unvegetated Bench-Scale Shear Stress (not to be used as design value)	ASTM D7207	2.75 lbs/ft^2 @ ½ in. soil loss
Seed Germination and Plant Growth Under Bench-Scale Conditions	ASTM D7322	266% Improvement (increased biomass)
*Soil Loss Ratio = Soil Loss Bare Soil / Soil Loss with RECP = 1 / C-Factor (Note: Soil loss is based on regression analysis)		

Design Values

- "C" factor = 0.002
- Maximum Permissible Shear Stress = 2.25 lbs/ft^2 (108 Pa)
- Maximum Permissible Velocity = 10 ft/sec (3.05 m/s)
- Manning's "n" = 0.03

Standard Roll Details

Width	2.44m (8ft)	4.88m (16ft)
Standard Length	34.3m (112.5ft)	34.3m (112.5ft)
Area	83.61m^2 (100yd^2)	167.2m^2 (200yd^2)
Weight ±10%	26.3kg (58lb)	51.7kg (114lb)

~~"Big Daddy"~~ Roll Details

Width	2.44m (8ft)	4.88m (16ft)
Standard Length	~~171.5m (562.5ft)~~	171.5m (562.5ft)
Area	418m^2 (500yd^2)	836.1m^2 (1000yd^2)
Weight ±10%	127kg (279lb)	254kg (558lb)

200 Michigan Street, Suite 705, Hancock, MI 49930
906-487-7452
www.MannikSmithGroup.com

LETTER OF TRANSMITTAL

To: Mr. Hans Haapala
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913

Project #: MDEQ0070
Date: July 5, 2017

Re: Submittal #012 – Seed/Fertilizer/Mulch
MDEQ Torch Lake Non-Superfund Site
Hubbell Processing Area

Enclosed are the following:

No. of Copies	Description
1	Approval as Noted of Submittal #012

The above items are transmitted as checked below:

☐ For review and approval
☒ For your use
☐ As requested
☐ For review and comment
☐ Approved as submitted
☐ Other:
☐ Returned for corrections
☒ Approved as noted

Remarks:

We will need to approve seed tickets in the field.

It is understood that fertilizer has been adjusted to reflect cap soil intended for use.

Copies To: MDEQ-RRD, Calumet District Office

File

Signed:

Printed: Jed Chrestensen
Project Engineer

This transmittal is subject to the following conditions to which you agree by accepting these terms on a reply to this message or using the information in any manner, including but not limited to, copying or using the information for reference.

1. Any work product of The Mannik & Smith Group, Inc. may not be altered in manner, form or content without our prior express written consent.
2. If you discover any errors and/or omissions in the attached information, you will promptly notify us so that we can make any necessary revisions.
3. For any electronic file(s) attached hereto, The Mannik & Smith Group, Inc. is not responsible for any errors caused by the transmission of said files, your software, or your computer systems.

SUBMITTAL# 012

DATE: June 30, 2017

Michigan Department of Environmental Quality
Torch Lake Non-Superfund Site
Hubbell Processing Area
Hubbell, MI
File No.: 761/16108.SAR Index No.44251

TO:
Jed Chrestensen
The Mannik & Smith Group, Inc
200 Michigan Street, Suite 705
Hancock, MI 49930

FROM:
Hans Haapala, Project Manager, 906-281-6908
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913

SUBMITTAL TYPE:

☒ Product Data	☐ Certificates	☐Record Documents	☐ Operation/Maintenance Manuals
☐Shop Drawings	☐Manufacturer's Instructions	☐Samples	☐ Contract Closeout
☐Test Reports	☐Construction Photographs	☐ Administrative	☐Other

SUPPLIER: G & J Site Solutions, Inc.

SPECIFICATION NUMBER AND TITLE: 32 92 00 Seeding, Fertilizing and Mulching

PART	TYPE	DESCRIPTION
1.2.1	Product Data	Seed Mixture – Deer Creek Seed, Windsor, WI
2.2.1	Product Data	Starter Fertilizer per Soil Testing – CSI GeoTurf, Highland, MI
2.3	Product Data	Straw Mulch – Holmquist Feed Mill, Trenary, MI

B&B Contracting, Calumet, Inc. certifies that review, approval verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents.

Signed: _____

Digitally signed by Hans P. Haapala
DN: cn=Hans P. Haapala, o=B&B Contracting, Calumet, Inc., ou=Project Engineer, email=hanshaapala@gmail.com, c=US
Date: 2017.06.30 15:59:53 -04'00'

Date: 6/30/17

APPROVED AS NOTED JC 7/5/17

- WILL NEED TO APPROVE SEED TICKETS IN THE FIELD
- IT IS UNDERSTOOD THAT FERTILIZER HAS BEEN ADJUSTED TO REFLECT CAP SOIL INTENDED FOR USE

An Equal Opportunity Employer
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913
Office: 906-337-0017
Fax: 906-934-2587

TRANSMITTAL

DATE:

June 30, 2017

FROM:

Hans Haapala (906)281-6908

ATTN:

Jed Chrestensen, P.E.

JOB NAME:

Torch Lake Non-Superfund Site
Hubbell Processing Area

ADDRESS:

The Mannik & Smith Group, Inc.
200 Michigan Street, Suite 705
Hancock, MI 49930

ATTACHED:

Submittal #012
Seeding, Fertilizing and Mulching

PHONE NUMBER:

(906)487-7451

RE:

Seeding, Fertilizing and Mulching

O URGENT **X** FOR REVIEW **O** PLEASE COMMENT **O** PLEASE REPLY **O** PLEASE RECYCLE

Notes/Comments:

Please review the attached submittal.

SUBMITTAL# 012

DATE: June 30, 2017

Michigan Department of Environmental Quality
Torch Lake Non-Superfund Site
Hubbell Processing Area
Hubbell, MI

File No.: 761/16108.SAR Index No.44251

TO:
Jed Chrestensen

The Mannik & Smith Group, Inc

200 Michigan Street, Suite 705

Hancock, MI 49930

FROM:
Hans Haapala, Project Manager, 906-281-6908

B&B Contracting, Calumet, Inc.

55670 Hwy M-26

Calumet, MI 49913

SUBMITTAL TYPE:

☒ Product Data	☐ Certificates	☐Record Documents	☐ Operation/Maintenance Manuals
☐Shop Drawings	☐Manufacturer's Instructions	☐Samples	☐ Contract Closeout
☐Test Reports	☐Construction Photographs	☐ Administrative	☐Other

SUPPLIER: G & J Site Solutions, Inc.

SPECIFICATION NUMBER AND TITLE: 32 92 00 Seeding, Fertilizing and Mulching

PART	TYPE	DESCRIPTION
1.2.1	Product Data	Seed Mixture – Deer Creek Seed, Windsor, WI
2.2.1	Product Data	Starter Fertilizer per Soil Testing – CSI GeoTurf, Highland, MI
2.3	Product Data	Straw Mulch – Holmquist Feed Mill, Trenary, MI

B&B Contracting, Calumet, Inc. certifies that review, approval verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents. Signed: _____ Date: 6/30/17	

G & J SITE SOLUTIONS

51811 Industrial Drive
Calumet, Michigan 49913
Phone: 1- 906-369-3455
Fax 1-906-483-2455
Traverse City, Michigan
Phone: 1-231-941-4400
Fax: 1-231-941-4404

June 30th, 2017

B & B Contracting, Inc
55670 State Highway M26
Calumet, MI 49913

RE: Abandoned Mining Wastes – Torch Lake Non- Superfund Site Hubbell Processing Area

Brian,

Attached are the cut sheets for the following project materials.

~~1. Silt Fence S1240~~
- Supplier –CSI Geo Turf – Highland, MI

~~2. Straw Mulch Blanket S75BN~~
- Supplier – North American Green – Poseyville, IN

~~3. Coconut Mulch Blanket C32~~
- Supplier –Erosion Control Blanket – Riverton, MB, Canada

4. Seed Mixture
   - Red Clover 10 Lb./Acre
   - Creeping Red Fescue 25 Lb./ Acre
   - Vernal Alfalfa 5 Lb./ Acre
   - White Dutch Clover 5 Lb./ Acre
   - Perennial Rye Grass 10 Lb./ Acre
   - Sweet Clover 5 Lb./ Acre
   - Orchard Grass 15 Lb./ Acre
   - Seed tickets can be field verified during application of work
   - Supplier – Deer Creek Seed – Windsor, WI

5. Fertilizer
    - Starter fertilizer based on existing conditions per soil test
    - Supplier – CSI Geoturf – Highland MI

6. Straw Mulch
    - Supplier –Holmquist Feed Mill – Trenary, MI

Geoturf® 16-32-04

Fertilizer

October 2015

Guaranteed Analysis

Total Nitrogen (N)	16%
Available Phosphate (P2O5)	32%
Soluble Potash (K20)	04%

Ingredients: Sulfate of potash, monammonium phosphate, urea, ammonium sulfate

Disclaimer: Buyer assumes any and all risks with this product. Seller disclaims all warranties, expressed or implied including, without limitation, any implied warranty of merchantability or implied warranty of fitness for a particular purpose or use. Seller's liability is limited to product price.

Caution: Breathing vapors may be harmful to respiratory system. Keep out of reach of children. Handle and apply safely to prevent possible bodily harm or property damage. Dispose of container properly. Store away from children and animals.

Net weight 50 lb / 22.7 kg

This information is to the best of our knowledge and belief accurate as of the date compiled. However no guarantee is made as to its accuracy reliability or completeness. It is the user's responsibility to satisfy his/her self as to the suitability and completeness of such information for his or her own particular use. We do not accept liability for any loss or damage that may occur from the use of this information nor do we offer any warranty against infringement.

200 Michigan Street, Suite 705, Hancock, MI 49930
906-487-7452
www.MannikSmithGroup.com

LETTER OF TRANSMITTAL

To: Mr. Hans Haapala
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913

Project #: MDEQ0070
Date: July 14, 2017

Re: Submittal #013 – Imported Soil Lab Analytical Testing
MDEQ Torch Lake Non-Superfund Site
Hubbell Processing Area

Enclosed are the following:

No. of Copies	Description
1	Approval - Submittal #013

The above items are transmitted as checked below:

☐ For review and approval ☐ For review and comment ☐ Returned for corrections
☒ For your use ☒ Approved as submitted ☐ Approved as corrected
☐ As requested ☐ Other:

Remarks:

Approved

Copies To: MDEQ-RRD, Calumet District Office
File

Signed:

Printed: Jed Chrestensen
Project Engineer

This transmittal is subject to the following conditions to which you agree by accepting these terms on a reply to this message or using the information in any manner, including but not limited to, copying or using the information for reference.

1. Any work product of The Mannik & Smith Group, Inc. may not be altered in manner, form or content without our prior express written consent.
2. If you discover any errors and/or omissions in the attached information, you will promptly notify us so that we can make any necessary revisions.
3. For any electronic file(s) attached hereto, The Mannik & Smith Group, Inc. is not responsible for any errors caused by the transmission of said files, your software, or your computer systems.

SUBMITTAL# 013

DATE: July 10, 2017

Michigan Department of Environmental Quality
Torch Lake Non-Superfund Site
Hubbell Processing Area
Hubbell, MI
File No.: 761/16108.SAR Index No.44251

TO:
Jed Chrestensen
The Mannik & Smith Group, Inc
200 Michigan Street, Suite 705
Hancock, MI 49930

FROM:
Hans Haapala, Project Manager, 906-281-6908
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913

SUBMITTAL TYPE:

☐ Product Data	☐ Certificates	☐Record Documents	☐ Operation/Maintenance Manuals
☐Shop Drawings	☐Manufacturer's Instructions	☐Samples	☐ Contract Closeout
☒Test Reports	☐Construction Photographs	☐ Administrative	☐Other

SUPPLIER: Whitewater Associates, Inc.

SPECIFICATION NUMBER AND TITLE: 01 45 00 Imported Soil Laboratory Analytical Testing

PART	TYPE	DESCRIPTION
1.3.1	Test Reports	Imported Borrow Soil Laboratory Analytical Testing, Charlie Kiilunen Pit

B&B Contracting, Calumet, Inc. certifies that review, approval verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents.

Signed: _____

Digitally signed by Hans P. Haapala
DN: cn=Hans P. Haapala, o=B&B Contracting, Calumet, Inc., ou=Project Engineer, email=hanshaapala@gmail.com, c=US
Date: 2017.07.10 14:56:50 -04'00'

Date: 7/10/17

APPROVED JC
7-14-17

An Equal Opportunity Employer
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913
Office: 906-337-0017
Fax: 906-934-2587

TRANSMITTAL

DATE:

July 10, 2017

FROM:

Hans Haapala (906)281-6908

ATTN:

Jed Chrestensen, P.E.

JOB NAME:

Torch Lake Non-Superfund Site
Hubbell Processing Area

ADDRESS:

The Mannik & Smith Group, Inc.
200 Michigan Street, Suite 705
Hancock, MI 49930

ATTACHED:

Submittal #013
Imported Soil Laboratory Analytical Testing

PHONE NUMBER:

(906)487-7451

RE:

Imported Soil Laboratory Analytical Testing,
Charlie Kiilunen Pit

O URGENT **X** FOR REVIEW **O** PLEASE COMMENT **O** PLEASE REPLY **O** PLEASE RECYCLE

Notes/Comments:

Please review the attached submittal.

SUBMITTAL# 013

DATE: July 10, 2017

Michigan Department of Environmental Quality
Torch Lake Non-Superfund Site
Hubbell Processing Area
Hubbell, MI

File No.: 761/16108.SAR Index No.44251

TO:
Jed Chrestensen
The Mannik & Smith Group, Inc
200 Michigan Street, Suite 705
Hancock, MI 49930

FROM:
Hans Haapala, Project Manager, 906-281-6908
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913

SUBMITTAL TYPE:

☐ Product Data	☐ Certificates	☐Record Documents	☐ Operation/Maintenance Manuals
☐Shop Drawings	☐Manufacturer's Instructions	☐Samples	☐ Contract Closeout
☒Test Reports	☐Construction Photographs	☐ Administrative	☐Other

SUPPLIER: Whitewater Associates, Inc.

SPECIFICATION NUMBER AND TITLE: 01 45 00 Imported Soil Laboratory Analytical Testing

PART	TYPE	DESCRIPTION
1.3.1	Test Reports	Imported Borrow Soil Laboratory Analytical Testing, Charlie Kiilunen Pit

B&B Contracting, Calumet, Inc. certifies that review, approval verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents. Signed: _____ Date: 7/10/17	

ANALYTICAL REPORT

WHITE WATER ASSOCIATES, INC.
429 River Lane • PO Box 27 Amasa, MI 49903 • Ph (906) 822-7889 • Fax -7977

Cover Page

Client: B & B Contracting **WWA Job #:** 70015

Project: Borrow Pit #2

Date Received: 6/19/2017 **Date Reported:** 7/10/2017

Sample Number	Client Sample ID	Date Sampled	Sample Matrix
70015-001	Borrow Pit Soil	06/15/17	Soil

WHITE WATER ASSOCIATES, INC.
429 River Lane • PO Box 27 Amasa, MI 49903 • Ph (906) 822-7889 • Fax -7977

Cover Page..continued

Client: B & B Contracting **WWA Job #:** 70015

Comments (if any):

Key to Laboratory Flags:

*: RPD exceeds limits.
B: The analyte was found in the associated blank as well as in the sample.
J: The quantitation is an estimated value because the result is less than the sample quantitation limit but greater than the detection limit.
M: A matrix effect was present.
Q: Batch QC data associated with the analysis does not meet the stated objectives
H: Indicates analytical holding time exceedance.
U: The analyte was analyzed for, but not detected.
P: A manual peak selection or manual integration was performed to correct an erroneous software selection.

ND = Not Detected, MDL = Method Detection Limit, MQL = Method Quantitation Limit
ppm = mg/L (liquid) or mg/kg (solid), ppb = ug/L (liquid) or ug/kg (solid)
For coliform, Negative = No coliform bacteria detected, Positive = Coliform bacteria detected

Sample Types:
S = Solids, DW = Drinking water, D = Dissolved, T = Total, TC = TCLP extract, SP = SPLP extract

All samples were received intact and properly preserved unless otherwise noted. The results reported relate only to the samples tested. This report shall not be reproduced, except in full, without the written approval of this laboratory. The Chain of Custody is attached.

This report satisfies the requirements of your project but has not been prepared to comply with NELAP reporting requirements.

I certify that the data contained in this Final Report has been generated and reviewed in accordance with approved methods and White Water Associates Standard Operating Procedures. Exceptions, if any, are discussed in the accompanying sample narrative. Release of this Final Report is authorized by White Water Associates management, as is verified by the following signature.

Approved By: Todd J. Prems

WI DNR Lab Certification Number: 999971280
MI DEQ Certification Number: 9306
DoD-ELAP Accreditation Number: 65802
ISO/IEC 17025:2005 Accredited

1 GW 6/21/17

Version 160504

Job # (WWA office use): 70015

CHAIN-OF-CUSTODY RECORD

WHITE WATER ASSOCIATES, INC.

429 River Lane, P.O. Box 27
Amasa, Michigan 49903

Phone: (906) 822-7889, Fax -7977
Web: white-water-associates.com

CLIENT NAME / BILL TO	EMAIL ADDRESS
BiB Contracting	hanshaapala@gmail.com
ADDRESS: 55670 M-26	TELEPHONE: cell BP ~~cell~~ ~~fax~~ 906-281-6908 934-2587
CITY: Calumet / STATE: MI / ZIP: 49913	CONTRACT / PO / PROJECT NAME / WSSN#: Borrow Pit #2
SAMPLER NAME (print first/last name): Hans Haapala	COUNTY OF LOCATION: / PAGE: 1 OF 1 (Indicate if more than one page of COC records used)
SAMPLER'S SIGNATURE	Check off preservatives for each bottle upon arrival and indicate total number of bottles. WWA database contains bottle preservation details.

SAMPLE ID AND LOCATION (Containers for each sample may be combined on one line.)	DATE	TIME	SAMPLE MATRIX: Drinking water	Aqueous	Sed.	Soil	Other:	CONTAINERS / PRESERVATIVES: None	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Na Thio	Total Number of Containers	ANALYSIS TYPE REQUESTED: 10 Metals – 6010	Mercury 7471	VOCs 8260	SVOCs 8270	PCBs 8082	Pesticides 8081
Borrow Soil	6/15	11:34				X									4	X	X	X	X	X	X

Instructions to White Water
Send my report by:
____ email
____ mail

Unless otherwise noted, drinking water report copies are sent to MDEQ and Health Dept.

REMARKS (Note any special instructions provided by client or conditions of receipt noted by WWA lab staff. Also note any residual chlorine.)

office & home 906-337-0017
Fax BP ~~cell~~ 906-934-2587
Cell 906-281-6908

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by: Bobby Preuss	Date: 6/16/17	Time: 1400

Comments/Sample temp. on receipt: Sample Temp. 20°C

Packing: Ice no
Cooler no

UPS☐ FedEx☐ USPS☐ Client☑ Other _____

WHITE - RETURN W/ REPORT CANARY - W/ SAMPLES PINK - CUSTOMER

ANALYTICAL REPORT

WHITE WATER ASSOCIATES, INC.

429 River Lane • PO Box 27 Amasa, MI 49903 • Ph (906) 822-7889 • Fax -7977

Client: B & B Contracting **WWA Job #:** 70015

Project: Borrow Pit #2

Date Received: 6/19/2017 **Date Reported:** 7/10/2017

Sample Results

Sample No. / ID / Description / Matrix	Result	Flags	Units	Date	Method	MDL	MQL
70015-001 / Borrow Pit Soil / Soil							
Volatile Organics							
Dichlorodifluoromethane	ND		ug/kg	6/20/2017	8260C	11	55
Chloromethane	ND		ug/kg	6/20/2017	8260C	17	55
Vinyl chloride	ND		ug/kg	6/20/2017	8260C	17	55
Bromomethane	ND	Q	ug/kg	6/20/2017	8260C	55	110
Chloroethane	ND	Q	ug/kg	6/20/2017	8260C	280	500
Trichlorofluoromethane	ND		ug/kg	6/20/2017	8260C	11	55
Diethyl Ether	ND		ug/kg	6/20/2017	8260C	17	55
Acrolein	ND		ug/kg	6/20/2017	8260C	41	130
1,1-Dichloroethene	ND		ug/kg	6/20/2017	8260C	11	55
Acetone	ND		ug/kg	6/20/2017	8260C	690	1400
Iodomethane	ND		ug/kg	6/20/2017	8260C	280	500
Carbon Disulfide	ND		ug/kg	6/20/2017	8260C	28	55
Methylene chloride	ND		ug/kg	6/20/2017	8260C	28	55
Methyl tert-butyl ether (MTBE)	ND		ug/kg	6/20/2017	8260C	17	55
Acrylonitrile	ND		ug/kg	6/20/2017	8260C	11	55
trans-1,2-Dichloroethene	ND		ug/kg	6/20/2017	8260C	17	55
Vinyl acetate	ND	Q	ug/kg	6/20/2017	8260C	28	55
1,1-Dichloroethane	ND		ug/kg	6/20/2017	8260C	11	55
2-Butanone (MEK)	ND		ug/kg	6/20/2017	8260C	110	280
cis-1,2-Dichloroethene	ND		ug/kg	6/20/2017	8260C	11	55
2,2-Dichloropropane	ND		ug/kg	6/20/2017	8260C	17	55
Bromochloromethane	ND		ug/kg	6/20/2017	8260C	17	55
Chloroform	ND		ug/kg	6/20/2017	8260C	11	55
1,1,1-Trichloroethane	ND		ug/kg	6/20/2017	8260C	28	55

ND = Not Detected, MDL = Method Detection Limit, MQL = Method Quantitation Limit,
ppm = mg/L (liquid) or mg/kg (solid), ppb = ug/L (liquid) or ug/kg (solid)

WHITE WATER ASSOCIATES, INC.
429 River Lane • PO Box 27 Amasa, MI 49903 • Ph (906) 822-7889 • Fax -7977

Client: B & B Contracting **WWA Job #:** 70015

Project: Borrow Pit #2

Date Received: 6/19/2017 **Date Reported:** 7/10/2017

Sample Results

Sample No. / ID / Description / Matrix	Result	Flags	Units	Date	Method	MDL	MQL
70015-001 / Borrow Pit Soil / Soil							
1,1-Dichloropropene	ND		ug/kg	6/20/2017	8260C	28	55
Carbon Tetrachloride	ND		ug/kg	6/20/2017	8260C	11	55
Benzene	ND		ug/kg	6/20/2017	8260C	28	55
1,2-Dichloroethane	ND		ug/kg	6/20/2017	8260C	11	55
Trichloroethene	ND		ug/kg	6/20/2017	8260C	17	55
1,2-Dichloropropane	ND		ug/kg	6/20/2017	8260C	11	55
Dibromomethane	ND		ug/kg	6/20/2017	8260C	17	55
Bromodichloromethane	ND		ug/kg	6/20/2017	8260C	11	55
2-Chloroethyl vinyl ether	ND		ug/kg	6/20/2017	8260C	11	55
cis-1,3-Dichloropropene	ND		ug/kg	6/20/2017	8260C	11	55
4-Methyl-2-Pentanone (MIBK)	ND		ug/kg	6/20/2017	8260C	11	55
Toluene	ND		ug/kg	6/20/2017	8260C	28	55
trans-1,3-Dichloropropene	ND		ug/kg	6/20/2017	8260C	11	55
1,1,2-Trichloroethane	ND		ug/kg	6/20/2017	8260C	11	55
Tetrachloroethene	ND	Q	ug/kg	6/20/2017	8260C	11	55
1,3-Dichloropropane	ND		ug/kg	6/20/2017	8260C	11	55
2-Hexanone	ND		ug/kg	6/20/2017	8260C	17	110
Chlorodibromomethane	ND		ug/kg	6/20/2017	8260C	11	55
1,2-Dibromoethane	ND		ug/kg	6/20/2017	8260C	11	55
Chlorobenzene	ND		ug/kg	6/20/2017	8260C	17	55
1,1,1,2-Tetrachloroethane	ND		ug/kg	6/20/2017	8260C	11	55
Ethylbenzene	ND		ug/kg	6/20/2017	8260C	17	55
m&p-Xylene	ND		ug/kg	6/20/2017	8260C	17	55
o-Xylene	ND		ug/kg	6/20/2017	8260C	17	55
Styrene	ND		ug/kg	6/20/2017	8260C	55	110

ND = Not Detected, MDL = Method Detection Limit, MQL = Method Quantitation Limit,
ppm = mg/L (liquid) or mg/kg (solid), ppb = ug/L (liquid) or ug/kg (solid)

WHITE WATER ASSOCIATES, INC.
429 River Lane • PO Box 27 Amasa, MI 49903 • Ph (906) 822-7889 • Fax -7977

Client: B & B Contracting **WWA Job #:** 70015

Project: Borrow Pit #2

Date Received: 6/19/2017 **Date Reported:** 7/10/2017

Sample Results

Sample No. / ID / Description / Matrix	Result	Flags	Units	Date	Method	MDL	MQL
70015-001 / Borrow Pit Soil / Soil							
Bromoform	ND		ug/kg	6/20/2017	8260C	11	55
Isopropylbenzene	ND		ug/kg	6/20/2017	8260C	17	55
1,1,2,2-Tetrachloroethane	ND		ug/kg	6/20/2017	8260C	11	55
Bromobenzene	ND		ug/kg	6/20/2017	8260C	11	55
trans-1,4-Dichloro-2-butene	ND		ug/kg	6/20/2017	8260C	110	280
1,2,3-Trichloropropane	ND		ug/kg	6/20/2017	8260C	11	55
n-Propylbenzene	ND		ug/kg	6/20/2017	8260C	28	55
2-Chlorotoluene	ND		ug/kg	6/20/2017	8260C	17	55
1,3,5-Trimethylbenzene	ND		ug/kg	6/20/2017	8260C	17	55
4-Chlorotoluene	ND		ug/kg	6/20/2017	8260C	17	55
tert-Butylbenzene	ND		ug/kg	6/20/2017	8260C	28	55
1,2,4-Trimethylbenzene	ND		ug/kg	6/20/2017	8260C	17	55
sec-Butylbenzene	ND		ug/kg	6/20/2017	8260C	17	55
1,3-Dichlorobenzene	ND		ug/kg	6/20/2017	8260C	17	55
p-Isopropyltoluene	ND		ug/kg	6/20/2017	8260C	28	55
1,4-Dichlorobenzene	ND		ug/kg	6/20/2017	8260C	17	55
1,2-Dichlorobenzene	ND		ug/kg	6/20/2017	8260C	17	55
n-Butylbenzene	ND		ug/kg	6/20/2017	8260C	28	55
Hexachloroethane	ND		ug/kg	6/20/2017	8260C	17	55
1,2-Dibromo-3-chloropropane	ND		ug/kg	6/20/2017	8260C	55	110
1,2,4-Trichlorobenzene	ND		ug/kg	6/20/2017	8260C	17	55
Hexachlorobutadiene	ND		ug/kg	6/20/2017	8260C	28	110
Naphthalene	ND		ug/kg	6/20/2017	8260C	17	110
1,2,3-Trichlorobenzene	ND		ug/kg	6/20/2017	8260C	11	110
2-Methylnaphthalene	ND	Q	ug/kg	6/20/2017	8260C	55	280

ND = Not Detected, MDL = Method Detection Limit, MQL = Method Quantitation Limit,
ppm = mg/L (liquid) or mg/kg (solid), ppb = ug/L (liquid) or ug/kg (solid)

Client Sample ID: 70015
Date Collected: 06/15/17 11:34
Date Received: 06/20/17 09:15

Lab Sample ID: 480-119829-1
Matrix: Solid
Percent Solids: 89.8

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Biphenyl	<27		190	27	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
bis (2-chloroisopropyl) ether	<37		190	37	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
2,4,5-Trichlorophenol	<50		190	50	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
2,4,6-Trichlorophenol	<37		190	37	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
2,4-Dichlorophenol	<20		190	20	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
2,4-Dimethylphenol	<45		190	45	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
2,4-Dinitrophenol	<860		1800	860	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
2,4-Dinitrotoluene	<38		190	38	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
2,6-Dinitrotoluene	<22		190	22	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
2-Chloronaphthalene	<31		190	31	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
2-Chlorophenol	<34		190	34	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
2-Methylphenol	<22		190	22	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
2-Methylnaphthalene	<37		190	37	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
2-Nitroaniline	<27		360	27	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
2-Nitrophenol	<52		190	52	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
3,3'-Dichlorobenzidine	<220		360	220	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
3-Nitroaniline	<51		360	51	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
4,6-Dinitro-2-methylphenol	<190		360	190	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
4-Bromophenyl phenyl ether	<26		190	26	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
4-Chloro-3-methylphenol	<46		190	46	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
4-Chloroaniline	<46		190	46	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
4-Chlorophenyl phenyl ether	<23		190	23	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
4-Methylphenol	<22		360	22	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
4-Nitroaniline	<97		360	97	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
4-Nitrophenol	<130		360	130	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
Acenaphthene	<27		190	27	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
Acenaphthylene	<24		190	24	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
Acetophenone	<25		190	25	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
Anthracene	<46		190	46	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
Atrazine	<64		190	64	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
Benzaldehyde	<150		190	150	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
Benzo[a]anthracene	<19		190	19	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
Benzo[a]pyrene	<27		190	27	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
Benzo[b]fluoranthene	<30		190	30	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
Benzo[g,h,i]perylene	<20		190	20	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
Benzo[k]fluoranthene	<24		190	24	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
Bis(2-chloroethoxy)methane	<39		190	39	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
Bis(2-chloroethyl)ether	<24		190	24	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
Bis(2-ethylhexyl) phthalate	<63		190	63	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
Butyl benzyl phthalate	<31		190	31	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
Caprolactam	<56		190	56	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
Carbazole	<22		190	22	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
Chrysene	<42		190	42	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
Dibenz(a,h)anthracene	<33		190	33	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
Di-n-butyl phthalate	<32		190	32	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
Di-n-octyl phthalate	<22		190	22	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
Dibenzofuran	<22		190	22	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
Diethyl phthalate	<24		190	24	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
Dimethyl phthalate	<22		190	22	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1

Client Sample ID: 70015
Date Collected: 06/15/17 11:34
Date Received: 06/20/17 09:15

Lab Sample ID: 480-119829-1
Matrix: Solid
Percent Solids: 89.8

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoranthene	<20		190	20	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
Fluorene	<22		190	22	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
Hexachlorobenzene	<25		190	25	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
Hexachlorobutadiene	<27		190	27	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
Hexachlorocyclopentadiene	<25		190	25	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
Hexachloroethane	<24		190	24	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
Indeno[1,2,3-cd]pyrene	<23		190	23	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
Isophorone	<39		190	39	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
N-Nitrosodi-n-propylamine	<32		190	32	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
N-Nitrosodiphenylamine	<150		190	150	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
Naphthalene	<24		190	24	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
Nitrobenzene	<21		190	21	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
Pentachlorophenol	<190		360	190	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
Phenanthrene	<27		190	27	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
Phenol	<28		190	28	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1
Pyrene	<22		190	22	ug/Kg	☼	06/21/17 14:25	06/22/17 20:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	*75*		*53 - 120*	*06/21/17 14:25*	*06/22/17 20:59*	*1*
Phenol-d5 (Surr)	*75*		*54 - 120*	*06/21/17 14:25*	*06/22/17 20:59*	*1*
p-Terphenyl-d14 (Surr)	*94*		*65 - 121*	*06/21/17 14:25*	*06/22/17 20:59*	*1*
2,4,6-Tribromophenol (Surr)	*92*		*54 - 120*	*06/21/17 14:25*	*06/22/17 20:59*	*1*
2-Fluorobiphenyl	*85*		*60 - 120*	*06/21/17 14:25*	*06/22/17 20:59*	*1*
2-Fluorophenol (Surr)	*75*		*52 - 120*	*06/21/17 14:25*	*06/22/17 20:59*	*1*

Method: 8081B - Organochlorine Pesticides (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aldrin	<0.40		1.6	0.40	ug/Kg		06/22/17 07:00	06/26/17 12:15	1
alpha-BHC	**0.33**	**J B**	1.6	0.29	ug/Kg		06/22/17 07:00	06/26/17 12:15	1
beta-BHC	<0.29		1.6	0.29	ug/Kg		06/22/17 07:00	06/26/17 12:15	1
Chlordane (technical)	<3.6		16	3.6	ug/Kg		06/22/17 07:00	06/26/17 12:15	1
4,4'-DDD	<0.32		1.6	0.32	ug/Kg		06/22/17 07:00	06/26/17 12:15	1
4,4'-DDE	<0.34		1.6	0.34	ug/Kg		06/22/17 07:00	06/26/17 12:15	1
4,4'-DDT	<0.38		1.6	0.38	ug/Kg		06/22/17 07:00	06/26/17 12:15	1
delta-BHC	<0.30		1.6	0.30	ug/Kg		06/22/17 07:00	06/26/17 12:15	1
Dieldrin	<0.39		1.6	0.39	ug/Kg		06/22/17 07:00	06/26/17 12:15	1
Endosulfan I	<0.31		1.6	0.31	ug/Kg		06/22/17 07:00	06/26/17 12:15	1
Endosulfan II	<0.29		1.6	0.29	ug/Kg		06/22/17 07:00	06/26/17 12:15	1
Endrin	<0.32		1.6	0.32	ug/Kg		06/22/17 07:00	06/26/17 12:15	1
Heptachlor	<0.35		1.6	0.35	ug/Kg		06/22/17 07:00	06/26/17 12:15	1
Heptachlor epoxide	<0.42		1.6	0.42	ug/Kg		06/22/17 07:00	06/26/17 12:15	1
Hexachlorobenzene	**0.41**	**J B**	1.6	0.37	ug/Kg		06/22/17 07:00	06/26/17 12:15	1
Lindane	<0.30		1.6	0.30	ug/Kg		06/22/17 07:00	06/26/17 12:15	1
Methoxychlor	<0.33		1.6	0.33	ug/Kg		06/22/17 07:00	06/26/17 12:15	1
Mirex	<0.40		1.6	0.40	ug/Kg		06/22/17 07:00	06/26/17 12:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*103*		*45 - 120*	*06/22/17 07:00*	*06/26/17 12:15*	*1*
Tetrachloro-m-xylene	*67*		*30 - 124*	*06/22/17 07:00*	*06/26/17 12:15*	*1*

Client Sample ID: 70015
Date Collected: 06/15/17 11:34
Date Received: 06/20/17 09:15

Lab Sample ID: 480-119829-1
Matrix: Solid
Percent Solids: 89.8

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	<0.040		0.20	0.040	mg/Kg		06/22/17 15:34	06/23/17 04:41	1
PCB-1221	<0.040		0.20	0.040	mg/Kg		06/22/17 15:34	06/23/17 04:41	1
PCB-1232	<0.040		0.20	0.040	mg/Kg		06/22/17 15:34	06/23/17 04:41	1
PCB-1242	<0.040		0.20	0.040	mg/Kg		06/22/17 15:34	06/23/17 04:41	1
PCB-1248	<0.040		0.20	0.040	mg/Kg		06/22/17 15:34	06/23/17 04:41	1
PCB-1254	<0.096		0.20	0.096	mg/Kg		06/22/17 15:34	06/23/17 04:41	1
PCB-1260	<0.096		0.20	0.096	mg/Kg		06/22/17 15:34	06/23/17 04:41	1
Polychlorinated biphenyls (PCB)	<0.096		0.20	0.096	mg/Kg		06/22/17 15:34	06/23/17 04:41	1

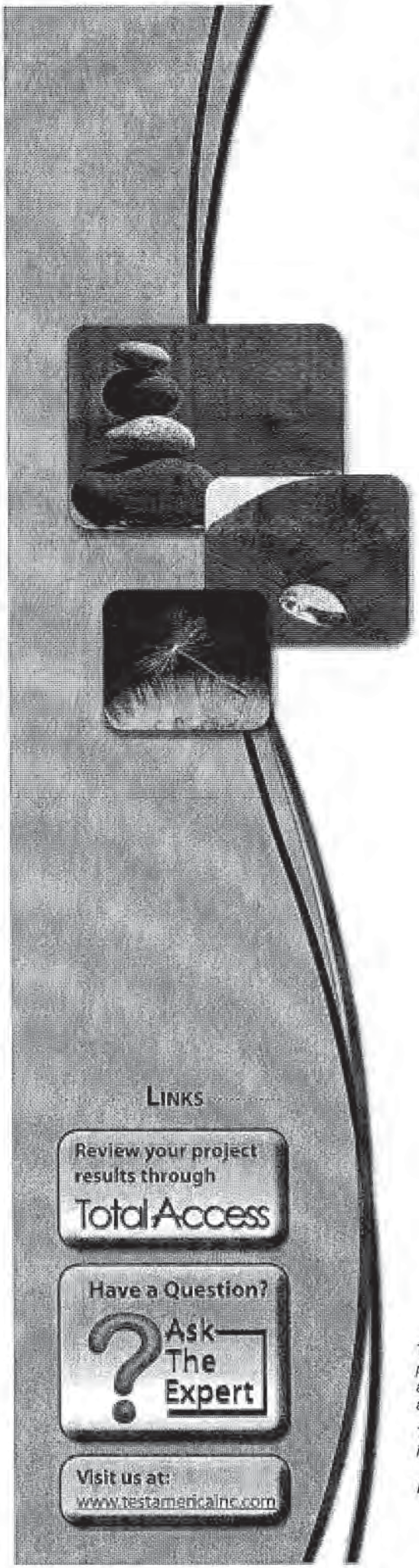
Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*109*		*60 - 154*	*06/22/17 15:34*	*06/23/17 04:41*	*1*
DCB Decachlorobiphenyl	*105*		*65 - 174*	*06/22/17 15:34*	*06/23/17 04:41*	*1*

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.91**	**J**	2.2	0.43	mg/Kg	☼	06/21/17 11:27	06/22/17 13:32	1
Barium	**19.0**		0.54	0.12	mg/Kg	☼	06/21/17 11:27	06/22/17 13:32	1
Cadmium	**0.052**	**J**	0.22	0.033	mg/Kg	☼	06/21/17 11:27	06/22/17 13:32	1
Chromium	**5.7**		0.54	0.22	mg/Kg	☼	06/21/17 11:27	06/22/17 13:32	1
Copper	**7.3**		1.1	0.23	mg/Kg	☼	06/21/17 11:27	06/22/17 13:32	1
Lead	**1.3**		1.1	0.26	mg/Kg	☼	06/21/17 11:27	06/22/17 13:32	1
Selenium	<0.43		4.3	0.43	mg/Kg	☼	06/21/17 11:27	06/22/17 13:32	1
Silver	<0.22		0.65	0.22	mg/Kg	☼	06/21/17 11:27	06/22/17 13:32	1
Zinc	**8.6**		2.2	0.69	mg/Kg	☼	06/21/17 11:27	06/22/17 13:32	1

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	<0.0082		0.020	0.0082	mg/Kg		06/21/17 10:00	06/21/17 12:45	1



TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

TestAmerica Job ID: 480-119829-1
Client Project/Site: White Water Associates - 70015

For:
White Water Associates
PO BOX 27
Amasa, Michigan 49903

Attn: Dr. Bette J Premo

Authorized for release by:
6/30/2017 5:06:08 PM

Orlette Johnson, Senior Project Manager
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The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Cover Page 1
Table of Contents 2
Definitions/Glossary 3
Case Narrative 4
Detection Summary 5
Client Sample Results 6
Surrogate Summary 9
QC Sample Results 10
QC Association Summary 16
Lab Chronicle 18
Certification Summary 19
Method Summary 20
Sample Summary 21
Chain of Custody 22
Receipt Checklists 23

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
X	Surrogate is outside control limits

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 480-119829-1

Laboratory: TestAmerica Buffalo

Narrative

Job Narrative
480-119829-1

Receipt
The samples were received on 6/20/2017 9:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.7° C.

GC/MS Semi VOA
Method(s) 8270D: The continuing calibration verification (CCV) associated with batch 480-363397 recovered above the upper control limit for 4-Nitrophenol and Atrazine. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The following sample is impacted: 70015 (480-119829-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC Semi VOA
Method(s) 8082A: The laboratory control sample (LCS) and Method Blank (MB) for preparation batch 480-363492 and analytical batch 480-363512 recovered outside control limits for the surrogate Tetrachloro-m-xylene. The analytes associated with this surrogate were not detected in associated client samples. Therefore, the data has been reported. The following samples are effected: 70015 (480-119829-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method(s) 3550C: The following samples required a Florisil clean-up, via EPA Method 3620C, to reduce matrix interferences: 70015 (480-119829-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: White Water Associates
Project/Site: White Water Associates - 70015

TestAmerica Job ID: 480-119829-1

Client Sample ID: 70015

Lab Sample ID: 480-119829-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
alpha-BHC	0.33	J B	1.6	0.29	ug/Kg	1		8081B	Total/NA
Hexachlorobenzene	0.41	J B	1.6	0.37	ug/Kg	1		8081B	Total/NA
Arsenic	0.91	J	2.2	0.43	mg/Kg	1	☼	6010C	Total/NA
Barium	19.0		0.54	0.12	mg/Kg	1	☼	6010C	Total/NA
Cadmium	0.052	J	0.22	0.033	mg/Kg	1	☼	6010C	Total/NA
Chromium	5.7		0.54	0.22	mg/Kg	1	☼	6010C	Total/NA
Copper	7.3		1.1	0.23	mg/Kg	1	☼	6010C	Total/NA
Lead	1.3		1.1	0.26	mg/Kg	1	☼	6010C	Total/NA
Zinc	8.6		2.2	0.69	mg/Kg	1	☼	6010C	Total/NA

This Detection Summary does not include radiochemical test results.

Surrogate Summary

Client: White Water Associates
Project/Site: White Water Associates - 70015

TestAmerica Job ID: 480-119829-1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Solid — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)					
		NBZ	PHL	TPH	TBP	FBP	2FP
Lab Sample ID	Client Sample ID	(53-120)	(54-120)	(65-121)	(54-120)	(60-120)	(52-120)
480-119829-1	70015	75	75	94	92	85	75
LCS 480-363217/2-A	Lab Control Sample	86	90	94	110	97	88
MB 480-363217/1-A	Method Blank	77	74	87	89	87	76

Surrogate Legend

NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = p-Terphenyl-d14 (Surr)
TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)

Method: 8081B - Organochlorine Pesticides (GC)

Matrix: Solid — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)	
		DCB2	TCX2
Lab Sample ID	Client Sample ID	(45-120)	(30-124)
480-119829-1	70015	103	67
LCS 480-363310/2-A	Lab Control Sample	108	69
MB 480-363310/1-A	Method Blank	100	65

Surrogate Legend

DCB = DCB Decachlorobiphenyl
TCX = Tetrachloro-m-xylene

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Matrix: Solid — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)	
		TCX1	DCB1
Lab Sample ID	Client Sample ID	(60-154)	(65-174)
480-119829-1	70015	109	105
LCS 480-363492/2-A	Lab Control Sample	172 X	160
MB 480-363492/1-A	Method Blank	181 X	167

Surrogate Legend

TCX = Tetrachloro-m-xylene
DCB = DCB Decachlorobiphenyl

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 480-363217/1-A
Matrix: Solid
Analysis Batch: 363397

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 363217

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Biphenyl	<25		170	25	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
bis (2-chloroisopropyl) ether	<33		170	33	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
2,4,5-Trichlorophenol	<45		170	45	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
2,4,6-Trichlorophenol	<33		170	33	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
2,4-Dichlorophenol	<18		170	18	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
2,4-Dimethylphenol	<40		170	40	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
2,4-Dinitrophenol	<770		1600	770	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
2,4-Dinitrotoluene	<34		170	34	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
2,6-Dinitrotoluene	<20		170	20	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
2-Chloronaphthalene	<28		170	28	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
2-Chlorophenol	<30		170	30	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
2-Methylphenol	<20		170	20	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
2-Methylnaphthalene	<33		170	33	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
2-Nitroaniline	<25		320	25	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
2-Nitrophenol	<47		170	47	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
3,3'-Dichlorobenzidine	<200		320	200	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
3-Nitroaniline	<46		320	46	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
4,6-Dinitro-2-methylphenol	<170		320	170	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
4-Bromophenyl phenyl ether	<24		170	24	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
4-Chloro-3-methylphenol	<41		170	41	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
4-Chloroaniline	<41		170	41	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
4-Chlorophenyl phenyl ether	<21		170	21	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
4-Methylphenol	<20		320	20	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
4-Nitroaniline	<88		320	88	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
4-Nitrophenol	<120		320	120	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
Acenaphthene	<25		170	25	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
Acenaphthylene	<22		170	22	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
Acetophenone	<23		170	23	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
Anthracene	<41		170	41	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
Atrazine	<58		170	58	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
Benzaldehyde	<130		170	130	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
Benzo[a]anthracene	<17		170	17	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
Benzo[a]pyrene	<25		170	25	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
Benzo[b]fluoranthene	<27		170	27	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
Benzo[g,h,i]perylene	<18		170	18	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
Benzo[k]fluoranthene	<22		170	22	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
Bis(2-chloroethoxy)methane	<35		170	35	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
Bis(2-chloroethyl)ether	<22		170	22	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
Bis(2-ethylhexyl) phthalate	<57		170	57	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
Butyl benzyl phthalate	<28		170	28	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
Caprolactam	<50		170	50	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
Carbazole	<20		170	20	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
Chrysene	<37		170	37	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
Dibenz(a,h)anthracene	<30		170	30	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
Di-n-butyl phthalate	<29		170	29	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
Di-n-octyl phthalate	<20		170	20	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
Dibenzofuran	<20		170	20	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
Diethyl phthalate	<22		170	22	ug/Kg		06/21/17 14:25	06/22/17 17:26	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 480-363217/1-A
Matrix: Solid
Analysis Batch: 363397

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 363217

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dimethyl phthalate	<20		170	20	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
Fluoranthene	<18		170	18	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
Fluorene	<20		170	20	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
Hexachlorobenzene	<23		170	23	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
Hexachlorobutadiene	<25		170	25	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
Hexachlorocyclopentadiene	<23		170	23	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
Hexachloroethane	<22		170	22	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
Indeno[1,2,3-cd]pyrene	<21		170	21	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
Isophorone	<35		170	35	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
N-Nitrosodi-n-propylamine	<29		170	29	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
N-Nitrosodiphenylamine	<140		170	140	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
Naphthalene	<22		170	22	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
Nitrobenzene	<19		170	19	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
Pentachlorophenol	<170		320	170	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
Phenanthrene	<25		170	25	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
Phenol	<26		170	26	ug/Kg		06/21/17 14:25	06/22/17 17:26	1
Pyrene	<20		170	20	ug/Kg		06/21/17 14:25	06/22/17 17:26	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5 (Surr)	77		53 - 120	06/21/17 14:25	06/22/17 17:26	1
Phenol-d5 (Surr)	74		54 - 120	06/21/17 14:25	06/22/17 17:26	1
p-Terphenyl-d14 (Surr)	87		65 - 121	06/21/17 14:25	06/22/17 17:26	1
2,4,6-Tribromophenol (Surr)	89		54 - 120	06/21/17 14:25	06/22/17 17:26	1
2-Fluorobiphenyl	87		60 - 120	06/21/17 14:25	06/22/17 17:26	1
2-Fluorophenol (Surr)	76		52 - 120	06/21/17 14:25	06/22/17 17:26	1

Lab Sample ID: LCS 480-363217/2-A
Matrix: Solid
Analysis Batch: 363397

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 363217

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Biphenyl	1660	1490		ug/Kg		90	59 - 120
bis (2-chloroisopropyl) ether	1660	1330		ug/Kg		81	44 - 120
2,4,5-Trichlorophenol	1660	1720		ug/Kg		104	59 - 126
2,4,6-Trichlorophenol	1660	1650		ug/Kg		100	59 - 123
2,4-Dichlorophenol	1660	1710		ug/Kg		104	61 - 120
2,4-Dimethylphenol	1660	1640		ug/Kg		99	59 - 120
2,4-Dinitrophenol	3310	3070		ug/Kg		93	41 - 146
2,4-Dinitrotoluene	1660	1780		ug/Kg		107	63 - 120
2,6-Dinitrotoluene	1660	1680		ug/Kg		102	66 - 120
2-Chloronaphthalene	1660	1580		ug/Kg		96	57 - 120
2-Chlorophenol	1660	1450		ug/Kg		88	53 - 120
2-Methylphenol	1660	1510		ug/Kg		91	54 - 120
2-Methylnaphthalene	1660	1570		ug/Kg		95	59 - 120
2-Nitroaniline	1660	1640		ug/Kg		99	61 - 120
2-Nitrophenol	1660	1530		ug/Kg		92	56 - 120
3,3'-Dichlorobenzidine	3310	2920		ug/Kg		88	54 - 120
3-Nitroaniline	1660	1510		ug/Kg		91	48 - 120

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 480-363217/2-A
Matrix: Solid
Analysis Batch: 363397

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 363217

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
4,6-Dinitro-2-methylphenol	3310	2970		ug/Kg		90	49 - 122
4-Bromophenyl phenyl ether	1660	1820		ug/Kg		110	58 - 120
4-Chloro-3-methylphenol	1660	1750		ug/Kg		105	61 - 120
4-Chloroaniline	1660	1440		ug/Kg		87	38 - 120
4-Chlorophenyl phenyl ether	1660	1690		ug/Kg		102	63 - 124
4-Methylphenol	1660	1500		ug/Kg		90	55 - 120
4-Nitroaniline	1660	1510		ug/Kg		91	56 - 120
4-Nitrophenol	3310	4050		ug/Kg		122	43 - 147
Acenaphthene	1660	1560		ug/Kg		94	62 - 120
Acenaphthylene	1660	1570		ug/Kg		95	58 - 121
Acetophenone	1660	1580		ug/Kg		95	54 - 120
Anthracene	1660	1640		ug/Kg		99	62 - 120
Atrazine	3310	3950		ug/Kg		119	60 - 127
Benzaldehyde	3310	2330		ug/Kg		70	10 - 150
Benzo[a]anthracene	1660	1530		ug/Kg		93	65 - 120
Benzo[a]pyrene	1660	1680		ug/Kg		102	64 - 120
Benzo[b]fluoranthene	1660	1720		ug/Kg		104	64 - 120
Benzo[g,h,i]perylene	1660	2060		ug/Kg		124	45 - 145
Benzo[k]fluoranthene	1660	1590		ug/Kg		96	65 - 120
Bis(2-chloroethoxy)methane	1660	1430		ug/Kg		86	55 - 120
Bis(2-chloroethyl)ether	1660	1370		ug/Kg		83	45 - 120
Bis(2-ethylhexyl) phthalate	1660	1490		ug/Kg		90	61 - 133
Butyl benzyl phthalate	1660	1500		ug/Kg		91	61 - 129
Caprolactam	3310	3220		ug/Kg		97	47 - 120
Carbazole	1660	1650		ug/Kg		100	65 - 120
Chrysene	1660	1550		ug/Kg		94	64 - 120
Dibenz(a,h)anthracene	1660	1820		ug/Kg		110	54 - 132
Di-n-butyl phthalate	1660	1720		ug/Kg		104	58 - 130
Di-n-octyl phthalate	1660	1480		ug/Kg		89	57 - 133
Dibenzofuran	1660	1550		ug/Kg		93	63 - 120
Diethyl phthalate	1660	1730		ug/Kg		104	66 - 120
Dimethyl phthalate	1660	1760		ug/Kg		106	65 - 124
Fluoranthene	1660	1760		ug/Kg		106	62 - 120
Fluorene	1660	1630		ug/Kg		98	63 - 120
Hexachlorobenzene	1660	1780		ug/Kg		107	60 - 120
Hexachlorobutadiene	1660	1730		ug/Kg		104	45 - 120
Hexachlorocyclopentadiene	1660	1660		ug/Kg		100	47 - 120
Hexachloroethane	1660	1540		ug/Kg		93	41 - 120
Indeno[1,2,3-cd]pyrene	1660	1930		ug/Kg		117	56 - 134
Isophorone	1660	1570		ug/Kg		95	56 - 120
N-Nitrosodi-n-propylamine	1660	1560		ug/Kg		94	52 - 120
N-Nitrosodiphenylamine	1660	1630		ug/Kg		99	51 - 128
Naphthalene	1660	1480		ug/Kg		89	55 - 120
Nitrobenzene	1660	1490		ug/Kg		90	54 - 120
Pentachlorophenol	3310	3240		ug/Kg		98	51 - 120
Phenanthrene	1660	1670		ug/Kg		101	60 - 120
Phenol	1660	1440		ug/Kg		87	53 - 120
Pyrene	1660	1430		ug/Kg		86	61 - 133

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 480-363217/2-A
Matrix: Solid
Analysis Batch: 363397

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 363217

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Nitrobenzene-d5 (Surr)	86		53 - 120
Phenol-d5 (Surr)	90		54 - 120
p-Terphenyl-d14 (Surr)	94		65 - 121
2,4,6-Tribromophenol (Surr)	110		54 - 120
2-Fluorobiphenyl	97		60 - 120
2-Fluorophenol (Surr)	88		52 - 120

Method: 8081B - Organochlorine Pesticides (GC)

Lab Sample ID: MB 480-363310/1-A
Matrix: Solid
Analysis Batch: 363931

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 363310

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aldrin	<0.40		1.6	0.40	ug/Kg		06/22/17 07:00	06/26/17 11:16	1
alpha-BHC	0.330	J	1.6	0.30	ug/Kg		06/22/17 07:00	06/26/17 11:16	1
beta-BHC	<0.30		1.6	0.30	ug/Kg		06/22/17 07:00	06/26/17 11:16	1
Chlordane (technical)	<3.6		16	3.6	ug/Kg		06/22/17 07:00	06/26/17 11:16	1
4,4'-DDD	<0.32		1.6	0.32	ug/Kg		06/22/17 07:00	06/26/17 11:16	1
4,4'-DDE	<0.35		1.6	0.35	ug/Kg		06/22/17 07:00	06/26/17 11:16	1
4,4'-DDT	<0.38		1.6	0.38	ug/Kg		06/22/17 07:00	06/26/17 11:16	1
delta-BHC	<0.31		1.6	0.31	ug/Kg		06/22/17 07:00	06/26/17 11:16	1
Dieldrin	<0.39		1.6	0.39	ug/Kg		06/22/17 07:00	06/26/17 11:16	1
Endosulfan I	<0.32		1.6	0.32	ug/Kg		06/22/17 07:00	06/26/17 11:16	1
Endosulfan II	<0.30		1.6	0.30	ug/Kg		06/22/17 07:00	06/26/17 11:16	1
Endrin	<0.33		1.6	0.33	ug/Kg		06/22/17 07:00	06/26/17 11:16	1
Heptachlor	<0.36		1.6	0.36	ug/Kg		06/22/17 07:00	06/26/17 11:16	1
Heptachlor epoxide	<0.42		1.6	0.42	ug/Kg		06/22/17 07:00	06/26/17 11:16	1
Hexachlorobenzene	0.385	J	1.6	0.37	ug/Kg		06/22/17 07:00	06/26/17 11:16	1
Lindane	<0.30		1.6	0.30	ug/Kg		06/22/17 07:00	06/26/17 11:16	1
Methoxychlor	<0.34		1.6	0.34	ug/Kg		06/22/17 07:00	06/26/17 11:16	1
Mirex	<0.40		1.6	0.40	ug/Kg		06/22/17 07:00	06/26/17 11:16	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	100		45 - 120	06/22/17 07:00	06/26/17 11:16	1
Tetrachloro-m-xylene	65		30 - 124	06/22/17 07:00	06/26/17 11:16	1

Lab Sample ID: LCS 480-363310/2-A
Matrix: Solid
Analysis Batch: 363931

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 363310

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aldrin	16.5	10.2		ug/Kg		62	38 - 120
alpha-BHC	16.5	11.0		ug/Kg		66	39 - 120
beta-BHC	16.5	11.4		ug/Kg		69	40 - 120
4,4'-DDD	16.5	15.6		ug/Kg		95	56 - 120
4,4'-DDE	16.5	12.8		ug/Kg		78	44 - 120

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: LCS 480-363310/2-A
Matrix: Solid
Analysis Batch: 363931

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 363310

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
4,4'-DDT	16.5	15.1		ug/Kg		91	38 - 120
delta-BHC	16.5	12.9		ug/Kg		78	45 - 120
Dieldrin	16.5	14.1		ug/Kg		85	58 - 120
Endosulfan I	16.5	13.0		ug/Kg		79	49 - 120
Endosulfan II	16.5	14.9		ug/Kg		90	55 - 120
Endrin	16.5	14.6		ug/Kg		88	58 - 120
Heptachlor	16.5	12.8		ug/Kg		77	50 - 120
Heptachlor epoxide	16.5	13.9		ug/Kg		84	50 - 120
Lindane	16.5	12.2		ug/Kg		74	50 - 120
Methoxychlor	16.5	15.4		ug/Kg		94	58 - 133

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
DCB Decachlorobiphenyl	*108*		*45 - 120*
Tetrachloro-m-xylene	*69*		*30 - 124*

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Lab Sample ID: MB 480-363492/1-A
Matrix: Solid
Analysis Batch: 363512

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 363492

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	<0.046		0.24	0.046	mg/Kg		06/22/17 15:34	06/23/17 00:55	1
PCB-1221	<0.046		0.24	0.046	mg/Kg		06/22/17 15:34	06/23/17 00:55	1
PCB-1232	<0.046		0.24	0.046	mg/Kg		06/22/17 15:34	06/23/17 00:55	1
PCB-1242	<0.046		0.24	0.046	mg/Kg		06/22/17 15:34	06/23/17 00:55	1
PCB-1248	<0.046		0.24	0.046	mg/Kg		06/22/17 15:34	06/23/17 00:55	1
PCB-1254	<0.11		0.24	0.11	mg/Kg		06/22/17 15:34	06/23/17 00:55	1
PCB-1260	<0.11		0.24	0.11	mg/Kg		06/22/17 15:34	06/23/17 00:55	1
Polychlorinated biphenyls (PCB)	<0.11		0.24	0.11	mg/Kg		06/22/17 15:34	06/23/17 00:55	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*181*	*X*	*60 - 154*	*06/22/17 15:34*	*06/23/17 00:55*	*1*
DCB Decachlorobiphenyl	*167*		*65 - 174*	*06/22/17 15:34*	*06/23/17 00:55*	*1*

Lab Sample ID: LCS 480-363492/2-A
Matrix: Solid
Analysis Batch: 363512

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 363492

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
PCB-1016	1.82	3.10		mg/Kg		171	51 - 185
PCB-1260	1.82	2.65		mg/Kg		146	61 - 184

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Tetrachloro-m-xylene	*172*	*X*	*60 - 154*
DCB Decachlorobiphenyl	*160*		*65 - 174*

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 480-363140/1-A
Matrix: Solid
Analysis Batch: 363456

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 363140

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.39		2.0	0.39	mg/Kg		06/21/17 11:27	06/22/17 12:42	1
Barium	<0.11		0.49	0.11	mg/Kg		06/21/17 11:27	06/22/17 12:42	1
Cadmium	<0.029		0.20	0.029	mg/Kg		06/21/17 11:27	06/22/17 12:42	1
Chromium	<0.20		0.49	0.20	mg/Kg		06/21/17 11:27	06/22/17 12:42	1
Copper	<0.21		0.98	0.21	mg/Kg		06/21/17 11:27	06/22/17 12:42	1
Lead	<0.23		0.98	0.23	mg/Kg		06/21/17 11:27	06/22/17 12:42	1
Selenium	0.649	J	3.9	0.39	mg/Kg		06/21/17 11:27	06/22/17 12:42	1
Silver	<0.20		0.59	0.20	mg/Kg		06/21/17 11:27	06/22/17 12:42	1
Zinc	<0.63		2.0	0.63	mg/Kg		06/21/17 11:27	06/22/17 12:42	1

Lab Sample ID: LCSSRM 480-363140/2-A
Matrix: Solid
Analysis Batch: 363456

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 363140

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	221	202.4		mg/Kg		91.6	71.0 - 133.5
Barium	428	380.7		mg/Kg		89.0	74.3 - 125.5
Cadmium	126	113.0		mg/Kg		89.7	73.3 - 126.2
Chromium	74.7	70.76		mg/Kg		94.7	68.5 - 131.3
Copper	83.3	78.73		mg/Kg		94.5	73.8 - 130.9
Lead	76.9	79.30		mg/Kg		103.1	68.8 - 131.3
Selenium	111	99.87		mg/Kg		90.0	65.7 - 134.2
Silver	59.6	52.59		mg/Kg		88.2	66.8 - 133.1
Zinc	338	295.0		mg/Kg		87.3	71.9 - 127.8

Method: 7471B - Mercury (CVAA)

Lab Sample ID: MB 480-363118/1-A
Matrix: Solid
Analysis Batch: 363209

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 363118

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	<0.0074		0.018	0.0074	mg/Kg		06/21/17 10:00	06/21/17 12:13	1

Lab Sample ID: LCSSRM 480-363118/2-A ^10
Matrix: Solid
Analysis Batch: 363209

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 363118

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits
Hg	12.6	11.88		mg/Kg		94.3	44.4 - 128.6

GC/MS Semi VOA

Prep Batch: 363217

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-119829-1	70015	Total/NA	Solid	3550C	
MB 480-363217/1-A	Method Blank	Total/NA	Solid	3550C	
LCS 480-363217/2-A	Lab Control Sample	Total/NA	Solid	3550C	

Analysis Batch: 363397

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-119829-1	70015	Total/NA	Solid	8270D	363217
MB 480-363217/1-A	Method Blank	Total/NA	Solid	8270D	363217
LCS 480-363217/2-A	Lab Control Sample	Total/NA	Solid	8270D	363217

GC Semi VOA

Prep Batch: 363310

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-119829-1	70015	Total/NA	Solid	3550C	
MB 480-363310/1-A	Method Blank	Total/NA	Solid	3550C	
LCS 480-363310/2-A	Lab Control Sample	Total/NA	Solid	3550C	

Prep Batch: 363492

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-119829-1	70015	Total/NA	Solid	3550C	
MB 480-363492/1-A	Method Blank	Total/NA	Solid	3550C	
LCS 480-363492/2-A	Lab Control Sample	Total/NA	Solid	3550C	

Analysis Batch: 363512

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-119829-1	70015	Total/NA	Solid	8082A	363492
MB 480-363492/1-A	Method Blank	Total/NA	Solid	8082A	363492
LCS 480-363492/2-A	Lab Control Sample	Total/NA	Solid	8082A	363492

Analysis Batch: 363931

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-119829-1	70015	Total/NA	Solid	8081B	363310
MB 480-363310/1-A	Method Blank	Total/NA	Solid	8081B	363310
LCS 480-363310/2-A	Lab Control Sample	Total/NA	Solid	8081B	363310

Metals

Prep Batch: 363118

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-119829-1	70015	Total/NA	Solid	7471B	
MB 480-363118/1-A	Method Blank	Total/NA	Solid	7471B	
LCSSRM 480-363118/2-A ^1	Lab Control Sample	Total/NA	Solid	7471B	

Prep Batch: 363140

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-119829-1	70015	Total/NA	Solid	3050B	
MB 480-363140/1-A	Method Blank	Total/NA	Solid	3050B	
LCSSRM 480-363140/2-A	Lab Control Sample	Total/NA	Solid	3050B	

Metals (Continued)

Analysis Batch: 363209

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-119829-1	70015	Total/NA	Solid	7471B	363118
MB 480-363118/1-A	Method Blank	Total/NA	Solid	7471B	363118
LCSSRM 480-363118/2-A ^1	Lab Control Sample	Total/NA	Solid	7471B	363118

Analysis Batch: 363456

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-119829-1	70015	Total/NA	Solid	6010C	363140
MB 480-363140/1-A	Method Blank	Total/NA	Solid	6010C	363140
LCSSRM 480-363140/2-A	Lab Control Sample	Total/NA	Solid	6010C	363140

General Chemistry

Analysis Batch: 363048

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-119829-1	70015	Total/NA	Solid	Moisture	

Lab Chronicle

Client: White Water Associates
Project/Site: White Water Associates - 70015

TestAmerica Job ID: 480-119829-1

Client Sample ID: 70015
Date Collected: 06/15/17 11:34
Date Received: 06/20/17 09:15

Lab Sample ID: 480-119829-1
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3550C			363310	06/22/17 07:00	CAM	TAL BUF
Total/NA	Analysis	8081B		1	363931	06/26/17 12:15	MAN	TAL BUF
Total/NA	Prep	3550C			363492	06/22/17 15:34	CAM	TAL BUF
Total/NA	Analysis	8082A		1	363512	06/23/17 04:41	JMO	TAL BUF
Total/NA	Prep	7471B			363118	06/21/17 10:00	MVZ	TAL BUF
Total/NA	Analysis	7471B		1	363209	06/21/17 12:45	MVZ	TAL BUF
Total/NA	Analysis	Moisture		1	363048	06/20/17 20:04	CMK	TAL BUF

Client Sample ID: 70015
Date Collected: 06/15/17 11:34
Date Received: 06/20/17 09:15

Lab Sample ID: 480-119829-1
Matrix: Solid
Percent Solids: 89.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3550C			363217	06/21/17 14:25	SMP	TAL BUF
Total/NA	Analysis	8270D		1	363397	06/22/17 20:59	MKP	TAL BUF
Total/NA	Prep	3050B			363140	06/21/17 11:27	MJW	TAL BUF
Total/NA	Analysis	6010C		1	363456	06/22/17 13:32	AMH	TAL BUF

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

Accreditation/Certification Summary

Client: White Water Associates
Project/Site: White Water Associates - 70015

TestAmerica Job ID: 480-119829-1

Laboratory: TestAmerica Buffalo

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Arkansas DEQ	State Program	6	88-0686	07-06-17 *
California	State Program	9	1169CA	09-30-17
Connecticut	State Program	1	PH-0568	09-30-18
Florida	NELAP	4	E87672	06-30-17 *
Georgia	State Program	4	10026 (NY)	03-31-18
Georgia	State Program	4	956	03-31-18
Illinois	NELAP	5	200003	09-30-17
Iowa	State Program	7	374	03-01-19
Kansas	NELAP	7	E-10187	01-31-18
Kentucky (DW)	State Program	4	90029	12-31-17
Kentucky (UST)	State Program	4	30	03-31-18
Kentucky (WW)	State Program	4	90029	12-31-17
Louisiana	NELAP	6	02031	06-30-17 *
Maine	State Program	1	NY00044	12-04-18
Maryland	State Program	3	294	03-31-18
Massachusetts	State Program	1	M-NY044	06-30-17 *
Michigan	State Program	5	9937	04-01-09 *
Minnesota	NELAP	5	036-999-337	12-31-17
New Hampshire	NELAP	1	2337	11-17-17
New Jersey	NELAP	2	NY455	06-30-17 *
New York	NELAP	2	10026	03-31-18
North Dakota	State Program	8	R-176	03-31-18
Oklahoma	State Program	6	9421	08-31-17
Oregon	NELAP	10	NY200003	06-09-18
Pennsylvania	NELAP	3	68-00281	07-31-17 *
Rhode Island	State Program	1	LAO00328	12-30-17
Tennessee	State Program	4	TN02970	03-31-18
Texas	NELAP	6	T104704412-15-6	07-31-17 *
USDA	Federal		P330-11-00386	11-26-17
Virginia	NELAP	3	460185	09-14-17
Washington	State Program	10	C784	02-10-18
Wisconsin	State Program	5	998310390	08-31-17

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: White Water Associates
Project/Site: White Water Associates - 70015

TestAmerica Job ID: 480-119829-1

Method	Method Description	Protocol	Laboratory
8270D	Semivolatile Organic Compounds (GC/MS)	SW846	TAL BUF
8081B	Organochlorine Pesticides (GC)	SW846	TAL BUF
8082A	Polychlorinated Biphenyls (PCBs) by Gas Chromatography	SW846	TAL BUF
6010C	Metals (ICP)	SW846	TAL BUF
7471B	Mercury (CVAA)	SW846	TAL BUF
Moisture	Percent Moisture	EPA	TAL BUF

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

Sample Summary

Client: White Water Associates
Project/Site: White Water Associates - 70015

TestAmerica Job ID: 480-119829-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-119829-1	70015	Solid	06/15/17 11:34	06/20/17 09:15

TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228
phone 716.691.2600 fax 716.691.7991

170619-TAL

Chain of Custody Record

TestAm
THE LEADER IN ENVIR

TestAmerica Lal 480-119829 COC

Regulatory Program: ☐DW ☐NPDES ☐RCRA ☐Other:

Client Contact	Project Manager: Orlette Johnson	Site Contact: Bette Premo	Date: 6/19	COC No:
White Water Associates, Inc.	Tel/Fax: 484.685.0864	bette.premo@white-water-associates.com	Carrier: FedEx	of ____ COCs
429 River Lane, PO Box 27	Analysis Turnaround Time			Sampler:
Amasa, Michigan 49903	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
(906)-822-7889 Phone	TAT if different from Below ____			Walk-in Client:
(906) 822-7977 FAX	☐ 2 weeks			Lab Sampling:
Project Name:	☐ 1 week			Job / SDG No.:
Site:	☐ 2 days			
P O #	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	RCRA Metals	Cu, Zn	Hg	SVOCs - 8270	PCBs - 8082	Pesticides - 8081	TOC	Uranium						Sample Specific Notes:
70015	6/15	11:34		S	3			X	X	X	X	X	X								
70001	6/16	09:37		W	2	X								X	X						this has been filtered

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☐Non-Hazard ☐Flammable ☐Skin Irritant ☐Poison B ☐Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐Return to Client ☐Disposal by Lab ☐Archive for____ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: 3.7 Corr'd: ____ Therm ID No.: 141

	Company:	Date/Time:		Company:	Date/Time:
Relinquished by: Bette J. Premo	WWA	6/19/17 1400	Received by:		
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time: 6/20/17 0945
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Form No. CA-C-WI-002, Rev. 4.2, dated 04/02/2013

Page 22 of 23

6/30/2017

Login Sample Receipt Checklist

Client: White Water Associates

Job Number: 480-119829-1

Login Number: 119829
List Number: 1
Creator: Wallace, Cameron

List Source: TestAmerica Buffalo

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time (Excluding tests with immediate HTs)..	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	WHITE WATER
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	True	
Chlorine Residual checked.	N/A	

200 Michigan Street, Suite 705, Hancock, MI 49930
906-487-7452
www.MannikSmithGroup.com

LETTER OF TRANSMITTAL

To: Mr. Hans Haapala
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913

Project #: MDEQ0070
Date: July 28, 2017

Re: Submittal #014 – Culvert and End Section
MDEQ Torch Lake Non-Superfund Site
Hubbell Processing Area

Enclosed are the following:

No. of Copies	Description
1	Approval - Submittal #014

The above items are transmitted as checked below:

☐ For review and approval ☐ For review and comment ☐ Returned for corrections
☒ For your use ☒ Approved as submitted ☐ Approved as corrected
☐ As requested ☐ Other:

Remarks:

Approved

Copies To: MDEQ-RRD, Calumet District Office

File

Signed:

Printed: Jed Chrestensen
Project Engineer

This transmittal is subject to the following conditions to which you agree by accepting these terms on a reply to this message or using the information in any manner, including but not limited to, copying or using the information for reference.

1. Any work product of The Mannik & Smith Group, Inc. may not be altered in manner, form or content without our prior express written consent.
2. If you discover any errors and/or omissions in the attached information, you will promptly notify us so that we can make any necessary revisions.
3. For any electronic file(s) attached hereto, The Mannik & Smith Group, Inc. is not responsible for any errors caused by the transmission of said files, your software, or your computer systems.

APPROVED LC 7-28-17

ADS N-12® WT IB PIPE (per AASHTO) SPECIFICATION

Scope
This specification describes 4- through 60-inch (100 to 1500 mm) ADS N-12 WT IB pipe (per AASHTO) for use in gravity-flow applications.

Pipe Requirements
N-12 WT IB pipe (per AASHTO) shall have a smooth interior and annular exterior corrugations.
- 4- through 10-inch (100 to 250 mm) shall meet AASHTO M252, Type S.
- 12- through 60-inch (300 to 1500 mm) shall meet AASHTO M294, Type S or ASTM F2306.
- Manning's "n" value for use in design shall be 0.012.

Joint Performance
Pipe shall be joined with the N-12 WT IB joint meeting the requirements of AASHTO M252, AASHTO M294, or ASTM F2306.

4- through 60-inch (100 to 1500 mm) shall be watertight according to the requirements of ASTM D3212. Gaskets shall meet the requirements of ASTM F477. Gaskets shall be installed by the pipe manufacturer and covered with a removable, protective wrap to ensure the gasket is free from debris. A joint lubricant available from the manufacturer shall be used on the gasket and bell during assembly.

12- through 60-inch (300 to 1500 mm) diameters shall have a reinforced bell with a polymer composite band. The bell tolerance device shall be installed by the manufacturer.

Fittings
Fittings shall conform to AASHTO M252, AASHTO M294, or ASTM F2306. Bell and spigot connections shall utilize a spun-on or welded bell and valley or saddle gasket meeting the watertight joint performance requirements of AASHTO M252, AASHTO M294 or ASTM F2306.

Field Pipe and Joint Performance
To assure watertightness, field performance verification may be accomplished by testing in accordance with ASTM F2487. Appropriate safety precautions must be used when field-testing any pipe material. Contact the manufacturer for recommended leakage rates.

Material Properties
Virgin material for pipe and fitting production shall be high-density polyethylene conforming with the minimum requirements of cell classification 424420C for 4- through 10-inch (100 to 250 mm) diameters, and 435400C for 12- through 60-inch (300 to 1500 mm) diameters, as defined and described in the latest version of ASTM D3350, except that carbon black content should not exceed 4%. The 12- through 60-inch (300 to 1500 mm) virgin pipe material shall comply with the notched constant ligament-stress (NCLS) test as specified in Sections 9.5 and 5.1 of AASHTO M294 and ASTM F2306 respectively.

Installation
Installation shall be in accordance with ASTM D2321 and ADS recommended installation guidelines, with the exception that minimum cover in trafficked areas for 4- through 48-inch (100 to 1200 mm) diameters shall be one foot. (0.3 m) and for 54- and 60-inch (1350 and 1500 mm) diameters, the minimum cover shall be 2 ft. (0.6 m) in single run applications. Backfill for minimum cover situations shall consist of Class 1, Class 2 (minimum 90% SPD) or Class 3 (minimum 90%) material. Maximum fill heights depend on embedment material and compaction level; please refer to Technical Note 2.01. Contact your local ADS representative or visit our website at www.ads-pipe.com for a copy of the latest installation guidelines.

Pipe Dimensions

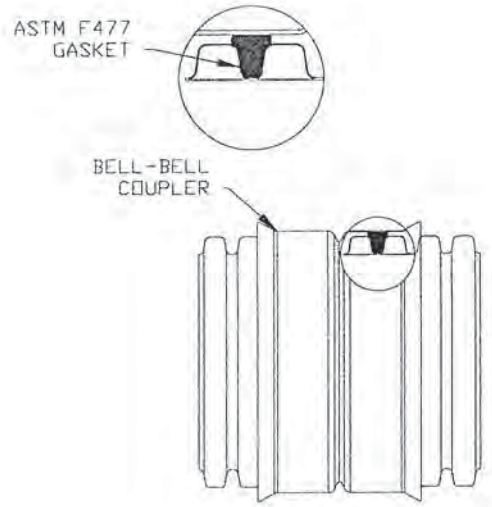
Nominal Diameter, in (mm)														
Pipe I.D. in (mm)	4 (100)	6 (150)	8 (200)	10 (250)	12 (300)	15 (375)	18 (450)	24 (600)	30 (750)	36 (900)	42 (1050)	48 (1200)	54* (1350)	60 (1500)
Pipe O.D.** in (mm)	4.8 (122)	6.9 (175)	9.1 (231)	11.4 (290)	14.5 (368)	18 (457)	22 (559)	28 (711)	36 (914)	42 (1067)	48 (1219)	54 (1372)	61 (1549)	67 (1702)
Perforations	All diameters available with or without perforations													

*Check with sales representative for availability by region.
**Pipe O.D. values are provided for reference purposes only, values stated for 12- through 60-inch are ± 1 inch. Contact a sales representative for exact values.

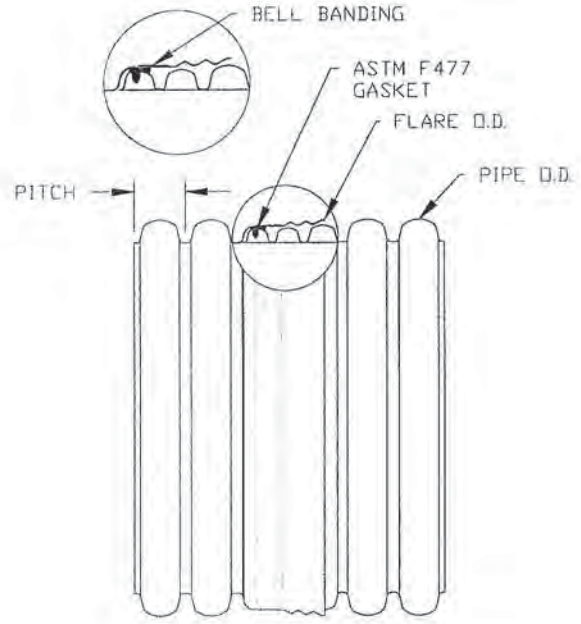
© ADS, Inc., October 2009

N-12® WT IB (per AASHTO) JOINT SYSTEM

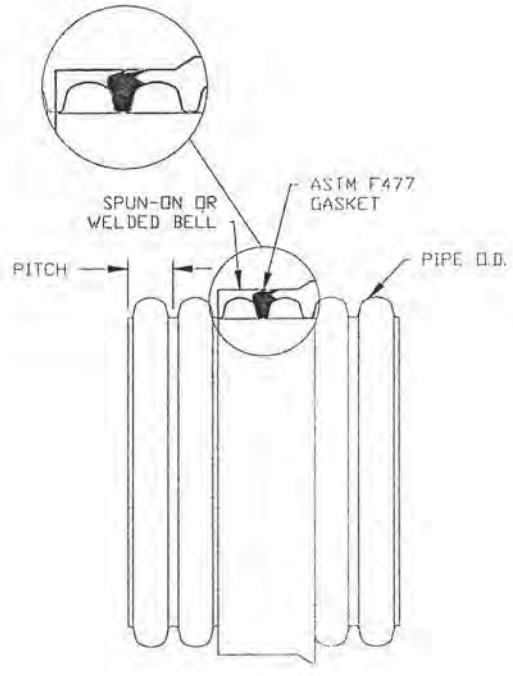
(Joint configuration & availability subject to change without notice. Product detail may differ slightly from actual product appearance.)



4" - 10"
(100-250 MM)



12" - 60"
(300-1500 MM)



12" - 60"
(300-1500 MM)

© ADS, Inc., October 2009

MDOT
Michigan Department of Transportation

PREPARED BY
DESIGN
SUPPORT AREA

DRAWN BY: B.L.T.
CHECKED BY: W.K.P.

DEPARTMENT DIRECTOR
Gloria J. Jeff

APPROVED BY: _____
ENGINEER OF DELIVERY

APPROVED BY: _____
ENGINEER OF DEVELOPMENT

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR

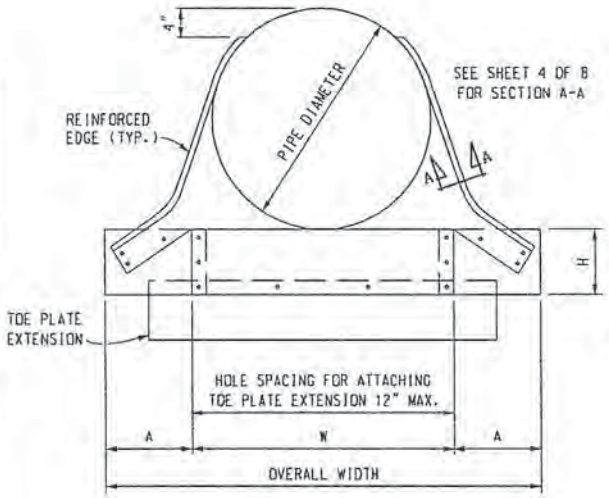
CULVERT
SLOPED END SECTIONS
(CONCRETE AND METAL)

F.H.W.A. APPROVAL

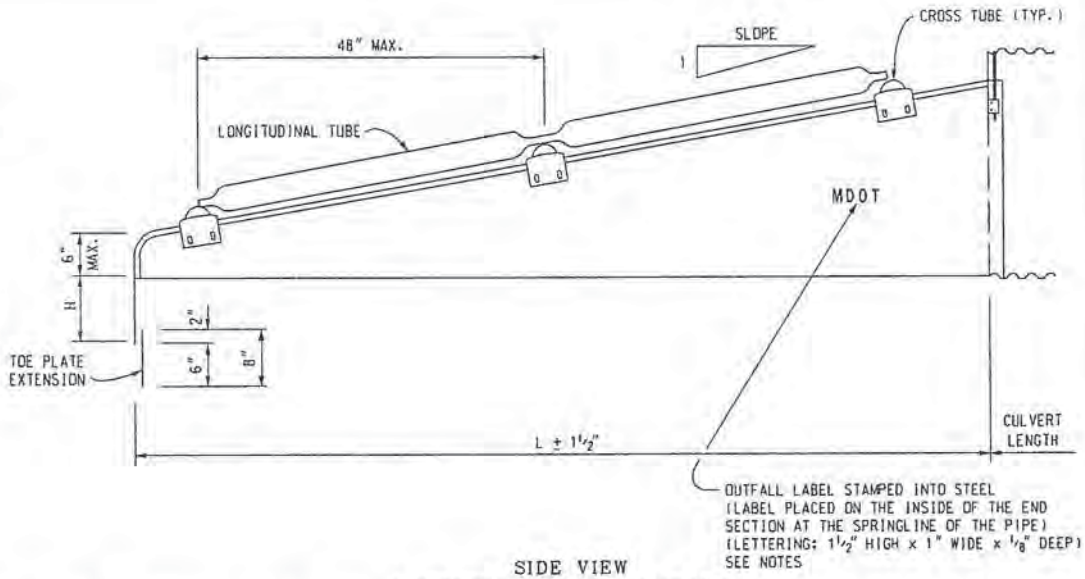
4-22-2005
PLAN DATE

R-95-F

SHEET
1 OF 7

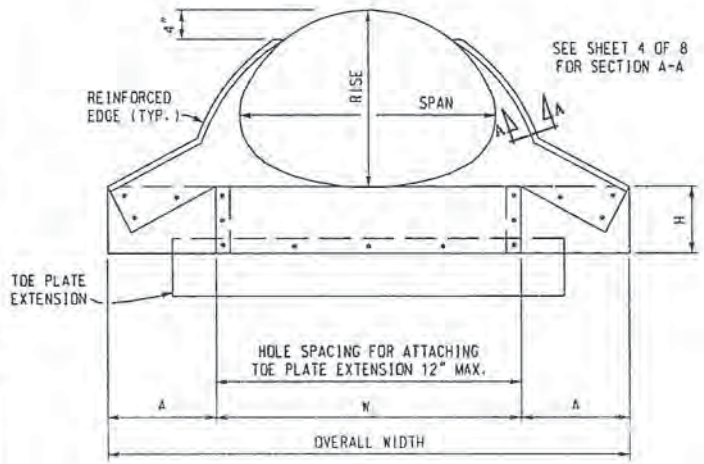


END VIEW

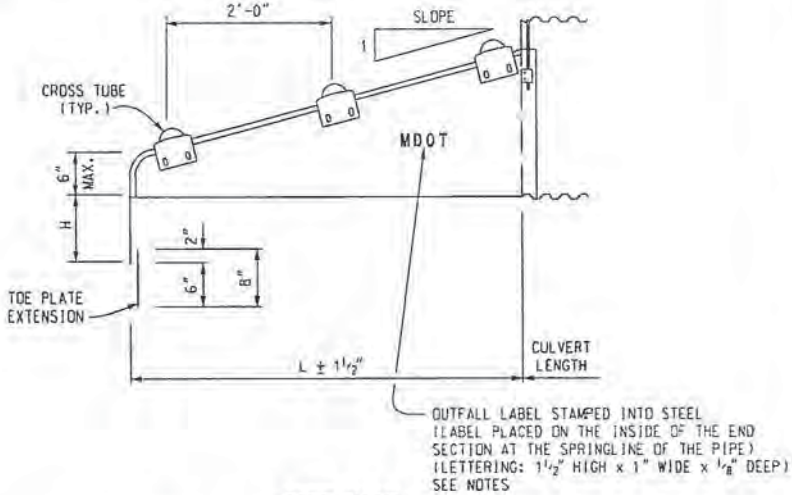


SIDE VIEW
(TRANSVERSE DRAINAGE INSTALLATION SHOWN)

METAL CULVERT SLOPED END SECTION FOR CORRUGATED METAL PIPE



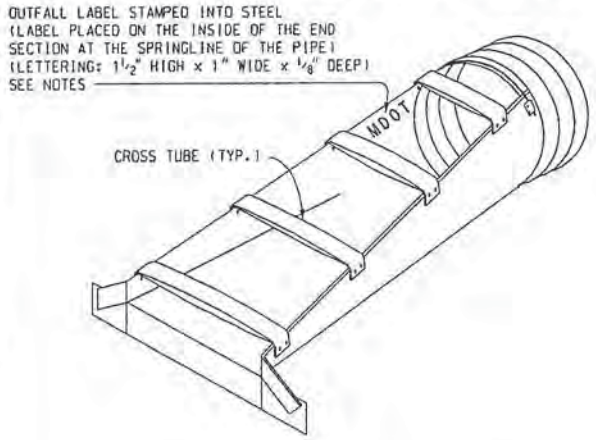
END VIEW



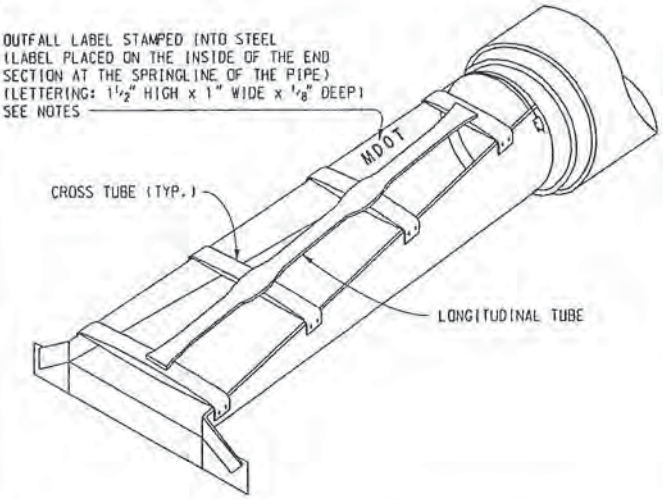
SIDE VIEW
(LONGITUDINAL DRAINAGE INSTALLATION SHOWN)

METAL CULVERT SLOPED END SECTION FOR ARCH PIPE

NOTE:
IN LONGITUDINAL DRAINAGE SITUATIONS, CROSS TUBES ARE REQUIRED AT A 24" MAXIMUM SPACING. THE NUMBER OF CROSS TUBES REQUIRED WILL VARY DEPENDING ON THE LENGTH OF THE CULVERT SLOPED END SECTION.



METAL CULVERT SLOPED END SECTION SHOWING CROSS TUBES USED FOR LONGITUDINAL DRAINAGE INSTALLATIONS



NOTE:
IN TRANSVERSE DRAINAGE SITUATIONS, NO TUBES ARE REQUIRED WHEN THE "W" DIMENSION IS 30" OR LESS. CROSS TUBES ARE REQUIRED WHEN THE CLEAR SPAN DIMENSION IS LARGER THAN 30". THE NUMBER OF CROSS TUBES WILL VARY DEPENDING ON THE LENGTH OF THE LONGITUDINAL TUBE REQUIRED. WHEN THE "W" DIMENSION IS 36" TO 60", ONE LONGITUDINAL TUBE IS REQUIRED. WHEN THE "W" DIMENSION IS LARGER THAN 60", TWO LONGITUDINAL TUBES EQUALLY SPACED ARE REQUIRED. LONGITUDINAL TUBES SHALL BE WELDED TO CROSS TUBES TO ATTAIN A SINGLE PIECE STRUCTURE.

METAL CULVERT SLOPED END SECTION SHOWING CROSS TUBES AND LONGITUDINAL TUBE USED FOR TRANSVERSE DRAINAGE INSTALLATIONS (CONNECTED TO CONCRETE PIPE SHOWN)

METAL SLOPED END SECTIONS FOR ARCH PIPES

SPAN/ RISE (INCHES)	MINIMUM THICKNESS (INCHES)	DIMENSIONS (INCHES)				L DIMENSIONS (INCHES)	
		A	H	W	OVERALL WIDTH	LENGTH (SLOPE 4:1)	LENGTH (SLOPE 6:1)
21 X 15	.064	8	6	27	43	20	30
24 X 18	.064	8	6	30	46	32	48
28 X 20	.064	8	6	34	50	40	60
35 X 24	.079	12	9	41	65	56	84
42 X 29	.109	12	9	48	72	76	114
49 X 33	.109	16	12	55	87	92	138
57 X 38	.109	16	12	63	95	112	168
64 X 43	.109	16	12	70	102	132	198
71 X 47	.109	16	12	77	109	148	222
77 X 52	.109	16	12	83	115	168	252
83 X 57	.109	16	12	89	121	188	282

METAL SLOPED END SECTIONS FOR CIRCULAR PIPES
(STEEL OPTION)

PIPE DIA. (INCHES)	MINIMUM THICKNESS (INCHES)	DIMENSIONS (INCHES)				L DIMENSIONS (INCHES)	
		A	H	W	OVERALL WIDTH	LENGTH (SLOPE 4:1)	LENGTH (SLOPE 6:1)
15	.064	8	6	21	37	20	30
18	.064	8	6	24	40	32	48
21	.064	8	6	27	43	44	66
24	.064	8	6	30	46	56	84
27	.109	12	9	33	57	68	102
30	.109	12	9	36	60	80	120
36	.109	12	9	42	66	104	156
42	.109	16	12	48	80	128	192
48	.109	16	12	54	86	152	228
54	.109	16	12	60	92	176	264
60	.109	16	12	66	98	200	300

METAL SLOPED END SECTIONS FOR ELLIPTICAL PIPES

HEIGHT/ WIDTH (INCHES)	MINIMUM THICKNESS (INCHES)	DIMENSIONS (INCHES)				L DIMENSIONS (INCHES)	
		A	H	W	OVERALL WIDTH	LENGTH (SLOPE 4:1)	LENGTH (SLOPE 6:1)
14 X 23	.064	8	6	29	45	16	24
19 X 30	.064	8	6	36	52	36	54
22 X 34	.079	12	9	40	64	48	72
24 X 38	.079	12	9	44	68	56	84
27 X 42	.109	12	9	48	72	68	102
29 X 45	.109	16	12	51	83	76	114
34 X 53	.109	16	12	59	91	96	144
38 X 60	.109	16	12	66	98	112	168
43 X 68	.109	16	12	74	106	132	198
48 X 76	.109	16	12	80	112	152	228

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR

CULVERT SLOPED END SECTIONS
(CONCRETE AND METAL)

F.H.W.A. APPROVAL	4-22-2005 PLAN DATE	R-95-F	SHEET 5 OF 7

An Equal Opportunity Employer
B&B Contracting, Calumet, Inc.
55670 Hwy M-26
Calumet, MI 49913
Office: 906-337-0017
Fax: 906-934-2587

TRANSMITTAL

DATE:

October 2, 2017

FROM:

Hans Haapala (906)281-6908

ATTN:

Jed Chrestensen, P.E.

JOB NAME:

Torch Lake Non-Superfund Site
Hubbell Processing Area

ADDRESS:

The Mannik & Smith Group, Inc.
200 Michigan Street, Suite 705
Hancock, MI 49930

ATTACHED:

Submittal #015
Concrete Load Slip

PHONE NUMBER:

(906)487-7451

RE:

Concrete Load Ticket

O URGENT **X** FOR REVIEW **O** PLEASE COMMENT **O** PLEASE REPLY **O** PLEASE RECYCLE

Notes/Comments:

Please review the attached submittal.

SUBMITTAL# 015

DATE: October 2, 2017

Michigan Department of Environmental Quality
Torch Lake Non-Superfund Site
Hubbell Processing Area
Hubbell, MI

File No.: 761/16108.SAR Index No.44251

TO:
Jed Chrestensen

The Mannik & Smith Group, Inc

200 Michigan Street, Suite 705

Hancock, MI 49930

FROM:
Hans Haapala, Project Manager, 906-281-6908

B&B Contracting, Calumet, Inc.

55670 Hwy M-26

Calumet, MI 49913

SUBMITTAL TYPE:

☐ Product Data	☐ Certificates	☐Record Documents	☐ Operation/Maintenance Manuals
☐Shop Drawings	☐Manufacturer's Instructions	☐Samples	☐ Contract Closeout
☐Test Reports	☐Construction Photographs	☐ Administrative	☒Other

SUPPLIER: Superior Sand & Gravel, Inc.

SPECIFICATION NUMBER AND TITLE: 03 30 00 Cast-In-Place Concrete

PART	TYPE	DESCRIPTION
1.3.2	Load Tickets	Concrete Load Ticket, 3.5 CYD, 7/12/2017

B&B Contracting, Calumet, Inc. certifies that review, approval verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents. Signed: _____ Date: 10/2/17	

1028 Ethel Avenue
P.O. Box 309
Hancock, MI 49930
(906) 482-3130

Superior sand & gravel Inc.

56541

"For Superior Concrete Insist on Superior Aggregates"

SOLD TO:
B&B CONTRACTING
BRIAN BONEN
55670 M26
CALUMET MI 49913

SHIP TO:
53264 M-26 LAKE
LINDEN.....ACROSS FROM
ZIEMNICK'S

TIME	FORMULA	LOAD SIZE	YARDS ORDERED	USE	DRIVER/TRUCK	MAP COORDINATE	PLANT/TRANSACTION #
10:37 AM	21	3.5	3.50	Walls	346 BRANDON PELTO		
DATE		LOAD #	YARDS DEL.	BATCH #	WATER TRIM	SLUMP	TICKET NUMBER
07/12/17		1	3.50	9205	130 PSI	4.00 in	9030

WARNING-FRESH (WET) CONCRETE IS IRRITATING TO THE SKIN AND EYES

Contains Portland Cement. Wear Rubber Boots and Gloves, PROLONGED CONTACT MAY CAUSE SERVERE BURNS. Avoid Contact With Eyes and Prolonged Contact With Skin. In Case of Contact With Skin or Eyes, Flush Thoroughly With Water. If Irritation Persists Get Medical Attention. KEEP CHILDREN AWAY FROM FRESH (WET) CONCRETE.

CONCRETE is a PERISHABLE COMMODITY and BECOMES the PROPERTY of the PURCHASER UPON LEAVING the PLANT. ANY CHANGES or CANCELLATION of ORIGINAL INSTRUCTIONS MUST be TELEPHONED to the OFFICE BEFORE **LOADING** STARTS.

The undersigned promises to pay all costs, including reasonable attorneys fees, incurred in collecting any sums owed

All accounts not paid within 30 days of delivery will bear interest at the rate of 18% per annum.

Not Responsible for Reactive Aggregate or Color Quality. No Claim Allowed Unless Made at Time Material is Delivered

A $15.00 Service Charge and Loss of the Cash Discount will be Collected on all Returned Checks

Excess Delay Time Charged @$60.00/HR

PROPERTY DAMAGE RELEASE
(TO BE SIGNED IF DELIVERY TO BE MADE INSIDE CURB LINE)

Dear Customer-The drive of this truck in presenting this RELEASE to you for your signature is of the opinion that the size and weight of his truck may possibly cause damage to the premises and/or adjacent property if he places the material in this load where you desire it. It is our wish to help you in every way that we can, but in order to do this the driver is requesting that you sign the RELEASE relieving him and this supplier from any responsibility from any damage that may occur to the premises and/or adjacent property, buildings, sidewalks, drive-ways, curbs, etc. by the delivery of this material, and that you also agree to help him remove mud from the wheels of his vehicle so that he will not litter the public street. Further, as additional consideration, the undersigned agrees to indemnity and hold harmless the driver of this truck and this supplier for any and all damage to the premises and/or adjacent property which may be claimed by anyone to have arisen out of delivery of this order

SIGNED
X _____

Excessive Water is Detrimental to Concrete Performance
H_2O Added By Request/Authorized By

_____ GAL X _____

WEIGHMASTER

Michael Thornton

NOTICE: MY SIGNATURE BELOW INDICATES THAT I HAVE READ THE HEALTH WARNING NOTICE AND SUPPLIER WILL NOT BE RESPONSIBLE FOR ANY DAMAGE CAUSED BY THE ADDITION OF EXCESS WATER OR WHEN DELIVERING INSIDE CURB LINE.

LOAD RECEIVED BY:
X _____

QUANTITY	CODE	DESCRIPTION	UNIT PRICE	EXTENDED PRICE
3.50 yd	21	(A)WITTING WALL MIX 5		

RETURNED TO PLANT	LEFT JOB	FINISH UNLOADING	DELAY EXPLANATION/CYLINDER TEST TAKEN	TIME ALLOWED
	11:46a	11:45a	1. JOB NOT READY 6. TRUCK BROKE DOWN 2. SLOW POUR OR PUMP 7. ACCIDENT 3. TRUCK AHEAD ON JOB 8. CITATION 4. CONTRACTOR BROKE DOWN 9. OTHER 5. ADDED WATER	
LEFT PLANT	ARRIVED JOB	START UNLOADING		TIME DUE
~~10:37 AM~~	11:11a	11:17a		
TOTAL ROUND TRIP	TOTAL AT JOB	UNLOADING TIME		DELAY TIME

HOT WATER
FIBER MESH
MISC. CHARGE _____
SUB-TOTAL
MI SALES TAX _____
GRAND TOTAL ▶

BATCH DATA

Truck	Driver	Load Size	Mix Code	Ticket ID	Time	Date
346	BRANDON PELT	3.50 yd	21	9030	10:37	7/12/17

Weighmaster
Mike

Customer Code: B&B
Load ID: 9205

Material	Design Qty	Required	Batched	% Var	% Moisture	Actual Wat
6A	1470 lb	5196 lb	5160 lb	.70%	1.00% M	6 gl
2NS	1430 lb	5164 lb	5160 lb	.08%	3.18% A	19 gl
CEMENT	442.0 lb	1547.0 lb	1550.0 lb	* .19%		
MICRO A	.35 /C	6.33 oz	9.00 oz	+ .11%		
997	9.00 /C	162.86 oz	165.00 oz	.32%		
122HE	12.00 /C	217.14 oz	216.00 oz	.53%		
WATER	30.00 gl	66.74 gl	67.00 gl	.39%		67.00 gl
FLY ASH	75.0 lb	262.5 lb	265.0 lb	.95%		
28B	250 lb	884 lb	860 lb	.69%	1.00% M	1 gl

Load Completed Load Time: 2 :15 ---Tares---

AGG B: 1 ST: 0 lb FT: 0 lb CEM B: 1 ST: 0 lb FT: 0

WEIGHMASTER SIGNATURE X Brandon Pelto

APPENDIX J

Photographic Log



Photo 1: Panoramic view looking east to the Coal Dock Area and upwelling. Photo taken July 6, 2017.



Photo 2: Panoramic view looking north to Waste Pile 11. Photo taken July 6, 2017.



Photo 3: Panoramic view looking southeast to the Coal Dock area from the access road. The historic crane rail is located along the left side of the standing water. Photo taken July 6, 2017.



Photo 4: Panoramic view looking northwest from the southeast corner of the Coal Dock. Photo taken July 6, 2017.



Photo 5: Panoramic view looking east to the work in progress. Photo taken July 12, 2017.



Photo 6: Panoramic view looking east to the cap material being spread following grading. Photo taken July 20, 2017.



Photo 7: View looking east to culvert alignment prior to replacement. Photo taken July 31, 2017.



Photo 8: View looking west to the installation of the new culvert. Photo taken August 2, 2017.



Photo 9: Panoramic view looking north to the completed capping activities. The historic crane rail is visible in the center of the photograph stretching north to the tree line. Photo taken August 2, 2017.



Photo 10: View looking southeast to the installation of the coconut shell erosion control blanket along the ditch. Photo taken August 14, 2017.



Photo 11: Panoramic view looking east to the Coal Dock area following seeding and mulching. Photo taken August 14, 2017.



Photo 12: Panoramic view looking east to Coal Dock area following grass establishment. Photo taken September 28, 2017.

APPENDIX K

Waste Management Records

WASTE SHIPMENT RECORD / ASBESTOS MANIFEST

(See Reverse for Instructions)

For Disposal Site Use Only

Elevation_____

North_____ East_____

Generator

1-A. Special Waste Profile Number	NESHAP Notified	WSR Number
ASB120685MI	X YES _____ NO	908329

1-B. Generator Name, Contact Name, and Complete Mailing Address (including Zip Code)
State of Michigan
55195 US HI Calumet, MI 49913

1-C. Generator's Phone Number
906-337-0389

1-D. Work Site Address
52634 Hwy M-26
Hubbell, MI 49934

1-E. 24 Hour Emergency Response Telephone Number

2. Operator's Name and Complete Mailing Address
Upper Peninsula Abatement Company
3349 US Highway 41 E Negaunee, MI 49866

Operator's Phone Number
906-250-6710

3. Waste Disposal Site (WDS) Name and Complete Mailing Address
K & W Landfill
11877 M-38
Ontonagon, MI 49953

WDS Phone Number
(906) 883-3504

4. Name and Address of Responsible Agency
State of Wisconsin; Department of Natural Resources
1125 Military Avenue, Green Bay, WI 54307

State of Michigan; Region 1 Headquarters
1990 US Highway 41 South, Marquette, MI 49855

5. Description of Materials		6. Containers No.	6. Containers Type	7. Total Quantity yd3
friable asbestos	Asbestos, 9, NA2212, III, RQ			.16 Tons
non-friable asbestos	Cat I X Cat II _____	5	Bags	1

8. Special Handling Instructions and Additional Information
24 HOUR NOTICE GIVEN PRIOR TO DISPOSAL, MUST BE BURIED

9. GENERATOR/OPERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and government regulations. I hereby certify that the asbestos is not contaminated with hazardous, PCB, and/or any special waste.

Printed/Typed Name and Title	Signature	Date
Amy Kerava DEQ	DEQ	8/1/17

Transporter

10. Transporter 1 Company Name: UPAC
Complete Mailing Address: 349 US highway 41 E Negaunee MI 49866
Telephone Number (including area code): 906-250-6710
Driver Signature
Printed Name and Title: Jordan Beaudry
Date: 8/16/17

11. Transporter 2 Company Name
Complete Mailing Address
Telephone Number (including area code)
Driver Signature
Printed Name and Title
Date

Disposal Site

12. Discrepancy Indication Space

13. Waste Disposal Site Owner or Operator
Special Waste Approval is issued by signature in the case of a Generic Asbestos Approval.
Certification of receipt of asbestos materials covered by this manifest except as noted in Item 12.

Printed/Typed Name and Title	Signature	Date
Linda Thoreson Operations Specialist	Linda Thoreson	8-16-17

WHITE - Disposal Site CANARY - Generator PINK - Transporter GOLD - Generator

DCE-230-99-MI-3/99 (r3/05)

Chemical Waste Management of the Northwest
17629 Cedar Springs Lane
Arlington, OR 97812
(541) 454-3235
(541) 454-3237

INVOICE

THIS IS AN INVOICE FOR CURRENT CHARGES. PLEASE PAY AMOUNT INDICATED BELOW.

TERMS

DUE UPON RECEIPT
OR PER CONTRACT

ALL PAST DUE AMOUNTS WILL BEAR INTEREST AT ONE AND ONE HALF PERCENT PER MONTH OR THE MAXIMUM RATE ALLOWED BY LAW, WHICHEVER IS LESS.

Invoice #1

B & B CONTRACTING CALUMET INC
ATTN: ACCOUNTS PAYABLE
55670 HWY M26
CALUMET MI 49913

Invoice Date: 10/12/2017
Customer #: 450-1494618
Invoice #: 2236-0112152
Page #: 1

Manifest#	Profile	Description	Gener/Quantity		P.O.#/Unit	Biller	Rate	Total
0000456462	OR334984	STAB04 PCB CONTAMINA	012293 STATE OF MICHIG		HUBBLE PROCESNG	NFLETCHE	Svc Date	09/27/2017
	STABILIZATION	DISPOSAL	14.72	TONS			498.00000	7,330.56
	CERTIFICATE OF DISPO	CERT OF DISP BEFORE	1.00	EACH			35.00000	35.00
	STATE WASTE MGMT FEE		14.72	TONS			20.00000	294.40
		MANIFEST DOCUMENT 016212205JJK						
							Subtotal	7,659.96
0000456465	OR334984	STAB04 PCB CONTAMINA	012293 STATE OF MICHIG		HUBBLE PROCESNG	NFLETCHE	Svc Date	09/27/2017
	STABILIZATION	DISPOSAL	17.17	TONS			498.00000	8,550.66
	CERTIFICATE OF DISPO	CERT OF DISP BEFORE	1.00	EACH			35.00000	35.00
	STATE WASTE MGMT FEE		17.17	TONS			20.00000	343.40
		MANIFEST DOCUMENT 016212206JJK						
							Subtotal	8,929.06
0000456467	OR334984	STAB04 PCB CONTAMINA	012293 STATE OF MICHIG		HUBBLE PROCESNG	NFLETCHE	Svc Date	09/27/2017
	STABILIZATION	DISPOSAL	17.33	TONS			498.00000	8,630.34
	CERTIFICATE OF DISPO	CERT OF DISP BEFORE	1.00	EACH			35.00000	35.00
	STATE WASTE MGMT FEE		17.33	TONS			20.00000	346.60
		MANIFEST DOCUMENT 016212202JJK						
							Subtotal	9,011.94
0000456469	OR334984	STAB04 PCB CONTAMINA	012293 STATE OF MICHIG		HUBBLE PROCESNG	NFLETCHE	Svc Date	09/27/2017
	STABILIZATION	DISPOSAL	17.29	TONS			498.00000	8,610.42
	CERTIFICATE OF DISPO	CERT OF DISP BEFORE	1.00	EACH			35.00000	35.00
	STATE WASTE MGMT FEE		17.29	TONS			20.00000	345.80
		MANIFEST DOCUMENT 016212204JJK						
							Subtotal	8,991.22

Remit to: CHEMICAL WASTE MANAGEMENT, INC.
P.O. BOX 660345
DALLAS, TX 75266

Continued

Chemical Waste Management of the Northwest
17629 Cedar Springs Lane
Arlington, OR 97812
(541) 454-3235
(541) 454-3237

INVOICE

THIS IS AN INVOICE FOR CURRENT CHARGES. PLEASE PAY AMOUNT INDICATED BELOW

TERMS

DUE UPON RECEIPT
OR PER CONTRACT

ALL PAST DUE AMOUNTS WILL BEAR INTEREST AT ONE AND ONE HALF PERCENT PER MONTH OR THE MAXIMUM RATE ALLOWED BY LAW, WHICHEVER IS LESS.

B & B CONTRACTING CALUMET INC
ATTN: ACCOUNTS PAYABLE
55670 HWY M26
CALUMET MI 49913

Invoice Date: 10/12/2017
Customer #: 450-1494618
Invoice #: 2236-0112152
Page #: 2

Manifest#	Profile	Description	Gener/Quantity	P.O.#/Unit	Biller	Rate	Total

AS REQUIRED BY 40 CFR 264.12 (b). WM IS NOTIFYING YOU THAT THIS FACILITY HAS THE APPROPRIATE PERMIT(S) FOR, AND WILL ACCEPT THE WASTE YOU THE GENERATOR IS SHIPPING.

Remit to: CHEMICAL WASTE MANAGEMENT, INC.
P.O. BOX 660345
DALLAS, TX 75266

Total Due $34,592.18

456 462 9/2 CW

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
	MIK193755066	2	(800)424-9300	016212205 JJK

5. Generator's Name and Mailing Address
STATE OF MICHIGAN
~~52634 HWY M26~~ 55195 US 41
~~HUBBELL MI 49934~~ Calumet, MI 49913
Generator's Phone: (906)337-0389

Generator's Site Address (if different than mailing address)
52634 Hwy M-26
Hubbell, MI 49934

6. Transporter 1 Company Name: ZIRON — U.S. EPA ID Number: IL000107581

7. Transporter 2 Company Name: — U.S. EPA ID Number:

8. Designated Facility Name and Site Address
CHEMICAL WASTE MANAGEMENT, INC.
17629 CEDAR SPRINGS LANE
ARLINGTON OR 97812-9709
Facility's Phone: (541)454-2643
U.S. EPA ID Number: ORD089452353

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
X	1. UN3077, WASTE ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S, (LEAD), 9, III, RQ	1	CM	12737 ~~13,190~~	K	D008 X002
	2.					
	3.					
	4.					

DW 9/30/17

14. Special Handling Instructions and Additional Information
COSD: 8/23/17
1. PROFILE OR334984: PCB CONTAMINATED SOIL; ERG # 171; RQ = 10 LBS.
BOX#00071 WMXU - 300007

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Amy Keranen, MDEQ — Signature: [signature] — Month 8 Day 23 Year 17

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: Zoth Wroblewski — Signature: [signature] — Month 8 Day 23 Year 17
Transporter 2 Printed/Typed Name: — Signature: — Month Day Year

18. Discrepancy
18a. Discrepancy Indication Space ☑ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
OK Per Bobby Wather to change weight to kg. DW 9/30/17
Manifest Reference Number:

18b. Alternate Facility (or Generator) — U.S. EPA ID Number:
Facility's Phone:

18c. Signature of Alternate Facility (or Generator) — Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)
1. H110 2. 3. 4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name: Patti Brandt — Signature: [signature] — Month 10 Day 02 Year 17

GENERATOR — INT'L — TRANSPORTER — DESIGNATED FACILITY

EPA Form 1700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

456462

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)

21. Generator ID Number: MIK193755066

22. Page: 2

23. Manifest Tracking Number: 016212205 JJK

24. Generator's Name: STATE OF MICHIGAN

25. Transporter _____ Company Name

U.S. EPA ID Number

26. Transporter _____ Company Name: CRRL

U.S. EPA ID Number: IBR0987173457

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes

32. Special Handling Instructions and Additional Information

WMX4 300007

GENERATOR

33. Transporter 3 Acknowledgment of Receipt of Materials

Printed/Typed Name: BONNIE SHAW

Signature: BShaw

Month: 9 Day: 25 Year: 17

TRANSPORTER

34. Transporter _____ Acknowledgment of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

EPA Form 8700-22A (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

Chemical Waste Management Of The Northwest
17629 Cedar Springs Lane
Arlington, Oregon 97812
541-454-2643
EPA I.D.# ORDO894[illegible]

LOAD NO. _____

MANIFEST DOC. NO. _____

INBOUND
T/D: 08:39:35 2017-10-02
ID: 456462 TRK ID: 300007 SU3A
77960 lb G

INBOUND
T/D: 09:00:24 2017-10-02
ID: 456462 TRK ID: 300007 SU3A
77960 lb G
48520 lb PT
29440 lb N

NET 14.72 TONS

13354.KG

GENERATOR _____

803-ARLINGTON OR

WASTE MANAGEMENT

CWM OF THE NORTHWEST
Federal EPA ID: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

STATE OF MICHIGAN
ATTN: MANIFEST SECTION
MIK193755066
52634 HWY M26
HUBBELL MI 49934

CERTIFICATE OF DISPOSAL

CWM OF THE NORTHWEST, EPA ID: ORD089452353, has received waste material from STATE OF MICHIGAN on 09/27/17 as described on Shipping Document number 016212205JJK. CWM OF THE NORTHWEST hereby certifies that the above described material was landfilled in accordance with the 40 CFR part 761 as it pertains to the land disposal of polychlorinated biphenyl contaminated materials.

Profile Number: OR334984
CWM Tracking ID: 45646201

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C 1001 and 15 U.S.C. 2615) I certify that the information contained in or accompanying this document is true accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true accurate and complete.

Becky Sumner

CWMNW RECORDS DEPARTMENT
Certificate # 223529
10/11/17

456465

CWMI

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number MIK193755066	2. Page 1 of 1	3. Emergency Response Phone (800)424-9300	4. Manifest Tracking Number 016212206 JJK

5. Generator's Name and Mailing Address: ~~STATE OF MICHIGAN~~ ~~52634 HWY M26~~ ~~HUBBELL~~ ~~MI 49934~~ 5195 US 41 Calumet, MI 49913
Generator's Phone: (906)337-0388
Generator's Site Address (if different than mailing address): 52634 Hwy M-26 Hubbell, MI 49934

6. Transporter 1 Company Name: Zion Environmental — U.S. EPA ID Number: ILR000107581
7. Transporter 2 Company Name — U.S. EPA ID Number:
8. Designated Facility Name and Site Address: CHEMICAL WASTE MANAGEMENT, INC. 17629 CEDAR SPRINGS LANE ARLINGTON OR 97812-9709 — U.S. EPA ID Number: ORD089452353
Facility's Phone: (541)454-2643

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
X	1. UN3077, WASTE ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S, (LEAD), 9, III, RQ	1	CM	~~37,360~~ 14678	~~P~~ K	D008 K002
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information
1. PROFILE OR334984: PCB CONTAMINATED SOIL; ERG # 171; RQ = 10 LBS
Box # HESU 48601 DOSD: 8/25/17
15577 KG

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Amy Keraven, MDEQ — Signature: Amy Keraven, MDEQ — Month 8 Day 25 Year 17

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit: Date leaving U.S.:
Transporter signature (for exports only):

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: Jacob Burgess — Signature: — Month 8 Day 25 Year 17
Transporter 2 Printed/Typed Name — Signature — Month Day Year

18. Discrepancy
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Per Bobby Watcher ok to change weight to kg — Manifest Reference Number: ~~9~~ 9/30/17
18b. Alternate Facility (or Generator) — U.S. EPA ID Number:
Facility's Phone:
18c. Signature of Alternate Facility (or Generator) — Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)
1. H110 2. 3. 4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name: Patricia Slider — Signature — Month 9 Day 27 Year 17

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

456465

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)	21. Generator ID Number MIK193755066	22. Page 2 of 2	23. Manifest Tracking Number 016212206JJK

24. Generator's Name: STATE OF MICHIGAN

25. Transporter _____ Company Name | U.S. EPA ID Number

26. Transporter _____ Company Name: CRLRC | U.S. EPA ID Number: ORD 987173457

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes

32. Special Handling Instructions and Additional Information

HESU 48601

33. Transporter _____ Acknowledgment of Receipt of Materials

Printed/Typed Name: Jacob Burgess | Signature: [signature] | Month 8 Day 25 Year 17

34. Transporter 3 Acknowledgment of Receipt of Materials

Printed/Typed Name: Bonnie Shaw | Signature: BShaw | Month 9 Day 25 Year 17

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

GENERATOR

TRANSPORTER

DESIGNATED FACILITY

EPA Form 8700-22A (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

Chemical Waste Management
Of The Northwest

17629 Cedar Springs Lane
Arlington, Oregon 97812
541-454-2643
EPA I.D.# ORDO89452353

LOAD NO. SU-3B

MANIFEST DOC. NO. _____

INBOUND
T/D: 15:08:01 2017-10-03
ID: 456465 TRK ID: 48601
83540 lb G

OUTBOUND
T/D: 15:21:39 2017-10-03
ID: 456465 TRK ID: 48601
83540 lb G
49200 lb PT
34340 lb N

NET 17.17 TONS

15577. KG

GENERATOR _____

903-ARLINGTON OR

WASTE MANAGEMENT

CWM OF THE NORTHWEST
Federal EPA ID: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

STATE OF MICHIGAN
ATTN: MANIFEST SECTION
MIK193755066
52634 HWY M26
HUBBELL MI 49934

CERTIFICATE OF DISPOSAL

CWM OF THE NORTHWEST, EPA ID: ORD089452353, has received waste material from STATE OF MICHIGAN on 09/27/17 as described on Shipping Document number 016212206JJK. CWM OF THE NORTHWEST hereby certifies that the above described material was landfilled in accordance with the 40 CFR part 761 as it pertains to the land disposal of polychlorinated biphenyl contaminated materials.

Profile Number: OR334984
CWM Tracking ID: 45646501

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C 1001 and 15 U.S.C. 2615) I certify that the information contained in or accompanying this document is true accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true accurate and complete.

Becky Sumner

CWMNW RECORDS DEPARTMENT
Certificate # 223620
10/12/17

456467

CWMI ✓

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number: MIK193755088	2. Page 1 of 2	3. Emergency Response Phone: (800)424-9300	4. Manifest Tracking Number: 016212202 JJK

5. Generator's Name and Mailing Address: STATE OF MICHIGAN ~~52634 HWY M28~~ 55195 US 41 ~~HUBBELL MI 49934~~ Calumet, MI 49913 (906)337-0389

Generator's Site Address (if different than mailing address): 52634 Hwy M-26 Hubbell, MI 49934

Generator's Phone:

6. Transporter 1 Company Name: Ziron Environmental — U.S. EPA ID Number: ILR000102581

7. Transporter 2 Company Name: — U.S. EPA ID Number:

8. Designated Facility Name and Site Address: CHEMICAL WASTE MANAGEMENT, INC. 17629 CEDAR SPRINGS LANE ARLINGTON OR 97812-9709 — U.S. EPA ID Number: ORD089452353

Facility's Phone: (541)454-2843

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
X	1. UN3077, WASTE ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S, (LEAD), 9, III, RQ	1	CM	14878 ~~32,800~~	K	D008 X002
	2.					
	3.					
	4.					

JW 9/30/17

14. Special Handling Instructions and Additional Information: COSD: 8/30/17 — 15722.KG

1. PROFILE OR334984: PCB CONTAMINATED SOIL; ERG # 171; RQ = 10 LBS

BOX# WMXU3001988 WMXU 3001988

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Amy Keranen, MDEQ — Signature: Amy Keranen, MDEQ — Month 8 Day 30 Year 17

16. International Shipments: ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit: Date leaving U.S.:

Transporter signature (for exports only):

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Jacob Burgess — Signature: [signature] — Month 8 Day 30 Year 17

Transporter 2 Printed/Typed Name: — Signature: — Month Day Year

18. Discrepancy

18a. Discrepancy Indication Space: ☑ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Per Bobby Watcher/WM OK to change weight to KG — Manifest Reference Number: JW 9/30/17

18b. Alternate Facility (or Generator) — U.S. EPA ID Number:

Facility's Phone:

18c. Signature of Alternate Facility (or Generator) — Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1. H110 2. 3. 4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name: Datti Brandt — Signature: Datti G Brandt — Month 09 Day 27 Year 17

GENERATOR — INT'L — TRANSPORTER — DESIGNATED FACILITY

EPA Form 8100-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

456467

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)	21. Generator ID Number MIK193755066	22. Page 2 of 2	23. Manifest Tracking Number 016212202 JJK

24. Generator's Name: STATE OF MICHIGAN

25. Transporter ____ Company Name | U.S. EPA ID Number

26. Transporter 3 Company Name: CRLRR | U.S. EPA ID Number: ORD987123457

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes

GENERATOR

32. Special Handling Instructions and Additional Information

WMXU300198

TRANSPORTER

33. Transporter ____ Acknowledgment of Receipt of Materials

Printed/Typed Name: Jacob Burgess | Signature: [signature] | Month Day Year: 8 30 17

34. Transporter 3 Acknowledgment of Receipt of Materials

Printed/Typed Name: Bonnie Shaw | Signature: BShaw | Month Day Year: 9 25 17

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

EPA Form 8700-22A (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

Chemical Waste Management
Of The Northwest

17629 Cedar Springs Lane
Arlington, Oregon 97812
541-454-2643
EPA I.D. # ORDO89452353

LOAD NO. _____

MANIFEST DOC. NO. _____

INBOUND
T/D: 08:33:59 2017-10-02
ID: 456467 TRK ID: 300198 SU3B
85720 lb G

OUTBOUND
T/D: 08:44:27 2017-10-02
ID: 456467 TRK ID: 300198 SU3B
85720 lb G
51060 lb PT
34660 lb N

NET 17.33 TONS

15722-KG

GENERATOR _____

903-ARLINGTON OR

WASTE MANAGEMENT

CWM OF THE NORTHWEST
Federal EPA ID: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

STATE OF MICHIGAN
ATTN: MANIFEST SECTION
MIK193755066
52634 HWY M26
HUBBELL MI 49934

CERTIFICATE OF DISPOSAL

CWM OF THE NORTHWEST, EPA ID: ORD089452353, has received waste material from STATE OF MICHIGAN on 09/27/17 as described on Shipping Document number 016212202JJK. CWM OF THE NORTHWEST hereby certifies that the above described material was landfilled in accordance with the 40 CFR part 761 as it pertains to the land disposal of polychlorinated biphenyl contaminated materials.

Profile Number: OR334984
CWM Tracking ID: 45646701

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C 1001 and 15 U.S.C. 2615) I certify that the information contained in or accompanying this document is true accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true accurate and complete.

Becky Sumner

CWMNW RECORDS DEPARTMENT
Certificate # 223532
10/11/17

45U461

CWMI

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number MIK193755066	2. Page 1 of 2	3. Emergency Response Phone (800)424-9300	4. Manifest Tracking Number 016212204 JJK

5. Generator's Name and Mailing Address
STATE OF MICHIGAN
~~52634 HWY M28~~ 5195 US 41
~~HUBBELL MI 49934~~ Calumet, MI 49913
Generator's Phone: (906)337-0389

Generator's Site Address (if different than mailing address)
52634 Hwy M-26
Hubbell, MI 49934

6. Transporter 1 Company Name
Zion Environmental

U.S. EPA ID Number
ILR000107581

7. Transporter 2 Company Name

U.S. EPA ID Number

8. Designated Facility Name and Site Address
CHEMICAL WASTE MANAGEMENT, INC.
17629 CEDAR SPRINGS LANE
ARLINGTON OR 97812-9709
Facility's Phone: (541)454-2643

U.S. EPA ID Number
ORD089452353

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
X	1. UN3077, WASTE ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (LEAD), 9, III, RQ	1	CM	~~14813~~ ~~32,660~~ 15685	K	D008 X002
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information
1. PROFILE OR334984: PCB CONTAMINATED SOIL; ERG # 171; RQ = 10 LBS
WMXU 3000913 COSD: 8/28/17

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generation or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Amy Kcranen, MDEQ
Signature: A. Kcranen, MDEQ
Month 8 Day 28 Year 17

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: Jacob Burgess
Signature:
Month 8 Day 28 Year 17
Transporter 2 Printed/Typed Name:
Signature:
Month Day Year

18. Discrepancy
18a. Discrepancy Indication Space ☒ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
OK Per Bobby Watcher/WM to change weight to KG Manifest Reference Number: SW 9/30/17
18b. Alternate Facility (or Generator)
U.S. EPA ID Number
Facility's Phone:
18c. Signature of Alternate Facility (or Generator)
Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)
1. H110 2. 3. 4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name: Patti Brandt
Signature: Patti Brandt
Month 10 Day 02 Year 17

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

456469

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)	21. Generator ID Number MIK193755066	22. Page 2	23. Manifest Tracking Number 016212204 JJK

24. Generator's Name: STATE OF MICHIGAN

25. Transporter ____ Company Name | U.S. EPA ID Number

26. Transporter 3 Company Name CLRC | U.S. EPA ID Number IRD987173457

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes

32. Special Handling Instructions and Additional Information

WMXU 300091

GENERATOR

TRANSPORTER

33. Transporter ____ Acknowledgment of Receipt of Materials

Printed/Typed Name: ~~Jacob~~ Burgess | Signature: [signature] | Month 8 Day 25 Year 17

34. Transporter 3 Acknowledgment of Receipt of Materials

Printed/Typed Name: Bowwie Shaw | Signature: B Shaw | Month 9 Day 25 Year 17

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

EPA Form 8700-22A (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

Chemical Waste Management
Of The Northwest

17629 Cedar Springs Lane
Arlington, Oregon 97812
541-454-2643
EPA I.D.# ORD089452353

LOAD NO. _____

MANIFEST DOC. NO. _____

INBOUND
T/D: 08:04:47 2017-10-02
ID: 456469 TRK ID: 300091
85600 lb G

OUTBOUND
T/D: 08:13:59 2017-10-02
ID: 456469 TRK ID: 300091
85600 lb G
51020 lb PT
34580 lb N

NET 17.29 TONS

15685. KG

GENERATOR _____

903-ARLINGTON OR

WASTE MANAGEMENT

CWM OF THE NORTHWEST
Federal EPA ID: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

STATE OF MICHIGAN
ATTN: MANIFEST SECTION
MIK193755066
52634 HWY M26
HUBBELL MI 49934

CERTIFICATE OF DISPOSAL

CWM OF THE NORTHWEST, EPA ID: ORD089452353, has received waste material from STATE OF MICHIGAN on 09/27/17 as described on Shipping Document number 016212204JJK. CWM OF THE NORTHWEST hereby certifies that the above described material was landfilled in accordance with the 40 CFR part 761 as it pertains to the land disposal of polychlorinated biphenyl contaminated materials.

Profile Number: OR334984
CWM Tracking ID: 45646901

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C 1001 and 15 U.S.C. 2615) I certify that the information contained in or accompanying this document is true accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true accurate and complete.

Becky Sumner

CWMNW RECORDS DEPARTMENT
Certificate # 223575
10/12/17

Chemical Waste Management of the Northwest
17629 Cedar Springs Lane
Arlington, OR 97812
(541) 454-3235
(541) 454-3237

INVOICE

THIS IS AN INVOICE FOR CURRENT CHARGES. PLEASE PAY AMOUNT INDICATED BELOW.

TERMS

DUE UPON RECEIPT OR PER CONTRACT

ALL PAST DUE AMOUNTS WILL BEAR INTEREST AT ONE AND ONE HALF PERCENT PER MONTH OR THE MAXIMUM RATE ALLOWED BY LAW, WHICHEVER IS LESS.

Invoice #2

B & B CONTRACTING CALUMET INC
ATTN: ACCOUNTS PAYABLE
55670 HWY M26
CALUMET MI 49913

Invoice Date: 11/01/2017
Customer #: 450-1494618
Invoice #: 2236-0112354
Page #: 1

Manifest#	Profile	Description	Gener/Quantity	P.O.#/Unit	Biller	Rate	Total
0000457043	OR334984	STA804 PCB CONTAMINA	012293 STATE OF MICHIG	HUBBLE PROCESNG	NFLETCHE	Svc Date	10/13/2017
	STABILIZATION	DISPOSAL	17.74	TONS		498.00000	8,834.52
	CERTIFICATE OF DISPO	CERT OF DISP BEFORE	1.00	EACH		35.00000	35.00
	STATE WASTE MGMT FEE		17.74	TONS		20.00000	354.80
		MANIFEST DOCUMENT 016212208JJK	17.00				
						Subtotal	9,224.32
0000457045	OR334984	STA804 PCB CONTAMINA	012293 STATE OF MICHIG	HUBBLE PROCESNG	NFLETCHE	Svc Date	10/13/2017
	STABILIZATION	DISPOSAL	18.13	TONS		498.00000	9,028.74
	CERTIFICATE OF DISPO	CERT OF DISP BEFORE	1.00	EACH		35.00000	35.00
	STATE WASTE MGMT FEE		18.13	TONS		20.00000	362.60
		MANIFEST DOCUMENT 016212203JJK	14.50				
						Subtotal	9,426.34

AS REQUIRED BY 40 CFR 264.12 (b), WM IS NOTIFYING YOU THAT THIS FACILITY HAS THE APPROPRIATE PERMIT(S) FOR, AND WILL ACCEPT THE WASTE YOU THE GENERATOR IS SHIPPING.

Remit to: CHEMICAL WASTE MANAGEMENT, INC.
P.O. BOX 660345
DALLAS, TX 75266

Total Due $18,650.66

457043

CWMI

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number: MIK193755066	2. Page 1 of 1	3. Emergency Response Phone: (800)424-9300	4. Manifest Tracking Number: 016212208 JJK

5. Generator's Name and Mailing Address: STATE OF MICHIGAN ~~52634 HWY M26 HUBBELL MI 49934~~ 55195 US 41 LAUMET, MI 49913

Generator's Phone: (906)337-0389

Generator's Site Address (if different than mailing address): 52634 HWY M26 HUBBELL, MI 49934

6. Transporter 1 Company Name: ZIRON — U.S. EPA ID Number: IL0001075P1

7. Transporter 2 Company Name: — U.S. EPA ID Number:

8. Designated Facility Name and Site Address: CHEMICAL WASTE MANAGEMENT, INC. 17629 CEDAR SPRINGS LANE ARLINGTON OR 97812-9709 — U.S. EPA ID Number: ORD089452353

Facility's Phone: (541)454-2843

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
X	1. UN3077, WASTE ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (LEAD), 9, III, RQ	1	CM	15422 ~~34,000~~ MB 10-23-17	KG	D008 X002
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information

1. PROFILE OR334984: PCB CONTAMINATED SOIL; ERG # 171; RQ = 10 LBS

Bay St Lumyn - 3002000 OSD - 8-23-17 MB 10-23-17

35,480. P 15422 KG

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Amy Keranen, MDEQ — Signature: [signature] — Month 8 Day 23 Year 17

16. International Shipments: ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit: Date leaving U.S.:
Transporter signature (for exports only):

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Jacob Burgess — Signature: [signature] — Month 8 Day 23 Year 17

Transporter 2 Printed/Typed Name: — Signature: — Month Day Year

18. Discrepancy

18a. Discrepancy Indication Space: ☒ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Approval to change weight and add OSD per bobby wachter/WM MB 10-23-17

Manifest Reference Number:

18b. Alternate Facility (or Generator): — U.S. EPA ID Number:

Facility's Phone:

18c. Signature of Alternate Facility (or Generator): — Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e. codes for hazardous waste treatment, disposal, and recycling systems)

1. H110 2. 3. 4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name: Dawn Dunlop — Signature: [signature] — Month 10 Day 16 Year 17

GENERATOR — INT'L — TRANSPORTER — DESIGNATED FACILITY

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

45704S

(Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)

21. Generator ID Number	22. Page	23. Manifest Tracking Number
MIK 193755066	2/2	016212208 JJK

24. Generator's Name

State of Michigan

25. Transporter ____ Company Name — U.S. EPA ID Number

26. Transporter ____ Company Name: CRLRI — U.S. EPA ID Number: ORD 987173457

27a. HM	27b U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes

32. Special Handling Instructions and Additional Information

LOMXU 300200

GENERATOR

TRANSPORTER

33. Transporter ____ Acknowledgment of Receipt of Materials
Printed/Typed Name | Signature | Month | Day | Year

34. Transporter ____ Acknowledgment of Receipt of Materials
Printed/Typed Name: Bonnie Shaw | Signature: BShaw | Month: 10 | Day: 1 | Year: 17

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

EPA Form 8700-22A (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

Chemical Waste Management
Of The Northwest
17629 Cedar Springs Lane
Arlington, Oregon 97812
541-454-2643
EPA I D # ORD089452353

LOAD NO. SU-4B

MANIFEST DOC. NO. _____

INBOUND
T/D: 13:13:58 2017-10-13
ID: 457043 TRK ID: 300200
86500 lb G

OUTBOUND
T/D: 13:24:18 2017-10-13
ID: 457043 TRK ID: 300200
86500 lb G
51020 lb PT
35480 lb N

NET 17.74 TONS

GENERATOR 15422 kg

903-ARLINGTON OR

CWM OF THE NORTHWEST
Federal EPA ID: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

STATE OF MICHIGAN
ATTN: MANIFEST SECTION
MIK193755066
52634 HWY M26
HUBBELL MI 49934

CERTIFICATE OF DISPOSAL

CWM OF THE NORTHWEST, EPA ID: ORD089452353, has received waste material from STATE OF MICHIGAN on 10/13/17 as described on Shipping Document number 016212208JJK. CWM OF THE NORTHWEST hereby certifies that the above described material was landfilled in accordance with the 40 CFR part 761 as it pertains to the land disposal of polychlorinated biphenyl contaminated materials.

Profile Number: OR334984
CWM Tracking ID: 45704301
CWM Unit #: 1*0
Disposal Date: 10/16/17

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C 1001 and 15 U.S.C. 2615) I certify that the information contained in or accompanying this document is true accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true accurate and complete.

CWMNW RECORDS DEPARTMENT
Certificate # 224242
11/13/17

457045

CWMI

print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
	MIK193755066	1	(800)424-9300	016212203 JJK

Generator's Name and Mailing Address
STATE OF MICHIGAN
~~52634 HWY M26~~ 55195 US 41
~~HUBBELL MI 49934~~ Calumet MI 49913
Generator's Phone: (906)337-0389

Generator's Site Address (if different than mailing address)
52634 Hwy M-26
Hubbell, MI 49934

Transporter 1 Company Name: SUNPRO
U.S. EPA ID Number: OH0000333336

Transporter 2 Company Name:
U.S. EPA ID Number:

Designated Facility Name and Site Address
CHEMICAL WASTE MANAGEMENT, INC.
17629 CEDAR SPRINGS LANE
ARLINGTON OR 97812-9709
Phone: (541)454-2643
U.S. EPA ID Number: ORD089452353

9a. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No	Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
1. UN3077, WASTE ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S, (LEAD), 9, III, RQ	1	CM	16447 ~~34000~~ MB 10-23-17	KG	D008 X002
2.					
3.					
4.					

Special Handling Instructions and Additional Information
PROFILE OR334984: PCB CONTAMINATED SOIL; ERG # 171; RQ = 10 LBS
BOX # HESU48104 OSD-8-28-17 MB 10-23-17
36,260P
16447KG

GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Amy Keranen, MDEQ
Signature: Amy Keranen, DEQ
Month 8 Day 28 Year 17

International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: BRYAN ROADRUCK
Signature: [signature]
Month 8 Day 28 Year 17

Transporter 2 Printed/Typed Name:
Signature:
Month Day Year

Discrepancy

Discrepancy Indication Space ☒ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Approval to Change weight per Bobby Wachter/WM MB 10-23-17
and add OSD.

Manifest Reference Number:

Alternate Facility (or Generator)
U.S. EPA ID Number:
Phone:

Signature of Alternate Facility (or Generator)
Month Day Year

Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.
H110			

Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed Name: Dawn Durbin
Signature: [signature]
Month 10 Day 6 Year 17

9700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

457045

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)	21. Generator ID Number	22. Page	23. Manifest Tracking Number
	MIK193755066	2/2	016212203 JJK

24. Generator's Name

State of Michigan

25. Transporter _____ Company Name | U.S. EPA ID Number

26. Transporter _____ Company Name CRLRL | U.S. EPA ID Number ORD987173457

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes

32. Special Handling Instructions and Additional Information

HESU 48104

GENERATOR

TRANSPORTER

33. Transporter _____ Acknowledgment of Receipt of Materials

Printed/Typed Name | Signature | Month | Day | Year

34. Transporter 4 Acknowledgment of Receipt of Materials

Printed/Typed Name Bonnie Shaw | Signature B Shaw | Month 10 | Day 1 | Year 12

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

EPA Form 8700-22A (Rev. 3-05) Previous editions are obsolete. DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

Chemical Waste Management
Of The Northwest

17629 Cedar Springs Lane
Arlington, Oregon 97812
541-454-2643
EPA I.D.# ORDO89452353

LOAD NO. SH-4B

MANIFEST DOC. NO. _____

INBOUND
T/D: 12:47:24 2017-10-13
ID: 457045 TRK ID: 48104
85740 lb G

OUTBOUND
T/D: 12:58:42 2017-10-13
ID: 457045 TRK ID: 48104
85740 lb G
49480 lb PT
36260 lb N

NET 18.13 TONS

GENERATOR 16447. KG

903-ARLINGTON OR

WASTE MANAGEMENT

CWM OF THE NORTHWEST
Federal EPA ID: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

STATE OF MICHIGAN
ATTN: MANIFEST SECTION
MIK193755066
52634 HWY M26
HUBBELL MI 49934

CERTIFICATE OF DISPOSAL

CWM OF THE NORTHWEST, EPA ID: ORD089452353, has received waste material from STATE OF MICHIGAN on 10/13/17 as described on Shipping Document number 016212203JJK. CWM OF THE NORTHWEST hereby certifies that the above described material was landfilled in accordance with the 40 CFR part 761 as it pertains to the land disposal of polychlorinated biphenyl contaminated materials.

Profile Number: OR334984
CWM Tracking ID: 45704501
CWM Unit #: 1*0
Disposal Date: 10/16/17

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C 1001 and 15 U.S.C. 2615) I certify that the information contained in or accompanying this document is true accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true accurate and complete.

Patricia J Brandt

CWMNW RECORDS DEPARTMENT
Certificate # 224243
11/13/17

Chemical Waste Management of the Northwest
17629 Cedar Springs Lane
Arlington, OR 97812
(541) 454-3235
(541) 454-3237

INVOICE

THIS IS AN INVOICE FOR CURRENT CHARGES. PLEASE PAY AMOUNT INDICATED BELOW

TERMS

DUE UPON RECEIPT OR PER CONTRACT

ALL PAST DUE AMOUNTS WILL BEAR INTEREST AT ONE AND ONE HALF PERCENT PER MONTH OR THE MAXIMUM RATE ALLOWED BY LAW, WHICHEVER IS LESS.

Invoice #3

B & B CONTRACTING CALUMET INC
ATTN: ACCOUNTS PAYABLE
55670 HWY M26
CALUMET MI 49913

Invoice Date: 11/01/2017
Customer #: 450-1494618
Invoice #: 2236-0112292
Page #: 1

Manifest#	Profile	Description	Gener/Quantity	P.O.#/Unit	Biller	Rate	Total
0000466468	OR334984	STAB04 PCB CONTAMINA	012293 STATE OF MICHIG	HUBBLE PROCESNG	NFLETCHE	Svc Date	09/27/2017
STABILIZATION		DISPOSAL	15.52	TONS		498.00000	7,728.96
CERTIFICATE OF DISPO		CERT OF DISP BEFORE	1.00	EACH		35.00000	35.00
STATE WASTE MGMT FEE			15.52	TONS		20.00000	310.40
		MANIFEST DOCUMENT 016212209JJK					
						Subtotal	8,074.36

AS REQUIRED BY 40 CFR 264.12 (b), WM IS NOTIFYING YOU THAT THIS FACILITY HAS THE APPROPRIATE PERMIT(S) FOR, AND WILL ACCEPT THE WASTE YOU THE GENERATOR IS SHIPPING.

Remit to: CHEMICAL WASTE MANAGEMENT, INC.
P.O. BOX 660345
DALLAS, TX 75266

Total Due $8,074.36

456468

CWMI

Form Approved. OMB No. 2050-0039

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number MIK193755066	2. Page 1 of 2	3. Emergency Response Phone (800)424-9300	4. Manifest Tracking Number 016212209 JJK

5. Generator's Name and Mailing Address
STATE OF MICHIGAN
~~52634 HWY M26~~ 55195 US 41
~~HUBBELL~~ ~~MI 49934~~ Calumet MI 49913
Generator's Phone: (906)337-0389

Generator's Site Address (if different than mailing address)
52634 Hwy M-26
Hubbell MI 49934

6. Transporter 1 Company Name: Zirkon — U.S. EPA ID Number: IRR000107581

7. Transporter 2 Company Name — U.S. EPA ID Number:

8. Designated Facility Name and Site Address
CHEMICAL WASTE MANAGEMENT, INC.
17629 CEDAR SPRINGS LANE
ARLINGTON OR 97812-9709
Facility's Phone: (541)454-2643
U.S. EPA ID Number: ORD089452353

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
X	1. UN3077, WASTE ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (LEAD), 9, III, RQ	1	CM	13118 ~~28916 lbs~~	K	D008 X002
X	2. UN3432, POLYCHLORINATED BIPHENYLS, SOLID, 9, II, RQ	1	CM	~~1601 lbs~~ 73	K	X002
	3.				JW 9/30/17	
	4.					

14. Special Handling Instructions and Additional Information — 14,080. Kg
1. PROFILE OR334984: PCB CONTAMINATED SOIL; ERG # 171; RQ = 10 LBS
1. PROFILE OR335016: PCB DEBRIS WITH NON-FRIABLE ASBESTOS; ERG # 171; RQ = 1 LB
Box# WMXU 3000894 OOSD: 8/25/17 1/2 Unique Id: 2209-01 MB 10-9-17

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgement of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Amy Keranen, MDEQ — Signature: Amy Keranen — Month 8 Day 25 Year 17

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit: Date leaving U.S.:
Transporter signature (for exports only):

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: Scott Grobleczak — Signature: [signature] — Month 8 Day 25 Year 17
Transporter 2 Printed/Typed Name — Signature — Month Day Year

18. Discrepancy
18a. Discrepancy Indication Space ☑ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Approval to add unique ID# 2209-01 per Sed Christensen/MB 10-9-17
Per Bobby Watcher/WM ok to change to Rg and OOSD. JW 9/30/17
Manifest Reference Number

18b. Alternate Facility (or Generator) — U.S. EPA ID Number
Facility's Phone:

18c. Signature of Alternate Facility (or Generator) — Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)
1. ~~H10~~ H110 2. H132 3. 4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name: Dawn Dunlop — Signature: [signature] — Month 10 Day 16 Year 17

GENERATOR / INT'L / TRANSPORTER / DESIGNATED FACILITY

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete. DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)

2. Generator ID Number	22. Page	23. Manifest Tracking Number
MIK193755066	2 of 2	016212209 JJK

24. Generator's Name: STATE OF MICHIGAN

25. Transporter ____ Company Name | U.S. EPA ID Number

26. Transporter ____ Company Name: CRLRL | U.S. EPA ID Number: ORD987173457

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes

32. Special Handling Instructions and Additional Information

WMX U300089

GENERATOR

TRANSPORTER

33. Transporter ____ Acknowledgment of Receipt of Materials
Printed/Typed Name: Kelly Robinson | Signature | Month: 12 | Day: 25 | Year: 17

34. Transporter ____ Acknowledgment of Receipt of Materials
Printed/Typed Name: Bonnie Shaw | Signature: B Shaw | Month: 12 | Day: 25 | Year: 17

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

EPA Form 8700-22A (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

Chemical Waste Management
Of The Northwest
17629 Cedar Springs Lane
Arlington, Oregon 97812
541-454-2643
EPA I.D. # ORDO89452353

LOAD NO. 9/-4B

MANIFEST DOC. NO. _____

INBOUND
T/D: 13:50:52 2017-10-13
ID: 456468 TRK ID: 300089
82040 lb G

OUTBOUND
T/D: 14:18:20 2017-10-13
ID: 456468 TRK ID: 300089
82040 lb G
51000 lb PT
31040 lb N

NET 15.52 TONS

GENERATOR 14,080. Kg

ARLINGTON OR

CWM OF THE NORTHWEST
Federal EPA ID: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

STATE OF MICHIGAN
ATTN: MANIFEST SECTION
MIK193755066
52634 HWY M26
HUBBELL MI 49934

CERTIFICATE OF DISPOSAL

CWM OF THE NORTHWEST, EPA ID: ORD089452353, has received waste material from STATE OF MICHIGAN on 09/27/17 as described on Shipping Document number 016212209JJK. CWM OF THE NORTHWEST hereby certifies that the above described material was landfilled in accordance with the 40 CFR part 761 as it pertains to the land disposal of polychlorinated biphenyl contaminated materials.

Profile Number: OR334984
CWM Tracking ID: 45646801
CWM Unit #: 1*0
Disposal Date: 10/16/17

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C 1001 and 15 U.S.C. 2615) I certify that the information contained in or accompanying this document is true accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true accurate and complete.

Patti J. Brandt

CWMNW RECORDS DEPARTMENT
Certificate # 224241
11/13/17

WASTE MANAGEMENT

CWM OF THE NORTHWEST
Federal EPA ID: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

STATE OF MICHIGAN
ATTN: MANIFEST SECTION
MIK193755066
52634 HWY M26
HUBBELL MI 49934

CERTIFICATE OF DISPOSAL

CWM OF THE NORTHWEST, EPA ID: ORD089452353, has received waste material from STATE OF MICHIGAN on 09/27/17 as described on Shipping Document number 016212209JJK. CWM OF THE NORTHWEST hereby certifies that the above described material was landfilled in accordance with the 40 CFR part 761 as it pertains to the land disposal of polychlorinated biphenyl contaminated materials.

Profile Number: OR335016
CWM Tracking ID: 45646802

Process	CWM Unit	Xfer Date	Site Location	Gen #
801 DRUM/PCB/SOLID/LANDFI	1*0	11/13/17	LANDFILL 14	2209-1

WASTE MANAGEMENT

CWM OF THE NORTHWEST
Federal EPA ID: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

STATE OF MICHIGAN
ATTN: MANIFEST SECTION
MIK193755066
52634 HWY M26
HUBBELL MI 49934

CERTIFICATE OF DISPOSAL

CWM OF THE NORTHWEST, EPA ID: ORD089452353, has received waste material from STATE OF MICHIGAN on 09/27/17 as described on Shipping Document number 016212209JJK. CWM OF THE NORTHWEST hereby certifies that the above described material was landfilled in accordance with the 40 CFR part 761 as it pertains to the land disposal of polychlorinated biphenyl contaminated materials.

Profile Number: OR335016
CWM Tracking ID: 45646802

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C 1001 and 15 U.S.C. 2615) I certify that the information contained in or accompanying this document is true accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true accurate and complete.

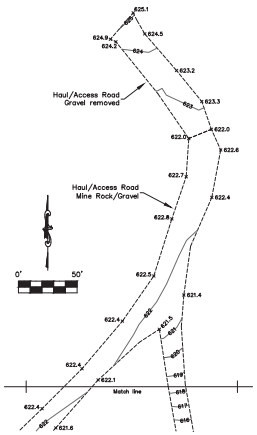
Becky Sumner

CWMNW RECORDS DEPARTMENT
Certificate # 225493
12/06/17

APPENDIX L

AS-BUILT SURVEY





Area Table

Clay Cap East	6.27 Acres	
Clay Cap West	0.43 Acres	
Total Clay Cap	6.70 Acres	=Total Restoration of Cap Area
Total Rock Cap	0.13 Acres	
Disturbed Uncapped #1	0.38 Acres	
Disturbed Uncapped #2	0.27 Acres	
Disturbed Uncapped #3	0.26 Acres	
Total Disturbed Uncapped	0.92 Acres	=Total Restoration of Uncapped Area

As-Built Survey Coordinate System

NAD83(2011) Michigan State Plane Coordinate System, North Zone, International Feet. Survey performed with Network RTK GPS using MDOT CORS Mount Point #87 "MITU" in Houghton MI.

Orthoheight of field measurements obtained by GPS reference geoid model GEOID2012; all elevations were lowered in office by 0.01' to reference Benchmark #1 as shown on the plans.

As-Built Survey

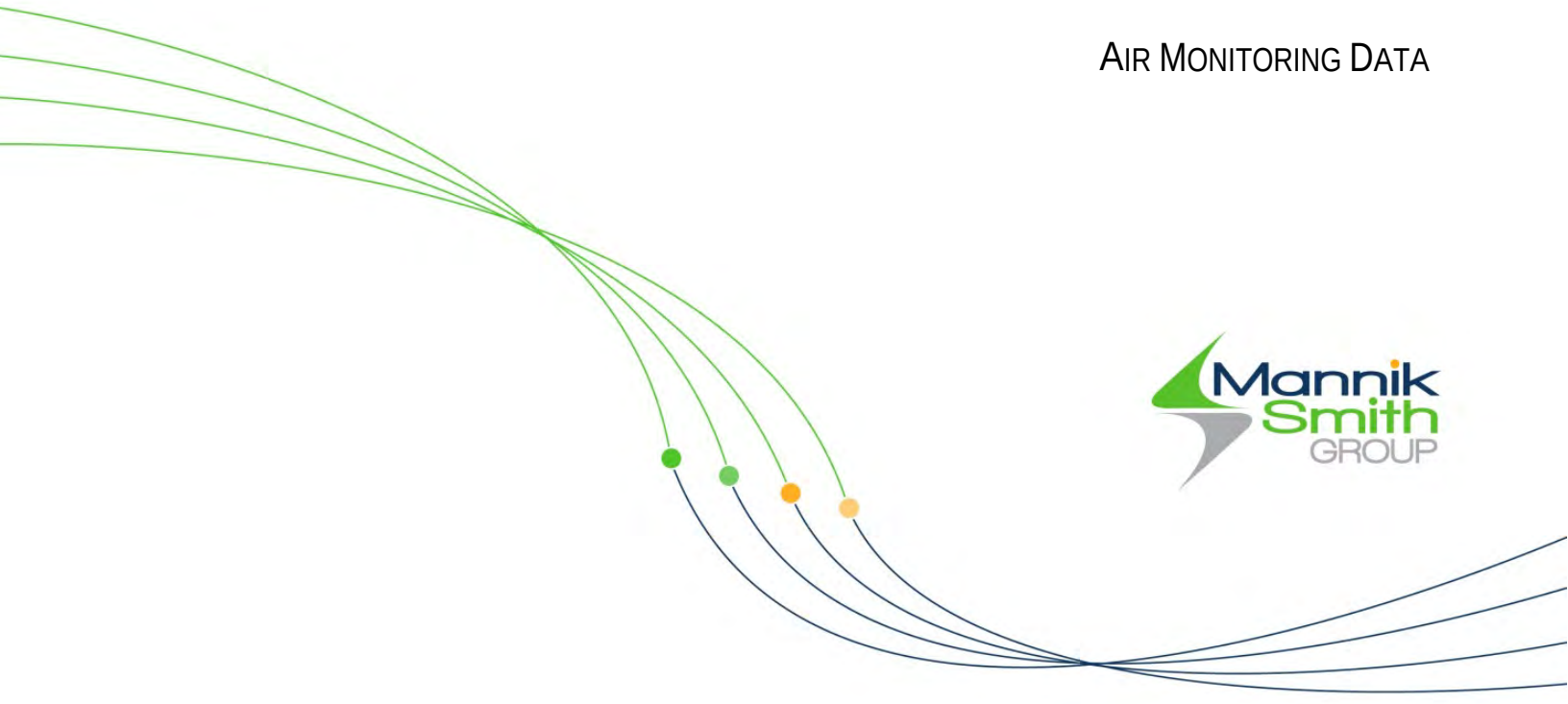
Hubbell Processing Grade and Cap

LeClaire GeoServices
200 MICHIGAN STREET
FOURTH FLOOR
HANCOCK, MI 49930
906-370-7564
WWW.LECLAIREGEOSERVICES.COM | STEVE@LECLAIREGEOSERVICES.COM

Job No.	2017-011
Date	September 14, 2017
Scale	1 in. = 50 ft.
Sheet #	1 of 1

APPENDIX M

AIR MONITORING DATA



HUBBELL PROCESSING AREA
FIELD REPORTS

FILE NO. 761/16108.SAR INDEX NO. 44521
TORCH LAKE NON-SUPERFUND SITE

UPEA ENGINEERS & ARCHITECTS

Field Report

TO ☐ Owner ☐ Architect ☐ Engineer
BY ☐ Field

Project: HUBBELL PROCESSING AREA PLAN A	**Field Report No.:** 1
Owner: STATE OF MICH., DEPT M&B, DEQ	**UPEA Project No.:**
Date: 7-6-2017 **Time:** 9:00 - ~~14:00~~ 16:00-17:30	**Weather:** CLEAR BREEZY **Temp Range:** 70°
Est. % of Completion:	**Conformance with Schedule:**
Work in Progress: PRE-CON MEETING	**Present at Site:** DEQ M&S UPEA PHONE CONTACT B&B

PRECON IN PROGRESS WHEN WE ARRIVED. MOST MATTERS ROUTINE.
WALK AROUND AFTER MEETING.
DISCUSSION OF TESTING LOCATIONS W/ BILL GRIFFIN - P.M.
SET UP OF EQUIPMENT FOR TESTING. PRELIMINARY RUNS

Observations:

WORK SITE HAS STANDING WATER. SCATTERED CONCRETE FOUNDATIONS AROUND SITE W/ LINEAR DERRICK PADS @ BREAKWATER & PARALLEL THRU CENTER OF WORK ZONE. FLOWING DRAINAGE W/ CULVERTS AND RIP RAP ALONG SOUTH END OF PROPERTY. LARGE GRAVEL TRUCK LOT ON ROPPERS TO SOUTH OF SITE. POTENTIAL BASELINE DUST READINGS FOR MONITORING, SUBJECT TO WIND DIRECTION
NOTICE TO PROCEED PENDING — START DATE → TODAY 7-6-2017
WEEKLY PROGRESS MEETING — THURSDAY @ 4:00 PM (16:00)

Items to Verify:

a) DOMINANT WIND
b) OFFSITE DUST PARTICLE CONTRIBUTION
c) ACCESS TO DOWN WIND MONITOR SITES ALONG BREAKWATER
d) B-10 CLEARING TO START - CONTINUE TO MID WEEK 7-6/7 HAUL ROAD PREP
e) B-11 HOT ZONE DEFINING
f) 8-26 SCHEDULED COMPLETION
g) TAILGATE MEETINGS DAILY @ 7 AM
h) 10 hr WORK DAY 7-5?

Information or Action Required:

1) WEATHER TIGHT BOXES FOR ASBESTOS MONITORING (PERMANENT SITES)
2) STABLE/ SECURE MONITORING MOUNTS ALONG BREAKWATER
3) DATA SHEETS FOR MONITORING READINGS
4) CONTRACT $430,000 - LIMITED TO $500,000. HIGHER NEEDS BOARD AUTHORIZATION

Attachments:

HUBBELL PROCESSING AREA PLAN A
CONTRACT Y17347
FILE TC1/10108.SAR
INDEX # 44251

Report By:

THURSDAY

UPEA ENGINEERS & ARCHITECTS

Field Report

TO ☐ Owner ☐ Architect ☐ Engineer
BY ☐ Field

Project: RUBBEL PROCESSING AREA PLAN A	**Field Report No.:** 2
Owner: STATE of MICH, DTMB, DEQ	**UPEA Project No.:**
Date: 7-7-2017 **Time:** 7:00 – 5:20 (17:20)	**Weather:** CLEAR BREEZY SHOWER IN AFTERNOON **Temp Range:** 69-72
Est. % of Completion: ~~GRAVEL RAMPS~~	**Conformance with Schedule:** ✓
Work in Progress: SETTING PERIMETER FENCE GRAVEL ENTRY ROAD & DECON	**Present at Site:** BRIAN BENNEN JED CHRISTENSEN HANS HAAPALA AMY KEMANEN BG BMR

UPEA: ESTABLISH LOCATIONS OF PERMANENT MONITORING
A) 60' N OF PERIMETER FENCE @ N & DECON
B) MID N LINE 40' N – EDGE PINES
C) NE CORNER 20' N OF FENCE & BM 2
D) MID BASE ON INSIDE FACE BULKHEAD
E) SOUTH & IN CONC. PILON 20 S OF CREEK
F) W N OF KOPPENS GATE – TOP PILE
G) WEST SIDE OF RAIL RAMP TO MINERAL BLDG

Observations:

PERIMETER FENCE BEING SET, INDICATES EXCLUSION AREA, NO HOT ZONE IDENTIFIED YET, MONITORING BOXES BEING KEPT 20+ FEET FROM FENCE TO AVOID INTERFERANCE W/ CONSTRUCTION TRAFFIC.

Items to Verify:

CALL FROM BONNEN @ 5:35 (17:35), OBJECTING TO NORTH SIDE A & B, TOO CLOSE TO FUTURE ROADS – MUST PULL BACK. WILL COMPLY TOMORROW AM AS 1ST SET OF MONITORS IS PERFORMED

Information or Action Required:

PREPARE FOR FULL DAY MONITOR OF B&B LAND CLEARING OPERATIONS. "CORRECT" POSITIONS OF "A", "B", "C", "D", & "E"

Attachments:

Report By: [signature]

FRIDAY

UPEA ENGINEERS & ARCHITECTS

Field Report

TO ☐ Owner ☐ Architect ☐ Engineer
BY ☐ Field

Project: HUBBELL PROCESSING AREA PLAN A		**Field Report No.:** 3	
Owner: S.O.M.I.C.H DTMB DEQ		**UPEA Project No.:**	
Date: 7-8-2017	**Time:** 8:00 – 11:00	**Weather:** CLEAR BREEZY	**Temp Range:** 68 – 78
Est. % of Completion: BRUSHING STARTED		**Conformance with Schedule:** ____	
Work in Progress: HAUL ROAD DEVELOPMENT		**Present at Site:** BONNEN, GMA, BG IN PM	

PREPARATION OF MONITORING CIRCUIT. INITIATION OF BASE LINE MONITORING READINGS. CORRECTION OF NORTH LINES MONITOR STATIONS TO COMPLY W/ B&B Challenge of Perimeter Clearance. EVACUATION OF EAST LINE TO DETERMINE HOW TO COMPLY W/ RESTRICTED ACCESS REQUIRE.

Observations: B&B BRUSHHOGGING HAUL ROAD & ACCESS ROAD & FENCE PERIMETER EQUIPMENT DOWN ≈ 9:25 TO 10:25. DAMAGED HYDRAULIC HOSE - REPAIRED BACK TO BRUSHING @ 11:00.

PREVIOUSLY SET MONITORING STATIONS RELOCATED AS REQUIRED BY S. BONNEN

A) MOVED 100' NORTH – NOW 200' NORTH OF FENCE ON EDGE OF CENTER CANAL RAIL
B) MOVED 150' NORTH TO EDGE OF WOOD LINE
C) MOVED 200' NORTH TO POINT 10' OFF BREAK WATER @ "CAMP SITE"
D) MOVED NORTH TO SOUTH END OF "BULKHEAD LOADING DOCK" RIP RAP JETTY, DRIVEN ON LAKE SIDE OF BREAK WATER. TEMPORARY PARTICLE SITE ADDED FOR TODAY.
E) ORIGINAL PYLON NOW INSIDE SOUTH EXCLUSION FENCE. MOVED ≈ 60' S of FENCE

Items to Verify: BILL G TO SHUT DOWN MONITOR STATIONS AT 4:30

a) PERMANENT MONITORING STATIONS – ACCEPTABLE
b) AUTHORIZED ACCESS TO EAST (DOWN WIND) SIDE
c) BRIAN SAID EXCEPTION BEING PROCESSED TO ALLOW Chloride Add. TO DUST WATER
d) PLAN SHOWS: Perimeter Fence across "BULKHEAD LOADING DOCK" PLACEMENT OF PERIMETER BARRIER SURROUNDS "BLD". FOOT ACCESS ACROSS "BLD" ON BULKHEAD REFUSED. ONLY EAST SIDE ACCESS PERMITTED IS ONLY BULKHEAD BREAK WATER OR TORCH LAKE LOADING

Information or Action Required:

A) ESTABLISH SOME FORM OF "DOWN WIND" MONITORING ON EAST SIDE BREAKWATER. ACCESS HEAVILY RESTRICTED BY "BULK HEAD LOADING DOCK" AND VEGETATION BLOCKS.
B) MUST ESTABLISH MONITOR STATION "D" ON BULKHEAD W/ SAFE ACCESS
C) NO ACCESS BETWEEN "D" & "E". MUST ACCESS VIA "G" → "F" → "E".
D) COORDINATE W/ BILL G ON MONDAY TO FINALIZE DATA DEVELOPMENT

Attachments:

Report By: [signature]

SATURDAY

HUBBELL PROCESSING AREA
AIR MONITORING LABORATORY REPORTS

FILE NO. 761/16108.SAR INDEX NO. 44521
TORCH LAKE NON-SUPERFUND SITE

Analysis Report

Schneider Laboratories Global, Inc

2512 W. Cary Street • Richmond, Virginia • 23220-5117
804-353-6778 • 800-785-LABS (5227) • Fax 804-359-1475

Customer: UP Engineers & Architects (2820)
Address: 100 Portage St
Houghton, MI 49931

Attn:

Project: Servpro
Location: Hubbell, MI
Number: B128-17462

Order #: 221347

Matrix Air
Received 07/14/17
Analyzed 07/14/17
Reported 07/14/17

PO Number: B128-17462

Method NIOSH 7400 Issue 2 Aug. 12 1994

Sample ID	Cust. ID	Location	Date	Time	Vol.	Fibers (f/field)	Density (f/mm²)	Exposure (f/cc)
221347-001	**1RTX**	**Background Air**						
			07/06/17	66 min	198 L	<0.0550	<7.01	<0.0136
221347-002	**2RTX**	**Background Air**						
			07/07/17	540 min	1890 L	<0.0550	<7.01	<0.00143
221347-003	**3PMD**	**Task T Icon D**						
			07/08/17	506 min	1770 L	<0.0550	<7.01	<0.00152
221347-004	**3PMG**	**Task T Icon G**						
			07/08/17	505 min	1770 L	<0.0550	<7.01	<0.00153

Analyst: Wilson, Jada
221347-07/14/17 02:47 PM

Reviewed By: **Charles Lynch**
Data Management

Analyst Sr

Initials	Range	Sr
JAW	5 - 20	0.215
	20.5 - 50	0.162
	50.5 - 500	0.107

Area Samples. OSHA Asbestos PEL is 0.1 f/cc for 8 hour TWA. Est. limit of detection: 7 f/mm² or 0.055 f/field. (<) refers to less than limit of detection. Results are not blank-corrected unless noted by analyst. Exposure and TWA calculations are based on client-supplied air volumes and times, and assume zero exposure for time not sampled. Analyst relative standard deviation (Sr) calculated using historical data. Calculated values are reported to three significant figures. The test results reported relate only to the samples submitted. NY Samples fall under NY Certificate #11413

Schneider Laboratories, Inc. 1/800-785-5227
2512 W. Cary Street, Richmond, VA 23220-5117

Submitting Co.
U.P. Engineers & Architects (Asb)
100 Portage St.
Houghton, MI 49931

Lab Use-WO#

Acct # 2820

Phone # (906) 482-4810

FAX # (906) 482-9799

Project Name Servpro - (give sample/Serv Pro name)
Project Location Hubbell, MI
Project Number B128-17462
Purchase Order No.

Special Instructions [include requests for special reporting or data packages]
Email Results to ___ bgriffin@upea.com & gallan@upea.com

Turn Around Time
[ ] 6-8 hours*
[X] 24 hours*
[ ] 48 hours*
[ ] 72 hour*
[ ] STANDARD (5 days)
[ ] Standard Full TCLP (10d)
[ ] Weekend*

* not available for all tests
Schedule rush organics, multi-metals & weekend tests in advance.

Matrix / Sample Type (Select ONE)
All samples on form should be of SAME matrix type. Use additional forms as needed.

[X] AIR	[ ] Solid
[ ] Aqueous	[ ] Waste
[ ] Bulk	[ ] Wastewater
[ ] Hi-Vol Filter (PM10)	[ ] Water,Drinking
[ ] Hi-Vol Filter (TSP)	[ ] Compliance
[ ] Oil	[ ] Wipe
[ ] Paint	[ ] Wipe, Composite
[ ] Sludge	[ ] _____
[ ] Soil	[ ] _____

Tests / Analytes (Select ALL that Apply)

Asbestos Air / Fiber Counts
[X] PCM (NIOSH 7400)
[ ] TEM (AHERA)
[ ] TEM (EPA Level II)
[ ]

Asbestos Bulk / Asb ID
[ ] PLM (EPA 600, 1993)
[ ] PLM (EPA Point Count)
[ ] PLM (Qualitative only)
[ ] NYELAP 198.1/.4
[ ] CAELAP (EPA Interim)
[ ] TEM (Chatfield)
[ ]

Metals-Total Conc.
[ ] Lead
[ ] RCRA Metals
[ ] _____
[ ] _____

Miscellaneous Tests
[ ] Total Dust (NIOSH 0500)
[ ] Resp. Dust (NIOSH 0600)
[ ] Silica - FTIR (NIOSH 7602)
[ ] Silica - XRD (NIOSH 7500)
[ ]

FOR ASBESTOS AIR:
TYPE OF RESPIRATOR USED:

Extraction Procedures
[ ] TCLP / Lead
[ ] TCLP / RCRA Metal Profile
[ ] TCLP / FULL (w/ organics)
[ ] _____
[ ] _____

ORGANICS TESTS and other Analyses
NOTE: All samples for organics should be kept at 4°C from collection until testing. Schedule rush analyses in advance. Indicate preservatives added & media type.
Indicate *analysis method* for organics tests.

Sample (number)	Date Sampled	Time	Sample Identification (e.g. Employee, SSN, Bldg, Material)	Wipes: Wiped Area (ft²)	Wipes: Type[1] A,B,P,E	Air Info: Time[2] Start	Air Info: Time[2] Stop	Air Info: Flow Rate[3] Start	Air Info: Flow Rate[3] Stop	Air Info: Total[4] Air Vol	Organics: # containers
1RTX	7/6/2017		Background Air -roving			16:05	17:11	3LPM	3 LPM	213	1
2RTX	7/7/2017		Background Air -perm location			8:07	17:07	3.5	3.5	1890	1
3PMD	7/8/2017		task T; locn D			8:40	17:06	3.5	3.5	1771	1
3PMG	7/8/2017		task T: locn G			8:30	16:55	3.5	3.5	1767.5	1

[1]Type: A=area B=blank P=personal E=excursion [2]Beginning/End of Sample Period [3]Pump Calibration in Liters/Minute [4]Volume in Liters [time in min × flow in L/min]

221347 S 4
V:\221\221347
fghraizi 7/14/2017 9:2 5:00 AM
UPS 1Z420051014)071202

Sample Collection & Custody Information

Sampled by [NAME] G. Allan [SIGNATURE] [DATE/TIME]
Relinquished by [NAME] B. Griffin [SIGNATURE] B. Griffin [DATE/TIME] 7/12/17 14:30
Received by [NAME] UPS [SIGNATURE] [DATE/TIME]
[ ]FX [ ]AB [X]UPS [ ]USM [ ]CL [ ]LG [ ]HD [ ]DB [ ]____
Unusual Sample Condition Noted:

STATE where samples were collected: MI
[ ] Sample return requested
[ ] Ambient temp [ ] Cool ____°C [ ] pH ____ [ ] Cl ____
Waybill# _____ [ ]R [ ]S
Chain-of-Custody documentation continued internally within lab.

LAB USE ONLY
Received in Lab by Date/Time
[ ] Ambient Temp.
[ ] Cool
[ ]FX [ ]AB [ ]UPS [ ]USM [ ]CL [ ]LG [ ]HD [ ]DB [ ]____
Waybill# _____ [ ]R [ ]S
Unusual Sample Condition Noted:

Sample Collection & Custody Information
Chain-of-custody documentation continued internally within lab.

Sampled by [NAME] [SIGNATURE] [DATE/TIME]
Relinquished by [NAME] [SIGNATURE] [DATE/TIME]
[ ] Sample return requested [ ] **STATE from which samples were collected**

Carefully read the terms and conditions printed on the back of this form.

Analysis Report

Schneider Laboratories Global, Inc

2512 W. Cary Street • Richmond, Virginia • 23220-5117
804-353-6778 • 800-785-LABS (5227) • Fax 804-359-1475

Customer: UP Engineers & Architects (2820)
Address: 100 Portage St
Houghton, MI 49931

Attn:

Project: Hubbell Processing Area
Location: Hubbell, MI
Number: B128-17462

Order #: 221485

Matrix Air
Received 07/17/17
Analyzed 07/18/17
Reported 07/18/17

PO Number:

Method NIOSH 7400 Issue 2 Aug. 12 1994

Sample ID	Cust. ID	Location	Date	Time	Vol.	Fibers (f/field)	Density (f/mm²)	Exposure (f/cc)
221485-001	**5RWH**	**Ground Team Labor**						
			07/11/17	490 min	1960 L	<0.0550	<7.01	<0.00138
221485-002	**4PMG**	**Location G**						
			07/10/17			<0.0550	<7.01	
221485-003	**5PMH**	**Location F**						
			07/11/17	279 min	614 L	<0.0550	<7.01	<0.00439
221485-004	**4PME**	**Location E**						
			07/10/17	417 min	1670 L	<0.0550	<7.01	<0.00162
221485-005	**4PMC**	**Location C**						
			07/10/17	429 min	858 L	<0.0550	<7.01	<0.00314
221485-006	**5PME**	**Location E**						
			07/11/17	270 min	810 L	<0.0550	<7.01	<0.00333
221485-007	**4RWH**	**Hubbell, MI**						
			07/10/17			<0.0550	<7.01	
221485-008	**5ROH**	**Hubbell, MI**						
			07/11/17	530 min	2120 L	<0.0550	<7.01	<0.00127
221485-009	**5PMG**	**Location G**						
			07/11/17	255 min	893 L	<0.0550	<7.01	<0.00302
221485-010	**4PMF**	**Monitor**						
			07/10/17	240 min	1200 L	<0.0550	<7.01	<0.00225

Analyst: Wilson, Jada
221485-07/18/17 02:07 PM

Reviewed By: **Charles Lynch**
Data Management

Analyst Sr

Initials	Range	Sr
JAW	5 - 20	0.215
	20.5 - 50	0.162
	50.5 - 500	0.107

Area Samples. OSHA Asbestos PEL is 0.1 f/cc for 8 hour TWA. Est. limit of detection: 7 f/mm² or 0.055 f/field. (<) refers to less than limit of detection. Results are not blank-corrected unless noted by analyst. Exposure and TWA calculations are based on client-supplied air volumes and times, and assume zero exposure for time not sampled. Analyst relative standard deviation (Sr) calculated using historical data. Calculated values are reported to three significant figures. The test results reported relate only to the samples submitted. NY Samples fall under NY Certificate #11413

Schneider Laboratories, Inc. 1/800-785-5227
2512 W. Cary Street, Richmond, VA 23220-5117

Submitting Co.
U.P. Engineers & Architects (Asb)
100 Portage St
Houghton, MI 49931

Lab Use-WO#

Acct # 2820

Phone # (906) 482-4810

FAX # (906) 482-9799

Project Name Hubbell Processing Area
Project Location Hubbell, MI
Project Number B128-17462
Purchase Order No.

Special Instructions [include requests for special reporting or data packages]
Email Results to ___ bgriffin@upea.com & gallan@upea.com

Turn Around Time
[ ] 6-8 hours*
[ ] 24 hours*
[ ] 48 hours*
[X] 72 hour*
[ ] STANDARD (5 days)
[ ] Standard Full TCLP (10d)
[ ] Weekend*

* not available for all tests
Schedule rush organics, multi-metals & weekend tests in advance.

Matrix / Sample Type (Select ONE)
All samples on form should be of SAME matrix type. Use additional forms as needed.
[X] AIR
[ ] Aqueous
[ ] Bulk
[ ] Hi-Vol Filter (PM10)
[ ] Hi-Vol Filter (TSP)
[ ] Oil
[ ] Paint
[ ] Sludge
[ ] Soil
[ ] Solid
[ ] Waste
[ ] Wastewater
[ ] Water,Drinking
[ ] Compliance
[ ] Wipe
[ ] Wipe, Composite
[ ] ____

Tests / Analytes (Select ALL that Apply)

Asbestos Air / Fiber Counts
[X] PCM (NIOSH 7400)
[ ] TEM (AHERA)
[ ] TEM (EPA Level II)
[ ]

Miscellaneous Tests
[ ] Total Dust (NIOSH 0500)
[ ] Resp. Dust (NIOSH 0600)
[ ] Silica - FTIR (NIOSH 7602)
[ ] Silica - XRD (NIOSH 7500)
[ ]

Asbestos Bulk / Asb ID
[ ] PLM (EPA 600, 1993)
[ ] PLM (EPA Point Count)
[ ] PLM (Qualitative only)
[ ] NYELAP 198.1/.4
[ ] CAELAP (EPA Interim)
[ ] TEM (Chatfield)
[ ]

FOR ASBESTOS AIR:
TYPE OF RESPIRATOR USED:

Metals-Total Conc.
[ ] Lead
[ ] RCRA Metals
[ ] ____
[ ] ____

Extraction Procedures
[ ] TCLP / Lead
[ ] TCLP / RCRA Metal Profile
[ ] TCLP / FULL (w/ organics)
[ ] ____
[ ] ____

ORGANICS TESTS and other Analyses
NOTE: All samples for organics should be kept at 4°C from collection until testing. Schedule rush analyses in advance. Indicate preservatives added & media type.
Indicate *analysis method* for organics tests.

Sample (number)	Date Sampled	Time	Sample Identification (e.g. Employee, SSN, Bldg, Material)	Wipes: Wiped Area (ft²)	Wipes: Type[1] A,B,P,E	Air: Time[2] Start	Air: Time[2] Stop	Air: Flow Rate[3] Start	Air: Flow Rate[3] Stop	Air: Total[4] Air Vol	Organics: # containers
5RWH	7/11/2017		Ground Team Labor			9:00	17:10	4	4	1,960	1
4PMG	7/10/2017		Location G			11:00	fault	5	5	unk.	1
5PMF	7/11/2017		Location F			12:31	17:10	2.2	2.2	614	1
4PME	7/10/2017		Location E			10:26	17:23	4	4	1668	1
4PMC	7/10/2017		Location C			9:59	17:08	2	2	738	1
5PME	7/11/2017		Location E			12:36	17:06	3	3	810	1
4RWH	7/10/2017		Wayne, Hot Labor			9:00		2.7	2.7	n/a	1
5ROH	7/11/2017		Operation			9:00	17:50	4	4	2120	1
5PMG	7/11/2017		Location G			13:00	17:15	3.5	3.5	893	1
4PMF	7/10/2017		Monitor, Location F			11:00	15:00	5	5	1,200	1

[1]Type: A=area B=blank P=personal E=exclusion [2]Beginning/End of Sample Period [3]Pump Calibration in Liters/Minute [4]Volume in Liters [time in min * flow in L/min]

Sample Collection & Custody Information

Sampled by [NAME] G. Allen
Relinquished by [NAME] B. Griffin [SIGNATURE] B. Griffin [DATE/TIME] 7/13/17 3:30
Received by [NAME] UPS [SIGNATURE] [DATE/TIME]

STATE where samples were collected: MI
[ ] Sample return requested
[ ] Ambient temp [ ] Cool ___ °C [ ] pH ___ [ ] Cl ___

LAB USE ONLY
[ ] Ambient Temp.
Received in Lab by Date/Time [ ] Cool
[ ]FX [ ]AB [ ]UPS [ ]USM [ ]CL [ ]LG [ ]HD [ ]DB [ ]____
Waybill# [ ]R [ ]S
Unusual Sample Condition Noted:

Sample Collection & Custody Information *Chain-of-custody documentation continued internally within lab.*

Sampled by [NAME] [SIGNATURE] [DATE/TIME]
Relinquished by [NAME] [SIGNATURE] [DATE/TIME]
[ ] Sample return requested [ ] **STATE from which samples were collected**

221485 S 10
V:\221\221485
fghraizi 7/17/2017 9:2 :00 AM
UPS 1Z420051025)761426

Carefully read the terms and conditions printed on the back of this form.

Analysis Report

Schneider Laboratories Global, Inc

2512 W. Cary Street • Richmond, Virginia • 23220-5117
804-353-6778 • 800-785-LABS (5227) • Fax 804-359-1475

Customer: UP Engineers & Architects (2820)
Address: 100 Portage St
Houghton, MI 49931

Attn:

Project: Hubbell Processing Area
Location: Hubbell, MI
Number: B128-17462

Order #: 222277

Matrix Air
Received 07/21/17
Analyzed 07/25/17
Reported 07/26/17

PO Number:

Method NIOSH 7400 Issue 2 Aug. 12 1994

Sample ID	Cust. ID	Location	Date	Time	Vol.	Fibers (f/field)	Density (f/mm²)	Exposure (f/cc)	30 Min TWA (f/cc)	8 Hr TWA (f/cc)
222277-001	6ROH	Location H	07/12/17	550 min	2200 L	<0.0550	<7.01	<0.00123		
		Brian.								<0.00141
222277-002	6RWH	Location H	07/12/17	539 min	1890 L	<0.0550	<7.01	<0.00143		
		Jordan/Bruce.								<0.00161
222277-007	7RWH	Location H	07/13/17	498 min	1990 L	<0.0550	<7.01	<0.00135		
		Wayne.								<0.00141
222277-008	7PME	Location H	07/13/17	592 min	1890 L	<0.0550	<7.01	<0.00142		
		Joe.								<0.00176
222277-012	8ROH	Location H	07/12/17	434 min	1520 L	<0.0550	<7.01	<0.00178		
		Wayne.								<0.00161
222277-013	8RSH	Location H	07/12/17	235 min	940 L	<0.0550	<7.01	<0.00287		
		Hans.								<0.00141

Analyst: Wilson, Jada
222277-07/26/17 01:16 PM

Reviewed By: **Charles Lynch**
Data Management

Analyst Sr

Initials	Range	Sr
JAW	5 - 20	0.215
	20.5 - 50	0.162
	50.5 - 500	0.107

Personal and/or Excursion Samples. OSHA Asbestos PELs are 1.0 f/cc for 30 min excursion and 0.1 f/cc for 8 hour TWA. Est. limit of detection: 7 f/mm² or 0.055 f/field. (<) refers to less than limit of detection. Results are not blank-corrected unless noted by analyst. Exposure and TWA calculations are based on client-supplied air volumes and times, and assume zero exposure for time not sampled. Analyst relative standard deviation (Sr) calculated using historical data. Calculated values are reported to three significant figures. The test results reported relate only to the samples submitted. NY Samples fall under NY Certificate #11413

Analysis Report

Schneider Laboratories Global, Inc

2512 W. Cary Street • Richmond, Virginia • 23220-5117
804-353-6778 • 800-785-LABS (5227) • Fax 804-359-1475

Customer: UP Engineers & Architects (2820)
Address: 100 Portage St
Houghton, MI 49931

Attn:

Project: Hubbell Processing Area
Location: Hubbell, MI
Number: B128-17462

Order #: 222277

Matrix Air
Received 07/21/17
Analyzed 07/25/17
Reported 07/26/17

PO Number:

Method NIOSH 7400 Issue 2 Aug. 12 1994

Sample ID	Cust. ID	Location	Date	Time	Vol.	Fibers (f/field)	Density (f/mm²)	Exposure (f/cc)
222277-003	**6PMG**	**Location G**						
			07/12/17	500 min	1500 L	<0.0550	<7.01	<0.0018
222277-004	**6PME**	**Location E**						
			07/12/17	503 min	1110 L	<0.0550	<7.01	<0.00244
222277-005	**7PMF**	**Location F**						
			07/13/17	577 min	1850 L	<0.0550	<7.01	<0.00146
222277-006	**7ROH**	**Location H**						
			07/13/17	575 min	1730 L	<0.0550	<7.01	<0.00156
222277-009	**7PMG**	**Location E**						
			07/13/17	573 min	1150 L	<0.0550	<7.01	<0.00235
222277-010	**8PMG**	**Location G**						
			07/12/17	249 min	548 L	<0.0550	<7.01	<0.00492
222277-011	**8PMEa**	**Location Ea**						
			07/12/17	733 min	2930 L	<0.0550	<7.01	<0.001
222277-014	**8PMEb**	**Location Eb**						
			07/13/17	363 min	726 L	<0.0550	<7.01	<0.00372

Analyst: Wilson, Jada
222277-07/26/17 01:15 PM

Reviewed By: **Charles Lynch**
Data Management

Analyst Sr

Initials	Range	Sr
JAW	5 - 20	0.215
	20.5 - 50	0.162
	50.5 - 500	0.107

Area Samples. OSHA Asbestos PEL is 0.1 f/cc for 8 hour TWA. Est. limit of detection: 7 f/mm² or 0.055 f/field. (<) refers to less than limit of detection. Results are not blank-corrected unless noted by analyst. Exposure and TWA calculations are based on client-supplied air volumes and times, and assume zero exposure for time not sampled. Analyst relative standard deviation (Sr) calculated using historical data. Calculated values are reported to three significant figures. The test results reported relate only to the samples submitted. NY Samples fall under NY Certificate #11413

Schneider Laboratories, Inc. 1/800-785-5227
2512 W. Cary Street, Richmond, VA 23220-5117

Submitting Co.: U.P. Engineers & Architects (Asb)
100 Portage St.
Houghton, MI 49931

Lab Use-WO#:
Acct #: 2820

Project Name: Hubbell Processing Area
Project Location: Hubbell, MI
Project Number: B128-17462
Purchase Order No.:

Special Instructions [include requests for special reporting or data packages]
Email Results to ___ bgriffin@upea.com & gallan@upea.com
PAGE 1 of 2

Phone #: (906) 482-4810
FAX #: (906) 482-9799

Turn Around Time
[ ] 6-8 hours*
[ ] 24 hours*
[ ] 48 hours*
[X] 72 hour*
[ ] STANDARD (5 days)
[ ] Standard Full TCLP (10d)
[ ] Weekend*
* not available for all tests
Schedule rush organics, multi-metals & weekend tests in advance.

Matrix / Sample Type (Select ONE)
All samples on form should be of SAME matrix type. Use additional forms as needed.
[X] AIR
[ ] Aqueous
[ ] Bulk
[ ] Hi-Vol Filter (PM10)
[ ] Hi-Vol Filter (TSP)
[ ] Oil
[ ] Paint
[ ] Sludge
[ ] Soil
[ ] Solid
[ ] Waste
[ ] Wastewater
[ ] Water,Drinking
[ ] Compliance
[ ] Wipe
[ ] Wipe, Composite
[ ] ____

Tests / Analytes (Select ALL that Apply)

Asbestos Air / Fiber Counts
[X] PCM (NIOSH 7400)
[ ] TEM (AHERA)
[ ] TEM (EPA Level II)
[ ] ____

Asbestos Bulk / Asb ID
[ ] PLM (EPA 600, 1993)
[ ] PLM (EPA Point Count)
[ ] PLM (Qualitative only)
[ ] NYELAP 198.1/.4
[ ] CAELAP (EPA Interim)
[ ] TEM (Chatfield)
[ ] ____

Metals-Total Conc.
[ ] Lead
[ ] RCRA Metals
[ ] ____
[ ] ____

Miscellaneous Tests
[ ] Total Dust (NIOSH 0500)
[ ] Resp. Dust (NIOSH 0600)
[ ] Silica - FTIR (NIOSH 7602)
[ ] Silica - XRD (NIOSH 7500)
[ ] ____

FOR ASBESTOS AIR:
TYPE OF RESPIRATOR USED:

Extraction Procedures
[ ] TCLP / Lead
[ ] TCLP / RCRA Metal Profile
[ ] TCLP / FULL (w/ organics)
[ ] ____
[ ] ____

ORGANICS TESTS and other Analyses
NOTE: All samples for organics should be kept at 4°C from collection until testing. Schedule rush analyses in advance. Indicate preservatives added & media type.
Indicate *analysis method* for organics tests.

Sample (number)	Date Sampled	Time	Sample Identification (e.g. Employee, SSN, Bldg, Material)	Wipes: Wiped Area (ft²)	Wipes: Type[1] A,B,P,E	Air: Time[2] Start	Air: Time[2] Stop	Air: Flow Rate[3] Start	Air: Flow Rate[3] Stop	Air: Total[4] Air Vol	Organics: # containers
6ROH	7/12/2017		Location H, Personnel:Brian			8:10	17:20	4	4	2,156	1
6RWH	7/12/2017		Location H, Personnel: Jordan/Bruce			8:10	17:09	3.5	3.5	1,463	1
6PMG	7/12/2017		Location G			9:15	17:35	3	3	1,554	1
6PME	7/12/2017		Location E			9:08	17:31	2.2	2.2	1,097.80	1
7PMF	7/13/2017		Location F			7:45	17:22	3.2	3.2	1846.4	1
7ROH	7/13/2017		Location H			7:05	16:40	3	3	1476	1
7RWH	7/13/2017		Location H, Personnel: Wayne			7:00	15:18	4	4	1,504	1
7PME	7/13/2017		Location H, Personnel: Joe			7:30	17:22	3.2	3.2	1,846.40	1
7PMG	7/13/2017		Location E			7:54	17:27	2	2	1,144	1

[1]Type: A=area B=blank P=personal E=excursion [2]Beginning/End of Sample Period [3]Pump Calibration in Liters/Minute [4]Volume in Liters [time in min * flow in L/min]

222277 S 14
V:\222\222277
fghraizi 7/21/2017 9:3 5:00 AM
UPS 1Z420051035 1030293

Sample Collection & Custody Information

Sampled by [NAME] Gerald Allan [SIGNATURE] ____ [DATE/TIME] ____
Relinquished by [NAME] Bill Griffin [SIGNATURE] ____ [DATE/TIME] 7/18 3:30
Received by [NAME] UPS [SIGNATURE] ____ [DATE/TIME] 7/18 3:30
[ ]FX [ ]AB [X]UPS [ ]USM [ ]CL [ ]LG [ ]HD [ ]DB [ ]____
Unusual Sample Condition Noted: ____

STATE where samples were collected: MI
[ ] Sample return requested
[ ] Ambient temp [ ] Cool ____°C [ ] pH ____ [ ] Cl ____
Waybill# ____ [ ]R [ ]S
Chain-of-Custody documentation continued internally within lab.

Received in Lab by ____ Date/Time ____ [ ] Cool
[ ]FX [ ]AB [ ]UPS [ ]USM [ ]CL [ ]LG [ ]HD [ ]DB [ ]____
Waybill# ____ [ ]R [ ]S
Unusual Sample Condition Noted: ____

Sampled by [NAME] ____ [SIGNATURE] ____ [DATE/TIME] ____
Relinquished by [NAME] ____ [SIGNATURE] ____ [DATE/TIME] ____
[ ] Sample return requested [ ] **STATE from which samples were collected**

Carefully read the terms and conditions printed on the back of this form.

Schneider Laboratories, Inc. 1/800-785-5227
2512 W. Cary Street, Richmond, VA 23220-5117

Submitting Co.
U.P. Engineers & Architects (Asb)
100 Portage St.
Houghton, MI 49931

Lab Use-WO#

Acct # 2820

Phone # (906) 482-4810

FAX # (906) 482-9799

Project Name: Hubbell Processing Area
Project Location: Hubbell, MI
Project Number: B128-17462
Purchase Order No.:

Special Instructions [include requests for special reporting or data packages]
Email Results to bgriffin@upea.com & gallan@upea.com
Page 2 of 2

Turn Around Time
[ ] 6-8 hours*
[ ] 24 hours*
[ ] 48 hours*
[X] 72 hour*
[ ] STANDARD (5 days)
[ ] Standard Full TCLP (10d)
[ ] Weekend*
* not available for all tests
Schedule rush organics, multi-metals & weekend tests in advance.

Matrix / Sample Type (Select ONE)
All samples on form should be of SAME matrix type. Use additional forms as needed.
[X] AIR
[ ] Aqueous
[ ] Bulk
[ ] Hi-Vol Filter (PM10)
[ ] Hi-Vol Filter (TSP)
[ ] Oil
[ ] Paint
[ ] Sludge
[ ] Soil
[ ] Solid
[ ] Waste
[ ] Wastewater
[ ] Water,Drinking
[ ] Compliance
[ ] Wipe
[ ] Wipe, Composite
[ ] _____

Tests / Analytes (Select ALL that Apply)

Asbestos Air / Fiber Counts
[X] PCM (NIOSH 7400)
[ ] TEM (AHERA)
[ ] TEM (EPA Level II)
[ ] _____

Miscellaneous Tests
[ ] Total Dust (NIOSH 0500)
[ ] Resp. Dust (NIOSH 0600)
[ ] Silica - FTIR (NIOSH 7602)
[ ] Silica - XRD (NIOSH 7500)
[ ] _____

Asbestos Bulk / Asb ID
[ ] PLM (EPA 600, 1993)
[ ] PLM (EPA Point Count)
[ ] PLM (Qualitative only)
[ ] NYELAP 198.1/.4
[ ] CAELAP (EPA Interim)
[ ] TEM (Chatfield)
[ ] _____

FOR ASBESTOS AIR:
TYPE OF RESPIRATOR USED:

Metals-Total Conc.
[ ] Lead
[ ] RCRA Metals
[ ] _____
[ ] _____

Extraction Procedures
[ ] TCLP / Lead
[ ] TCLP / RCRA Metal Profile
[ ] TCLP / FULL (w/ organics)
[ ] _____
[ ] _____

ORGANICS TESTS and other Analyses
NOTE: All samples for organics should be kept at 4°C from collection until testing. Schedule rush analyses in advance. Indicate preservatives added & media type. Indicate *analysis method* for organics tests.

Sample (number)	Date Sampled	Time	Sample Identification (e.g. Employee, SSN, Bldg, Material)	Wipes: Wiped Area (ft²)	Wipes: Type[1] A,B,P,E	Air: Time[2] Start	Air: Time[2] Stop	Air: Flow Rate[3] Start	Air: Flow Rate[3] Stop	Air: Total[4] Air Vol	Organics: # containers
8PMG	7/12/2017		Location G			9:22	13:31	2.2	2.2	541	1
8PMEa	7/12/2017		Location Ea			17:07	Auto Off	4	4	2,880	1
8ROH	7/12/2017		Location H, Personnel Wayne			16:32 9:22	20:00 13:08	3.5	3.5	1,744.50	1
8RSH	7/12/2017		Location H, Personnel Hans			7:00	10:56	4	4	684	1
8PMEb	7/13/2017		Location Eb			7:20	13:23	2	2	708	1

[1]Type: A=area B=blank P=personal E=excursion [2]Beginning/End of Sample Period [3]Pump Calibration in Liters/Minute [4]Volume in Liters [time in min * flow in L/min]

Sample Collection & Custody Information

Sampled by [NAME] Gerald Allan [SIGNATURE] _____ [DATE/TIME] _____

Relinquished by [NAME] Bill Griffin [SIGNATURE] Bill Griffin [DATE/TIME] 7/18 3:30

Received by [NAME] _UPS_____ [SIGNATURE] _____ [DATE/TIME] 7/18 3:30

[ ]FX [ ]AB [X]UPS [ ]USM [ ]CL [ ]LG [ ]HD [ ]DB [ ]____

Unusual Sample Condition Noted:

STATE where samples were collected: MI

[ ] Sample return requested

[ ] Ambient temp [ ] Cool ____°C [ ] pH ____ [ ] Cl ____

Waybill# _____ [ ]R [ ]S

Chain-of-Custody documentation continued internally within lab.

Received in Lab by: _____ Date/Time: _____ [ ] Cool

[ ]FX [ ]AB [ ]UPS [ ]USM [ ]CL [ ]LG [ ]HD [ ]DB [ ]____

Waybill# _____ [ ]R [ ]S

Unusual Sample Condition Noted:

Sampled by [NAME] _____ [SIGNATURE] _____ [DATE/TIME] _____

Relinquished by [NAME] ___ [SIGNATURE] _____ [DATE/TIME] _____

[ ] Sample return requested [ ] **STATE from which samples were collected**

Analysis Report

Schneider Laboratories Global, Inc

2512 W. Cary Street • Richmond, Virginia • 23220-5117
804-353-6778 • 800-785-LABS (5227) • Fax 804-359-1475

Customer: UP Engineers & Architects (2820)
Address: 100 Portage St
Houghton, MI 49931

Attn:

Project: Hubbell Processing Area
Location: Hubbell, MI
Number: B128-17462

Order #: 222869

Matrix Air
Received 07/25/17
Analyzed 07/26/17
Reported 07/27/17

PO Number:

Method NIOSH 7400 Issue 2 Aug. 12 1994

Sample ID	Cust. ID	Location	Date	Time	Vol.	Fibers (f/field)	Density (f/mm²)	Exposure (f/cc)	30 Min TWA (f/cc)	8 Hr TWA (f/cc)
222869-001	9ROH	Hubbell, MI	07/17/17	169 min	1410 L	<0.0550	<7.01	<0.00191		
		Dozer, W.								<0.00188
222869-002	9RTH	Hubbell, MI	07/17/17	445 min	1340 L	0.600	76.4	0.0220		
		Jordan								0.0204
222869-006	10ROH	Hubbell, MI	07/18/17	600 min	1680 L	0.0950	12.1	0.00277		
		Dozer, W.								0.00347
222869-007	10RWH	Hubbell, MI	07/18/17	420 min	5780 L	<0.0550	<7.01	<0.001		
		Joe								<0.000409
222869-008	10RTH	Hubbell, MI	07/18/17	420 min	1180 L	0.155	19.7	0.00646		
		Jordan								0.00566

Analyst: Abielmona, Nizar
222869-07/27/17 12:47 PM

Reviewed By: **Charles Lynch**
Data Management

Analyst Sr

Initials	Range	Sr
NAA	5 - 20	0.215
	20.5 - 50	0.162
	50.5 - 500	0.107

Personal and/or Excursion Samples. OSHA Asbestos PELs are 1.0 f/cc for 30 min excursion and 0.1 f/cc for 8 hour TWA. Est. limit of detection: 7 f/mm² or 0.055 f/field. (<) refers to less than limit of detection. Results are not blank-corrected unless noted by analyst. Exposure and TWA calculations are based on client-supplied air volumes and times, and assume zero exposure for time not sampled. Analyst relative standard deviation (Sr) calculated using historical data. Calculated values are reported to three significant figures. The test results reported relate only to the samples submitted. NY Samples fall under NY Certificate #11413

Analysis Report

Schneider Laboratories Global, Inc

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804-353-6778 • 800-785-LABS (5227) • Fax 804-359-1475

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Attn:

Project: Hubbell Processing Area
Location: Hubbell, MI
Number: B128-17462

Order #: 222869

Matrix Air
Received 07/25/17
Analyzed 07/26/17
Reported 07/27/17

PO Number:

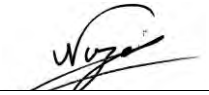
Method NIOSH 7400 Issue 2 Aug. 12 1994

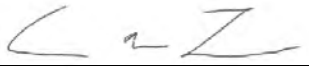
Sample ID	Cust. ID	Location	Date	Time	Vol.	Fibers (f/field)	Density (f/mm²)	Exposure (f/cc)
222869-003	**9PMC**	**Location C**						
			07/17/17	470 min	1490 L	<0.0550	<7.01	<0.00182
222869-004	**9PMG**	**Location G**						
			07/17/17	570 min	1710 L	<0.0550	<7.01	<0.00158
222869-005	**9PME**	**Location E**						
			07/17/17	514 min	1800 L	<0.0550	<7.01	<0.0015
222869-009	**10PMB**	**Down Wind**						
			07/18/17	412 min	1030 L	<0.0550	<7.01	<0.00262
222869-010	**10PMA**	**Down Wind**						
			07/18/17	415 min	1250 L	<0.0550	<7.01	<0.00217
222869-011	**10PMG**	**Up Wind**						
			07/18/17	184 min	589 L	<0.0550	<7.01	<0.00458
222869-012	**11PMF**	**Location F**						
			07/19/17	180 min	504 L	<0.0550	<7.01	<0.00535
222869-013	**11PMG**	**Location G**						
			07/19/17	182 min	582 L	<0.0550	<7.01	<0.00463
222869-014	**11PME**	**Location E**						
			07/19/17	175 min	490 L	<0.0550	<7.01	<0.00551
222869-015	**12PMG**	**Location G**						
			07/20/17	534 min	1340 L	<0.0550	<7.01	<0.00202
222869-016	**12PME**	**Location E**						
			07/20/17	511 min	1280 L	<0.0550	<7.01	<0.00211
222869-017	**12RWCV**	**Silt Fence Install**						
			07/20/17	270 min	756 L	0.220	28.0	0.0143
222869-018	**12PMD**	**Location D**						
			07/20/17	410 min	1230 L	<0.0550	<7.01	<0.00219
222869-019	**Field Blank**	**Manufacturing QA**						
			07/20/17			<0.0550	<7.01	

Area Samples. OSHA Asbestos PEL is 0.1 f/cc for 8 hour TWA. Est. limit of detection: 7 f/mm² or 0.055 f/field. (<) refers to less than limit of detection. Results are not blank-corrected unless noted by analyst. Exposure and TWA calculations are based on client-supplied air volumes and times, and assume zero exposure for time not sampled. Analyst relative standard deviation (Sr) calculated using historical data. Calculated values are reported to three significant figures. The test results reported relate only to the samples submitted. NY Samples fall under NY Certificate #11413

Method NIOSH 7400 Issue 2 Aug. 12 1994

Sample ID	Cust. ID	Location	Date	Time	Vol.	Fibers (f/field)	Density (f/mm²)	Exposure (f/cc)





Analyst: Abielmona, Nizar
222869-07/27/17 12:46 PM

Reviewed By: **Charles Lynch**
Data Management

Analyst Sr

Initials	Range	Sr
NAA	5 - 20	0.215
	20.5 - 50	0.162
	50.5 - 500	0.107

Area Samples. OSHA Asbestos PEL is 0.1 f/cc for 8 hour TWA. Est. limit of detection: 7 f/mm² or 0.055 f/field. (<) refers to less than limit of detection. Results are not blank-corrected unless noted by analyst. Exposure and TWA calculations are based on client-supplied air volumes and times, and assume zero exposure for time not sampled. Analyst relative standard deviation (Sr) calculated using historical data. Calculated values are reported to three significant figures. The test results reported relate only to the samples submitted. NY Samples fall under NY Certificate #11413

SLi aboratories, Inc. 1/800-785-5227
y Street, Richmond, VA 23220-5117

Submitting Co.
U.P. Engineers & Architects (Asb)
100 Portage St.
Houghton, MI 49931

Lab Use-WO#

Acct # 2820

Phone # (906) 482-4810

FAX # (906) 482-9799

Project Name: Hubbell Processing Area
Project Location: Hubbell, MI
Project Number: 8128-17462
Purchase Order No.

Special Instructions [include requests for special reporting or data packages]
Email Results to ___ bgriffin@upea.com & gallan@upea.com

Turn Around Time
[ ] 6-8 hours*
[ ] 24 hours*
[ ] 48 hours*
[X] 72 hour*
[ ] STANDARD (5 days)
[ ] Standard Full TCLP (10d)
[ ] Weekend*
* not available for all tests
Schedule rush organics, metals & weekend tests in advance.

Matrix / Sample Type (Select ONE)
All samples on form should be of SAME matrix type. Use additional forms as needed.
[X] AIR
[ ] Aqueous
[ ] Bulk
[ ] Hi-Vol Filter (PM10)
[ ] Hi-Vol Filter (TSP)
[ ] Oil
[ ] Paint
[ ] Sludge
[ ] Soil
[ ] Solid
[ ] Waste
[ ] Wastewater
[ ] Water,Drinking
[ ] Compliance
[ ] Wipe
[ ] Wipe, Composite
[ ] _____
[ ] _____

Tests / Analytes (Select ALL that Apply)

Asbestos Air / Fiber Counts
[X] PCM (NIOSH 7400)
[ ] TEM (AHERA)
[ ] TEM (EPA Level II)
[ ] _____

Asbestos Bulk / Asb ID
[ ] PLM (EPA 600, 1993)
[ ] PLM (EPA Point Count)
[ ] PLM (Qualitative only)
[ ] NYELAP 198.1/.4
[ ] CAELAP (EPA Interim)
[ ] TEM (Chatfield)
[ ] _____

Metals-Total Conc.
[ ] Lead
[ ] RCRA Metals
[ ] _____
[ ] _____

Miscellaneous Tests
[ ] Total Dust (NIOSH 0500)
[ ] Resp. Dust (NIOSH 0600)
[ ] Silica - FTIR (NIOSH 7602)
[ ] Silica - XRD (NIOSH 7500)
[ ] _____

FOR ASBESTOS AIR:
TYPE OF RESPIRATOR USED:

Extraction Procedures
[ ] TCLP / Lead
[ ] TCLP / RCRA Metal Profile
[ ] TCLP / FULL (w/ organics)
[ ] _____
[ ] _____

ORGANICS TESTS and other Analyses
NOTE: All samples for organics should be kept at 4°C from collection until testing. Schedule rush analyses in advance. Indicate preservatives added & media type. Indicate *analysis method* for organics tests.

Page one of two

Sample (number)	Date Sampled	Run Time	Sample Identification (e.g. Employee, SSN, Bldg, Material)	Wipes: Wiped Area (ft²)	Wipes: Type[1] A,D,P,O	Information for Air Samples: Time[2] Start	Time[2] Stop	Flow Rate[3] Start	Flow Rate[3] Stop	Total[4] Air Vol	Organics # containers
9ROH	7/17/2017	169	Wayne, Dozer			8:00	Auto off	3	3	507	1
9RTH	7/17/2017	377	Jordan, ACM			8:45	16:10	3	3	1131	1
9PMC	7/17/2017	470	Location C			8:15	Auto off	3	3	1410	1
9PMG	7/17/2017	529	Location G			8:15	17:45	3	3	1587	1
9PME	7/17/2017	490	Location E			8:45	17:19	3.5	3.5	1715	1
10ROH	7/18/2017	463	Wayne, Dozer			9:00	19:00	2.8	2.8	1296.4	1
10RWH	7/18/2017	43	Joe, Labor			9:00	16:00	2.5	2.5	107.5	1
10RTH	7/18/2017	251	Jordan, ACM			9:00	16:00	2.8	2.8	627.5	1
10PMB	7/18/2017	359	Down wind			9:15	16:07	2.5	2.5	897.5	1
10PMA	7/18/2017	363	Down wind			9:15	16:10	3	3	1089	1
10PMG	7/18/2017	184	Up wind			9:15	Auto off	3.2	3.2	588.8	1

222869 S 19
V:\222\222869
fghraizi 7/25/2017 9:25:00 AM
UPS 1Z420051025489364

Received by [NAME] UPS [SIGNATURE] [DATE/TIME]
[ ]FX [ ]AB [X]UPS [ ]USM [ ]CL [ ]LG [ ]HD [ ]DB [ ]____
Waybill# _____ [ ]R [ ]S
[ ] Ambient temp [ ] Cool ____°C [ ] pH _ MI
Unusual Sample Condition Noted:
Chain-of-Custody documentation continued internally within lab.

7-21-17

LAB USE ONLY
Received in Lab by Date/Time
[ ] Ambient Temp. [ ] Cool
[ ]FX [ ]AB [ ]UPS [ ]USM [ ]CL [ ]LG [ ]HD [ ]DB [ ]____
Waybill# _____ [ ]R [ ]S
Unusual Sample Condition Noted:

Sample Collection & Custody Information
Chain-of-custody documentation continued internally within lab.
Sampled by [NAME] [SIGNATURE] [DATE/TIME]
Relinquished by [NAME] [SIGNATURE] [DATE/TIME]
[ ] Sample return requested [ ] STATE from which samples were collected

Carefully read the terms and conditions printed on the back of this form.

SLi aboratories, Inc. 1/800-786-5227
y Street, Richmond, VA 23220-5117

Submitting Co.
U.P. Engineers & Architects (Asb)
100 Portage St.
Houghton, MI 49931

Lab Use-WO#

Acct # 2820

Phone # (906) 482-4810

FAX # (906) 482-9799

Project Name: Hubbell Processing Area
Project Location: Hubbell, MI
Project Number: B128-17462
Purchase Order No.

Special Instructions [include requests for special reporting or data packages]
Email Results to ___ bgriffin@upea.com & gallan@upea.com

Turn Around Time
[ ] 6-8 hours*
[ ] 24 hours*
[ ] 48 hours*
[X] 72 hour*
[ ] STANDARD (5 days)
[ ] Standard Full TCLP (10d)
[ ] Weekend*

* *not available for all tests*
Schedule rush organics, multi-metals & weekend tests in advance.

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All samples on form should be of SAME matrix type. Use additional forms as needed.
[X] AIR
[ ] Aqueous
[ ] Bulk
[ ] Hi-Vol Filter (PM10)
[ ] Hi-Vol Filter (TSP)
[ ] Oil
[ ] Paint
[ ] Sludge
[ ] Soil
[ ] Solid
[ ] Waste
[ ] Wastewater
[ ] Water, Drinking
[ ] Compliance
[ ] Wipe
[ ] Wipe, Composite
[ ] ___
[ ] ___

Tests / Analytes (Select ALL that Apply)

Asbestos Air / Fiber Counts
[X] PCM (NIOSH 7400)
[ ] TEM (AHERA)
[ ] TEM (EPA Level II)
[ ] ___

Miscellaneous Tests
[ ] Total Dust (NIOSH 0500)
[ ] Resp. Dust (NIOSH 0600)
[ ] Silica - FTIR (NIOSH 7602)
[ ] Silica - XRD (NIOSH 7500)
[ ] ___

Asbestos Bulk / Asb ID
[ ] PLM (EPA 600, 1993)
[ ] PLM (EPA Point Count)
[ ] PLM (Qualitative only)
[ ] NYELAP 198.1/.4
[ ] CAELAP (EPA Interim)
[ ] TEM (Chatfield)
[ ] ___

FOR ASBESTOS AIR:
TYPE OF RESPIRATOR USED:

Metals-Total Conc.
[ ] Lead
[ ] RCRA Metals
[ ] ___
[ ] ___

Extraction Procedures
[ ] TCLP / Lead
[ ] TCLP / RCRA Metal Profile
[ ] TCLP / FULL (w/ organics)
[ ] ___
[ ] ___

ORGANICS TESTS and other Analyses
NOTE: All samples for organics should be kept at 4°C from collection until testing. Schedule rush analyses in advance. Indicate preservatives added & media type. Indicate *analysis method* for organics tests.

Page two of two

Sample (number)	Date Sampled	Organics Run Time	Sample Identification (e.g. Employee, SSN, Bldg, Material)	Wipes Wiped Area (ft²)	Wipes Type[1] A,B,P,Q	Information for Air Samples Time[2] Start	Time[2] Stop	Flow Rate[3] Start	Flow Rate[3] Stop	Total[4] Air Vol	Organics # containers
11PMF	7/19/2017	145	Location F			13:48	16:48	2.8	2.8	406	1
11PMG	7/19/2017	154	Location G			13:49	16:51	3.2	3.2	492.8	1
11PME	7/19/2017	136	Location E			13:50	16:45	2.8	2.8	380.8	1
12PMG	7/20/2017	451	Location G			8:35	17:29	2.5	2.5	1127.5	1
12PME	7/20/2017	510	Location E			8:52	17:23	2.5	2.5	1275	1
12RWCv	7/20/2017	233	Silt Fence Install			7:20	11:50	2.8	2.8	652.4	1
12PMD	7/20/2017	382	Location D			10:15	17:05	3	3	1146	1
Field Blank	7/20/2017	0	Manufacturing QA								1

[1]Type: A=area B=blank P=personal E=excursion [2]Beginning/End of Sample Period [3]Pump Calibration in Liters/Minute [4]Volume in Liters [time in min * flow in L/min]

Collection & Custody Information
Sampled by [NAME] Gerald Allan [SIGNATURE] [signature] [DATE/TIME] 7-21-2017/14:20
Relinquished by [NAME] Bill Griffin [SIGNATURE] [signature] [DATE/TIME] 7/21/17
Received by [NAME] UPS [SIGNATURE] [DATE/TIME]

STATE where samples were collected: MI
[ ] Sample return requested
[ ] Ambient temp [ ] Cool ___ °C [ ] pH ___ [ ] Cl ___

LAB USE ONLY
Received in Lab by ___ Date/Time ___ [ ] Ambient Temp. [ ] Cool
[ ]FX [ ]AB [ ]UPS [ ]USM [ ]CL [ ]LG [ ]HD [ ]DB [ ]___
Waybill# ___ [ ]R [ ]S
Unusual Sample Condition Noted:

Sample Collection & Custody Information *Chain-of-custody documentation continued internally within lab.*
Sampled by [NAME] ___ [SIGNATURE] ___ [DATE/TIME] ___
Relinquished by [NAME] ___ [SIGNATURE] ___ [DATE/TIME] ___
[ ] Sample return requested [ ] STATE from which samples were collected

Carefully read the terms and conditions printed on the back of this form.

Analysis Report

Schneider Laboratories Global, Inc

2512 W. Cary Street • Richmond, Virginia • 23220-5117
804-353-6778 • 800-785-LABS (5227) • Fax 804-359-1475

Customer: UP Engineers & Architects (2820)
Address: 100 Portage St
Houghton, MI 49931

Attn:

Project: Hubbell Processing Area
Location: Hubbell, MI
Number: B128-17462

Order #: 224053

Matrix Air
Received 08/02/17
Analyzed 08/03/17
Reported 08/03/17

PO Number:

Method NIOSH 7400 Issue 2 Aug. 12 1994

Sample ID	Cust. ID	Location	Date	Time	Vol.	Fibers (f/field)	Density (f/mm²)	Exposure (f/cc)
224053-001	**13PMG**	**Perm Perimeter G**						
			07/24/17	594 min	1490 L	<0.0550	<7.01	<0.00182
224053-002	**13PME**	**Perm Perimeter E**						
			07/24/17	590 min	1590 L	<0.0550	<7.01	<0.00169
224053-003	**13PMC**	**Perm Perimeter C**						
			07/24/17	584 min	1690 L	<0.0550	<7.01	<0.00159
224053-004	**13PMA**	**Perm Perimeter A**						
			07/24/17	585 min	1760 L	<0.0550	<7.01	<0.00154
224053-005	**13FB2**	**Field Blank**						
			07/24/17			<0.0550	<7.01	
224053-006	**14PMG**	**Perm G**						
			07/25/17	614 min	1840 L	<0.0550	<7.01	<0.00146
224053-007	**14PME**	**Perm E**						
			07/25/17	608 min	1520 L	<0.0550	<7.01	<0.00177
224053-008	**14PMA**	**Perm A**						
			07/25/17	620 min	1860 L	<0.0550	<7.01	<0.00145
224053-009	**14PMC**	**Perm C**						
			07/25/17	597 min	1550 L	<0.0550	<7.01	<0.00174

Analyst: Wilson, Jada
224053-08/03/17 09:45 AM

Reviewed By: **Hind Eldanaf**
Microscopy Supervisor

Analyst Sr

Initials	Range	Sr
JAW	5 - 20	0.215
	20.5 - 50	0.162
	50.5 - 500	0.107

Area Samples. OSHA Asbestos PEL is 0.1 f/cc for 8 hour TWA. Est. limit of detection: 7 f/mm² or 0.055 f/field. (<) refers to less than limit of detection. Results are not blank-corrected unless noted by analyst. Exposure and TWA calculations are based on client-supplied air volumes and times, and assume zero exposure for time not sampled. Analyst relative standard deviation (Sr) calculated using historical data. Calculated values are reported to three significant figures. The test results reported relate only to the samples submitted. NY Samples fall under NY Certificate #11413

Schneider Laboratories, Inc. 1/800-785-5227
2512 W. Cary Street, Richmond, VA 23220-5117

Submitting Co.
U.P. Engineers & Architects (Asb)
100 Portage St.
Houghton, MI 49931

Lab Use-WO#

Acct # 2820

Phone # (906) 482-4810

FAX # (906) 482-9799

Project Name Hubbell Processing Area
Project Location Hubbell, MI
Project Number B128-17462
Purchase Order No.

Special Instructions [include requests for special reporting or data packages]
Email Results to ___ bgriffin@upea.com & gallan@upea.com
Asbestos Set 5 1 of 2

Turn Around Time
[ ] 6-8 hours*
[ ] 24 hours*
[ ] 48 hours*
[X] 72 hour*
[ ] STANDARD (5 days)
[ ] Standard Full TCLP (10d)
[ ] Weekend*

* not available for all tests
Schedule rush organics, multi-metals & weekend tests in advance.

Matrix / Sample Type (Select ONE)
All samples on form should be of SAME matrix type. Use additional forms as needed.
[X] AIR
[ ] Aqueous
[ ] Bulk
[ ] Hi-Vol Filter (PM10)
[ ] Hi-Vol Filter (TSP)
[ ] Oil
[ ] Paint
[ ] Sludge
[ ] Soil
[ ] Solid
[ ] Waste
[ ] Wastewater
[ ] Water,Drinking
[ ] Compliance
[ ] Wipe
[ ] Wipe, Composite
[ ] ____
[ ] ____

Tests / Analytes (Select ALL that Apply)

Asbestos Air / Fiber Counts
[X] PCM (NIOSH 7400)
[ ] TEM (AHERA)
[ ] TEM (EPA Level II)
[ ] ____

Asbestos Bulk / Asb ID
[ ] PLM (EPA 600, 1993)
[ ] PLM (EPA Point Count)
[ ] PLM (Qualitative only)
[ ] NYELAP 198.1/.4
[ ] CAELAP (EPA Interim)
[ ] TEM (Chatfield)
[ ] ____

Metals-Total Conc.
[ ] Lead
[ ] RCRA Metals
[ ] ____
[ ] ____

Miscellaneous Tests
[ ] Total Dust (NIOSH 0500)
[ ] Resp. Dust (NIOSH 0600)
[ ] Silica - FTIR (NIOSH 7602)
[ ] Silica - XRD (NIOSH 7500)
[ ] ____

FOR ASBESTOS AIR:
TYPE OF RESPIRATOR USED:

Extraction Procedures
[ ] TCLP / Lead
[ ] TCLP / RCRA Metal Profile
[ ] TCLP / FULL (w/ organics)
[ ] ____
[ ] ____

ORGANICS TESTS and other Analyses
NOTE: All samples for organics should be kept at 4°C from collection until testing. Schedule rush analyses in advance. Indicate preservatives added & media type.
Indicate *analysis method* for organics tests.

Sample (number)	Date Sampled	Time	Sample Identification (e.g. Employee, SSN, Bldg, Material)	Wipes: Wiped Area (ft²)	Wipes: Type[1] A,B,P,E	Air: Time[2] Start	Air: Time[2] Stop	Air: Flow Rate[3] Start	Air: Flow Rate[3] Stop	Air: Total[4] Air Vol	Organics: # containers
13PMG	7/24/2017	592	Perm Perimeter G			7:40	17:34	2.5	2.5	1,480	1
13PME	7/24/2017	588	Perm Perimeter E			7:50	17:40	2.7	2.7	1587.6	1
13PMC	7/24/2017	526	Perm Perimeter C			8:08	17:52	3	2.8	1542.6	1
13PMA	7/24/2017	585	Perm Perimeter A			8:05	17:50	3	3	1755	1
13FB2	7/24/2017	Day	Field Blank			7:40	18:00	0	0	0	1
14PMG	7/25/2017	605	Perm G			7:39	17:53	3	3	1815	1
14PME	7/25/2017	594	Perm E			7:40	17:48	2.5	2.5	1485	1
14PMA	7/25/2017	592	Perm A			7:41	18:01	3	3	1776	1
14PMC	7/25/2017	587	Perm C			8:01	17:58	2.6	2.6	1,526	1

224053 S 9
V:\224\224053
fghraizi 8/2/2017 9:3 0:00 AM
UPS 1Z420051024 139839

Sample Collection & Custody Information

[1]Type: A=area B=blank P=personal E=excursion [2]Beginning/End of Sample Period [3]Pump Calibration in Liters/Minute [4]Volume in Liters [time in min × flow in L/min]

Sampled by [NAME] Gerald Allan [SIGNATURE] [DATE/TIME] 7-30-2017
Relinquished by [NAME] [SIGNATURE] [DATE/TIME]
Received by [NAME] UPS [SIGNATURE] [DATE/TIME]

STATE where samples were collected: MI
[ ] Sample return requested
[ ] Ambient temp [ ] Cool ___ °C [ ] pH ___ [ ] Cl ___

LAB USE ONLY
[ ] Ambient Temp.
Received in Lab by Date/Time [ ] Cool
[ ]FX [ ]AB [ ]UPS [ ]USM [ ]CL [ ]LG [ ]HD [ ]DB [ ]____
Waybill# [ ]R [ ]S
Unusual Sample Condition Noted:

Sample Collection & Custody Information
Chain-of-custody documentation continued internally within lab.

Sampled by [NAME] [SIGNATURE] [DATE/TIME]
Relinquished by [NAME] [SIGNATURE] [DATE/TIME]
[ ] Sample return requested [ ] **STATE from which samples were collected**

Carefully read the terms and conditions printed on the back of this form.

Analysis Report

Schneider Laboratories Global, Inc

2512 W. Cary Street • Richmond, Virginia • 23220-5117
804-353-6778 • 800-785-LABS (5227) • Fax 804-359-1475

Customer: UP Engineers & Architects (2820)
Address: 100 Portage St
Houghton, MI 49931

Attn:

Project: Hubbell Processing Area
Location: Hubbell, MI
Number: B128-17462

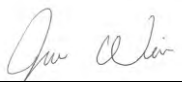
Order #: 224054

Matrix Air
Received 08/02/17
Analyzed 08/02/17
Reported 08/02/17

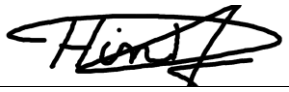
PO Number:

Method NIOSH 7400 Issue 2 Aug. 12 1994

Sample ID	Cust. ID	Location	Date	Time	Vol.	Fibers (f/field)	Density (f/mm²)	Exposure (f/cc)
224054-001	**15PMG**	**Perm Perimeter G**						
			07/26/17	542 min	1730 L	<0.0550	<7.01	<0.00156
224054-002	**15PME**	**Perm Perimeter E**						
			07/26/17	536 min	1610 L	<0.0550	<7.01	<0.00168
224054-003	**15PMC**	**Perm Perimeter C**						
			07/26/17	545 min	1360 L	<0.0550	<7.01	<0.00198
224054-004	**15PMA**	**Perm Perimeter A**						
			07/26/17	550 min	1650 L	<0.0550	<7.01	<0.00163
224054-005	**16PMG**	**Perm G**						
			07/26/17	435 min	1310 L	<0.0550	<7.01	<0.00207
224054-006	**16PME**	**Perm E**						
			07/26/17	437 min	1310 L	<0.0550	<7.01	<0.00206
224054-007	**16PMA**	**Perm A**						
			07/26/17	452 min	1130 L	<0.0550	<7.01	<0.00239
224054-008	**16PMC**	**Perm C**						
			07/26/17	452 min	1270 L	<0.0550	<7.01	<0.00213



Analyst: Wilson, Jada
224054-08/02/17 04:23 PM



Reviewed By: **Hind Eldanaf**
Microscopy Supervisor

Analyst Sr

Initials	Range	Sr
JAW	5 - 20	0.215
	20.5 - 50	0.162
	50.5 - 500	0.107

Area Samples. OSHA Asbestos PEL is 0.1 f/cc for 8 hour TWA. Est. limit of detection: 7 f/mm² or 0.055 f/field. (<) refers to less than limit of detection. Results are not blank-corrected unless noted by analyst. Exposure and TWA calculations are based on client-supplied air volumes and times, and assume zero exposure for time not sampled. Analyst relative standard deviation (Sr) calculated using historical data. Calculated values are reported to three significant figures. The test results reported relate only to the samples submitted. NY Samples fall under NY Certificate #11413

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FAX # (906) 482-9799

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Project Location Hubbell, MI
Project Number B128-17462
Purchase Order No.

Special Instructions [include requests for special reporting or data packages]
Email Results to ___ bgriffin@upea.com & gallan@upea.com
Asbestos Set 5 2 of 2

Turn Around Time
[ ] 6-8 hours*
[ ] 24 hours*
[ ] 48 hours*
[X] 72 hour*
[ ] STANDARD (5 days)
[ ] Standard Full TCLP (10d)
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[ ] Oil
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[ ] Sludge
[ ] Soil
[ ] Solid
[ ] Waste
[ ] Wastewater
[ ] Water,Drinking
[ ] Compliance
[ ] Wipe
[ ] Wipe, Composite
[ ] ____
[ ] ____

Tests / Analytes (Select ALL that Apply)

Asbestos Air / Fiber Counts
[X] PCM (NIOSH 7400)
[ ] TEM (AHERA)
[ ] TEM (EPA Level II)
[ ] ____

Asbestos Bulk / Asb ID
[ ] PLM (EPA 600, 1993)
[ ] PLM (EPA Point Count)
[ ] PLM (Qualitative only)
[ ] NYELAP 198.1/.4
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[ ] TEM (Chatfield)
[ ] ____

Metals-Total Conc.
[ ] Lead
[ ] RCRA Metals
[ ] ____
[ ] ____

Miscellaneous Tests
[ ] Total Dust (NIOSH 0500)
[ ] Resp. Dust (NIOSH 0600)
[ ] Silica - FTIR (NIOSH 7602)
[ ] Silica - XRD (NIOSH 7500)
[ ] ____

FOR ASBESTOS AIR:
TYPE OF RESPIRATOR USED:

Extraction Procedures
[ ] TCLP / Lead
[ ] TCLP / RCRA Metal Profile
[ ] TCLP / FULL (w/ organics)
[ ] ____
[ ] ____

ORGANICS TESTS and other Analyses
NOTE: All samples for organics should be kept at 4°C from collection until testing. Schedule rush analyses in advance. Indicate preservatives added & media type.
Indicate ***analysis method*** for organics tests.

Sample (number)	Date Sampled	Time	Sample Identification (e.g. Employee, SSN, Bldg, Material)	Wipes: Wiped Area (ft²)	Wipes: Type[1] A,B,P,E	Air: Time[2] Start	Air: Time[2] Stop	Air: Flow Rate[3] Start	Air: Flow Rate[3] Stop	Air: Total[4] Air Vol	Organics: # containers
15PMG	7/26/2017	533	Perm Perimeter G			8:34	17:36	3.2	3.2	1,706	1
15PME	7/26/2017	525	Perm Perimeter E			8:35	17:31	3	3	1575	1
15PMC	7/26/2017	518	Perm Perimeter C			8:37	17:42	2.5	2.5	1295	1
15PMA	7/26/2017	524	Perm Perimeter A			8:36	17:46	3	3	1572	1
16PMG	7/27/2017	416	Perm G			7:44	14:59	3	3	1248	1
16PME	7/27/2017	416	Perm E			7:46	15:03	3	3	1248	1
16PMA	7/27/2017	445	Perm A			7:45	15:17	2.5	2.5	1112.5	1
16PMC	7/27/2017	440	Perm C			7:43	15:15	2.8	2.8	1,232	1

[1]Type: A=area B=blank P=personal E=excursion [2]Beginning/End of Sample Period [3]Pump Calibration in Liters/Minute [4]Volume in Liters (time in min * flow in L/min)

224054 S 8

V:\224\224054

fghraizi 8/2/2017 9:3 0:00 AM

UPS 1Z420051024 9139839

Sample Collection & Custody Information

Sampled by [NAME] Gerald Allan [SIGNATURE] [DATE/TIME] 7-30-2017
Relinquished by [NAME] [SIGNATURE] [DATE/TIME] 7/31/17
Received by [NAME] UPS [SIGNATURE] [DATE/TIME]

STATE where samples were collected: MI
[ ] Sample return requested
[ ] Ambient temp [ ] Cool ___°C [ ] pH ___ [ ] Cl ___

LAB USE ONLY

Received in Lab by Date/Time [ ] Ambient Temp. [ ] Cool
[ ]FX [ ]AB [ ]UPS [ ]USM [ ]CL [ ]LG [ ]HD [ ]DB [ ]____
Waybill# ____ [ ]R [ ]S
Unusual Sample Condition Noted:

Sample Collection & Custody Information

Chain-of-custody documentation continued internally within lab.

Sampled by [NAME] ___ [SIGNATURE] ___ [DATE/TIME] ___
Relinquished by [NAME] ___ [SIGNATURE] ___ [DATE/TIME] ___
[ ] Sample return requested [ ] **STATE from which samples were collected**

Carefully read the terms and conditions printed on the back of this form.

HUBBELL PROCESSING AREA
DUST MONITORING DATA

FILE NO. 761/16108.SAR INDEX NO. 44521
TORCH LAKE NON-SUPERFUND SITE

pDR ID: 143116
Tag Number: 02
Number of logged points: 4
Start time and date: 13:39:23 06-Jul
Elapsed time: 00:04:00
Logging period (sec): 60
Calibration Factor (%): 100
Max Display Concentration: 0.021 mg/m3
Time at maximum: 13:39:32 Jul 06
Max STEL Concentration: 0.003 mg/m3
Time at max STEL: 13:43:23 Jul 06
Overall Avg Conc: 0.009 mg/m3
Logged Data:

Point	Date	Time	Avg.(mg/m3)
1	6-Jul	13:40:23	0.014
2	6-Jul	13:41:23	0.007
3	6-Jul	13:42:23	0.008
4	6-Jul	13:43:23	0.009

pDR ID: R6464
Tag Number: 08
Number of logged points: 37
Start time and date: 07:42:41 07-Jul
Elapsed time: 09:15:00
Logging period (sec): 900
Calibration Factor (%): 100
Max Display Concentration: 1.073 mg/m3
Time at maximum: 08:24:14 Jul 07
Max STEL Concentration: 0.091 mg/m3
Time at max STEL: 08:37:11 Jul 07
Overall Avg Conc: 0.005 mg/m3
Logged Data:

Point	Date	Time	Avg.(mg/m3)
1	7-Jul	07:57:41	0
2	7-Jul	08:12:41	0
3	7-Jul	08:27:41	0.082
4	7-Jul	08:42:41	0.014
5	7-Jul	08:57:41	0.005
6	7-Jul	09:12:41	0.006
7	7-Jul	09:27:41	0.006
8	7-Jul	09:42:41	0.002
9	7-Jul	09:57:41	0.005
10	7-Jul	10:12:41	0.008
11	7-Jul	10:27:41	0.001
12	7-Jul	10:42:41	0.003
13	7-Jul	10:57:41	0.002
14	7-Jul	11:12:41	0
15	7-Jul	11:27:41	0.005
16	7-Jul	11:42:41	0.003
17	7-Jul	11:57:41	0.005
18	7-Jul	12:12:41	0
19	7-Jul	12:27:41	0.003
20	7-Jul	12:42:41	0.013
21	7-Jul	12:57:41	0.006
22	7-Jul	13:12:41	0.002
23	7-Jul	13:27:41	0.012
24	7-Jul	13:42:41	0.002
25	7-Jul	13:57:41	0.007
26	7-Jul	14:12:41	0.007
27	7-Jul	14:27:41	0.013
28	7-Jul	14:42:41	0.012
29	7-Jul	14:57:41	0.007
30	7-Jul	15:12:41	0.006
31	7-Jul	15:27:41	0.028
32	7-Jul	15:42:41	0.035
33	7-Jul	15:57:41	0.012

34	7-Jul	16:12:41	0.032
35	7-Jul	16:27:41	0.01
36	7-Jul	16:42:41	0.012
37	7-Jul	16:57:41	0.038

pDR - 143116
Tag Number: 01
Number of logged points: 277
Start time and date: 09:44:29 14-Jul
Elapsed time: 04:37:00
Logging period (sec): 60
Calibration Factor (%): 100
Max Display Concentration: 0.060 mg/m3
Time at maximum: 13:13:29 Jul 14
Max STEL Concentration: 0.019 mg/m3
Time at max STEL: 13:18:00 Jul 14
Overall Avg Conc: 0.013 mg/m3
Logged Data:

Point	Date	Time	Avg.(mg/m3)
1	14 Jul	09:45:29	0.016
2	14 Jul	09:46:29	0.017
3	14 Jul	09:47:29	0.013
4	14 Jul	09:48:29	0.012
5	14 Jul	09:49:29	0.014
6	14 Jul	09:50:29	0.013
7	14 Jul	09:51:29	0.014
8	14 Jul	09:52:29	0.013
9	14 Jul	09:53:29	0.014
10	14 Jul	09:54:29	0.015
11	14 Jul	09:55:29	0.015
12	14 Jul	09:56:29	0.015
13	14 Jul	09:57:29	0.014
14	14 Jul	09:58:29	0.016
15	14 Jul	09:59:29	0.015
16	14 Jul	10:00:29	0.016
17	14 Jul	10:01:29	0.014
18	14 Jul	10:02:29	0.015
19	14 Jul	10:03:29	0.020
20	14 Jul	10:04:29	0.015
21	14 Jul	10:05:29	0.014
22	14 Jul	10:06:29	0.017
23	14 Jul	10:07:29	0.014
24	14 Jul	10:08:29	0.017
25	14 Jul	10:09:29	0.016
26	14 Jul	10:10:29	0.013
27	14 Jul	10:11:29	0.015
28	14 Jul	10:12:29	0.014
29	14 Jul	10:13:29	0.014
30	14 Jul	10:14:29	0.017
31	14 Jul	10:15:29	0.016
32	14 Jul	10:16:29	0.009
33	14 Jul	10:17:29	0.014
34	14 Jul	10:18:29	0.014
35	14 Jul	10:19:29	0.014
36	14 Jul	10:20:29	0.017
37	14 Jul	10:21:29	0.015
38	14 Jul	10:22:29	0.017
39	14 Jul	10:23:29	0.015
40	14 Jul	10:24:29	0.015
41	14 Jul	10:25:29	0.015
42	14 Jul	10:26:29	0.016
43	14 Jul	10:27:29	0.016
44	14 Jul	10:28:29	0.018
45	14 Jul	10:29:29	0.015
46	14 Jul	10:30:29	0.014
47	14 Jul	10:31:29	0.016
48	14 Jul	10:32:29	0.014
49	14 Jul	10:33:29	0.016

50,	14	Jul,	10:34:29,	0.015
51,	14	Jul,	10:35:29,	0.015
52,	14	Jul,	10:36:29,	0.014
53,	14	Jul,	10:37:29,	0.016
54,	14	Jul,	10:38:29,	0.016
55,	14	Jul,	10:39:29,	0.015
56,	14	Jul,	10:40:29,	0.013
57,	14	Jul,	10:41:29,	0.017
58,	14	Jul,	10:42:29,	0.016
59,	14	Jul,	10:43:29,	0.015
60,	14	Jul,	10:44:29,	0.015
61,	14	Jul,	10:45:29,	0.021
62,	14	Jul,	10:46:29,	0.014
63,	14	Jul,	10:47:29,	0.018
64,	14	Jul,	10:48:29,	0.014
65,	14	Jul,	10:49:29,	0.014
66,	14	Jul,	10:50:29,	0.014
67,	14	Jul,	10:51:29,	0.015
68,	14	Jul,	10:52:29,	0.021
69,	14	Jul,	10:53:29,	0.013
70,	14	Jul,	10:54:29,	0.014
71,	14	Jul,	10:55:29,	0.016
72,	14	Jul,	10:56:29,	0.016
73,	14	Jul,	10:57:29,	0.013
74,	14	Jul,	10:58:29,	0.014
75,	14	Jul,	10:59:29,	0.013
76,	14	Jul,	11:00:29,	0.014
77,	14	Jul,	11:01:29,	0.017
78,	14	Jul,	11:02:29,	0.013
79,	14	Jul,	11:03:29,	0.013
80,	14	Jul,	11:04:29,	0.014
81,	14	Jul,	11:05:29,	0.015
82,	14	Jul,	11:06:29,	0.015
83,	14	Jul,	11:07:29,	0.014
84,	14	Jul,	11:08:29,	0.014
85,	14	Jul,	11:09:29,	0.014
86,	14	Jul,	11:10:29,	0.014
87,	14	Jul,	11:11:29,	0.014
88,	14	Jul,	11:12:29,	0.014
89,	14	Jul,	11:13:29,	0.014
90,	14	Jul,	11:14:29,	0.015
91,	14	Jul,	11:15:29,	0.015
92,	14	Jul,	11:16:29,	0.014
93,	14	Jul,	11:17:29,	0.017
94,	14	Jul,	11:18:29,	0.015
95,	14	Jul,	11:19:29,	0.014
96,	14	Jul,	11:20:29,	0.015
97,	14	Jul,	11:21:29,	0.017
98,	14	Jul,	11:22:29,	0.017
99,	14	Jul,	11:23:29,	0.015
100,	14	Jul,	11:24:29,	0.013
101,	14	Jul,	11:25:29,	0.015
102,	14	Jul,	11:26:29,	0.018
103,	14	Jul,	11:27:29,	0.013
104,	14	Jul,	11:28:29,	0.014
105,	14	Jul,	11:29:29,	0.021
106,	14	Jul,	11:30:29,	0.013
107,	14	Jul,	11:31:29,	0.015
108,	14	Jul,	11:32:29,	0.013
109,	14	Jul,	11:33:29,	0.014
110,	14	Jul,	11:34:29,	0.014
111,	14	Jul,	11:35:29,	0.012
112,	14	Jul,	11:36:29,	0.013

113, 14 Jul, 11:37:29, 0.014
114, 14 Jul, 11:38:29, 0.019
115, 14 Jul, 11:39:29, 0.017
116, 14 Jul, 11:40:29, 0.013
117, 14 Jul, 11:41:29, 0.017
118, 14 Jul, 11:42:29, 0.017
119, 14 Jul, 11:43:29, 0.024
120, 14 Jul, 11:44:29, 0.013
121, 14 Jul, 11:45:29, 0.018
122, 14 Jul, 11:46:29, 0.019
123, 14 Jul, 11:47:29, 0.014
124, 14 Jul, 11:48:29, 0.016
125, 14 Jul, 11:49:29, 0.023
126, 14 Jul, 11:50:29, 0.013
127, 14 Jul, 11:51:29, 0.007
128, 14 Jul, 11:52:29, 0.021
129, 14 Jul, 11:53:29, 0.007
130, 14 Jul, 11:54:29, 0.023
131, 14 Jul, 11:55:29, 0.012
132, 14 Jul, 11:56:29, 0.016
133, 14 Jul, 11:57:29, 0.014
134, 14 Jul, 11:58:29, 0.014
135, 14 Jul, 11:59:29, 0.020
136, 14 Jul, 12:00:29, 0.014
137, 14 Jul, 12:01:29, 0.016
138, 14 Jul, 12:02:29, 0.014
139, 14 Jul, 12:03:29, 0.015
140, 14 Jul, 12:04:29, 0.015
141, 14 Jul, 12:05:29, 0.015
142, 14 Jul, 12:06:29, 0.014
143, 14 Jul, 12:07:29, 0.013
144, 14 Jul, 12:08:29, 0.013
145, 14 Jul, 12:09:29, 0.014
146, 14 Jul, 12:10:29, 0.013
147, 14 Jul, 12:11:29, 0.016
148, 14 Jul, 12:12:29, 0.014
149, 14 Jul, 12:13:29, 0.015
150, 14 Jul, 12:14:29, 0.014
151, 14 Jul, 12:15:29, 0.015
152, 14 Jul, 12:16:29, 0.014
153, 14 Jul, 12:17:29, 0.017
154, 14 Jul, 12:18:29, 0.014
155, 14 Jul, 12:19:29, 0.017
156, 14 Jul, 12:20:29, 0.053
157, 14 Jul, 12:21:29, 0.013
158, 14 Jul, 12:22:29, 0.001
159, 14 Jul, 12:23:29, 0.012
160, 14 Jul, 12:24:29, 0.016
161, 14 Jul, 12:25:29, 0.015
162, 14 Jul, 12:26:29, 0.014
163, 14 Jul, 12:27:29, 0.018
164, 14 Jul, 12:28:29, 0.012
165, 14 Jul, 12:29:29, 0.013
166, 14 Jul, 12:30:29, 0.014
167, 14 Jul, 12:31:29, 0.018
168, 14 Jul, 12:32:29, 0.015
169, 14 Jul, 12:33:29, 0.015
170, 14 Jul, 12:34:29, 0.016
171, 14 Jul, 12:35:29, 0.014
172, 14 Jul, 12:36:29, 0.014
173, 14 Jul, 12:37:29, 0.013
174, 14 Jul, 12:38:29, 0.013
175, 14 Jul, 12:39:29, 0.018

176, 14 Jul, 12:40:29, 0.015
177, 14 Jul, 12:41:29, 0.017
178, 14 Jul, 12:42:29, 0.013
179, 14 Jul, 12:43:29, 0.014
180, 14 Jul, 12:44:29, 0.014
181, 14 Jul, 12:45:29, 0.013
182, 14 Jul, 12:46:29, 0.014
183, 14 Jul, 12:47:29, 0.013
184, 14 Jul, 12:48:29, 0.014
185, 14 Jul, 12:49:29, 0.014
186, 14 Jul, 12:50:29, 0.014
187, 14 Jul, 12:51:29, 0.015
188, 14 Jul, 12:52:29, 0.014
189, 14 Jul, 12:53:29, 0.013
190, 14 Jul, 12:54:29, 0.026
191, 14 Jul, 12:55:29, 0.016
192, 14 Jul, 12:56:29, 0.015
193, 14 Jul, 12:57:29, 0.013
194, 14 Jul, 12:58:29, 0.014
195, 14 Jul, 12:59:29, 0.014
196, 14 Jul, 13:00:29, 0.015
197, 14 Jul, 13:01:29, 0.016
198, 14 Jul, 13:02:29, 0.015
199, 14 Jul, 13:03:29, 0.013
200, 14 Jul, 13:04:29, 0.015
201, 14 Jul, 13:05:29, 0.014
202, 14 Jul, 13:06:29, 0.015
203, 14 Jul, 13:07:29, 0.013
204, 14 Jul, 13:08:29, 0.015
205, 14 Jul, 13:09:29, 0.015
206, 14 Jul, 13:10:29, 0.014
207, 14 Jul, 13:11:29, 0.013
208, 14 Jul, 13:12:29, 0.014
209, 14 Jul, 13:13:29, 0.059
210, 14 Jul, 13:14:29, 0.014
211, 14 Jul, 13:15:29, 0.016
212, 14 Jul, 13:16:29, 0.019
213, 14 Jul, 13:17:29, 0.016
214, 14 Jul, 13:18:29, 0.027
215, 14 Jul, 13:19:29, 0.024
216, 14 Jul, 13:20:29, 0.016
217, 14 Jul, 13:21:29, 0.014
218, 14 Jul, 13:22:29, 0.017
219, 14 Jul, 13:23:29, 0.014
220, 14 Jul, 13:24:29, 0.013
221, 14 Jul, 13:25:29, 0.016
222, 14 Jul, 13:26:29, 0.012
223, 14 Jul, 13:27:29, 0.014
224, 14 Jul, 13:28:29, 0.020
225, 14 Jul, 13:29:29, 0.014
226, 14 Jul, 13:30:29, 0.015
227, 14 Jul, 13:31:29, 0.016
228, 14 Jul, 13:32:29, 0.016
229, 14 Jul, 13:33:29, 0.014
230, 14 Jul, 13:34:29, 0.014
231, 14 Jul, 13:35:29, 0.013
232, 14 Jul, 13:36:29, 0.014
233, 14 Jul, 13:37:29, 0.015
234, 14 Jul, 13:38:29, 0.013
235, 14 Jul, 13:39:29, 0.014
236, 14 Jul, 13:40:29, 0.014
237, 14 Jul, 13:41:29, 0.014
238, 14 Jul, 13:42:29, 0.014

239, 14 Jul, 13:43:29, 0.015
240, 14 Jul, 13:44:29, 0.014
241, 14 Jul, 13:45:29, 0.016
242, 14 Jul, 13:46:29, 0.017
243, 14 Jul, 13:47:29, 0.014
244, 14 Jul, 13:48:29, 0.013
245, 14 Jul, 13:49:29, 0.014
246, 14 Jul, 13:50:29, 0.015
247, 14 Jul, 13:51:29, 0.017
248, 14 Jul, 13:52:29, 0.015
249, 14 Jul, 13:53:29, 0.015
250, 14 Jul, 13:54:29, 0.015
251, 14 Jul, 13:55:29, 0.016
252, 14 Jul, 13:56:29, 0.013
253, 14 Jul, 13:57:29, 0.015
254, 14 Jul, 13:58:29, 0.013
255, 14 Jul, 13:59:29, 0.015
256, 14 Jul, 14:00:29, 0.023
257, 14 Jul, 14:01:29, 0.013
258, 14 Jul, 14:02:29, 0.016
259, 14 Jul, 14:03:29, 0.014
260, 14 Jul, 14:04:29, 0.014
261, 14 Jul, 14:05:29, 0.021
262, 14 Jul, 14:06:29, 0.017
263, 14 Jul, 14:07:29, 0.017
264, 14 Jul, 14:08:29, 0.014
265, 14 Jul, 14:09:29, 0.015
266, 14 Jul, 14:10:29, 0.015
267, 14 Jul, 14:11:29, 0.025
268, 14 Jul, 14:12:29, 0.019
269, 14 Jul, 14:13:29, 0.014
270, 14 Jul, 14:14:29, 0.026
271, 14 Jul, 14:15:29, 0.026
272, 14 Jul, 14:16:29, 0.016
273, 14 Jul, 14:17:29, 0.014
274, 14 Jul, 14:18:29, 0.013
275, 14 Jul, 14:19:29, 0.014
276, 14 Jul, 14:20:29, 0.014
277, 14 Jul, 14:21:29, 0.017

pDR ID: 143116
Tag Number: 01
Number of logged points: 277
Start time and date: 09:44:29 14-Jul
Elapsed time: 04:37:00
Logging period (sec): 60
Calibration Factor (%): 100
Max Display Concentration: 0.060 mg/m3
Time at maximum: 13:13:29 Jul 14
Max STEL Concentration: 0.019 mg/m3
Time at max STEL: 13:18:00 Jul 14
Overall Avg Conc: 0.013 mg/m3
Logged Data:

Point	Date	Time	Avg.(mg/m3)
1	14 Jul	09:45:29	0.016
2	14 Jul	09:46:29	0.017
3	14 Jul	09:47:29	0.013
4	14 Jul	09:48:29	0.012
5	14 Jul	09:49:29	0.014
6	14 Jul	09:50:29	0.013
7	14 Jul	09:51:29	0.014
8	14 Jul	09:52:29	0.013
9	14 Jul	09:53:29	0.014
10	14 Jul	09:54:29	0.015
11	14 Jul	09:55:29	0.015
12	14 Jul	09:56:29	0.015
13	14 Jul	09:57:29	0.014
14	14 Jul	09:58:29	0.016
15	14 Jul	09:59:29	0.015
16	14 Jul	10:00:29	0.016
17	14 Jul	10:01:29	0.014
18	14 Jul	10:02:29	0.015
19	14 Jul	10:03:29	0.020
20	14 Jul	10:04:29	0.015
21	14 Jul	10:05:29	0.014
22	14 Jul	10:06:29	0.017
23	14 Jul	10:07:29	0.014
24	14 Jul	10:08:29	0.017
25	14 Jul	10:09:29	0.016
26	14 Jul	10:10:29	0.013
27	14 Jul	10:11:29	0.015
28	14 Jul	10:12:29	0.014
29	14 Jul	10:13:29	0.014
30	14 Jul	10:14:29	0.017
31	14 Jul	10:15:29	0.016
32	14 Jul	10:16:29	0.009
33	14 Jul	10:17:29	0.014
34	14 Jul	10:18:29	0.014
35	14 Jul	10:19:29	0.014
36	14 Jul	10:20:29	0.017
37	14 Jul	10:21:29	0.015
38	14 Jul	10:22:29	0.017
39	14 Jul	10:23:29	0.015
40	14 Jul	10:24:29	0.015
41	14 Jul	10:25:29	0.015
42	14 Jul	10:26:29	0.016
43	14 Jul	10:27:29	0.016
44	14 Jul	10:28:29	0.018
45	14 Jul	10:29:29	0.015
46	14 Jul	10:30:29	0.014
47	14 Jul	10:31:29	0.016
48	14 Jul	10:32:29	0.014
49	14 Jul	10:33:29	0.016

```
 50, 14 Jul, 10:34:29,  0.015
 51, 14 Jul, 10:35:29,  0.015
 52, 14 Jul, 10:36:29,  0.014
 53, 14 Jul, 10:37:29,  0.016
 54, 14 Jul, 10:38:29,  0.016
 55, 14 Jul, 10:39:29,  0.015
 56, 14 Jul, 10:40:29,  0.013
 57, 14 Jul, 10:41:29,  0.017
 58, 14 Jul, 10:42:29,  0.016
 59, 14 Jul, 10:43:29,  0.015
 60, 14 Jul, 10:44:29,  0.015
 61, 14 Jul, 10:45:29,  0.021
 62, 14 Jul, 10:46:29,  0.014
 63, 14 Jul, 10:47:29,  0.018
 64, 14 Jul, 10:48:29,  0.014
 65, 14 Jul, 10:49:29,  0.014
 66, 14 Jul, 10:50:29,  0.014
 67, 14 Jul, 10:51:29,  0.015
 68, 14 Jul, 10:52:29,  0.021
 69, 14 Jul, 10:53:29,  0.013
 70, 14 Jul, 10:54:29,  0.014
 71, 14 Jul, 10:55:29,  0.016
 72, 14 Jul, 10:56:29,  0.016
 73, 14 Jul, 10:57:29,  0.013
 74, 14 Jul, 10:58:29,  0.014
 75, 14 Jul, 10:59:29,  0.013
 76, 14 Jul, 11:00:29,  0.014
 77, 14 Jul, 11:01:29,  0.017
 78, 14 Jul, 11:02:29,  0.013
 79, 14 Jul, 11:03:29,  0.013
 80, 14 Jul, 11:04:29,  0.014
 81, 14 Jul, 11:05:29,  0.015
 82, 14 Jul, 11:06:29,  0.015
 83, 14 Jul, 11:07:29,  0.014
 84, 14 Jul, 11:08:29,  0.014
 85, 14 Jul, 11:09:29,  0.014
 86, 14 Jul, 11:10:29,  0.014
 87, 14 Jul, 11:11:29,  0.014
 88, 14 Jul, 11:12:29,  0.014
 89, 14 Jul, 11:13:29,  0.014
 90, 14 Jul, 11:14:29,  0.015
 91, 14 Jul, 11:15:29,  0.015
 92, 14 Jul, 11:16:29,  0.014
 93, 14 Jul, 11:17:29,  0.017
 94, 14 Jul, 11:18:29,  0.015
 95, 14 Jul, 11:19:29,  0.014
 96, 14 Jul, 11:20:29,  0.015
 97, 14 Jul, 11:21:29,  0.017
 98, 14 Jul, 11:22:29,  0.017
 99, 14 Jul, 11:23:29,  0.015
100, 14 Jul, 11:24:29,  0.013
101, 14 Jul, 11:25:29,  0.015
102, 14 Jul, 11:26:29,  0.018
103, 14 Jul, 11:27:29,  0.013
104, 14 Jul, 11:28:29,  0.014
105, 14 Jul, 11:29:29,  0.021
106, 14 Jul, 11:30:29,  0.013
107, 14 Jul, 11:31:29,  0.015
108, 14 Jul, 11:32:29,  0.013
109, 14 Jul, 11:33:29,  0.014
110, 14 Jul, 11:34:29,  0.014
111, 14 Jul, 11:35:29,  0.012
112, 14 Jul, 11:36:29,  0.013
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113, 14 Jul, 11:37:29, 0.014
114, 14 Jul, 11:38:29, 0.019
115, 14 Jul, 11:39:29, 0.017
116, 14 Jul, 11:40:29, 0.013
117, 14 Jul, 11:41:29, 0.017
118, 14 Jul, 11:42:29, 0.017
119, 14 Jul, 11:43:29, 0.024
120, 14 Jul, 11:44:29, 0.013
121, 14 Jul, 11:45:29, 0.018
122, 14 Jul, 11:46:29, 0.019
123, 14 Jul, 11:47:29, 0.014
124, 14 Jul, 11:48:29, 0.016
125, 14 Jul, 11:49:29, 0.023
126, 14 Jul, 11:50:29, 0.013
127, 14 Jul, 11:51:29, 0.007
128, 14 Jul, 11:52:29, 0.021
129, 14 Jul, 11:53:29, 0.007
130, 14 Jul, 11:54:29, 0.023
131, 14 Jul, 11:55:29, 0.012
132, 14 Jul, 11:56:29, 0.016
133, 14 Jul, 11:57:29, 0.014
134, 14 Jul, 11:58:29, 0.014
135, 14 Jul, 11:59:29, 0.020
136, 14 Jul, 12:00:29, 0.014
137, 14 Jul, 12:01:29, 0.016
138, 14 Jul, 12:02:29, 0.014
139, 14 Jul, 12:03:29, 0.015
140, 14 Jul, 12:04:29, 0.015
141, 14 Jul, 12:05:29, 0.015
142, 14 Jul, 12:06:29, 0.014
143, 14 Jul, 12:07:29, 0.013
144, 14 Jul, 12:08:29, 0.013
145, 14 Jul, 12:09:29, 0.014
146, 14 Jul, 12:10:29, 0.013
147, 14 Jul, 12:11:29, 0.016
148, 14 Jul, 12:12:29, 0.014
149, 14 Jul, 12:13:29, 0.015
150, 14 Jul, 12:14:29, 0.014
151, 14 Jul, 12:15:29, 0.015
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153, 14 Jul, 12:17:29, 0.017
154, 14 Jul, 12:18:29, 0.014
155, 14 Jul, 12:19:29, 0.017
156, 14 Jul, 12:20:29, 0.053
157, 14 Jul, 12:21:29, 0.013
158, 14 Jul, 12:22:29, 0.001
159, 14 Jul, 12:23:29, 0.012
160, 14 Jul, 12:24:29, 0.016
161, 14 Jul, 12:25:29, 0.015
162, 14 Jul, 12:26:29, 0.014
163, 14 Jul, 12:27:29, 0.018
164, 14 Jul, 12:28:29, 0.012
165, 14 Jul, 12:29:29, 0.013
166, 14 Jul, 12:30:29, 0.014
167, 14 Jul, 12:31:29, 0.018
168, 14 Jul, 12:32:29, 0.015
169, 14 Jul, 12:33:29, 0.015
170, 14 Jul, 12:34:29, 0.016
171, 14 Jul, 12:35:29, 0.014
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173, 14 Jul, 12:37:29, 0.013
174, 14 Jul, 12:38:29, 0.013
175, 14 Jul, 12:39:29, 0.018

176, 14 Jul, 12:40:29, 0.015
177, 14 Jul, 12:41:29, 0.017
178, 14 Jul, 12:42:29, 0.013
179, 14 Jul, 12:43:29, 0.014
180, 14 Jul, 12:44:29, 0.014
181, 14 Jul, 12:45:29, 0.013
182, 14 Jul, 12:46:29, 0.014
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195, 14 Jul, 12:59:29, 0.014
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197, 14 Jul, 13:01:29, 0.016
198, 14 Jul, 13:02:29, 0.015
199, 14 Jul, 13:03:29, 0.013
200, 14 Jul, 13:04:29, 0.015
201, 14 Jul, 13:05:29, 0.014
202, 14 Jul, 13:06:29, 0.015
203, 14 Jul, 13:07:29, 0.013
204, 14 Jul, 13:08:29, 0.015
205, 14 Jul, 13:09:29, 0.015
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208, 14 Jul, 13:12:29, 0.014
209, 14 Jul, 13:13:29, 0.059
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213, 14 Jul, 13:17:29, 0.016
214, 14 Jul, 13:18:29, 0.027
215, 14 Jul, 13:19:29, 0.024
216, 14 Jul, 13:20:29, 0.016
217, 14 Jul, 13:21:29, 0.014
218, 14 Jul, 13:22:29, 0.017
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220, 14 Jul, 13:24:29, 0.013
221, 14 Jul, 13:25:29, 0.016
222, 14 Jul, 13:26:29, 0.012
223, 14 Jul, 13:27:29, 0.014
224, 14 Jul, 13:28:29, 0.020
225, 14 Jul, 13:29:29, 0.014
226, 14 Jul, 13:30:29, 0.015
227, 14 Jul, 13:31:29, 0.016
228, 14 Jul, 13:32:29, 0.016
229, 14 Jul, 13:33:29, 0.014
230, 14 Jul, 13:34:29, 0.014
231, 14 Jul, 13:35:29, 0.013
232, 14 Jul, 13:36:29, 0.014
233, 14 Jul, 13:37:29, 0.015
234, 14 Jul, 13:38:29, 0.013
235, 14 Jul, 13:39:29, 0.014
236, 14 Jul, 13:40:29, 0.014
237, 14 Jul, 13:41:29, 0.014
238, 14 Jul, 13:42:29, 0.014

239, 14 Jul, 13:43:29, 0.015
240, 14 Jul, 13:44:29, 0.014
241, 14 Jul, 13:45:29, 0.016
242, 14 Jul, 13:46:29, 0.017
243, 14 Jul, 13:47:29, 0.014
244, 14 Jul, 13:48:29, 0.013
245, 14 Jul, 13:49:29, 0.014
246, 14 Jul, 13:50:29, 0.015
247, 14 Jul, 13:51:29, 0.017
248, 14 Jul, 13:52:29, 0.015
249, 14 Jul, 13:53:29, 0.015
250, 14 Jul, 13:54:29, 0.015
251, 14 Jul, 13:55:29, 0.016
252, 14 Jul, 13:56:29, 0.013
253, 14 Jul, 13:57:29, 0.015
254, 14 Jul, 13:58:29, 0.013
255, 14 Jul, 13:59:29, 0.015
256, 14 Jul, 14:00:29, 0.023
257, 14 Jul, 14:01:29, 0.013
258, 14 Jul, 14:02:29, 0.016
259, 14 Jul, 14:03:29, 0.014
260, 14 Jul, 14:04:29, 0.014
261, 14 Jul, 14:05:29, 0.021
262, 14 Jul, 14:06:29, 0.017
263, 14 Jul, 14:07:29, 0.017
264, 14 Jul, 14:08:29, 0.014
265, 14 Jul, 14:09:29, 0.015
266, 14 Jul, 14:10:29, 0.015
267, 14 Jul, 14:11:29, 0.025
268, 14 Jul, 14:12:29, 0.019
269, 14 Jul, 14:13:29, 0.014
270, 14 Jul, 14:14:29, 0.026
271, 14 Jul, 14:15:29, 0.026
272, 14 Jul, 14:16:29, 0.016
273, 14 Jul, 14:17:29, 0.014
274, 14 Jul, 14:18:29, 0.013
275, 14 Jul, 14:19:29, 0.014
276, 14 Jul, 14:20:29, 0.014
277, 14 Jul, 14:21:29, 0.017

pDR ID: 143116
Tag Number: 08
Number of logged points: 37
Start time and date: 07:42:41 07-Jul
Elapsed time: 09:15:00
Logging period (sec): 900
Calibration Factor (%): 100
Max Display Concentration: 1.073 mg/m3
Time at maximum: 08:24:14 Jul 07
Max STEL Concentration: 0.091 mg/m3
Time at max STEL: 08:37:11 Jul 07
Overall Avg Conc: 0.005 mg/m3
Logged Data:

Point	Date	Time	Avg.(mg/m3)
1	07 Jul	07:57:41	0.000
2	07 Jul	08:12:41	0.000
3	07 Jul	08:27:41	0.082
4	07 Jul	08:42:41	0.014
5	07 Jul	08:57:41	0.005
6	07 Jul	09:12:41	0.006
7	07 Jul	09:27:41	0.006
8	07 Jul	09:42:41	0.002
9	07 Jul	09:57:41	0.005
10	07 Jul	10:12:41	0.008
11	07 Jul	10:27:41	0.001
12	07 Jul	10:42:41	0.003
13	07 Jul	10:57:41	0.002
14	07 Jul	11:12:41	0.000
15	07 Jul	11:27:41	0.005
16	07 Jul	11:42:41	0.003
17	07 Jul	11:57:41	0.005
18	07 Jul	12:12:41	0.000
19	07 Jul	12:27:41	0.003
20	07 Jul	12:42:41	0.013
21	07 Jul	12:57:41	0.006
22	07 Jul	13:12:41	0.002
23	07 Jul	13:27:41	0.012
24	07 Jul	13:42:41	0.002
25	07 Jul	13:57:41	0.007
26	07 Jul	14:12:41	0.007
27	07 Jul	14:27:41	0.013
28	07 Jul	14:42:41	0.012
29	07 Jul	14:57:41	0.007
30	07 Jul	15:12:41	0.006
31	07 Jul	15:27:41	0.028
32	07 Jul	15:42:41	0.035
33	07 Jul	15:57:41	0.012
34	07 Jul	16:12:41	0.032
35	07 Jul	16:27:41	0.010
36	07 Jul	16:42:41	0.012
37	07 Jul	16:57:41	0.038

pDR ID: 143116
Tag Number: 01
Number of logged points: 277
Start time and date: 09:44:29 14-Jul
Elapsed time: 04:37:00
Logging period (sec): 60
Calibration Factor (%): 100
Max Display Concentration: 0.060 mg/m3
Time at maximum: 13:13:29 Jul 14
Max STEL Concentration: 0.019 mg/m3
Time at max STEL: 13:18:00 Jul 14
Overall Avg Conc: 0.013 mg/m3
Logged Data:

Point	Date	Time	Avg.(mg/m3)
1	14-Jul	09:45:29	0.016
2	14-Jul	09:46:29	0.017
3	14-Jul	09:47:29	0.013
4	14-Jul	09:48:29	0.012
5	14-Jul	09:49:29	0.014
6	14-Jul	09:50:29	0.013
7	14-Jul	09:51:29	0.014
8	14-Jul	09:52:29	0.013
9	14-Jul	09:53:29	0.014
10	14-Jul	09:54:29	0.015
11	14-Jul	09:55:29	0.015
12	14-Jul	09:56:29	0.015
13	14-Jul	09:57:29	0.014
14	14-Jul	09:58:29	0.016
15	14-Jul	09:59:29	0.015
16	14-Jul	10:00:29	0.016
17	14-Jul	10:01:29	0.014
18	14-Jul	10:02:29	0.015
19	14-Jul	10:03:29	0.02
20	14-Jul	10:04:29	0.015
21	14-Jul	10:05:29	0.014
22	14-Jul	10:06:29	0.017
23	14-Jul	10:07:29	0.014
24	14-Jul	10:08:29	0.017
25	14-Jul	10:09:29	0.016
26	14-Jul	10:10:29	0.013
27	14-Jul	10:11:29	0.015
28	14-Jul	10:12:29	0.014
29	14-Jul	10:13:29	0.014
30	14-Jul	10:14:29	0.017
31	14-Jul	10:15:29	0.016
32	14-Jul	10:16:29	0.009
33	14-Jul	10:17:29	0.014

34	14-Jul	10:18:29	0.014
35	14-Jul	10:19:29	0.014
36	14-Jul	10:20:29	0.017
37	14-Jul	10:21:29	0.015
38	14-Jul	10:22:29	0.017
39	14-Jul	10:23:29	0.015
40	14-Jul	10:24:29	0.015
41	14-Jul	10:25:29	0.015
42	14-Jul	10:26:29	0.016
43	14-Jul	10:27:29	0.016
44	14-Jul	10:28:29	0.018
45	14-Jul	10:29:29	0.015
46	14-Jul	10:30:29	0.014
47	14-Jul	10:31:29	0.016
48	14-Jul	10:32:29	0.014
49	14-Jul	10:33:29	0.016
50	14-Jul	10:34:29	0.015
51	14-Jul	10:35:29	0.015
52	14-Jul	10:36:29	0.014
53	14-Jul	10:37:29	0.016
54	14-Jul	10:38:29	0.016
55	14-Jul	10:39:29	0.015
56	14-Jul	10:40:29	0.013
57	14-Jul	10:41:29	0.017
58	14-Jul	10:42:29	0.016
59	14-Jul	10:43:29	0.015
60	14-Jul	10:44:29	0.015
61	14-Jul	10:45:29	0.021
62	14-Jul	10:46:29	0.014
63	14-Jul	10:47:29	0.018
64	14-Jul	10:48:29	0.014
65	14-Jul	10:49:29	0.014
66	14-Jul	10:50:29	0.014
67	14-Jul	10:51:29	0.015
68	14-Jul	10:52:29	0.021
69	14-Jul	10:53:29	0.013
70	14-Jul	10:54:29	0.014
71	14-Jul	10:55:29	0.016
72	14-Jul	10:56:29	0.016
73	14-Jul	10:57:29	0.013
74	14-Jul	10:58:29	0.014
75	14-Jul	10:59:29	0.013
76	14-Jul	11:00:29	0.014
77	14-Jul	11:01:29	0.017
78	14-Jul	11:02:29	0.013
79	14-Jul	11:03:29	0.013
80	14-Jul	11:04:29	0.014

81	14-Jul	11:05:29	0.015
82	14-Jul	11:06:29	0.015
83	14-Jul	11:07:29	0.014
84	14-Jul	11:08:29	0.014
85	14-Jul	11:09:29	0.014
86	14-Jul	11:10:29	0.014
87	14-Jul	11:11:29	0.014
88	14-Jul	11:12:29	0.014
89	14-Jul	11:13:29	0.014
90	14-Jul	11:14:29	0.015
91	14-Jul	11:15:29	0.015
92	14-Jul	11:16:29	0.014
93	14-Jul	11:17:29	0.017
94	14-Jul	11:18:29	0.015
95	14-Jul	11:19:29	0.014
96	14-Jul	11:20:29	0.015
97	14-Jul	11:21:29	0.017
98	14-Jul	11:22:29	0.017
99	14-Jul	11:23:29	0.015
100	14-Jul	11:24:29	0.013
101	14-Jul	11:25:29	0.015
102	14-Jul	11:26:29	0.018
103	14-Jul	11:27:29	0.013
104	14-Jul	11:28:29	0.014
105	14-Jul	11:29:29	0.021
106	14-Jul	11:30:29	0.013
107	14-Jul	11:31:29	0.015
108	14-Jul	11:32:29	0.013
109	14-Jul	11:33:29	0.014
110	14-Jul	11:34:29	0.014
111	14-Jul	11:35:29	0.012
112	14-Jul	11:36:29	0.013
113	14-Jul	11:37:29	0.014
114	14-Jul	11:38:29	0.019
115	14-Jul	11:39:29	0.017
116	14-Jul	11:40:29	0.013
117	14-Jul	11:41:29	0.017
118	14-Jul	11:42:29	0.017
119	14-Jul	11:43:29	0.024
120	14-Jul	11:44:29	0.013
121	14-Jul	11:45:29	0.018
122	14-Jul	11:46:29	0.019
123	14-Jul	11:47:29	0.014
124	14-Jul	11:48:29	0.016
125	14-Jul	11:49:29	0.023
126	14-Jul	11:50:29	0.013
127	14-Jul	11:51:29	0.007

128	14-Jul	11:52:29	0.021
129	14-Jul	11:53:29	0.007
130	14-Jul	11:54:29	0.023
131	14-Jul	11:55:29	0.012
132	14-Jul	11:56:29	0.016
133	14-Jul	11:57:29	0.014
134	14-Jul	11:58:29	0.014
135	14-Jul	11:59:29	0.02
136	14-Jul	12:00:29	0.014
137	14-Jul	12:01:29	0.016
138	14-Jul	12:02:29	0.014
139	14-Jul	12:03:29	0.015
140	14-Jul	12:04:29	0.015
141	14-Jul	12:05:29	0.015
142	14-Jul	12:06:29	0.014
143	14-Jul	12:07:29	0.013
144	14-Jul	12:08:29	0.013
145	14-Jul	12:09:29	0.014
146	14-Jul	12:10:29	0.013
147	14-Jul	12:11:29	0.016
148	14-Jul	12:12:29	0.014
149	14-Jul	12:13:29	0.015
150	14-Jul	12:14:29	0.014
151	14-Jul	12:15:29	0.015
152	14-Jul	12:16:29	0.014
153	14-Jul	12:17:29	0.017
154	14-Jul	12:18:29	0.014
155	14-Jul	12:19:29	0.017
156	14-Jul	12:20:29	0.053
157	14-Jul	12:21:29	0.013
158	14-Jul	12:22:29	0.001
159	14-Jul	12:23:29	0.012
160	14-Jul	12:24:29	0.016
161	14-Jul	12:25:29	0.015
162	14-Jul	12:26:29	0.014
163	14-Jul	12:27:29	0.018
164	14-Jul	12:28:29	0.012
165	14-Jul	12:29:29	0.013
166	14-Jul	12:30:29	0.014
167	14-Jul	12:31:29	0.018
168	14-Jul	12:32:29	0.015
169	14-Jul	12:33:29	0.015
170	14-Jul	12:34:29	0.016
171	14-Jul	12:35:29	0.014
172	14-Jul	12:36:29	0.014
173	14-Jul	12:37:29	0.013
174	14-Jul	12:38:29	0.013

175	14-Jul	12:39:29	0.018
176	14-Jul	12:40:29	0.015
177	14-Jul	12:41:29	0.017
178	14-Jul	12:42:29	0.013
179	14-Jul	12:43:29	0.014
180	14-Jul	12:44:29	0.014
181	14-Jul	12:45:29	0.013
182	14-Jul	12:46:29	0.014
183	14-Jul	12:47:29	0.013
184	14-Jul	12:48:29	0.014
185	14-Jul	12:49:29	0.014
186	14-Jul	12:50:29	0.014
187	14-Jul	12:51:29	0.015
188	14-Jul	12:52:29	0.014
189	14-Jul	12:53:29	0.013
190	14-Jul	12:54:29	0.026
191	14-Jul	12:55:29	0.016
192	14-Jul	12:56:29	0.015
193	14-Jul	12:57:29	0.013
194	14-Jul	12:58:29	0.014
195	14-Jul	12:59:29	0.014
196	14-Jul	13:00:29	0.015
197	14-Jul	13:01:29	0.016
198	14-Jul	13:02:29	0.015
199	14-Jul	13:03:29	0.013
200	14-Jul	13:04:29	0.015
201	14-Jul	13:05:29	0.014
202	14-Jul	13:06:29	0.015
203	14-Jul	13:07:29	0.013
204	14-Jul	13:08:29	0.015
205	14-Jul	13:09:29	0.015
206	14-Jul	13:10:29	0.014
207	14-Jul	13:11:29	0.013
208	14-Jul	13:12:29	0.014
209	14-Jul	13:13:29	0.059
210	14-Jul	13:14:29	0.014
211	14-Jul	13:15:29	0.016
212	14-Jul	13:16:29	0.019
213	14-Jul	13:17:29	0.016
214	14-Jul	13:18:29	0.027
215	14-Jul	13:19:29	0.024
216	14-Jul	13:20:29	0.016
217	14-Jul	13:21:29	0.014
218	14-Jul	13:22:29	0.017
219	14-Jul	13:23:29	0.014
220	14-Jul	13:24:29	0.013
221	14-Jul	13:25:29	0.016

222	14-Jul	13:26:29	0.012
223	14-Jul	13:27:29	0.014
224	14-Jul	13:28:29	0.02
225	14-Jul	13:29:29	0.014
226	14-Jul	13:30:29	0.015
227	14-Jul	13:31:29	0.016
228	14-Jul	13:32:29	0.016
229	14-Jul	13:33:29	0.014
230	14-Jul	13:34:29	0.014
231	14-Jul	13:35:29	0.013
232	14-Jul	13:36:29	0.014
233	14-Jul	13:37:29	0.015
234	14-Jul	13:38:29	0.013
235	14-Jul	13:39:29	0.014
236	14-Jul	13:40:29	0.014
237	14-Jul	13:41:29	0.014
238	14-Jul	13:42:29	0.014
239	14-Jul	13:43:29	0.015
240	14-Jul	13:44:29	0.014
241	14-Jul	13:45:29	0.016
242	14-Jul	13:46:29	0.017
243	14-Jul	13:47:29	0.014
244	14-Jul	13:48:29	0.013
245	14-Jul	13:49:29	0.014
246	14-Jul	13:50:29	0.015
247	14-Jul	13:51:29	0.017
248	14-Jul	13:52:29	0.015
249	14-Jul	13:53:29	0.015
250	14-Jul	13:54:29	0.015
251	14-Jul	13:55:29	0.016
252	14-Jul	13:56:29	0.013
253	14-Jul	13:57:29	0.015
254	14-Jul	13:58:29	0.013
255	14-Jul	13:59:29	0.015
256	14-Jul	14:00:29	0.023
257	14-Jul	14:01:29	0.013
258	14-Jul	14:02:29	0.016
259	14-Jul	14:03:29	0.014
260	14-Jul	14:04:29	0.014
261	14-Jul	14:05:29	0.021
262	14-Jul	14:06:29	0.017
263	14-Jul	14:07:29	0.017
264	14-Jul	14:08:29	0.014
265	14-Jul	14:09:29	0.015
266	14-Jul	14:10:29	0.015
267	14-Jul	14:11:29	0.025
268	14-Jul	14:12:29	0.019

269	14-Jul	14:13:29	0.014
270	14-Jul	14:14:29	0.026
271	14-Jul	14:15:29	0.026
272	14-Jul	14:16:29	0.016
273	14-Jul	14:17:29	0.014
274	14-Jul	14:18:29	0.013
275	14-Jul	14:19:29	0.014
276	14-Jul	14:20:29	0.014
277	14-Jul	14:21:29	0.017

pDR - 143116
Tag Number: 03
Number of logged points: 39
Start time and date: 13:30:26 19-Jul
Elapsed time: 00:39:00
Logging period (sec): 60
Calibration Factor (%): 100
Max Display Concentration: 0.087 mg/m3
Time at maximum: 13:58:03 Jul 19
Max STEL Concentration: 0.059 mg/m3
Time at max STEL: 13:58:56 Jul 19
Overall Avg Conc: 0.056 mg/m3
Logged Data:

Point	Date	Time	Avg.(mg/m3)
1	19 Jul	13:31:26	0.047
2	19 Jul	13:32:26	0.060
3	19 Jul	13:33:26	0.056
4	19 Jul	13:34:26	0.051
5	19 Jul	13:35:26	0.055
6	19 Jul	13:36:26	0.053
7	19 Jul	13:37:26	0.051
8	19 Jul	13:38:26	0.053
9	19 Jul	13:39:26	0.054
10	19 Jul	13:40:26	0.046
11	19 Jul	13:41:26	0.046
12	19 Jul	13:42:26	0.053
13	19 Jul	13:43:26	0.054
14	19 Jul	13:44:26	0.051
15	19 Jul	13:45:26	0.081
16	19 Jul	13:46:26	0.063
17	19 Jul	13:47:26	0.056
18	19 Jul	13:48:26	0.049
19	19 Jul	13:49:26	0.057
20	19 Jul	13:50:26	0.053
21	19 Jul	13:51:26	0.049
22	19 Jul	13:52:26	0.052
23	19 Jul	13:53:26	0.048
24	19 Jul	13:54:26	0.059
25	19 Jul	13:55:26	0.055
26	19 Jul	13:56:26	0.059
27	19 Jul	13:57:26	0.081
28	19 Jul	13:58:26	0.060
29	19 Jul	13:59:26	0.053
30	19 Jul	14:00:26	0.052
31	19 Jul	14:01:26	0.051
32	19 Jul	14:02:26	0.053
33	19 Jul	14:03:26	0.055
34	19 Jul	14:04:26	0.055
35	19 Jul	14:05:26	0.066
36	19 Jul	14:06:26	0.059
37	19 Jul	14:07:26	0.057
38	19 Jul	14:08:26	0.059
39	19 Jul	14:09:26	0.062

pDR - 143116
Tag Number: 04
Number of logged points: 124
Start time and date: 14:09:37 19-Jul
Elapsed time: 02:04:00
Logging period (sec): 60
Calibration Factor (%): 100
Max Display Concentration: 0.097 mg/m3
Time at maximum: 14:42:17 Jul 19
Max STEL Concentration: 0.064 mg/m3
Time at max STEL: 16:01:37 Jul 19
Overall Avg Conc: 0.059 mg/m3
Logged Data:

Point	Date	Time	Avg.(mg/m3)
1	19 Jul	14:10:37	0.065
2	19 Jul	14:11:37	0.059
3	19 Jul	14:12:37	0.054
4	19 Jul	14:13:37	0.056
5	19 Jul	14:14:37	0.058
6	19 Jul	14:15:37	0.054
7	19 Jul	14:16:37	0.056
8	19 Jul	14:17:37	0.059
9	19 Jul	14:18:37	0.060
10	19 Jul	14:19:37	0.054
11	19 Jul	14:20:37	0.051
12	19 Jul	14:21:37	0.059
13	19 Jul	14:22:37	0.059
14	19 Jul	14:23:37	0.053
15	19 Jul	14:24:37	0.057
16	19 Jul	14:25:37	0.055
17	19 Jul	14:26:37	0.054
18	19 Jul	14:27:37	0.055
19	19 Jul	14:28:37	0.056
20	19 Jul	14:29:37	0.058
21	19 Jul	14:30:37	0.052
22	19 Jul	14:31:37	0.052
23	19 Jul	14:32:37	0.056
24	19 Jul	14:33:37	0.054
25	19 Jul	14:34:37	0.050
26	19 Jul	14:35:37	0.056
27	19 Jul	14:36:37	0.056
28	19 Jul	14:37:37	0.059
29	19 Jul	14:38:37	0.057
30	19 Jul	14:39:37	0.068
31	19 Jul	14:40:37	0.069
32	19 Jul	14:41:37	0.080
33	19 Jul	14:42:37	0.080
34	19 Jul	14:43:37	0.055
35	19 Jul	14:44:37	0.060
36	19 Jul	14:45:37	0.058
37	19 Jul	14:46:37	0.058
38	19 Jul	14:47:37	0.054
39	19 Jul	14:48:37	0.055
40	19 Jul	14:49:37	0.060
41	19 Jul	14:50:37	0.056
42	19 Jul	14:51:37	0.056
43	19 Jul	14:52:37	0.068
44	19 Jul	14:53:37	0.068
45	19 Jul	14:54:37	0.063
46	19 Jul	14:55:37	0.071
47	19 Jul	14:56:37	0.063
48	19 Jul	14:57:37	0.058
49	19 Jul	14:58:37	0.056

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 50, 19 Jul, 14:59:37,  0.062
 51, 19 Jul, 15:00:37,  0.054
 52, 19 Jul, 15:01:37,  0.058
 53, 19 Jul, 15:02:37,  0.063
 54, 19 Jul, 15:03:37,  0.060
 55, 19 Jul, 15:04:37,  0.058
 56, 19 Jul, 15:05:37,  0.050
 57, 19 Jul, 15:06:37,  0.055
 58, 19 Jul, 15:07:37,  0.053
 59, 19 Jul, 15:08:37,  0.052
 60, 19 Jul, 15:09:37,  0.052
 61, 19 Jul, 15:10:37,  0.053
 62, 19 Jul, 15:11:37,  0.055
 63, 19 Jul, 15:12:37,  0.052
 64, 19 Jul, 15:13:37,  0.056
 65, 19 Jul, 15:14:37,  0.057
 66, 19 Jul, 15:15:37,  0.055
 67, 19 Jul, 15:16:37,  0.052
 68, 19 Jul, 15:17:37,  0.056
 69, 19 Jul, 15:18:37,  0.057
 70, 19 Jul, 15:19:37,  0.053
 71, 19 Jul, 15:20:37,  0.056
 72, 19 Jul, 15:21:37,  0.067
 73, 19 Jul, 15:22:37,  0.059
 74, 19 Jul, 15:23:37,  0.051
 75, 19 Jul, 15:24:37,  0.052
 76, 19 Jul, 15:25:37,  0.054
 77, 19 Jul, 15:26:37,  0.053
 78, 19 Jul, 15:27:37,  0.052
 79, 19 Jul, 15:28:37,  0.068
 80, 19 Jul, 15:29:37,  0.054
 81, 19 Jul, 15:30:37,  0.050
 82, 19 Jul, 15:31:37,  0.053
 83, 19 Jul, 15:32:37,  0.052
 84, 19 Jul, 15:33:37,  0.058
 85, 19 Jul, 15:34:37,  0.058
 86, 19 Jul, 15:35:37,  0.059
 87, 19 Jul, 15:36:37,  0.062
 88, 19 Jul, 15:37:37,  0.057
 89, 19 Jul, 15:38:37,  0.051
 90, 19 Jul, 15:39:37,  0.065
 91, 19 Jul, 15:40:37,  0.057
 92, 19 Jul, 15:41:37,  0.052
 93, 19 Jul, 15:42:37,  0.055
 94, 19 Jul, 15:43:37,  0.055
 95, 19 Jul, 15:44:37,  0.054
 96, 19 Jul, 15:45:37,  0.054
 97, 19 Jul, 15:46:37,  0.056
 98, 19 Jul, 15:47:37,  0.064
 99, 19 Jul, 15:48:37,  0.088
100, 19 Jul, 15:49:37,  0.061
101, 19 Jul, 15:50:37,  0.060
102, 19 Jul, 15:51:37,  0.059
103, 19 Jul, 15:52:37,  0.068
104, 19 Jul, 15:53:37,  0.057
105, 19 Jul, 15:54:37,  0.058
106, 19 Jul, 15:55:37,  0.062
107, 19 Jul, 15:56:37,  0.069
108, 19 Jul, 15:57:37,  0.061
109, 19 Jul, 15:58:37,  0.063
110, 19 Jul, 15:59:37,  0.063
111, 19 Jul, 16:00:37,  0.060
112, 19 Jul, 16:01:37,  0.059
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113,	19 Jul,	16:02:37,	0.064
114,	19 Jul,	16:03:37,	0.059
115,	19 Jul,	16:04:37,	0.061
116,	19 Jul,	16:05:37,	0.062
117,	19 Jul,	16:06:37,	0.061
118,	19 Jul,	16:07:37,	0.066
119,	19 Jul,	16:08:37,	0.060
120,	19 Jul,	16:09:37,	0.070
121,	19 Jul,	16:10:37,	0.065
122,	19 Jul,	16:11:37,	0.062
123,	19 Jul,	16:12:37,	0.068
124,	19 Jul,	16:13:37,	0.064

pDR-R10383_07192017-1416 start

pDR - R10383
Tag Number: 01
Number of logged points: 26
Start time and date: 14:15:48 19-Jul
Elapsed time: 00:26:00
Logging period (sec): 60
Calibration Factor (%): 100
Max Display Concentration: 0.802 mg/m3
Time at maximum: 14:39:38 Jul 19
Max STEL Concentration: 0.036 mg/m3
Time at max STEL: 14:39:48 Jul 19
Overall Avg Conc: 0.030 mg/m3
Logged Data:

Point	Date	Time	Avg.(mg/m3)
1	19 Jul	14:16:48	0.040
2	19 Jul	14:17:48	0.038
3	19 Jul	14:18:48	0.022
4	19 Jul	14:19:48	0.021
5	19 Jul	14:20:48	0.023
6	19 Jul	14:21:48	0.029
7	19 Jul	14:22:48	0.024
8	19 Jul	14:23:48	0.024
9	19 Jul	14:24:48	0.024
10	19 Jul	14:25:48	0.023
11	19 Jul	14:26:48	0.024
12	19 Jul	14:27:48	0.026
13	19 Jul	14:28:48	0.022
14	19 Jul	14:29:48	0.023
15	19 Jul	14:30:48	0.023
16	19 Jul	14:31:48	0.024
17	19 Jul	14:32:48	0.023
18	19 Jul	14:33:48	0.025
19	19 Jul	14:34:48	0.025
20	19 Jul	14:35:48	0.025
21	19 Jul	14:36:48	0.025
22	19 Jul	14:37:48	0.032
23	19 Jul	14:38:48	0.047
24	19 Jul	14:39:48	0.169
25	19 Jul	14:40:48	0.010
26	19 Jul	14:41:48	0.000

pDR - R10383
Tag Number: 02
Number of logged points: 125
Start time and date: 14:50:11 19-Jul
Elapsed time: 02:05:00
Logging period (sec): 60
Calibration Factor (%): 100
Max Display Concentration: 1.141 mg/m3
Time at maximum: 15:30:09 Jul 19
Max STEL Concentration: 0.055 mg/m3
Time at max STEL: 15:30:41 Jul 19
Overall Avg Conc: 0.042 mg/m3
Logged Data:

Point	Date	Time	Avg.(mg/m3)
1	19 Jul	14:51:11	0.030
2	19 Jul	14:52:11	0.033
3	19 Jul	14:53:11	0.047
4	19 Jul	14:54:11	0.034
5	19 Jul	14:55:11	0.032
6	19 Jul	14:56:11	0.032
7	19 Jul	14:57:11	0.033
8	19 Jul	14:58:11	0.032
9	19 Jul	14:59:11	0.035
10	19 Jul	15:00:11	0.033
11	19 Jul	15:01:11	0.032
12	19 Jul	15:02:11	0.037
13	19 Jul	15:03:11	0.036
14	19 Jul	15:04:11	0.050
15	19 Jul	15:05:11	0.035
16	19 Jul	15:06:11	0.034
17	19 Jul	15:07:11	0.033
18	19 Jul	15:08:11	0.033
19	19 Jul	15:09:11	0.035
20	19 Jul	15:10:11	0.033
21	19 Jul	15:11:11	0.036
22	19 Jul	15:12:11	0.033
23	19 Jul	15:13:11	0.036
24	19 Jul	15:14:11	0.035
25	19 Jul	15:15:11	0.034
26	19 Jul	15:16:11	0.035
27	19 Jul	15:17:11	0.038
28	19 Jul	15:18:11	0.033
29	19 Jul	15:19:11	0.036
30	19 Jul	15:20:11	0.037
31	19 Jul	15:21:11	0.036
32	19 Jul	15:22:11	0.038
33	19 Jul	15:23:11	0.035
34	19 Jul	15:24:11	0.039
35	19 Jul	15:25:11	0.034
36	19 Jul	15:26:11	0.041
37	19 Jul	15:27:11	0.042
38	19 Jul	15:28:11	0.048
39	19 Jul	15:29:11	0.054
40	19 Jul	15:30:11	0.265
41	19 Jul	15:31:11	0.052
42	19 Jul	15:32:11	0.033
43	19 Jul	15:33:11	0.037
44	19 Jul	15:34:11	0.035
45	19 Jul	15:35:11	0.036
46	19 Jul	15:36:11	0.036
47	19 Jul	15:37:11	0.037
48	19 Jul	15:38:11	0.036
49	19 Jul	15:39:11	0.039

50,	19	Jul,	15:40:11,	0.035
51,	19	Jul,	15:41:11,	0.035
52,	19	Jul,	15:42:11,	0.036
53,	19	Jul,	15:43:11,	0.037
54,	19	Jul,	15:44:11,	0.037
55,	19	Jul,	15:45:11,	0.037
56,	19	Jul,	15:46:11,	0.036
57,	19	Jul,	15:47:11,	0.038
58,	19	Jul,	15:48:11,	0.039
59,	19	Jul,	15:49:11,	0.045
60,	19	Jul,	15:50:11,	0.038
61,	19	Jul,	15:51:11,	0.040
62,	19	Jul,	15:52:11,	0.040
63,	19	Jul,	15:53:11,	0.038
64,	19	Jul,	15:54:11,	0.041
65,	19	Jul,	15:55:11,	0.041
66,	19	Jul,	15:56:11,	0.042
67,	19	Jul,	15:57:11,	0.044
68,	19	Jul,	15:58:11,	0.041
69,	19	Jul,	15:59:11,	0.041
70,	19	Jul,	16:00:11,	0.040
71,	19	Jul,	16:01:11,	0.041
72,	19	Jul,	16:02:11,	0.041
73,	19	Jul,	16:03:11,	0.040
74,	19	Jul,	16:04:11,	0.041
75,	19	Jul,	16:05:11,	0.042
76,	19	Jul,	16:06:11,	0.043
77,	19	Jul,	16:07:11,	0.041
78,	19	Jul,	16:08:11,	0.042
79,	19	Jul,	16:09:11,	0.041
80,	19	Jul,	16:10:11,	0.040
81,	19	Jul,	16:11:11,	0.044
82,	19	Jul,	16:12:11,	0.041
83,	19	Jul,	16:13:11,	0.042
84,	19	Jul,	16:14:11,	0.063
85,	19	Jul,	16:15:11,	0.043
86,	19	Jul,	16:16:11,	0.043
87,	19	Jul,	16:17:11,	0.047
88,	19	Jul,	16:18:11,	0.044
89,	19	Jul,	16:19:11,	0.041
90,	19	Jul,	16:20:11,	0.043
91,	19	Jul,	16:21:11,	0.041
92,	19	Jul,	16:22:11,	0.043
93,	19	Jul,	16:23:11,	0.049
94,	19	Jul,	16:24:11,	0.046
95,	19	Jul,	16:25:11,	0.041
96,	19	Jul,	16:26:11,	0.041
97,	19	Jul,	16:27:11,	0.041
98,	19	Jul,	16:28:11,	0.043
99,	19	Jul,	16:29:11,	0.046
100,	19	Jul,	16:30:11,	0.042
101,	19	Jul,	16:31:11,	0.043
102,	19	Jul,	16:32:11,	0.040
103,	19	Jul,	16:33:11,	0.044
104,	19	Jul,	16:34:11,	0.044
105,	19	Jul,	16:35:11,	0.043
106,	19	Jul,	16:36:11,	0.043
107,	19	Jul,	16:37:11,	0.045
108,	19	Jul,	16:38:11,	0.041
109,	19	Jul,	16:39:11,	0.048
110,	19	Jul,	16:40:11,	0.047
111,	19	Jul,	16:41:11,	0.043
112,	19	Jul,	16:42:11,	0.043

pDR-R10383_07192017-1451 start

113, 19 Jul, 16:43:11, 0.047
114, 19 Jul, 16:44:11, 0.052
115, 19 Jul, 16:45:11, 0.044
116, 19 Jul, 16:46:11, 0.043
117, 19 Jul, 16:47:11, 0.043
118, 19 Jul, 16:48:11, 0.044
119, 19 Jul, 16:49:11, 0.045
120, 19 Jul, 16:50:11, 0.045
121, 19 Jul, 16:51:11, 0.048
122, 19 Jul, 16:52:11, 0.046
123, 19 Jul, 16:53:11, 0.044
124, 19 Jul, 16:54:11, 0.046
125, 19 Jul, 16:55:11, 0.054

pDR ID: 143116
Tag Number: 03
Number of logged points: 39
Start time and date: 13:30:26 19-Jul
Elapsed time: 00:39:00
Logging period (sec): 60
Calibration Factor (%): 100
Max Display Concentration: 0.087 mg/m3
Time at maximum: 13:58:03 Jul 19
Max STEL Concentration: 0.059 mg/m3
Time at max STEL: 13:58:56 Jul 19
Overall Avg Conc: 0.056 mg/m3
Logged Data:

Point	Date	Time	Avg.(mg/m3)
1	19-Jul	13:31:26	0.047
2	19-Jul	13:32:26	0.06
3	19-Jul	13:33:26	0.056
4	19-Jul	13:34:26	0.051
5	19-Jul	13:35:26	0.055
6	19-Jul	13:36:26	0.053
7	19-Jul	13:37:26	0.051
8	19-Jul	13:38:26	0.053
9	19-Jul	13:39:26	0.054
10	19-Jul	13:40:26	0.046
11	19-Jul	13:41:26	0.046
12	19-Jul	13:42:26	0.053
13	19-Jul	13:43:26	0.054
14	19-Jul	13:44:26	0.051
15	19-Jul	13:45:26	0.081
16	19-Jul	13:46:26	0.063
17	19-Jul	13:47:26	0.056
18	19-Jul	13:48:26	0.049
19	19-Jul	13:49:26	0.057
20	19-Jul	13:50:26	0.053
21	19-Jul	13:51:26	0.049
22	19-Jul	13:52:26	0.052
23	19-Jul	13:53:26	0.048
24	19-Jul	13:54:26	0.059
25	19-Jul	13:55:26	0.055
26	19-Jul	13:56:26	0.059
27	19-Jul	13:57:26	0.081
28	19-Jul	13:58:26	0.06
29	19-Jul	13:59:26	0.053
30	19-Jul	14:00:26	0.052
31	19-Jul	14:01:26	0.051
32	19-Jul	14:02:26	0.053
33	19-Jul	14:03:26	0.055

34	19-Jul	14:04:26	0.055
35	19-Jul	14:05:26	0.066
36	19-Jul	14:06:26	0.059
37	19-Jul	14:07:26	0.057
38	19-Jul	14:08:26	0.059
39	19-Jul	14:09:26	0.062

pDR ID: 143116
Tag Number: 04
Number of logged points: 124
Start time and date: 14:09:37 19-Jul
Elapsed time: 02:04:00
Logging period (sec): 60
Calibration Factor (%): 100
Max Display Concentration: 0.097 mg/m3
Time at maximum: 14:42:17 Jul 19
Max STEL Concentration: 0.064 mg/m3
Time at max STEL: 16:01:37 Jul 19
Overall Avg Conc: 0.059 mg/m3
Logged Data:

Point	Date	Time	Avg.(mg/m3)
1	19-Jul	14:10:37	0.065
2	19-Jul	14:11:37	0.059
3	19-Jul	14:12:37	0.054
4	19-Jul	14:13:37	0.056
5	19-Jul	14:14:37	0.058
6	19-Jul	14:15:37	0.054
7	19-Jul	14:16:37	0.056
8	19-Jul	14:17:37	0.059
9	19-Jul	14:18:37	0.06
10	19-Jul	14:19:37	0.054
11	19-Jul	14:20:37	0.051
12	19-Jul	14:21:37	0.059
13	19-Jul	14:22:37	0.059
14	19-Jul	14:23:37	0.053
15	19-Jul	14:24:37	0.057
16	19-Jul	14:25:37	0.055
17	19-Jul	14:26:37	0.054
18	19-Jul	14:27:37	0.055
19	19-Jul	14:28:37	0.056
20	19-Jul	14:29:37	0.058
21	19-Jul	14:30:37	0.052
22	19-Jul	14:31:37	0.052
23	19-Jul	14:32:37	0.056
24	19-Jul	14:33:37	0.054
25	19-Jul	14:34:37	0.05
26	19-Jul	14:35:37	0.056
27	19-Jul	14:36:37	0.056
28	19-Jul	14:37:37	0.059
29	19-Jul	14:38:37	0.057
30	19-Jul	14:39:37	0.068
31	19-Jul	14:40:37	0.069
32	19-Jul	14:41:37	0.08
33	19-Jul	14:42:37	0.08

34	19-Jul	14:43:37	0.055
35	19-Jul	14:44:37	0.06
36	19-Jul	14:45:37	0.058
37	19-Jul	14:46:37	0.058
38	19-Jul	14:47:37	0.054
39	19-Jul	14:48:37	0.055
40	19-Jul	14:49:37	0.06
41	19-Jul	14:50:37	0.056
42	19-Jul	14:51:37	0.056
43	19-Jul	14:52:37	0.068
44	19-Jul	14:53:37	0.068
45	19-Jul	14:54:37	0.063
46	19-Jul	14:55:37	0.071
47	19-Jul	14:56:37	0.063
48	19-Jul	14:57:37	0.058
49	19-Jul	14:58:37	0.056
50	19-Jul	14:59:37	0.062
51	19-Jul	15:00:37	0.054
52	19-Jul	15:01:37	0.058
53	19-Jul	15:02:37	0.063
54	19-Jul	15:03:37	0.06
55	19-Jul	15:04:37	0.058
56	19-Jul	15:05:37	0.05
57	19-Jul	15:06:37	0.055
58	19-Jul	15:07:37	0.053
59	19-Jul	15:08:37	0.052
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61	19-Jul	15:10:37	0.053
62	19-Jul	15:11:37	0.055
63	19-Jul	15:12:37	0.052
64	19-Jul	15:13:37	0.056
65	19-Jul	15:14:37	0.057
66	19-Jul	15:15:37	0.055
67	19-Jul	15:16:37	0.052
68	19-Jul	15:17:37	0.056
69	19-Jul	15:18:37	0.057
70	19-Jul	15:19:37	0.053
71	19-Jul	15:20:37	0.056
72	19-Jul	15:21:37	0.067
73	19-Jul	15:22:37	0.059
74	19-Jul	15:23:37	0.051
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79	19-Jul	15:28:37	0.068
80	19-Jul	15:29:37	0.054

81	19-Jul	15:30:37	0.05
82	19-Jul	15:31:37	0.053
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84	19-Jul	15:33:37	0.058
85	19-Jul	15:34:37	0.058
86	19-Jul	15:35:37	0.059
87	19-Jul	15:36:37	0.062
88	19-Jul	15:37:37	0.057
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90	19-Jul	15:39:37	0.065
91	19-Jul	15:40:37	0.057
92	19-Jul	15:41:37	0.052
93	19-Jul	15:42:37	0.055
94	19-Jul	15:43:37	0.055
95	19-Jul	15:44:37	0.054
96	19-Jul	15:45:37	0.054
97	19-Jul	15:46:37	0.056
98	19-Jul	15:47:37	0.064
99	19-Jul	15:48:37	0.088
100	19-Jul	15:49:37	0.061
101	19-Jul	15:50:37	0.06
102	19-Jul	15:51:37	0.059
103	19-Jul	15:52:37	0.068
104	19-Jul	15:53:37	0.057
105	19-Jul	15:54:37	0.058
106	19-Jul	15:55:37	0.062
107	19-Jul	15:56:37	0.069
108	19-Jul	15:57:37	0.061
109	19-Jul	15:58:37	0.063
110	19-Jul	15:59:37	0.063
111	19-Jul	16:00:37	0.06
112	19-Jul	16:01:37	0.059
113	19-Jul	16:02:37	0.064
114	19-Jul	16:03:37	0.059
115	19-Jul	16:04:37	0.061
116	19-Jul	16:05:37	0.062
117	19-Jul	16:06:37	0.061
118	19-Jul	16:07:37	0.066
119	19-Jul	16:08:37	0.06
120	19-Jul	16:09:37	0.07
121	19-Jul	16:10:37	0.065
122	19-Jul	16:11:37	0.062
123	19-Jul	16:12:37	0.068
124	19-Jul	16:13:37	0.064

pDR R10383
Tag Number: 03
Number of logged points: 609
Start time and date: 07:36:29 20-Jul
Elapsed time: 10:09:00
Logging period (sec): 60
Calibration Factor (%): 100
Max Display Concentration: 2.590 mg/m3
Time at maximum: 14:19:39 Jul 20
Max STEL Concentration: 0.090 mg/m3
Time at max STEL: 14:20:00 Jul 20
Overall Avg Conc: 0.039 mg/m3
Logged Data:

Point	Date	Time	Avg.(mg/m3)
1	20 Jul	07:37:29	0.032
2	20 Jul	07:38:29	0.033
3	20 Jul	07:39:29	0.032
4	20 Jul	07:40:29	0.033
5	20 Jul	07:41:29	0.033
6	20 Jul	07:42:29	0.033
7	20 Jul	07:43:29	0.033
8	20 Jul	07:44:29	0.033
9	20 Jul	07:45:29	0.034
10	20 Jul	07:46:29	0.035
11	20 Jul	07:47:29	0.037
12	20 Jul	07:48:29	0.035
13	20 Jul	07:49:29	0.036
14	20 Jul	07:50:29	0.035
15	20 Jul	07:51:29	0.035
16	20 Jul	07:52:29	0.036
17	20 Jul	07:53:29	0.036
18	20 Jul	07:54:29	0.037
19	20 Jul	07:55:29	0.037
20	20 Jul	07:56:29	0.038
21	20 Jul	07:57:29	0.037
22	20 Jul	07:58:29	0.038
23	20 Jul	07:59:29	0.038
24	20 Jul	08:00:29	0.038
25	20 Jul	08:01:29	0.039
26	20 Jul	08:02:29	0.040
27	20 Jul	08:03:29	0.040
28	20 Jul	08:04:29	0.039
29	20 Jul	08:05:29	0.040
30	20 Jul	08:06:29	0.039
31	20 Jul	08:07:29	0.045
32	20 Jul	08:08:29	0.040
33	20 Jul	08:09:29	0.045
34	20 Jul	08:10:29	0.043
35	20 Jul	08:11:29	0.042
36	20 Jul	08:12:29	0.042
37	20 Jul	08:13:29	0.042
38	20 Jul	08:14:29	0.045
39	20 Jul	08:15:29	0.043
40	20 Jul	08:16:29	0.043
41	20 Jul	08:17:29	0.044
42	20 Jul	08:18:29	0.043
43	20 Jul	08:19:29	0.044
44	20 Jul	08:20:29	0.044
45	20 Jul	08:21:29	0.043
46	20 Jul	08:22:29	0.044
47	20 Jul	08:23:29	0.049
48	20 Jul	08:24:29	0.045
49	20 Jul	08:25:29	0.045

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 52, 20 Jul, 08:28:29,  0.047
 53, 20 Jul, 08:29:29,  0.048
 54, 20 Jul, 08:30:29,  0.046
 55, 20 Jul, 08:31:29,  0.048
 56, 20 Jul, 08:32:29,  0.045
 57, 20 Jul, 08:33:29,  0.046
 58, 20 Jul, 08:34:29,  0.048
 59, 20 Jul, 08:35:29,  0.047
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 62, 20 Jul, 08:38:29,  0.046
 63, 20 Jul, 08:39:29,  0.046
 64, 20 Jul, 08:40:29,  0.045
 65, 20 Jul, 08:41:29,  0.046
 66, 20 Jul, 08:42:29,  0.048
 67, 20 Jul, 08:43:29,  0.047
 68, 20 Jul, 08:44:29,  0.048
 69, 20 Jul, 08:45:29,  0.046
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109, 20 Jul, 09:25:29,  0.049
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112, 20 Jul, 09:28:29,  0.050
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606, 20 Jul, 17:42:29, 0.024
607, 20 Jul, 17:43:29, 0.020
608, 20 Jul, 17:44:29, 0.020
609, 20 Jul, 17:45:29, 0.028

pDR ID: 143116
Tag Number: 07
Number of logged points: 534
Start time and date: 08:59:36 24-Jul
Elapsed time: 08:54:00
Logging period (sec): 60
Calibration Factor (%): 100
Max Display Concentration: 0.160 mg/m3
Time at maximum: 14:11:29 Jul 24
Max STEL Concentration: 0.041 mg/m3
Time at max STEL: 14:12:07 Jul 24
Overall Avg Conc: 0.021 mg/m3
Logged Data:

Point	Date	Time	Avg.(mg/m3)
1	24-Jul	09:00:36	0.015
2	24-Jul	09:01:36	0.015
3	24-Jul	09:02:36	0.002
4	24-Jul	09:03:36	0.006
5	24-Jul	09:04:36	0.011
6	24-Jul	09:05:36	0.007
7	24-Jul	09:06:36	0.002
8	24-Jul	09:07:36	0.007
9	24-Jul	09:08:36	0.004
10	24-Jul	09:09:36	0.017
11	24-Jul	09:10:36	0.006
12	24-Jul	09:11:36	0.006
13	24-Jul	09:12:36	0.003
14	24-Jul	09:13:36	0.012
15	24-Jul	09:14:36	0.016
16	24-Jul	09:15:36	0.001
17	24-Jul	09:16:36	0.003
18	24-Jul	09:17:36	0.003
19	24-Jul	09:18:36	0.001
20	24-Jul	09:19:36	0.007
21	24-Jul	09:20:36	0.004
22	24-Jul	09:21:36	0.006
23	24-Jul	09:22:36	0.008
24	24-Jul	09:23:36	0.002
25	24-Jul	09:24:36	0.009
26	24-Jul	09:25:36	0.015
27	24-Jul	09:26:36	0.021
28	24-Jul	09:27:36	0.012
29	24-Jul	09:28:36	0.013
30	24-Jul	09:29:36	0.021
31	24-Jul	09:30:36	0.01
32	24-Jul	09:31:36	0.014
33	24-Jul	09:32:36	0.026

34	24-Jul	09:33:36	0.02
35	24-Jul	09:34:36	0.029
36	24-Jul	09:35:36	0.022
37	24-Jul	09:36:36	0.017
38	24-Jul	09:37:36	0.026
39	24-Jul	09:38:36	0.023
40	24-Jul	09:39:36	0.022
41	24-Jul	09:40:36	0.022
42	24-Jul	09:41:36	0.026
43	24-Jul	09:42:36	0.028
44	24-Jul	09:43:36	0.027
45	24-Jul	09:44:36	0.027
46	24-Jul	09:45:36	0.033
47	24-Jul	09:46:36	0.021
48	24-Jul	09:47:36	0.002
49	24-Jul	09:48:36	0.001
50	24-Jul	09:49:36	0.004
51	24-Jul	09:50:36	0.003
52	24-Jul	09:51:36	0.012
53	24-Jul	09:52:36	0.008
54	24-Jul	09:53:36	0.004
55	24-Jul	09:54:36	0.004
56	24-Jul	09:55:36	0.011
57	24-Jul	09:56:36	0.006
58	24-Jul	09:57:36	0.007
59	24-Jul	09:58:36	0.025
60	24-Jul	09:59:36	0.012
61	24-Jul	10:00:36	0.009
62	24-Jul	10:01:36	0.007
63	24-Jul	10:02:36	0.009
64	24-Jul	10:03:36	0.008
65	24-Jul	10:04:36	0.007
66	24-Jul	10:05:36	0.007
67	24-Jul	10:06:36	0.005
68	24-Jul	10:07:36	0.007
69	24-Jul	10:08:36	0.01
70	24-Jul	10:09:36	0.015
71	24-Jul	10:10:36	0.018
72	24-Jul	10:11:36	0.016
73	24-Jul	10:12:36	0.016
74	24-Jul	10:13:36	0.019
75	24-Jul	10:14:36	0.019
76	24-Jul	10:15:36	0.025
77	24-Jul	10:16:36	0.024
78	24-Jul	10:17:36	0.017
79	24-Jul	10:18:36	0.016
80	24-Jul	10:19:36	0.018

81	24-Jul	10:20:36	0.01
82	24-Jul	10:21:36	0.009
83	24-Jul	10:22:36	0.019
84	24-Jul	10:23:36	0.015
85	24-Jul	10:24:36	0.02
86	24-Jul	10:25:36	0.017
87	24-Jul	10:26:36	0.018
88	24-Jul	10:27:36	0.018
89	24-Jul	10:28:36	0.014
90	24-Jul	10:29:36	0.014
91	24-Jul	10:30:36	0.013
92	24-Jul	10:31:36	0.017
93	24-Jul	10:32:36	0.014
94	24-Jul	10:33:36	0.013
95	24-Jul	10:34:36	0.014
96	24-Jul	10:35:36	0.013
97	24-Jul	10:36:36	0.01
98	24-Jul	10:37:36	0.016
99	24-Jul	10:38:36	0.013
100	24-Jul	10:39:36	0.016
101	24-Jul	10:40:36	0.013
102	24-Jul	10:41:36	0.016
103	24-Jul	10:42:36	0.013
104	24-Jul	10:43:36	0.047
105	24-Jul	10:44:36	0.013
106	24-Jul	10:45:36	0.016
107	24-Jul	10:46:36	0.017
108	24-Jul	10:47:36	0.03
109	24-Jul	10:48:36	0.019
110	24-Jul	10:49:36	0.014
111	24-Jul	10:50:36	0.013
112	24-Jul	10:51:36	0.024
113	24-Jul	10:52:36	0.02
114	24-Jul	10:53:36	0.015
115	24-Jul	10:54:36	0.018
116	24-Jul	10:55:36	0.013
117	24-Jul	10:56:36	0.013
118	24-Jul	10:57:36	0.012
119	24-Jul	10:58:36	0.018
120	24-Jul	10:59:36	0.015
121	24-Jul	11:00:36	0.009
122	24-Jul	11:01:36	0.005
123	24-Jul	11:02:36	0.009
124	24-Jul	11:03:36	0.009
125	24-Jul	11:04:36	0.01
126	24-Jul	11:05:36	0.008
127	24-Jul	11:06:36	0.013

128	24-Jul	11:07:36	0.014
129	24-Jul	11:08:36	0.012
130	24-Jul	11:09:36	0.014
131	24-Jul	11:10:36	0.012
132	24-Jul	11:11:36	0.014
133	24-Jul	11:12:36	0.017
134	24-Jul	11:13:36	0.021
135	24-Jul	11:14:36	0.018
136	24-Jul	11:15:36	0.017
137	24-Jul	11:16:36	0.017
138	24-Jul	11:17:36	0.019
139	24-Jul	11:18:36	0.016
140	24-Jul	11:19:36	0.016
141	24-Jul	11:20:36	0.015
142	24-Jul	11:21:36	0.017
143	24-Jul	11:22:36	0.021
144	24-Jul	11:23:36	0.019
145	24-Jul	11:24:36	0.019
146	24-Jul	11:25:36	0.02
147	24-Jul	11:26:36	0.02
148	24-Jul	11:27:36	0.019
149	24-Jul	11:28:36	0.013
150	24-Jul	11:29:36	0.013
151	24-Jul	11:30:36	0.019
152	24-Jul	11:31:36	0.022
153	24-Jul	11:32:36	0.019
154	24-Jul	11:33:36	0.022
155	24-Jul	11:34:36	0.023
156	24-Jul	11:35:36	0.015
157	24-Jul	11:36:36	0.013
158	24-Jul	11:37:36	0.014
159	24-Jul	11:38:36	0.019
160	24-Jul	11:39:36	0.02
161	24-Jul	11:40:36	0.021
162	24-Jul	11:41:36	0.023
163	24-Jul	11:42:36	0.021
164	24-Jul	11:43:36	0.022
165	24-Jul	11:44:36	0.021
166	24-Jul	11:45:36	0.021
167	24-Jul	11:46:36	0.02
168	24-Jul	11:47:36	0.019
169	24-Jul	11:48:36	0.022
170	24-Jul	11:49:36	0.046
171	24-Jul	11:50:36	0.021
172	24-Jul	11:51:36	0.02
173	24-Jul	11:52:36	0.017
174	24-Jul	11:53:36	0.017

175	24-Jul	11:54:36	0.035
176	24-Jul	11:55:36	0.027
177	24-Jul	11:56:36	0.025
178	24-Jul	11:57:36	0.023
179	24-Jul	11:58:36	0.02
180	24-Jul	11:59:36	0.029
181	24-Jul	12:00:36	0.024
182	24-Jul	12:01:36	0.021
183	24-Jul	12:02:36	0.029
184	24-Jul	12:03:36	0.018
185	24-Jul	12:04:36	0.018
186	24-Jul	12:05:36	0.023
187	24-Jul	12:06:36	0.024
188	24-Jul	12:07:36	0.029
189	24-Jul	12:08:36	0.031
190	24-Jul	12:09:36	0.025
191	24-Jul	12:10:36	0.027
192	24-Jul	12:11:36	0.022
193	24-Jul	12:12:36	0.023
194	24-Jul	12:13:36	0.025
195	24-Jul	12:14:36	0.025
196	24-Jul	12:15:36	0.022
197	24-Jul	12:16:36	0.022
198	24-Jul	12:17:36	0.021
199	24-Jul	12:18:36	0.027
200	24-Jul	12:19:36	0.03
201	24-Jul	12:20:36	0.018
202	24-Jul	12:21:36	0.032
203	24-Jul	12:22:36	0.125
204	24-Jul	12:23:36	0.022
205	24-Jul	12:24:36	0.022
206	24-Jul	12:25:36	0.02
207	24-Jul	12:26:36	0.023
208	24-Jul	12:27:36	0.036
209	24-Jul	12:28:36	0.054
210	24-Jul	12:29:36	0.025
211	24-Jul	12:30:36	0.032
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213	24-Jul	12:32:36	0.006
214	24-Jul	12:33:36	0.005
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216	24-Jul	12:35:36	0.006
217	24-Jul	12:36:36	0.005
218	24-Jul	12:37:36	0.009
219	24-Jul	12:38:36	0.022
220	24-Jul	12:39:36	0.006
221	24-Jul	12:40:36	0.017

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226	24-Jul	12:45:36	0.025
227	24-Jul	12:46:36	0.022
228	24-Jul	12:47:36	0.022
229	24-Jul	12:48:36	0.023
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231	24-Jul	12:50:36	0.026
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233	24-Jul	12:52:36	0.034
234	24-Jul	12:53:36	0.026
235	24-Jul	12:54:36	0.049
236	24-Jul	12:55:36	0.029
237	24-Jul	12:56:36	0.026
238	24-Jul	12:57:36	0.051
239	24-Jul	12:58:36	0.034
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241	24-Jul	13:00:36	0.032
242	24-Jul	13:01:36	0.022
243	24-Jul	13:02:36	0.036
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245	24-Jul	13:04:36	0.02
246	24-Jul	13:05:36	0.021
247	24-Jul	13:06:36	0.021
248	24-Jul	13:07:36	0.025
249	24-Jul	13:08:36	0.023
250	24-Jul	13:09:36	0.023
251	24-Jul	13:10:36	0.023
252	24-Jul	13:11:36	0.03
253	24-Jul	13:12:36	0.024
254	24-Jul	13:13:36	0.028
255	24-Jul	13:14:36	0.025
256	24-Jul	13:15:36	0.042
257	24-Jul	13:16:36	0.074
258	24-Jul	13:17:36	0.028
259	24-Jul	13:18:36	0.023
260	24-Jul	13:19:36	0.024
261	24-Jul	13:20:36	0.024
262	24-Jul	13:21:36	0.025
263	24-Jul	13:22:36	0.032
264	24-Jul	13:23:36	0.041
265	24-Jul	13:24:36	0.024
266	24-Jul	13:25:36	0.027
267	24-Jul	13:26:36	0.024
268	24-Jul	13:27:36	0.025

269	24-Jul	13:28:36	0.022
270	24-Jul	13:29:36	0.025
271	24-Jul	13:30:36	0.024
272	24-Jul	13:31:36	0.028
273	24-Jul	13:32:36	0.027
274	24-Jul	13:33:36	0.026
275	24-Jul	13:34:36	0.025
276	24-Jul	13:35:36	0.027
277	24-Jul	13:36:36	0.024
278	24-Jul	13:37:36	0.027
279	24-Jul	13:38:36	0.025
280	24-Jul	13:39:36	0.025
281	24-Jul	13:40:36	0.025
282	24-Jul	13:41:36	0.027
283	24-Jul	13:42:36	0.025
284	24-Jul	13:43:36	0.025
285	24-Jul	13:44:36	0.026
286	24-Jul	13:45:36	0.026
287	24-Jul	13:46:36	0.027
288	24-Jul	13:47:36	0.028
289	24-Jul	13:48:36	0.021
290	24-Jul	13:49:36	0.021
291	24-Jul	13:50:36	0.021
292	24-Jul	13:51:36	0.021
293	24-Jul	13:52:36	0.023
294	24-Jul	13:53:36	0.021
295	24-Jul	13:54:36	0.019
296	24-Jul	13:55:36	0.019
297	24-Jul	13:56:36	0.019
298	24-Jul	13:57:36	0.022
299	24-Jul	13:58:36	0.023
300	24-Jul	13:59:36	0.038
301	24-Jul	14:00:36	0.028
302	24-Jul	14:01:36	0.026
303	24-Jul	14:02:36	0.028
304	24-Jul	14:03:36	0.044
305	24-Jul	14:04:36	0.051
306	24-Jul	14:05:36	0.059
307	24-Jul	14:06:36	0.026
308	24-Jul	14:07:36	0.039
309	24-Jul	14:08:36	0.026
310	24-Jul	14:09:36	0.03
311	24-Jul	14:10:36	0.026
312	24-Jul	14:11:36	0.159
313	24-Jul	14:12:36	0.023
314	24-Jul	14:13:36	0.024
315	24-Jul	14:14:36	0.029

316	24-Jul	14:15:36	0.027
317	24-Jul	14:16:36	0.03
318	24-Jul	14:17:36	0.029
319	24-Jul	14:18:36	0.027
320	24-Jul	14:19:36	0.024
321	24-Jul	14:20:36	0.022
322	24-Jul	14:21:36	0.025
323	24-Jul	14:22:36	0.022
324	24-Jul	14:23:36	0.036
325	24-Jul	14:24:36	0.058
326	24-Jul	14:25:36	0.034
327	24-Jul	14:26:36	0.085
328	24-Jul	14:27:36	0.024
329	24-Jul	14:28:36	0.022
330	24-Jul	14:29:36	0.025
331	24-Jul	14:30:36	0.024
332	24-Jul	14:31:36	0.025
333	24-Jul	14:32:36	0.024
334	24-Jul	14:33:36	0.025
335	24-Jul	14:34:36	0.025
336	24-Jul	14:35:36	0.034
337	24-Jul	14:36:36	0.025
338	24-Jul	14:37:36	0.025
339	24-Jul	14:38:36	0.028
340	24-Jul	14:39:36	0.024
341	24-Jul	14:40:36	0.022
342	24-Jul	14:41:36	0.066
343	24-Jul	14:42:36	0.026
344	24-Jul	14:43:36	0.017
345	24-Jul	14:44:36	0.017
346	24-Jul	14:45:36	0.016
347	24-Jul	14:46:36	0.015
348	24-Jul	14:47:36	0.015
349	24-Jul	14:48:36	0.014
350	24-Jul	14:49:36	0.016
351	24-Jul	14:50:36	0.015
352	24-Jul	14:51:36	0.015
353	24-Jul	14:52:36	0.016
354	24-Jul	14:53:36	0.017
355	24-Jul	14:54:36	0.016
356	24-Jul	14:55:36	0.014
357	24-Jul	14:56:36	0.02
358	24-Jul	14:57:36	0.021
359	24-Jul	14:58:36	0.02
360	24-Jul	14:59:36	0.022
361	24-Jul	15:00:36	0.022
362	24-Jul	15:01:36	0.022

363	24-Jul	15:02:36	0.02
364	24-Jul	15:03:36	0.02
365	24-Jul	15:04:36	0.027
366	24-Jul	15:05:36	0.021
367	24-Jul	15:06:36	0.022
368	24-Jul	15:07:36	0.019
369	24-Jul	15:08:36	0.025
370	24-Jul	15:09:36	0.017
371	24-Jul	15:10:36	0.019
372	24-Jul	15:11:36	0.019
373	24-Jul	15:12:36	0.035
374	24-Jul	15:13:36	0.021
375	24-Jul	15:14:36	0.024
376	24-Jul	15:15:36	0.018
377	24-Jul	15:16:36	0.019
378	24-Jul	15:17:36	0.078
379	24-Jul	15:18:36	0.017
380	24-Jul	15:19:36	0.02
381	24-Jul	15:20:36	0.022
382	24-Jul	15:21:36	0.02
383	24-Jul	15:22:36	0.025
384	24-Jul	15:23:36	0.021
385	24-Jul	15:24:36	0.024
386	24-Jul	15:25:36	0.023
387	24-Jul	15:26:36	0.019
388	24-Jul	15:27:36	0.018
389	24-Jul	15:28:36	0.017
390	24-Jul	15:29:36	0.014
391	24-Jul	15:30:36	0.014
392	24-Jul	15:31:36	0.014
393	24-Jul	15:32:36	0.015
394	24-Jul	15:33:36	0.016
395	24-Jul	15:34:36	0.017
396	24-Jul	15:35:36	0.02
397	24-Jul	15:36:36	0.023
398	24-Jul	15:37:36	0.023
399	24-Jul	15:38:36	0.021
400	24-Jul	15:39:36	0.022
401	24-Jul	15:40:36	0.022
402	24-Jul	15:41:36	0.027
403	24-Jul	15:42:36	0.021
404	24-Jul	15:43:36	0.02
405	24-Jul	15:44:36	0.023
406	24-Jul	15:45:36	0.021
407	24-Jul	15:46:36	0.021
408	24-Jul	15:47:36	0.023
409	24-Jul	15:48:36	0.021

410	24-Jul	15:49:36	0.022
411	24-Jul	15:50:36	0.021
412	24-Jul	15:51:36	0.021
413	24-Jul	15:52:36	0.021
414	24-Jul	15:53:36	0.021
415	24-Jul	15:54:36	0.021
416	24-Jul	15:55:36	0.021
417	24-Jul	15:56:36	0.022
418	24-Jul	15:57:36	0.021
419	24-Jul	15:58:36	0.022
420	24-Jul	15:59:36	0.023
421	24-Jul	16:00:36	0.026
422	24-Jul	16:01:36	0.023
423	24-Jul	16:02:36	0.031
424	24-Jul	16:03:36	0.02
425	24-Jul	16:04:36	0.021
426	24-Jul	16:05:36	0.022
427	24-Jul	16:06:36	0.023
428	24-Jul	16:07:36	0.022
429	24-Jul	16:08:36	0.021
430	24-Jul	16:09:36	0.023
431	24-Jul	16:10:36	0.021
432	24-Jul	16:11:36	0.021
433	24-Jul	16:12:36	0.021
434	24-Jul	16:13:36	0.02
435	24-Jul	16:14:36	0.02
436	24-Jul	16:15:36	0.02
437	24-Jul	16:16:36	0.018
438	24-Jul	16:17:36	0.022
439	24-Jul	16:18:36	0.048
440	24-Jul	16:19:36	0.02
441	24-Jul	16:20:36	0.017
442	24-Jul	16:21:36	0.014
443	24-Jul	16:22:36	0.013
444	24-Jul	16:23:36	0.014
445	24-Jul	16:24:36	0.013
446	24-Jul	16:25:36	0.014
447	24-Jul	16:26:36	0.037
448	24-Jul	16:27:36	0.015
449	24-Jul	16:28:36	0.017
450	24-Jul	16:29:36	0.013
451	24-Jul	16:30:36	0.014
452	24-Jul	16:31:36	0.013
453	24-Jul	16:32:36	0.014
454	24-Jul	16:33:36	0.012
455	24-Jul	16:34:36	0.013
456	24-Jul	16:35:36	0.014

457	24-Jul	16:36:36	0.013
458	24-Jul	16:37:36	0.014
459	24-Jul	16:38:36	0.012
460	24-Jul	16:39:36	0.011
461	24-Jul	16:40:36	0.015
462	24-Jul	16:41:36	0.012
463	24-Jul	16:42:36	0.022
464	24-Jul	16:43:36	0.023
465	24-Jul	16:44:36	0.071
466	24-Jul	16:45:36	0.022
467	24-Jul	16:46:36	0.021
468	24-Jul	16:47:36	0.034
469	24-Jul	16:48:36	0.016
470	24-Jul	16:49:36	0.017
471	24-Jul	16:50:36	0.02
472	24-Jul	16:51:36	0.022
473	24-Jul	16:52:36	0.026
474	24-Jul	16:53:36	0.024
475	24-Jul	16:54:36	0.028
476	24-Jul	16:55:36	0.028
477	24-Jul	16:56:36	0.026
478	24-Jul	16:57:36	0.055
479	24-Jul	16:58:36	0.025
480	24-Jul	16:59:36	0.028
481	24-Jul	17:00:36	0.03
482	24-Jul	17:01:36	0.03
483	24-Jul	17:02:36	0.027
484	24-Jul	17:03:36	0.049
485	24-Jul	17:04:36	0.013
486	24-Jul	17:05:36	0.025
487	24-Jul	17:06:36	0.024
488	24-Jul	17:07:36	0.026
489	24-Jul	17:08:36	0.026
490	24-Jul	17:09:36	0.025
491	24-Jul	17:10:36	0.027
492	24-Jul	17:11:36	0.029
493	24-Jul	17:12:36	0.028
494	24-Jul	17:13:36	0.033
495	24-Jul	17:14:36	0.024
496	24-Jul	17:15:36	0.036
497	24-Jul	17:16:36	0.024
498	24-Jul	17:17:36	0.025
499	24-Jul	17:18:36	0.026
500	24-Jul	17:19:36	0.025
501	24-Jul	17:20:36	0.025
502	24-Jul	17:21:36	0.024
503	24-Jul	17:22:36	0.023

504	24-Jul	17:23:36	0.049
505	24-Jul	17:24:36	0.021
506	24-Jul	17:25:36	0.018
507	24-Jul	17:26:36	0.019
508	24-Jul	17:27:36	0.136
509	24-Jul	17:28:36	0.018
510	24-Jul	17:29:36	0.013
511	24-Jul	17:30:36	0.017
512	24-Jul	17:31:36	0.016
513	24-Jul	17:32:36	0.022
514	24-Jul	17:33:36	0.015
515	24-Jul	17:34:36	0.012
516	24-Jul	17:35:36	0.013
517	24-Jul	17:36:36	0.014
518	24-Jul	17:37:36	0.012
519	24-Jul	17:38:36	0.013
520	24-Jul	17:39:36	0.015
521	24-Jul	17:40:36	0.014
522	24-Jul	17:41:36	0.015
523	24-Jul	17:42:36	0.014
524	24-Jul	17:43:36	0.017
525	24-Jul	17:44:36	0.041
526	24-Jul	17:45:36	0.063
527	24-Jul	17:46:36	0.036
528	24-Jul	17:47:36	0.025
529	24-Jul	17:48:36	0.024
530	24-Jul	17:49:36	0.026
531	24-Jul	17:50:36	0.025
532	24-Jul	17:51:36	0.024
533	24-Jul	17:52:36	0.026
534	24-Jul	17:53:36	0.026

pDR ID: 143116
Tag Number: 08
Number of logged points: 492
Start time and date: 08:23:48 25-Jul
Elapsed time: 08:12:00
Logging period (sec): 60
Calibration Factor (%): 100
Max Display Concentration: 0.304 mg/m3
Time at maximum: 11:11:18 Jul 25
Max STEL Concentration: 0.061 mg/m3
Time at max STEL: 11:15:19 Jul 25
Overall Avg Conc: 0.023 mg/m3
Logged Data:

Point	Date	Time	Avg.(mg/m3)
1	25-Jul	08:24:48	0.011
2	25-Jul	08:25:48	0
3	25-Jul	08:26:48	0
4	25-Jul	08:27:48	0
5	25-Jul	08:28:48	0.002
6	25-Jul	08:29:48	0.002
7	25-Jul	08:30:48	0.001
8	25-Jul	08:31:48	0.019
9	25-Jul	08:32:48	0.006
10	25-Jul	08:33:48	0.006
11	25-Jul	08:34:48	0
12	25-Jul	08:35:48	0
13	25-Jul	08:36:48	0
14	25-Jul	08:37:48	0.001
15	25-Jul	08:38:48	0.001
16	25-Jul	08:39:48	0.002
17	25-Jul	08:40:48	0.003
18	25-Jul	08:41:48	0.009
19	25-Jul	08:42:48	0.004
20	25-Jul	08:43:48	0.005
21	25-Jul	08:44:48	0.006
22	25-Jul	08:45:48	0.008
23	25-Jul	08:46:48	0.015
24	25-Jul	08:47:48	0.019
25	25-Jul	08:48:48	0.005
26	25-Jul	08:49:48	0.012
27	25-Jul	08:50:48	0.013
28	25-Jul	08:51:48	0.022
29	25-Jul	08:52:48	0.026
30	25-Jul	08:53:48	0.005
31	25-Jul	08:54:48	0.005
32	25-Jul	08:55:48	0.005
33	25-Jul	08:56:48	0.004

34	25-Jul	08:57:48	0.006
35	25-Jul	08:58:48	0.002
36	25-Jul	08:59:48	0.003
37	25-Jul	09:00:48	0.004
38	25-Jul	09:01:48	0.034
39	25-Jul	09:02:48	0.036
40	25-Jul	09:03:48	0.022
41	25-Jul	09:04:48	0.046
42	25-Jul	09:05:48	0.023
43	25-Jul	09:06:48	0.044
44	25-Jul	09:07:48	0.07
45	25-Jul	09:08:48	0.029
46	25-Jul	09:09:48	0.023
47	25-Jul	09:10:48	0.027
48	25-Jul	09:11:48	0.028
49	25-Jul	09:12:48	0.021
50	25-Jul	09:13:48	0.022
51	25-Jul	09:14:48	0.021
52	25-Jul	09:15:48	0.021
53	25-Jul	09:16:48	0.023
54	25-Jul	09:17:48	0.021
55	25-Jul	09:18:48	0.02
56	25-Jul	09:19:48	0.023
57	25-Jul	09:20:48	0.025
58	25-Jul	09:21:48	0.026
59	25-Jul	09:22:48	0.018
60	25-Jul	09:23:48	0.023
61	25-Jul	09:24:48	0.018
62	25-Jul	09:25:48	0.019
63	25-Jul	09:26:48	0.014
64	25-Jul	09:27:48	0.013
65	25-Jul	09:28:48	0.011
66	25-Jul	09:29:48	0.013
67	25-Jul	09:30:48	0.015
68	25-Jul	09:31:48	0.016
69	25-Jul	09:32:48	0.013
70	25-Jul	09:33:48	0.013
71	25-Jul	09:34:48	0.013
72	25-Jul	09:35:48	0.013
73	25-Jul	09:36:48	0.012
74	25-Jul	09:37:48	0.009
75	25-Jul	09:38:48	0.009
76	25-Jul	09:39:48	0.01
77	25-Jul	09:40:48	0.009
78	25-Jul	09:41:48	0.01
79	25-Jul	09:42:48	0.021
80	25-Jul	09:43:48	0.021

81	25-Jul	09:44:48	0.022
82	25-Jul	09:45:48	0.021
83	25-Jul	09:46:48	0.022
84	25-Jul	09:47:48	0.022
85	25-Jul	09:48:48	0.023
86	25-Jul	09:49:48	0.023
87	25-Jul	09:50:48	0.023
88	25-Jul	09:51:48	0.021
89	25-Jul	09:52:48	0.02
90	25-Jul	09:53:48	0.02
91	25-Jul	09:54:48	0.021
92	25-Jul	09:55:48	0.023
93	25-Jul	09:56:48	0.022
94	25-Jul	09:57:48	0.023
95	25-Jul	09:58:48	0.023
96	25-Jul	09:59:48	0.024
97	25-Jul	10:00:48	0.025
98	25-Jul	10:01:48	0.021
99	25-Jul	10:02:48	0.022
100	25-Jul	10:03:48	0.021
101	25-Jul	10:04:48	0.023
102	25-Jul	10:05:48	0.02
103	25-Jul	10:06:48	0.019
104	25-Jul	10:07:48	0.019
105	25-Jul	10:08:48	0.018
106	25-Jul	10:09:48	0.021
107	25-Jul	10:10:48	0.021
108	25-Jul	10:11:48	0.022
109	25-Jul	10:12:48	0.023
110	25-Jul	10:13:48	0.022
111	25-Jul	10:14:48	0.022
112	25-Jul	10:15:48	0.021
113	25-Jul	10:16:48	0.021
114	25-Jul	10:17:48	0.023
115	25-Jul	10:18:48	0.027
116	25-Jul	10:19:48	0.024
117	25-Jul	10:20:48	0.021
118	25-Jul	10:21:48	0.021
119	25-Jul	10:22:48	0.031
120	25-Jul	10:23:48	0.024
121	25-Jul	10:24:48	0.03
122	25-Jul	10:25:48	0.023
123	25-Jul	10:26:48	0.023
124	25-Jul	10:27:48	0.022
125	25-Jul	10:28:48	0.02
126	25-Jul	10:29:48	0.025
127	25-Jul	10:30:48	0.02

128	25-Jul	10:31:48	0.035
129	25-Jul	10:32:48	0.042
130	25-Jul	10:33:48	0.025
131	25-Jul	10:34:48	0.023
132	25-Jul	10:35:48	0.021
133	25-Jul	10:36:48	0.021
134	25-Jul	10:37:48	0.016
135	25-Jul	10:38:48	0.007
136	25-Jul	10:39:48	0.011
137	25-Jul	10:40:48	0.02
138	25-Jul	10:41:48	0.022
139	25-Jul	10:42:48	0.027
140	25-Jul	10:43:48	0.013
141	25-Jul	10:44:48	0.01
142	25-Jul	10:45:48	0.006
143	25-Jul	10:46:48	0.013
144	25-Jul	10:47:48	0.023
145	25-Jul	10:48:48	0.018
146	25-Jul	10:49:48	0.015
147	25-Jul	10:50:48	0.017
148	25-Jul	10:51:48	0.021
149	25-Jul	10:52:48	0.02
150	25-Jul	10:53:48	0.023
151	25-Jul	10:54:48	0.013
152	25-Jul	10:55:48	0.006
153	25-Jul	10:56:48	0.076
154	25-Jul	10:57:48	0.101
155	25-Jul	10:58:48	0.026
156	25-Jul	10:59:48	0.02
157	25-Jul	11:00:48	0.071
158	25-Jul	11:01:48	0.057
159	25-Jul	11:02:48	0.036
160	25-Jul	11:03:48	0.02
161	25-Jul	11:04:48	0.018
162	25-Jul	11:05:48	0.02
163	25-Jul	11:06:48	0.023
164	25-Jul	11:07:48	0.032
165	25-Jul	11:08:48	0.038
166	25-Jul	11:09:48	0.026
167	25-Jul	11:10:48	0.131
168	25-Jul	11:11:48	0.201
169	25-Jul	11:12:48	0.062
170	25-Jul	11:13:48	0.064
171	25-Jul	11:14:48	0.102
172	25-Jul	11:15:48	0.034
173	25-Jul	11:16:48	0.033
174	25-Jul	11:17:48	0.025

175	25-Jul	11:18:48	0.024
176	25-Jul	11:19:48	0.036
177	25-Jul	11:20:48	0.03
178	25-Jul	11:21:48	0.021
179	25-Jul	11:22:48	0.026
180	25-Jul	11:23:48	0.031
181	25-Jul	11:24:48	0.025
182	25-Jul	11:25:48	0.022
183	25-Jul	11:26:48	0.028
184	25-Jul	11:27:48	0.022
185	25-Jul	11:28:48	0.022
186	25-Jul	11:29:48	0.022
187	25-Jul	11:30:48	0.019
188	25-Jul	11:31:48	0.057
189	25-Jul	11:32:48	0.02
190	25-Jul	11:33:48	0.019
191	25-Jul	11:34:48	0.027
192	25-Jul	11:35:48	0.015
193	25-Jul	11:36:48	0.015
194	25-Jul	11:37:48	0.019
195	25-Jul	11:38:48	0.019
196	25-Jul	11:39:48	0.019
197	25-Jul	11:40:48	0.035
198	25-Jul	11:41:48	0.076
199	25-Jul	11:42:48	0.129
200	25-Jul	11:43:48	0.025
201	25-Jul	11:44:48	0.023
202	25-Jul	11:45:48	0.021
203	25-Jul	11:46:48	0.02
204	25-Jul	11:47:48	0.021
205	25-Jul	11:48:48	0.021
206	25-Jul	11:49:48	0.021
207	25-Jul	11:50:48	0.02
208	25-Jul	11:51:48	0.025
209	25-Jul	11:52:48	0.024
210	25-Jul	11:53:48	0.021
211	25-Jul	11:54:48	0.022
212	25-Jul	11:55:48	0.027
213	25-Jul	11:56:48	0.024
214	25-Jul	11:57:48	0.027
215	25-Jul	11:58:48	0.026
216	25-Jul	11:59:48	0.019
217	25-Jul	12:00:48	0.017
218	25-Jul	12:01:48	0.023
219	25-Jul	12:02:48	0.018
220	25-Jul	12:03:48	0.015
221	25-Jul	12:04:48	0.019

222	25-Jul	12:05:48	0.018
223	25-Jul	12:06:48	0.019
224	25-Jul	12:07:48	0.021
225	25-Jul	12:08:48	0.021
226	25-Jul	12:09:48	0.022
227	25-Jul	12:10:48	0.021
228	25-Jul	12:11:48	0.02
229	25-Jul	12:12:48	0.021
230	25-Jul	12:13:48	0.024
231	25-Jul	12:14:48	0.021
232	25-Jul	12:15:48	0.02
233	25-Jul	12:16:48	0.02
234	25-Jul	12:17:48	0.02
235	25-Jul	12:18:48	0.019
236	25-Jul	12:19:48	0.021
237	25-Jul	12:20:48	0.02
238	25-Jul	12:21:48	0.018
239	25-Jul	12:22:48	0.019
240	25-Jul	12:23:48	0.017
241	25-Jul	12:24:48	0.022
242	25-Jul	12:25:48	0.023
243	25-Jul	12:26:48	0.027
244	25-Jul	12:27:48	0.024
245	25-Jul	12:28:48	0.024
246	25-Jul	12:29:48	0.024
247	25-Jul	12:30:48	0.028
248	25-Jul	12:31:48	0.024
249	25-Jul	12:32:48	0.023
250	25-Jul	12:33:48	0.025
251	25-Jul	12:34:48	0.024
252	25-Jul	12:35:48	0.023
253	25-Jul	12:36:48	0.023
254	25-Jul	12:37:48	0.027
255	25-Jul	12:38:48	0.027
256	25-Jul	12:39:48	0.025
257	25-Jul	12:40:48	0.024
258	25-Jul	12:41:48	0.025
259	25-Jul	12:42:48	0.025
260	25-Jul	12:43:48	0.033
261	25-Jul	12:44:48	0.031
262	25-Jul	12:45:48	0.029
263	25-Jul	12:46:48	0.026
264	25-Jul	12:47:48	0.026
265	25-Jul	12:48:48	0.027
266	25-Jul	12:49:48	0.026
267	25-Jul	12:50:48	0.025
268	25-Jul	12:51:48	0.04

269	25-Jul	12:52:48	0.031
270	25-Jul	12:53:48	0.038
271	25-Jul	12:54:48	0.04
272	25-Jul	12:55:48	0.067
273	25-Jul	12:56:48	0.025
274	25-Jul	12:57:48	0.024
275	25-Jul	12:58:48	0.024
276	25-Jul	12:59:48	0.031
277	25-Jul	13:00:48	0.035
278	25-Jul	13:01:48	0.025
279	25-Jul	13:02:48	0.029
280	25-Jul	13:03:48	0.026
281	25-Jul	13:04:48	0.024
282	25-Jul	13:05:48	0.026
283	25-Jul	13:06:48	0.027
284	25-Jul	13:07:48	0.025
285	25-Jul	13:08:48	0.025
286	25-Jul	13:09:48	0.028
287	25-Jul	13:10:48	0.025
288	25-Jul	13:11:48	0.024
289	25-Jul	13:12:48	0.025
290	25-Jul	13:13:48	0.023
291	25-Jul	13:14:48	0.024
292	25-Jul	13:15:48	0.024
293	25-Jul	13:16:48	0.011
294	25-Jul	13:17:48	0.009
295	25-Jul	13:18:48	0.009
296	25-Jul	13:19:48	0.014
297	25-Jul	13:20:48	0.006
298	25-Jul	13:21:48	0.007
299	25-Jul	13:22:48	0.004
300	25-Jul	13:23:48	0.023
301	25-Jul	13:24:48	0.022
302	25-Jul	13:25:48	0.023
303	25-Jul	13:26:48	0.022
304	25-Jul	13:27:48	0.021
305	25-Jul	13:28:48	0.021
306	25-Jul	13:29:48	0.023
307	25-Jul	13:30:48	0.025
308	25-Jul	13:31:48	0.029
309	25-Jul	13:32:48	0.022
310	25-Jul	13:33:48	0.041
311	25-Jul	13:34:48	0.023
312	25-Jul	13:35:48	0.022
313	25-Jul	13:36:48	0.022
314	25-Jul	13:37:48	0.022
315	25-Jul	13:38:48	0.021

316	25-Jul	13:39:48	0.022
317	25-Jul	13:40:48	0.022
318	25-Jul	13:41:48	0.038
319	25-Jul	13:42:48	0.045
320	25-Jul	13:43:48	0.033
321	25-Jul	13:44:48	0.027
322	25-Jul	13:45:48	0.021
323	25-Jul	13:46:48	0.021
324	25-Jul	13:47:48	0.022
325	25-Jul	13:48:48	0.023
326	25-Jul	13:49:48	0.021
327	25-Jul	13:50:48	0.02
328	25-Jul	13:51:48	0.022
329	25-Jul	13:52:48	0.021
330	25-Jul	13:53:48	0.024
331	25-Jul	13:54:48	0.025
332	25-Jul	13:55:48	0.105
333	25-Jul	13:56:48	0.046
334	25-Jul	13:57:48	0.067
335	25-Jul	13:58:48	0.053
336	25-Jul	13:59:48	0.04
337	25-Jul	14:00:48	0.025
338	25-Jul	14:01:48	0.03
339	25-Jul	14:02:48	0.028
340	25-Jul	14:03:48	0.026
341	25-Jul	14:04:48	0.022
342	25-Jul	14:05:48	0.023
343	25-Jul	14:06:48	0.023
344	25-Jul	14:07:48	0.025
345	25-Jul	14:08:48	0.023
346	25-Jul	14:09:48	0.037
347	25-Jul	14:10:48	0.025
348	25-Jul	14:11:48	0.045
349	25-Jul	14:12:48	0.048
350	25-Jul	14:13:48	0.03
351	25-Jul	14:14:48	0.021
352	25-Jul	14:15:48	0.021
353	25-Jul	14:16:48	0.022
354	25-Jul	14:17:48	0.022
355	25-Jul	14:18:48	0.023
356	25-Jul	14:19:48	0.022
357	25-Jul	14:20:48	0.02
358	25-Jul	14:21:48	0.02
359	25-Jul	14:22:48	0.018
360	25-Jul	14:23:48	0.018
361	25-Jul	14:24:48	0.018
362	25-Jul	14:25:48	0.018

363	25-Jul	14:26:48	0.018
364	25-Jul	14:27:48	0.018
365	25-Jul	14:28:48	0.019
366	25-Jul	14:29:48	0.018
367	25-Jul	14:30:48	0.017
368	25-Jul	14:31:48	0.017
369	25-Jul	14:32:48	0.018
370	25-Jul	14:33:48	0.018
371	25-Jul	14:34:48	0.018
372	25-Jul	14:35:48	0.018
373	25-Jul	14:36:48	0.02
374	25-Jul	14:37:48	0.017
375	25-Jul	14:38:48	0.017
376	25-Jul	14:39:48	0.017
377	25-Jul	14:40:48	0.016
378	25-Jul	14:41:48	0.018
379	25-Jul	14:42:48	0.019
380	25-Jul	14:43:48	0.017
381	25-Jul	14:44:48	0.016
382	25-Jul	14:45:48	0.016
383	25-Jul	14:46:48	0.016
384	25-Jul	14:47:48	0.017
385	25-Jul	14:48:48	0.021
386	25-Jul	14:49:48	0.017
387	25-Jul	14:50:48	0.017
388	25-Jul	14:51:48	0.017
389	25-Jul	14:52:48	0.017
390	25-Jul	14:53:48	0.016
391	25-Jul	14:54:48	0.017
392	25-Jul	14:55:48	0.016
393	25-Jul	14:56:48	0.016
394	25-Jul	14:57:48	0.016
395	25-Jul	14:58:48	0.016
396	25-Jul	14:59:48	0.018
397	25-Jul	15:00:48	0.015
398	25-Jul	15:01:48	0.016
399	25-Jul	15:02:48	0.015
400	25-Jul	15:03:48	0.018
401	25-Jul	15:04:48	0.017
402	25-Jul	15:05:48	0.018
403	25-Jul	15:06:48	0.018
404	25-Jul	15:07:48	0.018
405	25-Jul	15:08:48	0.018
406	25-Jul	15:09:48	0.018
407	25-Jul	15:10:48	0.019
408	25-Jul	15:11:48	0.02
409	25-Jul	15:12:48	0.018

410	25-Jul	15:13:48	0.017
411	25-Jul	15:14:48	0.018
412	25-Jul	15:15:48	0.018
413	25-Jul	15:16:48	0.019
414	25-Jul	15:17:48	0.02
415	25-Jul	15:18:48	0.022
416	25-Jul	15:19:48	0.022
417	25-Jul	15:20:48	0.023
418	25-Jul	15:21:48	0.022
419	25-Jul	15:22:48	0.022
420	25-Jul	15:23:48	0.021
421	25-Jul	15:24:48	0.02
422	25-Jul	15:25:48	0.022
423	25-Jul	15:26:48	0.02
424	25-Jul	15:27:48	0.02
425	25-Jul	15:28:48	0.02
426	25-Jul	15:29:48	0.022
427	25-Jul	15:30:48	0.02
428	25-Jul	15:31:48	0.02
429	25-Jul	15:32:48	0.019
430	25-Jul	15:33:48	0.019
431	25-Jul	15:34:48	0.02
432	25-Jul	15:35:48	0.019
433	25-Jul	15:36:48	0.02
434	25-Jul	15:37:48	0.019
435	25-Jul	15:38:48	0.02
436	25-Jul	15:39:48	0.02
437	25-Jul	15:40:48	0.023
438	25-Jul	15:41:48	0.023
439	25-Jul	15:42:48	0.024
440	25-Jul	15:43:48	0.023
441	25-Jul	15:44:48	0.025
442	25-Jul	15:45:48	0.027
443	25-Jul	15:46:48	0.074
444	25-Jul	15:47:48	0.103
445	25-Jul	15:48:48	0.031
446	25-Jul	15:49:48	0.013
447	25-Jul	15:50:48	0.019
448	25-Jul	15:51:48	0.022
449	25-Jul	15:52:48	0.025
450	25-Jul	15:53:48	0.024
451	25-Jul	15:54:48	0.054
452	25-Jul	15:55:48	0.067
453	25-Jul	15:56:48	0.075
454	25-Jul	15:57:48	0.036
455	25-Jul	15:58:48	0.044
456	25-Jul	15:59:48	0.044

457	25-Jul	16:00:48	0.026
458	25-Jul	16:01:48	0.025
459	25-Jul	16:02:48	0.024
460	25-Jul	16:03:48	0.019
461	25-Jul	16:04:48	0.026
462	25-Jul	16:05:48	0.026
463	25-Jul	16:06:48	0.029
464	25-Jul	16:07:48	0.043
465	25-Jul	16:08:48	0.024
466	25-Jul	16:09:48	0.022
467	25-Jul	16:10:48	0.021
468	25-Jul	16:11:48	0.02
469	25-Jul	16:12:48	0.021
470	25-Jul	16:13:48	0.021
471	25-Jul	16:14:48	0.02
472	25-Jul	16:15:48	0.021
473	25-Jul	16:16:48	0.022
474	25-Jul	16:17:48	0.021
475	25-Jul	16:18:48	0.02
476	25-Jul	16:19:48	0.021
477	25-Jul	16:20:48	0.021
478	25-Jul	16:21:48	0.021
479	25-Jul	16:22:48	0.02
480	25-Jul	16:23:48	0.021
481	25-Jul	16:24:48	0.021
482	25-Jul	16:25:48	0.02
483	25-Jul	16:26:48	0.022
484	25-Jul	16:27:48	0.021
485	25-Jul	16:28:48	0.022
486	25-Jul	16:29:48	0.02
487	25-Jul	16:30:48	0.021
488	25-Jul	16:31:48	0.02
489	25-Jul	16:32:48	0.02
490	25-Jul	16:33:48	0.019
491	25-Jul	16:34:48	0.022
492	25-Jul	16:35:48	0.026

unit143116july26afternoon

pDR ID: 143116
Tag Number: 10
Number of logged points: 243
Start time and date: 14:26:46 26-Jul
Elapsed time: 04:03:00
Logging period (sec): 60
Calibration Factor (%): 100
Max Display Concentration: 0.519 mg/m3
Time at maximum: 16:42:03 Jul 26
Max STEL Concentration: 0.050 mg/m3
Time at max STEL: 16:56:17 Jul 26
Overall Avg Conc: 0.015 mg/m3
Logged Data:

Point	Date	Time	Avg.(mg/m3)
1	26 Jul	14:27:46	0.006
2	26 Jul	14:28:46	0.018
3	26 Jul	14:29:46	0.017
4	26 Jul	14:30:46	0.005
5	26 Jul	14:31:46	0.003
6	26 Jul	14:32:46	0.004
7	26 Jul	14:33:46	0.003
8	26 Jul	14:34:46	0.001
9	26 Jul	14:35:46	0.001
10	26 Jul	14:36:46	0.002
11	26 Jul	14:37:46	0.005
12	26 Jul	14:38:46	0.005
13	26 Jul	14:39:46	0.005
14	26 Jul	14:40:46	0.010
15	26 Jul	14:41:46	0.017
16	26 Jul	14:42:46	0.010
17	26 Jul	14:43:46	0.006
18	26 Jul	14:44:46	0.013
19	26 Jul	14:45:46	0.014
20	26 Jul	14:46:46	0.008
21	26 Jul	14:47:46	0.005
22	26 Jul	14:48:46	0.005
23	26 Jul	14:49:46	0.004
24	26 Jul	14:50:46	0.001
25	26 Jul	14:51:46	0.006
26	26 Jul	14:52:46	0.009
27	26 Jul	14:53:46	0.002
28	26 Jul	14:54:46	0.035
29	26 Jul	14:55:46	0.020
30	26 Jul	14:56:46	0.002
31	26 Jul	14:57:46	0.003
32	26 Jul	14:58:46	0.003
33	26 Jul	14:59:46	0.005
34	26 Jul	15:00:46	0.003
35	26 Jul	15:01:46	0.006
36	26 Jul	15:02:46	0.004
37	26 Jul	15:03:46	0.006
38	26 Jul	15:04:46	0.003
39	26 Jul	15:05:46	0.002
40	26 Jul	15:06:46	0.005
41	26 Jul	15:07:46	0.002
42	26 Jul	15:08:46	0.002
43	26 Jul	15:09:46	0.004
44	26 Jul	15:10:46	0.003
45	26 Jul	15:11:46	0.002
46	26 Jul	15:12:46	0.004
47	26 Jul	15:13:46	0.004
48	26 Jul	15:14:46	0.005
49	26 Jul	15:15:46	0.004

50,	26	Jul,	15:16:46,	0.005
51,	26	Jul,	15:17:46,	0.005
52,	26	Jul,	15:18:46,	0.008
53,	26	Jul,	15:19:46,	0.004
54,	26	Jul,	15:20:46,	0.004
55,	26	Jul,	15:21:46,	0.001
56,	26	Jul,	15:22:46,	0.003
57,	26	Jul,	15:23:46,	0.007
58,	26	Jul,	15:24:46,	0.007
59,	26	Jul,	15:25:46,	0.004
60,	26	Jul,	15:26:46,	0.004
61,	26	Jul,	15:27:46,	0.007
62,	26	Jul,	15:28:46,	0.003
63,	26	Jul,	15:29:46,	0.031
64,	26	Jul,	15:30:46,	0.007
65,	26	Jul,	15:31:46,	0.005
66,	26	Jul,	15:32:46,	0.004
67,	26	Jul,	15:33:46,	0.009
68,	26	Jul,	15:34:46,	0.004
69,	26	Jul,	15:35:46,	0.003
70,	26	Jul,	15:36:46,	0.003
71,	26	Jul,	15:37:46,	0.006
72,	26	Jul,	15:38:46,	0.004
73,	26	Jul,	15:39:46,	0.003
74,	26	Jul,	15:40:46,	0.004
75,	26	Jul,	15:41:46,	0.004
76,	26	Jul,	15:42:46,	0.004
77,	26	Jul,	15:43:46,	0.004
78,	26	Jul,	15:44:46,	0.005
79,	26	Jul,	15:45:46,	0.004
80,	26	Jul,	15:46:46,	0.005
81,	26	Jul,	15:47:46,	0.004
82,	26	Jul,	15:48:46,	0.004
83,	26	Jul,	15:49:46,	0.002
84,	26	Jul,	15:50:46,	0.006
85,	26	Jul,	15:51:46,	0.004
86,	26	Jul,	15:52:46,	0.004
87,	26	Jul,	15:53:46,	0.005
88,	26	Jul,	15:54:46,	0.006
89,	26	Jul,	15:55:46,	0.004
90,	26	Jul,	15:56:46,	0.006
91,	26	Jul,	15:57:46,	0.003
92,	26	Jul,	15:58:46,	0.003
93,	26	Jul,	15:59:46,	0.004
94,	26	Jul,	16:00:46,	0.019
95,	26	Jul,	16:01:46,	0.008
96,	26	Jul,	16:02:46,	0.018
97,	26	Jul,	16:03:46,	0.003
98,	26	Jul,	16:04:46,	0.004
99,	26	Jul,	16:05:46,	0.007
100,	26	Jul,	16:06:46,	0.002
101,	26	Jul,	16:07:46,	0.003
102,	26	Jul,	16:08:46,	0.004
103,	26	Jul,	16:09:46,	0.005
104,	26	Jul,	16:10:46,	0.002
105,	26	Jul,	16:11:46,	0.003
106,	26	Jul,	16:12:46,	0.004
107,	26	Jul,	16:13:46,	0.001
108,	26	Jul,	16:14:46,	0.001
109,	26	Jul,	16:15:46,	0.038
110,	26	Jul,	16:16:46,	0.001
111,	26	Jul,	16:17:46,	0.003
112,	26	Jul,	16:18:46,	0.001

113,	26	Jul,	16:19:46,	0.002
114,	26	Jul,	16:20:46,	0.002
115,	26	Jul,	16:21:46,	0.004
116,	26	Jul,	16:22:46,	0.003
117,	26	Jul,	16:23:46,	0.003
118,	26	Jul,	16:24:46,	0.001
119,	26	Jul,	16:25:46,	0.001
120,	26	Jul,	16:26:46,	0.001
121,	26	Jul,	16:27:46,	0.006
122,	26	Jul,	16:28:46,	0.003
123,	26	Jul,	16:29:46,	0.003
124,	26	Jul,	16:30:46,	0.003
125,	26	Jul,	16:31:46,	0.003
126,	26	Jul,	16:32:46,	0.003
127,	26	Jul,	16:33:46,	0.002
128,	26	Jul,	16:34:46,	0.004
129,	26	Jul,	16:35:46,	0.008
130,	26	Jul,	16:36:46,	0.007
131,	26	Jul,	16:37:46,	0.007
132,	26	Jul,	16:38:46,	0.002
133,	26	Jul,	16:39:46,	0.005
134,	26	Jul,	16:40:46,	0.013
135,	26	Jul,	16:41:46,	0.055
136,	26	Jul,	16:42:46,	0.468
137,	26	Jul,	16:43:46,	0.009
138,	26	Jul,	16:44:46,	0.006
139,	26	Jul,	16:45:46,	0.003
140,	26	Jul,	16:46:46,	0.012
141,	26	Jul,	16:47:46,	0.018
142,	26	Jul,	16:48:46,	0.015
143,	26	Jul,	16:49:46,	0.016
144,	26	Jul,	16:50:46,	0.032
145,	26	Jul,	16:51:46,	0.021
146,	26	Jul,	16:52:46,	0.021
147,	26	Jul,	16:53:46,	0.027
148,	26	Jul,	16:54:46,	0.019
149,	26	Jul,	16:55:46,	0.019
150,	26	Jul,	16:56:46,	0.022
151,	26	Jul,	16:57:46,	0.022
152,	26	Jul,	16:58:46,	0.021
153,	26	Jul,	16:59:46,	0.030
154,	26	Jul,	17:00:46,	0.032
155,	26	Jul,	17:01:46,	0.020
156,	26	Jul,	17:02:46,	0.019
157,	26	Jul,	17:03:46,	0.025
158,	26	Jul,	17:04:46,	0.019
159,	26	Jul,	17:05:46,	0.035
160,	26	Jul,	17:06:46,	0.014
161,	26	Jul,	17:07:46,	0.029
162,	26	Jul,	17:08:46,	0.021
163,	26	Jul,	17:09:46,	0.025
164,	26	Jul,	17:10:46,	0.036
165,	26	Jul,	17:11:46,	0.031
166,	26	Jul,	17:12:46,	0.030
167,	26	Jul,	17:13:46,	0.029
168,	26	Jul,	17:14:46,	0.031
169,	26	Jul,	17:15:46,	0.026
170,	26	Jul,	17:16:46,	0.027
171,	26	Jul,	17:17:46,	0.023
172,	26	Jul,	17:18:46,	0.021
173,	26	Jul,	17:19:46,	0.028
174,	26	Jul,	17:20:46,	0.029
175,	26	Jul,	17:21:46,	0.022

176,	26	Jul,	17:22:46,	0.021
177,	26	Jul,	17:23:46,	0.021
178,	26	Jul,	17:24:46,	0.021
179,	26	Jul,	17:25:46,	0.022
180,	26	Jul,	17:26:46,	0.022
181,	26	Jul,	17:27:46,	0.021
182,	26	Jul,	17:28:46,	0.021
183,	26	Jul,	17:29:46,	0.022
184,	26	Jul,	17:30:46,	0.022
185,	26	Jul,	17:31:46,	0.021
186,	26	Jul,	17:32:46,	0.024
187,	26	Jul,	17:33:46,	0.024
188,	26	Jul,	17:34:46,	0.029
189,	26	Jul,	17:35:46,	0.024
190,	26	Jul,	17:36:46,	0.052
191,	26	Jul,	17:37:46,	0.026
192,	26	Jul,	17:38:46,	0.027
193,	26	Jul,	17:39:46,	0.026
194,	26	Jul,	17:40:46,	0.025
195,	26	Jul,	17:41:46,	0.025
196,	26	Jul,	17:42:46,	0.023
197,	26	Jul,	17:43:46,	0.022
198,	26	Jul,	17:44:46,	0.024
199,	26	Jul,	17:45:46,	0.024
200,	26	Jul,	17:46:46,	0.024
201,	26	Jul,	17:47:46,	0.023
202,	26	Jul,	17:48:46,	0.027
203,	26	Jul,	17:49:46,	0.025
204,	26	Jul,	17:50:46,	0.022
205,	26	Jul,	17:51:46,	0.047
206,	26	Jul,	17:52:46,	0.025
207,	26	Jul,	17:53:46,	0.024
208,	26	Jul,	17:54:46,	0.025
209,	26	Jul,	17:55:46,	0.024
210,	26	Jul,	17:56:46,	0.027
211,	26	Jul,	17:57:46,	0.025
212,	26	Jul,	17:58:46,	0.022
213,	26	Jul,	17:59:46,	0.023
214,	26	Jul,	18:00:46,	0.023
215,	26	Jul,	18:01:46,	0.023
216,	26	Jul,	18:02:46,	0.024
217,	26	Jul,	18:03:46,	0.022
218,	26	Jul,	18:04:46,	0.023
219,	26	Jul,	18:05:46,	0.024
220,	26	Jul,	18:06:46,	0.024
221,	26	Jul,	18:07:46,	0.029
222,	26	Jul,	18:08:46,	0.024
223,	26	Jul,	18:09:46,	0.032
224,	26	Jul,	18:10:46,	0.023
225,	26	Jul,	18:11:46,	0.025
226,	26	Jul,	18:12:46,	0.023
227,	26	Jul,	18:13:46,	0.024
228,	26	Jul,	18:14:46,	0.023
229,	26	Jul,	18:15:46,	0.026
230,	26	Jul,	18:16:46,	0.023
231,	26	Jul,	18:17:46,	0.027
232,	26	Jul,	18:18:46,	0.024
233,	26	Jul,	18:19:46,	0.023
234,	26	Jul,	18:20:46,	0.024
235,	26	Jul,	18:21:46,	0.024
236,	26	Jul,	18:22:46,	0.022
237,	26	Jul,	18:23:46,	0.024
238,	26	Jul,	18:24:46,	0.023

239, 26 Jul, 18:25:46, 0.022
240, 26 Jul, 18:26:46, 0.024
241, 26 Jul, 18:27:46, 0.023
242, 26 Jul, 18:28:46, 0.022
243, 26 Jul, 18:29:46, 0.051

pDR ID: 143116
Tag Number: 09
Number of logged points: 437
Start time and date: 07:04:28 26-Jul
Elapsed time: 07:17:00
Logging period (sec): 60
Calibration Factor (%): 100
Max Display Concentration: 0.073 mg/m3
Time at maximum: 13:10:33 Jul 26
Max STEL Concentration: 0.037 mg/m3
Time at max STEL: 13:14:59 Jul 26
Overall Avg Conc: 0.023 mg/m3
Logged Data:

Point	Date	Time	Avg.(mg/m3)
1	26-Jul	07:05:28	0.017
2	26-Jul	07:06:28	0.017
3	26-Jul	07:07:28	0.017
4	26-Jul	07:08:28	0.016
5	26-Jul	07:09:28	0.019
6	26-Jul	07:10:28	0.018
7	26-Jul	07:11:28	0.015
8	26-Jul	07:12:28	0.014
9	26-Jul	07:13:28	0.013
10	26-Jul	07:14:28	0.011
11	26-Jul	07:15:28	0.014
12	26-Jul	07:16:28	0.015
13	26-Jul	07:17:28	0.019
14	26-Jul	07:18:28	0.015
15	26-Jul	07:19:28	0.014
16	26-Jul	07:20:28	0.015
17	26-Jul	07:21:28	0.015
18	26-Jul	07:22:28	0.016
19	26-Jul	07:23:28	0.013
20	26-Jul	07:24:28	0.017
21	26-Jul	07:25:28	0.018
22	26-Jul	07:26:28	0.015
23	26-Jul	07:27:28	0.014
24	26-Jul	07:28:28	0.014
25	26-Jul	07:29:28	0.013
26	26-Jul	07:30:28	0.014
27	26-Jul	07:31:28	0.01
28	26-Jul	07:32:28	0.011
29	26-Jul	07:33:28	0.01
30	26-Jul	07:34:28	0.011
31	26-Jul	07:35:28	0.011
32	26-Jul	07:36:28	0.013
33	26-Jul	07:37:28	0.012

34	26-Jul	07:38:28	0.017
35	26-Jul	07:39:28	0.013
36	26-Jul	07:40:28	0.013
37	26-Jul	07:41:28	0.015
38	26-Jul	07:42:28	0.016
39	26-Jul	07:43:28	0.013
40	26-Jul	07:44:28	0.013
41	26-Jul	07:45:28	0.011
42	26-Jul	07:46:28	0.011
43	26-Jul	07:47:28	0.01
44	26-Jul	07:48:28	0.01
45	26-Jul	07:49:28	0.011
46	26-Jul	07:50:28	0.014
47	26-Jul	07:51:28	0.013
48	26-Jul	07:52:28	0.01
49	26-Jul	07:53:28	0.008
50	26-Jul	07:54:28	0.005
51	26-Jul	07:55:28	0.005
52	26-Jul	07:56:28	0.005
53	26-Jul	07:57:28	0.005
54	26-Jul	07:58:28	0.007
55	26-Jul	07:59:28	0.011
56	26-Jul	08:00:28	0.011
57	26-Jul	08:01:28	0.01
58	26-Jul	08:02:28	0.01
59	26-Jul	08:03:28	0.009
60	26-Jul	08:04:28	0.005
61	26-Jul	08:05:28	0.009
62	26-Jul	08:06:28	0.015
63	26-Jul	08:07:28	0.014
64	26-Jul	08:08:28	0.01
65	26-Jul	08:09:28	0.011
66	26-Jul	08:10:28	0.013
67	26-Jul	08:11:28	0.009
68	26-Jul	08:12:28	0.011
69	26-Jul	08:13:28	0.011
70	26-Jul	08:14:28	0.016
71	26-Jul	08:15:28	0.011
72	26-Jul	08:16:28	0.008
73	26-Jul	08:17:28	0.012
74	26-Jul	08:18:28	0.013
75	26-Jul	08:19:28	0.015
76	26-Jul	08:20:28	0.014
77	26-Jul	08:21:28	0.015
78	26-Jul	08:22:28	0.019
79	26-Jul	08:23:28	0.017
80	26-Jul	08:24:28	0.009

81	26-Jul	08:25:28	0.01
82	26-Jul	08:26:28	0.01
83	26-Jul	08:27:28	0.009
84	26-Jul	08:28:28	0.008
85	26-Jul	08:29:28	0.01
86	26-Jul	08:30:28	0.016
87	26-Jul	08:31:28	0.012
88	26-Jul	08:32:28	0.013
89	26-Jul	08:33:28	0.01
90	26-Jul	08:34:28	0.011
91	26-Jul	08:35:28	0.014
92	26-Jul	08:36:28	0.007
93	26-Jul	08:37:28	0.014
94	26-Jul	08:38:28	0.01
95	26-Jul	08:39:28	0.012
96	26-Jul	08:40:28	0.01
97	26-Jul	08:41:28	0.009
98	26-Jul	08:42:28	0.015
99	26-Jul	08:43:28	0.011
100	26-Jul	08:44:28	0.012
101	26-Jul	08:45:28	0.01
102	26-Jul	08:46:28	0.011
103	26-Jul	08:47:28	0.013
104	26-Jul	08:48:28	0.01
105	26-Jul	08:49:28	0.012
106	26-Jul	08:50:28	0.014
107	26-Jul	08:51:28	0.012
108	26-Jul	08:52:28	0.013
109	26-Jul	08:53:28	0.013
110	26-Jul	08:54:28	0.012
111	26-Jul	08:55:28	0.013
112	26-Jul	08:56:28	0.015
113	26-Jul	08:57:28	0.014
114	26-Jul	08:58:28	0.013
115	26-Jul	08:59:28	0.014
116	26-Jul	09:00:28	0.013
117	26-Jul	09:01:28	0.012
118	26-Jul	09:02:28	0.011
119	26-Jul	09:03:28	0.015
120	26-Jul	09:04:28	0.012
121	26-Jul	09:05:28	0.015
122	26-Jul	09:06:28	0.013
123	26-Jul	09:07:28	0.017
124	26-Jul	09:08:28	0.014
125	26-Jul	09:09:28	0.016
126	26-Jul	09:10:28	0.018
127	26-Jul	09:11:28	0.013

128	26-Jul	09:12:28	0.012
129	26-Jul	09:13:28	0.014
130	26-Jul	09:14:28	0.014
131	26-Jul	09:15:28	0.011
132	26-Jul	09:16:28	0.014
133	26-Jul	09:17:28	0.015
134	26-Jul	09:18:28	0.015
135	26-Jul	09:19:28	0.015
136	26-Jul	09:20:28	0.013
137	26-Jul	09:21:28	0.013
138	26-Jul	09:22:28	0.011
139	26-Jul	09:23:28	0.012
140	26-Jul	09:24:28	0.014
141	26-Jul	09:25:28	0.014
142	26-Jul	09:26:28	0.016
143	26-Jul	09:27:28	0.014
144	26-Jul	09:28:28	0.015
145	26-Jul	09:29:28	0.017
146	26-Jul	09:30:28	0.015
147	26-Jul	09:31:28	0.014
148	26-Jul	09:32:28	0.015
149	26-Jul	09:33:28	0.017
150	26-Jul	09:34:28	0.019
151	26-Jul	09:35:28	0.016
152	26-Jul	09:36:28	0.017
153	26-Jul	09:37:28	0.017
154	26-Jul	09:38:28	0.02
155	26-Jul	09:39:28	0.02
156	26-Jul	09:40:28	0.021
157	26-Jul	09:41:28	0.025
158	26-Jul	09:42:28	0.029
159	26-Jul	09:43:28	0.029
160	26-Jul	09:44:28	0.031
161	26-Jul	09:45:28	0.03
162	26-Jul	09:46:28	0.033
163	26-Jul	09:47:28	0.03
164	26-Jul	09:48:28	0.033
165	26-Jul	09:49:28	0.034
166	26-Jul	09:50:28	0.036
167	26-Jul	09:51:28	0.031
168	26-Jul	09:52:28	0.033
169	26-Jul	09:53:28	0.04
170	26-Jul	09:54:28	0.031
171	26-Jul	09:55:28	0.031
172	26-Jul	09:56:28	0.031
173	26-Jul	09:57:28	0.031
174	26-Jul	09:58:28	0.032

175	26-Jul	09:59:28	0.032
176	26-Jul	10:00:28	0.032
177	26-Jul	10:01:28	0.031
178	26-Jul	10:02:28	0.03
179	26-Jul	10:03:28	0.036
180	26-Jul	10:04:28	0.03
181	26-Jul	10:05:28	0.031
182	26-Jul	10:06:28	0.031
183	26-Jul	10:07:28	0.036
184	26-Jul	10:08:28	0.035
185	26-Jul	10:09:28	0.024
186	26-Jul	10:10:28	0.025
187	26-Jul	10:11:28	0.04
188	26-Jul	10:12:28	0.027
189	26-Jul	10:13:28	0.029
190	26-Jul	10:14:28	0.029
191	26-Jul	10:15:28	0.03
192	26-Jul	10:16:28	0.031
193	26-Jul	10:17:28	0.029
194	26-Jul	10:18:28	0.027
195	26-Jul	10:19:28	0.03
196	26-Jul	10:20:28	0.029
197	26-Jul	10:21:28	0.025
198	26-Jul	10:22:28	0.026
199	26-Jul	10:23:28	0.022
200	26-Jul	10:24:28	0.025
201	26-Jul	10:25:28	0.024
202	26-Jul	10:26:28	0.033
203	26-Jul	10:27:28	0.027
204	26-Jul	10:28:28	0.028
205	26-Jul	10:29:28	0.027
206	26-Jul	10:30:28	0.027
207	26-Jul	10:31:28	0.027
208	26-Jul	10:32:28	0.026
209	26-Jul	10:33:28	0.025
210	26-Jul	10:34:28	0.025
211	26-Jul	10:35:28	0.025
212	26-Jul	10:36:28	0.027
213	26-Jul	10:37:28	0.026
214	26-Jul	10:38:28	0.026
215	26-Jul	10:39:28	0.029
216	26-Jul	10:40:28	0.03
217	26-Jul	10:41:28	0.029
218	26-Jul	10:42:28	0.03
219	26-Jul	10:43:28	0.029
220	26-Jul	10:44:28	0.028
221	26-Jul	10:45:28	0.031

222	26-Jul	10:46:28	0.031
223	26-Jul	10:47:28	0.03
224	26-Jul	10:48:28	0.03
225	26-Jul	10:49:28	0.028
226	26-Jul	10:50:28	0.036
227	26-Jul	10:51:28	0.031
228	26-Jul	10:52:28	0.03
229	26-Jul	10:53:28	0.028
230	26-Jul	10:54:28	0.029
231	26-Jul	10:55:28	0.03
232	26-Jul	10:56:28	0.03
233	26-Jul	10:57:28	0.03
234	26-Jul	10:58:28	0.029
235	26-Jul	10:59:28	0.03
236	26-Jul	11:00:28	0.03
237	26-Jul	11:01:28	0.031
238	26-Jul	11:02:28	0.028
239	26-Jul	11:03:28	0.03
240	26-Jul	11:04:28	0.028
241	26-Jul	11:05:28	0.026
242	26-Jul	11:06:28	0.021
243	26-Jul	11:07:28	0.025
244	26-Jul	11:08:28	0.024
245	26-Jul	11:09:28	0.016
246	26-Jul	11:10:28	0.004
247	26-Jul	11:11:28	0.014
248	26-Jul	11:12:28	0.02
249	26-Jul	11:13:28	0.019
250	26-Jul	11:14:28	0.024
251	26-Jul	11:15:28	0.023
252	26-Jul	11:16:28	0.023
253	26-Jul	11:17:28	0.025
254	26-Jul	11:18:28	0.024
255	26-Jul	11:19:28	0.022
256	26-Jul	11:20:28	0.021
257	26-Jul	11:21:28	0.023
258	26-Jul	11:22:28	0.022
259	26-Jul	11:23:28	0.02
260	26-Jul	11:24:28	0.021
261	26-Jul	11:25:28	0.022
262	26-Jul	11:26:28	0.023
263	26-Jul	11:27:28	0.019
264	26-Jul	11:28:28	0.022
265	26-Jul	11:29:28	0.028
266	26-Jul	11:30:28	0.029
267	26-Jul	11:31:28	0.03
268	26-Jul	11:32:28	0.029

269	26-Jul	11:33:28	0.028
270	26-Jul	11:34:28	0.03
271	26-Jul	11:35:28	0.03
272	26-Jul	11:36:28	0.031
273	26-Jul	11:37:28	0.031
274	26-Jul	11:38:28	0.029
275	26-Jul	11:39:28	0.033
276	26-Jul	11:40:28	0.036
277	26-Jul	11:41:28	0.029
278	26-Jul	11:42:28	0.031
279	26-Jul	11:43:28	0.028
280	26-Jul	11:44:28	0.029
281	26-Jul	11:45:28	0.028
282	26-Jul	11:46:28	0.03
283	26-Jul	11:47:28	0.029
284	26-Jul	11:48:28	0.028
285	26-Jul	11:49:28	0.032
286	26-Jul	11:50:28	0.032
287	26-Jul	11:51:28	0.029
288	26-Jul	11:52:28	0.03
289	26-Jul	11:53:28	0.029
290	26-Jul	11:54:28	0.03
291	26-Jul	11:55:28	0.031
292	26-Jul	11:56:28	0.031
293	26-Jul	11:57:28	0.032
294	26-Jul	11:58:28	0.029
295	26-Jul	11:59:28	0.032
296	26-Jul	12:00:28	0.031
297	26-Jul	12:01:28	0.032
298	26-Jul	12:02:28	0.029
299	26-Jul	12:03:28	0.029
300	26-Jul	12:04:28	0.032
301	26-Jul	12:05:28	0.028
302	26-Jul	12:06:28	0.031
303	26-Jul	12:07:28	0.031
304	26-Jul	12:08:28	0.03
305	26-Jul	12:09:28	0.032
306	26-Jul	12:10:28	0.029
307	26-Jul	12:11:28	0.03
308	26-Jul	12:12:28	0.029
309	26-Jul	12:13:28	0.035
310	26-Jul	12:14:28	0.029
311	26-Jul	12:15:28	0.031
312	26-Jul	12:16:28	0.033
313	26-Jul	12:17:28	0.035
314	26-Jul	12:18:28	0.028
315	26-Jul	12:19:28	0.028

316	26-Jul	12:20:28	0.03
317	26-Jul	12:21:28	0.032
318	26-Jul	12:22:28	0.029
319	26-Jul	12:23:28	0.031
320	26-Jul	12:24:28	0.028
321	26-Jul	12:25:28	0.031
322	26-Jul	12:26:28	0.03
323	26-Jul	12:27:28	0.031
324	26-Jul	12:28:28	0.029
325	26-Jul	12:29:28	0.031
326	26-Jul	12:30:28	0.03
327	26-Jul	12:31:28	0.032
328	26-Jul	12:32:28	0.03
329	26-Jul	12:33:28	0.03
330	26-Jul	12:34:28	0.03
331	26-Jul	12:35:28	0.03
332	26-Jul	12:36:28	0.03
333	26-Jul	12:37:28	0.031
334	26-Jul	12:38:28	0.028
335	26-Jul	12:39:28	0.03
336	26-Jul	12:40:28	0.031
337	26-Jul	12:41:28	0.028
338	26-Jul	12:42:28	0.029
339	26-Jul	12:43:28	0.033
340	26-Jul	12:44:28	0.034
341	26-Jul	12:45:28	0.032
342	26-Jul	12:46:28	0.033
343	26-Jul	12:47:28	0.036
344	26-Jul	12:48:28	0.032
345	26-Jul	12:49:28	0.029
346	26-Jul	12:50:28	0.037
347	26-Jul	12:51:28	0.038
348	26-Jul	12:52:28	0.03
349	26-Jul	12:53:28	0.034
350	26-Jul	12:54:28	0.031
351	26-Jul	12:55:28	0.069
352	26-Jul	12:56:28	0.034
353	26-Jul	12:57:28	0.03
354	26-Jul	12:58:28	0.03
355	26-Jul	12:59:28	0.027
356	26-Jul	13:00:28	0.027
357	26-Jul	13:01:28	0.032
358	26-Jul	13:02:28	0.03
359	26-Jul	13:03:28	0.031
360	26-Jul	13:04:28	0.028
361	26-Jul	13:05:28	0.029
362	26-Jul	13:06:28	0.047

363	26-Jul	13:07:28	0.033
364	26-Jul	13:08:28	0.055
365	26-Jul	13:09:28	0.03
366	26-Jul	13:10:28	0.071
367	26-Jul	13:11:28	0.03
368	26-Jul	13:12:28	0.035
369	26-Jul	13:13:28	0.032
370	26-Jul	13:14:28	0.035
371	26-Jul	13:15:28	0.033
372	26-Jul	13:16:28	0.031
373	26-Jul	13:17:28	0.035
374	26-Jul	13:18:28	0.029
375	26-Jul	13:19:28	0.028
376	26-Jul	13:20:28	0.031
377	26-Jul	13:21:28	0.031
378	26-Jul	13:22:28	0.034
379	26-Jul	13:23:28	0.035
380	26-Jul	13:24:28	0.028
381	26-Jul	13:25:28	0.034
382	26-Jul	13:26:28	0.05
383	26-Jul	13:27:28	0.031
384	26-Jul	13:28:28	0.034
385	26-Jul	13:29:28	0.033
386	26-Jul	13:30:28	0.029
387	26-Jul	13:31:28	0.028
388	26-Jul	13:32:28	0.028
389	26-Jul	13:33:28	0.03
390	26-Jul	13:34:28	0.029
391	26-Jul	13:35:28	0.035
392	26-Jul	13:36:28	0.035
393	26-Jul	13:37:28	0.03
394	26-Jul	13:38:28	0.037
395	26-Jul	13:39:28	0.031
396	26-Jul	13:40:28	0.035
397	26-Jul	13:41:28	0.036
398	26-Jul	13:42:28	0.033
399	26-Jul	13:43:28	0.028
400	26-Jul	13:44:28	0.028
401	26-Jul	13:45:28	0.025
402	26-Jul	13:46:28	0.035
403	26-Jul	13:47:28	0.028
404	26-Jul	13:48:28	0.026
405	26-Jul	13:49:28	0.027
406	26-Jul	13:50:28	0.034
407	26-Jul	13:51:28	0.033
408	26-Jul	13:52:28	0.03
409	26-Jul	13:53:28	0.031

410	26-Jul	13:54:28	0.03
411	26-Jul	13:55:28	0.039
412	26-Jul	13:56:28	0.029
413	26-Jul	13:57:28	0.032
414	26-Jul	13:58:28	0.029
415	26-Jul	13:59:28	0.026
416	26-Jul	14:00:28	0.025
417	26-Jul	14:01:28	0.033
418	26-Jul	14:02:28	0.053
419	26-Jul	14:03:28	0.035
420	26-Jul	14:04:28	0.039
421	26-Jul	14:05:28	0.049
422	26-Jul	14:06:28	0.032
423	26-Jul	14:07:28	0.035
424	26-Jul	14:08:28	0.034
425	26-Jul	14:09:28	0.032
426	26-Jul	14:10:28	0.033
427	26-Jul	14:11:28	0.04
428	26-Jul	14:12:28	0.032
429	26-Jul	14:13:28	0.03
430	26-Jul	14:14:28	0.034
431	26-Jul	14:15:28	0.035
432	26-Jul	14:16:28	0.03
433	26-Jul	14:17:28	0.026
434	26-Jul	14:18:28	0.033
435	26-Jul	14:19:28	0.028
436	26-Jul	14:20:28	0.029
437	26-Jul	14:21:28	0.029

pDR ID: 143116
Tag Number: 11
Number of logged points: 496
Start time and date: 07:25:15 27-Jul
Elapsed time: 08:16:00
Logging period (sec): 60
Calibration Factor (%): 100
Max Display Concentration: 0.522 mg/m3
Time at maximum: 14:24:46 Jul 27
Max STEL Concentration: 0.084 mg/m3
Time at max STEL: 14:37:46 Jul 27
Overall Avg Conc: 0.029 mg/m3
Logged Data:

Point	Date	Time	Avg.(mg/m3)
1	27-Jul	07:26:15	0.014
2	27-Jul	07:27:15	0.008
3	27-Jul	07:28:15	0.006
4	27-Jul	07:29:15	0.006
5	27-Jul	07:30:15	0.007
6	27-Jul	07:31:15	0.004
7	27-Jul	07:32:15	0.01
8	27-Jul	07:33:15	0.009
9	27-Jul	07:34:15	0.01
10	27-Jul	07:35:15	0.005
11	27-Jul	07:36:15	0.014
12	27-Jul	07:37:15	0.003
13	27-Jul	07:38:15	0.004
14	27-Jul	07:39:15	0.001
15	27-Jul	07:40:15	0.004
16	27-Jul	07:41:15	0.004
17	27-Jul	07:42:15	0.004
18	27-Jul	07:43:15	0.004
19	27-Jul	07:44:15	0.004
20	27-Jul	07:45:15	0.003
21	27-Jul	07:46:15	0.003
22	27-Jul	07:47:15	0.014
23	27-Jul	07:48:15	0.009
24	27-Jul	07:49:15	0.003
25	27-Jul	07:50:15	0.005
26	27-Jul	07:51:15	0.006
27	27-Jul	07:52:15	0.011
28	27-Jul	07:53:15	0.002
29	27-Jul	07:54:15	0.007
30	27-Jul	07:55:15	0.005
31	27-Jul	07:56:15	0.016
32	27-Jul	07:57:15	0.014
33	27-Jul	07:58:15	0.024

34	27-Jul	07:59:15	0.024
35	27-Jul	08:00:15	0.028
36	27-Jul	08:01:15	0.024
37	27-Jul	08:02:15	0.022
38	27-Jul	08:03:15	0.021
39	27-Jul	08:04:15	0.015
40	27-Jul	08:05:15	0.026
41	27-Jul	08:06:15	0.032
42	27-Jul	08:07:15	0.032
43	27-Jul	08:08:15	0.021
44	27-Jul	08:09:15	0.023
45	27-Jul	08:10:15	0.025
46	27-Jul	08:11:15	0.022
47	27-Jul	08:12:15	0.024
48	27-Jul	08:13:15	0.025
49	27-Jul	08:14:15	0.023
50	27-Jul	08:15:15	0.026
51	27-Jul	08:16:15	0.026
52	27-Jul	08:17:15	0.025
53	27-Jul	08:18:15	0.026
54	27-Jul	08:19:15	0.025
55	27-Jul	08:20:15	0.039
56	27-Jul	08:21:15	0.026
57	27-Jul	08:22:15	0.024
58	27-Jul	08:23:15	0.024
59	27-Jul	08:24:15	0.029
60	27-Jul	08:25:15	0.018
61	27-Jul	08:26:15	0.019
62	27-Jul	08:27:15	0.028
63	27-Jul	08:28:15	0.022
64	27-Jul	08:29:15	0.026
65	27-Jul	08:30:15	0.014
66	27-Jul	08:31:15	0.013
67	27-Jul	08:32:15	0.009
68	27-Jul	08:33:15	0.013
69	27-Jul	08:34:15	0.017
70	27-Jul	08:35:15	0.011
71	27-Jul	08:36:15	0.01
72	27-Jul	08:37:15	0.02
73	27-Jul	08:38:15	0.019
74	27-Jul	08:39:15	0.018
75	27-Jul	08:40:15	0.02
76	27-Jul	08:41:15	0.019
77	27-Jul	08:42:15	0.02
78	27-Jul	08:43:15	0.019
79	27-Jul	08:44:15	0.022
80	27-Jul	08:45:15	0.035

81	27-Jul	08:46:15	0.031
82	27-Jul	08:47:15	0.028
83	27-Jul	08:48:15	0.023
84	27-Jul	08:49:15	0.02
85	27-Jul	08:50:15	0.021
86	27-Jul	08:51:15	0.023
87	27-Jul	08:52:15	0.023
88	27-Jul	08:53:15	0.024
89	27-Jul	08:54:15	0.022
90	27-Jul	08:55:15	0.021
91	27-Jul	08:56:15	0.027
92	27-Jul	08:57:15	0.024
93	27-Jul	08:58:15	0.028
94	27-Jul	08:59:15	0.022
95	27-Jul	09:00:15	0.024
96	27-Jul	09:01:15	0.022
97	27-Jul	09:02:15	0.021
98	27-Jul	09:03:15	0.023
99	27-Jul	09:04:15	0.026
100	27-Jul	09:05:15	0.022
101	27-Jul	09:06:15	0.022
102	27-Jul	09:07:15	0.023
103	27-Jul	09:08:15	0.023
104	27-Jul	09:09:15	0.023
105	27-Jul	09:10:15	0.023
106	27-Jul	09:11:15	0.028
107	27-Jul	09:12:15	0.034
108	27-Jul	09:13:15	0.036
109	27-Jul	09:14:15	0.024
110	27-Jul	09:15:15	0.021
111	27-Jul	09:16:15	0.024
112	27-Jul	09:17:15	0.022
113	27-Jul	09:18:15	0.025
114	27-Jul	09:19:15	0.025
115	27-Jul	09:20:15	0.025
116	27-Jul	09:21:15	0.027
117	27-Jul	09:22:15	0.032
118	27-Jul	09:23:15	0.027
119	27-Jul	09:24:15	0.026
120	27-Jul	09:25:15	0.026
121	27-Jul	09:26:15	0.029
122	27-Jul	09:27:15	0.025
123	27-Jul	09:28:15	0.027
124	27-Jul	09:29:15	0.025
125	27-Jul	09:30:15	0.033
126	27-Jul	09:31:15	0.024
127	27-Jul	09:32:15	0.027

128	27-Jul	09:33:15	0.025
129	27-Jul	09:34:15	0.027
130	27-Jul	09:35:15	0.029
131	27-Jul	09:36:15	0.025
132	27-Jul	09:37:15	0.024
133	27-Jul	09:38:15	0.024
134	27-Jul	09:39:15	0.025
135	27-Jul	09:40:15	0.025
136	27-Jul	09:41:15	0.023
137	27-Jul	09:42:15	0.024
138	27-Jul	09:43:15	0.027
139	27-Jul	09:44:15	0.025
140	27-Jul	09:45:15	0.025
141	27-Jul	09:46:15	0.025
142	27-Jul	09:47:15	0.027
143	27-Jul	09:48:15	0.024
144	27-Jul	09:49:15	0.025
145	27-Jul	09:50:15	0.024
146	27-Jul	09:51:15	0.023
147	27-Jul	09:52:15	0.024
148	27-Jul	09:53:15	0.026
149	27-Jul	09:54:15	0.025
150	27-Jul	09:55:15	0.025
151	27-Jul	09:56:15	0.026
152	27-Jul	09:57:15	0.027
153	27-Jul	09:58:15	0.024
154	27-Jul	09:59:15	0.024
155	27-Jul	10:00:15	0.029
156	27-Jul	10:01:15	0.025
157	27-Jul	10:02:15	0.026
158	27-Jul	10:03:15	0.024
159	27-Jul	10:04:15	0.026
160	27-Jul	10:05:15	0.029
161	27-Jul	10:06:15	0.025
162	27-Jul	10:07:15	0.027
163	27-Jul	10:08:15	0.025
164	27-Jul	10:09:15	0.024
165	27-Jul	10:10:15	0.024
166	27-Jul	10:11:15	0.024
167	27-Jul	10:12:15	0.025
168	27-Jul	10:13:15	0.027
169	27-Jul	10:14:15	0.025
170	27-Jul	10:15:15	0.029
171	27-Jul	10:16:15	0.046
172	27-Jul	10:17:15	0.024
173	27-Jul	10:18:15	0.023
174	27-Jul	10:19:15	0.013

175	27-Jul	10:20:15	0.013
176	27-Jul	10:21:15	0.022
177	27-Jul	10:22:15	0.013
178	27-Jul	10:23:15	0.015
179	27-Jul	10:24:15	0.014
180	27-Jul	10:25:15	0.022
181	27-Jul	10:26:15	0.023
182	27-Jul	10:27:15	0.023
183	27-Jul	10:28:15	0.02
184	27-Jul	10:29:15	0.017
185	27-Jul	10:30:15	0.031
186	27-Jul	10:31:15	0.022
187	27-Jul	10:32:15	0.022
188	27-Jul	10:33:15	0.022
189	27-Jul	10:34:15	0.028
190	27-Jul	10:35:15	0.024
191	27-Jul	10:36:15	0.027
192	27-Jul	10:37:15	0.021
193	27-Jul	10:38:15	0.016
194	27-Jul	10:39:15	0.012
195	27-Jul	10:40:15	0.018
196	27-Jul	10:41:15	0.011
197	27-Jul	10:42:15	0.014
198	27-Jul	10:43:15	0.013
199	27-Jul	10:44:15	0.013
200	27-Jul	10:45:15	0.063
201	27-Jul	10:46:15	0.016
202	27-Jul	10:47:15	0.012
203	27-Jul	10:48:15	0.012
204	27-Jul	10:49:15	0.03
205	27-Jul	10:50:15	0.021
206	27-Jul	10:51:15	0.022
207	27-Jul	10:52:15	0.025
208	27-Jul	10:53:15	0.025
209	27-Jul	10:54:15	0.022
210	27-Jul	10:55:15	0.025
211	27-Jul	10:56:15	0.03
212	27-Jul	10:57:15	0.026
213	27-Jul	10:58:15	0.028
214	27-Jul	10:59:15	0.03
215	27-Jul	11:00:15	0.029
216	27-Jul	11:01:15	0.03
217	27-Jul	11:02:15	0.052
218	27-Jul	11:03:15	0.028
219	27-Jul	11:04:15	0.025
220	27-Jul	11:05:15	0.042
221	27-Jul	11:06:15	0.022

222	27-Jul	11:07:15	0.03
223	27-Jul	11:08:15	0.028
224	27-Jul	11:09:15	0.02
225	27-Jul	11:10:15	0.021
226	27-Jul	11:11:15	0.022
227	27-Jul	11:12:15	0.022
228	27-Jul	11:13:15	0.024
229	27-Jul	11:14:15	0.021
230	27-Jul	11:15:15	0.026
231	27-Jul	11:16:15	0.027
232	27-Jul	11:17:15	0.027
233	27-Jul	11:18:15	0.026
234	27-Jul	11:19:15	0.026
235	27-Jul	11:20:15	0.028
236	27-Jul	11:21:15	0.026
237	27-Jul	11:22:15	0.026
238	27-Jul	11:23:15	0.025
239	27-Jul	11:24:15	0.025
240	27-Jul	11:25:15	0.027
241	27-Jul	11:26:15	0.027
242	27-Jul	11:27:15	0.025
243	27-Jul	11:28:15	0.028
244	27-Jul	11:29:15	0.025
245	27-Jul	11:30:15	0.025
246	27-Jul	11:31:15	0.026
247	27-Jul	11:32:15	0.024
248	27-Jul	11:33:15	0.025
249	27-Jul	11:34:15	0.024
250	27-Jul	11:35:15	0.062
251	27-Jul	11:36:15	0.028
252	27-Jul	11:37:15	0.024
253	27-Jul	11:38:15	0.025
254	27-Jul	11:39:15	0.026
255	27-Jul	11:40:15	0.026
256	27-Jul	11:41:15	0.024
257	27-Jul	11:42:15	0.025
258	27-Jul	11:43:15	0.025
259	27-Jul	11:44:15	0.025
260	27-Jul	11:45:15	0.026
261	27-Jul	11:46:15	0.026
262	27-Jul	11:47:15	0.026
263	27-Jul	11:48:15	0.027
264	27-Jul	11:49:15	0.028
265	27-Jul	11:50:15	0.027
266	27-Jul	11:51:15	0.026
267	27-Jul	11:52:15	0.054
268	27-Jul	11:53:15	0.026

269	27-Jul	11:54:15	0.027
270	27-Jul	11:55:15	0.026
271	27-Jul	11:56:15	0.026
272	27-Jul	11:57:15	0.03
273	27-Jul	11:58:15	0.073
274	27-Jul	11:59:15	0.028
275	27-Jul	12:00:15	0.029
276	27-Jul	12:01:15	0.029
277	27-Jul	12:02:15	0.025
278	27-Jul	12:03:15	0.027
279	27-Jul	12:04:15	0.028
280	27-Jul	12:05:15	0.028
281	27-Jul	12:06:15	0.027
282	27-Jul	12:07:15	0.027
283	27-Jul	12:08:15	0.027
284	27-Jul	12:09:15	0.027
285	27-Jul	12:10:15	0.028
286	27-Jul	12:11:15	0.026
287	27-Jul	12:12:15	0.028
288	27-Jul	12:13:15	0.027
289	27-Jul	12:14:15	0.027
290	27-Jul	12:15:15	0.029
291	27-Jul	12:16:15	0.028
292	27-Jul	12:17:15	0.028
293	27-Jul	12:18:15	0.027
294	27-Jul	12:19:15	0.027
295	27-Jul	12:20:15	0.027
296	27-Jul	12:21:15	0.032
297	27-Jul	12:22:15	0.026
298	27-Jul	12:23:15	0.027
299	27-Jul	12:24:15	0.027
300	27-Jul	12:25:15	0.027
301	27-Jul	12:26:15	0.029
302	27-Jul	12:27:15	0.03
303	27-Jul	12:28:15	0.033
304	27-Jul	12:29:15	0.033
305	27-Jul	12:30:15	0.031
306	27-Jul	12:31:15	0.029
307	27-Jul	12:32:15	0.027
308	27-Jul	12:33:15	0.027
309	27-Jul	12:34:15	0.029
310	27-Jul	12:35:15	0.027
311	27-Jul	12:36:15	0.029
312	27-Jul	12:37:15	0.027
313	27-Jul	12:38:15	0.029
314	27-Jul	12:39:15	0.029
315	27-Jul	12:40:15	0.03

316	27-Jul	12:41:15	0.03
317	27-Jul	12:42:15	0.03
318	27-Jul	12:43:15	0.029
319	27-Jul	12:44:15	0.03
320	27-Jul	12:45:15	0.031
321	27-Jul	12:46:15	0.03
322	27-Jul	12:47:15	0.03
323	27-Jul	12:48:15	0.031
324	27-Jul	12:49:15	0.031
325	27-Jul	12:50:15	0.022
326	27-Jul	12:51:15	0.044
327	27-Jul	12:52:15	0.037
328	27-Jul	12:53:15	0.044
329	27-Jul	12:54:15	0.031
330	27-Jul	12:55:15	0.035
331	27-Jul	12:56:15	0.034
332	27-Jul	12:57:15	0.029
333	27-Jul	12:58:15	0.035
334	27-Jul	12:59:15	0.038
335	27-Jul	13:00:15	0.03
336	27-Jul	13:01:15	0.032
337	27-Jul	13:02:15	0.031
338	27-Jul	13:03:15	0.034
339	27-Jul	13:04:15	0.037
340	27-Jul	13:05:15	0.053
341	27-Jul	13:06:15	0.034
342	27-Jul	13:07:15	0.032
343	27-Jul	13:08:15	0.025
344	27-Jul	13:09:15	0.023
345	27-Jul	13:10:15	0.025
346	27-Jul	13:11:15	0.143
347	27-Jul	13:12:15	0.079
348	27-Jul	13:13:15	0.123
349	27-Jul	13:14:15	0.104
350	27-Jul	13:15:15	0.107
351	27-Jul	13:16:15	0.023
352	27-Jul	13:17:15	0.036
353	27-Jul	13:18:15	0.02
354	27-Jul	13:19:15	0.02
355	27-Jul	13:20:15	0.026
356	27-Jul	13:21:15	0.019
357	27-Jul	13:22:15	0.02
358	27-Jul	13:23:15	0.224
359	27-Jul	13:24:15	0.095
360	27-Jul	13:25:15	0.019
361	27-Jul	13:26:15	0.019
362	27-Jul	13:27:15	0.018

363	27-Jul	13:28:15	0.072
364	27-Jul	13:29:15	0.017
365	27-Jul	13:30:15	0.026
366	27-Jul	13:31:15	0.03
367	27-Jul	13:32:15	0.03
368	27-Jul	13:33:15	0.028
369	27-Jul	13:34:15	0.034
370	27-Jul	13:35:15	0.03
371	27-Jul	13:36:15	0.028
372	27-Jul	13:37:15	0.031
373	27-Jul	13:38:15	0.029
374	27-Jul	13:39:15	0.034
375	27-Jul	13:40:15	0.032
376	27-Jul	13:41:15	0.033
377	27-Jul	13:42:15	0.033
378	27-Jul	13:43:15	0.035
379	27-Jul	13:44:15	0.032
380	27-Jul	13:45:15	0.031
381	27-Jul	13:46:15	0.031
382	27-Jul	13:47:15	0.031
383	27-Jul	13:48:15	0.032
384	27-Jul	13:49:15	0.032
385	27-Jul	13:50:15	0.032
386	27-Jul	13:51:15	0.032
387	27-Jul	13:52:15	0.036
388	27-Jul	13:53:15	0.033
389	27-Jul	13:54:15	0.031
390	27-Jul	13:55:15	0.031
391	27-Jul	13:56:15	0.031
392	27-Jul	13:57:15	0.032
393	27-Jul	13:58:15	0.032
394	27-Jul	13:59:15	0.033
395	27-Jul	14:00:15	0.03
396	27-Jul	14:01:15	0.029
397	27-Jul	14:02:15	0.034
398	27-Jul	14:03:15	0.039
399	27-Jul	14:04:15	0.041
400	27-Jul	14:05:15	0.046
401	27-Jul	14:06:15	0.041
402	27-Jul	14:07:15	0.036
403	27-Jul	14:08:15	0.03
404	27-Jul	14:09:15	0.029
405	27-Jul	14:10:15	0.027
406	27-Jul	14:11:15	0.029
407	27-Jul	14:12:15	0.028
408	27-Jul	14:13:15	0.031
409	27-Jul	14:14:15	0.029

410	27-Jul	14:15:15	0.029
411	27-Jul	14:16:15	0.029
412	27-Jul	14:17:15	0.029
413	27-Jul	14:18:15	0.033
414	27-Jul	14:19:15	0.035
415	27-Jul	14:20:15	0.031
416	27-Jul	14:21:15	0.031
417	27-Jul	14:22:15	0.127
418	27-Jul	14:23:15	0.032
419	27-Jul	14:24:15	0.211
420	27-Jul	14:25:15	0.35
421	27-Jul	14:26:15	0.04
422	27-Jul	14:27:15	0.029
423	27-Jul	14:28:15	0.041
424	27-Jul	14:29:15	0.03
425	27-Jul	14:30:15	0.029
426	27-Jul	14:31:15	0.03
427	27-Jul	14:32:15	0.032
428	27-Jul	14:33:15	0.03
429	27-Jul	14:34:15	0.041
430	27-Jul	14:35:15	0.028
431	27-Jul	14:36:15	0.028
432	27-Jul	14:37:15	0.175
433	27-Jul	14:38:15	0.163
434	27-Jul	14:39:15	0.028
435	27-Jul	14:40:15	0.03
436	27-Jul	14:41:15	0.029
437	27-Jul	14:42:15	0.029
438	27-Jul	14:43:15	0.029
439	27-Jul	14:44:15	0.03
440	27-Jul	14:45:15	0.03
441	27-Jul	14:46:15	0.029
442	27-Jul	14:47:15	0.03
443	27-Jul	14:48:15	0.031
444	27-Jul	14:49:15	0.029
445	27-Jul	14:50:15	0.03
446	27-Jul	14:51:15	0.032
447	27-Jul	14:52:15	0.031
448	27-Jul	14:53:15	0.03
449	27-Jul	14:54:15	0.03
450	27-Jul	14:55:15	0.057
451	27-Jul	14:56:15	0.028
452	27-Jul	14:57:15	0.028
453	27-Jul	14:58:15	0.028
454	27-Jul	14:59:15	0.03
455	27-Jul	15:00:15	0.029
456	27-Jul	15:01:15	0.028

457	27-Jul	15:02:15	0.03
458	27-Jul	15:03:15	0.03
459	27-Jul	15:04:15	0.03
460	27-Jul	15:05:15	0.031
461	27-Jul	15:06:15	0.031
462	27-Jul	15:07:15	0.032
463	27-Jul	15:08:15	0.032
464	27-Jul	15:09:15	0.032
465	27-Jul	15:10:15	0.032
466	27-Jul	15:11:15	0.032
467	27-Jul	15:12:15	0.031
468	27-Jul	15:13:15	0.032
469	27-Jul	15:14:15	0.034
470	27-Jul	15:15:15	0.032
471	27-Jul	15:16:15	0.033
472	27-Jul	15:17:15	0.032
473	27-Jul	15:18:15	0.034
474	27-Jul	15:19:15	0.032
475	27-Jul	15:20:15	0.034
476	27-Jul	15:21:15	0.032
477	27-Jul	15:22:15	0.04
478	27-Jul	15:23:15	0.035
479	27-Jul	15:24:15	0.033
480	27-Jul	15:25:15	0.034
481	27-Jul	15:26:15	0.034
482	27-Jul	15:27:15	0.034
483	27-Jul	15:28:15	0.039
484	27-Jul	15:29:15	0.034
485	27-Jul	15:30:15	0.033
486	27-Jul	15:31:15	0.035
487	27-Jul	15:32:15	0.053
488	27-Jul	15:33:15	0.038
489	27-Jul	15:34:15	0.033
490	27-Jul	15:35:15	0.034
491	27-Jul	15:36:15	0.064
492	27-Jul	15:37:15	0.034
493	27-Jul	15:38:15	0.033
494	27-Jul	15:39:15	0.033
495	27-Jul	15:40:15	0.055
496	27-Jul	15:41:15	0.049

HUBBELL PROCESSING AREA
WEATHER STATION DATA

FILE NO. 761/16108.SAR INDEX NO. 44521
TORCH LAKE NON-SUPERFUND SITE

Date	Time	Temp Out	Hi Temp	Low Temp	Out Hum	Dew Pt.	Wind Speed	Wind Dir	Wind Run	Hi Speed	Hi Dir	Wind Chill	Heat Index	THW Index	Bar	Rain	Rain Rate	Heat D-D	Cool D-D	In Temp	In Hum	In Dew	In Heat	In EMC	In Air Density	Temp 2nd	Hum 2nd	Wind Samp	Wind Tx	ISS Recept	Arc. Int.
7/6/2017	12:00 AM	77.9	78.2	77.9	49	57.2	0	---	0	0	---	77.9	77.8	77.8	29.18	0	0	0	0.269	77.3	53	58.8	77.5	9.65	0.0708	67	---	703	1	100	30
7/6/2017	12:30 AM	77.8	77.9	77.7	50	57.7	0	---	0	0	---	77.8	77.8	77.8	29.174	0	0	0	0.267	77.3	53	58.8	77.5	9.65	0.0708	67	---	699	1	100	30
7/6/2017	1:00 AM	77.6	77.8	77.6	50	57.5	0	---	0	0	---	77.6	77.5	77.5	29.171	0	0	0	0.262	77.3	53	58.8	77.5	9.65	0.0708	67	---	700	1	100	30
7/6/2017	1:30 AM	77.5	77.6	77.5	50	57.4	0	---	0	0	---	77.5	77.4	77.4	29.167	0	0	0	0.26	77.3	53	58.8	77.5	9.65	0.0708	67	---	702	1	100	30
7/6/2017	2:00 AM	77.5	77.5	77.5	51	57.9	0	---	0	0	---	77.5	77.5	77.5	29.155	0	0	0	0.26	77.3	53	58.8	77.5	9.65	0.0708	67	---	702	1	100	30
7/6/2017	2:30 AM	77.5	77.5	77.4	51	57.9	0	---	0	0	---	77.5	77.5	77.5	29.153	0	0	0	0.26	77.3	53	58.8	77.5	9.65	0.0708	67	---	702	1	100	30
7/6/2017	3:00 AM	77.5	77.5	77.4	51	57.9	0	---	0	0	---	77.5	77.5	77.5	29.148	0	0	0	0.26	77.3	53	58.8	77.5	9.65	0.0708	67	---	700	1	100	30
7/6/2017	3:30 AM	77.3	77.5	77.3	46	54.9	0	---	0	0	---	77.3	76.9	76.9	29.153	0	0	0	0.256	77.3	53	58.8	77.5	9.65	0.0708	67	---	702	1	100	30
7/6/2017	4:00 AM	76.9	77.3	76.9	44	53.3	0	---	0	0	---	76.9	76.3	76.3	29.155	0	0	0	0.248	76.8	53	58.4	76.9	9.65	0.0709	67	---	702	1	100	30
7/6/2017	4:30 AM	76.2	76.9	76.2	44	52.7	0	---	0	0	---	76.2	75.7	75.7	29.149	0	0	0	0.233	76.3	52	57.4	76.4	9.52	0.071	67	---	701	1	100	30
7/6/2017	5:00 AM	75.5	76.2	75.5	44	52.1	0	---	0	0	---	75.5	75.1	75.1	29.154	0	0	0	0.219	75.7	52	56.8	75.9	9.54	0.0711	67	---	703	1	100	30
7/6/2017	5:30 AM	74.8	75.5	74.8	44	51.4	0	---	0	0	---	74.8	74.3	74.3	29.156	0	0	0	0.204	75.2	52	56.4	75.4	9.55	0.0712	67	---	702	1	100	30
7/6/2017	6:00 AM	74.2	74.8	74.2	44	50.9	0	---	0	0	---	74.2	73.6	73.6	29.162	0	0	0	0.192	74.7	52	55.9	74.9	9.56	0.0713	67	---	703	1	100	30
7/6/2017	6:30 AM	73.6	74.2	73.6	45	50.9	0	---	0	0	---	73.6	72.9	72.9	29.152	0	0	0	0.179	74.2	52	55.4	74.2	9.57	0.0713	67	---	702	1	100	30
7/6/2017	7:00 AM	73	73.6	73	45	50.4	0	---	0	0	---	73	72.1	72.1	29.149	0	0	0	0.167	73.6	51	54.4	73.3	9.38	0.0714	67	---	702	1	100	30
7/6/2017	7:30 AM	72.6	73	72.6	48	51.8	0	---	0	0	---	72.6	71.8	71.8	29.164	0	0	0	0.158	73.3	51	54.1	73	9.38	0.0715	67	---	702	1	100	30
7/6/2017	8:00 AM	72.4	72.6	72.4	49	52.2	0	---	0	0	---	72.4	71.6	71.6	29.167	0	0	0	0.154	73.1	51	53.9	72.7	9.39	0.0716	67	---	702	1	100	30
7/6/2017	8:30 AM	72.4	72.4	72.4	50	52.7	0	---	0	0	---	72.4	71.7	71.7	29.164	0	0	0	0.154	73.1	51	53.9	72.7	9.39	0.0716	67	---	702	1	100	30
7/6/2017	9:00 AM	72.5	72.5	72.4	49	52.2	0	---	0	0	---	72.5	71.7	71.7	29.15	0	0	0	0.156	73.1	51	53.9	72.7	9.39	0.0715	67	---	703	1	100	30
7/6/2017	9:30 AM	72.6	72.6	72.5	48	51.8	0	---	0	0	---	72.6	71.8	71.8	29.166	0	0	0	0.158	73.1	51	53.9	72.7	9.39	0.0716	67	---	700	1	100	30
7/6/2017	10:00 AM	72.6	72.7	72.6	48	51.8	0	---	0	0	---	72.6	71.8	71.8	29.188	0	0	0	0.158	73.1	51	53.9	72.7	9.39	0.0716	67	---	701	1	100	30
7/6/2017	10:30 AM	72.5	72.6	72.5	48	51.7	0	---	0	0	---	72.5	71.6	71.6	29.199	0	0	0	0.156	73.1	51	53.9	72.7	9.39	0.0717	67	---	701	1	100	30
7/6/2017	11:00 AM	72.3	72.5	72.3	50	52.6	0	---	0	0	---	72.3	71.5	71.5	29.197	0	0	0	0.152	73	51	53.8	72.6	9.39	0.0717	67	---	702	1	100	30
7/6/2017	11:30 AM	72.2	72.3	72.2	50	52.5	0	---	0	0	---	72.2	71.4	71.4	29.188	0	0	0	0.15	73	51	53.8	72.6	9.39	0.0716	67	---	702	1	100	30
7/6/2017	12:00 PM	72.1	72.2	72.1	50	52.4	0	---	0	0	---	72.1	71.2	71.2	29.207	0	0	0	0.148	73	51	53.8	72.6	9.39	0.0717	67	---	700	1	100	30
7/6/2017	12:30 PM	72.1	72.1	72.1	50	52.4	0	---	0	0	---	72.1	71.2	71.2	29.176	0	0	0	0.148	73	51	53.8	72.6	9.39	0.0716	67	---	703	1	100	30
7/6/2017	1:00 PM	72.1	72.1	72.1	49	51.9	0	---	0	0	---	72.1	71.1	71.1	29.147	0	0	0	0.148	73	51	53.8	72.6	9.39	0.0715	67	---	700	1	100	30
7/6/2017	1:30 PM	72.1	72.1	72	49	51.9	0	---	0	0	---	72.1	71.1	71.1	29.131	0	0	0	0.148	72.8	51	53.6	72.3	9.39	0.0715	67	---	703	1	100	30
7/6/2017	2:00 PM	72.1	72.1	72	48	51.3	0	---	0	0	---	72.1	71	71	29.111	0	0	0	0.148	72.8	51	53.6	72.3	9.39	0.0715	67	---	702	1	100	30
7/6/2017	2:30 PM	73.8	73.8	72	60	59	0	E	0	2	E	73.8	74.4	74.4	29.159	0.01	0	0	0.183	74.9	57	58.6	75.5	10.35	0.0711	67	---	701	1	100	30
7/6/2017	3:00 PM	76.1	76.4	73.8	47	54.4	0	---	0	0	---	76.1	75.8	75.8	29.156	0	0	0	0.231	74.9	50	55	75	9.25	0.0713	67	---	700	1	100	30
7/6/2017	3:30 PM	85.9	85.9	76	49	64.5	3	WSW	1.5	15	SW	85.9	87.8	87.8	29.146	0.01	0	0	0.435	74	52	55.3	73.9	9.57	0.0713	67	---	698	1	100	30
7/6/2017	4:00 PM	87.8	87.8	85.9	45	63.8	3	SW	1.5	11	WSW	87.8	89.5	89.5	29.137	0	0	0	0.475	76.8	55	59.4	77.1	9.98	0.0708	67	---	693	1	100	30
7/6/2017	4:30 PM	89.1	89.1	87.7	43	63.7	2	WSW	1	8	SW	89.1	91.3	91.3	29.134	0	0	0	0.502	80.1	55	62.5	80.8	9.85	0.0702	67	---	691	1	100	30
7/6/2017	5:00 PM	88.6	89.3	88.6	42	62.6	2	WSW	1	14	ENE	88.6	90	90	29.124	0	0	0	0.492	85.9	48	63.9	87.6	8.73	0.0693	67	---	690	1	100	30
7/6/2017	5:30 PM	89	89	86.6	34	57	1	W	0.5	8	NNE	89	88	88	29.123	0.01	0	0	0.5	98	47	74.3	111	8.33	0.0672	67	---	690	1	100	30
7/6/2017	6:00 PM	85.6	90.4	85.6	39	57.8	0	SE	0	1	WSW	85.6	85.6	85.6	29.1	0.04	4.4	0	0.429	93.8	44	68.6	99.9	7.97	0.0681	67	---	703	1	100	30
7/6/2017	6:30 PM	77.9	85.6	77.9	37	49.5	0	---	0	0	---	77.9	76.8	76.8	28.851	0.08	1.12	0	0.269	87.5	44	62.9	88.9	8.1	0.0685	67	---	702	1	100	30
7/6/2017	7:00 PM	72.9	77.8	72.9	54	55.3	0	---	0	0	---	72.9	72.8	72.8	28.993	0.06	2.2	0	0.165	83.3	44	59.1	83.8	8.15	0.0696	67	---	703	1	100	30
7/6/2017	7:30 PM	73.1	73.1	72.8	64	60.2	0	S	0	1	S	73.1	73.8	73.8	29.042	0	0	0	0.169	81	46	58.3	80.7	8.45	0.07	67	---	702	1	100	30
7/6/2017	8:00 PM	72.6	73.1	72.6	61	58.4	0	---	0	0	---	72.6	72.9	72.9	28.98	0	0	0	0.158	80.5	46	57.8	80.2	8.45	0.07	67	---	703	1	100	30
7/6/2017	8:30 PM	72.4	72.6	72.3	64	59.5	0	---	0	0	---	72.4	72.8	72.8	28.99	0	0	0	0.154	79.9	47	57.9	79.7	8.65	0.0701	67	---	700	1	100	30
7/6/2017	9:00 PM	72.6	72.6	72.4	63	59.3	0	---	0	0	---	72.6	73	73	29.002	0	0	0	0.158	79.7	47	57.7	79.5	8.66	0.0701	67	---	701	1	100	30
7/6/2017	9:30 PM	72.3	72.6	72.3	63	59	0	---	0	0	---	72.3	72.6	72.6	29	0	0	0	0.152	79.3	48	57.9	79.3	8.86	0.0702	67	---	702	1	100	30
7/6/2017	10:00 PM	71.7	72.3	71.7	63	58.4	0	---	0	0	---	71.7	71.7	71.7	28.994	0	0	0	0.14	79.2	48	57.8	79.2	8.87	0.0702	67	---	702	1	100	30
7/6/2017	10:30 PM	70.8	71.7	70.8	64	58	0	---	0	0	---	70.8	70.6	70.6	29.008	0	0	0	0.121	78.6	48	57.3	78.5	8.88	0.0703	67	---	700	1	100	30
7/6/2017	11:00 PM	69.8	70.8	69.8	65	57.5	0	---	0	0	---	69.8	69.5	69.5	29.013	0	0	0	0.1	75.6	47	53.9	75.4	8.74	0.0709	67	---	702	1	100	30
7/6/2017	11:30 PM	68.8	69.8	68.8	66	57	0	---	0	0	---	68.8	68.9	68.9	29.018	0	0	0	0.079	73.1	47	51.7	72.4	8.75	0.0713	67	---	703	1	100	30
7/7/2017	12:00 AM	67.8	68.8	67.8	66	56	0	---	0	0	---	67.8	68	68	29.025	0	0	0	0.058	71.6	48	50.9	70.3	8.88	0.0715	67	---	702	1	100	30
7/7/2017	12:30 AM	66.9	67.8	66.9	67	55.6	0	---	0	0	---	66.9	67	67	29.026	0	0	0	0.04	70.2	48	49.6	68.4	8.85	0.0718	67	---	701	1	100	30
7/7/2017	1:00 AM	66.1	66.9	66.1	68	55.2	0	---	0	0	---	66.1	66.2	66.2	29.047	0	0	0	0.023	69.2	48	48.7	67.5	8.87	0.072	67	---	703	1	100	30
7/7/2017	1:30 AM	65.4	66.1	65.4	68	54.6	0	---	0	0	---	65.4	65.3	65.3	29.051	0	0	0	0.008	68.2	48	47.8	66.7	8.89	0.0722	67	---	702	1	100	30
7/7/2017	2:00 AM	64.7	65.4	64.7	68	53.9	0	---	0	0	---	64.7	64.5	64.5	29.055	0	0	0.006	0	67.4	49	47.6	65.9	9.1	0.0723	67	---	702	1	100	30
7/7/2017	2:30 AM	64	64.7	64	69	53.6	0	---	0	0	---	64	63.7	63.7	29.058	0	0	0.021	0	66.6	49	46.8	65	9.12	0.0724	67	---	700	1	100	30
7/7/2017	3:00 AM	63.3	64	63.3	69	53	0	---	0	0	---	63.3	63	63	29.063	0	0	0.035	0	65.9	49	46.2	64.2	9.13	0.0726	67	---	703	1	100	30
7/7/2017	3:30 AM	62.7	63.3	62.7	70	52.8	0	---	0	0	---	62.7	62.3	62.3	29.074	0	0	0.048	0	65.1	49	45.5	63.3	9.15	0.0727	67	---	701	1	100	30
7/7/2017	4:00 AM	62.1	62.7	62.1	70	52.2	0	---	0	0	---	62.1	61.6	61.6	29.076	0	0	0.06	0	64.5	49	44.9	62.7	9.17	0.0728	67	---	702	1	100	30
7/7/2017	4:30 AM	61.6	62.1	61.6	70	51.7	0	---	0	0	---	61.6	61.1	61.1	29.086	0	0	0.071	0	64	50	45	62.2	9.37	0.0729	67	---	703	1	100	30
7/7/2017	5:00 AM	60.9	61.5	60.9	70	51	0	---	0	0	---	60.9	60.3	60.3	29.098	0	0	0.085	0	63.2	50	44.2	61.3	9.39	0.0731	67	---	702	1	100	30
7/7/2017	5:30 AM	60.4	60.9	60.4	70	50.6	0	---	0	0	---	60.4	59.8	59.8	29.107	0	0	0.096	0	62.7	50	43.8	60.8	9.4	0.0732	67	---	702	1	100	30
7/7/2017	6:00 AM	60	60.4	60	78	53.1	0	---	0	0	---	60	59.8	59.8	29.116	0	0	0.104	0	62.1	50	43.2	60.2	9.41	0.0733	67	---	701	1	100	30
7/7/2017	6:30 AM	58.6	60	58.6	61	45.2	0	---	0	0	---	58.6	57.4	57.4	28.948	0.01	0	0.133	0	61.3	50	42.5	59.3	9.42	0.073	67	---	702	1	100	30
7/7/2017	7:00 AM	59.6	59.6	58.5	64	47.4	0	S	0	2	S	59.6	58.6	58.6	29.272	0	0	0.113	0	61.6	51	43.3	59.7	9.62	0.0738	67	---	701	1	100	30
7/7/2017	7:30 AM	60.5	60.6	59.6	81	54.6	0	NW	0	2	NW	60.5	60.5	60.5	29.274	0.03	6.47	0.094	0	61.1	61	47.5	60	11.25	0.0737	67	---	699	1	100	30
7/7/2017	8:00 AM	60.8	60.9	60.4	80	54.6	1	NW	0.5	6	N	60.8	60.8	60.8	29.284	0	0	0.088	0	62.2	71	52.7	61.8	13.49	0.0734	67	---	697	1	100	30
7/7/2017	8:30 AM	61.3	61.3	60.8	78	54.4	3	NNW	1.5	12	NE	61.3	61.2	61.2	29.288	0	0	0.077	0	63	70	53.1	62.7	13.31	0.0733	67	---	700	1	100	30
7/7/2017	9:00 AM	63.5	63.6	61.3	74	55.1	2	NNE	1	9	NE	63.5	63.5	63.5	29.29	0	0	0.031	0	75.7	58	59.9	76.3	10.52	0.0713	67	---	690	1	100	30
7/7/2017	9:30 AM	65.2	65.2	63.5	68	54.4	2	NE	1	10	NNE	65.2	65.1	65.1	29.296	0	0	0	0.004	84.5	45	60.8	85.6	8.26	0.0701	67	---	699	1	100	30
7/7/2017	10:00 AM	66.2	66.2	64.7	68	55.3	3	NE	1.5	9	NE	66.2	66.3	66.3	29.299	0	0	0	0.025	76.4	52	57.5	76.5	9.52	0.0713	67	---	690	1	100	30
7/7/2017	10:30 AM	67.8	67.8	66.2	65	55.6	2	NE	1	7	NE	67.8	68	68	29.303	0	0	0	0.058	75.6	52	56.7	75.8	9.54	0.0715	67	---	693	1	100	30
7/7/2017	11:00 AM	68.7	70.4	67.8	58	53.3	2	NNE	1	12	NE	68.7	68	68	29.305	0	0	0	0.077	73.6	49	53.3	73.2	9.05	0.0719	67	---	685	1	100	30
7/7/2017	11:30 AM	67.4	69.3	67.4	63	54.4	3	NE	1.5	9	NNE	67.4	67.3	67.3	29.31	0	0	0	0.05	72.1	46	50.2	70.8	8.61	0.0722	67	---	691	1	100	30
7/7/2017	12:00 PM	69.7	70.2	67.4	57	53.8	2	N	1	10	NNW	69.7	68.7	68.7	29.319	0	0	0	0.098	70.4	46	48.6	68.4	8.64	0.0725	67	---	687	1	100	30
7/7/2017	12:30 PM	68.3	69.7	68.3	58	52.9	2	NNW	1	8	WNW	68.3	67.7	67.7	29.319	0	0	0	0.069	68.9	42	44.9	66.7	8.07	0.0728	67	---	691	1	100	30
7/7/2017	1:00 PM	67.8	69.9	67.8	56	51.5	2	NW	1	9	NNE	67.8	67.1	67.1	29.32	0	0	0	0.058	69.2	44	46.4	67.1	8.35	0.0727	67	---	693	1	100	30
7/7/2017	1:30 PM	68.8	68.8	66.8	53	51	3	NW	1.5	12	NNE	68.8	67.7	67.7	29.321	0	0	0	0.079	68.5	44	45.7	66.5	8.35	0.0729	67	---	691	1	100	30
7/7/2017	2:00 PM	67.8	69	67.6	56	51.5	3	NW	1.5	10	NNE	67.8	67.1	67.1	29.321	0	0	0	0.058	69.2	44	46.4	67.1	8.35	0.0727	67	---	686	1	100	30
7/7/2017	2:30 PM	65.8	68.1	65.4	58	50.6	2	NNW	1	10	NNE	65.8	64.9	64.9	29.322	0	0	0	0.017	68.7	43	45.3	66.6	8.25	0.0728	67	---	693	1	100	30
7/7/2017	3:00 PM	66.5	66.5	65.3	55	49.8	3	NNW	1.5	9	ENE	66.5	65.5	65.5	29.324	0	0	0	0.031	69	45	46.8	67.1	8.47	0.0728	67	---	689	1	100	30
7/7/2017	3:30 PM	67	67.3	65.8	52	48.8	3	NE	1.5	12	NE	67	65.8	65.8	29.321	0	0	0	0.042	71.8	46	49.9	70.4	8.61	0.0723	67	---	688	1	100	30
7/7/2017	4:00 PM	68.1	68.5	66.7	50	48.8	3	NE	1.5	11	NE	68.1	66.8	66.8	29.317	0	0	0	0.065	74.7	37	46.7	73.6	7.26	0.072	67	---	692	1	100	30
7/7/2017	4:30 PM	68.5	69.2	67.9	47	47.5	3	NE	1.5	11	NE	68.5	66.8	66.8	29.31	0	0	0	0.073	74.5	36	45.8	73.3	7.07	0.072	67	---	699	1	100	30
7/7/2017	5:00 PM	69.7	69.7	68	44	46.8	3	NE	1.5	13	NNE	69.7	67.5	67.5	29.305	0	0	0	0.098	74.7	35	45.2	73.5	6.96	0.072	67	---	685	1	100	30

7/7/2017	5:30 PM	70.6	71.5	69.7	43	47	2	NNW	1	10	NNE	70.6	68.4	68.4	29.299	0	0	0	0.117	75.2	34	44.9	73.9	6.75	0.0719	67	---	692	1	100	30
7/7/2017	6:00 PM	69.5	70.7	69.3	45	47.2	2	NNE	1	11	NE	69.5	67.4	67.4	29.296	0	0	0	0.094	79.5	38	51.7	78.4	7.26	0.0711	67	---	698	1	100	30
7/7/2017	6:30 PM	70.3	70.3	69.3	47	49.1	2	NE	1	10	NE	70.3	68.4	68.4	29.297	0	0	0	0.11	82.9	39	55.4	82.4	7.39	0.0705	67	---	695	1	100	30
7/7/2017	7:00 PM	69.5	71.8	69.5	45	47.2	2	NW	1	9	NE	69.5	67.4	67.4	29.298	0	0	0	0.094	84.5	40	57.5	84.7	7.55	0.0702	67	---	684	1	100	30
7/7/2017	7:30 PM	70.9	70.9	69.3	46	49.1	2	NNW	1	7	NW	70.9	69.1	69.1	29.296	0	0	0	0.123	83.5	40	56.6	83.5	7.55	0.0704	67	---	696	1	100	30
7/7/2017	8:00 PM	67.7	70.9	67.7	52	49.4	2	NNW	1	6	NNE	67.7	66.6	66.6	29.292	0	0	0	0.056	81.6	40	54.9	80.8	7.55	0.0707	67	---	691	1	100	30
7/7/2017	8:30 PM	65.9	67.7	65.9	58	50.7	1	NNW	0.5	4	NNW	65.9	65	65	29.297	0	0	0	0.019	79.5	40	53.1	78.6	7.56	0.0711	67	---	695	1	100	30
7/7/2017	9:00 PM	62.7	65.9	62.7	66	51.2	1	NNW	0.5	6	NW	62.7	62.1	62.1	29.292	0	0	0.048	0	77.3	41	51.8	76.5	7.75	0.0714	67	---	694	1	100	30
7/7/2017	9:30 PM	59.4	62.7	59.4	69	49.2	2	NW	1	7	NNW	59.4	58.7	58.7	29.289	0	0	0.117	0	74.5	43	50.5	73.9	8.07	0.0718	67	---	687	1	100	30
7/7/2017	10:00 PM	57.8	59.3	57.8	67	46.9	2	NW	1	8	NW	57.8	56.9	56.9	29.292	0	0	0.15	0	71.8	43	48.1	70.1	8.18	0.0723	67	---	690	1	100	30
7/7/2017	10:30 PM	57.5	57.8	57.5	68	47	0	SSE	0	5	SSE	57.5	56.6	56.6	29.3	0	0	0.156	0	69.4	43	45.9	67.2	8.25	0.0727	67	---	689	1	100	30
7/7/2017	11:00 PM	57.3	57.4	56.9	65	45.6	0	SSW	0	5	SSW	57.3	56.3	56.3	29.306	0	0	0.16	0	67.2	43	43.9	65.1	8.25	0.073	67	---	692	1	100	30
7/7/2017	11:30 PM	57.5	57.6	57.3	62	44.6	1	NW	0.5	7	NNW	57.5	56.3	56.3	29.302	0	0	0.156	0	65.4	43	42.3	63.1	8.25	0.0733	67	---	690	1	100	30
7/8/2017	12:00 AM	56.9	57.6	56.9	69	46.8	2	NW	1	7	NNW	56.9	56.1	56.1	29.301	0	0	0.169	0	64	45	42.2	61.8	8.57	0.0735	67	---	688	1	100	30
7/8/2017	12:30 AM	55.7	56.9	55.6	74	47.5	3	NW	1.5	7	NW	55.7	55.1	55.1	29.301	0	0	0.194	0	62.7	46	41.6	60.5	8.74	0.0737	67	---	692	1	100	30
7/8/2017	1:00 AM	55.2	55.7	55.1	73	46.7	1	NW	0.5	6	NW	55.2	54.6	54.6	29.304	0	0	0.204	0	61.6	45	40	59.3	8.62	0.0739	67	---	691	1	100	30
7/8/2017	1:30 AM	54.7	55.2	54.7	73	46.2	0	NE	0	3	ESE	54.7	54.1	54.1	29.302	0	0	0.215	0	60.5	45	39	58.2	8.64	0.0741	67	---	692	1	100	30
7/8/2017	2:00 AM	54.7	54.8	54.7	72	45.8	0	S	0	4	SSW	54.7	54	54	29.298	0	0	0.215	0	59.4	45	38	57.1	8.65	0.0743	67	---	689	1	100	30
7/8/2017	2:30 AM	54.9	54.9	54.7	70	45.3	1	NW	0.5	6	SW	54.9	54.1	54.1	29.294	0	0	0.21	0	58.7	46	38	56.5	8.85	0.0744	67	---	690	1	100	30
7/8/2017	3:00 AM	55	55.1	54.9	70	45.4	2	NW	1	7	NNW	55	54.2	54.2	29.292	0	0	0.208	0	58.1	47	38	55.9	8.95	0.0744	67	---	688	1	100	30
7/8/2017	3:30 AM	55	55	54.9	72	46.1	2	NW	1	5	NNW	55	54.3	54.3	29.29	0	0	0.208	0	57.4	47	37.3	55.3	8.95	0.0746	67	---	687	1	100	30
7/8/2017	4:00 AM	55.7	55.8	55	74	47.5	1	NW	0.5	7	NW	55.7	55.1	55.1	29.288	0	0	0.194	0	57	47	37	54.9	8.95	0.0746	67	---	690	1	100	30
7/8/2017	4:30 AM	56.3	56.4	55.8	74	48.1	2	NW	1	8	NW	56.3	55.7	55.7	29.285	0	0	0.181	0	56.8	48	37.3	54.8	9.15	0.0746	67	---	692	1	100	30
7/8/2017	5:00 AM	56.4	56.4	56.3	77	49.3	2	NW	1	8	WNW	56.4	55.9	55.9	29.278	0	0	0.179	0	56.7	49	37.7	54.7	9.35	0.0746	67	---	688	1	100	30
7/8/2017	5:30 AM	57	57	56.3	80	50.9	3	WNW	1.5	7	WSW	57	56.7	56.7	29.278	0	0	0.167	0	56.7	49	37.7	54.7	9.35	0.0746	67	---	684	1	100	30
7/8/2017	6:00 AM	57.2	57.3	57	82	51.8	2	WNW	1	9	WNW	57.2	57	57	29.276	0	0	0.162	0	56.7	49	37.7	54.7	9.35	0.0746	67	---	690	1	100	30
7/8/2017	6:30 AM	57.6	57.6	57.2	83	52.5	2	WNW	1	9	WNW	57.6	57.4	57.4	29.274	0	0	0.154	0	56.8	49	37.8	54.8	9.35	0.0746	67	---	689	1	100	30
7/8/2017	7:00 AM	58.2	58.2	57.6	84	53.4	2	NW	1	11	NW	58.2	58.1	58.1	29.277	0	0	0.142	0	57.1	49	38.1	55.1	9.35	0.0746	67	---	686	1	100	30
7/8/2017	7:30 AM	58.9	58.9	58.2	84	54.1	2	WNW	1	8	NNW	58.9	58.9	58.9	29.274	0	0	0.127	0	58.2	51	40.1	56.3	9.65	0.0743	67	---	695	1	100	30
7/8/2017	8:00 AM	60	60	58.9	84	55.2	3	WNW	1.5	9	NW	60	60.1	60.1	29.281	0	0	0.104	0	59.3	52	41.7	57.5	9.76	0.0742	67	---	693	1	100	30
7/8/2017	8:30 AM	61.4	61.4	60	82	55.9	2	WNW	1	8	WSW	61.4	61.5	61.5	29.284	0	0	0.075	0	60	52	42.3	58.2	9.75	0.074	67	---	685	1	100	30
7/8/2017	9:00 AM	64.2	64.2	61.4	76	56.5	2	W	1	8	SSW	64.2	64.4	64.4	29.276	0	0	0.017	0	63	58	48	61.8	10.75	0.0734	67	---	692	1	100	30
7/8/2017	9:30 AM	67	67	64.2	70	56.9	2	W	1	11	WSW	67	67.4	67.4	29.274	0	0	0	0.042	66.4	58	51.2	65.6	10.75	0.0729	67	---	692	1	100	30
7/8/2017	10:00 AM	69.7	69.7	67	63	56.5	2	WNW	1	10	W	69.7	69.3	69.3	29.271	0	0	0	0.098	70.2	58	54.7	69.3	10.74	0.0722	67	---	692	1	100	30
7/8/2017	10:30 AM	70.6	70.6	69.7	62	56.9	2	WNW	1	9	NW	70.6	70.2	70.2	29.272	0	0	0	0.117	74	58	58.3	74.5	10.59	0.0715	67	---	695	1	100	30
7/8/2017	11:00 AM	70.1	70.8	70.1	62	56.5	3	WNW	1.5	11	NW	70.1	69.5	69.5	29.268	0	0	0	0.106	76.8	57	60.4	77.3	10.28	0.0711	67	---	691	1	100	30
7/8/2017	11:30 AM	70.3	70.3	69.4	61	56.2	3	WNW	1.5	10	NW	70.3	69.7	69.7	29.266	0	0	0	0.11	78.4	55	60.9	78.9	9.91	0.0708	67	---	691	1	100	30
7/8/2017	12:00 PM	71.5	71.6	70.3	58	55.9	3	WNW	1.5	14	SSW	71.5	71	71	29.266	0	0	0	0.135	80.1	56	63	80.9	10.05	0.0705	67	---	683	1	99.9	30
7/8/2017	12:30 PM	73.1	73.1	71.4	58	57.4	4	WNW	2	18	SSW	73.1	73.4	73.4	29.261	0	0	0	0.169	82	55	64.2	83.4	9.85	0.0702	67	---	695	1	100	30
7/8/2017	1:00 PM	74.1	74.1	73.1	57	57.9	3	WNW	1.5	14	S	74.1	74.5	74.5	29.255	0	0	0	0.19	84.1	54	65.7	86.6	9.75	0.0698	67	---	690	1	100	30
7/8/2017	1:30 PM	75.7	75.7	74.1	52	56.8	3	WNW	1.5	14	S	75.7	75.9	75.9	29.252	0	0	0	0.223	86.3	53	67.2	89.7	9.52	0.0694	67	---	691	1	100	30
7/8/2017	2:00 PM	76.6	76.6	75.1	50	56.6	3	WNW	1.5	11	SSW	76.6	76.5	76.5	29.248	0	0	0	0.242	88.2	52	68.4	92.5	9.35	0.0691	67	---	684	1	100	30
7/8/2017	2:30 PM	75.1	76.8	75.1	50	55.2	4	SSW	2	17	SSW	75.1	75.2	75.2	29.244	0	0	0	0.21	89.8	50	68.7	94.8	9.05	0.0689	67	---	693	1	100	30
7/8/2017	3:00 PM	75.4	75.5	75	50	55.5	4	WNW	2	18	SSW	75.4	75.5	75.5	29.236	0	0	0	0.217	90.7	48	68.3	95.7	8.64	0.0688	67	---	691	1	100	30
7/8/2017	3:30 PM	76.9	77	75.4	46	54.5	5	W	2.5	19	SSW	76.9	76.5	76.5	29.23	0	0	0	0.248	91.8	46	68.1	97	8.31	0.0686	67	---	691	1	100	30
7/8/2017	4:00 PM	78	78.2	76.8	45	54.9	4	SSW	2	15	S	78	77.6	77.6	29.223	0	0	0	0.271	93.8	45	69.2	100.4	8.15	0.0683	67	---	694	1	100	30
7/8/2017	4:30 PM	78.2	78.2	77.4	43	53.9	5	SSW	2.5	17	SW	78.2	77.6	77.6	29.22	0	0	0	0.275	95.3	42	68.6	101.8	7.55	0.0682	67	---	693	1	100	30
7/8/2017	5:00 PM	77.7	78.2	77.6	42	52.8	5	WNW	2.5	21	S	77.7	77	77	29.217	0	0	0	0.265	96.5	42	69.7	104.3	7.55	0.0679	67	---	690	1	100	30
7/8/2017	5:30 PM	78	78.1	77.4	42	53	5	SSW	2.5	19	SW	78	77.3	77.3	29.215	0	0	0	0.271	97.2	41	69.6	105.1	7.45	0.0679	67	---	695	1	100	30
7/8/2017	6:00 PM	77.1	78.1	77	43	52.9	5	SSW	2.5	15	SSW	77.1	76.5	76.5	29.212	0	0	0	0.252	96.8	40	68.5	103.6	7.25	0.068	67	---	695	1	100	30
7/8/2017	6:30 PM	76.4	77.7	76.4	44	52.9	4	SSW	2	16	SSW	76.4	75.9	75.9	29.21	0	0	0	0.238	96.1	40	67.9	102.2	7.25	0.0681	67	---	694	1	100	30
7/8/2017	7:00 PM	75.3	76.4	75.3	46	53.1	3	WNW	1.5	10	SSW	75.3	75.1	75.1	29.207	0	0	0	0.215	93.6	40	65.6	97.4	7.31	0.0685	67	---	692	1	100	30
7/8/2017	7:30 PM	69	75.3	69	55	52.2	3	NW	1.5	15	NNW	69	68	68	29.234	0	0	0	0.083	89.8	39	61.5	90.7	7.25	0.0692	67	---	696	1	100	30
7/8/2017	8:00 PM	65.7	69	65.7	68	54.8	1	NW	0.5	8	NW	65.7	65.7	65.7	29.224	0	0	0	0.015	86.9	41	60.4	87.5	7.65	0.0696	67	---	691	1	100	30
7/8/2017	8:30 PM	64.7	65.7	64.6	72	55.5	0	NNW	0	1	NNW	64.7	64.8	64.8	29.211	0	0	0.006	0	84.1	41	57.9	84.5	7.67	0.0701	67	---	692	1	100	30
7/8/2017	9:00 PM	64.5	64.6	64.5	74	56	1	NNW	0.5	8	NNW	64.5	64.6	64.6	29.235	0	0	0.01	0	81.4	42	56.1	80.8	7.85	0.0706	67	---	699	1	100	30
7/8/2017	9:30 PM	63	64.5	63	79	56.4	0	NW	0	2	NW	63	63.2	63.2	29.223	0	0	0.042	0	79	43	54.6	78.5	8.05	0.0709	67	---	697	1	100	30
7/8/2017	10:00 PM	61.8	63	61.8	82	56.2	0	WSW	0	2	WSW	61.8	62	62	29.22	0	0	0.067	0	76.6	44	53.1	76.1	8.22	0.0713	67	---	687	1	100	30
7/8/2017	10:30 PM	61.9	61.9	61.7	82	56.3	0	WSW	0	1	WSW	61.9	62.1	62.1	29.232	0	0	0.065	0	74.7	44	51.3	74.2	8.26	0.0716	67	---	699	1	100	30
7/8/2017	11:00 PM	61.8	62	61.8	83	56.6	0	WSW	0	3	WSW	61.8	62	62	29.243	0	0	0.067	0	73.1	45	50.5	72.2	8.45	0.0719	67	---	693	1	100	30
7/8/2017	11:30 PM	61.1	61.8	61.1	86	56.9	0	WSW	0	1	WSW	61.1	61.3	61.3	29.237	0	0	0.081	0	71.6	45	49.1	70	8.45	0.0721	67	---	691	1	100	30
7/9/2017	12:00 AM	60.6	61.1	60.4	86	56.4	0	WSW	0	2	WSW	60.6	60.8	60.8	29.241	0	0	0.092	0	70.2	46	48.4	68.2	8.65	0.0723	67	---	695	1	100	30
7/9/2017	12:30 AM	61.4	61.4	60.6	84	56.5	1	NW	0.5	4	NW	61.4	61.6	61.6	29.244	0	0	0.075	0	69	46	47.4	67.2	8.65	0.0725	67	---	689	1	100	30
7/9/2017	1:00 AM	61.3	61.6	61.3	84	56.4	1	NNW	0.5	5	NW	61.3	61.5	61.5	29.242	0	0	0.077	0	68	47	47	66.4	8.79	0.0727	67	---	695	1	100	30
7/9/2017	1:30 AM	60.8	61.3	60.8	85	56.3	1	WNW	0.5	4	NW	60.8	61	61	29.244	0	0	0.088	0	67	48	46.7	65.4	8.91	0.0728	67	---	692	1	100	30
7/9/2017	2:00 AM	60.4	60.8	60.4	87	56.5	2	NW	1	6	NNW	60.4	60.6	60.6	29.249	0	0	0.096	0	66.2	48	45.9	64.4	8.93	0.073	67	---	696	1	100	30
7/9/2017	2:30 AM	59.9	60.4	59.9	88	56.3	0	SE	0	5	SSE	59.9	60.1	60.1	29.25	0	0	0.106	0	65.3	48	45.1	63.4	8.94	0.0731	67	---	695	1	100	30
7/9/2017	3:00 AM	59.4	59.9	59.4	90	56.5	0	ENE	0	3	E	59.4	59.6	59.6	29.257	0	0	0.117	0	64.6	48	44.5	62.7	8.97	0.0733	67	---	696	1	100	30
7/9/2017	3:30 AM	59.7	59.7	59.4	89	56.5	1	NNW	0.5	5	NNW	59.7	59.9	59.9	29.257	0	0	0.11	0	64	48	43.9	62	8.99	0.0734	67	---	696	1	100	30
7/9/2017	4:00 AM	59.5	59.7	59.5	89	56.3	0	SSW	0	2	NNE	59.5	59.7	59.7	29.255	0	0	0.115	0	63.6	49	44.1	61.7	9.21	0.0734	67	---	691	1	100	30
7/9/2017	4:30 AM	59.1	59.5	59.1	90	56.2	0	NNW	0	5	NNW	59.1	59.3	59.3	29.259	0	0	0.123	0	63.2	49	43.7	61.2	9.22	0.0735	67	---	691	1	100	30
7/9/2017	5:00 AM	58.7	59.1	58.7	91	56.1	0	---	0	0	---	58.7	58.9	58.9	29.26	0	0	0.131	0	62.7	49	43.3	60.7	9.24	0.0736	67	---	690	1	100	30
7/9/2017	5:30 AM	57.5	58.7	57.5	90	54.6	0	---	0	0	---	57.5	57.6	57.6	29.265	0	0	0.156	0	62.1	49	42.7	60.1	9.27	0.0737	67	---	695	1	100	30
7/9/2017	6:00 AM	56	57.5	56	92	53.7	0	NNW	0	2	NNW	56	56.1	56.1	29.265	0	0	0.188	0	61.4	49	42.1	59.4	9.29	0.0738	67	---	690	1	100	30
7/9/2017	6:30 AM	55	56	55	92	52.7	0	NNW	0	1	NNW	55	55.1	55.1	29.267	0	0	0.208	0	60.5	49	41.2	58.4	9.33	0.074	67	---	692	1	100	30
7/9/2017	7:00 AM	54.8	55	54.7	94	53.1	0	---	0	0	---	54.8	55	55	29.272	0	0	0.213	0	59.9	50	41.2	57.9	9.45	0.0741	67	---	697	1	100	30
7/9/2017	7:30 AM	55.7	55.7	54.8	94	54	0	NNW	0	1	NNW	55.7	55.9	55.9	29.276	0	0	0.194	0	60.2	49	41	58.1	9.34	0.074	67	---	698	1	100	30
7/9/2017	8:00 AM	57.4	57.4	55.7	94	55.7	0	N	0	3	N	57.4	57.6	57.6	29.275	0	0	0.158	0	61	49	41.7	58.9	9.31	0.0739	67	---	689	1	100	30
7/9/2017	8:30 AM	59	59	57.4	94	57.3	0	---	0	0	---	59	59.4	59.4	29.276	0	0	0.125	0	61.6	50	42.8	59.7	9.42	0.0738	67	---	694	1	100	30
7/9/2017	9:00 AM	60.5	60.5	59	91	57.9	0	N	0	2	N	60.5	60.9	60.9	29.285	0	0	0.094	0	62.5	50	43.6	60.6	9.4	0.0737	67	---	694	1	100	30
7/9/2017	9:30 AM	63.1	63.1	60.5	86	58.8	0	S	0	3	E	63.1	63.6	63.6	29.276	0	0	0.04	0	64.1	52	46.1	62.5	9.75	0.0733	67	---	698	1	100	30
7/9/2017	10:00 AM	65.5	65.5	63.1	81	59.5	0	S	0	3	S	65.5	66.3	66.3	29.256	0	0	0	0.01	67.4	53	49.7	66.3	9.9	0.0727	67	---	693	1	100	30
7/9/2017	10:30 AM	66.7	66.7	65.5	77	59.3	0	SSE	0	3	S	66.7	67.5	67.5	29.256	0	0	0	0.035	70.6	53	52.6	69.3	9.83	0.0722	67	---	695	1	100	30
7/9/2017	11:00 AM	68.3	68.3	66.7	72	58.9	1	SSE	0.5	5	S	68.3	69	69	29.245	0	0	0	0.069	73.1	54	55.5	73	9.89	0.0717	67	---	694	1	100	30
7/9/2017	11:30 AM	70.4	70.4	68.4	70	60.1	1	SE	0.5	4	SE	70.4	70.6	70.6	29.235	0	0	0	0.113	76.1	55	58.8	76.4	10.01	0.0711	67	---	688	1	100	30

7/9/2017	12:00 PM	72.4	72.4	70.4	66	60.4	0	SSE	0	3	SE	72.4	72.9	72.9	29.227	0	0	0	0.154	79.2	54	61.1	79.7	9.77	0.0706	67	---	696	1	100	30
7/9/2017	12:30 PM	71.6	72.4	71.6	68	60.5	0	SSE	0	3	SSE	71.6	72	72	29.218	0	0	0	0.137	81.6	53	62.8	82.5	9.62	0.0702	67	---	694	1	100	30
7/9/2017	1:00 PM	70.8	71.6	70.8	67	59.3	0	ENE	0	3	ENE	70.8	70.9	70.9	29.212	0	0	0	0.121	82.7	52	63.3	84	9.4	0.07	67	---	693	1	100	30
7/9/2017	1:30 PM	70.1	70.8	70.1	67	58.6	0	ENE	0	2	ENE	70.1	70	70	29.209	0	0	0	0.106	83.7	50	63.1	85.3	9.08	0.0699	67	---	695	1	100	30
7/9/2017	2:00 PM	69.4	70.1	69.3	72	60	0	SE	0	3	ENE	69.4	69.9	69.9	29.197	0	0	0	0.092	84.1	50	63.5	85.9	9.07	0.0698	67	---	695	1	100	30
7/9/2017	2:30 PM	68.2	69.4	68.2	75	60	0	SE	0	4	SE	68.2	69.1	69.1	29.191	0	0	0	0.067	83.7	49	62.5	85.2	8.88	0.0699	67	---	693	1	100	30
7/9/2017	3:00 PM	67.8	68.2	67.6	75	59.6	0	ENE	0	2	SE	67.8	68.7	68.7	29.189	0	0	0	0.058	83.5	49	62.3	84.9	8.88	0.0699	67	---	692	1	100	30
7/9/2017	3:30 PM	67.2	67.9	67.2	74	58.6	0	ENE	0	3	ENE	67.2	67.9	67.9	29.183	0	0	0	0.046	84.3	49	63.1	86	8.86	0.0697	67	---	699	1	100	30
7/9/2017	4:00 PM	65.1	67.2	65.1	85	60.5	1	NNE	0.5	4	NNE	65.1	65.9	65.9	29.184	0.05	0.78	0	0.002	83.1	48	61.4	84.1	8.79	0.07	67	---	692	1	100	30
7/9/2017	4:30 PM	64.9	65.2	64.9	83	59.6	0	NE	0	3	NE	64.9	65.6	65.6	29.18	0	0	0.002	0	82.7	48	61	83.4	8.8	0.07	67	---	694	1	100	30
7/9/2017	5:00 PM	65	65	64.9	81	59	0	NE	0	2	NE	65	65.7	65.7	29.18	0	0	0	0	82.3	48	60.6	82.8	8.8	0.0701	67	---	696	1	100	30
7/9/2017	5:30 PM	66.6	66.6	65	80	60.2	0	NE	0	3	NE	66.6	67.6	67.6	29.169	0	0	0	0.033	82.3	48	60.6	82.8	8.8	0.0701	67	---	695	1	100	30
7/9/2017	6:00 PM	67	67.1	66.6	79	60.3	0	NE	0	4	NE	67	68	68	29.16	0	0	0	0.042	82.3	48	60.6	82.8	8.8	0.0701	67	---	694	1	100	30
7/9/2017	6:30 PM	68.5	68.5	67	82	62.8	0	NE	0	3	NE	68.5	70	70	29.147	0	0	0	0.073	82	48	60.4	82.3	8.81	0.0701	67	---	690	1	100	30
7/9/2017	7:00 PM	71.6	71.6	68.5	78	64.4	1	NE	0.5	6	SSW	71.6	72.8	72.8	29.152	0	0	0	0.137	82.9	49	61.8	83.9	8.89	0.0699	67	---	694	1	100	30
7/9/2017	7:30 PM	73	73.4	71.6	74	64.2	1	WSW	0.5	7	SSW	73	74.4	74.4	29.143	0	0	0	0.167	82.9	49	61.8	83.9	8.89	0.0699	67	---	696	1	100	30
7/9/2017	8:00 PM	68.8	73	68.8	77	61.3	1	S	0.5	5	S	68.8	70	70	29.144	0	0	0	0.079	82.1	49	61	82.6	8.91	0.07	67	---	693	1	100	30
7/9/2017	8:30 PM	66.5	68.8	66.5	83	61.2	0	NE	0	2	SE	66.5	67.6	67.6	29.152	0	0	0	0.031	80.6	49	59.7	80.6	8.94	0.0703	67	---	691	1	100	30
7/9/2017	9:00 PM	66.4	66.5	66.2	86	62.1	1	NW	0.5	7	NW	66.4	67.6	67.6	29.172	0	0	0	0.029	79	50	58.8	79.2	9.17	0.0706	67	---	692	1	100	30
7/9/2017	9:30 PM	62.4	66.4	62.4	88	58.8	4	NW	2	12	NNW	62.4	62.9	62.9	29.169	0	0	0.054	0	77	51	57.5	76.9	9.35	0.0709	67	---	688	1	100	30
7/9/2017	10:00 PM	61.6	62.3	61.6	91	58.9	1	NNW	0.5	6	NNW	61.6	62.1	62.1	29.173	0	0	0.071	0	74.9	51	55.6	75	9.35	0.0713	67	---	698	1	100	30
7/9/2017	10:30 PM	61.2	61.6	61.2	91	58.6	0	N	0	1	N	61.2	61.6	61.6	29.177	0	0	0.079	0	72.8	51	53.6	72.3	9.39	0.0716	67	---	692	1	100	30
7/9/2017	11:00 PM	60.4	61.2	60.4	92	58.1	0	N	0	1	N	60.4	60.8	60.8	29.172	0	0	0.096	0	71.1	52	52.6	69.9	9.63	0.0719	67	---	694	1	100	30
7/9/2017	11:30 PM	60	60.4	60	93	58	0	N	0	1	N	60	60.4	60.4	29.173	0	0	0.104	0	69.7	52	51.3	68.3	9.66	0.0721	67	---	693	1	100	30
7/10/2017	12:00 AM	60.8	60.8	60	94	59.1	0	N	0	2	N	60.8	61.3	61.3	29.178	0	0	0.088	0	68.5	52	50.2	67.3	9.68	0.0724	67	---	696	1	100	30
7/10/2017	12:30 AM	62	62	60.8	94	60.3	0	N	0	3	N	62	62.7	62.7	29.17	0	0	0.063	0	67.9	52	49.6	66.8	9.69	0.0724	67	---	695	1	100	30
7/10/2017	1:00 AM	62.2	62.3	62	94	60.5	0	N	0	1	N	62.2	62.9	62.9	29.16	0.01	0	0.058	0	67.2	53	49.5	66.1	9.91	0.0725	67	---	688	1	100	30
7/10/2017	1:30 AM	62	62.2	62	94	60.3	0	---	0	0	---	62	62.7	62.7	29.152	0	0	0.063	0	66.6	53	48.9	65.4	9.92	0.0726	67	---	700	1	100	30
7/10/2017	2:00 AM	60.9	62.1	60.8	94	59.2	0	N	0	1	N	60.9	61.4	61.4	29.154	0	0	0.085	0	65.9	53	48.3	64.6	9.93	0.0727	67	---	694	1	100	30
7/10/2017	2:30 AM	60.1	60.8	60.1	94	58.4	0	N	0	1	N	60.1	60.5	60.5	29.161	0	0	0.102	0	65.1	53	47.5	63.7	9.95	0.0729	67	---	693	1	100	30
7/10/2017	3:00 AM	59.5	60.1	59.5	95	58.1	0	N	0	1	N	59.5	59.9	59.9	29.159	0	0	0.115	0	64.5	53	47	63	9.95	0.073	67	---	695	1	100	30
7/10/2017	3:30 AM	58.9	59.5	58.9	95	57.5	0	N	0	1	N	58.9	59.3	59.3	29.161	0	0	0.127	0	63.6	53	46.1	62.1	9.95	0.0731	67	---	690	1	100	30
7/10/2017	4:00 AM	58.2	58.8	58.2	95	56.8	0	N	0	2	N	58.2	58.5	58.5	29.165	0	0	0.142	0	63	54	46.1	61.5	10.15	0.0732	67	---	694	1	100	30
7/10/2017	4:30 AM	57.5	58.2	57.5	95	56.1	0	N	0	2	N	57.5	57.8	57.8	29.166	0	0	0.156	0	62.4	54	45.5	60.9	10.15	0.0733	67	---	689	1	100	30
7/10/2017	5:00 AM	56.9	57.5	56.9	95	55.5	0	---	0	0	---	56.9	57.1	57.1	29.164	0	0	0.169	0	61.6	54	44.8	60	10.15	0.0734	67	---	699	1	100	30
7/10/2017	5:30 AM	56.6	56.9	56.5	95	55.2	0	N	0	2	N	56.6	56.8	56.8	29.166	0	0	0.175	0	61	54	44.2	59.3	10.15	0.0736	67	---	692	1	100	30
7/10/2017	6:00 AM	56	56.6	56	95	54.6	0	N	0	2	N	56	56.2	56.2	29.149	0	0	0.188	0	60.5	54	43.8	58.8	10.15	0.0736	67	---	699	1	100	30
7/10/2017	6:30 AM	55.3	56	55.3	95	53.9	0	---	0	0	---	55.3	55.5	55.5	29.154	0	0	0.202	0	59.9	54	43.2	58.2	10.15	0.0737	67	---	692	1	100	30
7/10/2017	7:00 AM	55.9	55.9	55.2	96	54.8	0	N	0	1	N	55.9	56.1	56.1	29.166	0	0	0.19	0	59.4	56	43.7	57.9	10.45	0.0738	67	---	693	1	100	30
7/10/2017	7:30 AM	57.7	57.7	55.9	96	56.6	0	N	0	2	N	57.7	58	58	29.175	0	0	0.152	0	60.5	63	47.8	59.5	11.65	0.0735	67	---	694	1	100	30
7/10/2017	8:00 AM	58.3	58.3	57.7	96	57.2	0	N	0	1	N	58.3	58.6	58.6	29.179	0	0	0.14	0	61.3	65	49.4	60.5	12.02	0.0734	67	---	696	1	100	30
7/10/2017	8:30 AM	58.8	58.8	58.3	96	57.7	0	N	0	2	N	58.8	59.2	59.2	29.183	0	0	0.129	0	62.1	68	51.4	61.5	12.75	0.0732	67	---	697	1	100	30
7/10/2017	9:00 AM	58.9	58.9	58.6	96	57.8	0	N	0	2	N	58.9	59.3	59.3	29.179	0	0	0.127	0	63.2	72	54	63	13.75	0.073	67	---	692	1	100	30
7/10/2017	9:30 AM	60	60.1	58.9	96	58.9	0	N	0	3	N	60	60.4	60.4	29.178	0	0	0.104	0	64.8	74	56.3	65	14.25	0.0726	67	---	694	1	100	30
7/10/2017	10:00 AM	60.5	60.5	59.9	96	59.4	1	NE	0.5	4	NE	60.5	61	61	29.182	0	0	0.094	0	66.9	73	58	67.5	14.01	0.0723	67	---	698	1	100	30
7/10/2017	10:30 AM	61.3	61.4	60.5	95	59.9	0	NNE	0	5	NNE	61.3	61.9	61.9	29.18	0	0	0.077	0	68.7	73	59.7	69.5	13.98	0.072	67	---	697	1	100	30
7/10/2017	11:00 AM	63	63	61.3	94	61.2	1	SSW	0.5	5	S	63	63.8	63.8	29.18	0	0	0.042	0	71.1	71	61.2	71.6	13.41	0.0716	67	---	693	1	100	30
7/10/2017	11:30 AM	67.3	67.3	63	87	63.3	1	NE	0.5	3	SSE	67.3	68.7	68.7	29.176	0	0	0	0.048	72.6	70	62.3	73.5	13.05	0.0713	67	---	693	1	100	30
7/10/2017	12:00 PM	71.2	71.2	67.4	79	64.4	0	ENE	0	4	NE	71.2	72.4	72.4	29.174	0	0	0	0.129	74.3	69	63.5	75.8	12.76	0.071	67	---	694	1	100	30
7/10/2017	12:30 PM	72.9	72.9	71.2	74	64.1	1	ENE	0.5	5	NNE	72.9	74.3	74.3	29.173	0	0	0	0.165	75.4	67	63.7	76.9	12.24	0.0708	67	---	694	1	100	30
7/10/2017	1:00 PM	75	75	72.9	67	63.3	1	NNE	0.5	6	N	75	76.5	76.5	29.165	0	0	0	0.208	77.7	64	64.5	79	11.6	0.0705	67	---	695	1	100	30
7/10/2017	1:30 PM	77.2	77.2	74.9	62	63.2	1	NE	0.5	5	NNE	77.2	78.2	78.2	29.159	0	0	0	0.254	79.3	57	62.7	80.1	10.18	0.0703	67	---	690	1	100	30
7/10/2017	2:00 PM	78.4	78.4	77.2	56	61.4	1	SE	0.5	4	ESE	78.4	79	79	29.158	0	0	0	0.279	81.6	52	62.3	82.3	9.42	0.0701	67	---	695	1	100	30
7/10/2017	2:30 PM	79.2	79.4	78.4	54	61.1	1	SE	0.5	5	SE	79.2	79.7	79.7	29.153	0	0	0	0.296	80.8	46	58.1	80.5	8.45	0.0703	67	---	690	1	100	30
7/10/2017	3:00 PM	80.4	80.4	79.1	51	60.6	1	SSE	0.5	7	SSE	80.4	80.7	80.7	29.15	0	0	0	0.321	80.8	45	57.5	80.4	8.33	0.0704	67	---	699	1	100	30
7/10/2017	3:30 PM	80.4	80.9	80.2	53	61.7	1	SSE	0.5	6	SSE	80.4	80.9	80.9	29.148	0	0	0	0.321	81	44	57	80.5	8.15	0.0704	67	---	696	1	100	30
7/10/2017	4:00 PM	80.1	80.5	79.9	55	62.5	1	SE	0.5	7	SE	80.1	80.8	80.8	29.145	0	0	0	0.315	82	40	55.3	81.3	7.55	0.0703	67	---	696	1	100	30
7/10/2017	4:30 PM	80	80.5	80	55	62.4	1	SE	0.5	5	SE	80	80.7	80.7	29.145	0	0	0	0.313	83.3	38	55	82.8	7.25	0.0701	67	---	695	1	100	30
7/10/2017	5:00 PM	78.7	80	78.7	63	65	1	SE	0.5	4	SSE	78.7	80.1	80.1	29.145	0	0	0	0.285	84.7	37	55.5	84.3	7.06	0.0699	67	---	696	1	100	30
7/10/2017	5:30 PM	78.6	78.7	78.2	61	64	0	E	0	3	E	78.6	79.7	79.7	29.142	0	0	0	0.283	84.9	35	54.2	84.1	6.65	0.0699	67	---	692	1	100	30
7/10/2017	6:00 PM	78.6	78.6	78.5	60	63.6	0	E	0	3	E	78.6	79.6	79.6	29.14	0	0	0	0.283	84.7	37	55.5	84.3	7.06	0.0699	67	---	695	1	100	30
7/10/2017	6:30 PM	78.2	78.7	78.1	57	61.7	0	E	0	2	E	78.2	78.9	78.9	29.136	0	0	0	0.275	86.5	41	60	87	7.65	0.0695	67	---	696	1	100	30
7/10/2017	7:00 PM	78.4	78.5	77.8	57	61.9	0	E	0	2	E	78.4	79.1	79.1	29.132	0	0	0	0.279	89.6	43	64.1	91.9	7.95	0.0689	67	---	696	1	100	30
7/10/2017	7:30 PM	77.8	78.5	77.8	60	62.8	0	E	0	2	E	77.8	78.7	78.7	29.131	0	0	0	0.267	89.4	44	64.6	92.1	8.06	0.0689	67	---	691	1	100	30
7/10/2017	8:00 PM	75.1	77.8	75.1	66	63	0	E	0	3	E	75.1	76.5	76.5	29.137	0	0	0	0.21	88.4	44	63.7	90.2	8.08	0.0691	67	---	695	1	100	30
7/10/2017	8:30 PM	72.3	75.1	72.3	68	61.1	0	E	0	1	E	72.3	73	73	29.14	0	0	0	0.152	86.7	46	63.4	88.4	8.42	0.0693	67	---	697	1	100	30
7/10/2017	9:00 PM	70.6	72.3	70.6	75	62.3	0	---	0	0	---	70.6	71.3	71.3	29.147	0	0	0	0.117	84.7	45	61	85.7	8.26	0.0697	67	---	697	1	100	30
7/10/2017	9:30 PM	68.5	70.6	68.5	79	61.7	0	---	0	0	---	68.5	69.8	69.8	29.148	0	0	0	0.073	82.5	46	59.6	82.8	8.45	0.07	67	---	692	1	100	30
7/10/2017	10:00 PM	65.6	68.5	65.6	83	60.3	0	---	0	0	---	65.6	66.5	66.5	29.153	0	0	0	0.012	80.1	46	57.5	79.8	8.45	0.0705	67	---	697	1	100	30
7/10/2017	10:30 PM	63.5	65.6	63.5	87	59.6	0	---	0	0	---	63.5	64.1	64.1	29.162	0	0	0.031	0	77.7	47	55.9	77.4	8.7	0.0709	67	---	693	1	100	30
7/10/2017	11:00 PM	62	63.5	62	89	58.7	0	---	0	0	---	62	62.5	62.5	29.166	0	0	0.063	0	75.6	48	54.5	75.5	8.94	0.0712	67	---	697	1	100	30
7/10/2017	11:30 PM	60.9	62	60.9	91	58.3	0	E	0	1	E	60.9	61.3	61.3	29.166	0	0	0.085	0	73.6	48	52.7	73.1	8.92	0.0715	67	---	694	1	100	30
7/11/2017	12:00 AM	60	60.9	60	92	57.7	0	---	0	0	---	60	60.3	60.3	29.165	0	0	0.104	0	71.9	49	51.7	70.9	9.05	0.0718	67	---	692	1	100	30
7/11/2017	12:30 AM	59.3	60	59.2	92	57	0	E	0	1	E	59.3	59.6	59.6	29.164	0	0	0.119	0	70.2	49	50.1	68.5	9.05	0.0721	67	---	689	1	100	30
7/11/2017	1:00 AM	58.4	59.3	58.3	93	56.4	0	---	0	0	---	58.4	58.7	58.7	29.164	0	0	0.137	0	68.7	49	48.8	67.2	9.08	0.0723	67	---	698	1	100	30
7/11/2017	1:30 AM	57.8	58.3	57.7	93	55.8	0	---	0	0	---	57.8	58	58	29.162	0	0	0.15	0	67.4	50	48.1	66	9.3	0.0725	67	---	694	1	100	30
7/11/2017	2:00 AM	57.6	57.7	57.5	94	55.9	0	---	0	0	---	57.6	57.8	57.8	29.167	0	0	0.154	0	66.1	50	46.9	64.5	9.33	0.0728	67	---	691	1	100	30
7/11/2017	2:30 AM	57.6	57.7	57.6	94	55.9	0	---	0	0	---	57.6	57.8	57.8	29.166	0	0	0.154	0	64.9	50	45.8	63.2	9.35	0.073	67	---	696	1	100	30
7/11/2017	3:00 AM	57.3	57.6	57.3	94	55.6	0	---	0	0	---	57.3	57.5	57.5	29.161	0	0	0.16	0	64	50	45	62.2	9.37	0.0731	67	---	695	1	100	30
7/11/2017	3:30 AM	57.3	57.3	57.2	95	55.9	0	E	0	2	E	57.3	57.5	57.5	29.161	0	0	0.16	0	63.2	51	44.8	61.4	9.59	0.0732	67	---	699	1	100	30
7/11/2017	4:00 AM	57.3	57.4	57.3	95	55.9	0	E	0	3	E	57.3	57.5	57.5	29.155	0	0	0.16	0	62.5	51	44.1	60.7	9.6	0.0733	67	---	691	1	100	30
7/11/2017	4:30 AM	56.7	57.3	56.7	95	55.3	0	E	0	2	E	56.7	56.9	56.9	29.16	0	0	0.173	0	61.8	51	43.5	60	9.61	0.0734	67	---	699	1	100	30
7/11/2017	5:00 AM	56.5	56.8	56.5	95	55.1	0	E	0	1	E	56.5	56.7	56.7	29.158	0	0	0.177	0	61.1	51	42.8	59.2	9.63	0.0736	67	---	692	1	100	30
7/11/2017	5:30 AM	56.1	56.5	56.1	95	54.7	0	E	0	1	E	56.1	56.3	56.3	29.153	0	0	0.185	0	60.5	51	42.3	58.6	9.64	0.0736	67	---	693	1	100	30
7/11/2017	6:00 AM	55.7	56.1	55.7	95	54.3	0	E	0	1	E	55.7	55.9	55.9	29.16	0	0	0.194	0	59.9	51	41.7	58	9.65	0.0738	67	---	694	1	100	30

7/11/2017	6:30 AM	55.7	55.8	55.6	95	54.3	0	E	0	1	E	55.7	55.9	55.9	29.159	0	0	0.194	0	59.4	51	41.3	57.5	9.65	0.0738	67	---	699	1	100	30
7/11/2017	7:00 AM	56.2	56.2	55.7	96	55.1	0	E	0	1	E	56.2	56.4	56.4	29.171	0	0	0.183	0	59.9	63	47.3	58.8	11.65	0.0736	67	---	697	1	100	30
7/11/2017	7:30 AM	57.3	57.3	56.2	96	56.2	0	E	0	1	E	57.3	57.6	57.6	29.182	0	0	0.16	0	61.3	63	48.6	60.4	11.65	0.0734	67	---	692	1	100	30
7/11/2017	8:00 AM	58.8	58.8	57.3	95	57.4	0	---	0	0	---	58.8	59.2	59.2	29.189	0	0	0.129	0	62.7	67	51.6	62.2	12.5	0.0731	67	---	701	1	100	30
7/11/2017	8:30 AM	60	60.1	58.9	95	58.6	0	E	0	1	E	60	60.4	60.4	29.197	0	0	0.104	0	64	67	52.8	63.6	12.47	0.0729	67	---	692	1	100	30
7/11/2017	9:00 AM	63.3	63.3	60.1	94	61.5	0	E	0	3	E	63.3	64.1	64.1	29.198	0	0	0.035	0	69	66	57.2	69	12.15	0.0721	67	---	696	1	100	30
7/11/2017	9:30 AM	68	68	63.3	84	63	0	E	0	2	E	68	69.5	69.5	29.193	0	0	0	0.063	71.1	68	60	71.3	12.55	0.0716	67	---	690	1	100	30
7/11/2017	10:00 AM	71	71	68	78	63.8	0	E	0	3	E	71	72.1	72.1	29.185	0	0	0	0.125	69.6	53	51.7	68.3	9.86	0.0722	67	---	696	1	100	30
7/11/2017	10:30 AM	73.9	73.9	71	69	63.1	0	E	0	4	E	73.9	75.4	75.4	29.178	0	0	0	0.185	67.5	52	49.3	66.3	9.7	0.0725	67	---	692	1	100	30
7/11/2017	11:00 AM	75	75	73.9	69	64.1	1	SE	0.5	4	SE	75	76.6	76.6	29.175	0	0	0	0.208	70.4	60	55.8	69.7	11.04	0.0719	67	---	692	1	100	30
7/11/2017	11:30 AM	77.4	77.4	75	63	63.8	1	SSE	0.5	5	SSE	77.4	78.5	78.5	29.176	0	0	0	0.258	77	62	63	78	11.21	0.0707	67	---	694	1	100	30
7/11/2017	12:00 PM	79.8	79.9	77.4	54	61.7	1	SSE	0.5	8	NNE	79.8	80.4	80.4	29.164	0	0	0	0.308	81.2	58	65	82.7	10.35	0.07	67	---	695	1	100	30
7/11/2017	12:30 PM	80.4	80.4	79.6	47	58.3	3	NNE	1.5	9	NE	80.4	80.2	80.2	29.168	0	0	0	0.321	79.7	48	58.3	79.6	8.86	0.0705	67	---	688	1	100	30
7/11/2017	1:00 PM	80.7	80.7	79.9	56	63.5	2	NE	1	8	NNE	80.7	81.7	81.7	29.17	0	0	0	0.327	79.9	46	57.3	79.6	8.45	0.0705	67	---	696	1	100	30
7/11/2017	1:30 PM	79.7	81.3	79.7	62	65.5	1	ENE	0.5	4	E	79.7	81.2	81.2	29.184	0	0	0	0.306	80.1	43	55.6	79.5	8.05	0.0706	67	---	696	1	100	30
7/11/2017	2:00 PM	78.8	79.7	78.3	63	65.1	1	E	0.5	4	E	78.8	80.2	80.2	29.188	0	0	0	0.288	79.7	41	53.9	78.9	7.75	0.0707	67	---	700	1	100	30
7/11/2017	2:30 PM	77.7	78.9	77.7	63	64.1	1	E	0.5	4	ESE	77.7	78.9	78.9	29.187	0	0	0	0.265	79.9	40	53.4	78.9	7.55	0.0707	67	---	697	1	100	30
7/11/2017	3:00 PM	77.5	78.4	77.5	62	63.5	1	E	0.5	3	E	77.5	78.6	78.6	29.195	0	0	0	0.26	80.3	41	54.5	79.4	7.74	0.0707	67	---	698	1	100	30
7/11/2017	3:30 PM	76.4	77.5	75.9	61	62	1	ESE	0.5	7	N	76.4	77.2	77.2	29.197	0	0	0	0.238	80.1	37	51.5	78.8	7.15	0.0708	67	---	693	1	100	30
7/11/2017	4:00 PM	75.4	76.7	75.4	61	61	1	ESE	0.5	4	E	75.4	76.3	76.3	29.192	0	0	0	0.217	79.7	37	51.1	78.5	7.16	0.0709	67	---	696	1	100	30
7/11/2017	4:30 PM	76	76	75.2	60	61.1	1	NE	0.5	4	ENE	76	76.7	76.7	29.193	0	0	0	0.229	80.3	36	50.9	78.9	6.94	0.0708	67	---	698	1	100	30
7/11/2017	5:00 PM	73.8	75.9	73.8	63	60.4	1	ESE	0.5	3	E	73.8	74.7	74.7	29.209	0	0	0	0.183	79.3	34	48.5	77.9	6.66	0.071	67	---	697	1	100	30
7/11/2017	5:30 PM	71.3	73.7	71.3	65	58.9	0	ESE	0	2	ESE	71.3	71.3	71.3	29.233	0	0	0	0.131	77.3	36	48.3	76.3	7	0.0714	67	---	689	1	100	30
7/11/2017	6:00 PM	68.9	71.3	68.9	67	57.5	0	ESE	0	2	ESE	68.9	69	69	29.25	0	0	0	0.081	72.3	37	44.6	70.3	7.3	0.0722	67	---	700	1	100	30
7/11/2017	6:30 PM	66.3	68.9	66.3	74	57.8	0	ESE	0	2	ESE	66.3	66.8	66.8	29.258	0	0	0	0.027	70.6	42	46.4	68.3	8.04	0.0724	67	---	691	1	100	30
7/11/2017	7:00 PM	63.7	66.3	63.7	83	58.4	0	ESE	0	2	ESE	63.7	64.2	64.2	29.252	0.02	0	0.027	0	72.1	48	51.3	71	8.89	0.072	67	---	697	1	100	30
7/11/2017	7:30 PM	61.7	63.7	61.7	87	57.8	0	ESE	0	2	ESE	61.7	62.1	62.1	29.239	0.02	0.07	0.069	0	72.1	48	51.3	71	8.89	0.072	67	---	693	1	100	30
7/11/2017	8:00 PM	60.5	61.7	60.5	88	56.9	1	NNW	0.5	5	NW	60.5	60.8	60.8	29.234	0	0	0.094	0	71.4	48	50.7	70	8.88	0.0721	67	---	694	1	100	30
7/11/2017	8:30 PM	59.7	60.5	59.7	90	56.8	1	NNE	0.5	5	NE	59.7	60	60	29.238	0	0	0.11	0	70.4	48	49.8	68.6	8.86	0.0723	67	---	691	1	100	30
7/11/2017	9:00 PM	59.9	59.9	59.6	92	57.6	0	NNE	0	4	NE	59.9	60.2	60.2	29.241	0	0	0.106	0	69.2	48	48.7	67.5	8.87	0.0725	67	---	698	1	100	30
7/11/2017	9:30 PM	59.8	59.9	59.7	92	57.5	0	NNE	0	5	NE	59.8	60.1	60.1	29.246	0	0	0.108	0	68.2	48	47.8	66.7	8.89	0.0726	67	---	697	1	100	30
7/11/2017	10:00 PM	59.5	59.8	59.5	92	57.2	0	NE	0	3	NE	59.5	59.8	59.8	29.245	0.01	0	0.115	0	67.4	49	47.6	65.9	9.1	0.0728	67	---	695	1	100	30
7/11/2017	10:30 PM	59.5	59.5	59.4	92	57.2	0	NNE	0	5	NE	59.5	59.8	59.8	29.263	0	0	0.115	0	66.6	49	46.8	65	9.12	0.0729	67	---	694	1	100	30
7/11/2017	11:00 PM	59.5	59.5	59.4	92	57.2	0	NNE	0	6	NNE	59.5	59.8	59.8	29.279	0	0	0.115	0	65.8	49	46.1	64.1	9.13	0.0731	67	---	697	1	100	30
7/11/2017	11:30 PM	59.3	59.5	59.3	92	57	0	NNE	0	3	NNE	59.3	59.6	59.6	29.28	0	0	0.119	0	65.1	49	45.5	63.3	9.15	0.0732	67	---	696	1	100	30
7/12/2017	12:00 AM	59.1	59.4	59.1	91	56.5	1	NE	0.5	4	NNE	59.1	59.3	59.3	29.276	0	0	0.123	0	64.6	50	45.5	62.9	9.36	0.0733	67	---	696	1	100	30
7/12/2017	12:30 AM	59.1	59.2	59.1	91	56.5	0	N	0	1	N	59.1	59.3	59.3	29.262	0	0	0.123	0	64.1	50	45.1	62.3	9.37	0.0733	67	---	693	1	100	30
7/12/2017	1:00 AM	59.4	59.4	59	92	57.1	0	NNE	0	3	NNE	59.4	59.7	59.7	29.257	0	0	0.117	0	63.6	50	44.6	61.8	9.38	0.0734	67	---	698	1	100	30
7/12/2017	1:30 AM	59.5	59.6	59.4	91	56.9	0	E	0	4	NE	59.5	59.8	59.8	29.268	0	0	0.115	0	63.3	50	44.3	61.4	9.38	0.0735	67	---	696	1	100	30
7/12/2017	2:00 AM	59	59.5	59	91	56.4	0	NE	0	4	NE	59	59.2	59.2	29.251	0	0	0.125	0	63	50	44.1	61.1	9.39	0.0735	67	---	695	1	100	30
7/12/2017	2:30 AM	58.7	59	58.7	91	56.1	0	NNE	0	4	N	58.7	58.9	58.9	29.258	0	0	0.131	0	62.5	50	43.6	60.6	9.4	0.0736	67	---	695	1	100	30
7/12/2017	3:00 AM	58.4	58.7	58.4	91	55.8	0	ENE	0	2	ENE	58.4	58.6	58.6	29.266	0	0	0.137	0	62.2	50	43.3	60.3	9.41	0.0737	67	---	698	1	100	30
7/12/2017	3:30 AM	58.1	58.4	58	92	55.8	1	NE	0.5	4	N	58.1	58.3	58.3	29.258	0	0	0.144	0	61.9	51	43.6	60.1	9.61	0.0737	67	---	696	1	100	30
7/12/2017	4:00 AM	58.1	58.1	58	92	55.8	0	NE	0	4	NE	58.1	58.3	58.3	29.277	0	0	0.144	0	61.6	51	43.3	59.7	9.62	0.0738	67	---	697	1	100	30
7/12/2017	4:30 AM	57.9	58.1	57.8	92	55.6	1	NE	0.5	6	NE	57.9	58.1	58.1	29.265	0	0	0.148	0	61.4	52	43.6	59.6	9.75	0.0738	67	---	693	1	100	30
7/12/2017	5:00 AM	57.5	57.8	57.5	92	55.2	1	NNE	0.5	6	NE	57.5	57.7	57.7	29.232	0	0	0.156	0	61.1	52	43.3	59.3	9.75	0.0737	67	---	699	1	100	30
7/12/2017	5:30 AM	57.4	57.5	57.4	91	54.8	1	NNE	0.5	7	NNE	57.4	57.5	57.5	29.236	0	0	0.158	0	61	52	43.2	59.2	9.75	0.0738	67	---	696	1	100	30
7/12/2017	6:00 AM	57.6	57.7	57.4	89	54.4	1	NE	0.5	6	NE	57.6	57.7	57.7	29.248	0	0	0.154	0	60.8	52	43.1	59	9.75	0.0738	67	---	691	1	100	30
7/12/2017	6:30 AM	57.6	57.6	57.5	89	54.4	1	NNE	0.5	6	NE	57.6	57.7	57.7	29.256	0	0	0.154	0	60.7	53	43.5	58.9	9.95	0.0738	67	---	699	1	100	30
7/12/2017	7:00 AM	57.5	57.7	57.5	90	54.6	1	NNE	0.5	6	ENE	57.5	57.6	57.6	29.253	0	0	0.156	0	60.7	59	46.3	59.4	10.95	0.0738	67	---	695	1	100	30
7/12/2017	7:30 AM	57.5	57.8	57.5	91	54.9	1	NNE	0.5	5	NNE	57.5	57.6	57.6	29.244	0.02	0.05	0.156	0	62.9	64	50.5	62.2	11.79	0.0733	67	---	692	1	100	30
7/12/2017	8:00 AM	56.4	57.5	56.4	93	54.4	1	NNE	0.5	8	NE	56.4	56.6	56.6	29.228	0.01	0.05	0.179	0	62.7	69	52.4	62.3	13	0.0732	67	---	698	1	100	30
7/12/2017	8:30 AM	56	56.4	55.9	94	54.3	1	NE	0.5	9	NE	56	56.2	56.2	29.232	0.01	0	0.188	0	63.2	70	53.3	62.9	13.31	0.0731	67	---	694	1	100	30
7/12/2017	9:00 AM	55.9	56	55.8	94	54.2	2	NNE	1	9	NE	55.9	56.1	56.1	29.226	0	0	0.19	0	63	66	51.5	62.5	12.23	0.0732	67	---	695	1	100	30
7/12/2017	9:30 AM	55.9	56	55.7	95	54.5	2	NE	1	9	NNE	55.9	56.1	56.1	29.229	0	0	0.19	0	62.5	65	50.6	61.8	12	0.0733	67	---	695	1	100	30
7/12/2017	10:00 AM	---	57.3	55.9	---	---	5	NNE	2.5	14	SSE	---	---	---	29.164	0	0	---	---	65.9	64	53.4	65.6	11.73	0.0726	67	---	61	1	8.9	30
7/12/2017	10:30 AM	---	---	---	---	---	0	---	0	0	---	---	---	---	29.161	0	0	---	---	71.8	58	56.2	71.5	10.68	0.0716	67	---	0	1	0	30
7/12/2017	11:00 AM	---	---	---	---	---	0	---	0	0	---	---	---	---	29.16	0	0	---	---	73.3	55	56.2	73.4	10.08	0.0714	67	---	0	1	0	30
7/12/2017	11:30 AM	---	---	---	---	---	0	---	0	0	---	---	---	---	29.16	0	0	---	---	74.2	54	56.5	74.4	9.87	0.0713	67	---	0	1	0	30
7/12/2017	12:00 PM	---	---	---	---	---	0	---	0	0	---	---	---	---	29.16	0	0	---	---	74.7	52	55.9	74.9	9.56	0.0713	67	---	0	1	0	30
7/12/2017	12:30 PM	---	---	---	---	---	0	---	0	0	---	---	---	---	29.162	0	0	---	---	75.2	53	56.9	75.5	9.65	0.0712	67	---	0	1	0	30
7/12/2017	1:00 PM	---	---	---	---	---	0	---	0	0	---	---	---	---	29.167	0	0	---	---	75	52	56.2	75.3	9.55	0.0712	67	---	0	1	0	30
7/12/2017	1:30 PM	---	---	---	---	---	0	---	0	0	---	---	---	---	29.173	0	0	---	---	74.7	52	55.9	74.9	9.56	0.0713	67	---	0	1	0	30
7/12/2017	2:00 PM	---	---	---	---	---	0	---	0	0	---	---	---	---	29.183	0	0	---	---	72.8	53	54.7	72.5	9.74	0.0716	67	---	0	1	0	30
7/12/2017	2:30 PM	---	---	---	---	---	0	---	0	0	---	---	---	---	29.183	0	0	---	---	70.4	53	52.4	69.1	9.83	0.072	67	---	0	1	0	30
7/12/2017	3:00 PM	---	---	---	---	---	0	---	0	0	---	---	---	---	29.239	0	0	---	---	68.9	69	58.3	69.2	12.89	0.0721	67	---	0	1	0	30
7/12/2017	3:30 PM	56	56.1	55.9	95	54.6	2	NNE	1	10	NNE	56	56.2	56.2	29.248	0	0	0.188	0	63	71	53.4	62.7	13.51	0.0732	67	---	658	1	96.2	30
7/12/2017	4:00 PM	55.8	56.1	55.7	95	54.4	3	NE	1.5	9	ENE	55.8	56	56	29.258	0	0	0.192	0	61.6	74	53.2	61.3	14.25	0.0734	67	---	689	1	100	30
7/12/2017	4:30 PM	55.5	55.8	55.4	95	54.1	2	NE	1	12	NE	55.5	55.7	55.7	29.259	0	0	0.198	0	60.7	76	53.1	60.4	14.94	0.0735	67	---	696	1	100	30
7/12/2017	5:00 PM	54.9	55.4	54.9	95	53.5	3	NNE	1.5	13	NE	54.9	55.1	55.1	29.253	0	0	0.21	0	60.3	76	52.7	60	14.94	0.0736	67	---	696	1	100	30
7/12/2017	5:30 PM	54.4	54.9	54.4	95	53	3	NNE	1.5	16	NNE	54.4	54.6	54.6	29.261	0	0	0.221	0	61.3	77	54	61.2	15.35	0.0734	67	---	691	1	100	30
7/12/2017	6:00 PM	54.3	54.4	54.2	95	52.9	2	NNE	1	9	NE	54.3	54.5	54.5	29.26	0	0	0.223	0	62.2	77	54.9	62.2	15.35	0.0733	67	---	695	1	100	30
7/12/2017	6:30 PM	54.3	54.5	54.3	95	52.9	3	NNE	1.5	9	NNE	54.3	54.5	54.5	29.251	0.01	0	0.223	0	62.7	76	55	62.7	14.9	0.0732	67	---	693	1	100	30
7/12/2017	7:00 PM	54	54.3	54	95	52.6	2	NNE	1	9	NE	54	54.2	54.2	29.256	0	0	0.229	0	61.9	75	53.9	61.7	14.57	0.0733	67	---	693	1	100	30
7/12/2017	7:30 PM	53.8	54	53.7	95	52.4	2	NNE	1	7	NNE	53.8	54	54	29.261	0	0	0.233	0	61.1	74	52.7	60.7	14.25	0.0735	67	---	697	1	100	30
7/12/2017	8:00 PM	52.8	53.8	52.8	95	51.4	3	NE	1.5	12	NE	52.8	53.1	53.1	29.262	0	0	0.254	0	60.2	74	51.9	59.8	14.25	0.0737	67	---	695	1	100	30
7/12/2017	8:30 PM	52.3	52.8	52.3	96	51.2	2	NNE	1	11	NE	52.3	52.6	52.6	29.273	0	0	0.265	0	59.3	73	50.6	58.7	14.01	0.0739	67	---	697	1	100	30
7/12/2017	9:00 PM	51.7	52.3	51.7	96	50.6	3	NNE	1.5	11	NNE	51.6	52.1	52	29.274	0	0	0.277	0	58.7	73	50.1	58.1	14.05	0.074	67	---	693	1	100	30
7/12/2017	9:30 PM	51.8	51.9	51.6	96	50.7	2	NNE	1	12	NNE	51.8	52.2	52.2	29.285	0	0	0.275	0	57.7	73	49.1	57.1	14.13	0.0742	67	---	701	1	100	30
7/12/2017	10:00 PM	52	52	51.8	96	50.9	2	NNE	1	8	NE	52	52.3	52.3	29.294	0	0	0.271	0	57	73	48.4	56.4	14.19	0.0743	67	---	692	1	100	30
7/12/2017	10:30 PM	51.9	52.2	51.9	96	50.8	3	NNE	1.5	9	NE	51.8	52.3	52.2	29.3	0.01	0	0.273	0	56.4	73	47.9	55.7	14.24	0.0744	67	---	694	1	100	30
7/12/2017	11:00 PM	51.5	51.9	51.4	96	50.4	3	NNE	1.5	11	NE	51.4	51.9	51.8	29.299	0	0	0.281	0	55.8	73	47.3	55.1	14.29	0.0745	67	---	698	1	100	30
7/12/2017	11:30 PM	51	51.4	51	96	49.9	3	NNE	1.5	10	NE	50.8	51.4	51.2	29.299	0.01	0	0.292	0	55.4	73	46.9	54.8	14.32	0.0746	67	---	692	1	100	30
7/13/2017	12:00 AM	50.4	51	50.4	96	49.3	3	NE	1.5	13	NE	50.1	50.9	50.6	29.31	0	0	0.304	0	54.9	73	46.4	54.3	14.35	0.0747	67	---	697	1	100	30
7/13/2017	12:30 AM	50.5	50.5	50.2	96	49.4	2	NE	1	9	NNE	50.5	51	51	29.313	0	0	0.302	0	54.5	73	46	53.9	14.33	0.0748	67	---	690	1	100	30

7/13/2017	1:00 AM	51	51	50.5	96	49.9	2	NNE	1	10	NNE	51	51.4	51.4	29.307	0	0	0.292	0	54.2	73	45.7	53.6	14.32	0.0748	67	---	697	1	100	30
7/13/2017	1:30 AM	51.2	51.2	51	96	50.1	2	NNE	1	7	NNE	51.2	51.6	51.6	29.313	0.01	0	0.287	0	53.9	73	45.4	53.3	14.31	0.0749	67	---	694	1	100	30
7/13/2017	2:00 AM	51.5	51.5	51.2	96	50.4	2	NNE	1	10	NNE	51.5	51.9	51.9	29.307	0	0	0.281	0	53.7	74	45.6	53.2	14.52	0.0749	67	---	694	1	100	30
7/13/2017	2:30 AM	51.5	51.5	51.3	96	50.4	3	NE	1.5	9	NE	51.4	51.9	51.8	29.311	0	0	0.281	0	53.7	74	45.6	53.2	14.52	0.0749	67	---	700	1	100	30
7/13/2017	3:00 AM	51.5	51.6	51.4	96	50.4	3	NNE	1.5	8	NE	51.4	51.9	51.8	29.312	0	0	0.281	0	53.6	74	45.5	53.1	14.52	0.075	67	---	695	1	100	30
7/13/2017	3:30 AM	51	51.5	51	96	49.9	3	NNE	1.5	10	N	50.8	51.4	51.2	29.321	0	0	0.292	0	53.6	74	45.5	53.1	14.52	0.075	67	---	696	1	100	30
7/13/2017	4:00 AM	51	51	50.8	96	49.9	2	NE	1	7	NE	51	51.4	51.4	29.324	0	0	0.292	0	53.4	74	45.3	52.9	14.52	0.075	67	---	691	1	100	30
7/13/2017	4:30 AM	50.8	51	50.8	96	49.7	1	NE	0.5	10	NNE	50.8	51.3	51.3	29.325	0.01	0	0.296	0	53.3	74	45.2	52.8	14.52	0.075	67	---	696	1	100	30
7/13/2017	5:00 AM	50.8	50.9	50.7	96	49.7	1	NNE	0.5	7	ENE	50.8	51.3	51.3	29.331	0	0	0.296	0	53.1	74	45	52.6	14.51	0.0751	67	---	697	1	100	30
7/13/2017	5:30 AM	50.7	50.8	50.7	96	49.6	1	NNE	0.5	6	NNE	50.7	51.2	51.2	29.333	0.06	0.29	0.298	0	53	74	44.9	52.5	14.51	0.0751	67	---	689	1	100	30
7/13/2017	6:00 AM	50.8	50.8	50.7	96	49.7	2	NNE	1	9	NNE	50.8	51.3	51.3	29.328	0.03	0.26	0.296	0	52.8	74	44.7	52.3	14.51	0.0751	67	---	697	1	100	30
7/13/2017	6:30 AM	50.8	50.8	50.6	96	49.7	2	NE	1	9	NNE	50.8	51.3	51.3	29.337	0.01	0.04	0.296	0	52.8	74	44.7	52.3	14.51	0.0752	67	---	697	1	100	30
7/13/2017	7:00 AM	51	51	50.6	96	49.9	2	NNE	1	9	NE	51	51.4	51.4	29.349	0	0	0.292	0	53.4	80	47.4	53.1	16.35	0.075	67	---	692	1	100	30
7/13/2017	7:30 AM	51.1	51.1	51	96	50	2	NE	1	8	NE	51.1	51.5	51.5	29.354	0	0	0.29	0	55.2	80	49.1	54.9	16.35	0.0747	67	---	693	1	100	30
7/13/2017	8:00 AM	51	51.2	50.9	96	49.9	2	NE	1	7	NNE	51	51.4	51.4	29.363	0	0	0.292	0	54.8	80	48.7	54.5	16.35	0.0748	67	---	697	1	100	30
7/13/2017	8:30 AM	51.1	51.2	50.9	96	50	2	NE	1	8	NNE	51.1	51.5	51.5	29.367	0	0	0.29	0	54.8	81	49.1	54.5	16.66	0.0748	67	---	694	1	100	30
7/13/2017	9:00 AM	51.3	51.4	51	96	50.2	1	NNE	0.5	7	NE	51.3	51.7	51.7	29.375	0	0	0.285	0	54.9	81	49.2	54.6	16.65	0.0748	67	---	692	1	100	30
7/13/2017	9:30 AM	51.7	51.7	51.3	96	50.6	1	NE	0.5	7	NNE	51.7	52.1	52.1	29.375	0	0	0.277	0	54.9	82	49.5	54.7	16.96	0.0748	67	---	696	1	100	30
7/13/2017	10:00 AM	52.1	52.1	51.7	96	51	1	NE	0.5	4	NNE	52.1	52.4	52.4	29.377	0	0	0.269	0	55.4	82	50	55.2	16.96	0.0747	67	---	699	1	100	30
7/13/2017	10:30 AM	52.3	52.3	51.9	96	51.2	1	NE	0.5	6	NE	52.3	52.6	52.6	29.384	0	0	0.265	0	55.5	83	50.4	55.3	17.36	0.0747	67	---	691	1	100	30
7/13/2017	11:00 AM	52.2	52.4	52.2	96	51.1	1	NE	0.5	6	NNE	52.2	52.5	52.5	29.387	0	0	0.267	0	56.4	83	51.3	56.2	17.38	0.0745	67	---	693	1	100	30
7/13/2017	11:30 AM	52.1	52.4	52	96	51	2	NE	1	7	NE	52.1	52.4	52.4	29.393	0	0	0.269	0	56.5	82	51.1	56.3	16.98	0.0746	67	---	693	1	100	30
7/13/2017	12:00 PM	52.4	52.4	52	96	51.3	2	NE	1	7	NE	52.4	52.7	52.7	29.393	0.01	0	0.262	0	57	82	51.6	56.8	16.99	0.0745	67	---	695	1	100	30
7/13/2017	12:30 PM	52.5	52.6	52.4	96	51.4	1	NE	0.5	6	NE	52.5	52.8	52.8	29.398	0	0	0.26	0	58.1	82	52.6	57.9	17.01	0.0743	67	---	689	1	100	30
7/13/2017	1:00 PM	53	53	52.5	96	51.9	2	NE	1	9	NE	53	53.3	53.3	29.402	0	0	0.25	0	58.1	80	52	57.9	16.35	0.0743	67	---	696	1	100	30
7/13/2017	1:30 PM	52.9	53	52.8	95	51.5	2	NE	1	7	NNE	52.9	53.2	53.2	29.407	0.03	0.28	0.252	0	58.1	81	52.3	57.9	16.71	0.0743	67	---	694	1	100	30
7/13/2017	2:00 PM	53.2	53.2	52.9	95	51.8	2	NE	1	10	NE	53.2	53.5	53.5	29.41	0.01	0.09	0.246	0	58.4	80	52.3	58.2	16.35	0.0743	67	---	690	1	100	30
7/13/2017	2:30 PM	53.7	53.7	53.2	95	52.3	1	NE	0.5	8	NNE	53.7	53.9	53.9	29.41	0	0	0.235	0	58.8	80	52.6	58.6	16.35	0.0742	67	---	699	1	100	30
7/13/2017	3:00 PM	54.3	54.3	53.6	95	52.9	2	NNE	1	8	NE	54.3	54.5	54.5	29.407	0	0	0.223	0	59.1	80	52.9	58.9	16.35	0.0742	67	---	692	1	100	30
7/13/2017	3:30 PM	54.5	54.7	54.3	95	53.1	1	NE	0.5	9	NE	54.5	54.7	54.7	29.417	0	0	0.219	0	59.6	80	53.4	59.5	16.35	0.0741	67	---	694	1	100	30
7/13/2017	4:00 PM	54.4	54.5	54.3	95	53	1	NNE	0.5	7	NE	54.4	54.6	54.6	29.417	0	0	0.221	0	59.4	81	53.6	59.3	16.74	0.0741	67	---	691	1	100	30
7/13/2017	4:30 PM	53.9	54.4	53.9	95	52.5	1	NE	0.5	8	NE	53.9	54.1	54.1	29.428	0	0	0.231	0	59.9	80	53.7	59.8	16.35	0.0741	67	---	697	1	100	30
7/13/2017	5:00 PM	54.1	54.1	53.8	95	52.7	2	NNE	1	9	NE	54.1	54.3	54.3	29.414	0	0	0.227	0	59.3	80	53.1	59.1	16.35	0.0741	67	---	693	1	100	30
7/13/2017	5:30 PM	54.7	54.7	54.1	96	53.6	1	NE	0.5	5	NE	54.7	54.9	54.9	29.421	0	0	0.215	0	59.9	81	54.1	59.8	16.75	0.074	67	---	689	1	100	30
7/13/2017	6:00 PM	54.8	54.8	54.6	95	53.4	1	NNE	0.5	7	NE	54.8	55	55	29.419	0	0	0.213	0	60	80	53.8	59.9	16.35	0.074	67	---	699	1	100	30
7/13/2017	6:30 PM	55.6	55.6	54.8	95	54.2	1	NE	0.5	4	NE	55.6	55.8	55.8	29.424	0	0	0.196	0	59.9	80	53.7	59.8	16.35	0.0741	67	---	691	1	100	30
7/13/2017	7:00 PM	56	56	55.5	94	54.3	0	NNE	0	4	NE	56	56.2	56.2	29.429	0	0	0.188	0	59.7	81	53.9	59.6	16.74	0.0741	67	---	695	1	100	30
7/13/2017	7:30 PM	56.1	56.2	56	94	54.4	0	NNE	0	3	N	56.1	56.3	56.3	29.434	0	0	0.185	0	59.7	82	54.2	59.7	17.04	0.0741	67	---	692	1	100	30
7/13/2017	8:00 PM	55.9	56.1	55.9	95	54.5	0	NNW	0	4	N	55.9	56.1	56.1	29.427	0	0	0.19	0	59.3	82	53.8	59.2	17.04	0.0741	67	---	692	1	100	30
7/13/2017	8:30 PM	54.4	56	54.4	94	52.7	1	NW	0.5	9	NNW	54.4	54.6	54.6	29.433	0	0	0.221	0	59.1	81	53.3	58.9	16.73	0.0742	67	---	691	1	100	30
7/13/2017	9:00 PM	54.3	54.4	54.2	95	52.9	1	NNW	0.5	5	NNW	54.3	54.5	54.5	29.431	0	0	0.223	0	58.8	80	52.6	58.6	16.35	0.0743	67	---	690	1	100	30
7/13/2017	9:30 PM	54.2	54.4	54.2	95	52.8	0	N	0	2	N	54.2	54.4	54.4	29.432	0.01	0	0.225	0	58.5	79	52	58.2	16.05	0.0743	67	---	698	1	100	30
7/13/2017	10:00 PM	54.4	54.4	54.2	95	53	0	---	0	0	---	54.4	54.6	54.6	29.436	0	0	0.221	0	58.1	79	51.6	57.8	16.05	0.0744	67	---	689	1	100	30
7/13/2017	10:30 PM	54.6	54.6	54.4	96	53.5	0	N	0	2	N	54.6	54.8	54.8	29.438	0	0	0.217	0	57.7	79	51.2	57.4	16.05	0.0745	67	---	697	1	100	30
7/13/2017	11:00 PM	54.9	54.9	54.6	96	53.8	0	N	0	3	N	54.9	55.1	55.1	29.438	0	0	0.21	0	57.4	79	50.9	57.1	16.05	0.0745	67	---	688	1	100	30
7/13/2017	11:30 PM	54.9	54.9	54.8	96	53.8	0	---	0	0	---	54.9	55.1	55.1	29.435	0	0	0.21	0	57.3	79	50.8	57	16.05	0.0746	67	---	691	1	100	30
7/14/2017	12:00 AM	54.8	55	54.8	96	53.7	0	N	0	2	N	54.8	55	55	29.437	0	0	0.213	0	57	79	50.5	56.7	16.05	0.0746	67	---	693	1	100	30
7/14/2017	12:30 AM	54	54.8	54	95	52.6	0	NNW	0	5	NNW	54	54.2	54.2	29.447	0	0	0.229	0	56.8	79	50.4	56.5	16.05	0.0747	67	---	687	1	100	30
7/14/2017	1:00 AM	53.8	54.1	53.7	95	52.4	0	---	0	0	---	53.8	54	54	29.448	0	0	0.233	0	56.7	78	49.9	56.3	15.72	0.0747	67	---	696	1	100	30
7/14/2017	1:30 AM	53.8	53.9	53.7	95	52.4	0	NE	0	1	NE	53.8	54	54	29.446	0	0	0.233	0	56.5	78	49.7	56.1	15.72	0.0747	67	---	692	1	100	30
7/14/2017	2:00 AM	53.9	53.9	53.8	95	52.5	0	---	0	0	---	53.9	54.1	54.1	29.444	0	0	0.231	0	56.3	78	49.5	55.9	15.72	0.0748	67	---	695	1	100	30
7/14/2017	2:30 AM	54.1	54.1	53.9	95	52.7	0	---	0	0	---	54.1	54.3	54.3	29.446	0	0	0.227	0	56.1	78	49.3	55.7	15.73	0.0748	67	---	688	1	100	30
7/14/2017	3:00 AM	53.8	54.1	53.6	95	52.4	0	---	0	0	---	53.8	54	54	29.45	0	0	0.233	0	56	78	49.2	55.6	15.73	0.0748	67	---	691	1	100	30
7/14/2017	3:30 AM	53.1	53.8	53.1	94	51.4	0	NNE	0	3	NNE	53.1	53.4	53.4	29.448	0	0	0.248	0	55.8	78	49	55.4	15.73	0.0749	67	---	692	1	100	30
7/14/2017	4:00 AM	52.9	53.1	52.9	94	51.2	0	NNE	0	2	NNE	52.9	53.2	53.2	29.448	0	0	0.252	0	55.7	78	48.9	55.3	15.74	0.0749	67	---	687	1	100	30
7/14/2017	4:30 AM	53.1	53.1	52.9	94	51.4	0	SSE	0	3	SSE	53.1	53.4	53.4	29.452	0	0	0.248	0	55.4	78	48.7	55	15.74	0.075	67	---	696	1	100	30
7/14/2017	5:00 AM	53.2	53.2	53	93	51.2	0	NNE	0	3	NNE	53.2	53.4	53.4	29.454	0	0	0.246	0	55.2	77	48.1	54.8	15.45	0.075	67	---	692	1	100	30
7/14/2017	5:30 AM	53.1	53.2	53.1	93	51.1	0	NNE	0	1	NNE	53.1	53.3	53.3	29.454	0	0	0.248	0	54.9	77	47.8	54.5	15.45	0.0751	67	---	690	1	100	30
7/14/2017	6:00 AM	53	53.1	53	93	51	0	NNE	0	1	NNE	53	53.2	53.2	29.456	0	0	0.25	0	54.8	77	47.7	54.4	15.45	0.0751	67	---	694	1	100	30
7/14/2017	6:30 AM	53.1	53.1	53	93	51.1	0	NNE	0	2	NNE	53.1	53.3	53.3	29.455	0	0	0.248	0	54.6	77	47.5	54.2	15.45	0.0751	67	---	691	1	100	30
7/14/2017	7:00 AM	53.5	53.5	53.1	93	51.5	0	WSW	0	3	WSW	53.5	53.7	53.7	29.459	0	0	0.24	0	55.2	80	49.1	54.9	16.35	0.075	67	---	690	1	100	30
7/14/2017	7:30 AM	53.6	53.7	53.5	92	51.3	0	WSW	0	3	WSW	53.6	53.8	53.8	29.465	0	0	0.238	0	56.8	80	50.7	56.5	16.35	0.0747	67	---	691	1	100	30
7/14/2017	8:00 AM	54.4	54.4	53.6	92	52.1	0	S	0	3	SSW	54.4	54.5	54.5	29.467	0	0	0.221	0	57.4	80	51.3	57.1	16.35	0.0746	67	---	694	1	100	30
7/14/2017	8:30 AM	55.3	55.3	54.4	90	52.4	0	S	0	5	SSE	55.3	55.4	55.4	29.466	0	0	0.202	0	58.7	79	52.2	58.4	16.05	0.0744	67	---	690	1	100	30
7/14/2017	9:00 AM	58.4	58.4	55.3	87	54.5	0	W	0	4	SSW	58.4	58.4	58.4	29.462	0	0	0.137	0	83.9	47	61.5	85.2	8.57	0.0705	67	---	694	1	100	30
7/14/2017	9:30 AM	61.5	61.5	58.4	81	55.6	1	NW	0.5	8	WNW	61.5	61.6	61.6	29.466	0	0	0.073	0	71.6	59	56.5	71.3	10.89	0.0724	67	---	697	1	100	30
7/14/2017	10:00 AM	63.5	63.5	61.5	79	56.9	1	SW	0.5	6	NNW	63.5	63.8	63.8	29.471	0	0	0.031	0	68.7	66	56.9	68.8	12.15	0.0728	67	---	698	1	100	30
7/14/2017	10:30 AM	66.1	66.1	63.6	72	56.8	1	NNW	0.5	10	NW	66.1	66.4	66.4	29.468	0	0	0	0.023	70.9	72	61.4	71.4	13.71	0.0723	67	---	691	1	100	30
7/14/2017	11:00 AM	67.9	67.9	66.1	66	56.1	1	NNW	0.5	7	N	67.9	68.2	68.2	29.464	0	0	0	0.06	72.3	62	58.5	72.5	11.3	0.0722	67	---	696	1	100	30
7/14/2017	11:30 AM	69.4	69.4	67.9	61	55.4	2	NW	1	8	N	69.4	68.8	68.8	29.463	0	0	0	0.092	72.3	60	57.6	72.4	11	0.0723	67	---	691	1	100	30
7/14/2017	12:00 PM	70.4	70.4	69.4	58	54.9	2	NW	1	11	N	70.4	69.5	69.5	29.468	0	0	0	0.113	72.4	55	55.3	72.1	10.1	0.0724	67	---	694	1	100	30
7/14/2017	12:30 PM	71.3	71.5	70.4	54	53.8	2	NW	1	9	NNW	71.3	70.4	70.4	29.461	0	0	0	0.131	73.3	52	54.6	73.1	9.58	0.0722	67	---	692	1	100	30
7/14/2017	1:00 PM	72.9	72.9	71.3	53	54.8	2	NW	1	10	NNW	72.9	72.7	72.7	29.457	0	0	0	0.165	74	49	53.6	73.6	9.05	0.0722	67	---	693	1	100	30
7/14/2017	1:30 PM	73.1	73.3	72.9	53	54.9	2	NW	1	8	NNW	73.1	72.9	72.9	29.448	0	0	0	0.169	74.9	49	54.4	74.9	9.05	0.072	67	---	689	1	100	30
7/14/2017	2:00 PM	73.8	74.2	73	50	54	2	NW	1	8	NNW	73.8	73.5	73.5	29.443	0	0	0	0.183	75.7	48	54.6	75.6	8.94	0.0719	67	---	692	1	100	30
7/14/2017	2:30 PM	75.3	75.5	73.8	50	55.4	1	NNW	0.5	9	NNW	75.3	75.4	75.4	29.439	0	0	0	0.215	77	46	54.6	76.6	8.51	0.0717	67	---	700	1	100	30
7/14/2017	3:00 PM	76.2	76.4	75.4	45	53.3	1	NW	0.5	7	NW	76.2	75.8	75.8	29.445	0	0	0	0.233	77.9	43	53.6	77.3	8.05	0.0716	67	---	689	1	100	30
7/14/2017	3:30 PM	75.2	76.2	75.2	52	56.4	2	NW	1	8	N	75.2	75.4	75.4	29.441	0	0	0	0.212	78.6	47	56.7	78.4	8.68	0.0714	67	---	695	1	100	30
7/14/2017	4:00 PM	75.6	75.6	74.8	49	55.1	2	NNW	1	8	NNW	75.6	75.6	75.6	29.434	0	0	0	0.221	86.5	45	62.6	87.8	8.22	0.0701	67	---	692	1	100	30
7/14/2017	4:30 PM	75.5	76.1	75.5	49	55	2	NW	1	9	NW	75.5	75.5	75.5	29.435	0	0	0	0.219	93.8	42	67.2	98.8	7.6	0.0689	67	---	692	1	100	30
7/14/2017	5:00 PM	75.1	75.5	75	52	56.3	2	NW	1	7	NNW	75.1	75.3	75.3	29.432	0	0	0	0.21	98.4	39	69.2	106.1	7.08	0.0682	67	---	693	1	100	30
7/14/2017	5:30 PM	73.1	75.1	73.1	51	53.9	2	NW	1	10	NW	73.1	72.7	72.7	29.423	0	0	0	0.169	99.2	41	71.4	109.5	7.45	0.068	67	---	693	1	100	30
7/14/2017	6:00 PM	73.2	73.4	72.9	51	54	2	NW	1	8	SW	73.2	72.8	72.8	29.416	0	0	0	0.171	98.4	42	71.4	108.4	7.55	0.0681	67	---	696	1	100	30
7/14/2017	6:30 PM	73.3	74.1	73.3	50	53.5	2	NW	1	6	NW	73.3	72.9	72.9	29.407	0	0	0	0.173	96.8	44	71.3	106.2	7.91	0.0683	67	---	696	1	100	30
7/14/2017	7:00 PM	73.5	73.7	73.2	48	52.6	1	NW	0.5	4	NW	73.5	73	73	29.401	0	0	0	0.177	94.9	45	70.2	102.7	8.15	0.0685	67	---	691	1	100	30

7/14/2017	7:30 PM	72.1	73.5	72	51	53	1	SSW	0.5	7	SSE	72.1	71.3	71.3	29.391	0	0	0	0.148	91.8	47	68.7	97.4	8.45	0.069	67	---	698	1	100	30
7/14/2017	8:00 PM	70.6	72.4	70.6	54	53.1	1	S	0.5	4	SSW	70.6	69.4	69.4	29.39	0	0	0	0.117	88.8	48	66.6	92.5	8.67	0.0695	67	---	695	1	100	30
7/14/2017	8:30 PM	68.4	70.6	68.4	66	56.6	0	SSW	0	3	SSW	68.4	68.6	68.6	29.39	0	0	0	0.071	85.5	49	64.2	87.3	8.85	0.07	67	---	696	1	100	30
7/14/2017	9:00 PM	64.5	68.4	64.5	70	54.5	0	---	0	0	---	64.5	64.4	64.4	29.384	0	0	0.01	0	82.3	49	61.2	82.9	8.9	0.0706	67	---	695	1	100	30
7/14/2017	9:30 PM	61.3	64.5	61.3	74	52.9	0	SSW	0	2	SSW	61.3	61	61	29.383	0	0	0.077	0	79	50	58.8	79.2	9.17	0.0711	67	---	698	1	100	30
7/14/2017	10:00 PM	58.5	61.3	58.5	80	52.4	0	SSW	0	1	SSW	58.5	58.3	58.3	29.386	0	0	0.135	0	75.7	51	56.3	75.8	9.35	0.0717	67	---	689	1	100	30
7/14/2017	10:30 PM	56.6	58.5	56.6	83	51.5	0	SSW	0	2	SSW	56.6	56.4	56.4	29.382	0	0	0.175	0	72.8	51	53.6	72.3	9.39	0.0722	67	---	690	1	100	30
7/14/2017	11:00 PM	55.3	56.6	55.3	86	51.2	0	NW	0	2	NW	55.3	55.2	55.2	29.389	0	0	0.202	0	70.2	52	51.7	68.7	9.65	0.0726	67	---	692	1	100	30
7/14/2017	11:30 PM	53.8	55.3	53.8	87	50	0	NW	0	1	NW	53.8	53.8	53.8	29.377	0	0	0.233	0	67.7	53	49.9	66.7	9.9	0.073	67	---	693	1	100	30
7/15/2017	12:00 AM	53.2	53.8	53.2	89	50	0	NW	0	1	NW	53.2	53.3	53.3	29.369	0	0	0.246	0	65.6	53	48	64.3	9.94	0.0733	67	---	691	1	100	30
7/15/2017	12:30 AM	52.4	53.2	52.4	88	48.9	0	---	0	0	---	52.4	52.5	52.5	29.376	0	0	0.262	0	63.5	54	46.6	62.1	10.15	0.0737	67	---	693	1	100	30
7/15/2017	1:00 AM	51.8	52.4	51.8	89	48.7	0	NW	0	1	NW	51.8	52	52	29.384	0	0	0.275	0	61.8	54	45	60.2	10.15	0.074	67	---	696	1	100	30
7/15/2017	1:30 AM	52.2	52.2	51.6	91	49.7	0	NW	0	1	NW	52.2	52.4	52.4	29.388	0	0	0.267	0	60.3	55	44.1	58.7	10.25	0.0742	67	---	696	1	100	30
7/15/2017	2:00 AM	54	54	52.2	93	52	0	---	0	0	---	54	54.2	54.2	29.373	0	0	0.229	0	59.4	55	43.2	57.8	10.26	0.0743	67	---	691	1	100	30
7/15/2017	2:30 AM	53.8	54.1	53.8	92	51.5	0	---	0	0	---	53.8	53.9	53.9	29.371	0	0	0.233	0	58.7	56	43	57.2	10.45	0.0744	67	---	693	1	100	30
7/15/2017	3:00 AM	53.6	53.8	53.6	93	51.6	0	W	0	1	W	53.6	53.8	53.8	29.37	0	0	0.238	0	57.9	56	42.3	56.4	10.45	0.0746	67	---	694	1	100	30
7/15/2017	3:30 AM	53.5	53.6	53.4	94	51.8	0	W	0	1	W	53.5	53.7	53.7	29.364	0	0	0.24	0	57.3	57	42.2	55.8	10.6	0.0746	67	---	689	1	100	30
7/15/2017	4:00 AM	53.9	53.9	53.4	95	52.5	0	W	0	2	W	53.9	54.1	54.1	29.36	0	0	0.231	0	56.8	58	42.2	55.4	10.75	0.0747	67	---	697	1	100	30
7/15/2017	4:30 AM	54.2	54.2	53.8	95	52.8	0	W	0	2	W	54.2	54.4	54.4	29.357	0	0	0.225	0	56.5	58	41.9	55.1	10.75	0.0747	67	---	691	1	100	30
7/15/2017	5:00 AM	55.4	55.4	54.2	95	54	0	W	0	1	W	55.4	55.6	55.6	29.35	0	0	0.2	0	56.5	58	41.9	55.1	10.75	0.0747	67	---	697	1	100	30
7/15/2017	5:30 AM	56.8	56.8	55.4	95	55.4	0	W	0	1	W	56.8	57	57	29.346	0	0	0.171	0	56.5	57	41.4	55	10.62	0.0747	67	---	690	1	100	30
7/15/2017	6:00 AM	60.6	60.6	56.8	89	57.3	0	SSW	0	5	SSW	60.6	60.9	60.9	29.344	0	0	0.092	0	56.8	57	41.7	55.3	10.61	0.0747	67	---	695	1	100	30
7/15/2017	6:30 AM	61.6	61.6	60.6	86	57.4	0	SSE	0	5	SSE	61.6	61.9	61.9	29.343	0	0	0.071	0	57.3	58	42.6	55.9	10.75	0.0746	67	---	691	1	100	30
7/15/2017	7:00 AM	62.8	62.8	61.6	84	57.9	1	SSW	0.5	5	S	62.8	63.2	63.2	29.326	0	0	0.046	0	57.9	58	43.2	56.5	10.75	0.0744	67	---	689	1	100	30
7/15/2017	7:30 AM	62.2	62.9	62.2	87	58.3	0	S	0	5	SSE	62.2	62.6	62.6	29.325	0	0	0.058	0	58.8	58	44	57.4	10.75	0.0743	67	---	696	1	100	30
7/15/2017	8:00 AM	62.6	62.6	62	89	59.3	0	S	0	4	S	62.6	63.2	63.2	29.333	0	0	0.05	0	60	58	45.2	58.6	10.75	0.0741	67	---	694	1	100	30
7/15/2017	8:30 AM	63.7	63.7	62.6	87	59.8	1	S	0.5	5	SSE	63.7	64.3	64.3	29.326	0	0	0.027	0	61.4	58	46.5	60.1	10.75	0.0738	67	---	691	1	100	30
7/15/2017	9:00 AM	66.2	66.2	63.7	81	60.2	2	SSE	1	9	SSE	66.2	67.2	67.2	29.317	0	0	0	0.025	62.4	58	47.4	61.1	10.75	0.0736	67	---	693	1	100	30
7/15/2017	9:30 AM	66.7	66.7	66.2	80	60.3	3	S	1.5	10	S	66.7	67.7	67.7	29.294	0	0	0	0.035	63.5	58	48.5	62.4	10.75	0.0734	67	---	699	1	100	30
7/15/2017	10:00 AM	67.7	67.8	66.7	81	61.7	3	S	1.5	10	SSE	67.7	69	69	29.3	0	0	0	0.056	66.1	61	52.3	65.5	11.25	0.0729	67	---	696	1	100	30
7/15/2017	10:30 AM	70.6	70.6	67.8	74	61.9	3	S	1.5	11	SSW	70.6	71.2	71.2	29.28	0	0	0	0.117	70.2	60	55.7	69.5	11.05	0.0722	67	---	691	1	100	30
7/15/2017	11:00 AM	73.1	73.1	70.7	69	62.3	3	SSW	1.5	11	SSW	73.1	74.2	74.2	29.265	0	0	0	0.169	73.3	61	59	73.9	11.12	0.0716	67	---	700	1	100	30
7/15/2017	11:30 AM	75.3	75.3	73.1	67	63.6	3	S	1.5	13	WNW	75.3	76.8	76.8	29.258	0	0	0	0.215	76.4	62	62.4	77.3	11.22	0.071	67	---	691	1	100	30
7/15/2017	12:00 PM	75.8	75.9	75	66	63.6	4	SSW	2	13	S	75.8	77.1	77.1	29.249	0	0	0	0.225	79.5	62	65.3	81	11.16	0.0704	67	---	696	1	100	30
7/15/2017	12:30 PM	77.6	77.7	75.7	63	64	3	SSW	1.5	11	SSW	77.6	78.8	78.8	29.239	0	0	0	0.262	82.5	61	67.7	85.2	10.95	0.0699	67	---	696	1	100	30
7/15/2017	1:00 PM	77	77.7	76.6	64	63.9	3	NW	1.5	15	SSE	77	78.2	78.2	29.247	0	0	0	0.25	85.5	59	69.5	90.1	10.54	0.0694	67	---	693	1	100	30
7/15/2017	1:30 PM	77.2	77.5	77	67	65.4	3	WNW	1.5	9	SSE	77.2	78.8	78.8	29.25	0	0	0	0.254	87.3	59	71.2	93.6	10.5	0.0691	67	---	692	1	100	30
7/15/2017	2:00 PM	77.3	77.8	77.1	63	63.7	4	NW	2	13	SW	77.3	78.4	78.4	29.253	0	0	0	0.256	89	58	72.3	96.5	10.27	0.0688	67	---	695	1	100	30
7/15/2017	2:30 PM	75.8	77.3	75.8	66	63.6	3	WNW	1.5	13	WSW	75.8	77.1	77.1	29.27	0	0	0	0.225	90.5	55	72.1	98.6	9.73	0.0687	67	---	694	1	100	30
7/15/2017	3:00 PM	76.3	76.3	75.6	66	64.1	3	WNW	1.5	8	SSW	76.3	77.7	77.7	29.27	0	0	0	0.235	91.6	55	73.1	101.1	9.69	0.0684	67	---	695	1	100	30
7/15/2017	3:30 PM	77.4	77.5	76.3	63	63.8	3	NW	1.5	11	NNW	77.4	78.5	78.5	29.273	0	0	0	0.258	93.3	53	73.6	104	9.32	0.0682	67	---	691	1	100	30
7/15/2017	4:00 PM	75.7	77.4	75.7	65	63.1	3	NW	1.5	9	NW	75.7	76.9	76.9	29.275	0	0	0	0.223	98.7	48	75.6	113.6	8.48	0.0674	67	---	692	1	100	30
7/15/2017	4:30 PM	75.9	76.4	75.7	66	63.7	3	NW	1.5	11	NNW	75.9	77.2	77.2	29.284	0	0	0	0.227	103	44	76.9	121.8	7.73	0.0668	67	---	691	1	100	30
7/15/2017	5:00 PM	72.6	76	72.6	70	62.3	3	NW	1.5	12	NNW	72.6	73.5	73.5	29.29	0	0	0	0.158	98.9	45	73.9	111.8	8.07	0.0676	67	---	687	1	100	30
7/15/2017	5:30 PM	72.4	72.6	71.7	72	62.9	2	NW	1	7	NNW	72.4	73.4	73.4	29.292	0	0	0	0.154	95.8	47	72.3	105.8	8.42	0.068	67	---	696	1	100	30
7/15/2017	6:00 PM	75	75	72.4	68	63.7	1	NW	0.5	5	NNW	75	76.5	76.5	29.291	0	0	0	0.208	97	47	73.4	108.6	8.37	0.0678	67	---	691	1	100	30
7/15/2017	6:30 PM	76.2	76.3	75	66	64	1	NNW	0.5	6	NNW	76.2	77.5	77.5	29.289	0	0	0	0.233	97.5	47	73.9	109.8	8.35	0.0677	67	---	693	1	100	30
7/15/2017	7:00 PM	76.8	76.8	75.8	65	64.1	1	NNW	0.5	6	NNW	76.8	78.1	78.1	29.29	0	0	0	0.246	96.8	47	73.2	108.2	8.38	0.0678	67	---	692	1	100	30
7/15/2017	7:30 PM	76.5	77.3	75.6	67	64.7	1	NNW	0.5	5	NE	76.5	78	78	29.293	0	0	0	0.24	94.9	48	72.1	104.4	8.55	0.0682	67	---	695	1	100	30
7/15/2017	8:00 PM	74.6	76.5	74.6	70	64.2	1	NNW	0.5	6	NNW	74.6	76.3	76.3	29.301	0	0	0	0.2	92.5	49	70.6	99.7	8.8	0.0686	67	---	694	1	100	30
7/15/2017	8:30 PM	73	74.6	73	72	63.4	0	NNW	0	3	NNW	73	74.3	74.3	29.304	0	0	0	0.167	90.1	50	69	95.3	9.05	0.069	67	---	691	1	100	30
7/15/2017	9:00 PM	71.7	73	71.7	74	63	1	NNW	0.5	4	NNW	71.7	72.6	72.6	29.31	0	0	0	0.14	87.5	51	67.1	91.1	9.2	0.0694	67	---	699	1	100	30
7/15/2017	9:30 PM	70.7	71.7	70.7	77	63.1	0	NNW	0	3	NNW	70.7	71.6	71.6	29.318	0	0	0	0.119	85.1	51	64.9	87.2	9.25	0.0699	67	---	688	1	100	30
7/15/2017	10:00 PM	68.3	70.7	68.3	77	60.8	3	NNW	1.5	8	NNW	68.3	69.4	69.4	29.336	0	0	0	0.069	82.3	52	62.9	83.4	9.4	0.0704	67	---	692	1	100	30
7/15/2017	10:30 PM	65.5	68.2	65.5	78	58.5	3	NNW	1.5	8	NNW	65.5	66.1	66.1	29.353	0	0	0	0.01	79.3	53	60.7	79.7	9.65	0.0709	67	---	694	1	100	30
7/15/2017	11:00 PM	63.6	65.5	63.6	79	57	3	NNW	1.5	9	N	63.6	63.9	63.9	29.362	0	0	0.029	0	76.8	54	58.9	77	9.81	0.0714	67	---	696	1	100	30
7/15/2017	11:30 PM	62.5	63.6	62.5	81	56.6	3	NNW	1.5	11	N	62.5	62.8	62.8	29.369	0	0	0.052	0	74.5	54	56.8	74.8	9.86	0.0718	67	---	696	1	100	30
7/16/2017	12:00 AM	61.9	62.6	61.9	81	56	2	NNW	1	8	NW	61.9	62.1	62.1	29.372	0	0	0.065	0	72.6	55	55.5	72.4	10.1	0.0721	67	---	692	1	100	30
7/16/2017	12:30 AM	61.1	61.9	61.1	81	55.2	2	NNW	1	6	N	61.1	61.2	61.2	29.391	0	0	0.081	0	70.9	55	53.9	69.9	10.13	0.0724	67	---	693	1	100	30
7/16/2017	1:00 AM	60.5	61.1	60.5	81	54.6	2	NNW	1	8	NE	60.5	60.5	60.5	29.402	0	0	0.094	0	69.6	55	52.7	68.4	10.16	0.0727	67	---	695	1	100	30
7/16/2017	1:30 AM	59.9	60.5	59.9	81	54.1	1	NNE	0.5	6	NNE	59.9	59.8	59.8	29.406	0	0	0.106	0	68.4	55	51.6	67.5	10.18	0.0729	67	---	691	1	100	30
7/16/2017	2:00 AM	58.9	59.9	58.9	82	53.4	0	NNW	0	3	NNW	58.9	58.8	58.8	29.416	0	0	0.127	0	67	56	50.8	66.2	10.41	0.0731	67	---	692	1	100	30
7/16/2017	2:30 AM	57.5	58.9	57.5	84	52.7	0	NW	0	3	NW	57.5	57.4	57.4	29.419	0	0	0.156	0	65.6	56	49.5	64.5	10.44	0.0734	67	---	691	1	100	30
7/16/2017	3:00 AM	56.3	57.5	56.3	86	52.2	0	NW	0	1	NW	56.3	56.2	56.2	29.423	0	0	0.181	0	64.1	56	48.1	62.9	10.45	0.0737	67	---	694	1	100	30
7/16/2017	3:30 AM	54.3	56.3	54.3	88	50.8	0	---	0	0	---	54.3	54.3	54.3	29.428	0	0	0.223	0	62.7	56	46.8	61.3	10.45	0.0739	67	---	692	1	100	30
7/16/2017	4:00 AM	53.7	54.3	53.7	91	51.1	0	NW	0	2	NW	53.7	53.8	53.8	29.441	0	0	0.235	0	61.4	57	46	60	10.58	0.0741	67	---	692	1	100	30
7/16/2017	4:30 AM	53.8	53.9	53.8	89	50.6	1	NNW	0.5	4	N	53.8	53.9	53.9	29.448	0	0	0.233	0	60.3	57	45	58.8	10.56	0.0743	67	---	694	1	100	30
7/16/2017	5:00 AM	53.8	53.8	53.6	89	50.6	1	NNW	0.5	4	NNW	53.8	53.9	53.9	29.457	0	0	0.233	0	59.6	57	44.3	58.1	10.56	0.0745	67	---	690	1	100	30
7/16/2017	5:30 AM	54.4	54.4	53.8	88	50.9	1	NNW	0.5	5	NNW	54.4	54.4	54.4	29.468	0	0	0.221	0	59	58	44.2	57.6	10.75	0.0746	67	---	690	1	100	30
7/16/2017	6:00 AM	53.2	54.4	53.2	88	49.7	1	NNW	0.5	5	N	53.2	53.2	53.2	29.463	0	0	0.246	0	58.2	58	43.5	56.8	10.75	0.0747	67	---	693	1	100	30
7/16/2017	6:30 AM	52.1	53.2	52.1	89	49	0	NNW	0	3	NNW	52.1	52.3	52.3	29.473	0	0	0.269	0	57.3	58	42.6	55.9	10.75	0.0749	67	---	692	1	100	30
7/16/2017	7:00 AM	51.9	52.1	51.9	87	48.2	1	NNW	0.5	4	NNW	51.9	52	52	29.481	0	0	0.273	0	56.7	58	42.1	55.3	10.75	0.075	67	---	693	1	100	30
7/16/2017	7:30 AM	53.1	53.1	51.9	82	47.7	1	NNW	0.5	5	N	53.1	52.9	52.9	29.489	0	0	0.248	0	56.5	58	41.9	55.1	10.75	0.0751	67	---	690	1	100	30
7/16/2017	8:00 AM	54.6	54.6	53	79	48.2	1	NE	0.5	7	W	54.6	54.3	54.3	29.484	0	0	0.217	0	56.7	58	42.1	55.3	10.75	0.075	67	---	697	1	100	30
7/16/2017	8:30 AM	56.9	56.9	54.6	71	47.6	2	NNW	1	6	NNW	56.9	56.2	56.2	29.491	0	0	0.169	0	57	57	41.9	55.5	10.61	0.075	67	---	687	1	100	30
7/16/2017	9:00 AM	60.5	60.5	56.9	65	48.7	2	NNW	1	7	NE	60.5	59.7	59.7	29.501	0	0	0.094	0	60.5	55	44.2	58.9	10.25	0.0745	67	---	693	1	100	30
7/16/2017	9:30 AM	61.6	61.6	60.5	55	45.3	3	NE	1.5	10	NNE	61.6	60.1	60.1	29.505	0	0	0.071	0	61.9	60	47.9	60.7	11.11	0.0742	67	---	689	1	100	30
7/16/2017	10:00 AM	63.4	63.4	61.6	48	43.4	3	NNE	1.5	8	NNE	63.4	61.4	61.4	29.505	0	0	0.033	0	65.8	60	51.5	65.1	11.05	0.0735	67	---	691	1	100	30
7/16/2017	10:30 AM	64.2	64.2	63.4	48	44.1	4	NE	2	13	NE	64.2	62.3	62.3	29.504	0	0	0.017	0	69	59	54.1	68.3	10.95	0.073	67	---	693	1	100	30
7/16/2017	11:00 AM	65.2	65.4	64.1	48	45	3	NNE	1.5	13	NNE	65.2	63.3	63.3	29.501	0	0	0	0.004	71.8	59	56.7	71.5	10.88	0.0725	67	---	695	1	100	30
7/16/2017	11:30 AM	65.4	65.7	65	49	45.7	3	NE	1.5	10	NNE	65.4	63.6	63.6	29.495	0	0	0	0.008	74	58	58.3	74.5	10.59	0.0721	67	---	688	1	100	30
7/16/2017	12:00 PM	66.3	66.5	65.5	49	46.6	3	NE	1.5	14	N	66.3	64.7	64.7	29.493	0	0	0	0.027	75.9	58	60.1	76.5	10.51	0.0717	67	---	693	1	100	30
7/16/2017	12:30 PM	68	68	66.3	45	45.9	1	ESE	0.5	8	NE	68	66.2	66.2	29.487	0	0	0	0.063	78.2	58	62.2	79	10.42	0.0713	67	---	699	1	100	30
7/16/2017	1:00 PM	68.5	68.5	67.9	49	48.6	1	ESE	0.5	7	N	68.5	67.1	67.1	29.484	0	0	0	0.073	80.6	57	64	81.7	10.16	0.0709	67	---	697	1	100	30
7/16/2017	1:30 PM	68.4	68.8	68.2	46	46.8	2	ESE	1	5	SE	68.4	66.7	66.7	29.484	0	0	0	0.071	82.9	56	65.6	84.9	10.05	0.0705	67	---	693	1	100	30

7/16/2017	2:00 PM	68.5	68.6	68.4	45	46.3	2	ESE	1	8	SE	68.5	66.6	66.6	29.484	0	0	0	0.073	84.7	55	66.7	87.5	9.85	0.0702	67	---	701	1	100	30
7/16/2017	2:30 PM	68.6	69.2	68.4	48	48.1	2	ESE	1	4	ESE	68.6	67	67	29.481	0	0	0	0.075	86.1	52	66.4	89	9.35	0.0701	67	---	691	1	100	30
7/16/2017	3:00 PM	68.7	69	68.6	46	47.1	2	E	1	5	ESE	68.7	66.9	66.9	29.476	0	0	0	0.077	87.3	51	67	90.8	9.2	0.0699	67	---	696	1	100	30
7/16/2017	3:30 PM	68.9	69	68.7	45	46.7	2	ESE	1	4	ESE	68.9	67	67	29.476	0	0	0	0.081	88.8	50	67.8	93.2	9.05	0.0696	67	---	696	1	100	30
7/16/2017	4:00 PM	68	68.9	67.9	45	45.9	1	ESE	0.5	6	SE	68	66.2	66.2	29.472	0	0	0	0.063	95.3	44	69.9	103	7.94	0.0687	67	---	695	1	100	30
7/16/2017	4:30 PM	68.4	68.4	67.7	45	46.2	2	E	1	7	SSE	68.4	66.6	66.6	29.467	0	0	0	0.071	99.9	39	70.5	109.4	7.05	0.0681	67	---	694	1	100	30
7/16/2017	5:00 PM	68.1	68.4	68	46	46.5	2	ESE	1	8	SSE	68.1	66.4	66.4	29.465	0	0	0	0.065	103.3	37	72	115.5	6.75	0.0676	67	---	694	1	100	30
7/16/2017	5:30 PM	67.2	68.2	67	42	43.3	2	SE	1	7	SSE	67.2	65	65	29.467	0	0	0	0.046	103	37	71.7	114.8	6.75	0.0676	67	---	695	1	100	30
7/16/2017	6:00 PM	67.3	67.4	66.9	43	44	1	SE	0.5	6	S	67.3	65.2	65.2	29.457	0	0	0	0.048	101.2	38	70.9	111.5	6.93	0.0679	67	---	694	1	100	30
7/16/2017	6:30 PM	67.1	67.4	67	43	43.8	1	SSE	0.5	8	S	67.1	65	65	29.446	0	0	0	0.044	98.7	39	69.4	106.8	7.08	0.0682	67	---	693	1	100	30
7/16/2017	7:00 PM	67.2	67.2	66.9	42	43.3	1	SSE	0.5	5	SE	67.2	65	65	29.443	0	0	0	0.046	96.3	39	67.3	101.9	7.12	0.0686	67	---	693	1	100	30
7/16/2017	7:30 PM	66.7	67.1	66.6	44	44.1	1	SSE	0.5	5	SSE	66.7	64.6	64.6	29.441	0	0	0	0.035	92.2	40	64.4	94.9	7.36	0.0693	67	---	692	1	100	30
7/16/2017	8:00 PM	65.6	66.9	65.6	48	45.4	1	SSE	0.5	7	SE	65.6	63.8	63.8	29.441	0	0	0	0.012	88.6	41	61.9	89.6	7.65	0.0699	67	---	690	1	100	30
7/16/2017	8:30 PM	63.6	65.6	63.6	51	45.1	1	SSE	0.5	7	SE	63.6	61.9	61.9	29.443	0	0	0.029	0	84.7	42	59.1	85.2	7.85	0.0705	67	---	697	1	100	30
7/16/2017	9:00 PM	62.2	63.6	62.2	53	44.9	1	SSE	0.5	3	SSE	62.2	60.6	60.6	29.438	0	0	0.058	0	81	42	55.7	80.2	7.85	0.0711	67	---	691	1	100	30
7/16/2017	9:30 PM	58.5	62.2	58.5	65	46.8	0	SSE	0	3	SSE	58.5	57.5	57.5	29.43	0	0	0.135	0	77.7	43	53.4	77.1	8.05	0.0716	67	---	694	1	100	30
7/16/2017	10:00 PM	54.8	58.4	54.8	73	46.3	0	SSE	0	2	SSE	54.8	54.2	54.2	29.424	0	0	0.213	0	74.2	44	50.9	73.6	8.27	0.0722	67	---	690	1	100	30
7/16/2017	10:30 PM	52.6	54.7	52.6	77	45.6	1	SSE	0.5	3	SSE	52.6	52.2	52.2	29.432	0	0	0.258	0	70.7	44	47.7	68.6	8.34	0.0728	67	---	700	1	100	30
7/16/2017	11:00 PM	51	52.5	51	80	45	0	SSE	0	3	SSE	51	50.9	50.9	29.445	0	0	0.292	0	67.7	45	45.6	65.9	8.5	0.0733	67	---	697	1	100	30
7/16/2017	11:30 PM	49.6	51	49.6	82	44.3	0	SSE	0	1	SSE	49.6	49.6	49.6	29.435	0	0	0.321	0	64.9	46	43.6	62.8	8.65	0.0737	67	---	690	1	100	30
7/17/2017	12:00 AM	47.9	49.6	47.9	85	43.6	0	SSE	0	1	SSE	47.9	47.9	47.9	29.426	0	0	0.356	0	62.5	46	41.4	60.3	8.75	0.0741	67	---	700	1	100	30
7/17/2017	12:30 AM	47.1	48	47.1	88	43.7	0	---	0	0	---	47.1	47.2	47.2	29.423	0	0	0.373	0	60	47	39.7	57.8	8.95	0.0745	67	---	688	1	100	30
7/17/2017	1:00 AM	46.8	47.1	46.8	89	43.7	0	SSE	0	2	SSE	46.8	46.9	46.9	29.423	0	0	0.379	0	57.9	48	38.3	55.8	9.15	0.0748	67	---	695	1	100	30
7/17/2017	1:30 AM	46.3	46.9	46.3	89	43.2	0	SSE	0	2	SSE	46.3	46.4	46.4	29.425	0	0	0.39	0	56.3	48	36.8	54.3	9.15	0.0751	67	---	693	1	100	30
7/17/2017	2:00 AM	45.7	46.3	45.7	90	42.9	0	SSE	0	2	SSE	45.7	45.8	45.8	29.416	0	0	0.402	0	54.8	49	36	53	9.35	0.0753	67	---	695	1	100	30
7/17/2017	2:30 AM	45.6	45.7	45.6	91	43.1	0	SSE	0	2	SSE	45.6	45.7	45.7	29.41	0	0	0.404	0	53.6	49	34.9	51.9	9.35	0.0755	67	---	689	1	100	30
7/17/2017	3:00 AM	45.5	45.6	45.5	92	43.3	0	---	0	0	---	45.5	45.7	45.7	29.408	0	0	0.406	0	52.6	49	34	51	9.35	0.0756	67	---	692	1	100	30
7/17/2017	3:30 AM	45.2	45.5	45.2	92	43	0	SSE	0	1	SSE	45.2	45.3	45.3	29.405	0	0	0.412	0	51.5	49	33	50.1	9.35	0.0758	67	---	698	1	100	30
7/17/2017	4:00 AM	44.7	45.2	44.7	92	42.5	0	SSE	0	1	SSE	44.7	44.8	44.8	29.399	0	0	0.423	0	50.5	49	32	49.2	9.35	0.076	67	---	695	1	100	30
7/17/2017	4:30 AM	44.7	44.9	44.7	93	42.8	0	SSE	0	1	SSE	44.7	44.9	44.9	29.402	0	0	0.423	0	49.6	50	31.7	48.4	9.45	0.0761	67	---	693	1	100	30
7/17/2017	5:00 AM	44.4	44.7	44.4	93	42.5	0	SSE	0	2	SSE	44.4	44.6	44.6	29.398	0	0	0.429	0	48.9	50	31.1	47.7	9.45	0.0762	67	---	692	1	100	30
7/17/2017	5:30 AM	43.9	44.4	43.9	94	42.3	0	---	0	0	---	43.9	44.1	44.1	29.404	0	0	0.44	0	48.1	50	30.3	46.9	9.45	0.0764	67	---	698	1	100	30
7/17/2017	6:00 AM	44.2	44.4	43.9	94	42.6	0	SSE	0	1	SSE	44.2	44.4	44.4	29.407	0	0	0.433	0	47.7	50	30	46.5	9.45	0.0764	67	---	699	1	100	30
7/17/2017	6:30 AM	44.3	44.6	44.2	94	42.7	0	SSE	0	1	SSE	44.3	44.5	44.5	29.414	0	0	0.431	0	47.4	50	29.7	46.2	9.45	0.0765	67	---	691	1	100	30
7/17/2017	7:00 AM	44.2	44.3	44	94	42.6	0	---	0	0	---	44.2	44.4	44.4	29.422	0	0	0.433	0	47.1	56	32.2	46.1	10.41	0.0765	67	---	698	1	100	30
7/17/2017	7:30 AM	44.5	44.5	44.2	94	42.9	0	---	0	0	---	44.5	44.7	44.7	29.415	0	0	0.427	0	48.1	67	37.7	47.5	12.59	0.0762	67	---	696	1	100	30
7/17/2017	8:00 AM	46	46	44.5	95	44.6	0	---	0	0	---	46	46.3	46.3	29.394	0	0	0.396	0	49.9	70	40.5	49.5	13.35	0.0759	67	---	693	1	100	30
7/17/2017	8:30 AM	48.7	48.7	46.1	95	47.3	0	SSE	0	1	SSE	48.7	49.2	49.2	29.396	0	0	0.34	0	51.7	72	43	51.2	13.92	0.0755	67	---	694	1	100	30
7/17/2017	9:00 AM	53.3	53.3	48.8	89	50.1	1	SSE	0.5	7	SSE	53.3	53.4	53.4	29.398	0	0	0.244	0	70.7	48	50	69	8.86	0.0726	67	---	695	1	100	30
7/17/2017	9:30 AM	58.6	58.6	53.4	71	49.2	3	S	1.5	9	S	58.6	57.9	57.9	29.407	0	0	0.133	0	64.3	57	48.7	63.2	10.64	0.0736	67	---	692	1	100	30
7/17/2017	10:00 AM	61.5	61.5	58.6	65	49.6	2	S	1	7	SE	61.5	60.8	60.8	29.408	0	0	0.073	0	64.8	58	49.7	63.8	10.75	0.0735	67	---	688	1	100	30
7/17/2017	10:30 AM	63.9	63.9	61.5	61	50.2	2	S	1	7	SSE	63.9	63.1	63.1	29.386	0	0	0.023	0	67	58	51.7	66.3	10.75	0.073	67	---	698	1	100	30
7/17/2017	11:00 AM	65.8	65.9	63.9	59	51.1	1	SE	0.5	7	SE	65.8	65	65	29.366	0	0	0	0.017	69.4	55	52.5	68.3	10.16	0.0726	67	---	692	1	100	30
7/17/2017	11:30 AM	66.6	66.7	65.8	60	52.3	1	SE	0.5	6	SSE	66.6	66	66	29.341	0	0	0	0.033	71.8	53	53.7	71	9.78	0.0722	67	---	691	1	100	30
7/17/2017	12:00 PM	70.5	70.5	66.6	60	55.9	2	SSE	1	7	SE	70.5	69.8	69.8	29.323	0	0	0	0.115	74.5	53	56.2	74.7	9.67	0.0717	67	---	695	1	100	30
7/17/2017	12:30 PM	70.9	71	70.5	59	55.9	1	SE	0.5	4	SSE	70.9	70.3	70.3	29.319	0	0	0	0.123	76.6	53	58.2	76.7	9.65	0.0713	67	---	695	1	100	30
7/17/2017	1:00 PM	72.7	72.7	70.9	58	57.1	1	SE	0.5	6	SSE	72.7	72.8	72.8	29.313	0	0	0	0.16	78.8	51	59.1	79	9.35	0.071	67	---	695	1	100	30
7/17/2017	1:30 PM	74.6	74.6	72.7	57	58.4	1	SSE	0.5	5	SSE	74.6	75.2	75.2	29.301	0	0	0	0.2	80.3	50	60	80.4	9.14	0.0707	67	---	692	1	100	30
7/17/2017	2:00 PM	74.9	75.7	74.7	59	59.6	2	ESE	1	7	SE	74.9	75.7	75.7	29.287	0	0	0	0.206	80.3	43	55.8	79.7	8.04	0.0708	67	---	700	1	100	30
7/17/2017	2:30 PM	74.5	74.9	74.4	59	59.2	1	ESE	0.5	5	ESE	74.5	75.2	75.2	29.284	0	0	0	0.198	79	39	51.9	78.1	7.47	0.0711	67	---	693	1	100	30
7/17/2017	3:00 PM	73	74.5	73	58	57.3	1	E	0.5	3	E	73	73.2	73.2	29.277	0	0	0	0.167	77.7	37	49.3	76.6	7.2	0.0714	67	---	696	1	100	30
7/17/2017	3:30 PM	74.6	74.6	73	56	57.9	1	ENE	0.5	6	NNE	74.6	75.1	75.1	29.264	0	0	0	0.2	77	39	50.1	76.2	7.51	0.0714	67	---	698	1	100	30
7/17/2017	4:00 PM	75.1	75.1	74.4	56	58.3	1	NE	0.5	4	NNE	75.1	75.7	75.7	29.251	0	0	0	0.21	79.9	36	50.6	78.5	6.95	0.071	67	---	700	1	100	30
7/17/2017	4:30 PM	76	76	75.1	53	57.6	1	E	0.5	6	N	76	76.2	76.2	29.245	0	0	0	0.229	82.7	36	53	81.6	6.84	0.0705	67	---	692	1	100	30
7/17/2017	5:00 PM	77.4	77.4	76	50	57.3	1	ENE	0.5	5	NNE	77.4	77.3	77.3	29.242	0	0	0	0.258	84.7	34	53.2	83.7	6.46	0.0703	67	---	697	1	100	30
7/17/2017	5:30 PM	77.8	77.8	77.5	53	59.3	0	E	0	3	NNE	77.8	78.1	78.1	29.247	0	0	0	0.267	84.3	33	52.1	83.2	6.38	0.0704	67	---	697	1	100	30
7/17/2017	6:00 PM	77.5	77.9	77.4	53	59	2	NE	1	8	NNE	77.5	77.7	77.7	29.27	0	0	0	0.26	85.3	40	58.2	85.4	7.54	0.07	67	---	693	1	100	30
7/17/2017	6:30 PM	79.2	79.3	77.5	52	60.1	1	NNE	0.5	5	NE	79.2	79.6	79.6	29.271	0	0	0	0.296	88	41	61.3	88.4	7.65	0.0696	67	---	694	1	100	30
7/17/2017	7:00 PM	78.8	79.2	78.7	54	60.7	1	NE	0.5	5	NE	78.8	79.3	79.3	29.271	0	0	0	0.288	90.3	41	63.4	92.1	7.64	0.0692	67	---	691	1	100	30
7/17/2017	7:30 PM	79.1	79.1	78.8	58	63.1	1	NNE	0.5	4	NNE	79.1	80	80	29.246	0	0	0	0.294	89.8	42	63.6	91.8	7.75	0.0692	67	---	694	1	100	30
7/17/2017	8:00 PM	77.4	79.3	77.4	57	61	0	SE	0	3	SE	77.4	78	78	29.22	0	0	0	0.258	88.8	43	63.4	90.7	7.95	0.0692	67	---	687	1	100	30
7/17/2017	8:30 PM	73.9	77.3	73.9	60	59.1	0	SE	0	5	SE	73.9	74.6	74.6	29.205	0	0	0	0.185	87.1	43	61.9	88.2	7.95	0.0695	67	---	701	1	100	30
7/17/2017	9:00 PM	71	73.8	71	64	58.2	0	NE	0	3	NE	71	70.8	70.8	29.215	0	0	0	0.125	85.1	43	60.1	85.8	7.95	0.0699	67	---	693	1	100	30
7/17/2017	9:30 PM	69.2	71	69.2	70	59	0	NE	0	1	NE	69.2	69.5	69.5	29.211	0	0	0	0.087	82.7	44	58.6	82.9	8.15	0.0702	67	---	693	1	100	30
7/17/2017	10:00 PM	66.8	69.2	66.8	76	59	0	NE	0	1	NE	66.8	67.5	67.5	29.215	0	0	0	0.038	80.5	45	57.2	80.1	8.34	0.0706	67	---	690	1	100	30
7/17/2017	10:30 PM	64.4	66.8	64.4	80	58.1	0	---	0	0	---	64.4	65	65	29.214	0	0	0.012	0	78.2	45	55.1	77.8	8.39	0.071	67	---	694	1	100	30
7/17/2017	11:00 PM	63.3	64.4	63.3	82	57.7	0	---	0	0	---	63.3	63.7	63.7	29.22	0	0	0.035	0	76.3	46	54	75.9	8.52	0.0713	67	---	694	1	100	30
7/17/2017	11:30 PM	62.6	63.3	62.6	83	57.4	0	---	0	0	---	62.6	63	63	29.234	0	0	0.05	0	74.5	46	52.4	74.1	8.56	0.0716	67	---	693	1	100	30
7/18/2017	12:00 AM	62	62.6	62	86	57.8	0	---	0	0	---	62	62.3	62.3	29.237	0	0	0.063	0	73	47	51.6	72.3	8.75	0.0718	67	---	697	1	100	30
7/18/2017	12:30 AM	62	62	61.9	87	58.1	0	NE	0	1	NE	62	62.4	62.4	29.233	0	0	0.063	0	71.6	48	50.9	70.3	8.88	0.072	67	---	689	1	100	30
7/18/2017	1:00 AM	62.1	62.1	61.9	89	58.8	0	NE	0	2	NE	62.1	62.6	62.6	29.215	0	0	0.06	0	70.4	48	49.8	68.6	8.86	0.0722	67	---	691	1	100	30
7/18/2017	1:30 AM	62.3	62.4	62.1	89	59	0	NE	0	2	NE	62.3	62.8	62.8	29.214	0	0	0.056	0	69.4	49	49.4	67.8	9.06	0.0723	67	---	697	1	100	30
7/18/2017	2:00 AM	62.5	62.5	62.3	89	59.2	0	NE	0	2	NE	62.5	63.1	63.1	29.208	0	0	0.052	0	68.7	49	48.8	67.2	9.08	0.0725	67	---	695	1	100	30
7/18/2017	2:30 AM	62.5	62.5	62.4	89	59.2	0	N	0	3	NE	62.5	63.1	63.1	29.196	0	0	0.052	0	68	50	48.7	66.7	9.29	0.0725	67	---	694	1	100	30
7/18/2017	3:00 AM	62.5	62.5	62.4	89	59.2	0	N	0	3	N	62.5	63.1	63.1	29.206	0	0	0.052	0	67.5	50	48.2	66.1	9.3	0.0726	67	---	691	1	100	30
7/18/2017	3:30 AM	62.7	62.7	62.5	88	59.1	0	N	0	3	N	62.7	63.3	63.3	29.229	0	0	0.048	0	67	50	47.7	65.6	9.31	0.0728	67	---	696	1	100	30
7/18/2017	4:00 AM	63	63.2	62.7	88	59.4	0	SSE	0	3	NE	63	63.6	63.6	29.223	0	0	0.042	0	66.6	51	47.9	65.2	9.52	0.0728	67	---	694	1	100	30
7/18/2017	4:30 AM	61.8	63	61.8	90	58.8	0	SSE	0	2	SSE	61.8	62.3	62.3	29.227	0	0	0.067	0	66.1	51	47.4	64.6	9.53	0.0729	67	---	691	1	100	30
7/18/2017	5:00 AM	60.9	61.8	60.9	92	58.6	0	NE	0	2	NE	60.9	61.3	61.3	29.222	0	0	0.085	0	65.4	51	46.8	63.8	9.54	0.073	67	---	696	1	100	30
7/18/2017	5:30 AM	60.3	60.9	60.3	92	58	0	S	0	2	S	60.3	60.7	60.7	29.237	0	0	0.098	0	64.8	52	46.8	63.3	9.75	0.0731	67	---	693	1	100	30
7/18/2017	6:00 AM	60.1	60.3	60.1	93	58.1	0	S	0	2	S	60.1	60.5	60.5	29.23	0	0	0.102	0	64.1	52	46.1	62.5	9.75	0.0732	67	---	696	1	100	30
7/18/2017	6:30 AM	59.9	60.1	59.9	94	58.2	0	NNE	0	3	NNE	59.9	60.3	60.3	29.233	0	0	0.106	0	63.6	52	45.6	62	9.75	0.0733	67	---	694	1	100	30
7/18/2017	7:00 AM	60.2	60.2	59.8	95	58.8	0	NNE	0	1	NNE	60.2	60.6	60.6	29.24	0	0	0.1	0	63.8	60	49.6	62.9	11.07	0.0732	67	---	698	1	100	30
7/18/2017	7:30 AM	61.2	61.2	60.2	95	59.8	0	---	0	0	---	61.2	61.7	61.7	29.237	0	0	0.079	0	65.9	70	55.8	66.1	13.31	0.0727	67	---	693	1	100	30
7/18/2017	8:00 AM	63.1	63.1	61.2	95	61.6	0	NNE	0	1	NNE	63.1	63.9	63.9	29.247	0	0	0.04	0	69.2	71	59.4	69.7	13.47	0.0721	67	---	691	1	100	30

7/18/2017	8:30 AM	64.7	64.7	63.1	94	62.9	0	NNE	0	1	NNE	64.7	65.8	65.8	29.247	0	0	0.006	0	70.2	71	60.4	70.5	13.44	0.0719	67	---	692	1	100	30
7/18/2017	9:00 AM	68.6	68.6	64.7	89	65.2	1	SSW	0.5	7	S	68.6	70.4	70.4	29.242	0	0	0	0.075	73.8	68	62.6	75.1	12.55	0.0713	67	---	692	1	100	30
7/18/2017	9:30 AM	73.3	73.3	68.6	81	67.1	2	S	1	7	SSE	73.3	75.2	75.2	29.242	0	0	0	0.173	77.7	66	65.4	79.2	12	0.0706	67	---	688	1	100	30
7/18/2017	10:00 AM	76.9	76.9	73.3	71	66.8	1	SSE	0.5	8	S	76.9	78.9	78.9	29.242	0	0	0	0.248	79	65	66.2	80.7	11.77	0.0704	67	---	699	1	100	30
7/18/2017	10:30 AM	79.2	79.2	77	65	66.4	3	SSW	1.5	13	SSE	79.2	81	81	29.224	0	0	0	0.296	81.8	61	67	84.1	10.95	0.07	67	---	694	1	100	30
7/18/2017	11:00 AM	81.7	81.7	79.2	62	67.4	2	SSW	1	10	SSW	81.7	84.1	84.1	29.228	0	0	0	0.348	84.5	59	68.6	88.3	10.55	0.0695	67	---	695	1	100	30
7/18/2017	11:30 AM	81.8	82.8	81.7	61	67	4	SSW	2	14	SSE	81.8	84.1	84.1	29.224	0	0	0	0.35	84.3	48	62.5	85.8	8.76	0.0699	67	---	689	1	100	30
7/18/2017	12:00 PM	83.1	83.1	81.2	59	67.3	3	SSW	1.5	13	SSW	83.1	85.7	85.7	29.227	0	0	0	0.377	81.6	43	56.9	81.1	8.02	0.0705	67	---	695	1	100	30
7/18/2017	12:30 PM	84.1	84.8	83.1	58	67.7	4	SSW	2	12	SSW	84.1	87.4	87.4	29.215	0	0	0	0.398	81.4	45	58	81.1	8.32	0.0704	67	---	697	1	100	30
7/18/2017	1:00 PM	83.4	84.1	82.5	61	68.5	2	SSW	1	12	S	83.4	86.8	86.8	29.207	0	0	0	0.383	83.3	50	62.7	84.7	9.08	0.0699	67	---	689	1	100	30
7/18/2017	1:30 PM	82.7	84	82.7	63	68.8	1	NW	0.5	8	SSW	82.7	85.9	85.9	29.201	0	0	0	0.369	86.7	55	68.6	91.2	9.82	0.0692	67	---	696	1	100	30
7/18/2017	2:00 PM	77.8	82.6	77.8	71	67.6	2	NW	1	9	WNW	77.8	79.9	79.9	29.242	0	0	0	0.267	82	42	56.6	81.5	7.85	0.0705	67	---	692	1	100	30
7/18/2017	2:30 PM	73.9	77.8	73.9	75	65.5	4	NW	2	19	NW	73.9	75.8	75.8	29.234	0	0	0	0.185	76.4	40	50.3	75.5	7.62	0.0714	67	---	692	1	100	30
7/18/2017	3:00 PM	70.1	73.9	70.1	80	63.6	3	NW	1.5	10	NW	70.1	71.2	71.2	29.229	0	0	0	0.106	73.8	47	52.3	73.3	8.75	0.0717	67	---	696	1	100	30
7/18/2017	3:30 PM	66.3	70	66.3	88	62.6	4	NW	2	17	NNW	66.3	67.6	67.6	29.265	0.01	0	0	0.027	74	49	53.6	73.6	9.05	0.0717	67	---	698	1	100	30
7/18/2017	4:00 PM	65.5	66.3	65.5	92	63.1	3	NW	1.5	11	N	65.5	66.7	66.7	29.255	0.07	0.4	0	0.01	73.6	54	55.9	73.6	9.88	0.0716	67	---	694	1	100	30
7/18/2017	4:30 PM	66.3	66.3	65.5	94	64.5	2	NW	1	10	W	66.3	67.7	67.7	29.25	0.06	0.4	0	0.027	74.2	56	57.5	74.6	10.27	0.0715	67	---	693	1	100	30
7/18/2017	5:00 PM	67.3	67.3	66.3	94	65.5	0	NNE	0	2	NNE	67.3	69	69	29.237	0.01	0.05	0	0.048	74.7	58	58.9	75.4	10.56	0.0713	67	---	697	1	100	30
7/18/2017	5:30 PM	68.3	68.3	67.3	94	66.5	1	S	0.5	6	SSE	68.3	70.3	70.3	29.248	0	0	0	0.069	75.4	68	64.1	76.9	12.53	0.071	67	---	691	1	100	30
7/18/2017	6:00 PM	68.6	68.7	68.3	94	66.8	2	S	1	7	SSE	68.6	70.7	70.7	29.264	0.01	0	0	0.075	75.4	70	64.9	77.1	12.94	0.071	67	---	691	1	100	30
7/18/2017	6:30 PM	68.1	68.6	68.1	94	66.3	1	S	0.5	7	SSW	68.1	70	70	29.275	0	0	0	0.065	74.7	73	65.5	76.6	13.76	0.0711	67	---	691	1	100	30
7/18/2017	7:00 PM	68.7	68.7	68.1	94	66.9	0	SSW	0	3	SSW	68.7	70.8	70.8	29.276	0	0	0	0.077	74.5	74	65.7	76.4	14.07	0.0711	67	---	693	1	100	30
7/18/2017	7:30 PM	67.9	68.7	67.8	92	65.5	0	SW	0	4	NNW	67.9	69.7	69.7	29.283	0	0	0	0.06	73.8	74	65	75.6	14.1	0.0713	67	---	687	1	100	30
7/18/2017	8:00 PM	66.7	67.9	66.7	92	64.3	1	WNW	0.5	5	WSW	66.7	68.2	68.2	29.285	0	0	0	0.035	73	73	63.8	74.3	13.83	0.0714	67	---	699	1	100	30
7/18/2017	8:30 PM	67	67	66.6	91	64.3	1	WNW	0.5	7	SSW	67	68.5	68.5	29.291	0	0	0	0.042	73	74	64.2	74.4	14.13	0.0714	67	---	694	1	100	30
7/18/2017	9:00 PM	66.4	67	66.4	92	64	0	WSW	0	4	SSE	66.4	67.8	67.8	29.3	0	0	0	0.029	72.8	71	62.8	73.9	13.34	0.0715	67	---	691	1	100	30
7/18/2017	9:30 PM	65.7	66.4	65.7	92	63.3	0	SW	0	5	W	65.7	67	67	29.307	0	0	0	0.015	71.9	69	61.2	72.5	12.81	0.0718	67	---	692	1	100	30
7/18/2017	10:00 PM	64.5	65.7	64.5	93	62.4	0	SW	0	1	SW	64.5	65.5	65.5	29.322	0	0	0.01	0	70.9	69	60.2	71.2	12.83	0.072	67	---	696	1	100	30
7/18/2017	10:30 PM	63.2	64.5	63.2	93	61.1	0	---	0	0	---	63.2	64	64	29.335	0	0	0.037	0	69.7	68	58.7	69.7	12.56	0.0723	67	---	695	1	100	30
7/18/2017	11:00 PM	62.2	63.2	62.2	94	60.5	0	SW	0	1	SW	62.2	62.9	62.9	29.337	0	0	0.058	0	68.5	68	57.5	68.8	12.61	0.0725	67	---	692	1	100	30
7/18/2017	11:30 PM	61.2	62.2	61.2	94	59.5	0	---	0	0	---	61.2	61.7	61.7	29.343	0	0	0.079	0	67.5	67	56.2	67.8	12.4	0.0727	67	---	698	1	100	30
7/19/2017	12:00 AM	60.2	61.2	60.2	95	58.8	0	---	0	0	---	60.2	60.6	60.6	29.349	0	0	0.1	0	66.4	67	55.1	66.4	12.42	0.0729	67	---	692	1	100	30
7/19/2017	12:30 AM	58.9	60.2	58.9	95	57.5	0	---	0	0	---	58.9	59.3	59.3	29.353	0	0	0.127	0	65.4	67	54.2	65.3	12.44	0.0731	67	---	695	1	100	30
7/19/2017	1:00 AM	58	58.9	58	95	56.6	0	---	0	0	---	58	58.3	58.3	29.355	0	0	0.146	0	64.3	67	53.1	64	12.46	0.0733	67	---	690	1	100	30
7/19/2017	1:30 AM	57	58	57	95	55.6	0	---	0	0	---	57	57.2	57.2	29.353	0	0	0.167	0	63.2	67	52.1	62.7	12.49	0.0735	67	---	691	1	100	30
7/19/2017	2:00 AM	56.2	57	56.2	95	54.8	0	SW	0	1	SW	56.2	56.4	56.4	29.361	0	0	0.183	0	62.2	66	50.7	61.6	12.26	0.0737	67	---	692	1	100	30
7/19/2017	2:30 AM	55.7	56.2	55.7	95	54.3	0	SW	0	1	SW	55.7	55.9	55.9	29.366	0	0	0.194	0	61.3	66	49.8	60.6	12.3	0.0738	67	---	692	1	100	30
7/19/2017	3:00 AM	55.4	55.7	55.4	95	54	0	---	0	0	---	55.4	55.6	55.6	29.368	0	0	0.2	0	60.3	66	48.9	59.5	12.34	0.074	67	---	697	1	100	30
7/19/2017	3:30 AM	55	55.4	55	95	53.6	0	SW	0	1	SW	55	55.2	55.2	29.37	0	0	0.208	0	59.6	66	48.2	58.7	12.36	0.0742	67	---	692	1	100	30
7/19/2017	4:00 AM	54.5	55	54.5	96	53.4	0	SW	0	1	SW	54.5	54.7	54.7	29.374	0	0	0.219	0	59	66	47.7	58.1	12.37	0.0743	67	---	697	1	100	30
7/19/2017	4:30 AM	54.5	54.6	54.5	96	53.4	0	SW	0	1	SW	54.5	54.7	54.7	29.377	0	0	0.219	0	58.2	66	46.9	57.2	12.39	0.0744	67	---	693	1	100	30
7/19/2017	5:00 AM	55.8	55.8	54.5	96	54.7	0	WNW	0	5	SSE	55.8	56	56	29.376	0	0	0.192	0	57.7	66	46.4	56.7	12.4	0.0745	67	---	693	1	100	30
7/19/2017	5:30 AM	56.7	56.7	55.8	95	55.3	0	NE	0	5	SSE	56.7	56.9	56.9	29.385	0	0	0.173	0	57.4	66	46.1	56.4	12.4	0.0746	67	---	693	1	100	30
7/19/2017	6:00 AM	58.2	58.2	56.7	88	54.7	1	NNW	0.5	5	NW	58.2	58.2	58.2	29.387	0	0	0.142	0	57.3	66	46	56.3	12.4	0.0746	67	---	692	1	100	30
7/19/2017	6:30 AM	60.1	60.1	58.2	83	54.9	2	NW	1	9	W	60.1	60.1	60.1	29.394	0	0	0.102	0	57.3	66	46	56.3	12.4	0.0746	67	---	693	1	100	30
7/19/2017	7:00 AM	60.7	60.7	60.1	82	55.2	2	NW	1	8	WSW	60.7	60.8	60.8	29.396	0	0	0.09	0	58.2	73	49.6	57.6	14.09	0.0744	67	---	692	1	100	30
7/19/2017	7:30 AM	61.6	61.6	60.8	81	55.7	2	WNW	1	7	WSW	61.6	61.7	61.7	29.404	0	0	0.071	0	60.3	76	52.7	60	14.94	0.074	67	---	694	1	100	30
7/19/2017	8:00 AM	62.5	62.5	61.6	80	56.2	2	NW	1	6	NNW	62.5	62.8	62.8	29.402	0	0	0.052	0	63	74	54.6	62.9	14.25	0.0735	67	---	698	1	100	30
7/19/2017	8:30 AM	63.6	63.6	62.5	79	57	2	NW	1	5	N	63.6	63.9	63.9	29.402	0	0	0.029	0	64.5	73	55.7	64.6	14.04	0.0733	67	---	696	1	100	30
7/19/2017	9:00 AM	66	66	63.7	76	58.2	2	NW	1	7	WSW	66	66.6	66.6	29.396	0	0	0	0.021	98	39	68.8	105.3	7.09	0.0682	67	---	694	1	100	30
7/19/2017	9:30 AM	67.6	67.6	66	74	59	2	NW	1	7	WSW	67.6	68.4	68.4	29.404	0	0	0	0.054	79	54	60.9	79.5	9.77	0.0711	67	---	694	1	100	30
7/19/2017	10:00 AM	69.5	69.5	67.6	72	60.1	2	NW	1	7	NW	69.5	70	70	29.406	0	0	0	0.094	75.6	60	60.7	76.4	10.93	0.0715	67	---	695	1	100	30
7/19/2017	10:30 AM	---	70.8	69.5	---	---	2	WNW	1	8	NNW	---	---	---	29.414	0	0	---	---	77.3	63	63.7	78.4	11.4	0.0712	67	---	412	1	60.2	30
7/19/2017	11:00 AM	---	---	---	---	---	0	---	0	0	---	---	---	---	29.364	0	0	---	---	75	54	57.2	75.4	9.85	0.0717	67	---	0	1	0	30
7/19/2017	11:30 AM	---	---	---	---	---	0	---	0	0	---	---	---	---	29.359	0	0	---	---	74.5	49	54.1	74.3	9.05	0.0719	67	---	0	1	0	30
7/19/2017	12:00 PM	---	---	---	---	---	0	---	0	0	---	---	---	---	29.358	0	0	---	---	74.2	51	54.9	74.1	9.37	0.0719	67	---	0	1	0	30
7/19/2017	12:30 PM	---	---	---	---	---	0	---	0	0	---	---	---	---	29.357	0	0	---	---	73.8	54	56.1	73.9	9.87	0.0719	67	---	0	1	0	30
7/19/2017	1:00 PM	---	---	---	---	---	0	---	0	0	---	---	---	---	29.394	0	0	---	---	74	58	58.3	74.5	10.59	0.0718	67	---	0	1	0	30
7/19/2017	1:30 PM	---	---	---	---	---	0	---	0	0	---	---	---	---	29.395	0	0	---	---	77	57	60.6	77.5	10.27	0.0713	67	---	0	1	0	30
7/19/2017	2:00 PM	---	---	---	---	---	0	---	0	0	---	---	---	---	29.403	0	0	---	---	78.4	54	60.4	78.8	9.78	0.0712	67	---	0	1	0	30
7/19/2017	2:30 PM	---	---	---	---	---	0	---	0	0	---	---	---	---	29.398	0	0	---	---	83.1	44	58.9	83.5	8.15	0.0706	67	---	0	1	0	30
7/19/2017	3:00 PM	77.7	79.3	77.7	54	59.7	1	WNW	0.5	8	SSW	77.7	78	78	29.391	0	0	0	0.265	81.8	41	55.8	81.2	7.71	0.0709	67	---	404	1	59.1	30
7/19/2017	3:30 PM	78.3	78.3	77.5	55	60.8	2	WSW	1	9	SSW	78.3	78.8	78.8	29.386	0	0	0	0.277	80.5	38	52.6	79.3	7.25	0.0712	67	---	699	1	100	30
7/19/2017	4:00 PM	77.8	78.4	77.8	54	59.8	1	SW	0.5	8	SSW	77.8	78.2	78.2	29.383	0	0	0	0.267	79	39	51.9	78.1	7.47	0.0714	67	---	694	1	100	30
7/19/2017	4:30 PM	78.7	78.7	77.7	55	61.2	1	SW	0.5	7	SSW	78.7	79.3	79.3	29.373	0	0	0	0.285	78.6	42	53.6	78	7.88	0.0714	67	---	701	1	100	30
7/19/2017	5:00 PM	79.7	79.7	78.7	55	62.1	1	SW	0.5	7	SSE	79.7	80.4	80.4	29.368	0	0	0	0.306	78.8	40	52.4	78	7.57	0.0714	67	---	692	1	100	30
7/19/2017	5:30 PM	79.4	80	79.4	54	61.3	1	WSW	0.5	5	SSW	79.4	79.9	79.9	29.345	0	0	0	0.3	81.8	46	59	81.8	8.45	0.0706	67	---	693	1	100	30
7/19/2017	6:00 PM	79.4	79.5	79.1	55	61.8	0	WSW	0	4	SSW	79.4	80	80	29.341	0	0	0	0.3	84.3	46	61.3	85.5	8.45	0.0702	67	---	698	1	100	30
7/19/2017	6:30 PM	79.4	79.5	79.2	53	60.8	0	WNW	0	4	NW	79.4	79.8	79.8	29.326	0	0	0	0.3	85.5	46	62.4	86.7	8.44	0.07	67	---	698	1	100	30
7/19/2017	7:00 PM	78.1	79.6	78.1	60	63.1	0	NNW	0	2	NNW	78.1	79	79	29.314	0	0	0	0.273	85.7	47	63.1	87.2	8.54	0.0699	67	---	695	1	100	30
7/19/2017	7:30 PM	76.3	78	76.3	71	66.2	0	NNW	0	2	NNW	76.3	78.3	78.3	29.304	0	0	0	0.235	84.7	47	62.2	86	8.56	0.07	67	---	695	1	100	30
7/19/2017	8:00 PM	73.2	76.3	73.2	76	65.2	0	NNW	0	1	NNW	73.2	74.8	74.8	29.301	0	0	0	0.171	83.5	48	61.7	84.7	8.78	0.0702	67	---	698	1	100	30
7/19/2017	8:30 PM	71	73.3	71	78	63.8	0	NNW	0	2	NNW	71	72.1	72.1	29.298	0	0	0	0.125	81.8	48	60.2	82	8.81	0.0705	67	---	695	1	100	30
7/19/2017	9:00 PM	69.7	71	69.6	81	63.6	0	NNW	0	2	NNW	69.7	71	71	29.282	0	0	0	0.098	80.3	49	59.4	80.3	8.94	0.0707	67	---	694	1	100	30
7/19/2017	9:30 PM	68.7	69.6	68.7	82	63	0	NNW	0	2	NNW	68.7	70.2	70.2	29.274	0	0	0	0.077	78.8	49	58	78.9	8.97	0.0709	67	---	691	1	100	30
7/19/2017	10:00 PM	67.8	68.7	67.8	83	62.4	0	NNW	0	3	NNW	67.8	69.2	69.2	29.272	0	0	0	0.058	77.3	50	57.2	77.2	9.2	0.0711	67	---	691	1	100	30
7/19/2017	10:30 PM	67.6	67.8	67.5	76	59.8	0	SSW	0	4	NE	67.6	68.5	68.5	29.278	0	0	0	0.054	76.1	50	56.1	76.1	9.23	0.0714	67	---	688	1	100	30
7/19/2017	11:00 PM	66.8	67.6	66.8	81	60.8	0	NNW	0	3	WNW	66.8	67.9	67.9	29.281	0	0	0	0.038	74.9	50	55	75	9.25	0.0716	67	---	699	1	100	30
7/19/2017	11:30 PM	65.8	66.8	65.8	84	60.8	0	NNW	0	3	NNW	65.8	66.7	66.7	29.266	0	0	0	0.017	73.6	51	54.4	73.3	9.38	0.0717	67	---	692	1	100	30
7/20/2017	12:00 AM	65.1	65.8	65.1	86	60.8	0	NNW	0	3	NNW	65.1	66	66	29.279	0	0	0	0.002	72.6	51	53.4	72	9.4	0.0719	67	---	693	1	100	30
7/20/2017	12:30 AM	64.2	65.1	64.2	88	60.6	0	NNW	0	2	NNW	64.2	65	65	29.277	0	0	0.017	0	71.6	52	53	70.7	9.62	0.0721	67	---	691	1	100	30
7/20/2017	1:00 AM	63.1	64.2	63.1	89	59.8	1	NNW	0.5	3	NNW	63.1	63.8	63.8	29.264	0	0	0.04	0	70.6	52	52.1	69.2	9.64	0.0722	67	---	694	1	100	30
7/20/2017	1:30 AM	62	63.1	62	91	59.3	0	NNW	0	3	NNW	62	62.5	62.5	29.262	0	0	0.063	0	69.4	53	51.5	68.1	9.86	0.0724	67	---	695	1	100	30
7/20/2017	2:00 AM	61.2	62	61.2	90	58.2	1	NNW	0.5	4	NNW	61.2	61.6	61.6	29.247	0	0	0.079	0	68.4	53	50.6	67.3	9.88	0.0725	67	---	691	1	100	30
7/20/2017	2:30 AM	60.4	61.2	60.4	91	57.8	0	NNW	0	3	NNW	60.4	60.8	60.8	29.242	0	0	0.096	0	67.2	54	50	66.2	10.06	0.0727	67	---	698	1	100	30

7/20/2017	3:00 AM	59.3	60.4	59.3	91	56.7	0	NNW	0	3	NNW	59.3	59.6	59.6	29.24	0	0	0.119	0	66.2	54	49.1	65	10.1	0.0729	67	---	693	1	100	30
7/20/2017	3:30 AM	58.7	59.3	58.7	93	56.7	0	NNW	0	1	NNW	58.7	59	59	29.231	0	0	0.131	0	65.3	54	48.2	64	10.14	0.073	67	---	696	1	100	30
7/20/2017	4:00 AM	58.2	58.7	58.2	93	56.2	0	NNW	0	2	NNW	58.2	58.4	58.4	29.217	0	0	0.142	0	64.3	54	47.3	62.9	10.15	0.0731	67	---	688	1	100	30
7/20/2017	4:30 AM	57.4	58.2	57.4	93	55.4	0	---	0	0	---	57.4	57.6	57.6	29.209	0	0	0.158	0	63.3	54	46.4	61.8	10.15	0.0733	67	---	693	1	100	30
7/20/2017	5:00 AM	57	57.4	57	94	55.3	0	NNW	0	1	NNW	57	57.2	57.2	29.213	0	0	0.167	0	62.4	54	45.5	60.9	10.15	0.0734	67	---	693	1	100	30
7/20/2017	5:30 AM	56.7	57	56.7	94	55	0	---	0	0	---	56.7	56.9	56.9	29.215	0	0	0.173	0	61.6	54	44.8	60	10.15	0.0736	67	---	694	1	100	30
7/20/2017	6:00 AM	56.7	56.7	56.6	95	55.3	0	---	0	0	---	56.7	56.9	56.9	29.221	0	0	0.173	0	61	55	44.7	59.4	10.25	0.0737	67	---	698	1	100	30
7/20/2017	6:30 AM	56.6	56.7	56.5	95	55.2	0	---	0	0	---	56.6	56.8	56.8	29.223	0	0	0.175	0	60.3	55	44.1	58.7	10.25	0.0738	67	---	692	1	100	30
7/20/2017	7:00 AM	57.1	57.1	56.6	95	55.7	0	---	0	0	---	57.1	57.3	57.3	29.223	0	0	0.165	0	60.2	60	46.3	58.9	11.15	0.0738	67	---	695	1	100	30
7/20/2017	7:30 AM	60.7	60.7	57.1	96	59.6	1	WSW	0.5	13	S	60.7	61.2	61.2	29.215	0	0	0.09	0	61.8	70	51.9	61.3	13.29	0.0733	67	---	693	1	100	30
7/20/2017	8:00 AM	64.5	64.5	60.8	87	60.5	1	NW	0.5	8	W	64.5	65.3	65.3	29.213	0	0	0.01	0	64.9	71	55.3	64.9	13.55	0.0728	67	---	692	1	100	30
7/20/2017	8:30 AM	67.1	67.1	64.5	78	60	1	N	0.5	5	S	67.1	68.1	68.1	29.215	0	0	0	0.044	67.5	69	57	67.9	12.95	0.0723	67	---	694	1	100	30
7/20/2017	9:00 AM	69.4	69.4	67.1	73	60.4	1	NW	0.5	6	NNW	69.4	70	70	29.224	0	0	0	0.092	69.9	65	57.6	69.6	11.85	0.072	67	---	694	1	100	30
7/20/2017	9:30 AM	70.5	70.5	69.4	71	60.6	3	NW	1.5	9	WSW	70.5	70.8	70.8	29.235	0	0	0	0.115	71.8	66	59.8	72.1	12.11	0.0717	67	---	695	1	100	30
7/20/2017	10:00 AM	71.3	71.3	70.4	65	58.9	3	NW	1.5	11	S	71.3	71.3	71.3	29.235	0	0	0	0.131	73.5	60	58.8	74.1	10.98	0.0715	67	---	694	1	100	30
7/20/2017	10:30 AM	72.5	72.5	71.3	63	59.2	3	WNW	1.5	8	NNW	72.5	72.9	72.9	29.236	0	0	0	0.156	74.3	59	59	75	10.78	0.0714	67	---	692	1	100	30
7/20/2017	11:00 AM	73.9	73.9	72.6	62	60.1	3	NW	1.5	8	WNW	73.9	74.8	74.8	29.237	0	0	0	0.185	75.7	57	59.4	76.2	10.32	0.0712	67	---	696	1	100	30
7/20/2017	11:30 AM	74.8	75	73.8	64	61.8	3	WNW	1.5	11	WSW	74.8	76	76	29.243	0	0	0	0.204	77.3	58	61.4	77.9	10.46	0.0709	67	---	698	1	100	30
7/20/2017	12:00 PM	76.5	76.5	74.8	64	63.4	3	NW	1.5	7	SSW	76.5	77.7	77.7	29.239	0	0	0	0.24	78.8	57	62.3	79.6	10.2	0.0706	67	---	695	1	100	30
7/20/2017	12:30 PM	77.2	77.2	76.4	65	64.5	3	NW	1.5	9	NW	77.2	78.5	78.5	29.247	0	0	0	0.254	80.1	57	63.5	81.1	10.15	0.0704	67	---	699	1	100	30
7/20/2017	1:00 PM	78.4	78.4	77.2	63	64.8	2	NW	1	9	W	78.4	79.7	79.7	29.253	0	0	0	0.279	82.1	56	64.8	83.7	10.05	0.0701	67	---	698	1	100	30
7/20/2017	1:30 PM	78.7	78.7	78.2	63	65	3	NW	1.5	10	SSW	78.7	80.1	80.1	29.26	0	0	0	0.285	83.5	54	65.1	85.6	9.75	0.0699	67	---	693	1	100	30
7/20/2017	2:00 PM	78.1	78.7	77.7	64	64.9	3	NW	1.5	9	SW	78.1	79.4	79.4	29.259	0	0	0	0.273	82.7	54	64.4	84.3	9.75	0.0701	67	---	694	1	100	30
7/20/2017	2:30 PM	79.8	79.8	77.4	63	66.1	3	NW	1.5	10	SSW	79.8	81.5	81.5	29.258	0	0	0	0.308	82.5	56	65.2	84.3	10.05	0.07	67	---	698	1	100	30
7/20/2017	3:00 PM	80.9	80.9	79.9	61	66.2	3	NW	1.5	12	NNW	80.9	82.7	82.7	29.259	0	0	0	0.331	83.7	54	65.3	85.9	9.75	0.0699	67	---	696	1	100	30
7/20/2017	3:30 PM	81.3	81.3	80.8	60	66.1	2	NW	1	9	SSW	81.3	83.2	83.2	29.256	0	0	0	0.34	84.3	54	65.8	86.8	9.75	0.0698	67	---	692	1	100	30
7/20/2017	4:00 PM	82.6	82.6	81.3	57	65.8	3	NW	1.5	10	NNW	82.6	84.6	84.6	29.258	0	0	0	0.367	85.7	52	66	88.3	9.35	0.0696	67	---	699	1	100	30
7/20/2017	4:30 PM	81.5	82.5	81.4	58	65.3	3	NW	1.5	11	NW	81.5	83.1	83.1	29.254	0	0	0	0.344	88.6	49	67	92.4	8.85	0.0692	67	---	698	1	100	30
7/20/2017	5:00 PM	81.3	81.8	81.3	57	64.6	3	NW	1.5	13	W	81.3	82.7	82.7	29.249	0	0	0	0.34	88.8	47	66	92.2	8.47	0.0692	67	---	702	1	100	30
7/20/2017	5:30 PM	81.7	81.7	81.2	59	66	2	NW	1	12	S	81.7	83.6	83.6	29.247	0	0	0	0.348	89.4	48	67.1	93.5	8.66	0.069	67	---	695	1	100	30
7/20/2017	6:00 PM	81.1	82.1	81.1	57	64.4	2	NW	1	8	SE	81.1	82.4	82.4	29.242	0	0	0	0.335	91.1	47	68.1	96.1	8.45	0.0688	67	---	698	1	100	30
7/20/2017	6:30 PM	79.3	81.1	79.3	60	64.2	2	WNW	1	9	SSW	79.3	80.5	80.5	29.245	0	0	0	0.298	93.1	47	69.9	100	8.45	0.0684	67	---	696	1	100	30
7/20/2017	7:00 PM	78.6	79.3	78.6	61	64	1	SSW	0.5	12	SSW	78.6	79.7	79.7	29.245	0	0	0	0.283	93.3	47	70.1	100.4	8.45	0.0684	67	---	695	1	100	30
7/20/2017	7:30 PM	77.8	78.6	77.8	63	64.2	2	SSW	1	9	S	77.8	79	79	29.247	0	0	0	0.267	92	48	69.5	98.2	8.61	0.0686	67	---	698	1	100	30
7/20/2017	8:00 PM	76.4	77.8	76.4	66	64.2	1	SSW	0.5	10	S	76.4	77.8	77.8	29.243	0	0	0	0.238	90.3	48	67.9	95	8.64	0.0689	67	---	696	1	100	30
7/20/2017	8:30 PM	75.4	76.4	75.4	69	64.5	0	WSW	0	5	SSW	75.4	77	77	29.241	0	0	0	0.217	88.4	48	66.2	91.6	8.68	0.0692	67	---	693	1	100	30
7/20/2017	9:00 PM	73	75.4	73	75	64.6	0	---	0	0	---	73	74.5	74.5	29.238	0	0	0	0.167	86.3	49	64.9	88.5	8.85	0.0695	67	---	691	1	100	30
7/20/2017	9:30 PM	70	72.9	70	80	63.5	0	---	0	0	---	70	71.1	71.1	29.242	0	0	0	0.104	83.9	49	62.7	85.5	8.87	0.07	67	---	694	1	100	30
7/20/2017	10:00 PM	67.7	70	67.7	84	62.7	0	WNW	0	1	WNW	67.7	69.1	69.1	29.246	0	0	0	0.056	81.6	50	61.2	82	9.12	0.0703	67	---	689	1	100	30
7/20/2017	10:30 PM	66	67.7	66	87	62	0	---	0	0	---	66	67.1	67.1	29.256	0	0	0	0.021	79.2	50	59	79.4	9.17	0.0708	67	---	698	1	100	30
7/20/2017	11:00 PM	64.6	66	64.6	89	61.3	0	---	0	0	---	64.6	65.5	65.5	29.261	0	0	0.008	0	77	51	57.5	76.9	9.35	0.0711	67	---	697	1	100	30
7/20/2017	11:30 PM	63.5	64.6	63.5	90	60.5	0	---	0	0	---	63.5	64.3	64.3	29.262	0	0	0.031	0	75.2	51	55.8	75.4	9.35	0.0714	67	---	693	1	100	30
7/21/2017	12:00 AM	62.9	63.5	62.9	91	60.2	0	---	0	0	---	62.9	63.6	63.6	29.262	0	0	0.044	0	73.5	52	54.8	73.3	9.58	0.0717	67	---	693	1	100	30
7/21/2017	12:30 AM	62.3	62.9	62.3	92	59.9	0	---	0	0	---	62.3	62.9	62.9	29.267	0	0	0.056	0	71.9	52	53.3	71.1	9.61	0.072	67	---	699	1	100	30
7/21/2017	1:00 AM	62.7	62.7	62.2	94	60.9	0	WNW	0	1	WNW	62.7	63.4	63.4	29.268	0	0	0.048	0	70.6	53	52.6	69.3	9.83	0.0722	67	---	700	1	100	30
7/21/2017	1:30 AM	63.7	63.7	62.7	91	61	0	WNW	0	1	WNW	63.7	64.5	64.5	29.268	0	0	0.027	0	69.6	53	51.7	68.3	9.86	0.0724	67	---	688	1	100	30
7/21/2017	2:00 AM	62.5	63.6	62.5	91	59.8	0	WNW	0	1	WNW	62.5	63.1	63.1	29.268	0	0	0.052	0	68.5	53	50.7	67.4	9.88	0.0726	67	---	700	1	100	30
7/21/2017	2:30 AM	61.3	62.5	61.3	92	59	0	WNW	0	1	WNW	61.3	61.8	61.8	29.268	0	0	0.077	0	67.5	54	50.3	66.6	10.05	0.0727	67	---	694	1	100	30
7/21/2017	3:00 AM	60.3	61.3	60.3	92	58	0	WNW	0	1	WNW	60.3	60.7	60.7	29.271	0	0	0.098	0	66.6	54	49.4	65.5	10.09	0.0729	67	---	693	1	100	30
7/21/2017	3:30 AM	59.5	60.3	59.5	93	57.5	0	---	0	0	---	59.5	59.8	59.8	29.266	0	0	0.115	0	65.6	54	48.5	64.4	10.13	0.073	67	---	694	1	100	30
7/21/2017	4:00 AM	58.9	59.5	58.8	93	56.9	0	---	0	0	---	58.9	59.2	59.2	29.275	0	0	0.127	0	64.6	54	47.6	63.3	10.15	0.0732	67	---	693	1	100	30
7/21/2017	4:30 AM	58.2	58.9	58.2	94	56.5	0	---	0	0	---	58.2	58.5	58.5	29.281	0	0	0.142	0	63.8	54	46.8	62.4	10.15	0.0734	67	---	696	1	100	30
7/21/2017	5:00 AM	57.8	58.2	57.8	94	56.1	0	---	0	0	---	57.8	58	58	29.283	0	0	0.15	0	63	54	46.1	61.5	10.15	0.0735	67	---	693	1	100	30
7/21/2017	5:30 AM	57.7	57.8	57.4	95	56.3	0	WNW	0	1	WNW	57.7	58	58	29.292	0	0	0.152	0	62.2	54	45.3	60.6	10.15	0.0737	67	---	699	1	100	30
7/21/2017	6:00 AM	57.4	57.7	57.4	94	55.7	0	WNW	0	1	WNW	57.4	57.6	57.6	29.299	0	0	0.158	0	61.6	55	45.3	60.1	10.25	0.0738	67	---	693	1	100	30
7/21/2017	6:30 AM	56.7	57.4	56.7	94	55	0	WNW	0	1	WNW	56.7	56.9	56.9	29.289	0	0	0.173	0	61	55	44.7	59.4	10.25	0.0739	67	---	698	1	100	30
7/21/2017	7:00 AM	56.5	56.7	56.4	95	55.1	0	---	0	0	---	56.5	56.7	56.7	29.282	0	0	0.177	0	60.5	55	44.2	58.9	10.25	0.0739	67	---	693	1	100	30
7/21/2017	7:30 AM	57.1	57.1	56.4	95	55.7	0	---	0	0	---	57.1	57.3	57.3	29.286	0	0	0.165	0	60.3	55	44.1	58.7	10.25	0.074	67	---	695	1	100	30
7/21/2017	8:00 AM	59.6	59.6	57.1	95	58.2	0	WNW	0	1	WNW	59.6	60	60	29.284	0	0	0.113	0	60.8	54	44	59.1	10.15	0.0739	67	---	693	1	100	30
7/21/2017	8:30 AM	60.4	60.4	59.6	95	59	0	NW	0	2	NW	60.4	60.8	60.8	29.281	0	0	0.096	0	61.4	54	44.6	59.8	10.15	0.0738	67	---	694	1	100	30
7/21/2017	9:00 AM	61.7	61.8	60.4	94	60	0	NW	0	1	NW	61.7	62.3	62.3	29.272	0	0	0.069	0	62.4	55	46	60.9	10.25	0.0736	67	---	698	1	100	30
7/21/2017	9:30 AM	62.8	62.8	61.7	92	60.4	0	N	0	3	NNW	62.8	63.5	63.5	29.265	0	0	0.046	0	63.6	56	47.6	62.3	10.45	0.0733	67	---	696	1	100	30
7/21/2017	10:00 AM	65.1	65.1	62.8	87	61.1	0	NNE	0	3	NNE	65.1	66	66	29.28	0	0	0	0.002	65.4	56	49.3	64.3	10.44	0.0731	67	---	690	1	100	30
7/21/2017	10:30 AM	66.5	66.5	65.1	84	61.5	0	ESE	0	3	ESE	66.5	67.6	67.6	29.28	0	0	0	0.031	67	56	50.8	66.2	10.41	0.0728	67	---	699	1	100	30
7/21/2017	11:00 AM	69.3	69.3	66.5	80	62.9	0	SE	0	6	SSE	69.3	70.7	70.7	29.289	0	0	0	0.09	69.2	56	52.8	68.2	10.37	0.0724	67	---	700	1	100	30
7/21/2017	11:30 AM	71.7	71.9	69.3	76	63.7	2	SSE	1	5	SSE	71.7	72.7	72.7	29.298	0	0	0	0.14	72.1	57	56	71.8	10.47	0.0719	67	---	695	1	100	30
7/21/2017	12:00 PM	72.4	72.4	71.4	73	63.3	1	SSW	0.5	5	S	72.4	73.5	73.5	29.298	0	0	0	0.154	74.2	56	57.5	74.6	10.27	0.0716	67	---	693	1	100	30
7/21/2017	12:30 PM	72.9	73.2	72.4	69	62.1	2	S	1	7	SSE	72.9	73.9	73.9	29.282	0	0	0	0.165	75.7	56	58.9	76.1	10.22	0.0713	67	---	699	1	100	30
7/21/2017	1:00 PM	73.5	73.5	72.9	63	60.1	2	S	1	7	SSE	73.5	74.3	74.3	29.299	0	0	0	0.177	77	55	59.6	77.3	9.97	0.0711	67	---	694	1	100	30
7/21/2017	1:30 PM	73.7	73.7	73.5	67	62.1	0	SSW	0	2	W	73.7	74.9	74.9	29.294	0	0	0	0.181	77.7	55	60.2	78.1	9.94	0.071	67	---	695	1	100	30
7/21/2017	2:00 PM	73.2	73.8	73.2	72	63.6	0	W	0	3	W	73.2	74.6	74.6	29.293	0	0	0	0.171	78.4	55	60.9	78.9	9.91	0.0709	67	---	697	1	100	30
7/21/2017	2:30 PM	73.6	73.6	73.2	71	63.6	0	N	0	2	N	73.6	75.1	75.1	29.281	0	0	0	0.179	79.2	54	61.1	79.7	9.77	0.0707	67	---	696	1	100	30
7/21/2017	3:00 PM	73.7	73.8	73.5	71	63.7	0	NE	0	4	NE	73.7	75.2	75.2	29.271	0	0	0	0.181	80.1	54	62	80.7	9.75	0.0706	67	---	690	1	100	30
7/21/2017	3:30 PM	75.9	75.9	73.7	69	65	2	NE	1	8	NNE	75.9	77.6	77.6	29.254	0	0	0	0.227	82.7	54	64.4	84.3	9.75	0.0701	67	---	698	1	100	30
7/21/2017	4:00 PM	78.9	78.9	76	59	63.4	1	NE	0.5	6	NNE	78.9	79.9	79.9	29.244	0	0	0	0.29	86.5	53	67.3	90.1	9.52	0.0694	67	---	696	1	100	30
7/21/2017	4:30 PM	81.6	81.7	78.9	51	61.7	0	SE	0	3	SE	81.6	82.2	82.2	29.254	0	0	0	0.346	91.4	51	70.7	98.5	9.12	0.0686	67	---	694	1	100	30
7/21/2017	5:00 PM	82.2	82.2	81.6	50	61.7	1	ESE	0.5	4	SE	82.2	82.9	82.9	29.248	0	0	0	0.358	95.6	49	73.4	106.6	8.73	0.0679	67	---	692	1	100	30
7/21/2017	5:30 PM	80.2	82.2	80.2	54	62	2	SE	1	9	SE	80.2	80.8	80.8	29.243	0	0	0	0.317	98.4	47	74.7	112	8.31	0.0674	67	---	696	1	100	30
7/21/2017	6:00 PM	77.8	80.2	77.8	55	60.3	0	E	0	3	E	77.8	78.3	78.3	29.24	0	0	0	0.267	98.4	48	75.3	112.8	8.48	0.0674	67	---	692	1	100	30
7/21/2017	6:30 PM	76.1	77.8	76.1	58	60.2	0	E	0	3	E	76.1	76.6	76.6	29.226	0	0	0	0.231	98.7	47	75	112.8	8.3	0.0673	67	---	695	1	100	30
7/21/2017	7:00 PM	75.1	76.1	75.1	57	58.8	0	E	0	3	E	75.1	75.7	75.7	29.224	0	0	0	0.21	98	47	74.3	111	8.33	0.0675	67	---	697	1	100	30
7/21/2017	7:30 PM	73.8	75.1	73.8	60	59	0	E	0	3	E	73.8	74.4	74.4	29.211	0	0	0	0.183	95.8	46	71.7	105.3	8.23	0.0679	67	---	698	1	100	30
7/21/2017	8:00 PM	71.5	73.8	71.4	60	56.9	0	SE	0	4	SE	71.5	71.2	71.2	29.216	0	0	0	0.135	93.1	47	69.9	100	8.45	0.0683	67	---	694	1	100	30
7/21/2017	8:30 PM	69.3	71.4	69.3	66	57.5	0	NE	0	6	NE	69.3	69.2	69.2	29.208	0	0	0	0.09	90.3	47	67.3	94.6	8.45	0.0688	67	---	698	1	100	30
7/21/2017	9:00 PM	67.2	69.2	67.2	70	57.1	1	NNE	0.5	5	NE	67.2	67.6	67.6	29.216	0	0	0	0.046	86.9	47	64.2	89	8.51	0.0694	67	---	697	1	100	30

7/21/2017	9:30 PM	66.6	67.2	66.6	72	57.3	1	NNE	0.5	5	NNE	66.6	67	67	29.216	0	0	0	0.033	83.7	48	61.9	85	8.78	0.07	67	---	700	1	100	30
7/21/2017	10:00 PM	65.4	66.6	65.4	73	56.5	1	NNE	0.5	3	NNE	65.4	65.7	65.7	29.216	0	0	0	0.008	80.8	48	59.3	80.7	8.83	0.0705	67	---	696	1	100	30
7/21/2017	10:30 PM	64.7	65.4	64.7	73	55.8	1	NNW	0.5	6	NW	64.7	64.8	64.8	29.218	0	0	0.006	0	78.6	49	57.8	78.6	8.98	0.0708	67	---	700	1	100	30
7/21/2017	11:00 PM	64.7	64.8	64.6	72	55.5	1	NNW	0.5	5	NNW	64.7	64.8	64.8	29.206	0	0	0.006	0	76.4	49	55.8	76.2	9.02	0.0712	67	---	694	1	100	30
7/21/2017	11:30 PM	64.2	64.8	64.2	73	55.4	0	NNW	0	3	NNW	64.2	64.2	64.2	29.199	0	0	0.017	0	74.7	50	54.8	74.7	9.25	0.0714	67	---	699	1	100	30
7/22/2017	12:00 AM	64.3	64.3	64.2	72	55.1	0	NNW	0	3	NNW	64.3	64.3	64.3	29.194	0	0	0.015	0	73.1	50	53.4	72.6	9.25	0.0717	67	---	697	1	100	30
7/22/2017	12:30 AM	64.3	64.3	64.3	72	55.1	1	NNW	0.5	4	NNW	64.3	64.3	64.3	29.186	0	0	0.015	0	71.9	51	52.8	71	9.41	0.0718	67	---	694	1	100	30
7/22/2017	1:00 AM	64.1	64.3	64.1	73	55.3	1	NNW	0.5	5	NNW	64.1	64.1	64.1	29.19	0	0	0.019	0	70.9	51	51.9	69.6	9.43	0.072	67	---	694	1	100	30
7/22/2017	1:30 AM	63.9	64.2	63.9	76	56.2	0	NNW	0	2	NNW	63.9	64.1	64.1	29.169	0	0	0.023	0	69.9	51	50.9	68.3	9.45	0.0721	67	---	700	1	100	30
7/22/2017	2:00 AM	63.3	63.9	63.3	74	54.9	1	NNW	0.5	4	NNW	63.3	63.2	63.2	29.159	0	0	0.035	0	69	51	50.1	67.7	9.47	0.0722	67	---	695	1	100	30
7/22/2017	2:30 AM	63.2	63.4	63.1	73	54.4	1	NNW	0.5	4	NNW	63.2	63.1	63.1	29.149	0	0	0.037	0	68.2	52	49.9	67.1	9.69	0.0723	67	---	696	1	100	30
7/22/2017	3:00 AM	63.4	63.4	63.1	72	54.2	1	NNW	0.5	4	NNW	63.4	63.2	63.2	29.156	0	0	0.033	0	67.5	52	49.3	66.3	9.7	0.0725	67	---	693	1	100	30
7/22/2017	3:30 AM	63.2	63.4	63.2	73	54.4	0	NNE	0	4	NNW	63.2	63.1	63.1	29.171	0	0	0.037	0	67	52	48.8	65.8	9.71	0.0726	67	---	698	1	100	30
7/22/2017	4:00 AM	62.6	63.2	62.6	74	54.2	0	NNE	0	5	NE	62.6	62.4	62.4	29.156	0	0	0.05	0	66.6	52	48.4	65.3	9.72	0.0726	67	---	694	1	100	30
7/22/2017	4:30 AM	62.3	62.6	62.3	74	53.9	0	N	0	2	N	62.3	62.1	62.1	29.161	0	0	0.056	0	66.1	52	48	64.7	9.73	0.0727	67	---	694	1	100	30
7/22/2017	5:00 AM	62.9	62.9	62.3	73	54.1	0	NNE	0	4	NE	62.9	62.7	62.7	29.156	0	0	0.044	0	65.8	52	47.7	64.4	9.73	0.0728	67	---	699	1	100	30
7/22/2017	5:30 AM	63.6	63.6	62.9	70	53.6	1	NNE	0.5	8	NNE	63.6	63.4	63.4	29.167	0	0	0.029	0	65.4	53	47.8	64	9.94	0.0728	67	---	694	1	100	30
7/22/2017	6:00 AM	63.4	63.7	63.4	71	53.8	1	NE	0.5	5	NNE	63.4	63.2	63.2	29.168	0	0	0.033	0	65.3	53	47.7	63.9	9.94	0.0729	67	---	697	1	100	30
7/22/2017	6:30 AM	63	63.4	62.9	73	54.2	1	NE	0.5	5	NE	63	62.8	62.8	29.16	0	0	0.042	0	64.9	53	47.4	63.5	9.95	0.0729	67	---	694	1	100	30
7/22/2017	7:00 AM	62.7	63	62.7	77	55.4	0	NNE	0	4	NNE	62.7	62.7	62.7	29.146	0	0	0.048	0	64.8	53	47.3	63.4	9.95	0.0729	67	---	696	1	100	30
7/22/2017	7:30 AM	62.5	62.7	62.5	79	55.9	1	NE	0.5	5	NNE	62.5	62.7	62.7	29.157	0	0	0.052	0	64.8	53	47.3	63.4	9.95	0.0729	67	---	690	1	100	30
7/22/2017	8:00 AM	62.6	62.7	62.5	82	57	1	NNE	0.5	4	NE	62.6	62.9	62.9	29.156	0	0	0.05	0	65.1	53	47.5	63.7	9.95	0.0729	67	---	696	1	100	30
7/22/2017	8:30 AM	62.8	62.8	62.6	84	57.9	1	NE	0.5	5	NE	62.8	63.2	63.2	29.154	0	0	0.046	0	65.4	53	47.8	64	9.94	0.0728	67	---	700	1	100	30
7/22/2017	9:00 AM	63.4	63.6	62.8	84	58.5	0	NNE	0	4	NNE	63.4	63.9	63.9	29.155	0	0	0.033	0	66.2	54	49.1	65	10.1	0.0727	67	---	693	1	100	30
7/22/2017	9:30 AM	64	64	63.4	85	59.4	2	NNE	1	7	NNE	64	64.6	64.6	29.16	0	0	0.021	0	67.5	55	50.8	66.6	10.2	0.0724	67	---	693	1	100	30
7/22/2017	10:00 AM	66.8	66.8	64	82	61.1	1	NNE	0.5	6	NE	66.8	67.9	67.9	29.153	0	0	0	0.038	70.2	56	53.8	69.1	10.35	0.0719	67	---	697	1	100	30
7/22/2017	10:30 AM	68.8	69	66.8	79	62	1	NNE	0.5	5	NNE	68.8	70.2	70.2	29.152	0	0	0	0.079	73.5	57	57.3	73.8	10.41	0.0713	67	---	697	1	100	30
7/22/2017	11:00 AM	72.4	72.4	68.8	74	63.6	1	NNE	0.5	4	NE	72.4	73.5	73.5	29.143	0	0	0	0.154	76.6	57	60.2	77.1	10.29	0.0708	67	---	697	1	100	30
7/22/2017	11:30 AM	73.1	73.1	72.2	73	63.9	1	NNE	0.5	5	NE	73.1	74.5	74.5	29.145	0	0	0	0.169	79.3	57	62.7	80.1	10.18	0.0703	67	---	695	1	100	30
7/22/2017	12:00 PM	75.2	75.2	73.1	72	65.6	1	ESE	0.5	3	SSE	75.2	77.1	77.1	29.14	0	0	0	0.212	83.1	57	66.3	85.4	10.21	0.0696	67	---	698	1	100	30
7/22/2017	12:30 PM	73.8	75.3	73.8	72	64.2	1	ESE	0.5	5	SE	73.8	75.4	75.4	29.14	0	0	0	0.183	86.5	56	68.9	91.1	10.02	0.069	67	---	694	1	100	30
7/22/2017	1:00 PM	73.9	74.1	73.6	73	64.7	1	ESE	0.5	3	ESE	73.9	75.6	75.6	29.146	0	0	0	0.185	89.2	54	70.4	95.4	9.67	0.0686	67	---	694	1	100	30
7/22/2017	1:30 PM	74.2	74.6	73.9	73	65	1	ESE	0.5	3	ESE	74.2	76	76	29.133	0	0	0	0.192	91.8	53	72.2	100.5	9.38	0.0682	67	---	699	1	100	30
7/22/2017	2:00 PM	75.7	75.8	74.2	69	64.8	1	ESE	0.5	4	ESE	75.7	77.4	77.4	29.134	0	0	0	0.223	93.3	52	73	103.3	9.22	0.0679	67	---	700	1	100	30
7/22/2017	2:30 PM	74.9	75.7	74.8	71	64.9	0	SE	0	4	SE	74.9	76.7	76.7	29.132	0	0	0	0.206	94	51	73.1	104.2	9.07	0.0678	67	---	691	1	100	30
7/22/2017	3:00 PM	72.7	74.9	72.7	68	61.5	1	E	0.5	3	E	72.7	73.5	73.5	29.139	0	0	0	0.16	95.3	50	73.7	106.4	8.84	0.0676	67	---	700	1	100	30
7/22/2017	3:30 PM	67.4	72.7	67.4	74	58.8	1	ESE	0.5	4	ESE	67.4	68.1	68.1	29.144	0	0	0	0.05	93.8	49	71.7	102.4	8.77	0.068	67	---	696	1	100	30
7/22/2017	4:00 PM	66.6	67.4	66.3	76	58.8	0	ESE	0	4	E	66.6	67.3	67.3	29.149	0	0	0	0.033	92	49	70.1	98.7	8.81	0.0683	67	---	699	1	100	30
7/22/2017	4:30 PM	66.7	67.3	66.7	76	58.9	1	NE	0.5	9	NE	66.7	67.4	67.4	29.154	0	0	0	0.035	90.7	48	68.3	95.7	8.64	0.0686	67	---	695	1	100	30
7/22/2017	5:00 PM	67.1	67.1	66.5	76	59.3	1	NE	0.5	7	N	67.1	67.9	67.9	29.151	0	0	0	0.044	89.2	48	66.9	93.3	8.67	0.0688	67	---	694	1	100	30
7/22/2017	5:30 PM	67.9	67.9	67.1	74	59.3	1	NNE	0.5	8	NNE	67.9	68.7	68.7	29.145	0	0	0	0.06	90.3	46	66.7	94.2	8.34	0.0687	67	---	694	1	100	30
7/22/2017	6:00 PM	68.2	68.4	67.9	71	58.4	1	ENE	0.5	3	NNE	68.2	68.8	68.8	29.147	0	0	0	0.067	92	46	68.3	97.3	8.31	0.0684	67	---	695	1	100	30
7/22/2017	6:30 PM	67.4	68.1	67.4	72	58.1	0	E	0	2	E	67.4	68	68	29.153	0	0	0	0.05	92.2	46	68.4	97.7	8.31	0.0684	67	---	698	1	100	30
7/22/2017	7:00 PM	65.2	67.4	65.1	75	57.1	1	NNE	0.5	7	NNE	65.2	65.5	65.5	29.148	0	0	0	0.004	90.1	45	65.9	93.5	8.15	0.0688	67	---	696	1	100	30
7/22/2017	7:30 PM	66.2	66.2	64.9	72	56.9	1	NNE	0.5	5	NE	66.2	66.6	66.6	29.139	0	0	0	0.025	87.7	46	64.4	89.7	8.4	0.0691	67	---	695	1	100	30
7/22/2017	8:00 PM	66	66.4	66	73	57.1	0	NNE	0	3	NE	66	66.4	66.4	29.135	0	0	0	0.021	85.3	46	62.2	86.5	8.44	0.0695	67	---	697	1	100	30
7/22/2017	8:30 PM	63.8	66	63.8	76	56.1	2	NE	1	6	NNE	63.8	63.9	63.9	29.13	0	0	0.025	0	82.7	47	60.4	83.3	8.6	0.0699	67	---	695	1	100	30
7/22/2017	9:00 PM	63.1	63.8	63.1	77	55.8	2	NE	1	8	NE	63.1	63.2	63.2	29.134	0	0	0.04	0	80.1	47	58	79.9	8.65	0.0704	67	---	698	1	100	30
7/22/2017	9:30 PM	62.6	63.1	62.6	78	55.6	0	NE	0	5	NNE	62.6	62.7	62.7	29.122	0	0	0.05	0	77.9	48	56.6	77.7	8.89	0.0707	67	---	696	1	100	30
7/22/2017	10:00 PM	61.5	62.6	61.5	80	55.3	0	NNE	0	4	NE	61.5	61.6	61.6	29.127	0	0	0.073	0	75.6	48	54.5	75.5	8.94	0.0711	67	---	699	1	100	30
7/22/2017	10:30 PM	60.5	61.6	60.5	84	55.6	0	NNE	0	1	NNE	60.5	60.6	60.6	29.136	0	0	0.094	0	73.5	49	53.2	73	9.05	0.0715	67	---	696	1	100	30
7/22/2017	11:00 PM	59.3	60.5	59.3	86	55.1	0	---	0	0	---	59.3	59.4	59.4	29.146	0	0	0.119	0	71.6	50	52	70.5	9.25	0.0718	67	---	699	1	100	30
7/22/2017	11:30 PM	59.7	59.8	59.3	86	55.5	0	NNE	0	1	NNE	59.7	59.8	59.8	29.135	0	0	0.11	0	70.1	50	50.6	68.4	9.25	0.072	67	---	696	1	100	30
7/23/2017	12:00 AM	59.7	59.8	59.6	86	55.5	0	NNE	0	2	NNE	59.7	59.8	59.8	29.136	0	0	0.11	0	68.7	50	49.3	67.3	9.28	0.0723	67	---	699	1	100	30
7/23/2017	12:30 AM	60	60	59.7	86	55.8	0	NNE	0	2	NNE	60	60.1	60.1	29.137	0	0	0.104	0	67.7	51	48.9	66.5	9.5	0.0724	67	---	694	1	100	30
7/23/2017	1:00 AM	59.1	60	59.1	87	55.2	0	NNE	0	1	NNE	59.1	59.2	59.2	29.127	0	0	0.123	0	66.6	51	47.9	65.2	9.52	0.0726	67	---	695	1	100	30
7/23/2017	1:30 AM	58.5	59.1	58.5	89	55.3	0	NNE	0	1	NNE	58.5	58.6	58.6	29.127	0	0	0.135	0	65.6	51	47	64.1	9.54	0.0727	67	---	697	1	100	30
7/23/2017	2:00 AM	57.7	58.5	57.7	90	54.8	0	NNE	0	1	NNE	57.7	57.8	57.8	29.127	0	0	0.152	0	64.6	52	46.6	63.1	9.75	0.0729	67	---	695	1	100	30
7/23/2017	2:30 AM	58	58	57.6	91	55.4	0	SSE	0	3	SE	58	58.1	58.1	29.14	0	0	0.146	0	63.8	52	45.8	62.2	9.75	0.073	67	---	696	1	100	30
7/23/2017	3:00 AM	58.2	58.3	58	89	55	0	SE	0	2	SSE	58.2	58.3	58.3	29.141	0	0	0.142	0	63.3	52	45.4	61.6	9.75	0.0731	67	---	698	1	100	30
7/23/2017	3:30 AM	58.2	58.3	58.2	88	54.7	0	NE	0	4	NE	58.2	58.2	58.2	29.135	0	0	0.142	0	62.9	52	45	61.2	9.75	0.0732	67	---	696	1	100	30
7/23/2017	4:00 AM	57.6	58.2	57.5	88	54.1	1	NE	0.5	5	NE	57.6	57.6	57.6	29.126	0	0	0.154	0	62.5	53	45.1	60.9	9.95	0.0732	67	---	692	1	100	30
7/23/2017	4:30 AM	57.6	57.7	57.5	88	54.1	0	N	0	3	NNE	57.6	57.6	57.6	29.126	0	0	0.154	0	62.1	53	44.8	60.4	9.95	0.0733	67	---	701	1	100	30
7/23/2017	5:00 AM	57.6	57.7	57.6	89	54.4	0	NE	0	4	NE	57.6	57.7	57.7	29.13	0	0	0.154	0	61.8	53	44.5	60.1	9.95	0.0733	67	---	693	1	100	30
7/23/2017	5:30 AM	57.9	57.9	57.6	90	55	0	NE	0	2	NE	57.9	58	58	29.131	0	0	0.148	0	61.4	53	44.1	59.7	9.95	0.0734	67	---	699	1	100	30
7/23/2017	6:00 AM	58.1	58.2	57.9	89	54.9	0	NE	0	4	N	58.1	58.2	58.2	29.136	0	0	0.144	0	61.3	53	44	59.6	9.95	0.0734	67	---	692	1	100	30
7/23/2017	6:30 AM	58.3	58.3	58.1	90	55.4	0	NNW	0	5	NNW	58.3	58.4	58.4	29.143	0	0	0.14	0	61.1	54	44.3	59.4	10.15	0.0735	67	---	694	1	100	30
7/23/2017	7:00 AM	58.6	58.6	58.3	92	56.3	2	NNW	1	14	NE	58.6	58.8	58.8	29.121	0.08	1.38	0.133	0	61	55	44.7	59.4	10.25	0.0734	67	---	693	1	100	30
7/23/2017	7:30 AM	58.1	58.6	58.1	93	56.1	0	NNW	0	3	NNW	58.1	58.3	58.3	29.157	0.02	0.32	0.144	0	60.8	55	44.5	59.2	10.25	0.0736	67	---	691	1	100	30
7/23/2017	8:00 AM	58.4	58.4	58.1	94	56.7	0	NNW	0	2	NNW	58.4	58.7	58.7	29.163	0	0	0.137	0	60.5	55	44.2	58.9	10.25	0.0736	67	---	701	1	100	30
7/23/2017	8:30 AM	58.8	58.8	58.4	95	57.4	0	NNW	0	2	NNW	58.8	59.2	59.2	29.168	0	0	0.129	0	60.7	54	43.9	59	10.15	0.0736	67	---	697	1	100	30
7/23/2017	9:00 AM	60.1	60.1	58.8	95	58.7	1	NNW	0.5	5	N	60.1	60.5	60.5	29.165	0	0	0.102	0	61.8	55	45.5	60.3	10.25	0.0734	67	---	697	1	100	30
7/23/2017	9:30 AM	59.2	60.1	59.2	94	57.5	1	NNW	0.5	5	NE	59.2	59.6	59.6	29.179	0	0	0.121	0	62.2	56	46.3	60.8	10.45	0.0734	67	---	697	1	100	30
7/23/2017	10:00 AM	59.1	59.2	59	94	57.4	1	NNE	0.5	4	ENE	59.1	59.5	59.5	29.186	0	0	0.123	0	62.4	55	46	60.9	10.25	0.0734	67	---	695	1	100	30
7/23/2017	10:30 AM	58.4	59.2	58.4	94	56.7	2	NNE	1	10	NE	58.4	58.7	58.7	29.196	0	0	0.137	0	62.9	56	47	61.6	10.45	0.0733	67	---	692	1	100	30
7/23/2017	11:00 AM	58.2	58.4	58.2	94	56.5	2	NNE	1	9	NNE	58.2	58.5	58.5	29.201	0	0	0.142	0	63	57	47.5	61.7	10.61	0.0733	67	---	698	1	100	30
7/23/2017	11:30 AM	58.7	58.7	58.2	94	57	3	NNE	1.5	8	NE	58.7	59	59	29.199	0	0	0.131	0	63.5	57	48	62.3	10.62	0.0732	67	---	696	1	100	30
7/23/2017	12:00 PM	59.7	59.7	58.7	93	57.7	2	NNE	1	10	NE	59.7	60	60	29.215	0	0	0.11	0	64.3	58	49.2	63.3	10.75	0.0731	67	---	693	1	100	30
7/23/2017	12:30 PM	60.1	60.1	59.6	91	57.5	3	NNE	1.5	12	NE	60.1	60.4	60.4	29.231	0	0	0.102	0	65.6	59	50.9	64.8	10.95	0.0729	67	---	692	1	100	30
7/23/2017	1:00 PM	61	61	60	90	58	3	NNE	1.5	10	NE	61	61.4	61.4	29.24	0	0	0.083	0	66.9	58	51.6	66.2	10.75	0.0727	67	---	696	1	100	30
7/23/2017	1:30 PM	61.8	61.8	61	88	58.2	2	NE	1	8	NNE	61.8	62.2	62.2	29.244	0	0	0.067	0	68.2	58	52.9	67.6	10.75	0.0725	67	---	695	1	100	30
7/23/2017	2:00 PM	62.2	62.4	61.8	86	58	2	NE	1	8	NNE	62.2	62.6	62.6	29.251	0	0	0.058	0	69	58	53.6	68.2	10.75	0.0723	67	---	696	1	100	30
7/23/2017	2:30 PM	63	63	62.2	86	58.7	1	NE	0.5	7	NE	63	63.5	63.5	29.258	0	0	0.042	0	69.2	58	53.8	68.4	10.75	0.0723	67	---	691	1	100	30
7/23/2017	3:00 PM	63.2	63.3	63	85	58.6	0	E	0	1	ENE	63.2	63.7	63.7	29.261	0	0	0.037	0	69.4	57	53.5	68.5	10.56	0.0723	67	---	701	1	100	30
7/23/2017	3:30 PM	63.6	63.6	63.2	86	59.3	0	E	0	4	NE	63.6	64.2	64.2	29.266	0	0	0.029	0	69.7	57	53.8	68.7	10.56	0.0723	67	---	690	1	100	30

7/23/2017	4:00 PM	64	64.2	63.6	81	58.1	2	NE	1	7	NE	64	64.5	64.5	29.273	0	0	0.021	0	70.9	57	54.9	70.1	10.51	0.0721	67	---	691	1	100	30
7/23/2017	4:30 PM	63.5	64.2	63.5	82	57.9	1	NE	0.5	5	NNE	63.5	64	64	29.287	0	0	0.031	0	71.2	57	55.2	70.5	10.5	0.0721	67	---	697	1	100	30
7/23/2017	5:00 PM	63.6	63.6	63.2	83	58.3	0	E	0	3	E	63.6	64.1	64.1	29.289	0	0	0.029	0	71.6	57	55.6	71.1	10.49	0.072	67	---	690	1	100	30
7/23/2017	5:30 PM	64.5	64.5	63.6	83	59.2	0	ESE	0	2	ESE	64.5	65.2	65.2	29.29	0	0	0.01	0	72.3	57	56.2	72.1	10.46	0.0719	67	---	694	1	100	30
7/23/2017	6:00 PM	64.6	64.6	64.4	78	57.6	0	E	0	4	ESE	64.6	65.1	65.1	29.298	0	0	0.008	0	72.8	56	56.2	72.8	10.29	0.0718	67	---	699	1	100	30
7/23/2017	6:30 PM	65.5	65.5	64.6	79	58.8	0	E	0	2	E	65.5	66.2	66.2	29.3	0	0	0	0.01	73.6	56	56.9	73.8	10.28	0.0717	67	---	694	1	100	30
7/23/2017	7:00 PM	65.8	65.9	65.5	72	56.5	0	ESE	0	3	ESE	65.8	66.1	66.1	29.308	0	0	0	0.017	74.9	56	58.1	75.5	10.25	0.0715	67	---	698	1	100	30
7/23/2017	7:30 PM	66.3	66.3	65.8	69	55.8	0	SE	0	3	ESE	66.3	66.5	66.5	29.304	0	0	0	0.027	74.7	56	58	75.2	10.26	0.0715	67	---	690	1	100	30
7/23/2017	8:00 PM	65.6	66.2	65.6	70	55.5	0	SE	0	3	SE	65.6	65.7	65.7	29.311	0	0	0	0.012	73.8	56	57.1	74.1	10.27	0.0717	67	---	698	1	100	30
7/23/2017	8:30 PM	64.1	65.6	64.1	71	54.5	0	SE	0	2	SE	64.1	64	64	29.314	0	0	0.019	0	72.4	56	55.8	72.2	10.3	0.072	67	---	693	1	100	30
7/23/2017	9:00 PM	62.9	64.1	62.9	76	55.2	0	SE	0	2	SE	62.9	62.9	62.9	29.321	0	0	0.044	0	71.1	55	54.1	70.1	10.13	0.0722	67	---	698	1	100	30
7/23/2017	9:30 PM	59.5	62.8	59.5	83	54.3	0	SE	0	2	SE	59.5	59.5	59.5	29.327	0	0	0.115	0	69.2	56	52.8	68.2	10.37	0.0725	67	---	698	1	100	30
7/23/2017	10:00 PM	57.1	59.5	57.1	85	52.6	0	SE	0	2	SE	57.1	57	57	29.339	0	0	0.165	0	67.2	56	51	66.4	10.41	0.0729	67	---	696	1	100	30
7/23/2017	10:30 PM	54.9	57.1	54.9	89	51.7	0	SE	0	2	SE	54.9	55	55	29.353	0	0	0.21	0	65.3	56	49.2	64.2	10.44	0.0733	67	---	697	1	100	30
7/23/2017	11:00 PM	53.6	54.9	53.6	90	50.7	1	SE	0.5	3	SE	53.6	53.7	53.7	29.359	0	0	0.238	0	63.5	57	48	62.3	10.62	0.0736	67	---	691	1	100	30
7/23/2017	11:30 PM	52.5	53.6	52.5	91	49.9	0	ESE	0	2	ESE	52.5	52.7	52.7	29.356	0	0	0.26	0	61.9	57	46.5	60.5	10.59	0.0738	67	---	695	1	100	30
7/24/2017	12:00 AM	51.5	52.5	51.5	92	49.3	0	ESE	0	1	ESE	51.5	51.8	51.8	29.361	0	0	0.281	0	60.3	57	45	58.8	10.56	0.0741	67	---	697	1	100	30
7/24/2017	12:30 AM	50.8	51.5	50.8	93	48.8	0	ESE	0	2	ESE	50.8	51.1	51.1	29.365	0	0	0.296	0	59	57	43.8	57.5	10.57	0.0744	67	---	690	1	100	30
7/24/2017	1:00 AM	50.3	50.8	50.3	93	48.4	0	ESE	0	1	ESE	50.3	50.7	50.7	29.369	0	0	0.306	0	57.6	57	42.5	56.1	10.6	0.0746	67	---	698	1	100	30
7/24/2017	1:30 AM	49.7	50.3	49.7	94	48	0	---	0	0	---	49.7	50.2	50.2	29.372	0	0	0.319	0	56.4	57	41.3	54.9	10.62	0.0748	67	---	697	1	100	30
7/24/2017	2:00 AM	49.5	49.7	49.5	94	47.8	0	---	0	0	---	49.5	50	50	29.37	0	0	0.323	0	55.4	57	40.4	54	10.64	0.075	67	---	695	1	100	30
7/24/2017	2:30 AM	48.9	49.5	48.9	94	47.2	0	---	0	0	---	48.9	49.4	49.4	29.375	0	0	0.335	0	54.5	57	39.6	53.1	10.64	0.0751	67	---	693	1	100	30
7/24/2017	3:00 AM	48.7	48.9	48.6	94	47.1	0	ESE	0	1	ESE	48.7	49.1	49.1	29.372	0	0	0.34	0	53.6	58	39.2	52.3	10.75	0.0753	67	---	694	1	100	30
7/24/2017	3:30 AM	48.1	48.7	48.1	95	46.7	0	---	0	0	---	48.1	48.5	48.5	29.374	0	0	0.352	0	52.7	58	38.3	51.5	10.75	0.0754	67	---	698	1	100	30
7/24/2017	4:00 AM	48	48.1	48	95	46.6	0	---	0	0	---	48	48.4	48.4	29.38	0	0	0.354	0	52.1	58	37.8	51	10.75	0.0756	67	---	693	1	100	30
7/24/2017	4:30 AM	47.9	48	47.9	95	46.5	0	---	0	0	---	47.9	48.3	48.3	29.381	0	0	0.356	0	51.4	58	37.1	50.4	10.75	0.0757	67	---	700	1	100	30
7/24/2017	5:00 AM	47.8	48	47.8	95	46.4	0	---	0	0	---	47.8	48.2	48.2	29.386	0	0	0.358	0	50.8	58	36.5	49.8	10.75	0.0758	67	---	697	1	100	30
7/24/2017	5:30 AM	47.6	47.8	47.6	95	46.2	0	---	0	0	---	47.6	48	48	29.387	0	0	0.363	0	50.3	58	36.1	49.4	10.75	0.0759	67	---	694	1	100	30
7/24/2017	6:00 AM	47.4	47.6	47.3	95	46	0	---	0	0	---	47.4	47.7	47.7	29.396	0	0	0.367	0	49.7	58	35.5	48.8	10.75	0.076	67	---	692	1	100	30
7/24/2017	6:30 AM	47.6	47.7	47.4	95	46.2	0	ESE	0	1	ESE	47.6	48	48	29.398	0	0	0.363	0	49.4	58	35.2	48.5	10.75	0.0761	67	---	701	1	100	30
7/24/2017	7:00 AM	48.2	48.2	47.7	95	46.8	0	ESE	0	1	ESE	48.2	48.6	48.6	29.406	0	0	0.35	0	49.4	63	37.3	48.7	11.76	0.076	67	---	695	1	100	30
7/24/2017	7:30 AM	48.8	48.8	48.1	95	47.4	0	---	0	0	---	48.8	49.3	49.3	29.416	0	0	0.338	0	51.2	69	41.4	50.6	13.1	0.0757	67	---	694	1	100	30
7/24/2017	8:00 AM	50.4	50.4	48.8	96	49.3	0	---	0	0	---	50.4	50.9	50.9	29.423	0	0	0.304	0	52.7	73	44.3	52.1	14.26	0.0754	67	---	697	1	100	30
7/24/2017	8:30 AM	52.7	52.7	50.4	96	51.6	0	---	0	0	---	52.7	53	53	29.424	0	0	0.256	0	54.2	74	46.1	53.7	14.53	0.0751	67	---	696	1	100	30
7/24/2017	9:00 AM	57	57	52.7	95	55.6	0	ESE	0	2	ESE	57	57.2	57.2	29.417	0	0	0.167	0	88	45	64	89.7	8.19	0.0698	67	---	694	1	100	30
7/24/2017	9:30 AM	61	61	57	85	56.5	0	N	0	5	SW	61	61.2	61.2	29.426	0	0	0.083	0	71.2	59	56.1	70.7	10.9	0.0724	67	---	699	1	100	30
7/24/2017	10:00 AM	65.7	65.7	61	72	56.4	1	WSW	0.5	5	SSW	65.7	66	66	29.428	0	0	0	0.015	68.9	62	55.3	68.5	11.37	0.0727	67	---	698	1	100	30
7/24/2017	10:30 AM	68.5	68.5	65.7	64	55.8	1	NNW	0.5	7	NNW	68.5	68.4	68.4	29.422	0	0	0	0.073	70.7	60	56.1	70.1	11.04	0.0724	67	---	698	1	100	30
7/24/2017	11:00 AM	70.2	70.2	68.5	59	55.2	1	SSW	0.5	6	S	70.2	69.4	69.4	29.418	0	0	0	0.108	72.6	55	55.5	72.4	10.1	0.0722	67	---	693	1	100	30
7/24/2017	11:30 AM	70.1	70.4	70	59	55.1	3	SSW	1.5	9	SSW	70.1	69.2	69.2	29.416	0	0	0	0.106	73.6	52	54.9	73.4	9.58	0.0721	67	---	701	1	100	30
7/24/2017	12:00 PM	72.6	72.7	70.1	58	57	2	NNW	1	8	SSW	72.6	72.6	72.6	29.415	0	0	0	0.158	75.6	53	57.3	75.8	9.65	0.0717	67	---	691	1	100	30
7/24/2017	12:30 PM	72.8	73.2	72.6	61	58.6	2	SSW	1	8	S	72.8	73.2	73.2	29.413	0	0	0	0.163	77.2	51	57.7	77.1	9.35	0.0715	67	---	695	1	100	30
7/24/2017	1:00 PM	74.7	74.7	72.6	56	58	2	SW	1	7	SSW	74.7	75.2	75.2	29.413	0	0	0	0.202	78.8	51	59.1	79	9.35	0.0712	67	---	696	1	100	30
7/24/2017	1:30 PM	76	76.1	74.6	52	57.1	2	NW	1	8	SSW	76	76.1	76.1	29.406	0	0	0	0.229	80.1	48	58.6	80	8.85	0.071	67	---	694	1	100	30
7/24/2017	2:00 PM	76.7	77	76.1	53	58.3	1	NNW	0.5	6	N	76.7	76.8	76.8	29.401	0	0	0	0.244	81.2	47	59.1	81.1	8.63	0.0709	67	---	695	1	100	30
7/24/2017	2:30 PM	78.2	78.2	76.7	51	58.6	1	NNW	0.5	7	NNW	78.2	78.3	78.3	29.394	0	0	0	0.275	82.1	46	59.3	82.2	8.45	0.0707	67	---	698	1	100	30
7/24/2017	3:00 PM	79.2	79.2	78.1	47	57.2	1	WNW	0.5	5	N	79.2	79.1	79.1	29.393	0	0	0	0.296	83.1	44	58.9	83.5	8.15	0.0706	67	---	695	1	100	30
7/24/2017	3:30 PM	79.4	79.7	78.8	44	55.6	2	NNW	1	7	NNW	79.4	79	79	29.39	0	0	0	0.3	84.3	40	57.3	84.5	7.55	0.0705	67	---	695	1	100	30
7/24/2017	4:00 PM	79.3	79.4	78.7	44	55.5	1	NNW	0.5	6	NNW	79.3	78.9	78.9	29.386	0	0	0	0.298	86.1	39	58.2	86.1	7.33	0.0702	67	---	695	1	100	30
7/24/2017	4:30 PM	78.7	79.5	78.6	45	55.6	1	SE	0.5	5	NNW	78.7	78.4	78.4	29.384	0	0	0	0.285	88	38	59.2	87.6	7.19	0.0699	67	---	694	1	100	30
7/24/2017	5:00 PM	78.9	79.2	78.6	46	56.4	1	ENE	0.5	4	N	78.9	78.7	78.7	29.38	0	0	0	0.29	89	36	58.6	88.6	6.83	0.0698	67	---	698	1	100	30
7/24/2017	5:30 PM	78.9	79.2	78.9	46	56.4	1	E	0.5	3	E	78.9	78.7	78.7	29.378	0	0	0	0.29	89.8	36	59.3	89.9	6.85	0.0697	67	---	693	1	100	30
7/24/2017	6:00 PM	78.8	78.9	78.4	49	58	0	E	0	3	E	78.8	78.9	78.9	29.371	0	0	0	0.288	90.5	38	61.4	91.4	7.14	0.0695	67	---	698	1	100	30
7/24/2017	6:30 PM	78.9	79.2	78.8	49	58.1	0	ENE	0	3	ENE	78.9	79	79	29.365	0	0	0	0.29	90.5	38	61.4	91.4	7.14	0.0695	67	---	696	1	100	30
7/24/2017	7:00 PM	77.3	79	76.4	49	56.6	2	NNE	1	9	NE	77.3	77.1	77.1	29.373	0	0	0	0.256	92.5	40	64.7	95.4	7.35	0.0691	67	---	697	1	100	30
7/24/2017	7:30 PM	77.1	77.8	76	54	59.2	1	NNW	0.5	5	NNE	77.1	77.3	77.3	29.376	0	0	0	0.252	91.4	40	63.7	93.5	7.39	0.0693	67	---	695	1	100	30
7/24/2017	8:00 PM	74.4	77.1	74.4	57	58.2	0	E	0	1	N	74.4	74.9	74.9	29.377	0	0	0	0.196	89.4	40	61.9	90.5	7.46	0.0696	67	---	699	1	100	30
7/24/2017	8:30 PM	70.6	74.4	70.6	62	56.9	0	E	0	2	E	70.6	70.2	70.2	29.383	0	0	0	0.117	86.9	41	60.4	87.5	7.65	0.07	67	---	695	1	100	30
7/24/2017	9:00 PM	68.1	70.5	68.1	65	55.9	1	NE	0.5	4	NE	68.1	68.3	68.3	29.386	0	0	0	0.065	84.3	41	58	84.7	7.66	0.0705	67	---	695	1	100	30
7/24/2017	9:30 PM	65.6	68.1	65.6	74	57.1	0	NE	0	1	NE	65.6	66	66	29.392	0	0	0	0.012	81.4	42	56.1	80.8	7.85	0.0709	67	---	701	1	100	30
7/24/2017	10:00 PM	62.6	65.5	62.6	80	56.3	0	---	0	0	---	62.6	62.9	62.9	29.396	0	0	0.05	0	78.8	43	54.4	78.3	8.05	0.0714	67	---	695	1	100	30
7/24/2017	10:30 PM	60.8	62.6	60.8	83	55.6	0	NE	0	1	NE	60.8	60.9	60.9	29.406	0	0	0.088	0	76.3	43	52.2	75.7	8.05	0.0718	67	---	695	1	100	30
7/24/2017	11:00 PM	59.6	60.8	59.6	85	55.1	0	NE	0	1	NE	59.6	59.7	59.7	29.408	0	0	0.113	0	73.6	44	50.3	72.8	8.28	0.0722	67	---	697	1	100	30
7/24/2017	11:30 PM	58.6	59.6	58.6	86	54.4	0	NE	0	1	NE	58.6	58.6	58.6	29.41	0	0	0.133	0	71.6	45	49.1	70	8.45	0.0725	67	---	693	1	100	30
7/25/2017	12:00 AM	57.8	58.6	57.8	88	54.3	0	NE	0	2	NE	57.8	57.8	57.8	29.41	0	0	0.15	0	69.7	46	48	67.7	8.65	0.0728	67	---	694	1	100	30
7/25/2017	12:30 AM	57.1	57.8	57.1	88	53.6	0	NE	0	2	NE	57.1	57.1	57.1	29.41	0	0	0.165	0	67.9	46	46.3	66.2	8.65	0.0731	67	---	695	1	100	30
7/25/2017	1:00 AM	56.5	57.1	56.4	90	53.6	0	NE	0	2	NE	56.5	56.6	56.6	29.416	0	0	0.177	0	66.4	47	45.5	64.6	8.82	0.0734	67	---	697	1	100	30
7/25/2017	1:30 AM	56.6	56.7	56.5	89	53.4	0	NNE	0	3	NNE	56.6	56.7	56.7	29.42	0	0	0.175	0	64.9	47	44.2	62.9	8.85	0.0737	67	---	695	1	100	30
7/25/2017	2:00 AM	56.1	56.6	56.1	89	52.9	0	N	0	3	N	56.1	56.2	56.2	29.416	0	0	0.185	0	63.8	48	43.7	61.8	9	0.0738	67	---	694	1	100	30
7/25/2017	2:30 AM	55.3	56.1	55.3	90	52.4	0	N	0	1	N	55.3	55.4	55.4	29.421	0	0	0.202	0	62.5	48	42.5	60.4	9.05	0.074	67	---	699	1	100	30
7/25/2017	3:00 AM	54.4	55.3	54.4	91	51.8	0	N	0	1	N	54.4	54.5	54.5	29.416	0	0	0.221	0	61.4	48	41.5	59.3	9.09	0.0742	67	---	694	1	100	30
7/25/2017	3:30 AM	53.9	54.4	53.9	92	51.6	0	N	0	1	N	53.9	54	54	29.417	0	0	0.231	0	60.5	48	40.7	58.4	9.13	0.0744	67	---	691	1	100	30
7/25/2017	4:00 AM	53.5	53.9	53.5	93	51.5	0	N	0	2	N	53.5	53.7	53.7	29.423	0	0	0.24	0	59.6	48	39.9	57.5	9.15	0.0745	67	---	697	1	100	30
7/25/2017	4:30 AM	53.4	53.5	53.3	93	51.4	0	N	0	1	N	53.4	53.6	53.6	29.43	0	0	0.242	0	58.7	49	39.6	56.6	9.35	0.0747	67	---	696	1	100	30
7/25/2017	5:00 AM	53.2	53.5	53.2	93	51.2	0	N	0	1	N	53.2	53.4	53.4	29.434	0	0	0.246	0	58.1	49	39	56	9.35	0.0748	67	---	694	1	100	30
7/25/2017	5:30 AM	52.7	53.2	52.6	93	50.7	0	---	0	0	---	52.7	52.9	52.9	29.443	0	0	0.256	0	57.3	49	38.3	55.3	9.35	0.0749	67	---	694	1	100	30
7/25/2017	6:00 AM	52.7	52.7	52.6	94	51	0	---	0	0	---	52.7	53	53	29.446	0	0	0.256	0	56.7	49	37.7	54.7	9.35	0.0751	67	---	697	1	100	30
7/25/2017	6:30 AM	53.2	53.2	52.7	95	51.8	0	N	0	1	N	53.2	53.5	53.5	29.448	0	0	0.246	0	56.3	50	37.9	54.4	9.52	0.0751	67	---	692	1	100	30
7/25/2017	7:00 AM	53.5	53.5	53.2	95	52.1	0	---	0	0	---	53.5	53.8	53.8	29.457	0	0	0.24	0	56.4	56	40.9	54.9	10.45	0.075	67	---	692	1	100	30
7/25/2017	7:30 AM	54.4	54.4	53.5	95	53	0	N	0	1	N	54.4	54.6	54.6	29.465	0	0	0.221	0	58.1	65	46.4	57.1	12.13	0.0747	67	---	699	1	100	30
7/25/2017	8:00 AM	56	56	54.4	95	54.6	0	---	0	0	---	56	56.2	56.2	29.462	0	0	0.188	0	59.3	67	48.3	58.4	12.58	0.0744	67	---	696	1	100	30
7/25/2017	8:30 AM	57.8	57.8	56	95	56.4	0	---	0	0	---	57.8	58.1	58.1	29.469	0	0	0.15	0	60.8	68	50.2	60.1	12.75	0.0742	67	---	693	1	100	30
7/25/2017	9:00 AM	62	62	57.8	90	59	2	S	1	7	SSE	62	62.5	62.5	29.45	0	0	0.063	0	88.8	47	66	92.2	8.47	0.0697	67	---	696	1	100	30
7/25/2017	9:30 AM	65.2	65.2	62.1	83	59.9	1	SSE	0.5	5	SSE	65.2	66	66	29.441	0	0	0	0.004	76.1	57	59.8	76.6	10.31	0.0716	67	---	697	1	100	30
7/25/2017	10:00 AM	68.1	68.1	65.2	76	60.2	3	SE	1.5	9	S	68.1	69.1	69.1	29.445	0	0	0	0.065	75	59	59.7	75.8	10.75	0.0718	67	---	701	1	100	30

7/25/2017	10:30 AM	70.2	70.2	68.1	70	60	4	S	2	9	SSE	70.2	70.4	70.4	29.435	0	0	0	0.108	77.2	57	60.8	77.7	10.26	0.0714	67	---	693	1	100	30
7/25/2017	11:00 AM	72.5	72.6	70.2	67	60.9	4	S	2	9	SSE	72.5	73.2	73.2	29.432	0	0	0	0.156	79	56	62	79.7	10.09	0.0711	67	---	698	1	100	30
7/25/2017	11:30 AM	74.6	74.6	72.5	62	60.7	3	S	1.5	10	S	74.6	75.6	75.6	29.422	0	0	0	0.2	81	54	62.8	81.8	9.75	0.0708	67	---	695	1	100	30
7/25/2017	12:00 PM	75.1	75.3	74.6	59	59.8	4	S	2	11	SE	75.1	75.9	75.9	29.417	0	0	0	0.21	82.7	51	62.7	83.9	9.3	0.0705	67	---	697	1	100	30
7/25/2017	12:30 PM	77.3	77.3	75	56	60.4	5	SSE	2.5	10	S	77.3	77.8	77.8	29.405	0	0	0	0.256	82	47	59.8	82.2	8.61	0.0707	67	---	690	1	100	30
7/25/2017	1:00 PM	78.8	78.8	77.3	56	61.8	5	SE	2.5	12	SE	78.8	79.5	79.5	29.399	0	0	0	0.288	81.8	49	60.8	82.2	8.91	0.0707	67	---	695	1	100	30
7/25/2017	1:30 PM	79.4	80	78.8	51	59.7	5	SE	2.5	13	SE	79.4	79.7	79.7	29.398	0	0	0	0.3	82.3	45	58.8	82.4	8.3	0.0707	67	---	692	1	100	30
7/25/2017	2:00 PM	80.5	81.2	79.4	45	57.2	6	SSE	3	18	SSE	80.5	80.1	80.1	29.389	0	0	0	0.323	82.7	41	56.6	82.4	7.7	0.0707	67	---	694	1	100	30
7/25/2017	2:30 PM	80.9	80.9	80	49	59.9	6	SE	3	15	SE	80.9	81	81	29.389	0	0	0	0.331	82.9	45	59.4	83.3	8.29	0.0706	67	---	700	1	100	30
7/25/2017	3:00 PM	81.7	82	80.9	50	61.2	7	SE	3.5	14	SE	81.7	82.2	82.2	29.381	0	0	0	0.348	84.3	45	60.6	85.4	8.26	0.0703	67	---	691	1	100	30
7/25/2017	3:30 PM	81.2	81.7	80.8	50	60.8	7	SE	3.5	14	SE	81.2	81.5	81.5	29.357	0	0	0	0.337	84.5	44	60.2	85.4	8.15	0.0703	67	---	692	1	100	30
7/25/2017	4:00 PM	81.5	82.2	81.2	45	58.1	7	SE	3.5	14	SSE	81.5	81.3	81.3	29.349	0	0	0	0.344	85.5	41	59.1	85.8	7.65	0.0702	67	---	695	1	100	30
7/25/2017	4:30 PM	80.3	81.5	80	45	57	6	SE	3	12	SE	80.3	79.9	79.9	29.341	0	0	0	0.319	84.9	40	57.9	85	7.55	0.0703	67	---	694	1	100	30
7/25/2017	5:00 PM	82.1	82.1	80.3	36	52.5	5	SSE	2.5	14	SSE	82.1	80.9	80.9	29.338	0	0	0	0.356	85.9	32	52.6	84.6	6.25	0.0704	67	---	695	1	100	30
7/25/2017	5:30 PM	81.6	82.3	81.6	38	53.5	5	SSE	2.5	14	S	81.6	80.6	80.6	29.323	0	0	0	0.346	86.1	34	54.5	85.2	6.47	0.0702	67	---	693	1	100	30
7/25/2017	6:00 PM	80.2	81.7	80.2	41	54.4	4	SSE	2	13	SSW	80.2	79.3	79.3	29.316	0	0	0	0.317	85.5	37	56.3	85.1	7.04	0.0702	67	---	695	1	100	30
7/25/2017	6:30 PM	78.4	80.2	78.4	49	57.7	3	SSE	1.5	11	SSE	78.4	78.4	78.4	29.31	0	0	0	0.279	86.7	38	58.1	86.6	7.22	0.07	67	---	696	1	100	30
7/25/2017	7:00 PM	77.3	78.4	77.3	53	58.8	2	SE	1	7	SE	77.3	77.5	77.5	29.295	0	0	0	0.256	86.3	40	59.1	86.6	7.52	0.0699	67	---	698	1	100	30
7/25/2017	7:30 PM	77.2	77.3	76.8	52	58.2	3	SSE	1.5	8	SE	77.2	77.2	77.2	29.287	0	0	0	0.254	86.1	41	59.6	86.5	7.65	0.0699	67	---	697	1	100	30
7/25/2017	8:00 PM	76.5	77.3	76.5	53	58.1	2	S	1	8	S	76.5	76.6	76.6	29.283	0	0	0	0.24	85.5	40	58.4	85.6	7.54	0.07	67	---	697	1	100	30
7/25/2017	8:30 PM	75.1	76.5	75	55	57.8	1	SSE	0.5	7	S	75.1	75.6	75.6	29.267	0	0	0	0.21	84.3	41	58	84.7	7.66	0.0702	67	---	694	1	100	30
7/25/2017	9:00 PM	74.8	75.3	74.8	57	58.5	2	SSE	1	6	SSE	74.8	75.4	75.4	29.263	0	0	0	0.204	83.1	41	57	83	7.69	0.0704	67	---	697	1	100	30
7/25/2017	9:30 PM	73.9	74.8	73.9	60	59.1	3	SE	1.5	8	SE	73.9	74.6	74.6	29.248	0	0	0	0.185	82	41	56	81.4	7.71	0.0705	67	---	698	1	100	30
7/25/2017	10:00 PM	73.7	74.1	73.7	62	59.9	5	S	2.5	15	SSE	73.7	74.5	74.5	29.265	0	0	0	0.181	80.6	41	54.7	79.7	7.74	0.0708	67	---	695	1	100	30
7/25/2017	10:30 PM	73.3	73.7	73.3	65	60.8	5	S	2.5	14	SSE	73.3	74.2	74.2	29.27	0	0	0	0.173	79.7	42	54.6	79	7.86	0.0709	67	---	695	1	100	30
7/25/2017	11:00 PM	73.1	73.3	73.1	66	61.1	4	S	2	11	SSE	73.1	73.9	73.9	29.276	0	0	0	0.169	78.8	43	54.4	78.3	8.05	0.0711	67	---	697	1	100	30
7/25/2017	11:30 PM	73	73.1	73	65	60.5	4	SSW	2	9	WSW	73	73.7	73.7	29.275	0	0	0	0.167	78	43	53.7	77.4	8.05	0.0712	67	---	694	1	100	30
7/26/2017	12:00 AM	72.9	73.1	72.9	66	60.9	3	SSW	1.5	11	SW	72.9	73.6	73.6	29.26	0	0	0	0.165	77.5	44	53.9	77	8.2	0.0712	67	---	689	1	100	30
7/26/2017	12:30 AM	72.9	73	72.8	68	61.7	2	SSE	1	8	SSW	72.9	73.8	73.8	29.251	0	0	0	0.165	76.8	44	53.2	76.3	8.21	0.0713	67	---	698	1	100	30
7/26/2017	1:00 AM	72.7	72.9	72.7	70	62.3	2	S	1	8	SSE	72.7	73.7	73.7	29.243	0	0	0	0.16	76.3	44	52.8	75.8	8.22	0.0714	67	---	691	1	100	30
7/26/2017	1:30 AM	72.2	72.7	72.2	73	63.1	2	S	1	8	S	72.2	73.2	73.2	29.243	0	0	0	0.15	75.9	45	53	75.5	8.43	0.0714	67	---	694	1	100	30
7/26/2017	2:00 AM	72.1	72.2	72	75	63.7	1	S	0.5	7	SSW	72.1	73.1	73.1	29.233	0	0	0	0.148	75.4	45	52.6	75.1	8.44	0.0715	67	---	694	1	100	30
7/26/2017	2:30 AM	72.9	72.9	72.1	72	63.3	4	SSW	2	12	SSW	72.9	74.1	74.1	29.232	0	0	0	0.165	75	46	52.8	74.8	8.55	0.0715	67	---	693	1	100	30
7/26/2017	3:00 AM	73.1	73.1	72.9	73	63.9	3	S	1.5	9	S	73.1	74.5	74.5	29.22	0	0	0	0.169	74.9	46	52.7	74.6	8.55	0.0715	67	---	691	1	100	30
7/26/2017	3:30 AM	72.2	73.1	72.2	79	65.3	3	SSW	1.5	9	SSW	72.2	73.6	73.6	29.229	0	0	0	0.15	74.9	47	53.3	74.7	8.75	0.0715	67	---	694	1	100	30
7/26/2017	4:00 AM	69.5	72.2	69.5	89	66.1	1	S	0.5	9	SW	69.5	71.4	71.4	29.215	0.08	1.61	0	0.094	74.2	47	52.7	73.8	8.75	0.0716	67	---	694	1	100	30
7/26/2017	4:30 AM	68.6	69.5	68.6	92	66.2	1	ENE	0.5	8	SSW	68.6	70.6	70.6	29.197	0	0	0	0.075	73.6	47	52.1	73	8.75	0.0716	67	---	696	1	100	30
7/26/2017	5:00 AM	68.5	68.8	68.4	92	66.1	2	SSW	1	7	SW	68.5	70.4	70.4	29.197	0	0	0	0.073	73.1	48	52.2	72.5	8.91	0.0717	67	---	691	1	100	30
7/26/2017	5:30 AM	68.5	68.6	68.4	93	66.4	1	SSW	0.5	5	SW	68.5	70.5	70.5	29.2	0	0	0	0.073	72.6	48	51.8	71.8	8.9	0.0718	67	---	698	1	100	30
7/26/2017	6:00 AM	68.3	68.5	68.3	93	66.2	0	SSW	0	3	SSW	68.3	70.2	70.2	29.196	0	0	0	0.069	72.3	48	51.5	71.3	8.9	0.0718	67	---	689	1	100	30
7/26/2017	6:30 AM	68.3	68.5	68.3	94	66.5	0	SSW	0	2	SSW	68.3	70.3	70.3	29.199	0	0	0	0.069	71.8	48	51	70.6	8.89	0.0719	67	---	697	1	100	30
7/26/2017	7:00 AM	67.6	68.3	67.6	94	65.8	0	---	0	0	---	67.6	69.3	69.3	29.208	0	0	0	0.054	71.6	56	55.1	71	10.32	0.0718	67	---	696	1	100	30
7/26/2017	7:30 AM	68.1	68.1	67.6	95	66.6	0	SSW	0	5	WSW	68.1	70	70	29.216	0	0	0	0.065	72.8	66	60.8	73.5	12.09	0.0714	67	---	699	1	100	30
7/26/2017	8:00 AM	68.7	68.7	68.1	94	66.9	1	W	0.5	7	WNW	68.7	70.8	70.8	29.23	0	0	0	0.077	73.6	69	62.8	74.9	12.78	0.0713	67	---	691	1	100	30
7/26/2017	8:30 AM	69.3	69.3	68.7	92	66.9	1	SSW	0.5	8	S	69.3	71.4	71.4	29.241	0	0	0	0.09	74.3	70	63.9	75.9	12.98	0.0711	67	---	697	1	100	30
7/26/2017	9:00 AM	69.8	69.8	69.3	91	67.1	1	W	0.5	7	SSW	69.8	71.9	71.9	29.248	0	0	0	0.1	82.9	62	68.5	86	11.09	0.0698	67	---	697	1	100	30
7/26/2017	9:30 AM	70.5	70.6	69.9	88	66.8	1	WSW	0.5	7	S	70.5	72.4	72.4	29.252	0	0	0	0.115	79.2	65	66.4	81	11.77	0.0704	67	---	697	1	100	30
7/26/2017	10:00 AM	72.7	72.7	70.5	83	67.2	1	WSW	0.5	7	S	72.7	74.6	74.6	29.249	0	0	0	0.16	79.2	65	66.4	81	11.77	0.0704	67	---	688	1	100	30
7/26/2017	10:30 AM	74.5	74.5	72.7	75	66.1	2	SW	1	9	SSW	74.5	76.5	76.5	29.251	0	0	0	0.198	80.8	63	67	82.9	11.33	0.0701	67	---	701	1	100	30
7/26/2017	11:00 AM	76	76	74.5	70	65.5	2	WNW	1	9	S	76	77.8	77.8	29.248	0	0	0	0.229	82.1	59	66.4	84.2	10.55	0.07	67	---	691	1	100	30
7/26/2017	11:30 AM	77.2	77.3	76.1	63	63.6	2	NW	1	10	SSW	77.2	78.3	78.3	29.246	0	0	0	0.254	82.9	56	65.6	84.9	10.05	0.0699	67	---	694	1	100	30
7/26/2017	12:00 PM	78.5	78.5	77	63	64.9	3	NW	1.5	9	NNW	78.5	79.8	79.8	29.247	0	0	0	0.281	83.7	54	65.3	85.9	9.75	0.0699	67	---	690	1	100	30
7/26/2017	12:30 PM	77.7	78.5	77.7	61	63.2	3	NW	1.5	9	NW	77.7	78.7	78.7	29.241	0	0	0	0.265	83.1	52	63.7	84.6	9.39	0.07	67	---	694	1	100	30
7/26/2017	1:00 PM	78.1	78.6	77.8	58	62.1	3	NW	1.5	11	NW	78.1	78.9	78.9	29.239	0	0	0	0.273	82.5	51	62.5	83.6	9.3	0.0701	67	---	695	1	100	30
7/26/2017	1:30 PM	78.7	78.8	78.1	57	62.2	3	WNW	1.5	12	SSW	78.7	79.5	79.5	29.238	0	0	0	0.285	82.9	50	62.4	84	9.09	0.0701	67	---	694	1	100	30
7/26/2017	2:00 PM	79.3	79.3	78.7	57	62.7	3	NW	1.5	12	NNW	79.3	80.1	80.1	29.241	0	0	0	0.298	83.3	50	62.7	84.7	9.08	0.07	67	---	696	1	100	30
7/26/2017	2:30 PM	79.6	79.8	79.3	57	63	3	NW	1.5	12	N	79.6	80.5	80.5	29.248	0	0	0	0.304	83.5	50	62.9	85	9.08	0.07	67	---	693	1	100	30
7/26/2017	3:00 PM	79.8	79.8	79.3	56	62.7	3	NW	1.5	10	SW	79.8	80.6	80.6	29.247	0	0	0	0.308	83.3	49	62.1	84.5	8.88	0.0701	67	---	691	1	100	30
7/26/2017	3:30 PM	79.2	80	79.1	57	62.7	3	WNW	1.5	11	SSW	79.2	80	80	29.249	0	0	0	0.296	83.7	49	62.5	85.2	8.88	0.07	67	---	697	1	100	30
7/26/2017	4:00 PM	79.4	79.6	79.1	58	63.3	3	NW	1.5	16	S	79.4	80.4	80.4	29.25	0	0	0	0.3	84.7	48	62.8	86.2	8.76	0.0699	67	---	695	1	100	30
7/26/2017	4:30 PM	79.9	80	79.4	54	61.8	3	WNW	1.5	21	S	79.9	80.5	80.5	29.247	0	0	0	0.31	87.1	44	62.5	88.5	8.11	0.0696	67	---	694	1	100	30
7/26/2017	5:00 PM	79.7	80.1	79.7	47	57.7	3	WNW	1.5	12	SSW	79.7	79.5	79.5	29.245	0	0	0	0.306	88	38	59.2	87.6	7.19	0.0696	67	---	696	1	100	30
7/26/2017	5:30 PM	80.5	80.5	79.7	46	57.8	2	WNW	1	12	SSW	80.5	80.2	80.2	29.246	0	0	0	0.323	89	39	60.8	89.7	7.27	0.0694	67	---	700	1	100	30
7/26/2017	6:00 PM	80.4	80.6	80.3	49	59.5	2	WNW	1	7	SSW	80.4	80.4	80.4	29.248	0	0	0	0.321	89.8	40	62.3	91	7.45	0.0692	67	---	694	1	100	30
7/26/2017	6:30 PM	79.8	80.4	79.7	49	58.9	2	SW	1	9	S	79.8	79.8	79.8	29.251	0	0	0	0.308	89.8	40	62.3	91	7.45	0.0692	67	---	697	1	100	30
7/26/2017	7:00 PM	78.8	80	78.7	50	58.6	2	SSW	1	11	NNW	78.8	79	79	29.246	0	0	0	0.288	90.9	42	64.6	93.6	7.71	0.069	67	---	697	1	100	30
7/26/2017	7:30 PM	77.5	78.8	77.5	53	59	2	SSW	1	8	S	77.5	77.7	77.7	29.244	0	0	0	0.26	90.3	42	64.1	92.6	7.74	0.0691	67	---	698	1	100	30
7/26/2017	8:00 PM	77	77.8	77	55	59.6	1	WNW	0.5	11	WSW	77	77.3	77.3	29.245	0	0	0	0.25	88.6	42	62.6	90	7.78	0.0694	67	---	687	1	100	30
7/26/2017	8:30 PM	74.6	77	74.6	59	59.3	1	WNW	0.5	8	SSW	74.6	75.3	75.3	29.248	0	0	0	0.2	86.5	42	60.7	87.2	7.82	0.0697	67	---	696	1	100	30
7/26/2017	9:00 PM	73	74.6	73	62	59.2	1	NW	0.5	7	WSW	73	73.5	73.5	29.249	0	0	0	0.167	84.5	43	59.5	85.2	7.96	0.07	67	---	693	1	100	30
7/26/2017	9:30 PM	71.6	73	71.6	66	59.6	1	WNW	0.5	3	NNW	71.6	71.8	71.8	29.256	0	0	0	0.137	82.3	43	57.6	82.1	8	0.0704	67	---	696	1	100	30
7/26/2017	10:00 PM	70.8	71.6	70.8	67	59.3	1	NW	0.5	5	NNW	70.8	70.9	70.9	29.262	0	0	0	0.121	80.6	44	56.7	80.1	8.15	0.0707	67	---	692	1	100	30
7/26/2017	10:30 PM	70.2	70.9	70.2	68	59.1	1	NW	0.5	5	NW	70.2	70.2	70.2	29.269	0	0	0	0.108	79	44	55.2	78.6	8.17	0.071	67	---	693	1	100	30
7/26/2017	11:00 PM	69.4	70.2	69.4	69	58.8	2	NW	1	5	NW	69.4	69.6	69.6	29.271	0	0	0	0.092	77.5	45	54.5	77.1	8.4	0.0712	67	---	691	1	100	30
7/26/2017	11:30 PM	68.5	69.4	68.5	71	58.7	2	NW	1	8	NNW	68.5	69.1	69.1	29.281	0	0	0	0.073	76.1	45	53.2	75.7	8.43	0.0715	67	---	694	1	100	30
7/27/2017	12:00 AM	66.5	68.5	66.5	76	58.7	0	NNW	0	1	NNW	66.5	67.2	67.2	29.291	0	0	0	0.031	74.7	46	52.5	74.4	8.56	0.0717	67	---	695	1	100	30
7/27/2017	12:30 AM	64.6	66.5	64.6	80	58.3	0	NNW	0	1	NNW	64.6	65.2	65.2	29.295	0	0	0.008	0	73.3	46	51.3	72.6	8.58	0.072	67	---	691	1	100	30
7/27/2017	1:00 AM	63	64.6	62.9	83	57.8	0	NNW	0	1	NNW	63	63.4	63.4	29.304	0	0	0.042	0	71.8	46	49.9	70.4	8.61	0.0722	67	---	691	1	100	30
7/27/2017	1:30 AM	61.6	62.9	61.6	86	57.4	0	---	0	0	---	61.6	61.9	61.9	29.308	0	0	0.071	0	70.4	47	49.2	68.5	8.75	0.0725	67	---	695	1	100	30
7/27/2017	2:00 AM	60.9	61.6	60.9	88	57.3	0	---	0	0	---	60.9	61.2	61.2	29.311	0	0	0.085	0	69	47	47.9	67.3	8.77	0.0727	67	---	695	1	100	30
7/27/2017	2:30 AM	60.2	60.9	60.2	89	56.9	0	---	0	0	---	60.2	60.5	60.5	29.313	0	0	0.1	0	67.9	47	46.9	66.3	8.79	0.0729	67	---	696	1	100	30
7/27/2017	3:00 AM	59.7	60.2	59.7	90	56.8	0	NNW	0	1	NNW	59.7	60	60	29.323	0	0	0.11	0	66.9	48	46.6	65.3	8.91	0.0731	67	---	693	1	100	30
7/27/2017	3:30 AM	59.3	59.7	59.3	91	56.7	0	NNW	0	1	NNW	59.3	59.6	59.6	29.325	0	0	0.119	0	65.9	48	45.6	64.1	8.93	0.0732	67	---	697	1	100	30
7/27/2017	4:00 AM	59.1	59.4	59.1	92	56.8	0	NNW	0	1	NNW	59.1	59.4	59.4	29.327	0	0	0.123	0	65.1	48	44.9	63.2	8.95	0.0734	67	---	692	1	100	30
7/27/2017	4:30 AM	58.8	59.2	58.8	92	56.5	0	---	0	0	---	58.8	59.1	59.1	29.331	0	0	0.129	0	64.3	48	44.2	62.4	8.98	0.0735	67	---	690	1	100	30

7/27/2017	5:00 AM	58.4	58.8	58.4	93	56.4	0	---	0	0	---	58.4	58.7	58.7	29.341	0	0	0.137	0	63.5	49	44	61.6	9.21	0.0737	67	---	692	1	100	30
7/27/2017	5:30 AM	58.1	58.4	58	93	56.1	0	---	0	0	---	58.1	58.3	58.3	29.349	0	0	0.144	0	62.9	49	43.4	60.9	9.23	0.0738	67	---	696	1	100	30
7/27/2017	6:00 AM	58.1	58.1	58.1	94	56.4	0	---	0	0	---	58.1	58.4	58.4	29.357	0	0	0.144	0	62.2	49	42.8	60.2	9.26	0.0739	67	---	697	1	100	30
7/27/2017	6:30 AM	57.8	58.1	57.8	94	56.1	0	---	0	0	---	57.8	58	58	29.368	0	0	0.15	0	61.8	49	42.4	59.8	9.28	0.074	67	---	695	1	100	30
7/27/2017	7:00 AM	58.2	58.2	57.8	94	56.5	0	---	0	0	---	58.2	58.5	58.5	29.38	0	0	0.142	0	61.8	56	45.9	60.3	10.45	0.0739	67	---	700	1	100	30
7/27/2017	7:30 AM	59	59	58.2	94	57.3	0	NNW	0	1	NNW	59	59.4	59.4	29.389	0	0	0.125	0	63	64	50.6	62.3	11.79	0.0736	67	---	692	1	100	30
7/27/2017	8:00 AM	60.1	60.1	59	94	58.4	0	NNW	0	1	NNW	60.1	60.5	60.5	29.391	0	0	0.102	0	64.9	66	53.3	64.6	12.15	0.0733	67	---	697	1	100	30
7/27/2017	8:30 AM	62.2	62.2	60	85	57.6	0	NNE	0	3	NNE	62.2	62.5	62.5	29.396	0	0	0.058	0	66.4	65	54.3	66.3	11.92	0.073	67	---	692	1	100	30
7/27/2017	9:00 AM	66.3	66.3	62.2	74	57.8	1	NE	0.5	7	NNE	66.3	66.8	66.8	29.392	0	0	0	0.027	87.5	46	64.2	89.5	8.4	0.0698	67	---	691	1	100	30
7/27/2017	9:30 AM	68.7	68.8	66.3	69	58.1	1	NNE	0.5	5	NE	68.7	69.1	69.1	29.4	0	0	0	0.077	77.3	53	58.8	77.5	9.65	0.0714	67	---	694	1	100	30
7/27/2017	10:00 AM	71.3	71.3	68.6	66	59.4	0	ENE	0	3	NE	71.3	71.4	71.4	29.405	0	0	0	0.131	75.7	56	58.9	76.1	10.22	0.0716	67	---	696	1	100	30
7/27/2017	10:30 AM	71.2	71.9	71.2	65	58.8	0	ENE	0	3	NE	71.2	71.2	71.2	29.41	0	0	0	0.129	76.1	55	58.8	76.4	10.01	0.0716	67	---	693	1	100	30
7/27/2017	11:00 AM	72.1	72.3	71.1	63	58.8	0	E	0	4	SE	72.1	72.3	72.3	29.414	0	0	0	0.148	76.8	54	58.9	77	9.81	0.0715	67	---	694	1	100	30
7/27/2017	11:30 AM	73.2	73.2	72	63	59.8	1	SE	0.5	3	SE	73.2	73.9	73.9	29.413	0	0	0	0.171	77.9	54	59.9	78.3	9.79	0.0713	67	---	694	1	100	30
7/27/2017	12:00 PM	73.9	73.9	73.3	61	59.6	1	ESE	0.5	3	ESE	73.9	74.7	74.7	29.417	0	0	0	0.185	79.2	51	59.5	79.5	9.35	0.0711	67	---	694	1	100	30
7/27/2017	12:30 PM	75.9	75.9	73.9	57	59.6	0	ESE	0	4	N	75.9	76.4	76.4	29.416	0	0	0	0.227	80.5	50	60.1	80.6	9.14	0.0709	67	---	693	1	100	30
7/27/2017	1:00 PM	76	76.3	75.9	56	59.2	1	SE	0.5	4	SSE	76	76.4	76.4	29.409	0	0	0	0.229	81.4	49	60.4	81.6	8.92	0.0708	67	---	693	1	100	30
7/27/2017	1:30 PM	77.1	77.2	76	52	58.1	1	SE	0.5	3	ESE	77.1	77.1	77.1	29.409	0	0	0	0.252	82.5	45	59	82.7	8.3	0.0707	67	---	697	1	100	30
7/27/2017	2:00 PM	77.5	77.6	76.8	53	59	1	SE	0.5	5	SE	77.5	77.7	77.7	29.411	0	0	0	0.26	83.7	45	60.1	84.6	8.28	0.0705	67	---	693	1	100	30
7/27/2017	2:30 PM	76.3	77.5	76.1	58	60.4	1	SE	0.5	8	SSE	76.3	76.9	76.9	29.408	0	0	0	0.235	84.3	45	60.6	85.4	8.26	0.0704	67	---	692	1	100	30
7/27/2017	3:00 PM	75.9	76.3	75.9	58	60.1	0	SE	0	3	SE	75.9	76.5	76.5	29.406	0	0	0	0.227	85.1	45	61.4	86.1	8.25	0.0703	67	---	693	1	100	30
7/27/2017	3:30 PM	76.5	76.5	75.9	58	60.6	1	ENE	0.5	3	E	76.5	77.1	77.1	29.406	0	0	0	0.24	84.7	40	57.7	84.9	7.55	0.0705	67	---	698	1	100	30
7/27/2017	4:00 PM	76.1	76.8	76	57	59.8	1	SE	0.5	4	SE	76.1	76.6	76.6	29.408	0	0	0	0.231	84.1	39	56.5	84.2	7.37	0.0706	67	---	696	1	100	30
7/27/2017	4:30 PM	76.5	76.5	76.1	55	59.1	1	SE	0.5	5	SE	76.5	76.8	76.8	29.401	0	0	0	0.24	82.5	34	51.3	81.1	6.55	0.071	67	---	691	1	100	30
7/27/2017	5:00 PM	77.1	77.1	76.5	56	60.2	1	SE	0.5	3	SE	77.1	77.5	77.5	29.402	0	0	0	0.252	81.8	35	51.5	80.5	6.78	0.0711	67	---	700	1	100	30
7/27/2017	5:30 PM	76.4	77.1	76.2	55	59	0	SE	0	3	SE	76.4	76.7	76.7	29.403	0	0	0	0.238	80.1	37	51.5	78.8	7.15	0.0713	67	---	689	1	100	30
7/27/2017	6:00 PM	74.4	76.4	74.4	58	58.7	2	SE	1	7	SE	74.4	75	75	29.396	0	0	0	0.196	84.3	43	59.4	85	7.96	0.0704	67	---	697	1	100	30
7/27/2017	6:30 PM	74.3	74.4	74.2	61	60	1	SSE	0.5	4	SSE	74.3	75.2	75.2	29.387	0	0	0	0.194	86.1	42	60.3	86.7	7.83	0.0701	67	---	694	1	100	30
7/27/2017	7:00 PM	74.3	74.3	73.9	61	60	0	SSE	0	1	SSE	74.3	75.2	75.2	29.383	0	0	0	0.194	86.5	43	61.3	87.4	7.95	0.07	67	---	695	1	100	30
7/27/2017	7:30 PM	73.8	74.6	73.8	60	59	0	SSE	0	3	SSE	73.8	74.4	74.4	29.377	0	0	0	0.183	86.7	43	61.5	87.7	7.95	0.07	67	---	691	1	100	30
7/27/2017	8:00 PM	73	74	73	63	59.7	1	SSE	0.5	3	SSE	73	73.6	73.6	29.374	0	0	0	0.167	85.7	43	60.6	86.4	7.95	0.0701	67	---	697	1	100	30
7/27/2017	8:30 PM	71	72.9	71	70	60.7	0	SSE	0	3	SSE	71	71.4	71.4	29.376	0	0	0	0.125	83.9	43	59	84.6	7.97	0.0705	67	---	692	1	100	30
7/27/2017	9:00 PM	67.8	70.9	67.8	78	60.7	0	SSE	0	2	SSE	67.8	68.9	68.9	29.376	0	0	0	0.058	81.6	44	57.6	81.3	8.15	0.0708	67	---	694	1	100	30
7/27/2017	9:30 PM	65.9	67.8	65.9	82	60.2	0	SSE	0	1	SSE	65.9	66.8	66.8	29.373	0	0	0	0.019	79.3	44	55.5	78.9	8.16	0.0712	67	---	690	1	100	30
7/27/2017	10:00 PM	64.5	65.9	64.5	84	59.6	0	SSE	0	1	SSE	64.5	65.2	65.2	29.373	0	0	0.01	0	77.3	45	54.3	76.8	8.4	0.0715	67	---	692	1	100	30
7/27/2017	10:30 PM	62.7	64.5	62.7	86	58.5	0	SSE	0	1	SSE	62.7	63.2	63.2	29.382	0	0	0.048	0	75.2	45	52.4	74.9	8.45	0.0719	67	---	692	1	100	30
7/27/2017	11:00 PM	61.4	62.6	61.4	88	57.8	0	SSE	0	2	SSE	61.4	61.8	61.8	29.387	0	0	0.075	0	73.1	46	51.1	72.3	8.59	0.0722	67	---	689	1	100	30
7/27/2017	11:30 PM	60.4	61.4	60.4	89	57.1	0	SSE	0	1	SSE	60.4	60.7	60.7	29.39	0	0	0.096	0	71.2	46	49.4	69.5	8.63	0.0725	67	---	697	1	100	30
7/28/2017	12:00 AM	59.2	60.4	59.2	89	56	0	---	0	0	---	59.2	59.4	59.4	29.394	0	0	0.121	0	69.6	46	47.9	67.6	8.65	0.0728	67	---	693	1	100	30
7/28/2017	12:30 AM	58	59.2	58	90	55.1	0	---	0	0	---	58	58.1	58.1	29.395	0	0	0.146	0	68	47	47	66.4	8.79	0.0731	67	---	689	1	100	30
7/28/2017	1:00 AM	57	58	56.9	91	54.4	0	---	0	0	---	57	57.1	57.1	29.399	0	0	0.167	0	66.4	47	45.5	64.6	8.82	0.0733	67	---	697	1	100	30
7/28/2017	1:30 AM	56.2	57	56.1	92	53.9	0	---	0	0	---	56.2	56.3	56.3	29.4	0	0	0.183	0	64.9	47	44.2	62.9	8.85	0.0736	67	---	693	1	100	30
7/28/2017	2:00 AM	55.6	56.2	55.6	92	53.3	0	---	0	0	---	55.6	55.7	55.7	29.406	0	0	0.196	0	63.6	47	43	61.5	8.88	0.0738	67	---	690	1	100	30
7/28/2017	2:30 AM	55.2	55.6	55.2	92	52.9	0	---	0	0	---	55.2	55.3	55.3	29.411	0	0	0.204	0	62.5	48	42.5	60.4	9.05	0.074	67	---	692	1	100	30
7/28/2017	3:00 AM	55.3	55.3	55.2	93	53.3	0	SSE	0	1	SSE	55.3	55.5	55.5	29.416	0	0	0.202	0	61.4	48	41.5	59.3	9.09	0.0742	67	---	697	1	100	30
7/28/2017	3:30 AM	54.8	55.3	54.8	92	52.5	0	SSE	0	1	SSE	54.8	54.9	54.9	29.422	0	0	0.213	0	60.5	48	40.7	58.4	9.13	0.0744	67	---	690	1	100	30
7/28/2017	4:00 AM	54.3	54.8	54.3	93	52.3	0	---	0	0	---	54.3	54.5	54.5	29.424	0	0	0.223	0	59.6	49	40.4	57.5	9.35	0.0745	67	---	694	1	100	30
7/28/2017	4:30 AM	54.2	54.3	54.1	94	52.5	0	SSE	0	1	SSE	54.2	54.4	54.4	29.43	0	0	0.225	0	58.8	49	39.7	56.7	9.35	0.0747	67	---	696	1	100	30
7/28/2017	5:00 AM	54	54.2	54	94	52.3	0	SSE	0	2	SSE	54	54.2	54.2	29.436	0	0	0.229	0	58.2	49	39.1	56.1	9.35	0.0748	67	---	694	1	100	30
7/28/2017	5:30 AM	53.6	54	53.6	94	51.9	0	---	0	0	---	53.6	53.8	53.8	29.437	0	0	0.238	0	57.4	49	38.4	55.4	9.35	0.0749	67	---	694	1	100	30
7/28/2017	6:00 AM	53.3	53.7	53.3	94	51.6	0	SSE	0	1	SSE	53.3	53.5	53.5	29.444	0	0	0.244	0	56.8	49	37.8	54.8	9.35	0.075	67	---	692	1	100	30
7/28/2017	6:30 AM	53.3	53.4	53.3	95	51.9	0	SSE	0	1	SSE	53.3	53.6	53.6	29.446	0	0	0.244	0	56.4	50	38	54.5	9.52	0.0751	67	---	695	1	100	30
7/28/2017	7:00 AM	53.2	53.3	53.1	95	51.8	0	---	0	0	---	53.2	53.5	53.5	29.447	0	0	0.246	0	56.1	49	37.2	54.1	9.35	0.0752	67	---	692	1	100	30
7/28/2017	7:30 AM	53.6	53.6	53.2	95	52.2	0	SSE	0	1	SSE	53.6	53.8	53.8	29.453	0	0	0.238	0	56	49	37.1	54	9.35	0.0752	67	---	693	1	100	30
7/28/2017	8:00 AM	54.7	54.7	53.6	96	53.6	0	---	0	0	---	54.7	54.9	54.9	29.457	0	0	0.215	0	56.1	49	37.2	54.1	9.35	0.0752	67	---	697	1	100	30
7/28/2017	8:30 AM	57.2	57.2	54.7	96	56.1	0	SSE	0	1	SSE	57.2	57.5	57.5	29.46	0	0	0.162	0	56.5	49	37.6	54.5	9.35	0.0751	67	---	694	1	100	30
7/28/2017	9:00 AM	60.8	60.8	57.2	94	59.1	0	SSE	0	1	SSE	60.8	61.3	61.3	29.458	0	0	0.088	0	58.4	50	39.8	56.4	9.48	0.0748	67	---	694	1	100	30
7/28/2017	9:30 AM	64.7	64.7	60.8	86	60.4	0	SSE	0	3	SSE	64.7	65.5	65.5	29.457	0	0	0.006	0	61.3	52	43.5	59.5	9.75	0.0743	67	---	692	1	100	30
7/28/2017	10:00 AM	67.7	67.7	64.7	76	59.9	0	SSE	0	2	SSE	67.7	68.6	68.6	29.456	0	0	0	0.056	65.9	54	48.8	64.7	10.11	0.0735	67	---	695	1	100	30
7/28/2017	10:30 AM	70.4	70.4	67.7	67	58.9	0	SSE	0	3	SSE	70.4	70.4	70.4	29.457	0	0	0	0.113	70.4	54	53	69.1	9.94	0.0727	67	---	692	1	100	30
7/28/2017	11:00 AM	73.3	73.3	70.5	66	61.3	0	SSE	0	3	NNW	73.3	74.2	74.2	29.455	0.04	1.45	0	0.173	80.1	52	60.9	80.5	9.45	0.0711	67	---	698	1	100	30
7/28/2017	11:30 AM	74.4	75	73.3	48	53.4	0	N	0	2	N	74.4	74.1	74.1	29.435	0.05	22.15	0	0.196	82.5	45	59	82.7	8.3	0.0708	67	---	684	1	100	30
7/28/2017	12:00 PM	71.4	74.4	71.4	52	52.9	0	---	0	0	---	71.4	70.4	70.4	29.408	0	0	0	0.133	76.3	46	54	75.9	8.52	0.0717	67	---	701	1	100	30
7/28/2017	12:30 PM	69.4	71.4	69.4	58	54	0	---	0	0	---	69.4	68.5	68.5	29.408	0	0	0	0.092	74.5	47	52.9	74.2	8.75	0.072	67	---	697	1	100	30
7/28/2017	1:00 PM	68.9	69.4	68.9	60	54.4	0	---	0	0	---	68.9	68.3	68.3	29.402	0	0	0	0.081	74	47	52.5	73.5	8.75	0.0721	67	---	701	1	100	30
7/28/2017	1:30 PM	69.1	69.2	68.9	59	54.2	0	---	0	0	---	69.1	68.4	68.4	29.403	0	0	0	0.085	73.6	47	52.1	73	8.75	0.0722	67	---	697	1	100	30

HUBBELL PROCESSING AREA
CULVERT BACKFILL SOIL COMPACTION

FILE NO. 761/16108.SAR INDEX NO. 44521
TORCH LAKE NON-SUPERFUND SITE

Michigan Department of Transportation
0582B (06/14)

MOISTURE AND DENSITY DETERMINATION
NUCLEAR METHOD

FILE 301
Page 1 of 2

DISTRIBUTION: ORIGINAL – Construction Engineer, COPIES – Area Density Specialist, Density Technology Unit (Lansing)
*SEE REVERSE SIDE

DATE	CONTROL SECTION ID	JOB NUMBER	~~ROUTE NO. or STREET~~	GAUGE NO.
7-31-2017		B128 - 12462	HUBBELL PROCESSING	62992

DENSITY INSPECTOR	CERTIFICATION NO.	CONSTRUCTION ENGINEER (~~MDOT~~)	PROJECT MANAGER	~~PROJECT MANAGER PHONE~~ NO.
Gerald M. Allen	10712-0321	JED CHRISTIANSEN	AMY KIENANEN	

Gold Flo 24" N-12

DETERMINATION OF IN-PLACE DENSITY

TEST ORIGINAL	TEST RECHECK	WET DENSITY COUNTS (DC)	WET DENSITY TEST DEPTH inch	WET DENSITY WET DENSITY PCF	MOISTURE COUNTS (MC)	MOISTURE MOIS-TURE PCF	MOISTURE MOIS-TURE %	DRY DENSITY DRY DENSITY PCF	DRY DENSITY MAX DENSITY PCF	DRY DENSITY PERCENT OF COM-PACTION	LOCATION OF TEST STATION	DISTANCE FROM ℄ ft LEFT	DISTANCE FROM ℄ ft RIGHT	DEPTH BELOW PLAN GRADE ft	ITEM OF WORK
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1		527	12	117.9	113	7.7	7.8	110.2	115.3	95.6	0+15		2	614.6	1ST LIFT
2		487	12	120.3	117	8.1	7.2	112.3		97.4	0+12	2			
3		2214	6	118.5	117	8.1	7.3	110.5		95.8	0+14	2			
4	1	407	12	125.9	130	9.1	7.8	116.7		100.0	0+15		2.5	614.6	
5		502	12	119.4	110	7.5	6.7	112.0		97.1	0+11	3		616	
6		543	12	117.0	102	6.8	6.2	110.2		95.6	0+14	2			SIDE OF PIPE
7		451	12	122.7	118	8.1	7.1	114.6		99.4	0+15		2		
8		579	12	115.1	98	6.5	6.0	108.6		94.2	0+30	2		615	Thread of Pipe
9	8	523	12	118.2	102	6.8	6.1	111.4		96.6	0+30	2	2	615	
10		506	12	119.2	111	7.6	6.8	111.6		96.8	0+31		2	616	TOP PIPE
11		2008	6	123.0	117	8.1	7.0	115.0	115.3	99.7	0+25	2.5		616	

DETERMINATION OF MAXIMUM DENSITY (Soil & Bituminous)

TEST NO.	MOISTURE %	VOLUME MOLD CU. FT.	DENSITY DETERMINATION WET SOIL + MOLD g	MOLD g	WET SOIL g	WET SOIL lbs	COMPACTED SOIL WET PCF	MAX DENSITY PCF	OPTIMUM MOISTURE %
A	B	C	D	E	F	G	H	I	J
Prelim A	7.8	.0450	4540.3	2025.6	2514.7	5.544	123.19	115.3	
B			4536.2		2510.6	5.535	123.09	115.0	
C			4541.5		2515.9	5.547	123.25	115.3	
								115.3	

NOTE:
To convert (g) to (lbs):
Wt. (g) ÷ 453.59 = Wt. (lbs)

CHART STANDARDS

DENSITY	MOISTURE
2064 / 2023	701

OPERATING STANDARDS

DENSITY	MOISTURE
2047	697

REMARKS
SUBMITTED @ 9:30 - FINAL SIGN SIGNED AVE VALUE 115.3

TWIN 18" CULVERT REPLACED W/ SINGLE 24" N-12 ACROSS RAIL YARD NORTH OF MINERALS BUILDING

10 Weights	1st	2nd		
3rd	4th	5th	DENSITY INSPECTOR'S SIGNATURE	AGENCY/COMPANY
				UPPER - HOUGHTON

Michigan Department of Transportation
0582B (06/14)

MOISTURE AND DENSITY DETERMINATION
NUCLEAR METHOD

FILE 301
Page 1 of 2

DISTRIBUTION: ORIGINAL – Construction Engineer, COPIES – Area Density Specialist, Density Technology Unit (Lansing)
*SEE REVERSE SIDE

DATE	CONTROL SECTION ID	JOB NUMBER	~~ROUTE NO. or STREET~~	GAUGE NO.
B 7-31-2017		B128 - 72462	HUBBELL PROCESSING	C2982

DENSITY INSPECTOR	CERTIFICATION NO.	CONSTRUCTION ENGINEER (~~MDOT~~)	PROJECT MANAGER	PROJECT MANAGER PHONE NO.
GERARD ALLEN	10717-0321	JED CHRISTIANSEN	AMY KENNEDY	

DETERMINATION OF IN-PLACE DENSITY

TEST		WET DENSITY			MOISTURE			DRY DENSITY			LOCATION OF TEST				
ORIGINAL	RECHECK	COUNTS (DC)	TEST DEPTH inch	WET DENSITY PCF	COUNTS (MC)	MOISTURE PCF	MOISTURE %	DRY DENSITY PCF	MAX DENSITY PCF	PERCENT OF COMPACTION	STATION	DISTANCE FROM ℄ ft LEFT	DISTANCE FROM ℄ ft RIGHT	DEPTH BELOW PLAN GRADE ft	ITEM OF WORK
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
11		2008	6	123.0	117	8.1	7.0	115.0	115.3	99.7	0+25	20.5		616	
12		500	12	119.6	104	7.0	6.2	112.6		97.6	0+27		3	616	
13		532	12	117.5	110	7.5	6.8	110.0		95.4	0+50	3		615	
14		914	10	118.9	126	8.8	8.1	109.2		94.7	0+48		2	615	
15		859	10	118.7	109	6.7	6.2	111.8	113.2	98.8	0+53	2		616	
16		924	10	117.7	111	7.6	6.9	110.1		97.3	0+54		2	616	
17		980	10	117.6	109	7.1	6.8	110.6		97.7	0+71	2		615	
18		955	10	116.5	105	7.0	6.4	109.5		96.7	0+73		2	615	
19		973	10	115.8	113	7.7	7.1	108.1		95.5	0+80	2		614	Thread
20		1004	10	114.7	104	7.0	6.5	107.7		95.1	0+86		2	614	
21	19	940	10	117.6	104	7.2	6.4	110.5		97.6	0+90			614	

DETERMINATION OF MAXIMUM DENSITY (Soil & Bituminous)

TEST NO.	MOISTURE %	VOLUME MOLD CU. FT.	DENSITY DETERMINATION						
			WET SOIL + MOLD g	MOLD g	WET SOIL g	WET SOIL lbs	COMPACTED SOIL WET PCF	MAX DENSITY PCF	OPTIMUM MOISTURE %
A	B	C	D	E	F	G	H	I	J
15	6.7	0.0450	4460.7	2025.6	2435.1	5.368	119.300	113.2	14%

NOTE:
To convert (g) to (lbs):
Wt. (g) ÷ 453.59 = Wt. (lbs)

CHART STANDARDS

DENSITY	MOISTURE
2064 / 2023	701

OPERATING STANDARDS

DENSITY	MOISTURE
2047	697

REMARKS
INTO CLEANER SAND

10 Weights	1st	2nd		
3rd	4th	5th	DENSITY INSPECTOR'S SIGNATURE	AGENCY/COMPANY
				UPEA - HOUGHTON

Michigan Department of Transportation
0582B (06/14)

MOISTURE AND DENSITY DETERMINATION
NUCLEAR METHOD

FILE 301
Page 1 of 2

DISTRIBUTION: ORIGINAL – Construction Engineer, COPIES – Area Density Specialist, Density Technology Unit (Lansing)
*SEE REVERSE SIDE

DATE	CONTROL SECTION ID	JOB NUMBER	ROUTE NO. or STREET	GAUGE NO.
7-31-2017		B128-17462	HUBBELL PROJECT	62992

DENSITY INSPECTOR	CERTIFICATION NO.	CONSTRUCTION ENGINEER ~~(MDOT)~~	PROJECT MANAGER	PROJECT MANAGER PHONE NO.
CONRAD M. ALLEN	10717-0321	JEB CHRISTIANSEN	AMY KENNANEN	

DETERMINATION OF IN-PLACE DENSITY

TEST		WET DENSITY			MOISTURE			DRY DENSITY			LOCATION OF TEST				
ORIGINAL	RECHECK	COUNTS (DC)	TEST DEPTH inch	WET DENSITY PCF	COUNTS (MC)	MOISTURE PCF	MOISTURE %	DRY DENSITY PCF	MAX DENSITY PCF	PERCENT OF COMPACTION	STATION	DISTANCE FROM ℄ ft LEFT	DISTANCE FROM ℄ ft RIGHT	DEPTH BELOW PLAN GRADE ft	ITEM OF WORK
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
21	19	940	10	117.6	104	7.2	6.4	110.5	113.2	97.6	0+90			614	
22	20	938	10	117.2	105	7.1	6.4	110.1		97.3	0+90			614	
23		1709	8	113.3	74	4.5	4.1	108.8		96.1	0+48		3	618	Top Lay
24		1746	8	112.4	83	5.4	4.9	107.2	110.5	97.0 ~~97.6~~	0+60	4			
25			8	111.1		6.1	5.8	105.0		95.0	0+68		4		
26		1813	8	110.9	84	5.3	5.0	105.6		95.6	0+80	4			
27		1715	8	113.1	89	5.7	5.3	107.4		97.2	0+90		4	614	~~Top~~ MID PIPE
		1161	10	109.4	98	6.5	6.3	107.9		97.6	0+98		3	614	Thread
29		940	10	117.8	105	7.2	6.3	110.4		99.9	0+95	3		616	MID PIPE
30		906	10	118.3	141	10.1	9.3	108.2		97.9	1+10			614	Thread
31		1023	10	113.9	121	8.4	7.9	105.6		95.6	1+14			614	Thread

RAIN
SURFACE SAND
HEAVY RAIN

DETERMINATION OF MAXIMUM DENSITY (Soil & Bituminous)

TEST NO.	MOISTURE %	VOLUME MOLD CU. FT.	DENSITY DETERMINATION: WET SOIL + MOLD g	MOLD g	WET SOIL g	WET SOIL lbs	COMPACTED SOIL WET PCF	MAX DENSITY PCF	OPTIMUM MOISTURE %
A	B	C	D	E	F	G	H	I	J
24	5.4	0.0450	4383.1	2025.6	2357.5	5.197	115.498	110.5	

NOTE:
To convert (g) to (lbs):
Wt. (g) ÷ 453.59 = Wt. (lbs)

CHART STANDARDS

DENSITY	MOISTURE
2023 / 2044	7.01

OPERATING STANDARDS

DENSITY	MOISTURE
2047	6.97

REMARKS
RAIN / SAND MOVING TO COARSE

10 Weights	1st	2nd	
3rd	4th	5th	DENSITY INSPECTOR'S SIGNATURE: Conrad M Allen

AGENCY/COMPANY: UPEA - HOUGHTON

Michigan Department of Transportation
0582B (06/14)

MOISTURE AND DENSITY DETERMINATION
NUCLEAR METHOD

FILE 301
~~Page 1 of 2~~

DISTRIBUTION: ORIGINAL – Construction Engineer, COPIES – Area Density Specialist, Density Technology Unit (Lansing)
*SEE REVERSE SIDE

DATE	CONTROL SECTION ID	JOB NUMBER	ROUTE NO. or STREET	GAUGE NO.
D 7-31-17		B128-12462	HUBBELL PROCESS CLIENT	62992

DENSITY INSPECTOR	CERTIFICATION NO.	CONSTRUCTION ENGINEER (~~MDOT~~)	PROJECT MANAGER	PROJECT MANAGER PHONE NO.
GERALD ALLAN	10717-0321	JEB CHRISTIANSON	AMY KERANEN	

DETERMINATION OF IN-PLACE DENSITY

TEST		WET DENSITY			MOISTURE			DRY DENSITY			LOCATION OF TEST				
ORIGINAL	RECHECK	COUNTS (DC)	TEST DEPTH inch	WET DENSITY PCF	COUNTS (MC)	MOISTURE PCF	MOISTURE %	DRY DENSITY PCF	MAX DENSITY PCF	PERCENT OF COMPACTION	STATION	DISTANCE FROM ℄ ft LEFT	DISTANCE FROM ℄ ft RIGHT	DEPTH BELOW PLAN GRADE ft	ITEM OF WORK
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
31		1023	10	113.9	121	8.4	7.9	105.6	110.5	95.6	1+14	2		614	Thread
32		965	10	116.0	143	10.2	9.7	105.8		95.7	1+08	2		616	
33		883	10	119.3	115	7.9	7.1	111.4	113.2	98.4	1+11		3	616	
34		901	10	118.6	117	7.6	6.8	111.0		98.0	1+11	2		618	Cover
35		881	10	119.3	132	9.3	8.5	110.0		97.2	1+05	3		619	
36		974	10	115.8	106	7.1	6.6	108.6		95.9	1+16	4		619	Cover
37		803	10	122.6	145	10.4	9.3	112.2		99.1	1+10		3	620	Cover

DETERMINATION OF MAXIMUM DENSITY (Soil & Bituminous)

TEST NO.	MOISTURE %	VOLUME MOLD CU. FT.	DENSITY DETERMINATION: WET SOIL + MOLD g	MOLD g	WET SOIL g	WET SOIL lbs	COMPACTED SOIL WET PCF	MAX DENSITY PCF	OPTIMUM MOISTURE %
A	B	C	D	E	F	G	H	I	J
33								113.2	
			Ref Page 2						

NOTE:
To convert (g) to (lbs):
Wt. (g) ÷ 453.59 = Wt. (lbs)

CHART STANDARDS	
DENSITY	MOISTURE
2064 / 2023	701

OPERATING STANDARDS	
DENSITY	MOISTURE
2047	697

REMARKS
33 - Finer material use B #15 Value 113.2

10 Weights	1st	2nd		
3rd	4th	5th	DENSITY INSPECTOR'S SIGNATURE [signature]	AGENCY/COMPANY UPEA - Houghton

APPENDIX N

SUBSTANTIAL AND FINAL COMPLETION

DTMB-0445 (R 04/19)

CERTIFICATE OF SUBSTANTIAL COMPLETION

DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
State Facilities Administration
Design and Construction Division

DATE OF SUBSTANTIAL COMPLETION: 11-14-17
FINAL COMPLETION DATE: 9-6-19

The work performed under the subject contract between the State of Michigan and the contractor named at the location listed, has been inspected and found to be in compliance with the contract documents, including duly authorized changes, except for the list of the exceptions noted. The Contractor agrees to complete or correct these items on or before (date).

SIGMA CODING	AGENCY NUMBER	FILE NUMBER	CONTRACT NUMBER
	761	761/16108.SAR	Y17347

DEPARTMENT/AGENCY
Department of Environment, Great Lakes, and Energy / Remediation and Redevelopment Division

PROJECT NAME	CONTRACT PRICE
Hubbell Processing Area	$452,765.06

CONTRACTOR NAME AND ADDRESS
B&B Contracting, Calumet, Inc., 55670 Hwy. M-26, Calumet, MI 49913

PROFESSIONAL
The Mannik & Smith Group, Inc.

1. **SCOPE**: This Certificate of Substantial Completion is for the entire Work _X_ or the parts of the Work listed in Attachment A _____.

2. **DIVISION OF RESPONSIBILITIES**: The responsibilities between the Owner and Contractor for security, operation, safety, maintenance, heat and utilities, insurance and warranties and guarantees, pending final payment (or Substantial Completion of the entire Work), shall be as shown on Attachment B.

3. **DOCUMENTS ATTACHED**: The following documents are attached to and made a part of this Certificate: None

PUNCH LIST

Provide all Closeout Documents

APPROVALS

		DATE
AGENCY REPRESENTATIVE	C. Kenagy, EGLE	9-11-19
CONTRACTOR	Hans Hoffman Project Manager	9/6/19
STATE FACILITIES ADMINISTRATION		
PROFESSIONAL		9-6-19

White - Contract Green - Project Manager Canary - Professional Service Contractor Pink - Contractor Goldenrod - Agency

Items of work must be completed before final payment can be made and the contract close out. Authority: 1984 PA 431.

DTMB-0445 (R 6/16)

CERTIFICATE OF SUBSTANTIAL COMPLETION

DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
State Facilities Administration
Design and Construction Division

DATE OF SUBSTANTIAL COMPLETION: 11-14-17
FINAL COMPLETION DATE:

The work performed under the subject contract between the State of Michigan and the contractor named at the location listed, has been inspected and found to be in compliance with the contract documents, including duly authorized changes, except for the list of the exceptions noted. The Contractor agrees to complete or correct these items on or before (date):

INDEX NUMBER(S)	AGENCY NUMBER	FILE NUMBER	CONTRACT NUMBER
44251	761	761/16108.SAR	Y17347

DEPARTMENT/AGENCY
Department of Environmental Quality/Remediation and Redevelopment Division

PROJECT NAME	CONTRACT PRICE
Hubbell Processing Area	$463,985.00

CONTRACTOR NAME AND ADDRESS
B&B Contracting, Calumet, Inc., 55670 Hwy. M-26, Calumet, MI 49913

PROFESSIONAL
The Mannik & Smith Group, Inc.

1. **SCOPE**: This Certificate of Substantial Completion is for the entire Work X or the parts of the Work listed in Attachment A _____.

2. **DIVISION OF RESPONSIBILITIES**: The responsibilities between the Owner and Contractor for security, operation, safety, maintenance, heat and utilities, insurance and warranties and guarantees, pending final payment (or Substantial Completion of the entire Work), shall be as shown on Attachment B.

3. **DOCUMENTS ATTACHED**: The following documents are attached to and made a part of this Certificate: None

PUNCH LIST

1. Adjust grades to raise the low spot with standing water so it drains to the ditch (i.e. provide positive drainage).
2. Remove silt fence once vegetation is established and soils are stabilized and obtain release of the SESC permit.
3. Provide documentation that the Houghton County Drain Commissioner accepts the borrow pit restoration.
4. Final vegetation and project acceptance (includes addressing bare spots, wet spots without vegetation, and restoration outside of the cap).

Note: $1,000 retained for #1; $1,300 retained for #2; balance of retainage ($8,600) for #3 and #4.

APPROVALS

AGENCY REPRESENTATIVE G. Keegan	DATE 12-11-17
CONTRACTOR	DATE 12-11-17
STATE FACILITIES ADMINISTRATION	DATE
PROFESSIONAL	DATE 12-11-17

White - Contract Green - Project Manager Canary - Professional Service Contractor Pink - Contractor Goldenrod - Agency

Items of work must be completed before final payment can be made and the contract close out. Authority: 1984 PA 431.