

**FORM EQP 5111 ATTACHMENT TEMPLATE A3
WASTE ANALYSIS PLAN (WAP)**

This document is an attachment to the Michigan Department of Environment, Great Lakes, and Energy's Instructions for Completing Form EQP 5111, Operating License Application Form for Hazardous Waste Treatment, Storage, and Disposal Facilities. See Form EQP 5111 for details on how to use this attachment.

The administrative rules promulgated pursuant to Part 111, Hazardous Waste Management, of Michigan's Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451), being R 299.9504, R 299.9508, and R 299.9605, and Title 40 of the Code of Federal Regulations (CFR) §§270.14(b)(3) and 264.13(b) and (c), establish requirements for WAPs for hazardous waste management facilities. All references to 40 CFR citations specified herein are adopted by reference in R 299.11003.

This license application template addresses requirements for a WAP for the hazardous waste management units and the hazardous waste management facility for The Dow Chemical Company (Dow) Michigan Operations Midland Plant (MID 000 724 724) and Salzburg Landfill (MID 980 617 435) facilities. These two facilities will be collectively referred to within the WAP as Michigan Operations, or the facility "Midland Plant" or "Salzburg" will be used to indicate site specific requirements. All activities associated with the WAP will be conducted at Dow's Michigan Operations Midland, Michigan facility.

Ensure that all samples collected for the purposes of waste characterization are collected, transported, analyzed, stored, and disposed by trained and qualified individuals in accordance with the Quality Assurance/Quality Control (QA/QC) Plan. The QA/QC Plan should, at a minimum, include the written procedures outlined in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," U.S. Environmental Protection Agency (EPA) Publication No. SW-846, Third Edition, Chapter 1 (November 1986), and its updates.

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A3.B CAPTIVE FACILITY

Although the Dow Michigan Operations is a captive facility, some off-site wastes (as described in A3.A) are received; therefore, it was more appropriate to complete Section A3.A of the template.

A3.C NOTIFICATION, CERTIFICATION, AND RECORD KEEPING REQUIREMENTS

	A3.C.1	Retention of Generator Notices and Certifications
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Appendix A3-1 - Quality Assurance/Quality Control Plan

Appendix A3-2 - Land Disposal Restriction Procedures

Appendix A3-3 - LDR Variance

Figure A3-1 - Example Generator Waste Characterization Form

Figure A3-2 - Logic Diagram for Treatment and Disposal of Hazardous Waste

Figure A3-3 – MiOps Industrial Park Waste Flow Diagram

A3.A CAPTIVE FACILITY ACCEPTING CERTAIN OFF-SITE AND NON-DOW WASTE

Dow's Michigan Operations is a captive facility that generates and manages wastes on site and also receives certain wastes generated off site or from non-Dow generators in support of Dow operations or strategic business relationships. The vast majority of the waste streams managed on-site are generated at captive facilities owned by Dow. A waste is considered from "Dow," for purposes of this categorization, if Dow has any ownership in the company generating the waste (e.g. joint venture, subsidiary). Waste received from off-site or non-Dow generators include:

- Other sites owned by The Dow Chemical Company (e.g., Freeport, Texas);
- Dow subsidiaries and joint ventures (e.g., , Union Carbide Corporation; Dow Silicones Corporation; Rohm and Haas Company);
- On-site non-Dow facilities (formerly Dow) located within the Facility Boundary, if the wastes were originally Dow wastes approved to be received at the kiln or landfill (the change of ownership for certain Michigan Operations plants associated with Trinseo (formerly Styron) is an example of this scenario) ;
- Off-site non-Dow facilities (formerly Dow) not located within the Facility Boundary, if the wastes were originally Dow wastes approved to be received at the kiln or landfill (the

change of ownership of Dow's facilities in Dalton, Georgia and Allyn's Point, Connecticut associated with Trinseo is an example of this scenario);

- On-site non-Dow facilities located within or contiguous to Dow's Midland Plant Site (Industrial Park concept) that have a strategic business relationship with Dow (e.g., landlord/tenant, supplier/receiver of raw material or service) and whose wastes are similar to wastes already approved to be received at the kiln or landfill;
- Off-site non-Dow facilities that are or will be in a strategic business relationship with Dow (e.g., landlord/tenant, supplier/receiver of raw material or service) whose wastes are similar to wastes already approved to be received at the kiln or landfill;
- Off-site non-Dow facilities that generate waste with heating value of greater than 5000 BTU/lb for liquids or 100 BTU/standard cubic foot for gas. These waste streams will be used to reduce consumption of natural gas and Diesel fuel at the incinerator; and
- Small quantities of waste as a "public service" (e.g., household hazardous waste, waste from local educational and not-for-profit institutions). These services are provided at no charge.

The off-site and/or non-Dow waste locations can and will change over time.

Dow's Michigan Operations has developed a WAP to ensure that its facility at Midland, Michigan will accept only wastes that it is authorized to accept. The hazardous wastes stored, treated, and disposed at Dow's Michigan Operations will be properly characterized prior to waste acceptance. All generators will be required to provide a complete waste characterization, including chemical analysis when appropriate. Waste screening will be conducted on every shipment of waste to ensure that the waste conforms to the waste profile for the generator and information on incoming manifests and to ensure that the waste is properly managed within the facility.

All analysis performed pursuant to this application will be consistent with the QA/QC Plan included in this WAP. All samples for the purpose of waste characterization will be collected, transported, stored, and disposed by trained and qualified individuals in accordance with the QA/QC Plan. For a more detailed description of the quality assurance process, refer to the Dow Chemical Michigan Operations License Reapplication (Appendix C of the Sampling and Analysis Plan which is Appendix B5-1 of Attachment XIV.B5, Environmental Monitoring) and Section 2.10 of Appendix I of Section V of the Salzburg Landfill Operating License Reapplication.

In accordance with R 299.9609 and 40 CFR §264.73 and Part 264, Appendix I, Dow's Michigan Operations will retain all records and results of waste determinations performed as specified in 40 CFR §§264.13, 264.17, 264.314, 264.1034, 264.1063, 264.1083, 268.4(a), and 268.7 in the facility operating record until closure of the facility.

A3.A.1 Initial Waste Characterization Requirements for Generators
[R 299.9605(1) and R 299.9504(1)(c) and 40 CFR §264.13(b)(5)]

Dow's Michigan Operations will require the following waste profile information for initial waste shipments from all generators prior to waste acceptance.

See Figure A3-1 Example Generator Waste Characterization Form (GWCF).

The GWCF has specific sections that address generator identification, the type of transport container, the chemical composition, the regulatory status of the waste, physical properties, process knowledge reference, data analysis, reactive chemicals properties, exposure hazards, and cleanup procedures, etc.

The GWCF is completed and evaluated using a computer based waste characterization system. This system enables computer-based input, evaluation, archiving and use of waste characterization data. A printable version of the GWCF can be obtained from the system. All references to the GWCF within this WAP refer to the form and/or the computer-based waste characterization system.

Figure A3-2 is a logic diagram that a generator can follow in order to determine the proper treatment and disposal of hazardous wastes. The steps include the characterization of a waste initially, the selection of a method of disposal, an assessment of the disposal method, internal tracking procedures and finally treatment. If information is lacking in the GWCF, the process of characterization is repeated.

Figure A3.A.1 Information to be on Each Generator Waste Profile Form.

In addition to the GWCF submitted by the generator, for non-Dow generators Michigan Operations will:

- Require submittal of a representative waste sample
- Conduct an audit of the generator facility
- Review industry literature to identify typical waste streams
- Other: [describe]

A3.A.1(a) Generator Waste Characterization Discrepancies
[R 299.9605(1) and R 299.9504(1)(c) and 40 CFR §§264.13(a)(3) and (4),
264.13(b)(c), and 264.72]

Prior to acceptance of the waste for management at the Michigan Operations site, sufficient information is obtained from the waste generator to enable qualified personnel to determine the suitable treatment or disposal method. This information is collected by use of the GWCF. Information is collected to determine if the waste is characteristically hazardous (ignitable, corrosive, reactive, or toxic), or if it meets the definition of one of the RCRA listed hazardous wastes (F, K, P, and U lists). Information is also collected to determine if the waste is hazardous as defined under Part 111 of Michigan Act 451 (toxic or Michigan S and U lists).

Regulatory compliance, personnel exposure, environmental impact, technical data, and material handling concerns are reviewed on the basis of available information. After a review by qualified waste characterization reviewers (and if necessary, by other appropriate resources such as Industrial Hygiene, Safety, Emergency Response, Product Technical Centers, and Dow's reactive chemical experts), information on waste preparation, proper handling, packaging, and other requirements is conveyed to the waste generator. Only wastes meeting

Environmental Operations' requirements will be accepted (see the GWCF (Figure A3-1) and Logic Diagram for Treatment and Disposal of Hazardous Waste (Figure A3-2)).

The type of information requested will depend upon the preliminary waste management mode proposed. If sufficient data exists in the GWCF to ensure the appropriate treatment or disposal procedures can be implemented safely, additional analyses will not be performed. In cases where insufficient data is submitted by a waste generator, the generator will be notified and required to provide additional data and/or analysis of the waste. Analyses performed will follow Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846) or equivalent methods. The most recent approved version of SW-846 will be used when applicable.


A3.A.1(b) Subsequent Waste Shipment Procedures
 [R 299.9605(1) and R 299.9504(1)(c) and 40 CFR §§264.13(a)(3) and 264.13(b)(4)]

All waste characterizations are reviewed and updated by the generator on a specified frequency depending on the unit receiving the waste (see table below). Additionally, a re-characterization and/or analysis will occur whenever a process modification has resulted in a waste change that is significant enough to affect its regulatory status or handling characteristics. A new waste characterization form may need to be filled out if off-site waste arriving at the facility is suitable for treatment at the facility but does not match the accompanying manifest or shipping paper.

Unit	Review Frequency
Landfill	Annual (all streams)
Waste Water Treatment Plant Influent	Every two years (on-site Dow streams) Annual for off-site or non-Dow streams
Tertiary Treatment Pond Influent	Annual (all streams)
Incineration	Every three years (on-site Dow streams) Annual for off-site or non-Dow streams

A3.A.1(c) Additional Waste Analysis Requirements
 [R 299.9605(1) and R 299.9504(1)(c) and 40 CFR §§264.13(b)(6) and 264.13(c)(3)]

Dow's Michigan Operations will ensure that qualified personnel review the waste profile information to ensure that the facility is authorized to receive the waste, and can manage the waste in compliance with the following:

 (Check as appropriate)

- R 299.9605 and 40 CFR §264.17 General requirements for ignitable, reactive, or incompatible wastes (not accepted at Salzburg Landfill, unless the waste meets treatment standards)
[See the appropriate Preventative Procedures section]
- R 299.9631 and 40 CFR §264.1063(d) Test methods and procedures (Subpart BB)
[Template A3, Section A3.A.2(c)]

- | | |
|---|---|
| <input checked="" type="checkbox"/> 40 CFR §264.1083 | Waste determination procedures (Subpart CC)
[Template A3, Section A3.A.2(c)] |
| <input checked="" type="checkbox"/> R 299.9627 and 40 CFR §268.7 | Waste analysis and record keeping LDR
requirements
Appendix 3-2 of this Module |
| <input checked="" type="checkbox"/> R 299.9503 (1) (h) and 40 CFR
264.13 (c) (3) | Procedures to verify that no addition of
biodegradable sorbents in containers destined to
be landfilled has occurred. |
| <input type="checkbox"/> R 299.9228 | Universal waste requirements
[Template _____, Section _____] |

A3.A.2 Waste Acceptance Procedures
[R 299.9605(1) and R 299.9504(1)(c), and 40 CFR §§264.13(c), 264.72(a) and (b),
and 264.73(b)]

Waste shipments arrive at the facilities in the following containers:

- | | | |
|--|--|--|
| <input checked="" type="checkbox"/> Drums/Packs | <input checked="" type="checkbox"/> Totes* | <input checked="" type="checkbox"/> Tanker trucks* |
| <input checked="" type="checkbox"/> Lab packs* | <input checked="" type="checkbox"/> Dump trucks | <input checked="" type="checkbox"/> Railroad cars* |
| <input checked="" type="checkbox"/> Roll-off boxes | <input checked="" type="checkbox"/> Vacuum trucks* | <input checked="" type="checkbox"/> Gas cylinders* |
| <input checked="" type="checkbox"/> Portable tanks (dinos, dempsters)* | | |

* Salzburg Landfill does not accept waste in/ from these containers, since these typically contain liquid or contained-gas wastes. However, in the rare event that a container itself is deemed a waste, that container may be placed into Salzburg Landfill subject to applicable regulations and license requirements.

Upon receipt of wastes from an off-site or non-Dow generator, Dow's Michigan Operations will ensure qualified personal will perform all of the following tasks:

- Review paperwork
- Visually inspect the waste
- Perform waste screening of waste

These tasks are discussed below.

A3.A.2(a) Review Paperwork
[R 299.9605(1) and R 299.9504(1)(c), and 40 CFR §§264.13(c), 264.72(a) and
(b), and 264.73(b)]

Dow's Michigan Operations will ensure that qualified personal review all paperwork, including manifests and LDR notifications, before any wastes are accepted by the Michigan Operations facility. Dow's Michigan Operations will ensure that qualified personal review all paperwork for

completeness. In addition, the manifest and LDR notification will be compared for consistency. The manifest will also be compared to the waste profile and analytical information provided by the generator and to the waste shipment to ensure the accuracy of information provided on shipment paperwork. The manifest will also be compared to the number of containers, the volume, and/or the weight of the waste in the shipment. All discrepancies will be resolved before processing the waste.

3.A.2(b) Visual Inspection of Waste
[R 299.9605(1) and R 299.9504(1)(c) and 40 CFR §264.13(c)]

Dow's Michigan Operations procedures ensure qualified personnel visually inspect a minimum of one container and up to a maximum of 100 percent of the containers from each generator for the condition of the containers and proper labeling (including barcodes for waste in packs). All discrepancies will be resolved before processing the waste.

A3.A.2(c) Waste Screening
[R 299.9605(1) and R 299.9504(1)(c) and 40 CFR §§264.13(b)(14) and 264.13(c)(2)]

For off-site or non-Dow approved wastes that can be mixed with wastes at the facility, quality acceptance testing may be appropriate. These may be physical or analytical tests such as pH, color, specific gravity, or visual appearance. The sampling method will be an appropriate method described in 40 CFR 261, Appendix I. If deemed necessary, the specifics of such procedures are defined with the assistance of the generator prior to shipment. As with wastes generated on-site, these wastes will be evaluated for compatibility prior to being co-managed with other wastes.

In the event that sampling at the time of arrival indicates that the shipment is not the same as was previously characterized, then the waste is isolated and contained and the generator is contacted. The material will be re-characterized and re-approved prior to acceptance, or the shipment is rejected and returned to the generator. Waste accumulation periods for generators are managed within the requirements of 40 CFR 262.34.

During the waste characterization approval process, the qualified reviewer will evaluate waste that could go to the Landfill for non-biodegradable absorbents prior to final approval of the waste characterization. This would normally be the Environmental Management Unit approver. The generator will indicate on the GWCF, types of absorbent to be used for each waste. The following absorbents are approved for use on wastes disposed at Salzburg Landfill: Zorball®, sand, spun polypropylene, clay, vermiculite, and other non-biodegradable absorbents as defined in 40 CFR 264.314(d).

Salzburg Landfill does not accept wastes containing free liquids. Wastes will be visually screened for free liquids prior to landfilling.

The GWCF is attached at the end of this section in lieu of template Tables A3.A.1 and A3.A.2.

A3.A.3 Procedures to Ensure Compliance with Land Disposal Restrictions (LDR) Requirements [R 299.9627 and 40 CFR, Part 268]

All shipments of wastes subject to LDR received at the facility will be accompanied by appropriate generator notification and LDR notification in accordance with R 299.9627 and 40 CFR §268.7. The LDR notification accompanying generator wastes will be reviewed, and

any discrepancies in the LDR notification and the associated manifest, analytical records, or Waste Profile Form will require shipment rejection unless additional, satisfactory, clarifying information is provided by the generator. All information obtained to document LDR compliance will be maintained in the facility operating record until closure of the facility.

If the facility receives a shipment of waste without LDR notification, or a notification with incorrect or incomplete information, the following actions will be conducted:

- Dow Michigan Operations will follow up with waste generator to address the issue.

In accordance with the LDR regulations, all wastes shipped off site will be analyzed, or generator knowledge will be used when appropriate, to determine whether the waste meets the applicable LDR treatment standards specified in R 299.9627 and 40 CFR §§268.41-43. All analytical results will be maintained in the facility operating record until closure of the facility. Wastes that are determined through analysis to meet treatment standards as specified in R 299.9627 and 40 CFR §268.41-43 will be landfilled.

Dow's Michigan Operations will supply LDR notifications and certification, including appropriate analytical records to support the certification, to the receiving TSDf with each off-site shipment of waste. The notifications and certifications will contain the information required under R 299.9627 and 40 CFR §268.7. Any additional data obtained from the generators (e.g., Waste Profile Forms, original LDR notifications, analysis provided by generators) will be provided to the licensed TSDf where the waste will be sent.

Dow has obtained in the past and may obtain future variances from LDR requirements per 40 CFR 268.6. Where variances exist, disposal of the solids will meet the approved variance requirements. Active variances can be found in the appendices of this Attachment.

A3.A.3(a) Spent Solvent and Dioxin Wastes
[R 299.9627 and 40 CFR §§264.13(a)(1), 268.7, 268.30, 268.31, 268.40, 268.41, 268.42, and 268.43]

Spent solvent wastes (F001-F005) are accepted at the facility. Generator process knowledge will be used to determine the presence of spent solvent wastes (F001-F005). Generator process knowledge will be documented on the GWCF and LDR notification. The LDR notification will provide additional information regarding the appropriate treatment standards for the waste and whether it has already been treated to the appropriate standards.

A3.A.3(b) Listed Wastes
[R 299.9627, R 299.9213, and R 299.9214 and 40 CFR §§264.13(a)(1), 268.7, 268.33, 268.34, 268.35, 268.36, 268.39, 268.40, 268.41, 268.42, and 268.43]

Generator process knowledge will be used to determine whether listed waste meets the applicable treatment standards or to demonstrate that the waste has been treated by the appropriate specified treatment technology. In accordance with R 299.9627 and 40 CFR §268.41, where treatment standards are based on concentrations in the waste extract, the facility will use toxicity characteristic leaching procedures (TCLP) to determine if wastes meet treatment standards. The information gathered during generator process knowledge creation will be documented on the waste material profile report and LDR notification.

A3.A.3(c) Characteristic Wastes
[R 299.9627, R 299.9208, and R 299.9212 and 40 CFR §§261.3(d)(1), 264.13(a)(1), 268.7, 268.9, 268.37, 268.40, 268.41, 268.42, 268.43 and Part 268, Appendix I and Appendix IX]

Generator process knowledge will be used to determine whether characteristic waste meets the applicable treatment standards or to demonstrate that the waste has been treated by the appropriate specified treatment technology. In accordance with R 299.9627 and 40 CFR §268.41, where treatment standards are based on concentrations in the waste extract, generators shipping waste to the facility will determine if their wastes meet treatment standards.

If laboratory analysis is necessary, characteristic D008 lead nonwastewaters and D004 arsenic nonwastewaters will be analyzed using TCLP to determine compliance with treatment standards of 40 CFR §§268.40 and 268.48. If after treatment a hazardous waste displays a characteristic for the first time, the characteristic waste code will be added to the LDR notification and facility records. Wastes will be retreated, as appropriate, to meet the characteristic treatment standards of 40 CFR §§268.40 and 268.48 prior to land disposal. In addition, the Generator process knowledge will be used to identify the underlying hazardous constituents that are expected to be present in the waste. Generator process knowledge will be documented on the waste material profile report and LDR notification.

A3.A.3(d) Radioactive Mixed Waste
[R 299.9627 and 40 CFR §§268.7, 268.35(c), 268.35(d), 268.36, and 268.42(d)]

Generator process knowledge will be used to determine whether a radioactive mixed waste meets the applicable treatment standard. Radioactive mixed waste is characterized using the same process as all other waste. Michigan Operations has a license from the Nuclear Regulatory Commission for treatment of the radioactive materials handled on the site.

NOTE: Salzburg Landfill does not accept radioactive waste for disposal, but it does receive treatment residues from the Midland Plant incineration complex. Salzburg Landfill does accept waste containing naturally occurring radioactive material, "NORM", as exempted by R 325.5052 of Michigan's Ionizing Radiation Rules, Act No. 305 of the Public Acts of 1972.

A3.A.3(e) Leachates
[R 299.9627 and 40 CFR §260.10 and 40 CFR §§268.35(a) and 268.40]

Dow's Michigan Operations F039 multi-source leachate is treated in its waste water treatment plant. The secondary effluent from the waste water treatment plant is checked annually to confirm that it meets LDR treatment standards. Based on the F039 constituents in the wastes treated the prior year according to completed GWCFs, a selected list of constituents is monitored. A list of analytes for prior years is available upon request.

A3.A.3(f) Laboratory Packs
[R 299.9627 and 40 CFR §§268.7 and 268.42(c) and Part 268, Appendix IV and Appendix V]

The laboratory packs accepted at the facility are not land disposed. Laboratory packs are treated by incineration and the incinerator ash is tested annually to verify that it meets LDR treatment standards.

If a laboratory pack hazardous waste is combined with nonlaboratory pack hazardous waste prior to or during treatment, the entire mixture will be treated to meet the most stringent treatment standards for each waste constituent before being land disposed.

A3.A.3(g) Contaminated Debris
[R 299.9627 and 40 CFR §§268.2(g), 268.7, 268.9, 268.36, 268.45, and 270.13(n)]

The hazardous debris categories and the contaminant categories associated with the types of hazardous debris accepted at the facility are presented in Table A3.A.3.

Hazardous debris accepted at the facility that exhibits the characteristics of ignitability, corrosivity, or reactivity will be treated using one of the extraction, destruction, or immobilization technologies identified in Table 1 of 40 CFR §268.45.

A3.A.3(h) Waste Mixtures and Wastes with Overlapping Requirements
[R 299.9627 and 40 CFR §§264.13(a), 268.7, 268.41(b), 268.43(b), and 268.45(a)]

Generator process information and analytical data will be used to demonstrate that those waste mixtures and wastes with multiple codes are properly characterized. Each waste that has more than one characteristic will be identified with a number for each characteristic. Waste identified as meeting a listing and exhibiting a characteristic will be primarily identified with the listed waste code for the purpose of manifesting, etc. Wastes that carry more than one characteristic or listed waste code are treated by the appropriate treatment standard for each waste code as required by 40 CFR 268.

A3.A.3(i) Dilution and Aggregation of Wastes
[R 299.9627 and 40 CFR §268.3]

Listed wastes, if destined for land disposal, may not be diluted from the point of generation to the point of land disposal. Characteristic wastes may only be diluted if, (1) the waste is managed in a Clean Water Act (CWA)/CWA-equivalent surface unit or a Class I Safe Drinking Water Act injection well, (2) the waste has a concentration-based treatment standard or is treated using the DEACT technology-based treatment standard, and (3) the waste is not a D003 reactive waste. [Note: these requirements may change in the future. At that time, this template may be amended.]

The facility may not dilute or partially treat a listed waste to change its treatability category (i.e., from nonwastewater to wastewater), in order to comply with different treatment standards. If the wastes are all legitimately amenable to the same type of treatment to be performed, the facility may aggregate wastes for treatment.

Table A3.A.3 Contaminated Debris Categories

Hazardous Debris Category	Contaminant Category
Glass: Yes	Toxicity characteristic waste, or debris contaminated with listed waste
Metal: Yes	Toxicity characteristic waste, or debris contaminated with listed waste
Plastic: Yes	Toxicity characteristic waste, or debris contaminated with listed waste
Rubber: Yes	Toxicity characteristic waste, or debris contaminated with listed waste
Brick: Yes	Toxicity characteristic waste, or debris contaminated with listed waste
Cloth: Yes	Toxicity characteristic waste, or debris contaminated with listed waste
Concrete: Yes	Toxicity characteristic waste, or debris contaminated with listed waste
Paper: Yes	Toxicity characteristic waste, or debris contaminated with listed waste
Asphalt: Yes	Toxicity characteristic waste, or debris contaminated with listed waste
Rock: Yes	Toxicity characteristic waste, or debris contaminated with listed waste
Wood: Yes	Toxicity characteristic waste, or debris contaminated with listed waste

The waste characterization process used for all other waste will be used to characterize the hazardous debris managed at the facility. These procedures ensure hazardous debris is treated in accordance with treatment standards specified in R 299.9627 and 40 CFR 268.45, or to meet the existing treatment standards for each waste constituent specified in R 299.9627 and 40 CFR 268.41 and 268.43 (except wastes with a specified treatment technology listed in R 299.9627 and 40 CFR 268.42, which must be treated as required in R 299.9627 and 40 CFR 268.42).

A3.B CAPTIVE FACILITY

Although the Dow Michigan Operations is a captive facility, some off-site wastes (as described in A3.A) are received; therefore, it was more appropriate to complete Section A3.A of the template.

In accordance with R 299.9609 and 40 CFR §264.73 and Part 264, Appendix I, Dow's Michigan Operations will retain all records and results of waste determinations performed as specified in 40 CFR §§264.13, 264.17, 264.314, 264.1034, 264.1063, 264.1083, 268.4(a), and 268.7 in the facility operating record until closure of the facility.

A3.C NOTIFICATION, CERTIFICATION, AND RECORDKEEPING REQUIREMENTS [R 299.9627 and R 299.9609 and 40 CFR §§264.73, 268.7, and 268.9(d)]

Dow's Michigan Operations will perform the following procedures for preparing and/or maintaining applicable notifications and certifications to comply with LDRs: Appendix A3-2 to the WAP describes Dow's Michigan Operations' procedures for preparing and/or maintaining applicable notifications and certifications to comply with LDRs.

A3.C.1 Retention of Generator Notices and Certifications [R 299.9627 and 40 CFR §268.7(a)(7)]

Dow's Michigan Operations will retain a copy of all notices, certifications, demonstrations, data, and other documentation associated with compliance to LDRs. The following notices and certifications submitted by the initial generator of the waste will be reviewed and maintained:

- Notices of restricted wastes not meeting treatment standards or exceeding levels specified in RCRA §3004(d), including the information listed in R 299.9627 and 40 CFR §268.7(a)(1).
- Notices of restricted wastes meeting applicable treatment standards and prohibition levels, including the information in R 299.9627 and 40 CFR §268.7(a)(2).

A3.C.2 Notification and Certification Requirements for Treatment Facilities [R 299.9627 and 40 CFR §268.7(b)]

The treatment facility will submit a one-time notice and certification to the land disposal facility with each shipment of restricted waste or treatment residue of a restricted waste. The notice will include the information specified in R 299.9627 and 40 CFR §§268.7(b)(4) and 268.7(b)(5).

If the waste or treatment residue will be further managed at a different treatment or storage facility, the facility will comply with the notice and certification requirements applicable to generators as specified in R 299.9627 and 40 CFR §268.7(b)(6).

A3.C.3 Waste Shipped to Subtitle C Facilities [R 299.9627 and 40 CFR §§268.7(a) and 268.7(b)(6)]

- For restricted waste or waste treatment residues that will be further managed at a Subtitle C (hazardous waste management) facility, the facility will submit notifications and certifications in compliance with the notice and certification requirements applicable to generators under R 299.9627 and 40 CFR §268.7(a) and (b)(6). Each shipment of

waste to be transported off site to a RCRA-authorized Subtitle C TSD will include a written notification and certification that the waste either meets or does not meet applicable treatment standards of prohibition levels.

A3.C.4 Waste Shipped to Subtitle D Facilities
[R 299.9627 and 40 CFR §§268.7(d) and 268.9(d)]

- If the facility ships hazardous debris or characteristic waste to a Subtitle D facility, the facility will submit a one-time notification and certification for characteristic wastes, or listed wastes that are listed only because they exhibit a characteristic, that have been treated to remove the hazardous characteristic and are no longer considered hazardous. The facility will place a certification and all treatment records in the facility's file and send a notification and certification to the Director, or delegated representative, describing the wastes and applicable treatment standards and identifying the Subtitle D (solid waste management) disposal facility receiving the waste. On an annual basis, the notification and certification will be updated and refiled if the process or operation generating the waste changes and/or if the Subtitle D facility receiving the waste changes.

A3.C.5 Recyclable Materials
[R 299.9627 and 40 CFR §268.7(b)(6)]

- The facility does not accept recyclable materials used in a manner constituting disposal.

A3.C.6 Record Keeping
[R 299.9608(4), R 299.9609, R 299.9610(3), and R 299.9627 and
40 CFR §§264.72, 264.73, 268.7(a)(5), 268.7(a)(6), 268(a)(7), and 268.7(d)]

Dow's Michigan Operations maintains a facility operating log in accordance with R 299.9609 and 40 CFR §264.73.

Copies of all necessary notifications and certifications, as well as relevant inspection forms and monitoring data, are also maintained on file at the facility. Files will be maintained for a minimum of three years (for inspection records and LDR notification), or until facility closure (for inventory records).

If a significant manifest discrepancy is discovered (such as variation in one-piece count or misrepresentation of the type of waste or corrosive rather than flammable) that cannot be resolved with the generator or transporter within 15 days of receipt, facility personnel will submit to the Director and Regional Administrator a letter describing the discrepancy and all attempts to reconcile the discrepancy. The letter will include a copy of the discrepant manifest or shipping document.

In the event that the facility manages a restricted waste that is excluded from the definition of a hazardous or solid waste or exempt from Subtitle C regulations: The facility will place a one-time notice in the facility files describing the generation, basis for exclusion or exemption, and disposal of the waste. For each shipment of treated debris, the facility will place a certification of compliance with applicable treatment standards in the facility's files.

A3.C.7 Required Notice

[R 299.9605(1) and 40 CFR §264.12(a) and (b)]

The facility will notify the Division Director in writing at least four weeks before the date the facility expects to receive hazardous waste from a foreign source. Notice of subsequent shipments of the same waste from the same foreign source is not required. When receiving such hazardous waste, the facility will comply with applicable treaties or other agreements entered into between the country in which the foreign source is located and the United States.

When the facility is to receive hazardous waste from an off-site source, the facility will inform the generator in writing that the facility has the appropriate license for and will accept the waste the generator is shipping. The facility will keep a copy of this written notice in the operating record.

WASTE ANALYSIS PLAN - APPENDIX A3-1

QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

Quality Assurance/Quality Control Procedures

Analyses performed will follow Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846) or equivalent methods. The most recent approved version of SW-846 will be used when applicable. The appropriate quality assurance/quality control procedures as specified in the SW-846 methods will be followed. The quality assurance process is designed to insure that the information and data is technically sound, statistically valid, and properly documented. The quality assurance process provides the highest quality data possible or needed, within the constraints of the existing methods, sample matrix, and informational needs. The amount of quality assurance review that is needed may vary depending on the complexity of analyses required for the waste management method or regulatory program.

The quality control procedures are used to estimate and evaluate the reliability of the analytical data and to determine the necessity or the effect of corrective action on sampling, storage, shipping and analytical procedures. Inaccuracies can result from many causes, including unanticipated matrix effects, equipment malfunctions, and operator error. These factors are minimized through the use of quality control procedures by means of precision, accuracy, method detection limit studies, recovery determination, and other quantifiable and qualitative indicators.

For a more detailed description of the Quality Assurance Program (QAP) refer to the Dow Chemical Michigan Operations License Reapplication (Appendix C of the Sampling and Analysis Plan which is Appendix B5-1 of Attachment XIV.B5, Environmental Monitoring) or the Salzburg Landfill license application (Section V, Appendix A, Attachment C).

WASTE ANALYSIS PLAN - APPENDIX A3-2

LAND DISPOSAL RESTRICTIONS

Land Disposal Restrictions

R 299.9627, 40 CFR 270.14(b)(3), 40 CFR 268.7(b)

The purpose of this section is to define how the regulated facilities at Dow's Michigan Operations will comply with the requirements of R 299.9627 [40 CFR 268].

Generators

All generators (both on-site and off-site) must submit a completed Generator's Waste Characterization Form (GWCF) to the appropriate Environmental Operations personnel for approval before any waste will be accepted for treatment, storage, or disposal at any of the regulated units covered by this reapplication. This submittal and the approval procedure are explained in Attachment XIV.A2—Chemical and Physical Analyses, of this reapplication. The GWCF incorporates the Land Disposal Restriction (LDR) notifications and certification as required by R 299.9627 [40 CFR 268.7] for generators submitting wastes for treatment, storage, or disposal. Therefore, it is assured that all generators will submit the required LDR paperwork.

The generator submits the appropriate LDR documentation as part of the GWCF for the waste stream to be treated, stored, or disposed in the regulated units. The LDR notifications and any required certifications are maintained in the operating record of the owner/operator of the unit until closure of the unit as required by R 299.9609 [40 CFR 264.73(b)(11-14)].

For off-site shipments, a copy of the LDR notification and any required certification must accompany the first shipment of waste to the treatment, storage, or disposal facility. The manifest number associated with the first shipment of off-site waste to Dow's Michigan Operations will be maintained as part of the operating record.

Annual LDR Certification Sampling and Analysis

The sampling and analysis program is coordinated between the Incinerator, the ash dewatering-staging area, and the WWTP personnel. The program involves a certification burn in which representative wastes managed by the units are burned during a single campaign to generate residues for analyses. Scrubber water is not analyzed directly for LDR constituents because it is sent to the WWTP for treatment, not to land disposal. The importance of scrubber water as a waste stream is that, due to the derived-from rule, it contributes many of the hazardous waste codes for which the WWTP certifies in their secondary effluent.

Selection of Wastes for Annual Certification Burn

Waste codes associated with waste streams incinerated in excess of 250,000 pounds during the previous calendar year are codes that are burned for the LDR Certification Burn.

Leachate from the Michigan Operations Midland Plant site, as well as the Salzburg Landfill site, is treated at the Michigan Operations WWTP. Solid residues from the WWTP are then sent to the incinerator for treatment. WWTP solids are included as part of the recipe for the LDR certification burn, and they act as a surrogate for the regulated hazardous constituents attached to F039 and the RCRA codes the constituents carry. (268.40)

The quantity of 250,000 pounds was determined from the historical EPA HSWA permit of October 1988. In the past, for purposes of the LDR program, the year was based on the date of issuance of the historical HSWA permit for the facility. The year is currently based on a calendar year.

Sampling Techniques and Locations

Incinerator Ash

The primary sampling location for Incinerator ash is in the ash dewatering-staging area (33 Building). A representative sample of ash is collected. The methods referenced in R 299.9212(7) [40 CFR 261 Appendix I] are used when applicable.

Secondary Effluent

Sampling times for secondary effluent are based on retention time through the WWTP. This retention time will vary based on hydraulic load at the time that the certification program is conducted. After the specified retention time has elapsed to allow for scrubber water from the Incineration Complex to be passing through the system, samples of secondary effluent are taken on a periodic basis (typically once per hour) for the period of time corresponding to the duration of the certification burn. These samples are composited to form one sample for analysis.

Determination of Target Analyte List for Certification

The target compounds for analysis are determined from waste stream data. The target compounds are specified in R 299.9311 [40 CFR 268 Subpart D]. These analytes may include total content and Toxicity Characteristics Leaching Procedure (TCLP) analysis for volatile, semi-volatiles, inorganics, and metals.

Analysis

Samples will be analyzed by the Dow Environmental Analysis Research Laboratory and Analytical Sciences Laboratories. In some cases, the services of an outside laboratory will be engaged. All analyses performed will follow SW-846 methods or equivalent.

Interpretation of Land Disposal Restrictions Sample Results

Results of the sample analyses will be evaluated against the published treatment standards to demonstrate compliance. This procedure will compare the concentrations of constituents in the regulated waste streams to fixed treatment standards. This comparison will test a hypothesis that compares a mean to a fixed number using a t-test.

The concentrations of constituents in the regulated waste streams at the designated Points of Compliance will be compared to their treatment standards to determine if they are in compliance with the treatment standards. The comparison will use a Student's t-test at the 0.05 level of significance to determine if a statistically significant increase over the treatment standard limit has occurred.

Initially, one sample from each of the appropriate regulated waste streams will be taken and analyzed for the applicable constituents to be monitored from R 299.9311 [40 CFR 268]. If all of the constituents analyzed in all of the samples are below their respective treatment standards, then the treatment standard is not being exceeded and the sampling period is over. If, on the other hand, the concentration of a constituent in a sample is determined to be above the treatment standard, then that stream will be re-sampled four (4) consecutive times, generating four (4) different samples. These four (4) samples will each be analyzed for the constituent(s) which exceeded the treatment standard. This analysis will generate a total of five (5) analyses of the specific hazardous waste constituent(s) in the stream, and these five (5) analyses will be statistically compared to the treatment standard.

The five (5) analyses of the detected constituent will form a population of size $n=5$. From this population, the mean (\bar{X}) and the standard deviation (s) will be calculated as follows:

$$\bar{X} = \frac{1}{n} \sum x_i$$
$$s = \left[\frac{1}{(n-1)} \sum (x_i - \bar{x})^2 \right]^{1/2}$$

where: x_i = the individual measured concentrations of the specific constituent.

When a measured concentration is below the detection level, one-half of the detection level will be used as the value x_i . Though this can cause errors in the estimation of the standard deviation and the mean, these errors should be small because the treatment standards are all above the detection limits. The data will then be used to test the null hypothesis (H_0) that “the concentration of the constituent in the waste stream is less than or equal to the treatment standard” versus the alternate hypothesis (H_1) that “the concentration of the constituent in the waste stream is greater than the treatment standard.”

The rejection region for the null hypothesis is set up as:

If $x \leq (c_j + t^*s/n)$: Do not reject H_0
If $x > (c_j + t^*s/n)$: Reject H_0 in favor of H_1

Where c_j equals the treatment standard for hazardous waste constituent j , and t is the t-statistic with a 0.05 level of significance. For a sample size (n) of 5, and therefore 4 degrees of freedom, $t = 2.132$.

For situations where additional samples are taken, or fewer samples need to be compared to the concentration limit due to currently unforeseen difficulties, a list of values for the t-statistic are included below.

Land Disposal Restrictions
t-Table for Proposed t-Test Alpha = 0.05

Degrees of Freedom ¹	t Statistic
1	6.314
2	2.920
3	2.353
4	2.132
5	2.015
6	1.943
7	1.895
8	1.860
9	1.833
10	1.812
11	1.796
12	1.782
13	1.771
14	1.761
15	1.753
16	1.746
17	1.740
18	1.734
19	1.729
20	1.725
21	1.721
22	1.717
23	1.714
24	1.711
25	1.708
30	1.697
40	1.684
60	1.671
120	1.658
Infinity	1.645

¹ For the statistical test proposed in Section XVI.B, the degrees of freedom equals the sample size minus one, or d.f. = n-1.

WASTE ANALYSIS PLAN - APPENDIX A3-3
LAND DISPOSAL RESTRICTIONS VARIANCE

WASTE ANALYSIS PLAN - FIGURE A3-1

EXAMPLE GENERATOR'S WASTE CHARACTERIZATION FORM

WASTE ANALYSIS PLAN - FIGURE A3-2

LOGIC DIAGRAM FOR TREATMENT AND DISPOSAL OF HAZARDOUS WASTE

Dow Waste Characterization Form - Example

The Dow Waste Characterization Form consists of a series of subject matter forms. The subject matter forms are used and included only when they are applicable to an individual waste stream. Not all subject matter forms will be applicable for every waste stream. Dow utilizes an electronic system in order for generators, including non-Dow generators, to complete the Generator Waste Characterization Form (GWCF). If information is not pertinent to a particular stream, then pages on the detailed GWCF are currently printed with blanks. In order to reduce the amount of blank paper printed needlessly, one improvement that has been applied to the GWCF is that the generator will be able to print the Profile Summary Report, which includes only the applicable information. A list of the subject matter form names and a brief overview of their content is given below.

Form Name	Included For:	Length	Signature
Submittal Form	All wastes	1 page	Yes
Profile Summary Report	All wastes	3-8 pages	No
LDR Forms listed below:	Hazardous wastes only		
<ul style="list-style-type: none"> • LDR Off-site shipments 	Wastes sent from off-site to Dow and from Dow to off-site	1 page	No
<ul style="list-style-type: none"> • LDR Appendix IV Lab Pack Certification 	RCRA Hazardous Lab Packs only	1 page	Yes
<ul style="list-style-type: none"> • LDR Notification 	RCRA Hazardous wastes	1-2 pages	Yes
<ul style="list-style-type: none"> • LDR Certification 	RCRA Hazardous with land disposal	1 page	Yes
<ul style="list-style-type: none"> • LDR Attachment 1 	RCRA Hazardous with RCRA F codes	2 pages	No
<ul style="list-style-type: none"> • LDR Attachment 2 (UHCs/UTS) 	RCRA Hazardous with RCRA D codes	8 pages	No

Examples of each form are included below.

EXAMPLE SUBMITTAL FORM

THE DOW CHEMICAL COMPANY UNIVERSAL WASTE CHARACTERIZATION

****Waste Profile Number:**

****Tracking ID:**

A. GENERATOR INFORMATION

- 1. Company Name :
- 2. Street Address :
- 3. Generator EPA ID # :
- 4. a. Contact name : b. Dow ID #:
- 5 a. Site Name/Plant Name/OPN :
- 6. NEA Cost Center Code (10 digits) :

B. GENERAL INFORMATION

- 1. Waste Title:

C. RECEIVER INFORMATION

- 1. Proposed location for waste storage, treatment or disposal

Name

GENERATOR/CONTACT PERSON CERTIFICATION

(MUST be trained in RCRA management)

I certify that, based on process knowledge, laboratory analysis, or my inquiry of those individuals immediately responsible for obtaining this information, the information on this form is true, accurate and complete, I am aware that significant penalties (including the possibility of fine and imprisonment) may be assessed for knowingly causing the improper classification and/or disposal of wastes.

Name(printed):

Master #:

Title:

Bldg #:

Telephone #:

Signature(original):

Date:

DO NOT DELETE. This marks the end of this waste characterization packet

Component Name	CAS Number	Specification ID	Concentration Range with units (% Wt, PPM, etc)	Average Concentration	Additive	Detrm. Meth.

[Total Aver. Conc. WCT Standard Composition : 100 %]

E. PHYSICAL CHARACTERISTICS

1. Physical state of waste as generated:

2. Physical state of waste as shipped:

3. Specific properties. DM = Determination Method (i.e. Analytical, Process Knowledge, Best Engineering

Property	Calc. Avg.	Calc. Min.	Calc. Max.	Avg.	Min.	Max.	Text Value/Cmnt.	DM
1,2-DICHLOROETHANE								
2-PROPENEAMINE								
2-PROPENEAMINE POLYMERS								
ALUMINUM NITRIDE								
ANTIMONY CONTENT								
ARSENIC CONTENT								
ASH								
AUTO IGNITION TEMPERATURE								
BERYLLIUM CONTENT								
BIS CHLOROMETHYL ETHER								
BROMINE CONTENT								
CADMIUM CONTENT								
CARBON CONTENT								
CHLORINE CONTENT								
CHROMIUM CONTENT								
CHROMIUM VI CONTENT								
COBALT CONTENT								
COLOR								
COPPER CONTENT								
DENSITY								
ETHANOL								
FLASHPOINT								
FLUORINE CONTENT								
HEAT OF COMBUSTION								
HYDRAZINE								
HYDROGEN CONTENT								
IODINE CONTENT								
LEAD CONTENT								
LITHIUM CONTENT								
LITHIUM HYDROXIDE								
MANGANESE CONTENT								
MERCURY CONTENT								

Property	Calc. Avg.	Calc. Min.	Calc. Max.	Avg.	Min.	Max.	Text Value/Cmnt.	DM
METHANOL								
MOLES OF H+								
NICKEL CONTENT								
NITROGEN CONTENT								
OXYGEN CONTENT								
PCB								
PH								
PHOSPHOROUS CONTENT								
PLATINUM CONTENT								
POTASSIUM CONTENT								
QUINOLINE								
SILVER CONTENT								
SODIUM CONTENT								
SULFUR CONTENT								
SULFURIC ACID CONTENT								
TETRACHLOROSILANE								
THALLIUM CONTENT								
TOLUENE								
TOTAL DISSOLVED SOLIDS								
TOTAL ORGANIC CARBON								
TOTAL OXYGEN DEMAND								
VINYL CHLORIDE								
ZINC CONTENT								

4. Reactive Chemical Properties

	Y/N/NA	Explanation
Shock Sensitive		
Decompose <200 ° F		
Perform testing		
Long term stability issues		
LOPA		
Preferred solvent		
Reactive with diesel fuel or other common solvents		
Polymer deposits		

5. Safety and Exposure Hazard

	Y/N/NA	Explanation
Sensitizer		
Lachrymator		
Acute Skin Exposure Hazard		
Carcinogenic		
Offensive Odor		
Acute Vapor Exposure Hazard		
Toxic		
Irritant		

	Y/N/NA	Explanation
Explain and list any acute hazard		

6. Personal Protective Equipment (PPE)

Handling

Type	PPE to wear in normal handling situations will be listed here (i.e. monogoggles, gloves, etc)
Eyes	
Hands	
Body	
FEET	
Breath	
Cartridge Type	

Spill

Type	
Eyes	
Hands	
Body	
FEET	
Breath	
Cartridge Type	

Others

Type	Other PPE to wear for handling or spill situations will be listed here
Eyes	
Hands	
Body	
FEET	
Breath	

7. Absorbents - USE

Additional absorbents to USE:

Absorbents to use appear here.

Absorbents - AVOID

Additional absorbents to AVOID:

Absorbents to avoid appear here.

How is the waste handled at the manufacturing plant? List any special precautions or procedures:

8. Have there been any known problems with treating this waste in the past?

9. Any additional information relevant to this profile?

Reference Codes

Substance

Reference Code Type	Reference Code	Description	Confirmed
Michigan Waste Catalog - MI_WC	MI State Codes		
USA Hazardous Waste Catalog (RCRA) - RCRA	D Codes		
USA Hazardous Waste Catalog (RCRA) - RCRA	F Codes		
USA Hazardous Waste Catalog (RCRA) - RCRA	U Codes		
USA Hazardous Waste Catalog (RCRA) - RCRA	P Codes		
USA Hazardous Waste Catalog (RCRA) - RCRA	K Codes		
APPLICABLE REGULATIONS - APPREG	RCRA HAZ		
APPLICABLE REGULATIONS - APPREG	TSCA 5E		
GHS - STATE OF MATTER - GHSSOM	GHS Related Codes		
EPA Source Codes - EPA Source Code	G-Code		

Receiver

Receiver	Reference Code Type	Reference Code	Description	Confirmed

Comments

Substance

Comment Type	Comment

Receiver

Receiver	Comment Type	Comment

THE DOW CHEMICAL COMPANY LDR CERTIFICATION WORKSHEET

**** For help, click on the [blue](#) hyperlinks to be forwarded to the appropriate section of the guidance document.**

Important:

- This form must be completed for all RCRA Hazardous Wastes and hazardous waste treatment residues.
- Records Retention of three years from the date the waste was last disposed of

A. LDR OFF-SITE SHIPMENTS **EXAMPLE OF LDR OFF-SITE SHIPMENTS FORM**

1. If the waste is to be transported to an off-site facility, complete the following generator information and send the applicable LDR Worksheet Sections and Attachments with the initial shipment of the waste

Name	<input type="text"/>	Phone	<input type="text"/>
Company	<input type="text"/>	EPA ID #	<input type="text"/>
Address	<input type="text"/>		

2. The waste identified on the accompanying (name of State) Hazardous Waste Manifest Number

does does not meet the applicable [LDR treatment standards](#).

3. The waste will be shipped to the following treatment, storage, or disposal unit or facility:

<input type="checkbox"/> Rotary Kiln	Dow Location	<input type="text"/>
<input type="checkbox"/> Permitted Storage	Dow Location	<input type="text"/>
<input type="checkbox"/> Landfill	Dow Location	<input type="text"/>
<input type="checkbox"/> Other Company	Facility Name	<input type="text"/>
	Location	<input type="text"/>

Note: Use the forms provided by the outside company for Waste Characterization and Land Disposal Restriction documentation rather than this LDR Worksheet unless the company does not have available forms.

B. LAB PACKS **SEE PAGE 20 FOR EXAMPLE OF LAB PACK CERTIFICATION FORM**

1. If the Lab Pack Exemption is to be used, complete the Lab Pack Certification form and send a copy with each shipment of waste. This applies to both on-site and off-site shipments. Other LDR sections do not need to be completed. To add this form to your waste characterization packet, go to the Main Form Section I and double-click the "Add" button for the "LDR App IV Lab Pack Certification"

C. LAND DISPOSAL RESTRICTION NOTIFICATION **EXAMPLE OF LDR NOTIFICATION**

This waste is subject to Land disposal Restrictions under 40 CFR 268. Attach Waste Analysis, if available.

1. This Waste requires requires treatment to meet the LDR requirements. *DO not complete Section E.*
 meets the treatment standards or has been treated by the [LDR specified technology](#). *(Complete Section E, LDR Certification, in addition to the other sections.)*
2. This waste meets the definition of a: Wastewater Non-wastewater.

A wastewater is a waste that contains <1% by weight Total Suspended Solids AND <1% by weight Total Organic Carbon

3. The information applicable to this waste is identified below. Check off at least one of the applicable box(es) below. If you do not know which box(es) to check, consult the Approver.

- a.** The waste is not restricted because there is no land disposal (or land disposal of waste treatment residues, e.g., ash).
- b.** The waste is a F001-F005 spent solvent. Complete the LDR Attachment 1 to specify the applicable constituents.

- c. The waste is F039 multi-source leachate. Complete the LDR Attachment 2 to specify the constituents present in the waste.^a
- d. The waste is an EPA listed hazardous waste (other than F001-F005, F039) as determined in Section A.4 of the RCRA Assessment Worksheet. Copy the EPA hazardous waste numbers to Section D of this LDR worksheet.
- e. This is a RCRA hazardous wastewater that is treated in a elementary neutralization system, wastewater treatment system, is discharged through an NPDES outfall, and/or is sent to a Publicly Owned Treatment Works, which are all subject to the Clean Water Act. Subsequent to generation, the wastewater becomes exempt from further RCRA regulation because it is managed as specified at 40 CFR 261.4(a)(2). Copy the EPA hazardous waste numbers from Section A and B of the RCRA Assessment Worksheet to Section D of this LDR worksheet.
 [This is the One-time Notice to File Pursuant to 40 CFR 268.7(a)(7)].
- f. The waste is characteristically hazardous (D001-D043) as determined in specified in Section B of the RCRA Assessment Worksheet. Copy the EPA hazardous waste numbers to Section D of this LDR worksheet. Complete the LDR Attachment 2 for the Underlying Hazardous Constituents present in the waste.a,b Specify any applicable Subcategories for these characteristic wastes in Section D of this LDR Worksheet. (Refer to [LDR Treatment Standards Table](#))
- g. The waste is RCRA-hazardous debris that will be or has been treated via alternative treatment technologies. Copy the applicable EPA hazard codes (D,K,F,P,U) associated with the debris to Section D of the LDR worksheet. Attachments 1 and 2 do not need to be filled out. **Contact the Approver before checking this box.**
- h. This waste is soil contaminated with RCRA-hazardous waste for which the Alternative LDR Treatment Standards for Soil of 40 CFR 268.49 (see [Soil Alternative Concentration Limits](#)) will be used. **Contact the Approver before checking this box.** If the Alternative LDR Treatment Standards for Soil are not going to be used, then treat the contaminated soil as any other RCRA-hazardous waste.

^a LDR Attachment 2 is not required for Freeport on-site generators who send this waste to the B-33 Rotary Kiln Incinerator. For other situations where the waste will be monitored for all constituents, there is no need to specify them. Consult the Approver if you have questions.

^b LDR Attachment 2 is not required for the following Subcategories:D001 ignitable wastes that are incinerated or recovered,D003 reactive cyanides or sulfides,D006 cadmium batteries,D008 lead acid batteries,D009 high mercury organic wastes,and D009 high mercury inorganic wastes.

- D001 ignitable wastes that are incinerated or recovered
- D003 reactive cyanides or sulfides,
- D006 cadmium batteries,
- D008 lead acid batteries,
- D009 high mercury organic wastes, and
- D009 high mercury inorganic wastes.

D. EPA HAZARDOUS WASTE NUMBER(S) AND SUBCATEGORY IDENTIFICATION

Refer to the guidance document (use the hyperlink above) or [LDR Treatment Standards Table](#) for help in determining the applicable Subcategories.

EPA Hazardous Waste Number	Subcategory (if applicable)	EPA Hazardous Waste Number	Subcategory (if applicable)

Authorized signature

Date

Printed or Typed Name

Title

LAND DISPOSAL RESTRICTION CERTIFICATION **EXAMPLE OF LDR CERTIFICATION**

This section can only be completed if the waste meets the applicable LDR treatment standards or has been treated according to waste specific technology for the EPA Hazardous Waste Numbers listed in Section D (see [LDR Treatment Standards Table](#)), and is going directly to land disposal. **IF THE WASTE IS NOT GOING DIRECTLY TO LANDFILL, DO NOT COMPLETE THIS SECTION.** As required by 40 CFR 268.7, the following applicable certification(s) are made for this restricted waste:

1. Waste or contaminated soil which meets treatment standards without prior treatment:

I certify under penalty of law that I have personally examined and am familiar with the waste through analysis and testing or through knowledge of the waste to support this certification that the waste complies with the treatment standards specified in 40 CFR 268 Subpart D. I believe that the information I submitted is true, accurate and complete. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment

2. Waste which now meets treatment standards after treatment or has been treated by a specified technology (e.g., combustion, carbon adsorption, etc.):

I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification. Based on my inquiry of those individuals immediately responsible for obtaining this information, I believe that the treatment process has been operated and maintained properly so as to comply with the treatment standards specified in 40 CFR 268.40 without impermissible dilution of the prohibited waste. I am aware there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment.

3. The waste is debris and was treated by a technology listed in Table I of 40 CFR 268.45. List the Alternative Treatment Method used for treating the debris

I certify under penalty of law that the debris has been treated in accordance with the requirements of 40 CFR 268.45. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment.

Contact the Approver before checking this box

4. Wastes that are characteristic only (D001-D043) that have been decharacterized and are to be sent to a non-hazardous landfill. **Contact the Approver before checking this box.**

I certify under penalty of law that the waste has been treated in accordance with the requirements of 40 CFR 268.40 to remove the hazardous characteristic and that underlying hazardous constituents, as defined in 268.2(I) have been treated on-site to meet the Universal Treatment Standards. I am aware there are significant penalties for submitting false certification, including the possibility of fine and imprisonment.

Authorized signature

Date

Printed or Typed Name

Title

EXAMPLE OF LDR ATTACHMENT 1 – F LIST**THE DOW CHEMICAL COMPANY****LDR ATTACHMENT 1 (F-LIST)****(Mark all applicable EPA Hazardous Waste Numbers and Constituents of Concern)**

EPA Hazardous Waste Number	Hazardous Waste Description	Constituents of Concern
<input type="checkbox"/> F001	Spent halogenated solvents used in degreasing and still bottoms from the recovery of these spent solvents and spent solvents mixtures.	<input type="checkbox"/> Carbon tetrachloride <input type="checkbox"/> Methylene chloride <input type="checkbox"/> Tetrachloroethylene <input type="checkbox"/> 1,1,1 -Trichloroethane <input type="checkbox"/> Trichloroethylene <input type="checkbox"/> 1,1,2-Trichloro-1,2,2-trifluoroethane <input type="checkbox"/> Trichlorofluoromethane
<input type="checkbox"/> F002	Spent halogenated solvents and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	<input type="checkbox"/> Chlorobenzene <input type="checkbox"/> o-Dichlorobenzene <input type="checkbox"/> Methylene chloride <input type="checkbox"/> Tetrachloroethylene <input type="checkbox"/> 1,1,1 -Trichloroethane <input type="checkbox"/> 1,1,2-Trichloroethane <input type="checkbox"/> Trichloroethylene <input type="checkbox"/> 1,1,2-Trichloro-1,2,2-trifluoroethane <input type="checkbox"/> Trichlorofluoromethane
<input type="checkbox"/> F003 Subcategory	Spent non- Halogenated solvents and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	<input type="checkbox"/> Acetone <input type="checkbox"/> n-Butyl alcohol <input type="checkbox"/> Cyclohexanone <input type="checkbox"/> Ethyl acetate <input type="checkbox"/> Ethyl benzene <input type="checkbox"/> Ethyl ether <input type="checkbox"/> Methanol <input type="checkbox"/> Methyl isobutyl ketone <input type="checkbox"/> Xylene
<input type="checkbox"/> F003 and/or F005 Subcategory	Spent non- halogenated solvents containing only one or more of the following: carbon disulfide, and cyclohexanone, and/or methanol	<input type="checkbox"/> Carbon disulfide <input type="checkbox"/> Cyclohexanone <input type="checkbox"/> Methanol
<input type="checkbox"/> F004	Spent non-halogenated solvents and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	<input type="checkbox"/> Cresols (m and p isomers) <input type="checkbox"/> Nitrobenzene <input type="checkbox"/> o-Cresol <input type="checkbox"/> Cresol (mixed isomers)

EPA Hazardous Waste Number	Hazardous Waste Description	Constituents of Concern
<input type="checkbox"/> F005 Subcategory	Spent non- halogenated solvents and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	<input type="checkbox"/> Benzene <input type="checkbox"/> Carbon disulfide <input type="checkbox"/> 2-Ethoxyethanol <input type="checkbox"/> Isobutanol <input type="checkbox"/> Methyl ethyl ketone <input type="checkbox"/> 2-Nitropropane <input type="checkbox"/> Pyridine <input type="checkbox"/> Toluene
<input type="checkbox"/> F005 Subcategory	Spent non- halogenated solvents : 2-Nitropropane only	<input type="checkbox"/> 2-Nitropropane
<input type="checkbox"/> F005 Subcategory	Spent non- halogenated solvents : 2-Ethoxyethanol only	<input type="checkbox"/> 2-Ethoxyethanol

EXAMPLE OF LDR ATTACHMENT 2 – UHCs / UTS

THE DOW CHEMICAL COMPANY
LDR ATTACHMENT 2 (Underlying Hazardous Constituents / Universal Treatment Standards
(Mark all applicable Constituents of Concern)

Regulated constituent--common name	CAS No.	Wastewater Standard in mg/L	Non-Wastewater Standard in mg/kg
<input type="checkbox"/> Acenaphthene	83-32-9	0.059	3.4
<input type="checkbox"/> Acenaphthylene	208-96-8	0.059	3.4
<input type="checkbox"/> Acetone	67-64-1	0.28	160
<input type="checkbox"/> Acetonitrile	75-05-8	5.6	38
<input type="checkbox"/> Acetophenone	98-86-2	0.010	9.7
<input type="checkbox"/> 2-Acetylaminofluorene	53-96-3	0.059	140
<input type="checkbox"/> Acrolein	107-02-8	0.29	NA
<input type="checkbox"/> Acrylamide ¹	79-06-1	19	23
<input type="checkbox"/> Acrylonitrile	107-13-1	0.24	84
<input type="checkbox"/> Aldicarb sulfone ¹	1646-88-4	0.056	0.28
<input type="checkbox"/> Aldrin	309-00-2	0.021	0.066
<input type="checkbox"/> 4-Aminobiphenyl	92-67-1	0.13	NA
<input type="checkbox"/> Aniline	62-53-3	0.81	14
<input type="checkbox"/> o-Anisidine (2-methoxyaniline)	90-04-0	0.01	0.66
<input type="checkbox"/> Anthracene	120-12-7	0.059	3.4
<input type="checkbox"/> Aramite	140-57-8	0.36	NA
<input type="checkbox"/> Barban ¹	101-27-9	0.056	1.4
<input type="checkbox"/> Bendiocarb ¹	22781-23-3	0.056	1.4
<input type="checkbox"/> Benomyl ¹	17804-35-2	0.056	1.4
<input type="checkbox"/> Benz(a)anthracene	56-55-3	0.059	3.4
<input type="checkbox"/> Benzal chloride ¹	98-87-3	0.055	6.0
<input type="checkbox"/> Benzene	71-43-2	0.14	10
<input type="checkbox"/> Benzo(b)fluoranthene (difficult to distinguish from benzo(k)fluoranthene)	205-99-2	0.11	6.8
<input type="checkbox"/> Benzo(b)fluoranthene (difficult to distinguish from benzo(k)fluoranthene)	207-08-9	0.11	6.8
<input type="checkbox"/> Benzo(g,h,i)perylene	191-24-2	0.0055	1.8
<input type="checkbox"/> Benzo(a)pyrene	50-32-8	0.061	3.4
<input type="checkbox"/> alpha-BHC	319-84-6	0.00014	0.066
<input type="checkbox"/> beta-BHC	319-85-7	0.00014	0.066
<input type="checkbox"/> delta-BHC	319-86-8	0.023	0.066
<input type="checkbox"/> gamma-BHC	58-89-9	58-89-9	0.066
<input type="checkbox"/> Bromodichloromethane	75-27-4	0.35	15
<input type="checkbox"/> Methyl bromide (Bromomethane)	74-83-9	0.11	15
<input type="checkbox"/> 4-Bromophenyl phenyl ether	101-55-3	0.055	15

Regulated constituent--common name	CAS No.	Wastewater Standard in mg/L	Non-Wastewater Standard in mg/kg
<input type="checkbox"/> n-Butyl alcohol	71-36-3	5.6	2.6
<input type="checkbox"/> Butyl benzyl phthalate	85-68-7	0.017	28
<input type="checkbox"/> Butylate ¹	2008-41-5	0.042	1.4
<input type="checkbox"/> 2-sec-Butyl-4,6-dinitrophenol (Dinoseb)	88-85-7	0.066	2.5
<input type="checkbox"/> Carbaryl ¹	63-25-2	0.006	0.14
<input type="checkbox"/> Carbenzadim ¹	10605-21-7	0.056	1.4
<input type="checkbox"/> Carbofuran ¹	1563-66-2	0.006	0.14
<input type="checkbox"/> Carbofuran phenol ¹	1563-38-8	0.056	1.4
<input type="checkbox"/> Carbon disulfide	75-15-0	3.8	4.8 mg/l TCLP
<input type="checkbox"/> Carbon tetrachloride	56-23-5	0.057	6
<input type="checkbox"/> Carbosulfan ¹	55285-14-8	0.028	1.4
<input type="checkbox"/> Chlordane (alpha and gamma isomers) ¹	57-74-9	0.0033	0.26
<input type="checkbox"/> p-Chloroaniline	106-47-8	0.46	16
<input type="checkbox"/> Chlorobenzene	108-90-7	0.057	6
<input type="checkbox"/> Chlorobenzilate	510-15-6	0.1	NA
<input type="checkbox"/> 2-Chloro-1,3-butadiene	126-99-8	0.057	0.28
<input type="checkbox"/> Chlorodibromomethane	124-48-1	0.057	15
<input type="checkbox"/> Chloroethane	75-00-3	0.27	6
<input type="checkbox"/> bis(2-Chloroethoxy)methane	111-91-1	0.036	7.2
<input type="checkbox"/> bis(2-Chloroethyl)ether	111-44-4	0.033	6
<input type="checkbox"/> 2-Chloroethyl vinyl ether ¹	110-75-8	0.062	NA
<input type="checkbox"/> Chloroform	67-66-3	0.046	6
<input type="checkbox"/> bis(2-Chloroisopropyl)ether	39638-32-9	0.055	7.2
<input type="checkbox"/> p-Chloro-m-cresol	59-50-7	0.018	14
<input type="checkbox"/> Chloromethane (Methyl chloride)	74-87-3	0.19	30
<input type="checkbox"/> 2-Chloronaphthalene	91-58-7	0.055	5.6
<input type="checkbox"/> 2-Chlorophenol	95-57-8	0.044	5.7
<input type="checkbox"/> 3-Chloropropylene	107-05-1	0.036	30
<input type="checkbox"/> Chrysene	218-01-9	0.059	3.4
<input type="checkbox"/> p-Cresidine	120-71-8	0.01	0.66
<input type="checkbox"/> o-Cresol	95-48-7	0.11	5.6
<input type="checkbox"/> m-Cresol (difficult to distinguish from p-cresol)	108-39-4	0.77	5.6
<input type="checkbox"/> p-Cresol (difficult to distinguish from m-cresol)	106-44-5	0.77	5.6
<input type="checkbox"/> m-Cumenyl methylcarbamate ¹	64-00-6	0.056	1.4
<input type="checkbox"/> Cyclohexanone	108-94-1	0.36	0.75 mg/l TCLP

Regulated constituent--common name	CAS No.	Wastewater Standard in mg/L	Non-Wastewater Standard in mg/kg
<input type="checkbox"/> o,p'-DDD	53-19-0	0.023	0.087
<input type="checkbox"/> p,p'-DDD	72-54-8	0.023	0.087
<input type="checkbox"/> o,p'-DDE	3424-82-6	0.031	0.087
<input type="checkbox"/> p,p'-DDE	72-55-9	0.031	0.087
<input type="checkbox"/> o,p'-DDT	789-02-6	0.0039	0.087
<input type="checkbox"/> p,p'-DDT	50-29-3	0.0039	0.087
<input type="checkbox"/> Dibenz(a,h)anthracene	53-70-3	0.055	8.2
<input type="checkbox"/> Dibenz(a,e)pyrene	192-65-4	0.061	NA
<input type="checkbox"/> 1,2-Dibromo-3-chloropropane	96-12-8	0.11	15
<input type="checkbox"/> Ethylene dibromide (1,2- Dibromoethane)	106-93-4	0.028	15
<input type="checkbox"/> Dibromomethane	74-95-3	0.11	15
<input type="checkbox"/> m-Dichlorobenzene	541-73-1	0.036	6
<input type="checkbox"/> o-Dichlorobenzene	95-50-1	0.088	6
<input type="checkbox"/> p-Dichlorobenzene	106-46-7	0.09	6
<input type="checkbox"/> Dichlorodifluoromethane	75-71-8	0.23	7.2
<input type="checkbox"/> 1,1-Dichloroethane	75-34-3	0.059	6
<input type="checkbox"/> 1,2-Dichloroethane	107-06-2	0.21	6
<input type="checkbox"/> 1,1-Dichloroethylene	75-35-4	0.025	6
<input type="checkbox"/> trans-1,2-Dichloroethylene	156-60-5	0.054	30
<input type="checkbox"/> 2,4-Dichlorophenol	120-83-2	0.044	14
<input type="checkbox"/> 2,6-Dichlorophenol	87-65-0	0.044	14
<input type="checkbox"/> 2,4-D (2,4-Dichlorophenoxyacetic acid)	94-75-7	0.72	10
<input type="checkbox"/> 1,2-Dichloropropane	78-87-5	0.85	18
<input type="checkbox"/> cis-1,3-Dichloropropylene	10061-01-5	0.036	18
<input type="checkbox"/> trans-1,3-Dichloropropylene	10061-02-6	0.036	18
<input type="checkbox"/> Dieldrin	60-57-1	0.017	0.13
<input type="checkbox"/> Diethyl phthalate	84-66-2	0.2	28
<input type="checkbox"/> 2,4-Dimethylaniline (2,4-xylidine)	95-68-1	0.01	0.66
<input type="checkbox"/> 2,4-Dimethyl phenol	105-67-9	0.036	14
<input type="checkbox"/> Dimethyl phthalate	131-11-3	0.047	28
<input type="checkbox"/> Di-n-butyl phthalate	84-74-2	0.057	28
<input type="checkbox"/> 1,4-Dinitrobenzene	100-25-4	0.32	2.3
<input type="checkbox"/> 4,6-Dinitro-o-cresol	534-52-1	0.28	160
<input type="checkbox"/> 2,4-Dinitrophenol	51-28-5	0.12	160
<input type="checkbox"/> 2,4-Dinitrotoluene	121-14-2	0.32	140

Regulated constituent--common name	CAS No.	Wastewater Standard in mg/L	Non-Wastewater Standard in mg/kg
<input type="checkbox"/> 2,6-Dinitrotoluene	606-20-2	0.55	28
<input type="checkbox"/> Di-n-octyl phthalate	117-84-0	0.017	28
<input type="checkbox"/> p-Dimethylaminoazobenzene ¹	60-11-7	0.13	NA
<input type="checkbox"/> Di-n-propylnitrosamine	621-64-7	0.4	14
<input type="checkbox"/> 1,4-Dioxane	123-91-1	12	170
<input type="checkbox"/> Diphenylamine (difficult to distinguish from diphenylnitrosamine)	122-39-4	0.92	13
<input type="checkbox"/> Diphenylnitrosamine (difficult to distinguish from diphenylamine)	86-30-6	0.92	13
<input type="checkbox"/> 1,2-Diphenylhydrazine	122-66-7	0.087	NA
<input type="checkbox"/> Disulfoton	298-04-4	0.017	6.2
<input type="checkbox"/> Dithiocarbamates (total) ¹	137-30-4	0.028	28
<input type="checkbox"/> Endosulfan I	959-98-8	0.023	0.066
<input type="checkbox"/> Endosulfan II	33213-65-9	0.029	0.13
<input type="checkbox"/> Endosulfan sulfate	1031-07-8	0.029	0.13
<input type="checkbox"/> Endrin	72-20-8	0.0028	0.13
<input type="checkbox"/> Endrin aldehyde	7421-93-4	0.025	0.13
<input type="checkbox"/> EPTC ¹	759-94-4	0.042	1.4
<input type="checkbox"/> Ethyl acetate	141-78-6	0.34	33
<input type="checkbox"/> Ethyl benzene	100-41-4	0.057	10
<input type="checkbox"/> Ethyl cyanide (Propanenitrile)	107-12-0	0.24	360
<input type="checkbox"/> Ethyl ether	60-29-7	0.12	160
<input type="checkbox"/> Ethyl methacrylate	97-63-2	0.14	160
<input type="checkbox"/> Ethylene oxide	75-21-8	0.12	NA
<input type="checkbox"/> bis(2-Ethylhexyl) phthalate	117-81-7	0.28	28
<input type="checkbox"/> Famphur	52-85-7	0.017	15
<input type="checkbox"/> Fluoranthene	206-44-0	0.068	3.4
<input type="checkbox"/> Fluorene	86-73-7	0.059	3.4
<input type="checkbox"/> Formetanate hydrochloride ¹	23422-53-9	0.056	1.4
<input type="checkbox"/> Heptachlor	76-44-8	0.0012	0.066
<input type="checkbox"/> Heptachlor epoxide	1024-57-3	0.016	0.066
<input type="checkbox"/> 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-HpCDD)	35822-46-9	0.000035	0.0025
<input type="checkbox"/> 1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF)	67562-39-4	0.000035	0.0025
<input type="checkbox"/> 1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-HpCDF)	55673-89-7	0.000035	0.0025
<input type="checkbox"/> Hexachlorobenzene	118-74-1	0.055	10
<input type="checkbox"/> Hexachlorobutadiene	87-68-3	0.055	5.6
<input type="checkbox"/> Hexachlorocyclopentadiene	77-47-4	0.057	2.4

Regulated constituent--common name	CAS No.	Wastewater Standard in mg/L	Non-Wastewater Standard in mg/kg
<input type="checkbox"/> Hexachloroethane	67-72-1	0.055	30
<input type="checkbox"/> Hexachloropropylene	1888-71-7	0.035	30
<input type="checkbox"/> HxCDDs (All Hexachlorodibenzo-p-dioxins)	NA	0.000063	0.001
<input type="checkbox"/> HxCDFs (All Hexachlorodibenzofurans)	NA	0.000063	0.001
<input type="checkbox"/> Indeno (1,2,3-c,d) pyrene	193-39-5	0.0055	3.4
<input type="checkbox"/> Iodomethane	74-88-4	0.19	65
<input type="checkbox"/> Isobutyl alcohol	78-83-1	5.6	170
<input type="checkbox"/> Isodrin	465-73-6	0.021	0.066
<input type="checkbox"/> Isosafrole	120-58-1	0.081	2.6
<input type="checkbox"/> Kepone	143-50-8	0.0011	0.13
<input type="checkbox"/> Methacrylonitrile	126-98-7	0.24	84
<input type="checkbox"/> Methanol	67-56-1	5.6	0.75 mg/l TCLP
<input type="checkbox"/> Methapyrilene	91-80-5	0.081	1.5
<input type="checkbox"/> Methiocarb ¹	2032-65-7	0.056	1.4
<input type="checkbox"/> Methomyl ¹	16752-77-5	0.028	0.14
<input type="checkbox"/> Methoxychlor	72-43-5	0.25	0.18
<input type="checkbox"/> Methyl ethyl ketone	78-93-3	0.28	36
<input type="checkbox"/> Methyl isobutyl ketone	108-10-1	0.14	33
<input type="checkbox"/> Methyl methacrylate	80-62-6	0.14	160
<input type="checkbox"/> Methyl methansulfonate	66-27-3	0.018	NA
<input type="checkbox"/> Methyl parathion	298-00-0	0.014	4.6
<input type="checkbox"/> 3-Methylcholanthrene	56-49-5	0.0055	15
<input type="checkbox"/> 4,4-Methylene bis(2-chloroaniline)	101-14-4	0.5	30
<input type="checkbox"/> Methylene chloride	75-09-2	0.089	30
<input type="checkbox"/> Metolcarb ¹	1129-41-5	0.056	1.4
<input type="checkbox"/> Mexacarbate ¹	315-18-4	0.056	1.4
<input type="checkbox"/> Molinate ¹	2212-67-1	0.003	1.4
<input type="checkbox"/> Naphthalene	91-20-3	0.059	5.6
<input type="checkbox"/> 2-Naphthylamine	91-59-8	0.52	NA
<input type="checkbox"/> o-Nitroaniline ¹	88-74-4	0.27	14
<input type="checkbox"/> p-Nitroaniline	100-01-6	0.028	28
<input type="checkbox"/> Nitrobenzene	98-95-3	0.068	14
<input type="checkbox"/> 5-Nitro-o-toluidine	99-55-8	0.32	28
<input type="checkbox"/> o-Nitrophenol ¹	88-75-5	0.028	13
<input type="checkbox"/> p-Nitrophenol	100-02-7	0.12	29

Regulated constituent--common name	CAS No.	Wastewater Standard in mg/L	Non-Wastewater Standard in mg/kg
<input type="checkbox"/> N-Nitrosodiethylamine	55-18-5	0.4	28
<input type="checkbox"/> N-Nitrosodimethylamine	62-75-9	0.4	2.3
<input type="checkbox"/> N-Nitroso-di-n-butylamine	924-16-3	0.4	17
<input type="checkbox"/> N-Nitrosomethylethylamine	10595-95-6	0.4	2.3
<input type="checkbox"/> N-Nitrosomorpholine	59-89-2	0.4	2.3
<input type="checkbox"/> N-Nitrosopiperidine	100-75-4	0.013	35
<input type="checkbox"/> N-Nitrosopyrrolidine	930-55-2	0.013	35
<input type="checkbox"/> 1,2,3,4,6,7,8,9-Octochlorodibenzo-p-dioxin (OCDD)	3268-87-9	0.000063	0.005
<input type="checkbox"/> 1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	39001-02-0	0.000063	0.005
<input type="checkbox"/> Oxamyl ¹	23135-22-0	0.056	0.28
<input type="checkbox"/> Parathion	56-38-2	0.014	4.6
<input type="checkbox"/> Total PCBs (sum of all PCB isomers, or all Aroclors)	1336-36-3	0.1	10
<input type="checkbox"/> Pebulate ¹	1114-71-2	0.042	1.4
<input type="checkbox"/> Pentachlorobenzene	608-93-5	0.055	10
<input type="checkbox"/> PeCDDs (All Pentachlorodibenzo-p-dioxins)	NA	0.000063	0.001
<input type="checkbox"/> PeCDFs (All Pentachlorodibenzofurans)	NA	0.000035	0.001
<input type="checkbox"/> Pentachloroethane ¹	76-01-7	0.055	6
<input type="checkbox"/> Pentachloronitrobenzene	82-68-8	0.055	4.8
<input type="checkbox"/> Pentachlorophenol	87-86-5	0.089	7.4
<input type="checkbox"/> Phenacetin	62-44-2	0.081	16
<input type="checkbox"/> Phenanthrene	85-01-8	0.059	5.6
<input type="checkbox"/> Phenol	108-95-2	0.039	6.2
<input type="checkbox"/> 1,3-Phenylenediamine	108-45-2	0.01	0.66
<input type="checkbox"/> Phorate	298-02-2	0.021	4.6
<input type="checkbox"/> Phthalic acid ¹	100-21-0	0.055	28
<input type="checkbox"/> Phthalic anhydride	85-44-9	0.055	28
<input type="checkbox"/> Physostigmine ¹	57-47-6	0.056	1.4
<input type="checkbox"/> Physostigmine salicylate ¹	57-64-7	0.056	1.4
<input type="checkbox"/> Promecarb ¹	2631-37-0	0.056	1.4
<input type="checkbox"/> Pronamide	23950-58-5	0.093	1.5
<input type="checkbox"/> Propham ¹	122-42-9	0.056	1.4
<input type="checkbox"/> Propoxur ¹	114-26-1	0.056	1.4
<input type="checkbox"/> Prosulfocarb ¹	52888-80-9	0.042	1.4
<input type="checkbox"/> Pyrene	129-00-0	0.067	8.2
<input type="checkbox"/> Pyridine	110-86-1	0.014	16

Regulated constituent--common name	CAS No.	Wastewater Standard in mg/L	Non-Wastewater Standard in mg/kg
<input type="checkbox"/> Safrole	94-59-7	0.081	22
<input type="checkbox"/> Silvex (2,4,5-TP)	93-72-1	0.72	7.9
<input type="checkbox"/> 1,2,4,5-Tetrachlorobenzene	95-94-3	0.055	14
<input type="checkbox"/> TCDDs (All Tetrachlorodibenzo-p-dioxins)	NA	0.000063	0.001
<input type="checkbox"/> TCDFs (All Tetrachlorodibenzofurans)	NA	0.000063	0.001
<input type="checkbox"/> 1,1,1,2-Tetrachloroethane	630-20-6	0.057	6
<input type="checkbox"/> 1,1,2,2-Tetrachloroethane	79-34-5	0.057	6
<input type="checkbox"/> Tetrachloroethylene	127-18-4	0.056	6
<input type="checkbox"/> 2,3,4,6-Tetrachlorophenol	58-90-2	0.03	7.4
<input type="checkbox"/> Thiodicarb ¹	59669-26-0	0.019	1.4
<input type="checkbox"/> Thiophanate-methyl ¹	23564-05-8	0.056	1.4
<input type="checkbox"/> Toluene	108-88-3	0.08	10
<input type="checkbox"/> Toxaphene	8001-35-2	0.0095	2.6
<input type="checkbox"/> Triallate ¹	2303-17-5	0.042	1.4
<input type="checkbox"/> Tribromomethane/Bromoform	75-25-2	0.63	15
<input type="checkbox"/> 1,2,4-Trichlorobenzene	120-82-1	0.055	19
<input type="checkbox"/> 1,1,1-Trichloroethane	71-55-6	0.054	6
<input type="checkbox"/> 1,1,2-Trichloroethane	79-00-5	0.054	6
<input type="checkbox"/> Trichloroethylene	79-01-6	0.054	6
<input type="checkbox"/> Trichloromonofluoromethane	75-69-4	0.02	30
<input type="checkbox"/> 2,4,5-Trichlorophenol	95-95-4	0.18	7.4
<input type="checkbox"/> 2,4,6-Trichlorophenol	88-06-2	0.035	7.4
<input type="checkbox"/> 2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)	93-76-5	0.72	7.9
<input type="checkbox"/> 1,2,3-Trichloropropane	96-18-4	0.85	30
<input type="checkbox"/> 1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	0.057	30
<input type="checkbox"/> Triethylamine ¹	121-44-8	0.081	1.5
<input type="checkbox"/> tris-(2,3-Dibromopropyl)phosphate	126-72-7	0.11	0.1
<input type="checkbox"/> Vernolate ¹	1929-77-7	0.042	1.4
<input type="checkbox"/> Vinyl chloride	75-01-4	0.27	6
<input type="checkbox"/> Xylenes-mixed isomers (sum of o-,m-, and p-xylene concentrations)	1330-20-7	0.32	30

Please note on the last page of this attachment that there are two sets of UTS limits for metals.

- Column 4 is to be used for waste being disposed of in states that have not adopted the revised UTS metals limits.
- Column 5 can be used in states that have adopted these new metals standards. These states include Texas, Michigan, and Louisiana.

More information on the metals LDR limits is provided in <http://ehs.intranet.dow.com/rmec/GuidanceLinks/solidwaste.htm> Regional

II. Inorganic Constituents:	CAS Number	Wastewater Standard in mg/L	Non-Wastewater Standard for States that have not adopted LDR changes	Non-Wastewater Standard for States that have adopted LDR changes
<input type="checkbox"/> Antimony	7440-36-0	1.9	2.1 mg/l TCLP	1.15 mg/l TCLP
<input type="checkbox"/> Arsenic	7440-38-2	1.4	5.0 mg/l TCLP	5.0 mg/l TCLP
<input type="checkbox"/> Barium	7440-39-3	1.2	7.6 mg/l TCLP	21 mg/l TCLP
<input type="checkbox"/> Beryllium	7440-41-7	0.82	0.014 mg/l TCLP	1.22 mg/l TCLP
<input type="checkbox"/> Cadmium	7440-43-9	0.69	0.11 mg/l TCLP	0.11 mg/l TCLP
<input type="checkbox"/> Chromium (Total)	7440-47-3	2.77	0.6 mg/l TCLP	0.6 mg/l TCLP
<input type="checkbox"/> Cyanides (Total)	57-12-5	1.2	590 mg/l	590 mg/l
<input type="checkbox"/> Cyanides (Amenable)	57-12-5	0.86	30mg/l	30mg/l
<input type="checkbox"/> Fluoride ²	16984-48-8	35	NA	NA
<input type="checkbox"/> Lead	7439-92-1	0.69	0.37 mg/l TCLP	0.75 mg/l TCLP
<input type="checkbox"/> Mercury--Nonwastewater from Retort ¹	7439-97-6	NA	0.20 mg/l TCLP	0.20 mg/l TCLP
<input type="checkbox"/> Mercury--All Others	7439-97-6	0.15	0.025 mg/l TCLP	0.025 mg/l TCLP
<input type="checkbox"/> Nickel	7440-02-0	3.98	5.0 mg/l TCLP	11 mg/l TCLP
<input type="checkbox"/> Selenium ²	7782-49-2	0.82	0.16 mg/l TCLP	5.7 mg/l TCLP
<input type="checkbox"/> Silver	7440-22-4	0.43	0.14 mg/l TCLP	0.14 mg/l TCLP
<input type="checkbox"/> Sulfide ²	8496-25-8	14	NA	NA
<input type="checkbox"/> Thallium	7440-28-0	1.4	0.078 mg/l TCLP	0.2 mg/l TCLP
<input type="checkbox"/> Vanadium ²	7440-62-2	4.3	0.23 mg/l TCLP	1.6 mg/l TCLP
<input type="checkbox"/> Zinc ³	7440-66-6	2.61	4.3 mg/l TCLP	4.3 mg/l TCLP

¹ Not applicable to F039 wastes

² Not an underlying hazardous constituent. Only applicable to F039 wastes

³ Not an underlying hazardous constituent.

EXAMPLE OF LAB PACK CERTIFICATION FORM

**THE DOW CHEMICAL COMPANY
APPENDIX IV LAB PACK CERTIFICATION**

** For help on using Lab Packs, see guidance from the [Main Form, Section D](#).

Complete this form only if the pack contains waste having at least one RCRA Hazardous Waste Number

Name: _____ Phone _____
Company: _____ [EPA ID #](#) _____
Address: _____

The waste identified on the accompanying _____ (name of State) Hazardous Waste Manifest Number _____ (off-site shipments only) is an Appendix IV lab pack containing the following EPA Hazardous waste number(s) and will be incinerated at:

- Rotary Kiln** Dow Location _____
- Other Company** Name and Location _____

This lab pack does not contain any constituents found in 40 CFR Part 268, [Appendix IV](#)

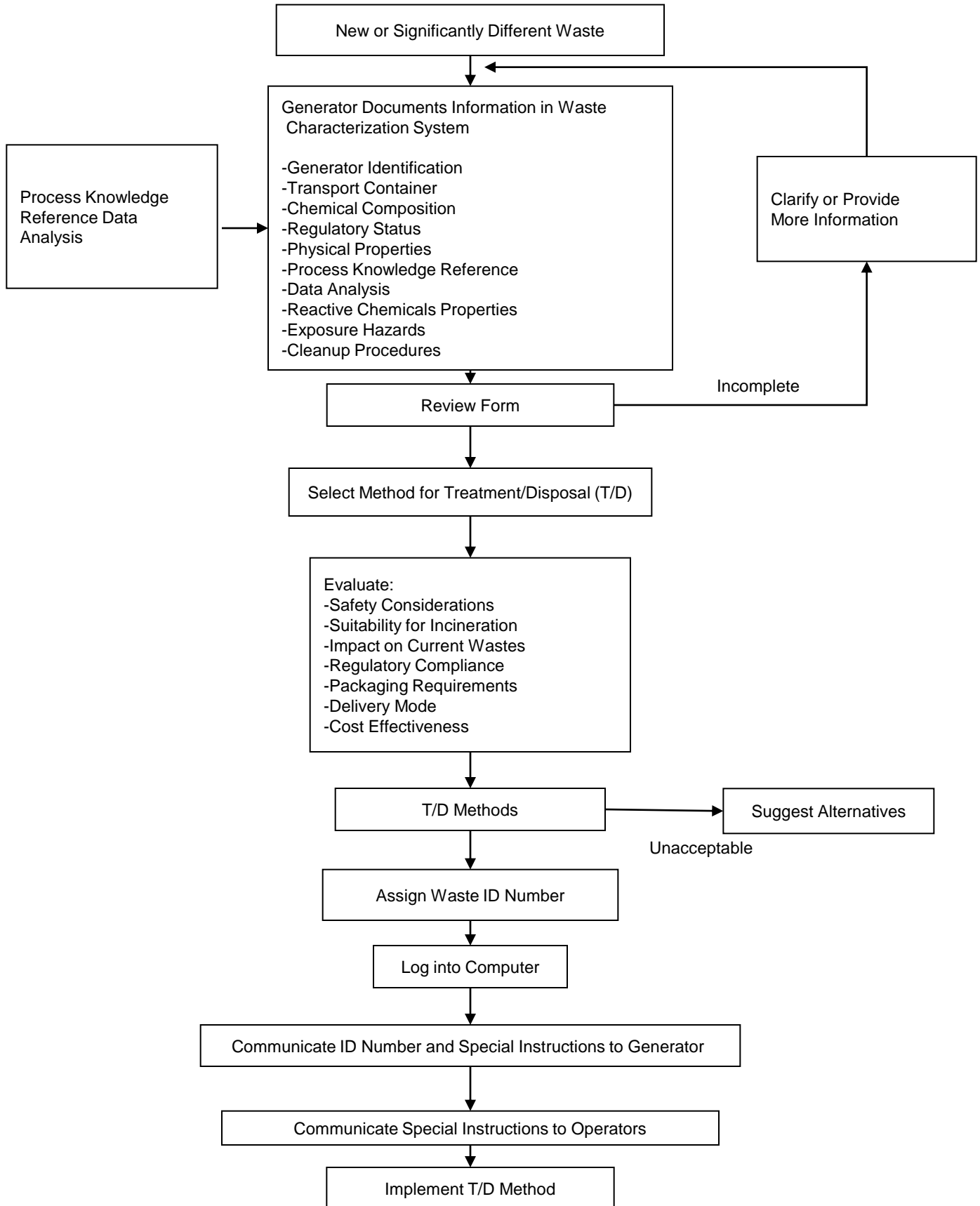
Chemical Name	<i>EPA Hazardous Waste Number</i>	Quantity & Units

The wastes do not meet the treatment standards specified in 268, Subpart D. The alternate lab pack treatment standards under 268.48(c) will be used. As required by 40 CFR 268.7, the following certification is made:

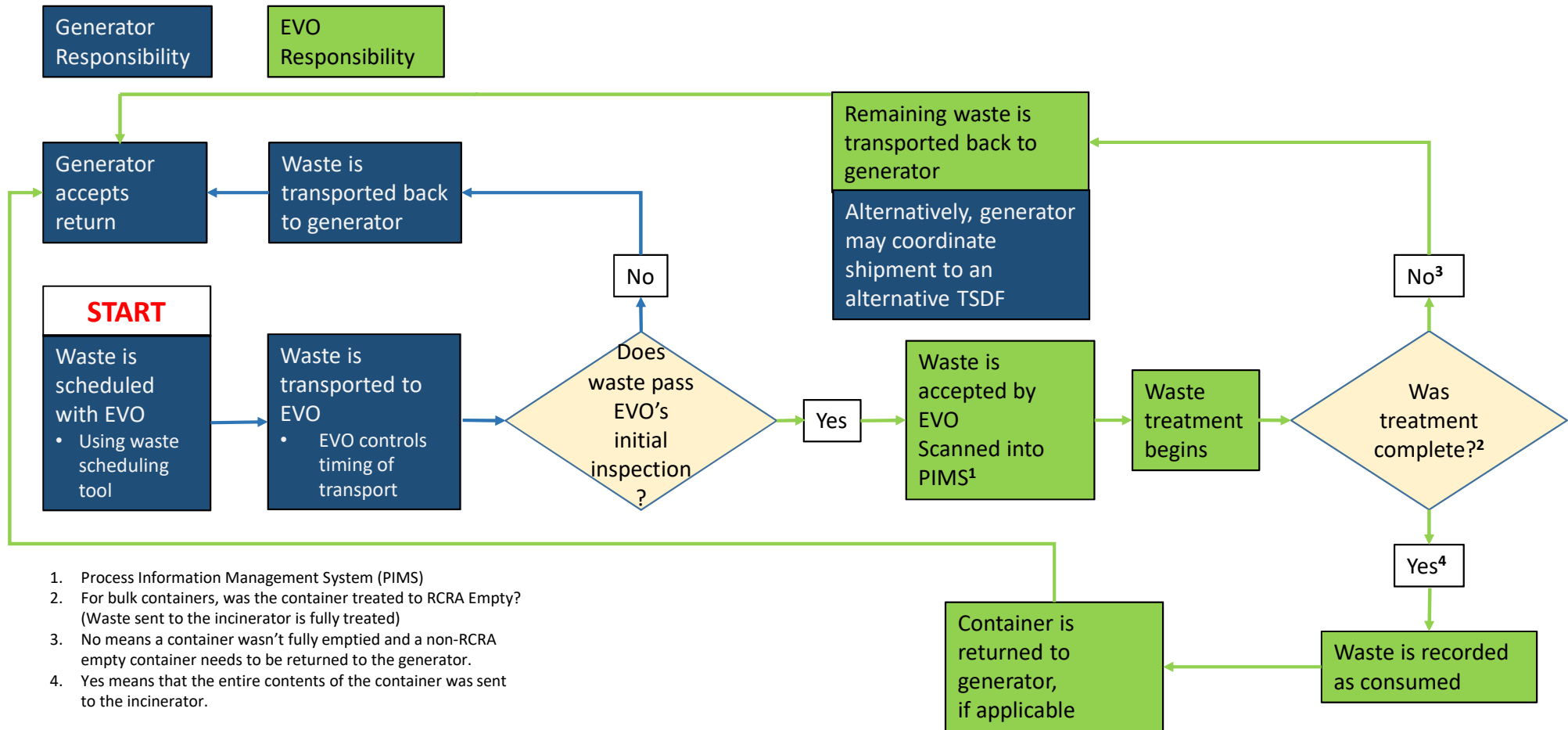
I certify under penalty of law that I personally have examined and am familiar with the waste and that the lab pack contains only wastes that have not been excluded under [Appendix IV](#) to 40 CFR Part 268 and that this lab pack will be sent to a combustion facility in compliance with the alternative treatment standards for lab packs at 40 CFR 268.42(c). I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment.

Authorized signature: _____ Date: _____
Printed or Typed Name: _____ Title: _____

Figure A3-2
Logic Diagram for Treatment and Disposal of Hazardous Waste at the Incineration Complex



MIOps Industrial Park Waste Flow Diagram





RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



DAN WYANT
DIRECTOR

**Site-Specific Land Disposal Restrictions
Treatability Variance Approval
The Dow Chemical Company, Midland, Michigan
MID 000 724 724**

In accordance with Title 40 of the Code of Federal Regulations (40 CFR), Section 268.44(h), and the authority granted by the United States Environmental Protection Agency to implement this regulation under R 299.9311 of the administrative rules promulgated pursuant to Part 111, Hazardous Waste Management, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451), The Dow Chemical Company (Dow), Michigan Operations, Midland Plant, is granted a Site-Specific Land Disposal Restrictions Treatability Variance Approval (Approval) by the Department of Environmental Quality (DEQ). The Approval is for contaminated soils, including those contaminated with dioxins and furans, exhibiting a hazardous waste characteristic or containing listed hazardous waste generated during corrective action or as a result of upgrade or maintenance of corrective action management systems, including the Revetment Groundwater Interceptor System (RGIS), and non-routine removal of solids from the Pentagonal, Rectangular or Main Pond of the Tertiary Pond at the facility located in Midland, Michigan (Material Subject to Variance).

The Material Subject to Variance, which is hazardous waste according to the provisions of the Part 111 administrative rules, including soils contaminated by hazardous waste identified by hazardous waste number F039, is now subject to alternate treatment standards pursuant to the following conditions:

1. The Approval is based on the information submitted to the DEQ by Dow in the Variance Petition submitted on October 1, 2007, the *Treatability Variance Petition for Soils Generated from Maintenance and Repair of the Revetment Groundwater Interception System (RGIS), Revision 1*, dated February 1996, and the *Revised Petition for Treatability Variance for Soils Generated from Maintenance and Repair of the Revetment Groundwater Interception System (RGIS) and Corrective Action Management Systems*, dated January 21, 2008, as modified by the June 26, 2015, request for the Variance to include non-routine removal of solids from the Tertiary Pond as an acceptable waste stream covered by the Approval and for the Variance to become a component of Dow's approved Waste Analysis Plan (Attachment XIV.A3 of the License re-application) under the renewal License. If information obtained by the DEQ shows that this information is erroneous, inaccurate, or otherwise unreliable, the DEQ may amend or revoke this Approval.
2. Prior to land disposal, the Material Subject to Variance must not contain concentrations of constituents greater than 50 times the applicable universal treatment standards specified in 40 CFR, Section 268.48, except as allowed in Condition 3, below, for dioxins and furans.

3. If the dioxin and furan standards required by Condition 2, above, are not met prior to land disposal, the Material Subject to Variance must not contain dioxins or furans with a toxic equivalence (TEQ) greater than 50 parts per billion. The TEQ shall be determined using the *2005 World Health Organization Reevaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-Like Compounds*, Van den Berg, M., L. Birnbaum, M. Denison, M. De Vito, W. Farland, M. Feeley, H. Fiedler, H. Hakansson, A. Hanberg, L. Haws, M. Rose, S. Safe, D. Schrenk, C. Tohyama, A. Tritscher, J. Tuomisto, M. Tyskind, M. Walker, and R.E. Peterson. 2006. *Toxicological Sciences* 93 (2):223-241.
4. The Material Subject to Variance must not exhibit the characteristics of ignitability, corrosivity, or reactivity at the time of land disposal.
5. The Material Subject to Variance shall be land disposed in Dow's Salzburg Landfill.
6. Dow must comply with the waste analysis requirements for restricted waste found in 40 CFR, Section 268.7. Records associated with this condition shall be kept in the facility operating record.
7. Data used to demonstrate compliance with this Approval must be submitted to the DEQ in accordance with the requirements of Dow's Hazardous Waste Management Facility Operating License (License).
8. Dow must maintain records of the disposition and volume of soils subject to this Approval consistent with the requirements of Dow's License Condition II.S.
9. Work plans for each modification to a corrective action management system, other corrective action work, or non-routine removal of solids from the Tertiary Pond subject to this Variance must be submitted to the Chief of the Hazardous Waste Section, Office of Waste Management and Radiological Protection (OWMRP), DEQ, for review and approval prior to implementation, consistent with the requirements of Dow's License.
10. All soils determined not to be hazardous waste are not subject to this Approval and shall be managed as required by state and federal law.
11. Dow may petition the DEQ to amend the scope and conditions of this Approval. Minor amendments, such as incorporation of new regulations, may be approved at the discretion of the Chief of the OWMRP. Dow and the Chief of the OWMRP shall allow for notification and comment of interested parties prior to making major changes to the scope of this Approval.
12. If the DEQ determines, at any time, that a new Best Available Technology (BAT) is available as an alternative to both thermal destruction and landfilling for Material Subject to Variance similar in both quantity and contamination to those subject to this

Approval, which allows a significant decrease in risk as compared to the actual risk associated with the disposal of the Material Subject to Variance in the Salzburg Landfill, the DEQ may require Dow to employ that BAT to treat newly-generated Material Subject to Variance in accordance with the then-existing federal Resource Conservation and Recovery Act of 1976 (RCRA) regulations and any applicable laws.

13. This Approval does not preclude Dow from disposing of the Material Subject to Variance in accordance with Part 111 of Act 451 at a properly licensed hazardous waste treatment, storage, or disposal facility or at an out-of-state facility in accordance with the RCRA and that state or country's applicable regulations.
14. Violations of this Approval are subject to the enforcement provisions of Part 111 of Act 451, the RCRA, and other applicable laws.
15. Nothing in this Approval shall affect or limit the DEQ's ability to bring any claim or cause of action or take administrative or judicial action allowed by law against any party.
16. This Approval shall remain in effect during the term of Dow's License, including any extension in time related to review and processing of a timely and sufficient application for renewal of the License and Variance. Dow may request an extension or renewal of the Variance to facilitate corrective action, maintenance or upgrade of corrective action systems, or non-routine Tertiary Pond solids removal at the Midland Plant facility.

The effective date of the Approval is the date signed by the Chief of the OWMRP.



Bryce Feighner, P.E., Chief
Office of Waste Management and
Radiological Protection
Department of Environmental Quality

Date: 9-25-2015

RGIS Upgrade Projects
Summary of Trace Analysis of Excess Soils

Sample Name	Sample Date	Units	2378-TCDD	12378-PCDD	123478-HCDD	123678-HCDD	123789-HCDD	1234678-HpCDD	OCDD	2378-TCDF	12378-PCDF	23478-PCDF	123478-HCDF	123678-HCDF	234678-HCDF	123789-HCDF	1234678-HpCDF	1234789-HpCDF	OCDF	2005 Who Tec	
SB-25 (0-3)	6/18/2009	ppt	<3	2	<6	9	<4	271	3747	<4	<4	3	9	<3	<4	<5	130	<5	710	13	
SB-25 (3-6)	6/18/2009	ppt	<19	11	<19	147	38	2713	32379	55	25	34	142	27	27	<5	1814	150	7998	135	
SB-25 (6-9)	6/18/2009	ppt	30	40	37	396	180	4962	51931	122	91	75	330	76	78	<9	3273	193	11609	321	
SB-25 (9-12)	6/18/2009	ppt	<7	<7	<12	105	44	1519	17491	41	22	23	96	17	21	<4	794	100	3849	78	
SB-50 (0-3)	6/18/2009	ppt	<4	19	<54	809	98	21280	434524	90	63	72	407	72	121	<13	11921	807	78010	701	
SB-50 (3-6)	6/18/2009	ppt	50	456	485	9091	2162	264324	4780581	1344	817	927	4840	648	1502	159	128932	7571	766345	8505	
SB-50(6-9)	6/18/2009	ppt	121	848	968	18427	3884	553216	12422609	1651	1058	1418	7986	1305	2537	241	255112	15648	1719313	17608	
SB-50 (9-12)	6/18/2009	ppt	<678	<985	<6051	83728	<6545	3523387	67913081	3078	<753	1491	34319	<4071	8247	<1458	1659084	86584	11341407	91601	
SB-50 (12-15)	6/18/2009	ppt	<322	850	<3641	65718	7636	2475600	42287467	10194	2354	3951	26901	4013	6619	<1025	1017847	79210	7462489	65260	
8882 (12)	11/25/2013	ppt	1.61	2.76	2.3	20	5.03	767	6910	910	276	299	237	46.3	29.7	4.32	512	45.3	2000	240	
8882 (15)	11/25/2013	ppt	<0.23	<0.5	<0.41	0.59	0.36	11	170	8.9	4.1	4	3.7	170	0.67	0.49	<0.23	10	0.8	40	3.5
8882 (18)	11/25/2013	ppt	<0.25	<0.53	<0.43	<0.34	<0.21	3.9	64	4.4	2.7	2.5	2.1	0.4	0.31	<0.24	2.9	<0.38	13	2.1	
8882 (6)	11/25/2013	ppt	4.7	7.3	3.2	9.9	4.4	230	2900	10000	4400	4100	2700	560	330	63	480	140	700	2800	
8882 (9)	11/25/2013	ppt	1.7	3.3	1.6	19	3.3	140	1200	1500	650	620	430	91	55	14	140	31	280	430	
8884 (18)	11/21/2013	ppt	<0.28	<0.59	<0.48	<0.43	<0.52	25	390	<0.26	<0.3	<0.25	<0.3	<0.32	<0.33	<0.5	13	7	68	1.2	
8886 (12)	12/3/2013	ppt	<0.18	<0.38	<0.67	23	2.8	830	18000	9.6	4.2	4.3	10	2.6	3.2	<0.43	390	25	2600	25	
8886 (15)	12/3/2013	ppt	<0.26	0.79	1.5	69	6.7	2300	42000	6.3	3.4	3.3	23	4.8	11	<0.63	1300	74	8700	66	
8886 (18)	12/3/2013	ppt	<0.22	<0.46	<0.58	<0.64	<0.77	68	1200	<0.23	<0.23	<0.19	<0.36	<0.4	<0.33	<0.54	32	<1.7	210	2	
8886 (21)	12/3/2013	ppt	<0.22	<0.48	<0.6	3.5	<0.72	68	1200	2.2	0.93	0.77	1.1	<0.34	0.74	<0.33	33	3	190	2.9	
8886 (3)	12/3/2013	ppt	<26	<56	71	1200	250	36000	630000	140	79	70	480	120	190	<26	16000	900	110000	1100	
8886 (6)	12/3/2013	ppt	<120	360	<1000	41000	3600	1600000	30000000	9100	3000	3300	1700	3600	4600	<240	780000	44000	5200000	44000	
8886 (9)	12/3/2013	ppt	<25	83	350	31000	1700	1300000	27000000	4100	2100	1800	11000	1800	2900	<97	610000	33000	4200000	35000	
8907 (3-6)	6/3/2014	ppt	< 2.10	< 4.40	< 3.60	< 2.90	< 1.70	16.2	453	19.4	13.2	13	16.7	3.64	2.54	< 2.00	14.5	3.17	34.7	12.7	
8907 (6-9)	6/3/2014	ppt	< 2.10	< 4.40	< 3.60	< 2.90	< 1.70	49.5	465	134	71	71.7	79.7	15.7	9.36	< 2.00	52.3	13.1	124	52.7	
8907 (9-12)	6/3/2014	ppt	< 2.30	< 5.00	< 4.10	7.17	4.13	56	447	200	119	104	226	41.3	16.2	< 2.30	119	55.7	394	90.9	
8907 (12-15)	6/3/2014	ppt	< 2.60	< 5.50	< 4.50	< 3.60	< 2.20	8.62	64	31.9	20.3	19.7	32.7	5.08	< 2.10	< 2.50	14	7.16	47.2	18.6	
8907 (15-18)	6/3/2014	ppt	< 2.30	< 5.00	< 4.10	< 3.20	< 2.00	< 3.20	< 7.20	< 2.20	< 2.50	< 2.00	< 2.50	< 2.60	< 1.90	< 2.30	< 2.40	< 3.60	< 3.60	5.08	
8907 (18-21)	6/3/2014	ppt	< 2.90	< 6.30	< 5.10	< 4.10	< 2.50	< 4.00	10.2	2.9	< 3.20	< 2.50	< 3.20	< 3.30	< 2.30	< 2.90	< 3.00	< 4.50	< 4.50	6.54	
8908 (3-6)	6/3/2014	ppt	< 2.30	< 5.00	< 4.10	< 3.20	< 2.00	15.3	178	10.7	6.36	5.43	9.74	< 2.70	< 1.90	< 2.30	11.3	< 3.60	25.2	8.68	
8908 (6-9)	6/3/2014	ppt	< 1.90	< 4.10	< 3.40	< 2.70	< 1.60	29.1	315	30.5	19.8	15.7	26.1	3.67	2.52	< 1.90	24.3	4.04	61.1	15.8	
8908 (9-12)	6/3/2014	ppt	< 2.40	< 5.10	< 4.20	< 3.30	< 2.00	18	189	10.7	5.57	6.54	8.58	< 2.70	< 1.90	< 2.30	12.7	< 3.70	30.9	9.01	
8908 (15-18)	6/3/2014	ppt	< 2.00	< 4.20	< 3.40	< 2.70	< 1.70	< 2.70	12.3	19.1	11.1	8.02	19.3	3.09	< 1.60	< 1.90	6.16	3.63	14.9	10.7	
8908 (18-21)	6/3/2014	ppt	< 3.80	< 8.10	< 6.70	< 5.30	< 3.20	< 5.20	< 12.0	< 3.60	< 4.10	< 3.30	< 4.10	< 4.30	< 3.00	< 3.70	< 3.90	< 5.90	< 5.80	8.31	
8900 (3-6)	5/28/2014	ppt	2.4	4.6	2.5	12	5.4	200	2100	10000	5100	2200	11000	1200	260	150	2900	2300	7300	3200	
8900 (6-9)	5/28/2014	ppt	0.77	1.1	0.91	4	1.6	65	630	320	330	150	1000	110	27	13	390	210	1200	220	
8900 (9-12)	5/28/2014	ppt	<19	<40	<33	<26	<16	67	350	4900	6400	2700	24000	2100	490	250	7700	5000	29000	5800	
8900 (12-15)	5/28/2014	ppt	0.52	<1.1	<0.89	1.6	0.57	10	65	690	600	260	1500	160	40	18	500	290	1400	350	
8900 (15-16.5)	5/28/2014	ppt	0.56	3.1	1.8	7.5	3.6	110	1200	870	760	330	2000	210	51	29	900	400	2100	460	
8901 (3-6)	5/28/2014	ppt	2.4	4.4	3.5	16	8.3	99	460	4800	5200	2300	17000	1700	390	150	5600	3200	17000	3300	
8901 (6-9)	5/28/2014	ppt	1.5	1.7	1.8	6.6	3.3	50	350	2100	1800	930	5000	580	140	46	1700	950	5400	1200	
8901 (9-12)	5/28/2014	ppt	4.6	4.5	4	20	8.1	270	2000	3500	3100	1700	8500	950	260	80	2900	1600	9200	2000	
8901 (12-15)	5/28/2014	ppt	<0.6	<1.3	<1.1	0.85	<0.51	8.1	35	200	160	74	500	57	13	3.6	170	100	550	110	
8901 (18-21)	5/28/2014	ppt	<0.6	<1.2	<1	<0.83	<0.51	0.84	6.4	3.7	2.5	1.6	9.2	1.1	<0.47	<0.59	4.2	1.6	10	3.1	
8902 (3-6)	5/28/2014	ppt	21	3.5	2.5	8.5	4.7	100	870	2600	1200	1100	940	180	110	23	280	94	430	780	
8902 (6-9)	5/28/2014	ppt	2.6	5.8	4.8	26	12	130	670	870	440	410	420	89	43	9.1	220	48	440	300	
8902 (9-12)	5/28/2014	ppt	3.4	4	3.7	14	7.7	96	450	980	470	420	460	87	44	7.5	180	61	410	310	
8902 (12-15)	5/28/2014	ppt	<0.57	<1.1	<1	<0.8	<0.49	2.8	21	1100	260	340	170	36	25	3.9	35	9.7	23	240	
8902 (15-18)	5/28/2014	ppt	<0.52	<1.3	<0.9	<0.72	<0.44	<0.71	4	20	7.3	8.7	6.7	1.2	0.93	<0.8	2	<0.8	2	6.7	
8902 (18-21)	5/28/2014	ppt	<0.6	<1.3	<1	<0.83	<0.51	0.94	9.4	490	130	190	98	21	15	2.3	19	4.4	6.5	120	
8903 (3-6)	5/29/2014	ppt	2	1.8	1.5	4.9	2.8	48	350	2800	1700	1100	3800	470	150	31	1300	670	4400	1100	
8903 (6-9)	5/29/2014	ppt	<19	<14	<33	<26	<16	67	350	4900	6400	2700	24000	2100	490	250	7700	5000	29000	4300	
8903 (6-9)	5/29/2014	ppt	<6.6	<1.3	<11	17	7.3	87	800	13000	13000	5800	44000	3700	890	410	13000	9100	53000	8600	
8903 (9-12)	5/29/2014	ppt	2.8	4.2	2	5.1	2.2	40	350	3800	1800	1400	3200	420	170	31	1100	590	3300	1300	
8903 (12-15)	5/29/2014	ppt	6.8	9.6	<5.7	<4.6	<2.8	9.3	270	29000	7200	8500	3900	870	570	67	580	210	410	6200	
8903 (15-18)	5/29/2014	ppt	<0.61	<1.2	<1.1	<0.84	<0.51	1.5	8.9	280	96	110	83	16	8.7	1.9	17	8.2	31	75	
8903 (18-21)	5/29/2014	ppt	<0.58	<40	<1	<0.81	<0.5	<0.8	8.1	15	6.3	5.4	9.8	1.1	0.58	<0.96	4.4	1.1	10	5.6	
8904 (3-6)	5/29/2014	ppt	8.5	21	12	55	26	630	5600	5600	3400	2900	6000	880	430	68	2900	1100	6500	2400	
8904 (6-9)	5/29/2014	ppt	12	23	13	92	44	540	3700	7500	3600	3200	5200	780	380	50	3000	900	5000	2600	
8904 (9-12)	5/29/2014	ppt	160	190	40	150	91	480	3300	3900	3200	6500	7100	1200	1000	77	3100	2000	8600	3800	
8904 (12-15)	5/29/2014	ppt	<0.62	<1.3	<1.1	<0.86	<0.53	1.8	12	130	47	48									

RGIS Upgrade Projects
Summary of Trace Analysis of Excess Soils

Sample Name	Sample Date	Units	2378-TCDD	12378-PCDD	123478-HCDD	123678-HCDD	123789-HCDD	1234678-HpCDD	OCDD	2378-TCDF	12378-PCDF	23478-PCDF	123478-HCDF	123678-HCDF	234678-HCDF	123789-HCDF	1234678-HpCDF	1234789-HpCDF	OCDF	2005 Who Tec
8905 (3-6)	5/29/2014	ppt	2	2.5	2.5	13	5.5	150	1300	620	350	270	710	100	46	7.1	400	160	1100	250
8905 (6-9)	5/29/2014	ppt	8	14	9.8	32	18	250	1900	960	620	480	1600	210	100	12	930	510	2600	500
8905 (12-15)	5/29/2014	ppt	6.8	13	6.8	33	16	290	2300	14000	8800	6600	5100	1100	600	91	1000	370	1400	4400
8905 (15-18)	5/29/2014	ppt	4.8	5.5	2.4	18	7.9	210	1700	1300	660	590	470	97	59	7.4	230	57	530	410
8905 (18-21)	5/29/2014	ppt	<0.59	<1.3	<1	<0.82	<0.5	1.1	10	11	5.2	4.7	3.1	0.77	0.56	<0.5	1.4	<0.91	2.4	4.2
8906 (3-6)	5/29/2014	ppt	16	38	28	280	100	5100	96000	710	490	660	1500	320	240	28	3500	460	11000	710
8906 (6-9)	5/29/2014	ppt	26	98	61	620	340	2700	17000	810	670	580	2500	390	230	31	3600	750	7800	890
8906 (12-15)	5/29/2014	ppt	8.4	15	14	110	50	690	4100	520	310	330	890	170	110	15	1500	290	2300	350
8906 (15-18)	5/29/2014	ppt	8.2	25	17	130	65	760	4600	3700	2000	1700	2500	480	270	33	1800	500	4200	1400
8906 (18-21)	5/29/2014	ppt	<0.61	<1.3	<1.1	4.7	2.9	29	180	49	27	27	58	12	7.3	0.86	80	15	130	25
8878 (3')	11/19/2013	ppt	1.2	2.1	1.9	15	3.2	280	1600	270	110	110	83	18	14	1.3	660	15	670	90
8878 (6')	11/19/2013	ppt	13	34	29	130	61	1400	16000	8300	4100	3800	2800	590	380	40	2500	310	4500	2600
8878 (9')	11/19/2013	ppt	41	110	70	380	210	2300	18000	7800	3500	3300	3400	690	430	52	5700	670	7600	2700
8878 (12')	11/19/2013	ppt	<0.27	<0.57	<0.47	1.1	0.64	8.7	58	79	43	34	28	5.9	3.3	0.5	23	2.5	28	24
8878 (15')	11/19/2013	ppt	<0.27	<0.57	<0.47	<0.37	0.31	4.2	30	5.8	2.7	2.5	3.1	0.63	0.3	0.26	9.7	0.57	9.4	2.5
8878 (18')	11/19/2013	ppt	<0.26	<0.56	<0.45	1.5	0.53	31	360	23	12	10	9.9	2.2	1.6	0.37	17	2.4	24	8.3
8879 (3')	11/20/2013	ppt	35	47	44	190	99	2400	22000	8200	3400	3300	2900	560	390	47	3500	400	4800	2500
8879 (6')	11/20/2013	ppt	37	76	67	250	140	2100	18000	6900	2800	2600	3500	690	480	70	29000	970	25000	2500
8879 (9')	11/20/2013	ppt	0.47	<0.95	<0.78	1.2	0.7	17	140	100	57	51	54	10	6.7	0.84	64	7.3	85	36
8879 (12')	11/20/2013	ppt	<0.27	<0.58	<0.48	<0.38	0.24	1.4	13	2.8	2.2	1.9	1.9	0.43	<0.22	0.27	1.9	<0.42	1.5	1.7
8879 (15')	11/20/2013	ppt	0.32	<0.6	<0.49	0.64	<0.24	4.6	30	8.8	3.1	3.9	7.5	0.94	0.42	0.27	11	1.3	16	4
8879 (18')	11/20/2013	ppt	<0.28	<0.6	<0.49	<0.39	<0.24	1.3	11	0.58	<0.3	0.36	<0.3	<0.32	<0.22	0.28	0.7	<0.43	<0.43	0.75
8880 (3')	11/20/2013	ppt	18	82	49	200	93	1600	16000	180	130	310	630	130	140	13	2500	280	5900	390
8880 (6')	11/20/2013	ppt	<0.32	<0.69	<0.56	<0.45	<0.27	1	9.2	<0.3	<0.35	<0.28	0.4	<0.37	<0.26	<0.33	1.2	<0.5	2.4	0.75
8880 (9')	11/20/2014	ppt	<0.27	<0.58	<0.47	<0.38	<0.23	0.54	2.6	6.2	0.74	4.3	1.3	<0.31	0.26	<0.27	0.65	<0.42	11	2.6
8880 (12')	11/20/2014	ppt	<0.25	<0.54	<0.44	<0.35	<0.21	0.51	3.8	2.4	0.82	1.7	2.1	0.34	0.42	0.25	2.7	1.5	65	1.6
8880 (15')	11/20/2014	ppt	<0.26	<0.56	<0.46	<0.37	<0.22	1.7	11	2.9	0.92	0.52	0.49	<0.3	<0.21	0.26	2	<0.41	1.8	1.1
8880 (18')	11/20/2014	ppt	0.35	<0.59	<0.48	<0.38	0.38	1.5	10	0.28	<0.3	<0.24	<0.3	<0.31	<0.22	0.27	<0.29	<0.43	0.48	0.87
8881 (3')	11/20/2014	ppt	0.61	1.5	1.1	5.6	2.7	72	610	28	11	15	16	5.1	5.8	0.51	46	6.8	110	15
8881 (6')	11/20/2014	ppt	1.7	2.4	2.3	9.9	4.1	260	2800	430	210	200	170	34	23	3.8	140	26	560	140
8881 (9')	11/20/2014	ppt	2.2	2.8	4.4	18	8.6	560	5300	48	20	21	21	5.8	6.4	0.43	190	16	820	33
8881 (12')	11/20/2014	ppt	9.9	13	9.8	62	21	1200	14000	1000	380	390	300	67	54	6	640	74	2900	330
8881 (15')	11/20/2014	ppt	2.6	4.3	3.6	35	8.8	320	3200	410	150	150	110	25	19	2.5	170	23	660	120
8881 (18')	11/20/2014	ppt	<0.26	<0.57	<0.46	<0.37	<0.22	2.1	14	0.79	0.37	0.27	<0.29	<0.3	<0.21	<0.26	0.77	<0.41	2.4	0.73
8882 (3')	11/25/2013	ppt	<0.23	<0.5	<0.41	1.9	<0.54	36	400	99	25	28	17	4.2	2.8	0.55	29	2.7	110	23
8882 (6')	11/25/2013	ppt	4.7	7.3	3.2	9.9	4.4	230	2900	10000	4400	4100	2700	560	330	63	480	140	700	2800
8882 (9')	11/25/2013	ppt	1.7	3.3	1.6	19	3.3	140	1200	1500	650	620	430	91	55	14	140	31	280	430
8882 (12')	11/25/2013	ppt	1.6	2.8	2.3	20	5	470	6900	910	280	300	240	46	30	4.3	510	45	2000	240
8882 (15')	11/25/2013	ppt	<0.23	<0.5	<0.41	0.59	0.36	11	170	8.9	4.1	4	3.7	0.67	0.49	<0.23	10	0.8	40	3.5
8882 (18')	11/25/2013	ppt	<0.25	<0.53	<0.43	<0.34	<0.21	3.9	64	4.4	2.7	2.5	2.1	0.4	0.31	<0.24	2.9	<0.38	13	2.1
8883 (3')	11/21/2013	ppt	13	1.3	2.1	19	4.2	620	5400	45	18	20	31	7.1	8.9	0.91	430	34	1600	46
8883 (6')	11/21/2013	ppt	0.36	0.62	0.62	3.7	1.9	89	740	4	1.8	3.2	5.5	1.7	2.4	<0.23	43	5.3	150	5.6
8883 (9')	11/21/2013	ppt	<0.22	<0.47	0.64	3.4	1.5	94	910	4.2	2	2.8	4	1.4	1.8	<0.22	41	4.2	180	4.7
8883 (12')	11/21/2013	ppt	91	23	52	590	110	26000	380000	1500	800	750	1600	250	230	24	12000	1100	62000	1300
8883 (15')	11/21/2013	ppt	<0.28	<0.6	<0.49	1.7	<0.66	29	430	5.9	4.2	6	9.5	1.8	1.1	<0.28	90	3.6	130	5.9
8883 (18')	11/21/2013	ppt	0.65	2.2	0.93	4.1	3.1	40	410	45	29	31	45	10	6	0.67	250	15	210	28
8884 (3')	11/21/2013	ppt	8.8	13	11	75	23	2100	24000	3300	1500	1300	970	210	130	16	1100	97	4000	980
8884 (6')	11/21/2013	ppt	22	75	36	220	82	3300	41000	15000	6900	7000	5300	1200	790	100	12000	920	13000	4900
8884 (9')	11/21/2013	ppt	<0.39	<0.82	<0.67	<0.54	<0.85	15	190	16	7.2	7.3	5.3	1.7	<0.34	<0.56	16	1.5	41	5.8
8884 (12')	11/21/2013	ppt	<0.25	<0.52	<0.43	3.1	1.3	97	1200	92	44	42	33	7.9	5.2	0.94	85	6.9	250	31
8884 (15')	11/21/2013	ppt	<0.27	<0.58	<0.47	0.45	<0.26	9.1	160	3.1	1.2	0.91	0.84	<0.31	<0.22	<0.27	4.9	<0.42	24	1.5
8884 (18')	11/21/2013	ppt	<0.28	<0.59	<0.48	<0.43	<0.52	25	390	<0.26	<0.3	<0.25	<0.3	<0.32	<0.33	<0.5	13	7	68	1.2
8885 (3')	11/21/2013	ppt	72	150	97	1600	300	39000	500000	1200	500	510	870	190	240	26	19000	1200	120000	1600
8885 (6')	11/21/2013	ppt	32	65	38	500	110	8900	88000	180	76	88	150	39	53	3.4	3000	190	18000	380
8885 (9')	11/21/2013	ppt	1.8	9.2	3.2	46	11	220	1300	2900	1200	1100	750	180	100	23	310	150	4100	770
8885 (12')	11/21/2013	ppt	<0.27	<0.59	<0.48	1.1	<0.28	28	330	0.95	0.56	0.39	0.95	<0.31	<0.22	<0.27	14	<0.51	83	1.5
8885 (15')	11/21/2013	ppt	<0.26	<0.56	<0.46	0.74	<0.28	12	130	1.4	0.67	0.58	0.45	<0.3	<0.21	<0.26	4.8	<0.4	26	1.2
8885 (18')	11/21/2013	ppt	<0.25	<0.54	<0.44	1.3	0.5	21	230	0.73	<0.27	0.3	0.55	<0.29	<0.2	<0.25	8.7	0.54	53	1.2
8886 (3')	12/3/2013	ppt	<26	<56	71	1200	250	36000	630000	140	79	70	480	120	190	<26	16000	900	110000	1100
8886 (6')	12/3/2013	ppt	<120	360	<1000	41000	3600	1600000	30000000	9100	3000	3300	17000	3600	4600	<240	780000	44000	5200000	44000
8886 (9')	12/3/2013	ppt	<25	83	350	31000	1700	1300000	27000000	4100	2100	1800	11000	1800	2900	<97	610000	33000	4200000	35000
8886 (12')	12/3/2013	ppt	<0.18	<0.38	<0.67	23	2.8	830	18000	9.6	4.2	4.3	10	2.6	3.2	<0.43	390	25	2600	25
8886 (15')	12/3/2013	ppt	<0.26																	

RGIS Upgrade Projects
Summary of Trace Analysis of Excess Soils

Sample Name	Sample Date	Units	2378-TCDD	12378-PCDD	123478-HCDD	123678-HCDD	123789-HCDD	1234678-HpCDD	OCDD	2378-TCDF	12378-PCDF	23478-PCDF	123478-HCDF	123678-HCDF	234678-HCDF	123789-HCDF	1234678-HpCDF	1234789-HpCDF	OCDF	2005 Who Tec
B2B (41.5-47)	11/14/2006	ppt	0.855	1.06	ND	ND	ND	2.81	17.8	3500	2660	1560	1790	359	91.2	34.6	163	73.6	54.2	1495
B2E (58-63.5)	11/14/2006	ppt	0.402	0.388	ND	0.255	0.359	1.31	13.6	0.937	0.47	0.375	0.315	ND	ND	ND	0.475	ND	0.38	2.00
B2D (52.5-58)	11/14/2006	ppt	0.239	0.208	0.148	ND	0.17	0.814	5.24	0.294	0.167	0.151	0.141	ND	ND	ND	0.192	ND	ND	0.56
B2F (63.5-69)	11/14/2006	ppt	0.272	0.43	ND	0.265	0.27	1.24	9.09	0.365	0.258	0.178	0.124	ND	ND	ND	0.291	ND	ND	0.85
B2C (47-52.5)	11/14/2006	ppt	0.277	0.235	ND	ND	ND	1.09	8.29	0.172	0.12	ND	ND	ND	ND	ND	0.283	ND	0.195	0.64
B2A (36-41.5)	11/14/2006	ppt	1.64	2.33	0.876	1.15	0.551	7.4	48.2	6890	4460	2800	3210	698	185	62.5	349	161	197	2088
B1A (0-3)	9/21/2006	ppt	0.612	0.86	0.481	1.46	0.783	15.3	137	1350	429	376	191	43.2	18.4	4.88	41.5	8.73	38.7	289
B1B (3-6)	9/21/2006	ppt	3.08	5.52	4.48	21.7	10.8	271	2800	794	389	288	458	102	28.6	10.8	507	70.8	902	267
B1C (6-9)	9/21/2006	ppt	2.92	3.44	0.825	1.49	0.706	15	153	9470	3900	2840	2530	498	162	52.5	407	156	482	2253
B1D (9-12)	9/21/2006	ppt	0.473	0.398	0.181	0.414	0.371	1.62	14.8	4.09	3.04	2.67	2.17	0.659	0.354	0.385	1.09	0.145	0.75	2.7
B1E (12-15)	9/21/2006	ppt	0.292	0.365	ND	0.27	0.22	1.41	10.2	1.88	0.894	0.845	0.87	0.33	0.155	0.193	1.02	ND	0.747	1.4
B1F (15-18)	9/21/2006	ppt	0.191	0.162	0.209	0.174	0.186	1.1	8.8	0.8	0.481	0.412	0.578	0.12	0.108	0.114	0.538	0.156	0.577	0.8
B3A (0-3)	9/21/2006	ppt	0.384	0.545	0.653	3.08	1.59	32.5	245	63.3	35.8	27.1	57.9	10.1	3.3	1.03	49.6	15.3	124	26
B3B (3-6)	9/21/2006	ppt	23.7	38	37.1	143	62.9	1790	13400	2760	1600	1060	2460	511	146	49.3	2600	501	5500	1135
B3C (6-9)	9/21/2006	ppt	7.05	7.23	4.83	20.1	9.91	201	1520	970	444	338	573	110	33.3	10.5	374	105	850	314
B3D (9-12)	9/21/2006	ppt	16.4	43.9	56.2	117	58.9	1290	4010	6670	3920	2820	4000	904	301	84.6	2610	812	3000	2303
B3E (12-15)	9/21/2006	ppt	206	134	122	456	202	1490	26600	5430	4490	2720	12500	1660	404	163	7920	3000	28700	3597
B3F (15-18)	9/21/2006	ppt	59.5	63.9	44.1	213	82.2	2160	16200	10500	5200	3920	6600	1370	380	123	6310	1100	10800	3534
B4A (0-3)	9/21/2006	ppt	0.605	ND	ND	2.19	1.16	24.8	234	19	13.9	9.64	21.8	4.51	2.9	4.31	31.5	5.82	53.8	11.3
B4B (3-6)	9/21/2006	ppt	2.92	13.1	9.98	75.2	35.7	420	3970	846	463	357	801	173	48.6	14	1190	208	1470	368
B4C (6-9)	9/21/2006	ppt	10.4	47.4	57.4	415	207	4100	8130	1940	1250	971	2400	575	174	58.5	3880	686	3690	1081
B4D (9-12)	9/21/2006	ppt	17.2	121	111	1070	444	4530	10200	1070	796	3330	11400	3880	1000	135	41000	4990	26100	3616
B4E (12-15)	9/21/2006	ppt	2.51	28.6	24.6	208	117	644	1910	206	146	121	459	136	43.5	14.9	1080	201	926	218
B4F (15-18)	9/21/2006	ppt	ND	ND	ND	3.3	0.551	82.4	511	23.4	13.3	8.87	17.5	3.67	1.72	2.44	40.5	5.7	215	11.4
B5A (0-3)	9/22/2006	ppt	0.651	2.47	2.43	14.4	7.54	86	329	111	77.1	65.5	150	37.8	11.9	3.39	254	36.4	208	64
B5B (3-6)	9/22/2006	ppt	3.8	19.9	15.6	144	69	634	1740	477	352	305	1140	279	68.5	17.5	2560	345	1870	388
B5C (6-9)	9/22/2006	ppt	9.31	63.5	58.3	608	277	2510	6120	737	596	973	3740	1010	292	53.7	13700	1410	9490	1258
B5D (9-12)	9/22/2006	ppt	20	108	100	941	450	4470	10100	1340	1100	2290	7240	2060	613	102	21600	2380	13700	2452
B5E (12-15)	9/22/2006	ppt	65.5	359	149	1770	819	6170	17500	18600	1930	6590	21100	7090	2070	206	60700	6710	38400	8440
B6A (0-3)	9/22/2006	ppt	1.5	2.25	2.06	12	5.88	146	1120	413	169	137	206	40.4	12.3	3.61	173	37.9	304	126
B6B (3-6)	9/22/2006	ppt	19	31.5	24.4	110	58.2	1500	13600	10100	4920	3360	6810	1050	265	99.3	3190	1150	7310	3159
B6C (6-9)	9/22/2006	ppt	48.1	57	61.7	370	176	3080	29100	4950	2500	2020	4800	1040	282	72.1	7810	1380	10800	2175
B6D (9-12)	9/22/2006	ppt	10.9	37.7	23.4	275	141	1140	4220	1530	1170	272	3050	514	110	34.7	3350	707	4770	799
B6E (12-15)	9/22/2006	ppt	8.67	36.5	23.8	126	65	288	920	729	834	414	4090	566	98.5	40.3	3840	1120	8950	826
B6F (15-18)	9/22/2006	ppt	0.308	0.994	0.65	4.86	2.4	33	251	41.4	25.5	20.9	63.5	13.6	3.63	0.86	104	16.3	138	24

**Tertiary Pond Surface Impoundments
Main Pond
Summary of Trace Analysis of Accumulated Solids**

Sample Name	Sample Date	Units	2378-TCDD	12378-PCDD	123478-HCDD	123678-HCDD	123789-HCDD	1234678-HpCDD	OCDD	2378-TCDF	12378-PCDF	23478-PCDF	123478-HCDF	123678-HCDF	234678-HCDF	123789-HCDF	1234678-HpCDF	1234789-HpCDF	OCDF	2005 Who Tec
MDP	5/15/2014	ppt	488	412	294	1140	533	25300	244000	<280	<280	775	1240	499	498	<280	24700	771	37400	420
MPSB-1-4	5/15/2014	ppt	558	724	434	1020	714	28700	258000	<420	<420	838	1220	527	533	<420	21700	752	33200	420
MP-24-1	5/20/2014	ppt	1150	1030	710	3100	1460	75700	766000	532	381	2680	4550	2110	1950	115	136000	3000	197000	7580
MP-31-1	5/16/2014	ppt	4590	5210	4350	7720	7030	270000	1850000	879	757	5870	5680	2530	3010	<150	54000	5940	105000	18500
MP-2-1	5/20/2014	ppt	273	207	159	858	326	17400	170000	366	233	767	1200	493	540	28.4	31600	703	45000	1880
MP-13-1	5/19/2014	ppt	363	427	217	600	354	17800	138000	68.1	62.6	367	532	249	279	18.5	13900	444	21300	1480
MP-20-1	5/19/2014	ppt	558	62.2	33.7	182	99.9	2660	20500	55.1	70.3	86.8	242	71.1	64.4	7.07	1860	74.6	2190	780
MP-20-3	5/19/2014	ppt	333	297	258	1380	518	30200	293000	203	166	966	1740	845	906	44.9	54600	1100	75300	2790
MP-31-3	5/16/2014	ppt	489	966	1880	3140	2340	51900	248000	268	254	1290	2370	1530	1730	50.3	58500	1140	25300	4350

Salzburg Landfill
Summary of Trace Analysis
of Cell Leachate

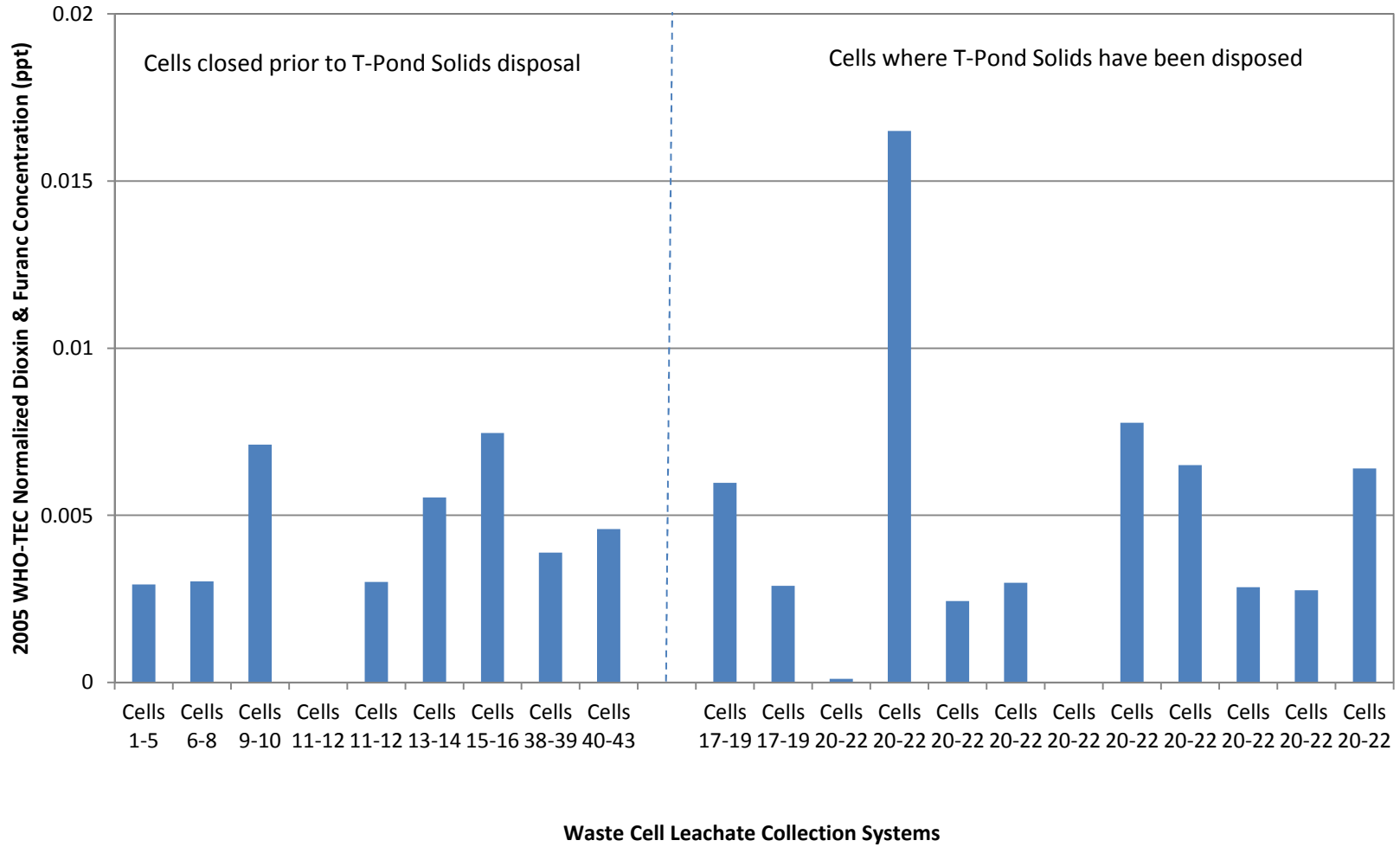
Sample Name	Sample Date		2378-TCDD	12378-PCDD	123478-HCDD	123678-HCDD	123789-HCDD	1234678-HpCDD	OCDD	2378-TCDF	12378-PCDF	23478-PCDF	123478-HCDF	123678-HCDF	234678-HCDF	123789-HCDF	1234678-HpCDF	1234789-HpCDF	OCDF	2005 Who Tec
Cells 17-19	4/18/2008	ppt	<0.00005	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Cells 20-22	4/18/2008	ppt	<0.00005	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Cells 1-5	7/24/2008	ppt	<0.00005	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Cells 9-10	7/24/2008	ppt	<0.00005	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Cells 11-12	7/30/2008	ppt	<0.0074	<0.0211	<0.0122	<0.0122	<0.0119	<0.016	0.073	<0.00956	<0.00969	<0.00868	<0.00322	<0.00359	<0.00377	<0.0057	0.0118	<0.0083	<0.0183	<0.0191
Cells 17-19	7/24/2008	ppt	<0.00005	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Cells 20-22	7/24/2008	ppt	<0.00005	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Cells 1-5	10/16/2008	ppt	<0.05	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Cells 9-10	10/16/2008	ppt	<0.05	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Cells 11-12	10/16/2008	ppt	<0.05	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Cells 17-19	10/16/2008	ppt	<0.05	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Cells 20-22	10/16/2008	ppt	<0.114	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Cells 1-5	3/12/2009	ppt	<0.05	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Cells 9-10	3/12/2009	ppt	<0.05	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Cells 11-12	3/12/2009	ppt	<0.05	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Cells 15-16	3/12/2009	ppt	<0.05	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Cells 17-19	3/12/2009	ppt	<0.05	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Cells 20-22	3/12/2009	ppt	<0.05	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Cells 20-22	6/23/2009	ppt	<0.00082	<0.00116	<0.00319	<0.00333	<0.00306	<0.00663	0.0447	<0.00127	<0.00254	<0.00252	<0.0011	<0.00107	<0.00125	<0.00167	0.00494	<0.00329	0.0071	0.002438
Cells 9-10	7/20/2010	ppt	<0.001309	<0.002537	<0.001555	0.0057	0.00209	0.173	2.8	<0.000982	<0.001309	<0.001309	0.00174	<0.000982	0.00227	<0.001228	0.0893	0.00303	0.201	0.007112
Cells 6-8	7/20/2010	ppt	<0.001322	<0.002561	<0.00157	<0.00157	<0.00162	0.0122	0.0801	<0.000991	<0.001322	<0.001322	<0.000991	<0.000991	<0.001074	<0.001239	0.0193	<0.002148	0.027	0.003021
Cells 40-43	7/20/2010	ppt	<0.00132	<0.002557	<0.001567	0.00346	<0.00165	0.0191	0.112	0.00381	<0.00132	0.00213	0.00262	<0.00099	0.00235	<0.001237	0.025	<0.002145	0.0415	0.004591
Cells 38-39	7/20/2010	ppt	<0.0013	<0.00252	<0.001544	<0.001544	<0.001626	0.00938	0.0347	<0.000975	<0.0013	<0.0013	0.00114	<0.000975	<0.001057	<0.001219	0.0078	<0.002113	0.0118	0.003882
Cells 20-22	7/20/2010	ppt	<0.001304	<0.002526	<0.001548	<0.001548	<0.00163	0.0119	0.0743	<0.000978	<0.001304	<0.001304	0.00122	<0.000978	<0.001059	<0.001222	0.0125	<0.002119	0.0234	0.002985
Cells 17-19	7/20/2010	ppt	<0.00131	<0.00254	<0.00156	<0.00156	<0.00164	0.0115	0.0502	<0.00098	<0.00131	<0.00131	<0.00098	<0.00098	<0.00106	<0.00123	0.0108	<0.00213	0.0179	0.002893
Cells 15-16	7/20/2010	ppt	<0.001322	<0.002561	<0.00157	0.00534	0.00248	0.0959	0.681	0.00138	<0.001322	0.00256	0.00446	0.00147	0.00361	0.00124	0.14	0.00321	0.203	0.007461
Cells 1-5	7/20/2010	ppt	<0.001312	<0.002541	<0.001558	<0.001558	<0.00164	0.0165	0.0963	<0.000984	<0.001312	<0.001312	<0.000984	<0.000984	<0.001066	<0.00123	0.00837	<0.002131	0.0148	0.002935
Cells 13-14	7/20/2010	ppt	<0.001377	<0.002515	<0.001542	0.00358	<0.001623	0.0577	0.548	<0.000974	<0.001298	0.00231	0.00272	0.00109	0.00173	<0.001217	0.0893	0.00231	0.111	0.00553
Cells 11-12	7/20/2010	ppt	<0.001304	<0.002526	<0.001548	<0.001548	<0.00163	0.0192	0.128	<0.000978	<0.001304	<0.001304	<0.000978	<0.000978	<0.001059	<0.001222	0.013	<0.002119	0.0199	0.003004
Cells 20-22	7/20/2011	ppt	0.000394	<0.00253	<0.000599	0.00487	<0.000671	0.00487	0.0392	0.00257	0.00164	0.00169	0.00356	<0.00084	<0.00023	<0.00031	0.00463	<0.000907	<0.0109	<0.00184
Cells 20-22	7/23/2012	ppt	<0.00294	<0.00627	<0.00513	<0.00408	<0.00249	0.0293	0.219	<0.00274	<0.00319	<0.00254	0.00346	<0.00334	<0.00234	<0.0029	0.0253	<0.00453	0.0427	0.00777
Cells 20-22	7/23/2012	ppt	<0.00289	<0.00616	<0.00504	<0.00401	<0.00245	0.00929	0.0549	<0.00269	<0.00313	<0.0025	<0.00313	<0.00328	<0.0023	<0.00284	0.00872	<0.00445	0.0176	0.0065
Cells 20-22	7/22/2013	ppt	<0.00188	<0.00169	<0.000992	<0.00109	<0.00139	0.00775	0.0281	0.00187	<0.000694	0.00111	<0.000892	<0.000793	<0.00139	<0.000892	0.00447	<0.00109	0.0116	0.002851
Cells 20-22	7/22/2013	ppt	<0.00183	<0.00164	<0.000962	<0.00106	<0.00135	0.00397	0.0236	0.00173	0.00144	0.00112	<0.00105	<0.000769	<0.00135	<0.000866	0.00452	<0.00106	0.00912	0.002754
Cells 20-22	7/1/2014	ppt	<0.004	<0.004	<0.004	0.008	<0.004	0.008	0.039	0.004	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.0054	<0.004	0.013	0.0064

Notes:

* 2005 WHO-TEC was calculated using LoD=0, due to significantly elevated reporting limits, and OCDD being the sole detected component. All others are calculated using 0.5*LoD.

LoD = Limit of Detection

Total 2005 WHO-TEC Normalized Dioxin and Furan Concentrations in Salzburg Landfill Leachate from Waste Cells





RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



C. HEIDI GREYER
DIRECTOR

May 2, 2017

Mr. Scott Bemis
Responsible Care Leader
Environment, Health and Safety
The Dow Chemical Company
1790 Building, Washington Street
Midland, Michigan 48674

Dear Mr. Bemis:

SUBJECT: In Compliance; Application of Waste Analysis Plan to Qualawash Holdings, LLC, Wastes; The Dow Chemical Company, Michigan Operations, Midland; MID 000 724 724

The Department of Environmental Quality (DEQ), Waste Management and Radiological Protection Division (WMRPD), has reviewed the Request for Regulatory Applicability Determination – Hazardous Waste Management Facility Operating License (License), letter dated January 26, 2017 (the Letter). The Letter request is summarized below.

Based on:

1. The language of the Waste Analysis Plan, Attachment 1 to the License, issued September 15, 2015 (WAP), for The Dow Chemical Company (Dow) facility located at 1790 Building, Washington Street, Midland, Michigan (the Facility),
2. Dow's strategic business relationship with Qualawash Holdings, LLC, located at 4200 James Savage Road, Midland, Michigan (Qualawash), and
3. The wastes generated from the container cleaning process are similar to those that are already approved and received at the 32 Incinerator kiln;

Dow requests DEQ, WMRPD, confirmation that

1. The provisions of Dow's License apply to Dow container cleaning wastes generated by Qualawash, and
2. Dow can receive and treat those wastes.

The DEQ, WMRPD, reviewed the basis and the request for compliance with the WAP. Based on this review, the DEQ, WMRPD, agrees that the WAP provisions apply to Dow container cleaning wastes generated by Qualawash, and that the Facility can receive these wastes for storage and treatment in the 32 Incinerator kiln in compliance with the WAP. The WAP provisions do not apply to other wastes generated by Qualawash.

Additional Information

1. The WAP

The DEQ, WMRPD, reviewed the WAP language provided by the Letter:

Copied directly from Page 4 of 29 of the WAP**A3.A CAPTIVE FACILITY ACCEPTING CERTAIN OFF-SITE AND NON-DOW WASTE**

Dow's Michigan Operations is a captive facility that generates and manages wastes onsite and also receives certain wastes generated off-site or from non-Dow generators in support of Dow operations or strategic business relationships. The vast majority of the waste streams managed on-site are generated at captive facilities owned by Dow. A waste is considered from "Dow," for purposes of this categorization, if Dow has any ownership in the company generating the waste (e.g. joint venture, subsidiary). Waste received from off-site or non-Dow generators include:

- *Off-site non-Dow facilities that are or will be in a strategic business relationship with Dow (e.g., landlord/tenant, supplier/receiver of raw material or service) whose wastes are similar to wastes already approved to be received at the kiln or landfill;*

Receipt of Dow container cleaning waste generated by Qualawash for storage at the Facility and treatment in the 32 Incinerator kiln is consistent with the WAP provision specified in the Letter and is acceptable.

2. Strategic Business Relationship

Dow describes the strategic business relationship with Qualawash as:

As a part of this program, waste is generated from the container cleaning process. The waste typically consists of residual material in the container and the cleaning agent used to remove the residual material from the container. Currently the waste is captured, containerized, and sent to an offsite third party TSD for treatment and disposal. Dow would like to take advantage of our strategic business relationship with Qualawash and have the waste captured, containerized, and returned to the Dow kiln for treatment and disposal.

When Dow introduces a material to Qualawash for cleaning, Dow provides Qualawash with all the necessary information on the material (e.g., Safety Data Sheet(s), waste profile, process knowledge, known cleaning agents, etc.). Examples of materials that could be introduced to Qualawash for cleaning

include, but are not limited to: raw materials, waste streams, and final products.

Qualawash, with consultation from Dow, then creates a cleaning procedure that utilizes either the same cleaning agent or a similar cleaning agent to what is used by Dow to clean process equipment, so as to generate a waste stream similar to what is already approved and received at the Dow kiln.

This is acceptable. Dow and Qualawash must comply with the notification requirements in the WAP. In addition, Qualawash and Dow must ensure that only wastes that are generated from the cleaning of Dow containers are returned to Dow for treatment, storage, and disposal.

3. Dow container cleaning wastes generated by Qualawash, are similar to wastes received at the 32 Incinerator kiln.

The DEQ, WMRPD, consulted manifest information from the Michigan Waste Data System for hazardous wastes generated by Qualawash during the years of 2014 through 2016, as received by US Ecology in Detroit, Michigan. The results of this review are summarized below:

Table 1
2014 - 2016 Wastes Generated by Qualawash as Shown on US Ecology Manifests

Waste Type	Waste Code
Michigan Hazardous Wastes/Liquid Industrial By-Products	029U 029L
Characteristically Hazardous Wastes	D001, D002, D003, D004, D005, D007, D016, D018, D019, D022, D024, D025, D035, D039, D040
Listed Hazardous Waste Spent Solvents	F002, F003, F005
Listed Hazardous Waste Discarded Commercial Chemical Products	U007, U044, U080, U154, U210, U213, U240

This list of waste types generated from Qualawash is included in the list of acceptable waste types for the 32 Incinerator kiln, based on a comparison to Attachment 10, List of Acceptable Waste Types, INCIN TANK FARM STORAGE and CONTAINER columns. As long as Dow maintains a strategic business relationship with Qualawash, Dow container cleaning wastes generated by Qualawash are acceptable for storage at the Facility and treatment in the 32 Incinerator kiln pursuant to the provisions of the WAP.

Conditions for Dow Wastes Located at Qualawash

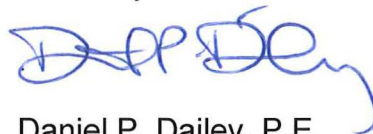
Since Dow has a strategic business relationship with Qualawash, Qualawash must ensure that only Dow wastes are handled using this relationship. Therefore, wastes generated from the cleaning of Dow containers at the Qualawash site must:

1. Be easily identifiable for DEQ inspectors;
2. Not be commingled with other, non-Dow wastes; and
3. Be stored in separate areas from other, non-Dow wastes handled at Qualawash.

Qualawash must continue to comply with all hazardous waste generator requirements contained in Part 3 of the Part 111 Administrative Rules in handling wastes generated from the cleaning of Dow containers.

Should you have any questions regarding this letter, please contact me at 517-242-7261; daileyd@michigan.gov; or DEQ, WMRPD, P.O. Box 30241, Lansing, Michigan 48909-7741.

Sincerely,



Daniel P. Dailey, P.E.
Environmental Engineer Specialist
Hazardous Waste Section
Waste Management and Radiological
Protection Division

cc: Mr. Brent Gaudreau, The Dow Chemical Company
Mr. Charles Boyd, Qualawash
Ms. Ann Marie Walters, Qualawash
Mr. Al Taylor, DEQ
Ms. Virginia Himich, DEQ
Ms. Kathy Brewer, DEQ
Ms. Trisha Confer, DEQ
HWS/C&E File