

DTE Energy®



Prepared for

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**2019 ANNUAL INSPECTION REPORT
RANGE ROAD LANDFILL
ASH DISPOSAL FACILITY**

China Township, St. Clair County, Michigan

Prepared by

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consultants

engineers | scientists | innovators

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TABLE OF CONTENTS

1.	INTRODUCTION.....	1-1
1.1	Overview	1-1
1.2	Purpose.....	1-2
1.3	Report Organization.....	1-2
1.4	Terms of Reference	1-3
2.	REVIEW OF AVAILABLE INFORMATION	2-1
3.	FACILITY DESCRIPTION.....	3-1
3.1	Overall Site Description.....	3-1
3.2	Design.....	3-2
3.3	Construction	3-3
4.	VISUAL INSPECTION RESULTS.....	4-1
5.	INSTRUMENTATION MONITORING	5-1
5.1	Surface Water and Groundwater Collection	5-1
5.2	Groundwater Elevations and Offsite Capture System Monitoring	5-1
5.3	RRLF CCR Monitoring Wells	5-1
6.	OPERATION ACTIVITIES	6-1
6.1	Observations.....	6-2
7.	EVALUATION	7-1
7.1	Design.....	7-1
7.2	Construction	7-1

7.3 Maintenance	7-1
7.4 Operations	7-2
7.4.1 Operations Plan	7-2
7.4.2 Fugitive Dust Control	7-2
7.4.3 Run-on and Run-off Control	7-2
7.4.4 Inspections	7-3
7.4.5 Annual Visual Inspection	7-3
8. CONCLUSIONS and certification.....	8-1

LIST OF TABLES

Table 1: Available Information Reviewed for Annual Inspection

Table 2: Site Phasing Summary-December 2015 and Updated for 2019 Report

LIST OF FIGURES

Figure 1: Landfill Work Area Phasing Plan

Figure 2: Site Surface Water Flow System

LIST OF APPENDICES

Appendix A Resume of the Qualified Professional Engineer

Appendix B Range Road Landfill 2019 Annual Inspection Log and Photographs

1. INTRODUCTION

1.1 Overview

This 2019 Annual Inspection Report (AIR) was prepared by Geosyntec Consultants (Geosyntec) to provide the results of the annual inspection of the coal combustion residuals (CCR) Range Road Ash Disposal Facility (Landfill) located in China Township, St. Clair County, Michigan. The annual inspection has been prepared to comply with United States Environmental Protection Agency (USEPA) Coal Combustion Residuals Rule (CCR Rule) published on April 17, 2015 (40 CFR 257.84). Under the CCR Rule, the Landfill is an “existing landfill” per 40 CFR 257.53 and must be inspected by a qualified professional engineer on a periodic basis, not to exceed one year.

The Landfill is located approximately one mile west of the St. Clair River between Lake Huron and Lake St. Clair. The Landfill is licensed by the Michigan Department of Environment, Great Lakes, and Energy (EGLE) as a Type III Low Hazard Industrial Landfill. The property encompasses 514 acres of which 402 are designated for landfill development. The EGLE Facility ID Number is 392562 and License Number 9395. DTE has prepared and transmitted to MDEQ a license renewal document of which was one of the documents viewed.

During 2019 the Landfill accepted bottom ash, fly ash, and waste coal from the St. Clair and Belle River Power Plants. The Marysville Power Plant is included in the current license but has been decommissioned and no longer sends ash to the landfill. The Harbor Beach Power Plant is no longer operating but is transferring ash to the Landfill in accordance with the Harbor Beach Power Plant closure project. Filling operations at the site began in the 1950s and the current Operating License issued to DTE Electric Company (DTE) and defined as Number 9395 replaced the previous license (#9207) which was issued to Detroit Edison Company on April 6, 2009. The Landfill has had an operating license since 1966.

The Landfill has multiple operating and planned phases defined by work areas as discussed in the Landfill Development Plan, design drawings, and draft drawings and memorandums on RRLF Waste Filling Sequence. Currently nine work areas are certified closed and three active. Areas D3, G2 and F3/D3 are active as identified in Figure 1. For construction purposes, Area G2 has been subdivided into three phases. Area G2 Phases 1 and 2 have been approved for waste placement while Phase 3 is still under base liner construction per discussions with the DTE inspector. Area E was not included in a current waste filling sequence overall site plan (Draft September 26, 2017), and may not be needed depending on actual future volumes of CCR disposed of during the life of the plants. However, it is still identified in the permit renewal application.

1.2 **Purpose**

The purpose of the inspection under the CCR Rule [40 CFR 257.84(b)(1)] is:

“...to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards. The inspection must, at a minimum, include:

- (i) A review of available information regarding the status and condition of the CCR unit, including, but not limited to, files available in the operating record (e.g., the results of inspection by a qualified person, and results of previous annual inspections); and
- (ii) A visual inspection of the CCR unit to identify signs of distress or malfunction of the CCR unit.”

The purpose is accomplished through periodic visual inspection (and photo-documentation) of the Landfill, review of construction certification documentation, review of available operating records, and review of instrumentation monitoring data and evaluations intended to detect signs of instability.

1.3 **Report Organization**

The remainder of this report is organized as follows:

- Section 2 – Review of available information: summarizes various historical documents that were reviewed as part of this inspection
- Section 3 - Facility Description: provides information about the facility
- Section 4 – Visual Inspection Results: summarizes visual observations during inspections of the Landfill
- Section 5 – Instrumentation Monitoring: discusses the instrumentation and monitoring program
- Section 6 – Operation Activities: describes the operations organization and activities
- Section 7 – Evaluation: evaluates the results of the annual inspection
- Section 8 – Conclusions: provides the overall conclusions of the annual inspection

1.4 **Terms of Reference**

The annual visual inspection was performed by Mr. Daniel G. Bodine, P.E. of Geosyntec whose qualifications as a “qualified professional engineer” under the CCR Rule are presented in Appendix A. DTE’s “qualified person” accompanied Mr. Bodine.

This report was prepared by Mr. Daniel G. Bodine, P.E. of Geosyntec. The senior review was completed by Mr. John Seymour, P.E., of Geosyntec. He is a qualified professional engineer per the requirements of §257.53 of the CCR Rule.

2. REVIEW OF AVAILABLE INFORMATION

Geosyntec reviewed the documents listed in Table 1 for the 2019 annual inspection. Geosyntec is not responsible for the accuracy of the documents reviewed that have been prepared by others and has prepared this inspection report based on good engineering judgement and data review. References to TRC refer to TRC Environmental Corporation, NTH to NTH Consultants, Ltd., AECOM to AECOM and Headwaters to Headwaters Plant Services, a division of Headwaters Inc. Headwaters Inc. has been acquired by Boral. As such forms are being used with both names.

Table 1 Available Information Reviewed for the 2019 Annual Inspection

Title	Prepared by	Month and Year	Content with 2019 Update Status
2018 Annual Inspection Report - Range Road Landfill Ash Disposal Facility	Geosyntec Consultants	January 2019	Results of 2018 RRLF Inspection Report on Review of Documents and Files Related to the Operating Record and Conducting a Visual Site Inspection of the Facility.
Landfill Development Plan with Plan Sheets	TRC	Final November 2013	Overall Development Plan for Landfill Including Design, Construction, Surface Water Management, Operation, Monitoring and Site Closure. The 2013 Plan Remains Unchanged for the 2019 Inspection.
Range Road Solid Waste Disposal Area Operating License Renewal Application	DTE	April 2019	Operating License Renewal Application for the Range Road Ash Disposal Facility
Range Road Ash Disposal Operating Number and License Facility No. 392562 License No. 9395	MDEQ	June 2014	Solid Waste Disposal Area Operating License, Including Terms and Conditions. License Remains Active for the 2019 New License Issued (Renewal Application Listed Above)
Construction Certification /Soil Verification (Area G2) Range Road Landfill	MDEQ	September 2015	MDEQ Authorization for Waste Placement in Area G2 Northern Portion (Phase 1). Waste Placement in Area G2 Phase 1 was Active During 2019 Inspection.

Title	Prepared by	Month and Year	Content with 2019 Update Status
2019 Site Plan Figure 1 Attachment B of DTE Range Road Operating License Renewal Application	TRC	April 2019	Landfill Area Plan Locations and Designations, Status and Phasing Legend. Used as Figure 1 in Geosyntec's 2019 Annual Inspection Report (This Report)
DTE Energy Company Range Road Landfill Area G2 Phase II Base Liner Draft Construction Plans	NTH	March 2018	Area G2 Phase 2 Base Liner Construction Plans
DTE Range Road Waste Filling Sequence with RRLF Estimated Life Expectancy and Capacity Summary	NTH	April 2018	Ash Volumes and Estimated Fill Volumes for Closure for Areas G2 Phases 1, 2 and 3, and Area F3/D3. Estimated Dates for Start of Closure Also Given.
Certification of Base Liner Grades (Area G2-13.1 Acres) DEQ Review Letter	State of Michigan DEQ	September 2018	DEQ's Review Indicating Certification is Consistent with the Requirements of Part 115.
Soil Erosion and Sedimentation Control Permit No. SE2017-41	St. Clair County Health Department	April 2017	Permit Issued April 10, 2017 and Expires April 10, 2019. Activity Associated with Final Cover Construction and Installation of Landfill Cap of Approximately 18 Acres and Borrow Pit of 14 Acres.
NPDES Permit No. MIR11436	State of Michigan DEQ	June 2017	Permit Authorizing Discharge of Storm Water from Construction Activities at DECO-Belle River Pit (Site Name).
Surface Water Flow Figure 00 (Working Copy)	TRC	December 2015	Plan Showing Ditch Flow Directions, Locations of Staff Gauges, Monitoring Wells Piezometers, Slurry Wall and Offsite Capture Systems. Copy used as Reference Drawing.
Closure Plan for Existing CCR Unit 40CFR 257.102 (b)	AECOM	October 2016	Closure Plan Description, Inventory and Area Estimates, Schedule and PE Certification. Plan Remains Unchanged.

Title	Prepared by	Month and Year	Content with 2019 Update Status
Post Closure Plan for Existing CCR Unit 40CFR 257.104	AECOM	October 2016	Post Closure Plan Description, Monitoring & Maintenance, Owner Operator Requirements and PE Certification. Plan Remains Unchanged.
Run-On/Run-Off Control System Plan for CCR Disposal Facility-Range Road	AECOM	October 2016	Plan to Address §257.81(c) of the USEPA CCR Final Rule. Appendices Included Historical Design Drawings and HydroCAD Analysis Output. Plan Remains Unchanged.
Groundwater Contour Maps November 2016, March 2017 and April 2017	TRC	January, April and July 2017	Groundwater Flow Directions and Elevations Outside & Inside of Slurry Wall. Perimeter Ditch Water Elevations at Staff Gauge Locations.
Area F3 Cap Material Borrow Areas	NTH	August 2016	Identifies Approx. Quantities of F3 Cap Topsoil, Clay and Inert Fill Required and Quantities of G3 Area Borrow Available.
Range Road Area F3 Final Closure – Existing Site Plan Draft - Dwg No. 6C664-158	DTE	February 2017	Drawing Showing Landfill Areas Including Future Portions of Area G that can be Used for Active Topsoil and Clay Borrow.
DTE Energy Company - Range Road Area F3 Final Closure - Drawings	NTH	March 2017	Bid Issue Cover Drawing Listing Sheet Index of 8 Drawings.
Range Road Landfill Coal Combustion Residuals Fugitive Dust Plan	DTE	September 2015	Plan Certified by Professional Engineer to 40 CFR 257.80(b)(7) Revision 0. Plan Remains Unchanged.
DTE Electric Company – Range Road Landfill Coal Combustion Residuals Annual Fugitive Dust Reports	DTE	November 2017 and November 2018	Annual Fugitive Dust Control Reports Pursuant to 40CFR 257.80(c). Descriptions and Actions Taken to Control CCR Fugitive Dust.
CCR Groundwater Monitoring Well Locations (Working Copy)	TRC	April 2016	Plan Showing Name & Locations of Seven (7) Monitoring Wells Around Landfill.

Title	Prepared by	Month and Year	Content with 2019 Update Status
Groundwater Potentiometric Elevation Summary Figure 7	TRC	October 2017	Groundwater Elevation Summary for the 7 Groundwater Monitoring Wells Numbers 16-01 thru 16-07.
3 rd & 4 th Quarter 2018 and 1 st Quarter 2019 Groundwater Elevation Monitoring Table 1 in Each Report	TRC	October 2018 & January and April 2019	Summary Tables of Groundwater Well/Piezometer and Perimeter Ditch Staff Gauge Elevation Monitoring.
MDEQ WMRPD Q3 FY18 Inspection Report	Michigan DEQ	July 2018	2018 3 rd Quarter Inspection Report
MDEQ WMRPD Q4 FY18 Inspection Report	Michigan DEQ	September 2018	2018 4 th Quarter Inspection Report Recommend Removal of Top Cover Woody Vegetation
MDEQ WMRPD Q1 FY19 Inspection Report	Michigan DEQ	December 2018	2019 1 st Quarter Inspection Report Recommended Repair of Erosion on Slope Along Haul Road and Fence Where Tree Has Fallen
DTE 2018 1 st , 2 nd , 3 rd and 4 th Quarterly Comprehensive Inspection Log (s)	DTE	March, May, August and November, Respectively 2018	Inspection Condition and Notes: Final Cover for Areas, Surface Water Ditches & Signage. Ditch Cleaning Recommended in Most Reports. Also Recommending Updating Form.
2019 Weekly General Inspection Log (s)	DTE	Weekly Logs Jan 2019 thru Feb 19, 2019	Inspection for General Site, Waste & Nuisance Control, Final Cover, Leachate & Surface Water Control. Viewed Weekly Logs. High WL Feb at NW Pump Area.
Environmental Outside Rounds Log Sheet (A Daily Inspection Log)	DTE	Not Viewed	Daily Plant Environmental Inspection Log Sheet. Record Unusual Conditions, Gate Conditions, Flow Meter Readings, etc. Other Unusual Observations Report for March 27, 2018 was reviewed.

Title	Prepared by	Month and Year	Content with 2019 Update Status
Groundwater Monitoring System - Summary Report	TRC	October 2017	Summary Report Figure 2 Used for Identifying Monitoring Well Locations
Mobil & Fixed System Equipment Training Record	Headwaters, Inc.	August 2017	Classroom, Field Discussion, Observation, Operation and Unassisted Operation Training Record for New Employee. No Updates Provided for 2019.
<p>Four Geosyntec Selected Headwaters Resources Standardized Work Sheet JHAs Representing Added New Site Employee and Four Work Processes</p> <p>For 2019 Two JHAs were Provided</p>	Headwaters, Inc.	<p>Feb. 17, 2017 Feb. 22, 2017 May 25, 2017 June 8, 2017</p> <p>Aug. 18, 2013 Oct. 14, 2014</p>	<p>Training Records for Any New Added Employees for 2018 were not Available. JHAs were Provided for Onsite Inspection During the 2017 Inspection.</p> <p>Provided for Process: Silo Loading and Dozer Operations</p>
Appendix D to §1910.134 (Mandatory) Information for Employees Using Respirators When No Required Under the Standard	Headwaters, Inc.	Sept. 9, 2017	Discussion of Respirator Use, Selection, Cleaning, Related Hazards and Respirator Labeling was Provided for the 2017 Inspection. No Updates for 2019
Employee Acknowledgement of Receipt of Safety Consequence Policy	Headwaters, Inc.	Sept. 9, 2017	Employee Acknowledgement of Reading, Understanding of Policy and Safety Guidelines. Copy Applicable to New Employees for 2017. No Updates for 2019.
Copy of Unsigned Issue of Construction Drawings for G2 Phase 2 Base Liner	NTH	April 23, 2018 Revised March 12, 2018	Area G2 Phase 2 Base Line Construction Drawings. March Draft Contains 3 Sheets.
Partial Closure Certification (Area F3)	MDEQ	May 22, 2018	Approval Letter for Partial Closure

3. FACILITY DESCRIPTION

3.1 Overall Site Description

The overall site facility property is composed of the 514 acres of which 402 are designated for landfill development. The Landfill work areas are currently divided into fourteen work areas, nine that have been identified as “Certified Closed”, three identified as “Active” and two identified as “Unconstructed”. The work areas are listed below in **Table 2** and shown in **Figure 1**. **Figure 1** is taken from the 2019 Site Plan provided in Attachment B of the DTE’s renewal permit application dated April 26, 2019.

Table 2 Site Phasing Summary - 2019

<u>Area</u>	<u>Status</u>	<u>Size, Acres</u>	<u>Comments</u>
A	Closed	7	Certified Closed, May 17, 2002
B	Closed	102	Certified Closed prior to September 2, 1999
B1	Closed	9	Certified Closed prior to September 2, 1999
C	Closed *	16	Cert. Report Approved August 25, 2009
D1	Closed*	21	Cert. Report Approved August 25, 2009
D2	Closed *	10	Cert. Report Approved August 25, 2009
D3	Active	3	Interim Cover Placed at Time of Inspection
E	Unconstructed	117	No Cell Construction or Waste Placed
F1	Closed	17	Cert. Report Approved January 4, 2010
F2	Closed	12	Cert. Report Approved February 28, 2013
F3	Closed	17	Closed Reported Certification Approval
F3/D3	Active	1	Active Per Renewal Application
G1/G3	Unconstructed	56	No Cell Construction or Waste Placed

G2	Active	<u>54</u> **(Total Permitted)
	G2 Phase 1	(Waste Placement InProgress)
	G2 Phase 2	(Waste Placement InProgress)
	G2 Phase 3	(Construction InProgress)

** Acreage from DTE Renewal Permit Application

The Landfill includes perimeter ditches, roadways, a shallow perimeter slurry wall, earth berms, a 10 Acre NPDES Stormwater Detention Basin (SDB) and basin pump house. The basin has also been referred to as the sedimentation basin in some of the reviewed documents and figures. The SDB is located in the southeast corner of the property, the slurry wall, reported to be approximately 10 to 15 ft deep, surrounds the entire landfill along the property perimeter. The perimeter ditch surrounds the entire Landfill connecting and draining to the SDB (Figure 2). The pump control areas for these systems and the SDB pumping system were observed during the 2019 annual inspection.

The Landfill is a dry-handled (conditioned) CCR landfill licensed by EGLE as a Type III low hazard industrial landfill with maximum 4 horizontal to 1 vertical final cover side slopes and 3 horizontal to 1 vertical or flatter interim cover slopes. The current revised estimated annual total CCR disposal rate is 225,500 in-place cubic yards/year (average) based on historical CCR production rates and calculations of volumes by NTH using aerial flyovers performed in 2013 and 2017. The currently permitted areas of the Landfill are expected to handle the anticipated volume of CCR through the year 2030, consistent with the Landfill's Closure Plan.

The Landfill has a compacted natural clay liner ranging from 86 to 188 feet thick and is present beneath the entire Landfill. A thin discontinuous near-surface sand seam is present beneath the north eastern portion of the landfill, however, a slurry wall and perimeter ditch system were designed and installed to prevent any off-site flow from the sand seam.

3.2 **Design**

The Landfill design and operation is summarized in the Landfill Development Plan, Remedial Action Plan, Run-on/Run-off Control System Plan and the Quarterly Monitoring Reports. The key components of the Landfill include:

- Perimeter slurry wall keyed into top of 70-foot thick subbase clay layer;
- Perimeter drainage ditch capturing surface water and near surface groundwater;
- 10-Acre SDB collecting ditch water and pumping to plant;

- Two off site groundwater capture systems collecting water in the shallow sand seam;
- Final Cover installation from top to bottom that includes:
 - 6-inch thick vegetated topsoil layer (erosion layer);
 - 24-inch thick infiltration layer (select clay layer with hydraulic conductivity, $k \leq 1 \times 10^{-7}$ cm/sec);
 - Maximum 4H to 1V side slopes;
 - Minimum 1% grade top of closed areas and minimum 2% grade for future, and
 - Phasing plans and special conditions detailed in drawings, plans and license.
- Closure and Post Closure Plans

Landfill design and construction are supported by construction phasing plans, surface water management plans and details, site operation (waste placement) plans and details, and leachate and environmental monitoring plans and reporting. Additionally, landfill monitoring systems maintenance and inspection, and site closure and post closure plans with long term care procedures are covered.

3.3 Construction

The Landfill has been operating since the 1950s. The Landfill Operating License discusses the work areas (see Section 3.1), references design, construction and monitoring documents submitted by DTE and includes conditions and criteria required for the Landfill operation, phase construction and monitoring. A renewal permit application has been prepared by DTE and transmitted to MDEQ. Closure and Post Closure Plans in accordance with 40 CFR 257.102 (b) and 40 CFR 257.104, respectively, have been prepared with an operating record date of October 17, 2016. Permits, from St. Clair County Health Department for Soil Erosion and Sedimentation Control and from MDEQ for a NPDES permit for discharge of storm water, have been issued.

The Landfill Development Plan discusses site operations in Section 4 of the plan. Included are discussions on dust control, noise control, odor control, and access and security requirements, among other operating aspects. CCR filling procedures and requirements for construction observation and documentation are also included in the development plan.

4. VISUAL INSPECTION RESULTS

The annual inspection onsite was completed on May 24, 2019. The annual inspection log and photographs are presented in **Appendix B**.

In summary, no evidence of landfill instability, significant perimeter slope erosion or detrimental settlement was noted. The perimeter ditch, perimeter slurry wall, and pumping of water in the SDB appeared to be working as designed and in accordance with recognized and generally accepted good engineering standards except that only one of the three pumps in the SDB pump house was in service. Since the inspection was performed, DTE has repaired the pumps and all three pumps are back in service.

The northwest groundwater capture system and collection has had its two pumps replaced in late 2017. The pumps are used to transfer the captured water to the perimeter ditch for gravity flow to the SDB. At the time of the inspection the control panel showed both pumps in auto position, switches were checked, and the DTE inspector manually operated each pump to verify their operation.

Specific results of the visual inspection are summarized below. All photographs referenced are provided in **Appendix B**. The weather on the day of the inspection was partly cloudy with periods of sun and temperatures ranging from 55° F at 0730 hrs to a high of 63° F in midafternoon. Local weather reported total precipitation (rain) of 0.16 inches for the previous day and night.

SDB: The SDB appeared in good condition. basin slopes and entrance flume with vegetation recently cut as shown in Photographs 1 and 2. The pump control panel is shown in Photograph 3. The basin intake screen was unblocked as shown in Photograph 3.

Landfill Final Cover: Closed work area phases were inspected including slopes. Conditions appeared generally good considering agreements approved with the MDEQ allowing trees remaining along and on the downstream slope at the north end of the Landfill, predominately in historical Areas A and B. These slopes were observed from the perimeter toe and along the top of slope from the landfill cover. Photographs 12, 14, 15, and 16 in background areas show slope vegetation and some of the slope conditions of closed landfill along the north and northeast sides of the landfill. Greater detail of trees on outside slopes was provided in the 2018 inspection. The non-historical areas, such as Areas C, D1 and D2, typically shown in Photographs 24 through 28, have no or minor woody vegetation present. These cover and slope area are well vegetated and appear very stable. The closed area locations are identified on **Figure 1** and listed in **Table 2**.

Operating maintenance activities for areas, such as Area F1, has had the removal of woody vegetation from the perimeter landfill slopes that are part of the final cover. This was recommended during the 2016 inspection and was completed on November 9, 2016, as reported by DTE. Isolated

small woody vegetation remains on berm slopes west side of unconstructed areas of Area G2 and along the east side of the northern most historically closed areas, as shown in Photographs 27, 28 and 31. DTE indicated in 2016 that woody vegetation will be removed in the G2 area when the slope is prepared for development into an active placement and containment area. No new locations of woody vegetation were observed on top of the closed landfill areas. Photographs 24, 25 and 26 show final cover surfaces and slopes of closed landfill areas. The small woody brush on cover areas and PE-certified approved area slopes, as typically shown in 2018 Annual Inspection Photographs 58, 61, 91 and 107 have been removed after the annual inspection was performed, as recommended. There were no observed significant areas of pooled water on the top cover from the recent rain.

The final cover swales, downslope drains (down-chutes) and downslope ditches were observed as part of the final cover inspection. All observed appeared in acceptable condition. Photos of cover swales, downslope drains, downslope ditches are shown in Photographs 14, 23, 24, 25, 26, 29, 30 and 46.

In conclusion, the top and final slopes of the closed landfill final cover areas appeared well vegetated and are consistent with recognized and generally accepted good engineering standards.

Temporary slope runoff erosion was noted along the southeast side of Active Area F3 cover construction and road ramp up to the work areas. This eroded temporary slope was identified in 2018 and had some repair (Photograph 35), but as noted during this inspection and by an EGLE inspection, additional repair was needed. DTE completed repairs on the eroded slope shortly after this inspection.

Active Area G2 and Continued Clay Borrow Development: Area G2 Waste Filling Sequence has been divided into Phase 1, Phase 2 and Phase 3 for purposes of liner construction and certification. The G2 Phase 1 area ties in with Area F2. As such the temporary clay covered slope over F2 CCR waste was removed for reuse.

New or fresh conditioned CCR waste in Area G2 Phase 1 is shown in Photographs 32, 36, 37, 38 and 39. Placement and compaction procedures of conditioned CCR closely follows the Ash Filling Procedures discussed in the Landfill Development Plan. CCR is now being placed and compacted in horizontal lifts. The temporary seeded slope along the east side of Area F3, reported by DTE as constructed in horizontal layers, appeared stable, and where currently seeded appeared well protected until vegetation grows. The slope is shown in Photographs 37, 38 and 39.

Perimeter Ditch System: The perimeter ditch system is shown on **Figure 2**. Flow through the ditch system is maintained and monitored by DTE to ensure adequate flow to the SDB. Vegetation in the ditches is well established and is routinely maintained. The plant has put together a 3-year rotation (2017-2019) ditch maintenance program where approximately 1/3 of the ditch alignment

length is scheduled for removal of excessive vegetation each year. In 2017 and/or 2018 scheduled maintenance was performed in the perimeter ditch alignment on the east and north sides of the Landfill and along the SDB perimeter slopes. The SDB slopes that were cleared of excessive vegetation appeared stable and well maintained as shown in Photograph 1. Photographs of ditch maintenance completed are provided in **Appendix B** and include Photographs 10, 12, 14, 15, 16 and 19. Photograph 34 shows a new ditch constructed in Early 2018 replacing an old ditch that previously drained water from an onsite runoff collection pond. Additional photos were provided in the 2018 inspection report. Ditch maintenance schedule modifications are subject to the needs of the site.

A ditch staff gauge system is used to monitor water level in the perimeter ditch. Review of the monitoring summary tables prepared by TRC for the 3rd and 4th Quarter 2018 together with the completed maintenance activities for the NW Groundwater Capture System indicates ditch flow is occurring in the appropriate flow direction. Review of the 1st Quarter 2019 ditch elevations all indicate proper flow direction, except that Staff Gauge 13, located near the SDB, indicated a slightly higher water level. This level may have been a miss reading or report typo but DTE was requested to re-read the staff gauge and the new reading indicated continuous gradient flow to the SDB, consistent with previous 2018 reported elevations. Photographs 6, 8, 9, 10, 11, 12, 14, 15, 16, 19, 41, 42, 43 and 48 (includes those mentioned above) show typical ditch conditions at various staff gauge and culvert locations.

The slurry wall is located outside of the perimeter ditch and along the property boundary. Most of the slurry wall markers have been removed for road construction or general maintenance activities.

Operation Activities Including Waste Placement: The landfill operating contractor is Boral (formerly Headwaters). A couple loaded trucks hauling conditioned CCR material were observed hauling to active waste placement Area G2. CCR dumping, placement and grading was discussed in report Section 4 above. Observations during the inspection indicated procedures were satisfactory.

DTE provides operation monitoring through daily log monitoring of pumping from the SDB (NPDES pond flow monitoring) and weekly and quarterly check list monitoring. SDB Pump operation and flow is inspected by DTE daily and weekly.

Record Keeping: At the start of the 2019 annual inspection, records of current DTE monitoring inspections and new or updated reports were obtained from the landfill engineer or transmitted via email the following week. Additional records exist, electronically or in project files not checked or specifically requested. The current operating license dated June 26, 2014 lists many documents that have been submitted to the MDEQ by DTE as part of the landfill design, plan preparation,

construction certification and documentation, surface and groundwater monitoring, and landfill operation. The records for the Landfill appear comprehensive.

5. INSTRUMENTATION MONITORING

5.1 Surface Water and Groundwater Collection

Surface water and groundwater monitoring are conducted under a monitoring plan approved by the MDEQ. The surface water that falls within the landfill waste areas and within the perimeter ditch system is collected by the ditch system and flows, for the most part by gravity, to the SDB, as shown in **Figure 2**. Exception to this is the perimeter ditch located at the northwest corner of the property where the ditch water is collected and pumped to a portion of the ditch on the north side which gravity drains to the SDB. The perimeter slurry wall installed along the property line and outside of the ditch and basin system supplements and supports surface water collection as well as contains and directs any near-surface groundwater to the perimeter ditch.

Monitoring of the ditch water collection is accomplished through ditch visual inspection and maintenance, review of water elevations from a series of twelve (12) ditch staff gauges (SG) and one (1) at the entrance to the SDB and implementation of monitoring plans which have been approved by the MDEQ. Reporting of the monitoring is summarized in tables prepared by TRC. Review of the ditch water levels for the staff gauges show that the water gradient flows to the SDB, with its water elevation monitored with SG-13. A discussion of details of the review is provided in report Section 7.3 on ditch maintenance.

The perimeter ditch also collects near-surface groundwater that is imported along the east side of the property where near-surface sand is located above the subsurface thick layer of clay. The slurry wall, with top elevation higher than the groundwater elevation, in that area acts as a barrier and supports collection by the perimeter ditch.

5.2 Groundwater Elevations and Offsite Capture System Monitoring

Monitoring well and piezometer locations are shown on **Figure 2** and monitoring water depths and elevations summarized in tables prepared by TRC. Groundwater elevations and flow directions indicates that the site-wide slurry wall and perimeter ditch network continue to perform as designed to prevent shallow groundwater beneath the RRLF site from migrating off-site. DTEs visual weekly inspection monitoring logs were available and reviewed.

5.3 RRLF CCR Monitoring Wells

During the 2018 annual inspection locations of seven (7) groundwater monitoring wells were observed. During the 2019 inspection five of the 7 wells were photographed with their protective bollards typical as shown in Photograph 7. All 7 of the well locations were shown in the 2016 AIR. They were all stick-up wells except for MW-16-07, a flush-mount well, located on the south side of the property near Puttygut Road.

6. OPERATION ACTIVITIES

Operations are defined in Section 4 of the Landfill Development Plan. The following operation control measures are described in the plan:

1. Hours of Operation
2. Waste Types
3. Traffic Routing
4. Lines and Grades
5. Nuisance Control (includes Fugitive Dust Control)
6. Police and Fire Protection
7. Access Control
8. Inclement Weather Operations
9. Drainage and Erosion Control
10. Record Keeping
11. Personnel and Equipment
12. Ash Filling Procedures
13. Leachate Management
14. Environmental Monitoring

Engineering design and construction related to the Landfill design, waste type and volumes, subbase grades, site phasing, final cover, surface water management, construction observation and documentation, and final closure and long-term care are included in the Landfill Development Plan. The plan was written by DTE/TRC in November 2013 and contained the Landfill operating license valid at that time. The current Landfill operating license issued by MDEQ is dated 26 June 2014.

In addition, the following plans and inspections are currently required by the CCR Rule:

- Weekly inspections by a qualified person,
- Dust control in accordance with a Fugitive Dust Control Plan,
- Preparation and Implementation of a Run-on/Run-off Control System Plan,
- Preparation of the Closure Plan for the Existing CCR Unit, and
- Preparation of the Post-Closure Plan for the Existing CCR Unit.

These plans were available for inspection during this or previous visits and are included in the project document file. The Annual Fugitive Dust Control Report dated November 30, 2018, and 2019 weekly inspection reports from October through March 2018 were reviewed.

6.1 Observations

It was identified that the overall intent of the Operations Plan was being followed. Documentation that the Operations Plan was being followed in a method “...to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards” in accordance with the CCR Rule was for the most part verified.

Operating control measure Items 1 through 9, 10, 11&12 (DTE records and contractor work sheet and Job Hazard Analysis (JHA) documents), 13 and 14 from above were verified during the 2017 annual inspection or with documents submitted and reviewed after that inspection. Those items appeared to be compliant with the Landfill Development Plan. It was not known if any new contractor employees were added to the landfill work force. There is a full-time DTE guard shack or building near the entrance of the Landfill and the Landfill is surrounded by security fencing and locked gates.

7. EVALUATION

7.1 Design

The Landfill design was completed by TRC and is well documented in the references listed in the 26 June 2014 Landfill Solid Waste Disposal Area Operating License, and the Landfill Development Plan, dated November 2013. The design appears consistent with recognized and generally accepted good engineering standards, based on available information.

7.2 Construction

Construction of final cover Phase Work Areas is being well documented in area closure documentation reports by NTH. Construction certification or documentation reports or portions of those reports were viewed during the 2015 and 2016 annual inspection for Work Areas C, D1, D2, F1 and F2 and they were signed by a professional engineer licensed in Michigan. During this 2018 inspection final cover capping of Area F3 was nearly complete. Some additional work remained, and more seeding or additional seeding may have been completed. A partial closure certification letter for Area F3, dated May 22, 2018, was prepared by MDEQ. Clay for the capping was excavated as part of subgrade excavation within portions of Area G2. No construction was occurring on the date of the inspection. CCR hauling and placement did take place.

7.3 Maintenance

Maintenance of final cover vegetation and erosion control has been identified by the DTE qualified person as an ongoing activity based on results of weekly inspections. Quarterly Comprehensive Inspection Logs lists specific comments on the status, schedule and results of maintenance activities. These activities reviewed included, pump operation and maintenance, closure cover construction, ditch repairs and vegetation clearing, and slope vegetation maintenance. Many of the activities mentioned are necessary to maintain operation and consistent flow direction of water collected by the perimeter ditch. Tables summarizing staff gauge water elevations recorded during the fourth quarter 2017 monitoring program were reviewed. Results of the fourth quarter summary, dated January 2018, indicated that the ditch flow direction is in agreement with the stated design and flow to the SDB.

Control of vegetation growth in the site ditches has been identified by DTE as a routine maintenance activity. DTE has instituted a 3-year rotation ditch maintenance program where 1/3 of the perimeter ditch alignment is cleared of excessive vegetation. Results of this inspection indicates that the ditch maintenance program is progressing according to or ahead of schedule. Photographs of ditch maintenance results are provided in Appendix B and were discussed in Section 4.

7.4 **Operations**

7.4.1 Operations Plan

The Landfill Development Plan serves as DTE's main operations plan for the landfill. The plan has been discussed in previous AIRs and has again been reviewed as part of this AIR. The plan has not been revised. The landfill ash fill contractor, Boral, made improvements in following the plan CCR placement and compaction procedures. This has been discussed in Section 4 on final cover construction observations.

After the 2019 site inspection Boral onsite personnel provided DTE two Standardized Work Sheet and JHA documents on training of specific equipment for a new employee added to the site work force.

Records by DTE, such as the daily shift report for the SDB, Landfill weekly inspection logs were provided as part of the annual inspection information. These inspection logs are consistent with recognized and generally accepted good engineering standards.

7.4.2 Fugitive Dust Control

A Fugitive Dust Control Plan was provided by DTE in 2015. Fugitive Dust Control is also discussed in the Landfill Development Plan. Annual Fugitive Dust Reports, dated November 22, 2017 and November 30, 2018, were provided for review. The reports summarized CCR fugitive dust control actions, listed citizen complaints, if any, and provided discussion of any corrective actions taken for the period December 2016 through November 2018. There were no citizen complaints and no corrective actions reported. During the site inspection there were no observed dust clouds or active dust control activities. Rainfall had occurred over night and intermittently during the inspection that may have helped keep ground and road dust under control. Basin water is used for dust control and signs limiting the use of the water in areas near the construction entrances have been posted by DTE. Dust control operations at the site are considered consistent with recognized and generally accepted good engineering standards.

7.4.3 Run-on and Run-off Control

Run-on and run-off control are maintained by final cover temporary or permanent berms, the perimeter ditch system, the offsite pumping systems and the SDB pump and discharge system. The Landfill Development Plan and the Run-on and Run-off Control System Plan have not been updated since they were issued in 2013 and 2016, respectively. As reported the 2016 AIR, the Run-on and Run-off Control System Plan appears to be consistent with recognized and generally accepted good engineering standards in accordance with the requirements of 40 CFR 257.81(c).

7.4.4 Inspections

Weekly and quarterly inspections have been ongoing and documented by qualified persons. Inspections reviewed have been discussed and are consistent with recognized and generally accepted good engineering standards, based on available information. A 2019 annual inspection form has been prepared by the qualified professional engineer and is provided in **Appendix B**.

7.4.5 Annual Visual Inspection

This annual visual inspection did not identify any evidence of structural weakness or instability. The perimeter ditch, perimeter slurry wall, offsite capture system pumping, and collection appeared to be working as designed and in accordance with recognized and generally accepted good engineering standards. Two of the three pumps in the control house for the SDB were out-of-service at the time of the annual inspection, however, the two down pumps were repaired shortly after the annual inspection. Water levels within the SDB need to be controlled to collect gravity drainage from the perimeter ditch system. This is the third year of a 3-year ditch maintenance program for cleaning out ditch vegetation.

8. CONCLUSIONS AND CERTIFICATION

The annual visual inspection did not identify any evidence of structural weakness or instability.

Based on the annual inspection results and review of the available data, the Landfill was designed, constructed, operated and maintained in accordance with generally accepted good engineering standards.

Certified by:

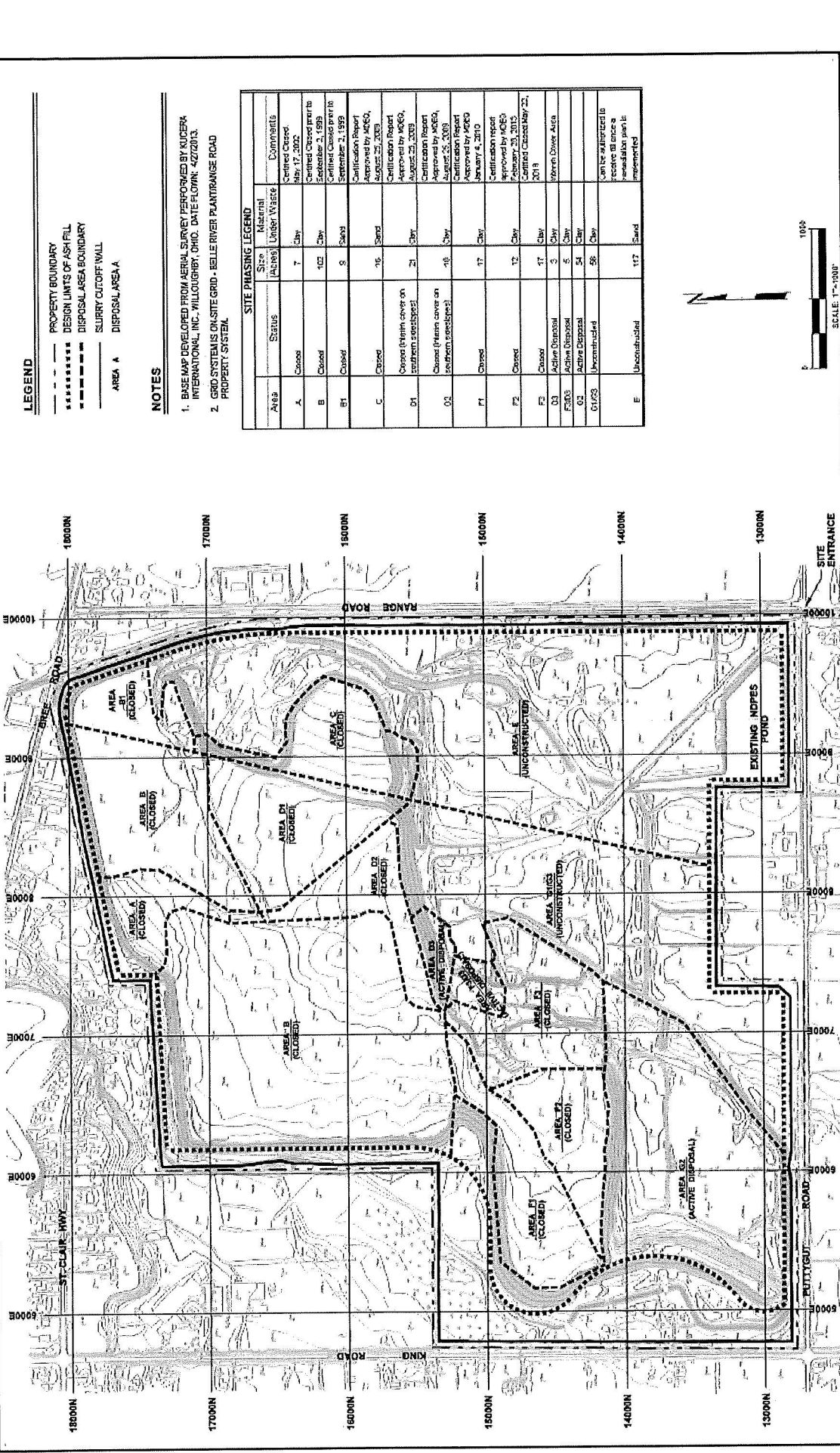
Daniel G. Bodine Date 01-09-20

Daniel G. Bodine, P.E. - Michigan P.E. No. 6201051139
Senior Consultant

Plot Data
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 Levels On: 1-63

Reference Files
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 Ref. File 3: J:\DTE\ST.Clair Co\320507\0000\REF\Proposed.dgn
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Logical Names
 (1) 45-50.53-56.58.59.61.63
 (2) 7-10.18.29.30
 (3)
 (4) 1-63



LEGEND

- PROPERTY BOUNDARY
- DESIGN LIMITS OF ASH FILL
- DISPOSAL AREA BOUNDARY
- SURRY CUTOFF WALL
- AREA A DISPOSAL AREA A

NOTES

- BASE MAP DEVELOPED FROM AERIAL SURVEY PERFORMED BY KUDERA INTERNATIONAL, INC., WILLOUGHBY, OHIO. DATE: 6/10/19. AZ: 2013.
- GRID SYSTEMS ON SITE GRID - BELLE RIVER PLANT/RANGE ROAD PROPERTY SYSTEM.

Area	Status	Site Phasing Legend		Comments
		Material	Under Waste	
A	Closed	Clay	7	Centrifuge May 17, 2012
B	Closed	Clay	142	Centrifuge prior to September 1, 1993 September 1, 1993
B1	Closed	Clay	8	Centrifuge September 1, 1993
C	Closed	Clay	16	Centrifuge September 1, 1993 September 1, 1993 September 1, 1993
D1	Closed	Clay	24	Centrifuge September 1, 1993 September 1, 1993 September 1, 1993
D2	Closed	Clay	18	Centrifuge September 1, 1993 September 1, 1993 September 1, 1993
F1	Closed	Clay	17	Centrifuge September 1, 1993 September 1, 1993 September 1, 1993
F2	Closed	Clay	12	Centrifuge September 1, 1993 September 1, 1993 September 1, 1993
F3	Closed	Clay	17	Centrifuge September 1, 1993 September 1, 1993 September 1, 1993
G1/G2	Unconstructed	Clay	3	Centrifuge September 1, 1993 September 1, 1993 September 1, 1993
G1/G3	Unconstructed	Clay	56	Centrifuge September 1, 1993 September 1, 1993 September 1, 1993
E	Unconstructed	Clay	117	Centrifuge September 1, 1993 September 1, 1993 September 1, 1993

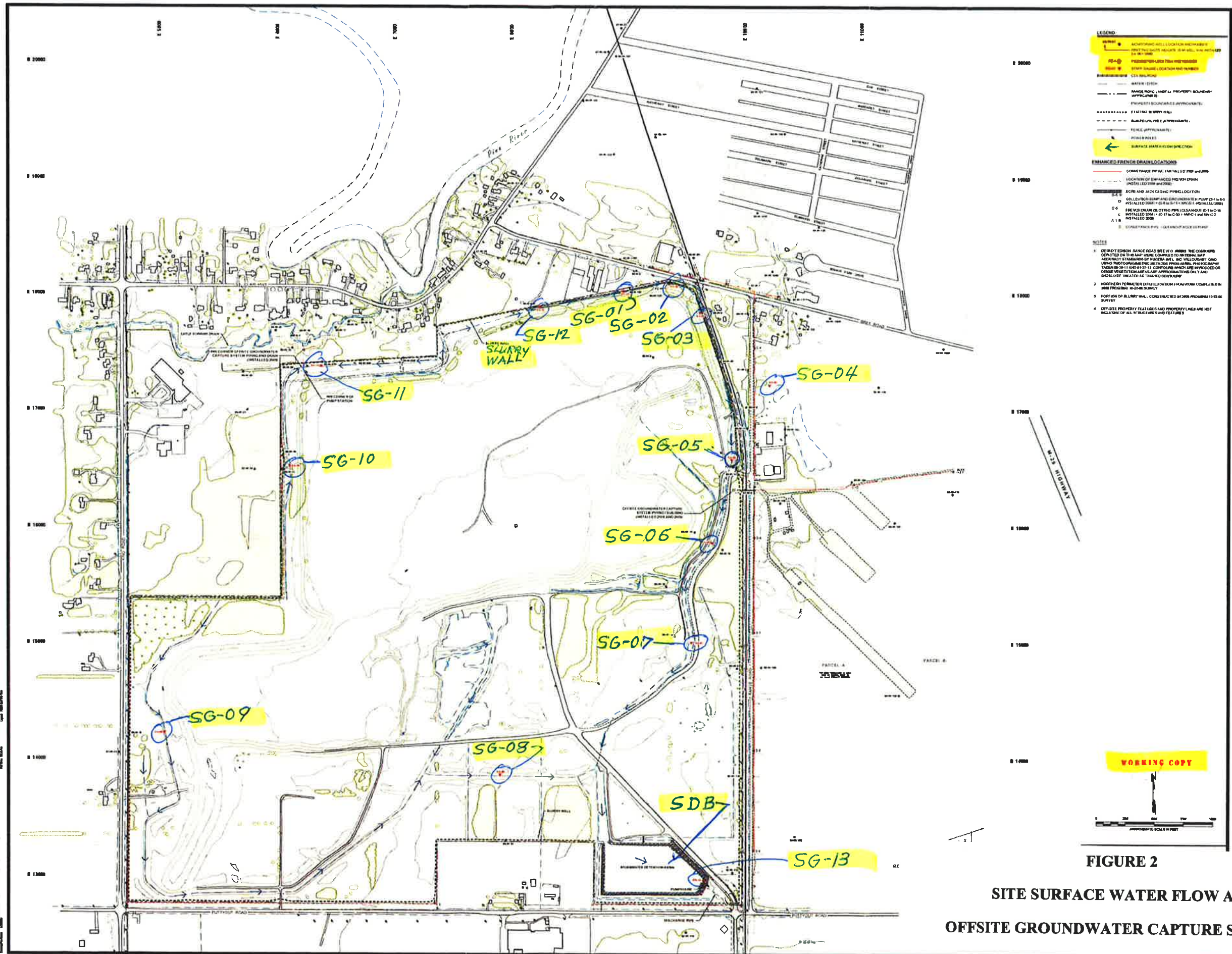
**DTE ELECTRIC COMPANY
RANGE ROAD LANDFILL**

2019 SITE PLAN

TRC

DRAWN BY: T.Flebranz
APPROVED BY: V. BUENING
PROJECT NO.: 320507.0000
FILE NO.: 320507.0000.01.plt
DATE: APRIL 2019

FIGURE 1



APPENDIX A

Resume of the Qualified Professional Engineer

DANIEL G. BODINE, P.E

**geotechnical and civil engineering
geo-environmental engineering
project management
litigation support
resident engineering
construction management**

EDUCATION

M.S., Geotechnical Engineering, Rutgers University, 1973

B.S., Civil Engineering, Rutgers University, 1970

Continuing Education Seminars

PROFESSIONAL REGISTRATION

Illinois, P.E. Number 0062-047218

Ohio, P.E. Number E-61363

Nebraska, P.E. Number E-9478

Michigan, P.E. Number 6201051139

Indiana, P.E. Number 920347

South Carolina, P.E. Number 15628

Colorado, P.E. Number 47434

CAREER SUMMARY

Mr. Bodine has over 50 years of experience in all aspects of civil and environmental engineering. He has worked 13 years for a large AE firm in the civil, geotechnical and site development departments on fossil and nuclear power plant facilities and the remainder time with two major geotechnical and environmental consultants. He has supervised and coordinated fossil and nuclear power plant geotechnical site investigations, foundation and landfill design, construction and post construction activities. He has also performed geotechnical design and construction monitoring work for recent projects for private, industrial, oil and chemical industry, and municipal and government clients. These projects involve design and construction for deep foundations including all types of piles and caissons, several types of barrier walls, site dewatering, insitu solidification and stabilization, runoff collection and treatment basins and landfill liners and caps. He has worked on dam projects such as the Ludington Pump Storage Project, Center Hill Dam Foundation Remediation, AEP's Stingy Run and Amos Fly Ash Dams, CCR Ash Disposal Dike and Dam Inspections, and numerous other dam safety inspections for the power industry. He has worked with attorneys related to litigation/arbitration and expert witness support related to geotechnical engineering and construction claims. Specialties include barrier wall design and construction, insitu solidification/stabilization, deep foundation design and landfill design & construction including design/build and bid package preparation.

Mr. Bodine's experience on various projects has included the following:

Barrier Wall Technical Report, Confidential National Research Institute. Completed report summarizing approximately 10 types of barrier walls 60-ft deep based on comparisons of their design, constructability, and installation details. Provided construction and QC/QA cost estimates.

Casper Wyoming Barrier Wall, Wyoming DEQ, Casper, WY. Working for the department as a slurry wall specialist providing design and construction document review and comment and attended site review meetings. Barrier wall construction of Phase 1 was completed in 2018 with Phases 2 and 3 to follow. Site was location of former refinery and review and comments were well received by the lead oil company.

Boeing Design/Build Slurry Wall & Landfill Cap Expansion, Remedial Construction Services, Wichita, KS. Mr. Bodine was Geosyntec's lead technical engineer supervising the preparation of design and construction plans and specifications including technical reports and documents submitted to the KDEH. Served as the technical task manager for the construction QC/QA work including preparation of the construction completion report completed in August 2010. The slurry wall and landfill cap extension, located adjacent to the Arkansas River, surrounded a closed landfill and was constructed without opening the landfill clay cover. Monitoring well water level drawdown on the down-gradient side along the river was noted by owner to drop almost immediately after completion of construction. This has been verified 1 year later, except during periods of river flooding that raises water levels outside of the wall containment.

US Forestry Holden Mine Barrier Wall, U.S. Forestry, Chelan, WA. Working through USF Consultant, Hart Crowser, Mr. Bodine provided specialist consulting review for design and construction of deep 70-100 ft slag & Portland cement bentonite slurry wall located along river and tailings piles at a closed copper mine in middle of a national forest. Work included review of mix design and compatibility testing, construction procedures and quality control test results. Mr. Bodine provided onsite observation and review for US Forestry and their consultant. Field work was completed in 2015.

Wood River Refinery Sludge Basin Closure, Shell Oil Products, USA, Wood River, IL. As PM and EOR completed an oil refinery engineering design, bid document preparation and construction engineering involving in-situ solidification and capping of over 300,000 cubic yards of oily sludge for an in place RCRA closure of a 20-acre oil refinery sludge disposal basin located in Wood River, IL. This project is unique in that there is approximately 550,000 cubic yards of sludge in the basin and that the design, permitting and construction was successfully completed saving millions of dollars over alternative closures. Design involved detailed geotechnical settlement analyses of the soils and sludge. Closure construction was completed, and certification report issued to the client and IEPA. Mr. Bodine supervised the CQA monitoring and prepared and

sealed the CQA certification report.

Steel Facility Landfill Cap & Tar Pond Solidification, Confidential Owner, NW IN,. Working for contractor provided CQA project management, site work and construction certification of an approximate 60-acre landfill containing two large tar ponds. Geosyntec performed onsite CQA observation, testing, documentation and preparation of the construction completion report including onsite testing of tar solidification /stabilization activities. Project substantially completed in 2014 with Construction Completion Report issued in early 2015. Report for the landfill closure was approved by agency without comment.

BP-Amoco Refinery Sludge Basin Closure, Amoco Corp., Whiting, IN. As EOR and lead engineer supervised design and prepared and evaluated construction bid documents for in-place closure of an oil refinery sludge disposal basin. Design included providing demolition of structural and mechanical equipment, slurry and grout cutoff wall containment, insitu solidification of the sludge, design of wells and pump control systems for surface water collection and as back-up for water level control beneath the solidified sludge. The design included a thicken RCRA type cap with HDPE and soil covers. Also managed CQA and resident engineer construction oversight for the project, including setup and operation of on-site project meetings and laboratory testing operations. The design and oversight included structural work (concrete, steel and asphalt), electrical and mechanical work (wiring, piping, pumps, motors, and controls in accordance with refinery standards) as well as geotechnical and environmental work. Closure of this project under jurisdiction of U.S. EPA Region 5 and IDEM was completed in July 1992 on schedule for Amoco Oil located in Whiting, Indiana. Test program and certification reports for these agencies were prepared under the direct supervision of Mr. Bodine. The thicken RCRA cap was designed, permitted and constructed to accommodate future structures on top of the landfill closure, prior to the widely-used Brownfield concept. Twenty-two years later new structures have been constructed and the new foundation settlement design remains consistent with the original design.

Bofors Nobel Superfund Site, PSDs, Muskegon, MI. Geosyntec PM and EOR responsible for design and management of barrier wall and chemical sludge lagoon cap for the Bofors-Nobel superfund project located near Muskegon, Mi. Work included field and laboratory investigation work plan, 30%, 95% and 100% design, construction bid package preparation and construction and CQA documentation and performance of barrier wall onsite. Barrier wall construction was Phase 1 of the work and is 100% complete. The wall consists of a soil-bentonite (SB) slurry wall approximately 75 to 125 ft deep and 2000 ft long. Closure cap design and construction of 10 chemical sludge lagoons (portion of Phase 2 work) was completed in 2007. Mr. Bodine was the lead geotechnical engineer for the Phase 2 work, on the Parsons team. Other consulting team

members provided team project management, conducted groundwater monitoring and treatment, designed and monitored construction of the treatment and diffuser wetlands, and phytoenhancement of the lagoon cover and surrounding area. Geosyntec assisted these team activities and provided geotechnical portions of the work.

Design & Construction of Permeable Reactive Barrier (PRB) Slurry Wall, Quantum Murray, LLC, Ontario, Canada. Worked as the contractor's slurry wall specialist and prepared contractor plans and technical memorandums for bench scale testing and mix design and construction quality control testing and monitoring procedures for a slurry wall that included design sheet pile control structures for the reactive material. This was for a funnel & gate PRB wall within soils and ground water impacted with radiation. Provided recommendations for onsite construction procedures and QC training of personnel performing slurry and soil-bentonite backfill mixing and testing. Project is completed, performing exceptionally well and is confidential.

Colorado Soil-Bentonite Slurry Wall Construction, Tri-Districts, Ft. Collins, CO. Responsible Project Manager and Lead Engineer for bid document preparation and construction of a 5400 ft long slurry wall around former sand, gravel and cobble pit. Project completed in September 2013 with both contractor construction and engineering oversight completed on schedule and under budget. A 90-day leakage test was performed by an independent consultant and exceeded all requirements by the state.

Gavin Power Plant Residual Waste Landfill Expansion, AEP, Cheshire, OH. Part of the project design team preparing a permit to install (PTI) package for the lateral and vertical expansion of a 58,000 cubic yards waste landfill. Performed design reviews of plans, drawings and specifications, including leachate treatment ponds and assisted in major field investigation program that had to be performed thru-out the winter months and during the holiday period. The PTI was approved and formal permit issued in early 2014. Construction packages for the landfill expansion were prepared and construction of Phases 1 and 2 have been completed.

Detroit Edison Power Company Ash Basin Evaluation & Design Modifications, Monroe, MI. Performed dike inspection of large ash basin to assist in evaluation of a large number of shallow slope failures. Project work included prepared construction plans and specifications for repair and reconstruction of slopes and related drainage facilities. Provided quality construction expertise for the 2009, 2010 and 2011 construction phases, all now completed. Mr. Bodine consults on designs as needed with team members on other site projects for DTE.

Detroit Edison Power Company Ash Basin Drainage Ditch Evaluation & Design. Managed and performed design of a large drainage ditch which is part of the Range Road Landfill existing ash basin that involved culvert alternatives including a large diameter structural pipe arch. Project completed in 2010.

DTE Energy Range Road Landfill Annual Inspections, St. Clair, MI. Conducted field inspection and office file review under the CCR Rule 40 CFR 257.84(b)(1) for the Range Road 418-acre landfill. The annual inspections and reports were for years 2015, 2016, 2017, 2018 and 2019.

American Electric Power Dam Inspections. Providing multi-year (1999-2001) independent annual dam safety inspections and reporting of dike and dam structures at 18 facilities for American Electric Power in the states of Indiana, Ohio, Kentucky, West Virginia and Virginia. Dams range from small dike containment structures to large high hazard classification dams. Internal inspections and repair recommendations for discharge pipes were also provided at 3 AEP facilities. Reports for the utility and state agencies were prepared for all facilities. Prior to this project Mr. Bodine performed dike and dam inspections of ash disposal and power plant lake facilities in the states of Illinois, Wisconsin, Indiana, Ohio, Kentucky, Colorado and Texas.

CCR Location Restriction and Groundwater Monitoring Network Reports. AEP, Ohio. Provided CCR facility evaluation and report preparation for Location Restriction Evaluation at two separate AEP plants. Assisted the Groundwater Monitoring Network report preparation and review for the same two plants.

CCR Alternative Source Demonstration (ASD) and Assessment Reports. Buckeye Power, Inc., Ohio. Part of Geosyntec's team in preparing ASD reports for an RSW landfill and assessment and monitoring report for a bottom ash disposal basin at Buckeye's Cardinal Plant. Geosyntec's ASDs monitoring work is ongoing at this plant site and other sites for other power clients.

Indianapolis Power & Light Ash Pond Dike Inspections, Indiana. Provided ash pond facility inspection in 2008 for three coal fired power plant sites. Prepared inspection report findings and recommendations for maintenance and for critical dike re-evaluations.

Sylvan Lake Dam Evaluation, RCCD, Rome City, In. Performed dam and spillway inspections and report for 2004 through 2018 at Rome City, Indiana. In 2004 Geosyntec prepared a special dam evaluation report reviewing a critical Dam safety report prepared by U.S. Army Corps of Engineers. In 2007 consulted with dam owner during periods of very heavy rainfall concerning opening of emergency flood gate, however, it was not necessary to open the gate. Attended and took part in the Emergency Action Plan table-top-exercise in 2007, 2011, 2016 and 2018. Prepared the project O&M Manual and provided owner training and annual inspection activities since 2004. Remain as Rome City's on-call engineer with respect to dam safety and inspection.

Ash Reservoir Dam Modification, AEP, Cheshire, OH. As part of the design and permitting work for the closure and capping of a large ash reservoir the 100 ft high dam

is being modified by reducing the dam height and providing a new discharge spillway structure for safe discharge of the 100-year and PMF storm flows. Mr. Bodine is the Engineer of Record for the dam modification with construction that is currently under construction and expected to be completed in 2020.

Cardinal FAR 1, AEP, Brilliant, OH. As EOR responsible for Geosyntec design and major permit document preparation for a 127 acre 18 million cubic yards FGD gypsum landfill at a power plant facility in the State of Ohio. Major portion of new landfill is to be constructed over an existing closed fly ash disposal area. Design and permit documents included detailed geotechnical settlement and stability analyses. Agency has completed review and permit was issued in April 2007. Construction of Cell 1 was completed and a minor permit modification to construct Cell 3 before Cell 2 was prepared with agency approval in 2008. Preparation of Cell 3 construction drawings was completed in 2010 and cell construction followed in 2011. Waste filling is ongoing.

Chicago Public Building Commission (PBC), Chicago IL. Provided review of construction documents and prepared report on lessons learned for a new school project that involved construction dewatering, excavation and earth retention that resulted in schedule delay and some foundation redesign. Consulted on means and methods for turning around dewatering and excavation problems. With other Geosyntec team members worked on several other PBC projects related to dewatering, earth retention design and permitting, including one high profile downtown Chicago project. Other PBC projects (library & athletic field house) included preparing and reviewing foundation designs for the architect/engineer and performing foundation inspections.

CSX Talleyrand, CSX, Jacksonville, FL. Served as senior reviewer and in-house barrier wall consultant for design and construction of a Florida landfill slurry wall approximate 43 feet in depth. Designed and summarized the slurry wall compatibility and mix design testing program and trained others on the design and onsite for the slurry wall quality control/quality assurance testing and inspection. Site is unique because of high groundwater adjacent to a river, adjacent to a major city sewer line, and included a large portion of excavation within peat soils. Wall was completed in summer of 2011 and landfill cap late in 2011.

CSX Richmond, CSX, Richmond, VA. Serving as senior reviewer and in-house consultant on slurry design and permitting for 40 ft deep soil-bentonite wall at a former wood treating facility in Richmond, Virginia. Project design and review by the US EPA and VA DEQ is final. The slurry wall construction was started and completed in 2014.

Former Camilla Wood Preserving Site, Black & Veatch, Camilla, GA. Providing barrier wall consulting and in-house recommendations for design team on slurry wall compatibility testing and response to US EPA questions. Conventional soil-bentonite wall was selected and wall construction completed in 2013.

O'Hare Airport Stormwater Flood Control Reservoir, AOR, City of Chicago, IL. Provided technical review of existing reservoir design by others during construction to assist in solving design/construction problem involving slope seepage and erosion. Geosyntec provided recommendations for design changes and repairs, as well as additional monitoring to prevent slope erosion and reduce uplift pressures to acceptable factors of safety.

O'Hare Airport Stormwater Damage Mitigation Measures, CARE, Chicago Department of Aviation, Chicago, IL. Technical lead providing investigation, evaluation and corrective measure design of stormwater related seepage damage to an underground training area located adjacent to an existing airport utility tunnel. Designed concrete retaining wall repairs and preventative measures to collect and transfer excessive groundwater during and immediately after stormwater events from causing future similar problems.

Rt 44 Barrier Wall, Tauton, MA. Served as in-house consultant for an 800-foot long, 50-foot deep slurry wall installed to contain contaminants present in the saturated portion of the soil. Barrier wall was part of an overall drum removal and thermal desorption project. Provided onsite monitoring and training of others for the slurry wall quality control/quality assurance testing and inspection. Wall was completed in 2010.

McColl Superfund Site, CA. Served as in-house consultant and mentor for the field monitoring and site engineering of the slurry wall construction phase. Provided daily contact as needed for the two soil-bentonite slurry walls that transverse sloping topography and were tied into the final cover system.

Home Depot Site Redevelopment, Burbank, CA. Geosyntec provided concept and detail design, construction, operation, maintenance and monitoring of site remediation of a dual-phase extraction (DPE) and soil vapor extraction (SVE) systems at a redevelopment site. Part of the design included a 2,600 ft long, 55 ft deep soil-bentonite slurry wall. Mr. Bodine consulted on the design and led the construction quality assurance monitoring and testing of the barrier wall.

138th Street Landfill. Land And Lakes, Dalton, IL. Performed full time Resident Engineering and Construction Management for landfill client on an IEPA remedial action project located on the southeast side of Chicago. Project involved earthwork, slurry wall and leachate collection and transfer systems installation. Duties included review of project submittals, contractor invoices, CQA activities, preparation of progress reports, design modifications approved by the designer and preparation of the Construction Completion Report. Construction project was brought-in under budget.

Historical Slurry Wall Design & CQA. Provided full-time construction quality assurance activities for landfills and cooling lakes with slurry and grout cutoff walls, including preparing summary CQA reports. Cutoffs have performed exceptionally well,

some for over 40 years. Slurry wall experience includes shallow and deep Soil Bentonite and Cement Bentonite walls, specification preparation, and full time CQA/CQC activities for approximately 1.5 million square feet of wall. Recent projects involved environmental remediation and closure at landfill and disposal projects where construction dewatering, containment and site closure were involved. Another involved slurry wall design and specifications for groundwater and flood control for a 4-lane state highway project with railroad and river overpass crossings. Total slurry wall experience involves walls totaling over 25 miles long. Completed local Midwest projects with deep walls (>50 ft and <130 ft) include Schaefer Power Station in Indiana and Braidwood Nuclear Power Station in Illinois and the Bofors Nobel project mentioned above. Projects with medium depth cutoff walls (>30 ft and <50 ft) include Collins Power Station in Illinois and Amoco Oil (now BP) Refinery in Indiana. The Amoco walls (4 total) involved cement bentonite, jet grout and chemical grout barriers. Specification and CQA monitoring review for soil bentonite walls was also performed for the McColl Superfund project and a Home Depot project in California. Two of the recent slurry walls have been design/build projects where Mr. Bodine, in addition to design and project management activities, supervised the QC/QA work and certified the construction. The Amoco project is discussed in a paper listed at the end of this resume. Copy provided upon request.

Groundwater Remediation System CM and CQA, Shell, Kankakee, IL. Provided design and construction bid document and specification review for a bedrock groundwater interceptor trench and surface water collection basin and controls. Performed CM and CQA activities at the site and prepared a project construction certification report. Reviewed all contractor draft invoices and assisted client negotiating settlement of work claims and revised contract when project changed from non-union to union labor and operator work. Project was successfully completed and performing as intended.

Naval Training Center and Power Plant Site, TN & Associates, Newport, RI. Mr. Bodine has prepared designs, plans, specifications, and monitored installation and testing for numerous pile and drilled shaft construction projects. Most current pile installation and load test monitoring occurred in 2006 at Newport Naval Training Facility in Newport Rhode Island. Selected, monitored and evaluated dynamic pile testing and static load test at site of Fuel Oil Tank No. 2. Pile testing was successful and exceeded design requirements.

DOE Fernald Onsite Disposal Facility, Flour, Fernald, OH. Performed duties as responsible onsite Resident Engineer for construction of the leachate conveyance system and two onsite disposal facility (OSDF) cells at DOE's Fernald Environmental Management Project, located near Cincinnati, Ohio. Systems included structural, geotechnical, mechanical, electrical and environmental equipment. Duties included review of contractor submittals, preparation, review and approval of design

modifications, preparation of reports, interaction with client and contractor construction management, engineering and quality assurance personnel and project's CQC staff. Cell 1 began accepting impacted material in 1997. During 1998 Mr. Bodine performed the duties of Geosyntec's onsite Managing Engineer and Certifying Engineer during which time filling of Cell 1 with low level impacted materials and construction of Cell 2 was completed. All 8 Cells of the OSDF were completed by end of 2006 ahead of schedule.

Willow Ranch Landfill Retaining Wall, Land And Lakes, Romeoville, IL. Provided Construction Management assistance and Construction Quality Assurance monitoring and Engineering Certification of the installation of a geogrid tieback concrete retaining wall located at a closed landfill site. The wall consists of 700 lineal feet of panels with 3 and 4 stepped levels, constructed at a 7 percent alignment grade. One hundred and seven (107) concrete panels twenty-foot long were formed, constructed and installed on site. Construction submittals, schedules and testing for concrete and soils was provided.

Elgin Illinois Landfill Closure, BFI, Elgin, IL. Managed CQA monitoring and provided CQA certification of Closure of Elgin Landfill Superfund Site located in Kane County, Illinois. Closure design by US Army Corps of Engineers (US ACE) involved a soil and geosynthetic cap. Project fieldwork completed end of Nov. 2001 and the remedial construction completion report (RCCR) prepared in Dec. 2001. The US EPA and Corps without comment approved the RCCR. For the same landfill closure Mr. Bodine prepared the Operation and Maintenance Plan that involved normal landfill maintenance, long term groundwater monitoring and operation of the landfill gas management system.

City of Janesville Wisconsin Landfill, Provided management of project consisting of the review and evaluation of a poorly performing landfill gas system, and the design of a new dual well gas/leachate collection system. Services included field measurements, preparation of landfill permit modification and construction bid documents with contract requirements, specifications and drawings. Project began in May 2002 with construction of the new dual well collection system completed in December 2002.

Permits. Responsible for preparation and certification of NPDES permits, Construction permits, Joint permits, Dam safety permits, stormwater permits and plans, local permits and other agency documents for flood control projects, wastewater treatment facilities, landfills and various site remediation projects. Selected completed projects include the Meacham Grove Dam and Reservoir Flood Control Project in DuPage County Illinois and permitting activities for BASF, Amoco Chemical and Exxon Chemical.

Boston Tunnel Construction Claim, CAT, Boston MA. Provided expert witness support for major geotechnical construction claim. Work consisted of technical assessment of contractor claims for extra compensation for excavation of Central Artery

Tunnel. Mr. Bodine was a key member of the assessment team that resulted in full rejection of the \$25 million claim against the CA/T project.

Scottsville Landfill Construction Claim, Scottsville, MI. Provided technical assessment of construction claim for new landfill construction in the State of Michigan. Assessment resulted in nearly full rejection of contractor claim for 2 to 4 million of extra compensation for earthwork construction and schedule extension.

Unloading Dock Construction Claim, Honduras. Performed independent review of geotechnical foundation investigation and design for pile foundation for arbitration hearings concerning significant design-build cost extras for a large docking facility located in Central America.

Power Plant Circulating Water Pipe Evaluations, NW IN. Provided confidential evaluation of two large 14-ft diameter CMP pipe collapses for an AE designer and assisted field sampling and evaluation of two other power plant CMPs for long term integrity condition evaluations.

Foundation Site Investigation and Geotechnical Design. During the 1970's and 1980's coordinated site investigation and geotechnical foundation design of power plant and waste disposal structures for several fossil units between 500 MW to 750 MW in size located in the Midwest and South. Foundation and pond design included shallow and deep foundations (piles, caissons and drilled shafts) and water and waste holding ponds and dikes. The deep foundations were subject to a large range of loading conditions and conducting several large-scale load tests where necessary. One major project located along the Mississippi River in Louisiana is discussed in a paper listed at the end of this resume. Projects specific to Illinois and Indiana included those at several plants designed by Sargent & Lundy during the period.

Safety Analysis Report Preparation. Supervised and prepared geotechnical foundation design criteria and geotechnical and groundwater sections of safety analysis reports (SARs) for nuclear power plants located in Illinois, Indiana, and South Korea.

Cooling Lake and Dam Inspections. Conducted cooling lake and dam inspection and monitoring activities for lakes up to 3000 acres in size and over 25 miles of embankment dikes or dams. Prepared reports for submittal to client and appropriate state and federal agencies. The largest of these projects (Braidwood Nuclear Power Station Cooling Lake) involved dike construction and cutoffs constructed over and through extensive coal strip-mine spoils and over underground coal mines. Site monitoring included settlement monitoring of pre-load and dike fills over strip-mine spoils up to 120 ft thick, slope indicator movements, piezometer measurements and sampling for seepage and water quality evaluations.

SWMU's at Argonne National Lab, Illinois. Performed Visual Site Inspections and Structural Integrity Assessments for a large number of Solid Waste Management Units

(SWMUs) at DOE's Argonne National Laboratory-East as part of a corrective action program under RCRA. Performed duties as the Certifying Professional Engineer.

PROFESSIONAL EXPERIENCE

Geosyntec Consultants, Chicago/Oak Brook, IL, June 1996-Present
Woodward-Clyde Consultants, Chicago, IL, March 1989-June 1996
Sargent & Lundy Engineers, Chicago, IL, 1976-1989
Woodward-Clyde Consultants, Clifton, NJ, 1970-1972, Chicago IL, 1973-1976

PROFESSIONAL AFFILIATIONS

American Society of Civil Engineers - Life Member - Geo-Institute
Illinois Society of Professional Engineers (ISPE)
Deep Foundation Institute (DFI)
ACEC: American Council of Engineering Companies
Society of American Military Engineers
Three Rivers Manufacturing Association (Industry Association)

REPRESENTATIVE PUBLICATIONS

“Implementation of a Permeable Reactive Barrier for Treatment of Groundwater Impacted by Strontium-90”, Andrzej Przepiora, Dan Bodine, Peter Dollar and Jim Coughlin, *The 19th Pacific Basin Nuclear Conference (PBNC 2014)*, August 24-28, 2014, Vancouver, Canada.

“Analysis and Verification of Louisiana Pile Foundation Design Based on Pressuremeter Results”, D.G. Bodine and R. R. Davidson, in *The Pressuremeter and Its Marine Applications*: American Society for Testing and Materials, 1986.

“Effects of Clay Swelling on Permeability Calculations Obtained From Sealed Double Ring Infiltrometer Tests”, C. B. Avci, D. G. Bodine and E. Guler, in *The First International Congress on Environmental Geotechnics*, Edmonton, Canada; July 10-15, 1994.

“RCRA Closure of Refinery Sludge Basin Using In-situ Solidification and Containment”, D. G. Bodine and F. M. Trevino, in *The Proceedings of The Fourth Great Lakes Geotechnical/Geoenvironmental Conference: In-Situ Remediation of Contaminated Sites*, Krishna R. Reddy, Editor, University of Illinois at Chicago; May 17, 1996. Containment was by cement bentonite slurry wall and cement bentonite jet grout wall on the shore of Lake Michigan.

“Design and Permitting of a FGD Landfill Over and Existing Ash Reservoir” (2009), D.

G. Bodine, B. F. Tanyu, P. J. Sabatini, M. A. Ajlouni and D. E. Limes, Geotechnical Special Publication No. 187, Contemporary Topics in Ground Modification, Problem Soils, and Geo-Support, pp. 496-503.

“Case Study: Stability of Two Horizontal to One Vertical Embankment” (2011), Tanyu, B. F., Neal, W., Seymour, J. P., Bodine, D. G, Bozok, O., Paper presented at the ASCE Geo-Frontiers March, 2011, Dallas, Texas.

APPENDIX B

Range Road Landfill Annual Inspection Log

Range Road Landfill Annual Inspection Photographs

DTE Electric Company Range Road Ash Disposal Facility Annual Inspection Log

Inspector: Dan Bodine, P.E., Geosyntec
DTE: Jason Roggenbuck Provided Documents
and Accompanied Field Inspection
 Date: 24 May 2019, 7:30-3 pm

Weather: Sunny to Partly Cloudy, AM
Temperature 55°-65 F, Light Wind

Previous P.E. Annual Inspection Date: 29 March 2018

Item	Condition			Related Photo # (s)	Notes and Comments (LDP=Landfill Development Plan)
	Good	Adequate	CA Req.		
General Site					
1. Site Access Restricted / Attendant On-duty	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Visitor Sign in	Gates locked, except active ash haul road entrance near Guard.
2. Security Fence / Gates	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Gates: 13, 20 & 47	Good. One gate appeared not to have signage, Photo 13. All locked.
3. Signs and Markers	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	13, 20 & 47	Signs/markers were present at most gates and entrance. Recheck Gate at Photo 13. Signage present last year and may not show.
4. Access Roads and Construction Site Roads	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4, 35, 37 & 44	All very good. Ramp to top of landfill (Photo 35) subject to runoff. DTE to discuss with contractor erosion and repair. conditions.
5. Traffic Flow and Waste Unloading	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	None provided	Haul Trucks appeared moving and unloading in safe manor.
6. AST Inspection	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	5	Observed a possible dispensing leak. DTE & Contractor Alerted and Repair Planned.
7. Universal Waste (properly labelled, container condition, less than one (1) year from accumulation start date)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	None provided	Reported on only CCR waste material hauled to landfill. Sources noted in previous documents reviewed.
Waste and Nuisance Control					
8. Ash Hauling Contractor On-site Safety/Training	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	None provided	Training JHA and Operations Review Checklist provided for review.
9. Ash Hauling Contractor Equipment Condition/Adequacy	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	None provided	Ash hauling equipment appeared adequate. Traffic was almost non-existing, plus inspection focused away from active disposal.
10. Ash Hauling Contractor Filling Active Area to Appropriate Grade	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	32, 37, 38 & 39	Observed Filling Area G2. Filling procedures acceptable as dumped loads were graded using onsite dozer.
11. Waste Condition (i.e. - waste from approved source, no recyclables, no MSW, no liquids, no hazardous wastes, etc.)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	32, 36 & 39	Observative waste piles appeared acceptable in accordance with permit.
12. Noise Level	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	None provided	Covered in Landfill Development Plan. No contractor noise heard during inspection of perimeter ditch and closed landfill cover.

DTE Electric Company
Range Road Ash Disposal Facility
Annual Inspection Log

13. Dust Control	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	None provided	Dust Control Plan and Annual Reports available. No complaints and no action needed. Nov. 22, 2018 Annual Report Reviewed.
14. Adequacy of Interim Cover and Interim Stockpile Cover	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	22, 23, 35,37 & 39	Closed or final cover slopes and most interim cover area slopes joining active areas appeared stable. Continued erosion observed on <u>temporary slopes</u> shown in Photo 35 at haul road. Grading at Locations in Photos Appeared Incomplete and Not Ready for interim cover.
Final Cover			
15. Landfill Side Slope Condition (i.e.-no seeps, no cracking, no settling, no burrows, adequate vegetation)	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	27, 28, 30 & 31	No erosion noted except interior road slope discussed above. Trees on N, NE, NW sides approved to stay and did not appear to cause any observable stability problems. Small Trees and brush noted in Several Photos.
16. Final Cover Top Condition	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	25, 26 & 29 top 27, 28 & 31 slopes (small brush/trees recommended for removal)	Top and slope final cover areas were well vegetated. Some small woody vegetation present on slopes of recent areas where historical tress not approved. No observed settlement or stability conditions. Relatively flat cover designs require swales to direct potential flows to downchutes.
Leachate and Surface Water Control			
17. Stormwater Detention Pond Water Quality (unnatural films, foams, oils, etc.) and pump operating condition (panel, meter etc)	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	1, 2 & 3	Quality appeared acceptable. Recent rains appear to result in some visible surface water discoloration. Pumps 1 & 2 lights indicated out of service, but reason not known. DTE inspector to Investigate. Flow meter working and Pump #3 was running. DTE later reported lights and/or pumps now repaired and working.
18. Stormwater Detention Pond Side Slope Condition (erosion, riprap, vegetation) and any other operating observations not in 17 above.	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	1 & 2	Appeared stable and adequately vegetated & protected. WL also monitored with staff gauge, SG-13. Slope vegetation cut in 2017.
19. NW Corner Lift Station Surface Water Ditch Level & Pump	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	18	New pumps & sump level controls were installed in late 2017. Pumps and switches were checked (DTE person) and all appeared operating correctly. Switches remain in auto position. Both pumps were checked for operation manually.

DTE Electric Company
Range Road Ash Disposal Facility
Annual Inspection Log

20. NW Corner Lift Station Operating Condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	18	See also Item 19 above. Both pumps operated when checked.
21. NE Off-site French Drain Operating Condition	<input type="checkbox"/>	<input type="checkbox"/>	None provided	Control building locked and DTE Inspector did not have key.
22. NW Off-site French Drain Operating Condition	<input type="checkbox"/>	<input type="checkbox"/>	None provided	Offsite, not Inspected; Covered in TRC reports. Items 19 & 20 discusses lift station and pump conditions.
23. NE/NW Off-site French Drain Outfall Water Quality	<input type="checkbox"/>	<input type="checkbox"/>		Not part of this CCR inspection. Covered in other consultant reports.
24. Perimeter Slurry Wall Marker Condition	<input type="checkbox"/>	<input checked="" type="checkbox"/>	None provided	Slurry wall below Grade and Surrounds Entire Landfill at/near Property Line. Barrier to any below grade GW Flow. Markers show Alignment. Most markers have been removed for road upgrades. Slurry Wall as-built location is reported in several reports and on file in DTE office. Therefore, it is judged as Adequate.
25. Perimeter Ditch System (Flow & Staff Gauge Monitoring)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	6 & 11 typical	Some flow observed and one or two videos taken. Staff gauge elevations in tables provided. Reviewed and confirmed gradient flow in system. Staff Gauge 13 may have inaccurate reported elevation. DTE rechecked. Many areas are due for vegetation removal. Not known which areas are scheduled for 2019 or 2020.
26. Perimeter Ditch System (Slope & Bottom Conditions); Includes Internal Ditch if a Main Discharge to Perimeter Ditch	<input type="checkbox"/>	<input checked="" type="checkbox"/>	6, 8, 9, 10, 11, 12, 14, 15, 16, 19, 21, 34, 41, 42, 43 & 48	Perimeter ditch located around entire active and closed landfill areas. Major internal ditches also drain to perimeter ditch. Runoff from landfill and runoff from the site is controlled by the ditch system and perimeter slurry wall. Flow appears to be maintained. DTE Indicates that non-woody vegetation has been approved to remain as long as flow maintained. DTE had a rotating 3-year vegetation maintenance program in effect. Maintenance is being provide, but not known if a formal rotating program still exists. Internal ponds also shown in these and other photos attached.

APPENDIX B
DTE Electric Company Range Road Landfill Annual Inspection 24 May 2019



1. Storm Water Detention Basin (SWDB), S & W Sides. Slopes are Protected with Stone. No Visible Slope Erosion on all Sides. Same for N & E Sides.



2. Intake Screens at SWDB. Water from Basin is Pumped Back to Power Plant Using One or More of 3 Pumps. DTE Inspects Daily and Records



3. Pump Control Panel. Pump #3 Running. Pumps 1 & 2 Identified as Out of Service. Wall Flow Meter (Not Shown) was Operating. Pumps Observed.



4. Looking at Well Maintained Haul Road within Landfill Limits. Condition Typical of Main Haul Roads to Waste Placement Areas.

APPENDIX B
DTE Electric Company Range Road Landfill Annual Inspection 24 May 2019



5. Second Fuel Tank Appeared to have Possible Dispensing Leak. DTE Informed Contractor Management and Repairs were Later Reported Completed.



6. Perimeter Ditch Staff Gauge SG-07. Heavy Vegetation. No Flow Noted. Water Present. Vegetation Approx. Typical at Staff Gauges 13, 10, 6, 5 & 3.



7. Monitoring Well 16-02. Well Protected and Cap Locked. Well Protection and Capping Typical of Inspected Above Ground Monitoring Wells (16-03,04,05&06).



8. View of Area where Discharge Flow into Perimeter Ditch from NE Off-Site GW Capture System. Ditch Slope Vegetation was Cleared in 2017.

APPENDIX B
DTE Electric Company Range Road Landfill Annual Inspection 24 May 2019



9. View of End of Large Culvert at Crossing Near Staff Gauge SG-5. Culvert Opening and Not Blocked.



10. Looking at Last Year's Maintenance Along East Side Perimeter Ditch. Ditch Cleared of Vegetation. Road Also Remains in Good Condition.



11. Looking at SG-03. Ditch Flow Observed. Vegetation Thick but Not Blocking Flow.



12. Looking at Perimeter Ditch, Staff Gauge SG-02 and PZ-1R. Ditch Cleared of Vegetation in 2018. Same Type Clearing at SG-01 and

APPENDIX B
DTE Electric Company Range Road Landfill Annual Inspection 24 May 2019



13. Locked Gate in Security Fence Along Perimeter Ditch. Signage not Visible but is Located on Right Side of Gate.



14. Large Culvert and Small Culvert. There was No Blockage of Small Culvert. Riprap Downchute from Closed Landfill Area Slope Visible.



15. Perimeter Ditch Shown Here was Previously Cleaned. Riprap Along Ditch Noted. Flow Observed.



16. Previous Maintenance Along Perimeter Ditch and Culvert Crossing. Both Sides of Culvert Open and Ditch Cleared of Vegetation.

APPENDIX B
DTE Electric Company Range Road Landfill Annual Inspection 24 May 2019



17. Landfill Slope on North Side Shown. Appeared Stable and Well Vegetated.



18. Sump Where 2 New Pumps Installed Last Year. Off-site GW Inlet Pipe Shown. Control Panel and Pump Operation Verified by DTE Inspector.



19. Perimeter Ditch Vegetation and Riprap Along Slope. Vegetation Partially Removed but Ditch Flow Appeared Not Blocked.



20. Security Fence and Gate at West Side of Landfill. Gate Locked and Signage Present. Typical of Gates Around Landfill Perimeter.

APPENDIX B
DTE Electric Company Range Road Landfill Annual Inspection 24 May 2019



21. Photo of Offsite GW Capture System Flow into Perimeter Ditch at Pump and Control Panel Location.



22. Top of Clay Stockpile for Later Use. Surface Graded for Drainage. Rainfall Previous Day/Night.



23. View of Perimeter Landfill Slope Along East Side.



24. DTE Inspector Checking Slope Drainage Channel. Channel Swale Open and Well Protected with Slope Vegetation.

APPENDIX B
DTE Electric Company Range Road Landfill Annual Inspection 24 May 2019



25. View of a Cover Surface Collection Swale Along the Perimeter at the Top of Landfill. Swale Well Vegetated and Typical of Surface Swales Elsewhere.



26. View of the Top of Closed Portions of the Landfill with Center Swale. Top Well Vegetated. No significant Surface Erosion Noted During Travel.



27. View of Perimeter Slope East Side. Well Vegetated, Appearing Stable but with a few Clumps of Brush Vegetation.



28. A Look Back at Perimeter Slope of Closed Portions of the Landfill. Slope Well Vegetated and No Visual Evidence of Stability Problems.

APPENDIX B
DTE Electric Company Range Road Landfill Annual Inspection 24 May 2019



29. Termination of One Drainage Swale Top of Landfill at Downslope Pipe. Riprap was Added Years Ago to Control Erosion During Heavy Rainfall.



30. Looking Downslope at Downchute of South Slope of Closed Area F2. Small Tree Brush Present Not Causing Any Blockage.



31. Looking West at Landfill Perimeter Slope in Area F1 from Corner of F2. Small Tree/Brush Vegetation Portion of F1 Downstream Slope.



32. Waste Placement in Area G2 Phase 1 Along Temporary Slope of Area F2.

APPENDIX B
DTE Electric Company Range Road Landfill Annual Inspection 24 May 2019



33. Runoff Collection Pond within Landfill Limits. Landfill Area Slopes on Left Appeared Stable and Well Vegetated.



34. Interior Landfill Drainage Ditch. New Routing of Ditch. Slopes Appeared Stable. Check Dam at Far End of Photo. Same as 2018 Photo 76.



35. Slope where Some Runoff Erosion Noted Along Side of Active Haul Road.



36. Active Waste Placement Area.

APPENDIX B
DTE Electric Company Range Road Landfill Annual Inspection 24 May 2019



37. Interior Haul Road Leading into Active Waste Placement Area G2. Compacted Waste Supporting Haul Trucks without Rutting.



38. Top of Active Placement Area G2, Graded and Used as Interior Haul Road.



39. View of Interior Waste Slope in Area G2. Truck Dumping at Toe of Slope. Bottom of Slope Runoff Causes Some Wet Conditions as Shown in Photos.



40. Future Waste Placement Area G2 Phase 2.

APPENDIX B
DTE Electric Company Range Road Landfill Annual Inspection 24 May 2019



41. Slope Along Internal Ditch. Erosion Control Bails Placed. Vegetation Appeared Heavy and Typical of This Internal Ditch.



42. Looking East at Perimeter Ditch from Southwest Corner of Property. Culvert for Road Crossing Near Monitoring Well 16-05.



43. Looking West at Perimeter Ditch and Slopes Along NW Landfill Corner. Slopes Appeared Stable and Typical. Riprap at Inlet of Culvert Road Crossing.



44. View of Interior Haul Road/Inspection Road. Interior Pond on Left in Photo. Area Slope Appeared Stable and Well Vegetated.

APPENDIX B
DTE Electric Company Range Road Landfill Annual Inspection 24 May 2019



45. Left Side of Pond where Water Exits to Interior Drainage Ditch. Interior Landfill Slope in Background.



46. Right Side of Collection Pond. Landfill Slopes Appeared Stable. Surface Runoff Ditch from Interior Road.



47. Main Entrance Gate to Landfill. Plant Area Road and Security Gate Manned Office to the Right (Not Shown). Gate Opened for Our Exit by Inspector.



48. Perimeter Ditch on West Side of Landfill Property Looking East from Road Crossing. Ditch Vegetation Typical. Slopes Appeared Stable.