

**The Dow Chemical Company**  
**Michigan Operations, Midland Plant Site**  
**Ambient Air Monitoring Program (AAMP)**

Revision 9  
August 2015

**AMBIENT AIR MONITORING PROGRAM  
FOR DOW'S MICHIGAN OPERATIONS, MIDLAND PLANT SITE  
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## **AMBIENT AIR MONITORING PROGRAM**

### **1.0 OVERVIEW & OBJECTIVES OF THE PROGRAM**

The primary objective of this Ambient Air Monitoring Program is to characterize the emissions from The Dow Chemical Company, Michigan Operations, Midland Plant site's management of hazardous wastes and its impact on Midland's ambient air. Other objectives are to:

- a) Provide a basis for setting priorities for voluntary emission reduction projects;
- b) Compare trends in air emission rates with measured and predicted ambient air concentrations;
- c) Fulfill the regulatory requirements of the Hazardous Waste Management Facility Operating License, and;
- d) Demonstrate compliance with National Ambient Air Quality Standards (NAAQS) for TSP/PM-10. Note: If TSP results meet the PM-10 limits, Dow will be in compliance since PM-10 is a subset of TSP.

The airborne parameters to be monitored are outlined in section 6.0 of this AAMP.

### **2.0 BACKGROUND INFORMATION**

Appendix A contains a table listing the dates of revision and a summary of the revision(s) made.

### 3.0 PARAMETERS, METHODS, AND SAMPLING FREQUENCIES

Table 3-1 summarizes the parameters and methods used in this AAMP and some of the target goals for quantifying these compounds.

The rationale for selecting these compounds is described in section 6.0. The methods used will be based on current EPA methods or slight modifications.

Appendices B, C, and D describe the methods for monitoring the target compounds.

For all compounds, the goal is to obtain valid monitoring methods, which have an analytical accuracy of  $\pm 30\%$ , a method precision of  $\pm 25\%$ , and an applicable concentration range for the sampling period as stated in Table 3-1. These concentration ranges were chosen based upon expected ambient air levels, levels found in other urban communities, and levels which are biologically relevant.

Hourly meteorological data for the Midland area will be collected at 3600 Building, Salzburg Landfill, each day. The location of this station is shown in Figure 5-1.

Appendix C includes a description of the meteorological measurement station. Volumes of air sampled will be corrected to EPA Standard Conditions (25°C, 760 mm Hg) through use of average daily temperatures and pressures.

**Table 3-1  
Parameters, Methods, and Associated Limits**

	<b>Organic Compounds</b>	<b>TSP</b>
<b>Sampling Apparatus</b>	Canister (TO-15) SUMMA (Passivated)	HI-VOL TSP (Glass Filter)
<b>Sampling Duration</b>	24-Hour	24-Hour
<b>Sample Frequency for Sites 1E/1W, 3, 4A, and 5A</b>	Every 6 days based on NAAQS Sample Calendar	Every 12 days based on NAAQS Sample Calendar
<b>Sample Volume</b>	6 liters	1600 m <sup>3</sup>
<b>Analytical Method</b>	EPA Method TO-15	EPA Method IO-2.1
<b>Target Validation Range</b>	0.02-100 ug/m <sup>3</sup> (0.01-30 ppb v/v)	0.001-70 ug/m <sup>3</sup>

Organic Compounds = Acetonitrile, Acrylonitrile, Benzene, Chloroform, 1,2-Dibromoethane, 1,2-Dichloroethane, Methyl Chloride, 1,1,1,2-Tetrachloroethane, 1,1,2-Trichloroethane, and Trichloroethylene

TSP = Total Suspended Particulates

### 3.1 AAMP-Analyte Organic Compounds

Appendix B describes the Dow environmental monitoring method for the determination of these organic compounds in ambient air samples. The frequency of organic compound sampling is every six days at all sites (Table 3-1).

### 3.2 AAMP-Analyte Total Suspended Particulates (TSP)

Appendix B describes the Dow environmental monitoring methods for TSP. The frequency of sampling is every 12 days at all sites (Table 3-1). Concentrations will be determined on HI-VOL TSP samplers using glass filters.

## 4.0 LOCATION AND DESCRIPTION OF SAMPLE COLLECTION SITES

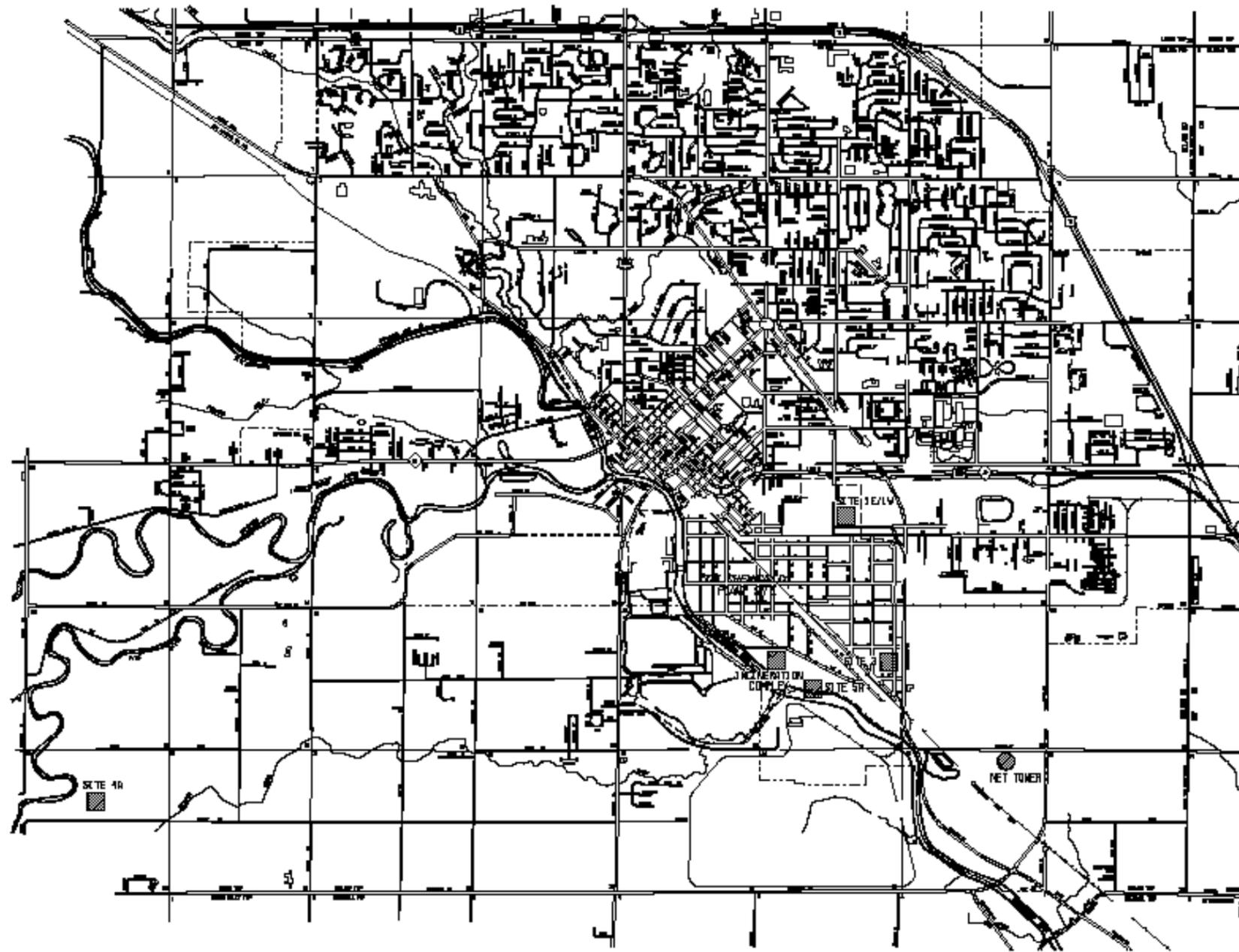
Figure 5-1 shows the location of the four monitoring stations around Dow’s Michigan Operations, Midland Plant site, and the one monitoring station located off-site. All sites represent off-site ambient air. Sampling equipment will be located at a height of three to ten meters.

Site 1E/1W is a co-located site in the northeast corner of the Michigan Operations, Midland Plant site, and is aligned with the maximum off-site annual average ground level concentration of emissions from the Dow 32 Incinerator.

Sites 3 and 5A are located near the fence-line east, and south of the Midland Plant site. Site 3 is located about 100 meters south of Midland Plant site Gate 52 on Saginaw Road, and northeast of the Midland Plant site wastewater treatment plant (WWTP), which is approximately downwind of the prevailing wind direction from the WWTP. Site 5A is located south of the WWTP, near the Tittabawassee River at the location of maximum “off-site” 24-hour concentration from the WWTP emissions. Site 4A is located on Stewart Road east of Homer Road, which is upwind (prevailing) from the Midland Plant site.

Site Number & Location	AQS Number
Sites 1E & 1W - Dow Michigan Operations co-located site	261110960 and 261110961
Site 3 - 3900 S. Saginaw Road	261110953
Site 4A - Stewart Road; Dow Brinewell Site 22P	261110959
Site 5A – Dow Michigan Operations WWTP	261110955

AMBIENT AIR SAMPLE COLLECTION SITES  
 FIGURE 6-1



REVISION A UPDATED TO CORRECT SITE NAMES B REVISION OF FACILITY BOUNDARY FROM SITE 2E/LV		BY DC	DATE 2/16/2016 7/29/20	REVISION BY BK BY DATE	DEMONS CODE RECORD DATE BY APPROVAL BY DATE	JTP COHAN T. C. COHEN J.C. J.C. T.A. KOSCIUSKO	DATE 8/12 8/12 8/12 8/12 8/12	TITLE PLN	THE DOW CHEMICAL COMPANY MIDLAND, MISSOURI 64302	AMBIENT AIR SAMPLE COLLECTION SITES OPERATING LICENSE RE-APPLICATION SHEET 2 PLN
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## 5.0 RESULTS AND EVALUATIONS

The overall Project Management Plan for the implementation of the AAMP is described in Appendix D. Since the implementation of this AAMP involves several different organizational tasks, such as sample collection, procedure documentation, vendor selection, and monitoring method documentation, the personnel that developed this AAMP will also coordinate its implementation.

### 5.1 Reports

Ambient air monitoring results will be submitted to the Michigan Department of Environmental Quality (MDEQ) Office of Waste Management and Radiological Protection (OWMRP) with electronic copies to the MDEQ Air Quality Division (AQD) in accordance with the applicable Environmental Monitoring Reporting license condition(s). Hourly meteorological measurements will be maintained on file by Dow and made available for inspection upon request.

### 5.2 Quality Assurance (QA)

Quality assurance reports will be submitted to the MDEQ-OWMRP with copies to the MDEQ-AQD which describes the results of all blanks and blind spikes in accordance with the applicable Environmental Monitoring Reporting license condition(s). Explanations of all outliers, “out-of-control” analytical systems, and samples collected outside specified conditions will be reported with explanation of the corrective measures employed.

At a minimum, one analytical audit will be performed each quarter for all organic compound parameters. For AAMP-Analyte Organic Compounds, all audit samples will be humidified. Audit as defined here means the analyte concentration of the samples is not known to the analyst when the analysis is performed. The audit samples may be purchased or prepared in the laboratory doing the analysis. Annually, well-characterized standards will be obtained from an independent source and analyzed by the laboratory conducting the analysis for audit purposes. The standards will conform to qualifications supplied by U.S. EPA.

Dow or the contract lab performing the analysis commits to a laboratory audit to be conducted by U.S. EPA and MDEQ. At a minimum, Dow or the contract lab will have available for inspection, a suitable package consisting of at least two months of data.

Dow’s Environmental Quality System Documents are designed to document procedures to be followed to provide data of known and documented quality. These procedures cover aspects of quality control (QC), personnel qualifications and training, sample collection, preservation, storage, analysis, records generation, and records review. These documents are consistent with the applicable procedures and principles outlined in U.S. Department of Commerce’s National Technical Information Services publication PB-254 658: “Quality Assurance handbook for Air Pollution Measurements Systems.”

### 5.2.1 QA Coordinator

The coordinator or designee is responsible for providing reports to management, keeping track of documents, evaluating and storing data, audit procedures, documenting corrective action and approving and documenting any deviations from the published sampling and analytical methods. The reports to management will include descriptions of the QA system, QA data reports, and audit reports. The coordinator assures documentation exists of the training provided to the personnel collecting and analyzing samples.

### 5.2.2 Sampling Apparatus Quality Assurance

Samplers will be calibrated and maintained according to the operating instructions provided by the manufacturer. Field records will cover all field observations, required equipment and sampling information. Complete records will be maintained. These records will include, but are not limited to, the following:

- A. Apparatus name, serial number, and location;
- B. Date of maintenance, persons doing the maintenance, and what maintenance was done;
- C. All sampler calibration data, including the date, the time, the name of the person doing the calibration, and the results;
- D. All observations and data required are in the sampling SOPs. Strict chain-of-custody procedures will be maintained to assist with the identification and tracking of the sample from the time of collection through the time of analysis and disposal. Samples will be labeled with the same description, number or location, samplers name or initials, date and time of sampling, a list of the preservatives added, and any applicable hazard information;
- E. Side-by-side field duplicates (co-located sampling) will be done at Site 1E/1W for organic compounds and TSP. A mobile sampling vehicle may be used for duplicate sampling at other sites.
- F. For the TSP filters, field blanks shall be collected and analyzed for each site. The number of required field blanks shall be at least 10% of the scheduled field samples. A field blank is placed in the sampler for a short period of time, no air is pulled through the filter, and the filter is removed and sent to the laboratory for a final weight.

### 5.2.3 Analytical Quality Assurance

Samples will be logged into the laboratory system and their condition noted. The receiving person will note any discrepancies or losses of samples before signing the chain-of-custody. The sample will be stored according to the method or Standard Operating Procedure (SOP). Analysts will acknowledge the receipt of samples by signing the chain-of-custody forms. Samples will be stored in a secured refrigerator at the appropriate temperature according to the method.

The standard analytical methods have very specific requirements for QA/QC and these requirements are detailed in the methods. The exact requirements for demonstrating the reliability of a developed method are normally dictated by the specific program. All analytical methods will have the appropriate blanks, spikes, blind spikes, surrogates, and duplicates.

Instrument calibration, linearity, maintenance records and raw data will be maintained, and standards will be traceable to the EPA or a manufacturer by name and lot number. Raw data will comply with the definition of Section 7.11 of the "Good Automated Laboratory Practices" guidance document.

#### 5.2.4 Data Reduction and Storage

The specific equations that will be used to calculate all results are included in the sampling and analytical methods.

Several stages of data confirmation will occur. All field and analytical data will be compared to the acceptance criteria of the reference method. All reports will be peer-reviewed. Data submitted to the agency will be reviewed by the QA/QC Coordinator or designee. Any outliers will be treated on a case-by-case basis with appropriate action taken. Any action concerning outliers will be reported to MDEQ.

Data will be retained in accordance with Part 111 operating license records retention requirements. SOPs will be retained according to Dow records retention policies.

#### 5.2.5 Sampler Accuracy

All sampling equipment will be audited at least once per calendar quarter. The audit will consist of a one-point flow rate check within the normal operating range of the sampler. The equipment and personnel used for auditing will be different than those used for normal equipment operation. The standards used for auditing will be traceable to NIST whenever possible. The percentage difference between the actual and measured values is used to assess accuracy of the sampling equipment. Acceptable results will be within  $\pm 10$  percent ( $\pm 7$  percent for high volume air samplers). Audit results will be reported in the EPA PARS format to the MDEQ Air Quality Division in accordance with the applicable Environmental Monitoring Reporting license condition(s).

#### 5.2.6 Analytical Accuracy

A minimum of one analytical audit (referenced in section 5.2, paragraph 2) will be conducted each calendar quarter using spiked blank sampling media. Two different concentrations of spiked samples will be analyzed. The concentration level of one of these spiked samples will be at a level of that expected in ambient air. The audit samples will be prepared using different standards than those used for normal equipment calibrations. Audit standards will be traceable to NIST whenever possible. In addition, audit samples will be extracted using the same extraction procedure that is used for sample analysis. Method accuracy will be calculated as described in 40 CFR 58, Appendix A. Acceptable results will be within  $\pm 30$  percent for EPA Reference Methods. Analytical audit results will be reported in accordance with the applicable Environmental Monitoring Reporting license condition(s).

#### 5.2.7 Method Precision

To assess precision, co-located samplers will be operated at sampling Site 1E/1W for each event. The two samplers will be within 2 and 4 meters of each other. In addition the calibration, sampling, and analytical procedures will be the same for both samplers. One sampler will be used to report the sample measurements and the other will be designated as the duplicate sampler. Method precision will be calculated as described in 40 CFR 58, Appendix A. Acceptable results will be within  $\pm 25$  percent for EPA Reference Methods. Precision results will be submitted in the quarterly quality assurance report (section 5.2) in accordance with the applicable Environmental Monitoring Reporting license condition(s).

### 5.3 Data Evaluation Criteria

#### 5.3.1 Total Suspended Particulates

<b>Total Suspended Particulate (TSP)</b>	<b>NAAQS Limits for TSP (PM10)*</b>
24-Hour	150 ug/m <sup>3</sup>
Yearly Average	50 ug/m <sup>3</sup>

\*Limit is for PM-10. As long as TSP meets this limit, the PM-10 limit cannot be exceeded.

In the case that an exceedance of TSP is confirmed, Dow shall notify the Office, Hazardous Waste Section, and MDEQ-AQD by email as soon as possible but no later than three business days. This notification will include the analytical results, and a proposal for follow-up monitoring and/or corrective actions, if appropriate. The follow-up actions would address activities that may be occurring at the site which might impact the results of the TSP monitoring (e.g., construction, events not associated with Dow operations, analytical quality exceptions). Dow will submit the results of actions taken, if any, for this event in the subsequent quarterly quality assurance report.

#### 5.3.2 Organic Compounds

Since none of the organic compounds in this monitoring program have NAAQS values, the organic compound results will be evaluated by comparing against a compound's respective initial threshold screening level (ITSL) and secondary risk screening level (SRSL). If an ITSL value has not been published by the MDEQ-AQD for a particular compound, then the monitoring results will be compared against a 24 hour screening level. This level is calculated as 10 times the MDEQ annual SRSL for a particular compound.

In the case that an organic compound result is confirmed at or exceeding the 24 hour (or shorter) averaging time screening level, or for annually averaged parameters, three times the annual averaged screening level value, Dow shall notify the Office, Hazardous Waste Section, and MDEQ-AQD by email as soon as possible but no later than three business days. This notification will include the analytical results, and a proposal for follow-up monitoring and/or corrective actions, if appropriate. The follow-up actions would address activities that may be occurring at the site which might impact the results of the monitoring (e.g., plant upsets, events not associated with Dow operations, analytical quality exceptions). Dow will submit the results of actions taken, if any, for this event in the subsequent quarterly quality assurance report.

## 6.0 CRITERIA FOR REVISING

Dow may petition the MDEQ for a change of any of the monitoring parameters or sampling frequency after at least one year of monitoring has been conducted, the data has been validated, and a demonstration has been made that emissions are non-detectable, or will not cause noncompliance with the National Ambient Air Quality Standards (NAAQS), or an unacceptable risk to human health or the environment. All changes to the approved AAMP will be approved in advance by the MDEQ using a letter modification rather than an Operating License minor modification. Supporting data will be submitted with any requests to change AAMP-Analytes.

Dow will review the organic compound list at least every three years and propose adjustments to direct the resources of this program on the most meaningful set of parameters. This will be accomplished by using calculated air emissions from the Michigan Operations, Midland Plant site's management of hazardous wastes over the latest available three year period. An organic compound will be included in the evaluation if it is one of the EPA's Method TO-15 Volatile Organic Compounds and calculated air emissions during that time frame meet either of the following criteria:

- The organic compound has a ratio that is greater than or equal to 100 using the highest total calculated annual air emissions (lbs) over the three year period / MDEQ screening level (ITSL/SRSL value;  $\text{ug}/\text{m}^3$ ); or
- The organic compound is a regulated chemical under 29 CFR Part 1910 – Occupational Safety and Health Standards, Subpart Z - Toxic and Hazardous Substances and the ratio of the highest total calculated annual air emissions (lbs) over the three year period / the lowest available occupational exposure level (OEL;  $\text{ug}/\text{m}^3$ ) is greater than or equal to 1.

The organic compound list can be further refined by any of the following means:

- The organic compound is requested by MDEQ to be included and there is a readily available analytical method for measuring the organic compound in ambient air samples;
- The organic compound may be excluded if there are previous AAMP monitoring results demonstrating that the organic compound has met human health screening levels at similar or higher emissions levels that is representative of current operations and there is:
  - At least one year of data with results <50% of human health screening level(s) considering averaging time; or
  - At least two years of data with results below the human health screening level(s) considering averaging time;
- The organic compound may be excluded if fate or transport information demonstrates that the organic compound would be transformed to a less hazardous material prior to reaching the monitoring locations, and/or cannot be reliably measured;
- The organic compound may be included based on consideration of shorter term hazards (e.g., site specific, non-corrective action, projects). Note: AAMP-Analytes for corrective action projects will be addressed in the individual work plan for that project.

Using this process, the organic compound list will also be assessed for compounds that either no longer meet the above criteria, or have consistently demonstrated non-detectable concentrations in routine AAMP monitoring at all AAMP monitoring sites.

Dow will submit proposed revisions to the AAMP to the MDEQ-OWMRP, using a letter modification request, for approval prior to implementation and shall revise any other affected document accordingly.

The table below summarizes the AAMP-Analyte list. The supporting data for the organic compounds on this list can be found in Appendix E. The 'Basis' column in the table below documents the reason the material is being included. SARA 313 means the ratio of the material's highest total calculated annual air emissions (lbs) divided by the ITSL/SRSL value ( $\text{ug}/\text{m}^3$ ) is greater than or equal to 100. Section 1910 citation in the 'Basis' column refers to specific 29 CFR Part 1910, Subpart Z chemical standards. Section 1910 chemicals means a the ratio of the material's highest total calculated annual air emissions (lbs) divided by the lowest OEL ( $\text{ug}/\text{m}^3$ )

is greater than or equal to 1. DEQ Defined Criteria means that the material does not meet either of the criteria defined above, but remains on the list per the request of the DEQ. Additional AAMP-Analytes may be added based on modifications to waste handling processes and/or changes in hazardous waste constituents.

AAMP–Analyte	CAS	Basis
Acetonitrile	75-05-8	DEQ Defined Criteria
Acrylonitrile	107-13-1	SARA 313
Benzene	71-43-2	SARA 313
Chloroform	67-66-3	SARA 313
1,2-Dibromoethane	106-93-4	SARA 313
1,2-Dichloroethane	107-06-2	SARA 313
Methyl Chloride	74-87-3	DEQ Defined Criteria
1,1,1,2-Tetrachloroethane	630-20-6	DEQ Defined Criteria
1,1,2-Trichloroethane	79-00-5	SARA 313
Trichloroethylene	79-01-6	DEQ Defined Criteria
Total Suspended Particulates (TSP)	NA	NAAQS for TSP/PM-10

#### 6.1 Revision of Standard Operating Procedures (SOP), Changes to EPA Methods, and Availability of SOPs

Dow will collect and analyze samples according to the methods listed in Appendix B. Dow will submit proposed revisions to the AAMP to the MDEQ-OWMRP, using a letter modification request, for approval prior to implementation and shall revise any other affected document accordingly. If approved, the revision(s) to the AAMP shall become part of the Part 111 Operating License without the need for a minor license modification. Dow agrees to have their SOPs available during an audit. Contract laboratory SOPs will also be made available provided sufficient advance notice is given to obtain the documents (30 days).

**APPENDIX A**

**AMBIENT AIR MONITORING PROGRAM REVISION HISTORY**

<b>Date</b>	<b>Summary of Changes/Modifications</b>
Nov. 16, 1994	Original AAMP created/approved.
Mar. 31, 1994	Elimination of the requirement for PM-10 monitoring. Discontinue of monitoring at sites 2, 6 and 7. Discontinue of reporting of data from two meteorological stations. Continuation of hydrogen chloride monitoring using a new method. Discontinue of monitoring of ethyl benzene, chloroethane, and toluene. Continuation of monitoring of metals and carcinogenic VOCs (i.e. Acrylonitrile, Benzene, 1,3-Butadiene, Carbon Tetrachloride, Chloroform, Ethylene Dichloride, Methyl Chloride, Methylene Chloride, Styrene, Tetrachloroethylene, and Vinyl Chloride (New)).
Oct. 21, 1994	Elimination of hydrogen chloride as a monitoring parameter.
Sept. 20, 2000	Reduction in the frequency of monitoring for metals. Changed from every six days to every twelve days.
Sept. 19, 2002	Approval of the AAMP for Dow's Midland Manufacturing Site, Revision 4, dated May 31, 2002, as revised by the July 8, 2002 submittal. This included relocation of the upwind monitoring site (Site 4).
2010	Metals analysis was discontinued.
Aug. 6, 2015	Per the Criteria For Revising (Section 6.0), removed 1,3-butadiene, chloroform, methylene chloride, styrene, tetrachlorethylene, toluene, and vinyl chloride and added 1,2-dibromoethane, 1,1,1,2-Tetrachloroethane, 1,1,2-trichloroethane, and Trichloroethylene as monitoring parameters.

## APPENDIX B

### DOW ENVIRONMENTAL MONITORING METHODS

AAMP–Analyte Organic Compounds	EPA Method TO-15 Sampling Method: “Automated Volatile Organic Compound Canister Sampler Operating Procedures”
AAMP-Analyte Total Suspended Particulates	EPA Method IO-2.1 Sampling Method: “High Volume Atmospheric Suspended Particulate Matter Sampler Operating Procedure”

## APPENDIX C

### METEOROLOGICAL DATA

Meteorological data are gathered from a meteorological measurement station located at 3600 Building, Salzburg Landfill. The wind speed and direction is collected using a wind monitor sensitive to  $\pm 0.3$  m/s changes in wind speed (range of 0-100 m/s) and  $\pm 3^\circ$  changes in wind direction. Temperature (to  $0.1^\circ\text{C}$   $\pm 0.15^\circ\text{C}$ ), relative humidity (to  $0.1\%$   $\pm 2\%$ ), and barometric pressure (to 0.1 in Hg  $\pm 0.08$  in Hg) are also measured at the Salzburg Landfill meteorological measurement station.

The following meteorological data will be collected in accordance with EPA guidance:\*

1. Mean Horizontal Velocity (mean and standard deviation)
2. Mean Wind Direction (mean and standard deviation)
3. Temperature (high and low)
4. Wind Stability Class
5. Relative Humidity

A spreadsheet of these data with date, time, and weather parameters will be retained on-site and made available for review upon request. These data will be used to assign “upwind” and “downwind” sampling stations relative to the 32 Incinerator Complex and WWTP.

\* “Quality Assurance Handbook for Air Pollution Measurement Systems,” EPA 600/4-82-060, March 24, 2008 Revision.

## **APPENDIX D**

### **PROJECT MANAGEMENT PLAN**

#### **D.1 KEY PERSONNEL**

The overall responsibility for this program resides with the Environmental Manager of the Midland Analytical Sciences Laboratory of The Dow Chemical Company. The responsibility for collecting and analyzing samples and generating the quality assurance data will reside with some combination of the Environmental Services Department, the Analytical Sciences Laboratory, and contract laboratories.

The responsibility for evaluating the adequacy of the quality assurance information associated with the program and compiling a quarterly interpretative report resides with the Environmental Analytical Sciences Quality Assurance Team.

#### **D.2 OCCUPATIONAL HEALTH AND SAFETY**

As a condition of employment, Dow's Standards, practices, and Guidelines for protecting the health and safety of its employees must be followed at all times by all Dow employees. These practices include, but are not limited to using appropriate protective equipment when handling hazardous materials, exercising caution when climbing ladders, and driving defensively. Each of Dow's Environmental Monitoring methods will contain a section describing any special safety considerations associated with the method.

**APPENDIX E**

**BASIS FOR THE AAMP-ANALYTE ORGANIC COMPOUNDS LIST**

<b>Chemical Name</b>	<b>CAS #</b>	<b>Calculated Air Emissions</b>			<b>Scr Lvl (ug/m3)</b>	<b>ITSL/SRSL</b>	<b>ITSL/SRSL Ratio</b>	<b>OEL (ug/m3)</b>	<b>OEL Ratio</b>	<b>Method TO-15 VOC?</b>
		<b>2014 (lbs)</b>	<b>2013 (lbs)</b>	<b>2012 (lbs)</b>						
1,1,1,2-Tetrachloroethane <sup>†</sup>	000630-20-6	142	252	90	1	SRSL	252	687	0.4	NO
1,1,2-Trichloroethane	000079-00-5	95	71	73	0.6	SRSL	158	54600	0.0	YES
1,2-Dichloroethane	000107-06-2	307	387	584	0.4	SRSL	1460	4050	0.1	YES
Acetonitrile <sup>†</sup>	000075-05-8	2263	2477	5399	60	ITSL	90	33600	0.2	YES
Acrylamide <sup>@</sup>	000079-06-1	11	11	15	0.05	SRSL	292	87.21	0.2	YES
Acrylonitrile	000107-13-1	15	11	1	0.1	SRSL	146	2170	0.0	YES
Benzene	000071-43-2	263	290	611	1	SRSL	611	1595	0.4	YES
Chloroform	000067-66-3	1259	1854	1551	4	SRSL	464	9760	0.2	YES
Methyl Chloride <sup>†</sup>	000074-87-3	483	796	728	90	ITSL	9	51750	0.0	YES
Chloromethyl Methyl Ether <sup>**</sup>	000107-30-2	91	102	131				32.9	4.0	YES
Epichlorohydrin <sup>#</sup>	000106-89-8	0	18	215	1	ITSL	215	1890	0.1	YES
1,2-Dibromoethane	000106-93-4	0	0	4	0.02	SRSL	183	76.8	0.0	YES
N-Nitrosodimethylamine <sup>@</sup>	000062-75-9	0	3	0	0.0007	SRSL	4468	NA		YES
Trichloroethylene <sup>†</sup>	000079-01-6	128	191	154	2	ITSL	96	26850	0.0	YES
Triethylamine <sup>@</sup>	000121-44-8	1365	2986	1836	7	ITSL	427	4140	0.7	YES

<sup>†</sup> Compound did not meet the initial screening criteria, but was requested by MDEQ to be included.

<sup>@</sup> Excluded due to analysis not being supported by labs for EPA Method TO-15.

<sup>#</sup> Excluded due to this chemical no longer being used at the Midland Plant site.

<sup>\*\*</sup> Excluded due to the hydrolysis of Bis(chloromethyl) ether (BCME) and Chloromethyl methyl ether (CMME) in water being rapid. At 20°C, half-lives in water of 38 seconds for BCME and <1 second for CMME have been reported (U.S. EPA, 1980; Tou et al., 1974; Radding et al., 1977). Although BCME and CMME may be degraded by oxidation, the extremely rapid hydrolysis of BCME and CMME in an aqueous medium precludes any oxidative degradation from taking place in aquatic systems (Callahan et al., 1979). BCME is hydrolyzed to formaldehyde and hydrogen chloride (ASTDR, 1989). CMME is hydrolyzed to hydrogen chloride, methanol, and formaldehyde (Travenius, 1982).