DTE Energy®

Prepared for

DTE Energy
One Energy Plaza
Detroit, Michigan 48226

2018 ANNUAL INSPECTION REPORT
RANGE ROAD LANDFILL
ASH DISPOSAL FACILITY

China Township, St. Clair County, Michigan

Prepared by

Geosyntec consultants

engineers | scientists | innovators

1420 Kensington Road, Suite 103
Oak Brook, Illinois 60523

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1. INTRODUCTION

1.1 Overview

This 2018 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 Environmental Quality (MDEQ) as a Type III Low Hazard Industrial Landfill. The property encompasses 514 acres of which 402 are designated for landfill development. The MDEQ Facility ID Number is 392562 and License Number 9395. The current license is set to expire on June 26, 2019.

During 2018 the Landfill accepted bottom ash and fly ash from the St. Clair and Belle River Power Plants. The Marysville Power plant is included in the license but has been decommissioned and no longer sends ash to the landfill. The Harbor Beach Power plant is no longer operating and no longer sends ash to the Landfill. Filling operations at the site began in the 1950s and the current Operating License issued to Detroit Electric Company 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, four areas (Area F3 is closed pending certification, Areas G2 Phases I and II are active, Area G2 Phase III not active and not constructed. Areas D3 and F3/D3 were active but may now be included in the F3 closed area pending certification. Two areas (Area G1 and Area E) remain unconstructed. For permit and construction purposes, Area G2 has been subdivided into phases. Area G2 Phase II has been approved for waste placement by MDEQ. 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.

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 2018 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.

Table 1 Available Information Reviewed for the 2018 Annual Inspection

Title	Prepared by	Month and Year	Content with 2018 Update Status
2017 Annual Inspection Report - Range Road Landfill Ash Disposal Facility	Geosyntec Consultants	January 2018	Results of 2017 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 2018 Inspection.
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 2018 year and Beyond.
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 2018 Inspection.
2014 Site Plan TRC Figure 1	TRC	March 2014	Landfill Area Plan Locations and Designations, Status and Phasing Legend. Figure Marked up for Discussion and Use as Figure 1 in the 2017 and 2018 Reports by DTE and Geosyntec.

Title	Prepared by	Month and Year	Content with 2018 Update Status
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.
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.

Title	Prepared by	Month and Year	Content with 2018 Update Status
Range Road Area F3 Final Closure – Existing Site Plan Draft - Dwg No. 6C664-158	DTE Engineering	February 2017	Drawing Showing Landfill Areas Including Future Portions of Area G that can be Used for Active Topsoil and Clay Borrow.
Memorandum Regard to DTE Range Road Waste Filling Sequence with Draft RRLF Estimated Life Expectancy and Capacity Analysis	NTH	September 2017	Ash Volume Projections for Years 2017 through 2030 and Comparison to Available Volume Remaining in Landfill. Plans for Developing Remaining Disposal Areas (Area F3 and Area G2).
DTE Energy Company – Range Road Landfill Waste Filling Sequence - Drawings	NTH	September2017	Sequence of Waste Filling Grades for Phases 1, 2 and 3 of Waste Area G2 and Area F3-D3.
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.
Groundwater Potentiometric Elevation Summary Figure 7	TRC	October 2017	Groundwater Elevation Summary for the 7 Groundwater Monitoring Wells Numbers 16-01 thru 16-07.

Title	Prepared by	Month and Year	Content with 2018 Update Status
Fourth Quarter 2017 Groundwater Elevation Monitoring Tables 1 & 2	TRC	January 2018	Summary Tables of Groundwater Well/Piezometer and Perimeter Ditch Staff Gauge Elevation Monitoring.
DTE 2017-2018 Quarterly Comprehensive Inspection Log (s)	DTE	Nov/Dec 2017 & March 2018	Inspection Condition and Notes: Final Cover for Areas, Surface Water Ditches & Signage. Referenced Quarterly Reports Not Available for Review.
2017-2018 Weekly General Inspection Log (s)	DTE	Weekly Logs Oct 2017 thru March 2018	Inspection for General Site, Waste & Nuisance Control, Final Cover, Leachate & Surface Water Control. Viewed Weekly File Onsite. Logs Reviewed Onsite.
Environmental Outside Rounds Log Sheet (A Daily Inspection Log)	DTE	March 2018	An Example of Daily Plant Environmental Inspection Log Sheet. Record Unusual Conditions, Gate Conditions, Flow Meter Readings, and Other Unusual Observations Report for March 27, 2018 was reviewed.
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.
Four Geosyntec Selected Headwaters Resources Standardized Work Sheet JHAs Representing Added New Site Employee and Four Work Processes	Headwaters, Inc.	Feb. 17, 2017 Feb. 22, 2017 May 25, 2017 June 8, 2017	Training Records for Any New Added Employees for 2018 were not Available. JHAs were Provided for Onsite Inspection During the 2017 Inspection.
Appendix D to ξ1910.134 (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.

Title	Prepared by	Month and Year	Content with 2018 Update Status
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.
Certification of Base Liner Grades (Area G2-13.1 Acres)	DEQ	Sept. 21, 2018	Approval Letter for Portion of Area G2 for Active Placement. Area Assumed to be G2 Phase 2.
Copy of Unsigned Issue of Construction Drawings for G2 Phase 2 Base Liner	NTH	April 23, 2018	Area G2 Phase 2 Base Line Construction Drawings, Sheets 1 and 2. 12.9 Acres
DEQ Fiscal 2018 3rd & 4th Quarterly Inspection	DEQ	July 9, 2018 and Sept 28, 2018 (Dated)	Michigan DEQ Site Inspection and Evaluation for Compliance with Part 115

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 (14) work areas, eight (8) that have been identified as "Certified Closed", three (3) identified as "Active" and three (3) identified as "Unconstructed". The work areas are listed below in **Table 2** and shown in **Figure 1**. **Figure 1** is taken from a Phasing Plan dated November 2013 but modified to include Active Area D3 shown on a Phasing Plan dated March 2014 and discussed in the current operating license. The March 2014 plan did not show the breakdown areas of Area G that have been referenced in the September 2015 area certification for waste placement. Area G2 was divided into Phase I, II and III waste filling areas as shown in the September 26, 2017 Draft Range Road Landfill Waste Filling Sequence Drawings.

Table 2 Site Phasing Summary - 2018

Area	Status	Size, Acres	Comments
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	22	Closed Pending Certification Approval
F3-D3	Closed	1	May be Closed Pending Certification

G1	Unconstructed (see below)		No Cell Construction or Waste Placed
G2	Active	48.4 (Total Permitted)	Active Waste Disposal G2 (Phase I)
	G2 Phase I	15.5 (Waste Placement)	Acreage From Drawing Set, Sept. 26, 2017
	G2 Phase II	13.1 (Waste Placement)	Acreage From DEQ Letter Sept. 21, 2018
	G2 Phase III	9.0 (Construction)	Acreage From Drawing Set, Sept. 26, 2017
	G3	Unconstructed (see below)	No Cell Construction or Waste Placement

* Areas C, D1, D2 and F2 have been certified closed, but documents note that the southern edge or slopes that join active, unconstructed or closed pending certification areas, such as E, D3, F3, G1, G2 and/or G3 may have interim cover as designed and approved. Submittal closure documents for Areas D3, F3 and/or F3-D3 if applicable were not available for this inspection review.

Also note that project documents for identifying G2 phases use roman numerals at times and standard numbers at other times. All are referring to the same area phase.

Table 2 does not list acreages for Areas G1 or G3 because the areas have not yet been developed. However, the total acreage for the combined G areas is 110 acres, as reported in the operating license. Using the 110 acres for G areas and adding the acreage for the other areas in Table 2 gives a Total Area of 447 acres that is 1 acre over the totals given in the operating license for the active, certified and unconstructed areas. This is because of the F3-F2 one (1) acre area was previously discussed or identified as a possible G1 area and active F2 area (see **Figure 1** taken from 2016 inspection report). Therefore, the Unconstructed G areas would actually be less than 110 acres because of the G1 name change. This is less than the 514-property acreage, but greater than the 402 acres stated in the November 2013 Landfill Development Plan. Geosyntec realizes that acreages for future unconstructed areas may only be estimates until actual design is complete and waste placement approved. Additional documents reviewed, and observations made during the 2017 and 2018 site inspections, resulted in updating the status of placement of ash close to final grade in Area F3 and placement of ash at the north end of Area G2, now identified as G2 (Phase I). During 2018 the base liner for Area G2 Phase 2 was constructed and approved by DEQ. The DEQ approval letter was reviewed and is one of the new documents listed in Table 1.

The Landfill Site includes perimeter ditches, roadways, a shallow perimeter slurry wall, earth berms, a 10 Acre NPDES Stormwater Detention Basin (SDB) and Basin Pump House. The detention 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 nearly all of the closed and active portions of the landfill connecting and draining to the SDB. **Figure 2**, taken from TRC's December 2015 Surface Water Flow drawing, shows the location of these items, including flow and capture details of the two

Offsite Groundwater Capture Systems. The pump control areas for these systems and the SDB pumping system were observed during the 2018 annual inspection.

The Landfill is a dry-handled (conditioned) CCR landfill licensed by MDEQ 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 ash disposal rate is 225,500 in-place cubic yards/year (average) based on historical ash production rates and calculations of volumes by NTH using aerial flyovers performed in 2013 and 2017. Based on ash volume expected to come from Harbor Beach in 2018, St. Clair volumes assuming the plant to close in 2023, and Belle River plant to close in 2030, the total remaining ash volume has been estimated to be approximately 218,540 cubic yards over the calculated storage volume. This has been reported in waste filling sequence memorandum by NTH, dated September 26, 2017, but is qualified and subject to details of future closure designs and area certifications that will result in refinement of the volume calculations. Since the current waste volume estimates are less than previously estimated, the total landfill waste volume should be less than the approximate 20 million cubic yards reported in the 2016 Annual Inspection Report.

The Landfill subbase is reported to average over 70-foot thick of naturally occurring clay soil layer throughout most of the landfill. An exception to this is on the east side of the site where an approximately 10-foot thick near-surface sand layer exists. To cutoff this sand layer and any near surface flow the entire site has been encircled along the property perimeter with a soil-bentonite slurry wall with a reported depth of 10 to 15 ft designed to key into the underlying clay Landfill subbase.

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 Stormwater Detention Basin collecting ditch water and pumping to plant;
- Two Offsite Groundwater Capture Systems collecting impacted water;
- 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, $k \leq 1x10^{-7}$ 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 the operating 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. New 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 stormwater, 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. Ash 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 March 29, 2018. 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. The northwest groundwater capture system pumping 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 Hands-On position. This may have been related to low flow from the intake pipe due to vegetation blockage at the pipe collection point, which when removed by DTE provided a much larger flow from the collection ditch. Switches were checked, and the Auto position and level controls appeared to be operating correctly. The DTE inspection person is checking with equipment operators to determine why pumps were left in the Hands-On position.

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 cloudy with on and off light rain and temperatures ranging from 40° F at 0730 hrs to a high of 43° F in midafternoon. Local weather reported total precipitation (rain) for the date of 0.67 inches.

Stormwater Detention Basin: The basin and pump system appeared in good condition. Basin slopes and entrance flume also appeared in good condition with vegetation recently cut as shown in Photographs 1and 2. Pump 1 was operating, and all pump switches were in the auto mode. The Pump control panel is shown in Photograph 4. The discharge flow meter, shown in Photograph 5, appeared to be working correctly. 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. Isolated locations, suspected to be small erosion gullies, were checked to determine if repair work was needed. Follow-up observations from the top of slope determined that repair was not currently needed and that a portion of the small gully was actually a vegetated animal trail, as shown in Photograph 57. Photographs 25, 38, 41, 43, 49, 53, 56, 57, 60, 66, 70, 71, and 72 show slope vegetation and general slope conditions of closed landfill areas. The non-historical areas, such as Area D1 and D2, shown in Photographs 49 and 66, have no or

minor woody vegetation present. These slopes 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 9 November 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 31, 48, 49 and 61. 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 51, 54, 55, 58, 52, 62 and 71 show final cover surfaces of closed landfill areas. The small woody brush on cover areas and PE-certified approved area slopes, as typically shown in Photographs 58, 61, 91 and 107 should be scheduled for future removal or cutting with wood stumps brushed to eliminate regrowth. There also were no observed significant areas of pooled water on the top cover from the recent rain.

The cover downslope drains (downchutes) and downslope ditches were observed as part of the final cover inspection. All observed appeared in acceptable condition with one showing a minor amount of surface water near the inlet due to tire rutting altering fine grading. Photos of downslope drains, downslope ditches and previously repaired slope erosion gullies are shown in Photographs 30, 38, 47,50, 56, 57, 59, 73 and 74. Photograph 85 of the perimeter ditch on the west side shows a newly constructed slope drain draining bottom surface water from an active portion of Area G2.

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. Some minor woody brush removal has been recommended. This has also been observed and noted in the DEQ 3rd and 4th Quarter Inspections. Area F3 that is identified as “Closed” in Table 2 had its final cover area graded and seeded at the time of site inspection, but the area was not entirely complete or not yet showing vegetation growth and therefore had not yet been certified by the responsible CQA Certifying Engineer. Current documents now indicated that the area is awaiting or pending certification approval. Photos of the final cover of Area F3 include Photographs 62-64, 104 and 105. The area identified as F3-D3 has had temporary cover placed but did not appear to have reached final grade. Area F3-D3 is shown in Photograph 65.

One significant area of temporary slope runoff erosion is along the southeast side of Active Area F3 cover construction and road ramp up to the work areas. This eroded temporary slope is shown in Photographs 102 and 103. The slope erosion may have already been repaired as DTE planned to discuss a repair with the onsite contractor. If not, the erosion does represent a safety stability problem because the runoff and gullies cross an active haul road, as shown in the photographs.

The site typically does not have problems getting cover vegetation to grow but does have a battle getting the phragmite vegetation under control within the landfill internal and perimeter ditches. Results of ditch observations and inspections are presented in later sections of this report.

Active Area G2 and Continued Clay Borrow Development: Area G2 Waste Filling Sequence has been divided into Phase I (currently active waste placement), Phase II and Phase III future development areas based on draft Drawings dated September 26, 2017. The G2 Phase I area ties in with Area F2. As such the temporary clay covered slope over F2 CCR waste was removed for reuse together with a small portion of the F2 solidified waste. That F2 cut-slope and solidified waste were observed in 2017 and again in 2018. Photograph 110 shows the cut slope that again appeared stable, although steeper than 2H to 1V. That slope will be bench cut and tied into the G2 CCR as the material is raised in elevation based on previous discussions with DTE.

New or fresh conditioned CCR waste in Area G2 Phase I is shown in Photographs 81, 82, 110 and 111. Placement and compaction procedures of conditioned CCR waste closely follows the Ash Filling Procedures discussed in the Landfill Development Plan. CCR waste 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 67, 68 and 77.

Perimeter Ditch System: The perimeter ditch and ditch flow directions to the SDB or northwest pump location are shown on **Figure 2**. Vegetation in the bottom of many ditch areas appeared excessive but is of the non-woody type vegetation. If ditch flow is maintained and monitored to confirm adequate flow the vegetation can remain until maintenance activity can be performed. The plant has put together a 3-year rotation (2017-2019) ditch maintenance program where approximately 1/3 of the ditch alignment length is cleared of excessive vegetation each year. In 2017 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 Photographs 1 and 2. Photographs of ditch maintenance completed are provided in **Appendix B** and include Photographs 7,10, 13, 15, 16, 17, 18, 36, 37, 42, 46, 75, 86, 87, 88, 90, 94, 95, and 98. Photograph 18 is actually a culvert blockage due to removed ditch vegetation piling up in front of the culvert opening. DTE indicated it will be cleared. Photographs 76, 77 and 100 show a new constructed ditch and inlet replacing an old ditch shown in Photograph 80 that previously drained water from an onsite runoff collection pond. Ditch maintenance schedule modifications are subject to the needs of the site as it did appear more work was performed in 2017 than initially projected.

In addition to clearing the culvert vegetation blockage shown in Photograph 18 and runoff erosion on the temporary waste slope shown in Photographs 102 and 103, it is recommended that ditch

slope erosion near the southwest corner and shown in Photographs 96, 97 and 99 be scheduled for repair. One or more of these repair recommendations may have already completed.

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 4th Quarter 2017 together with the completed maintenance activities for the NW Groundwater Capture System indicates ditch flow is occurring in the appropriate flow direction. This was verified during field visual examinations during the annual inspection and review of the ditch water elevations measured and reported by TRC. See Photographs 9, 11, 13, 16, 19, 22-24, and 40 that show typical ditch conditions at various staff gauge and pump discharge locations. Note that many of these photographs may have been referenced in report Section 7.3 on Maintenance. Photograph 39 shows a white slurry wall marker. Most of the slurry wall markers have been removed for road construction or general maintenance activities. The slurry wall is located outside of the ditch perimeter and along the property boundary. If there is a need to re-install some of the markers they could be offset from the road and slurry wall centerline, and the offset distance noted on the marker.

Operation Activates Including Waste Placement: The landfill operating contractor is Headwaters Inc. 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 2018 annual inspection, records of current DTE monitoring inspections and new or updated reports were obtained from the landfill engineer. 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) with their locations shown on **Figure 2**, 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. Four of the 7 wells with their protective bollards are shown in Photographs 06, 20, 27 and 89. 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 prior to the effective date of the CCR Rule (19 October 2015).

In addition, the following plans and inspections are specifically 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 22, 2017, and 2018 weekly inspection reports from October through March 2018 were reviewed onsite. The November 30, 2018 Annual Fugitive Dust Control Report was reviewed prior to finalizing this report for certification.

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 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 be required. A closure report for Area F3 was expected to be completed in 2018. At the end of 2018 Area F3 was identified as closed awaiting or pending certification approval. Clay for the capping was excavated as part of subgrade excavation within portions of G2 Phase II and Phase III areas. 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 significant 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 report Section 4 on the Perimeter Ditch System.

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 annual inspection. The plan has not been revised. The landfill ash fill contractor, Headwaters, made improvements in following the plan CCR placement and compaction procedures. This has been discussed in AIR Section 4 on final cover construction observations.

After the 2017 site inspection Headwaters onsite personal provided their Standardized Work Sheet and JHA 2017 documents, and contractor's worker training of specific equipment for a new employee added to the site work force. It is not known if any additional Headwaters site personal were added to the work force prior to the 2018 March inspection.

Records by DTE, such as the daily shift report for the NPDES Pond (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 stormwater detention pond 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 2018 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 and pumping of water in the SDB appeared to be working as designed and in accordance with recognized and generally accepted good engineering standards. Some maintenance needs to be scheduled for removal of one culvert vegetation blockage, some minor identified small woody vegetation, and erosion gulley repair on the ditch slope along the southwest perimeter ditch.

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 9 January 2019

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

Plot Data
Design File J:\DTE\St Clair Co\212568\0000\212568.0000.01.plt
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Plot File = J:\DTE\St Clair Co\212568\0000\212568.0000.01.prf
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Reference Files
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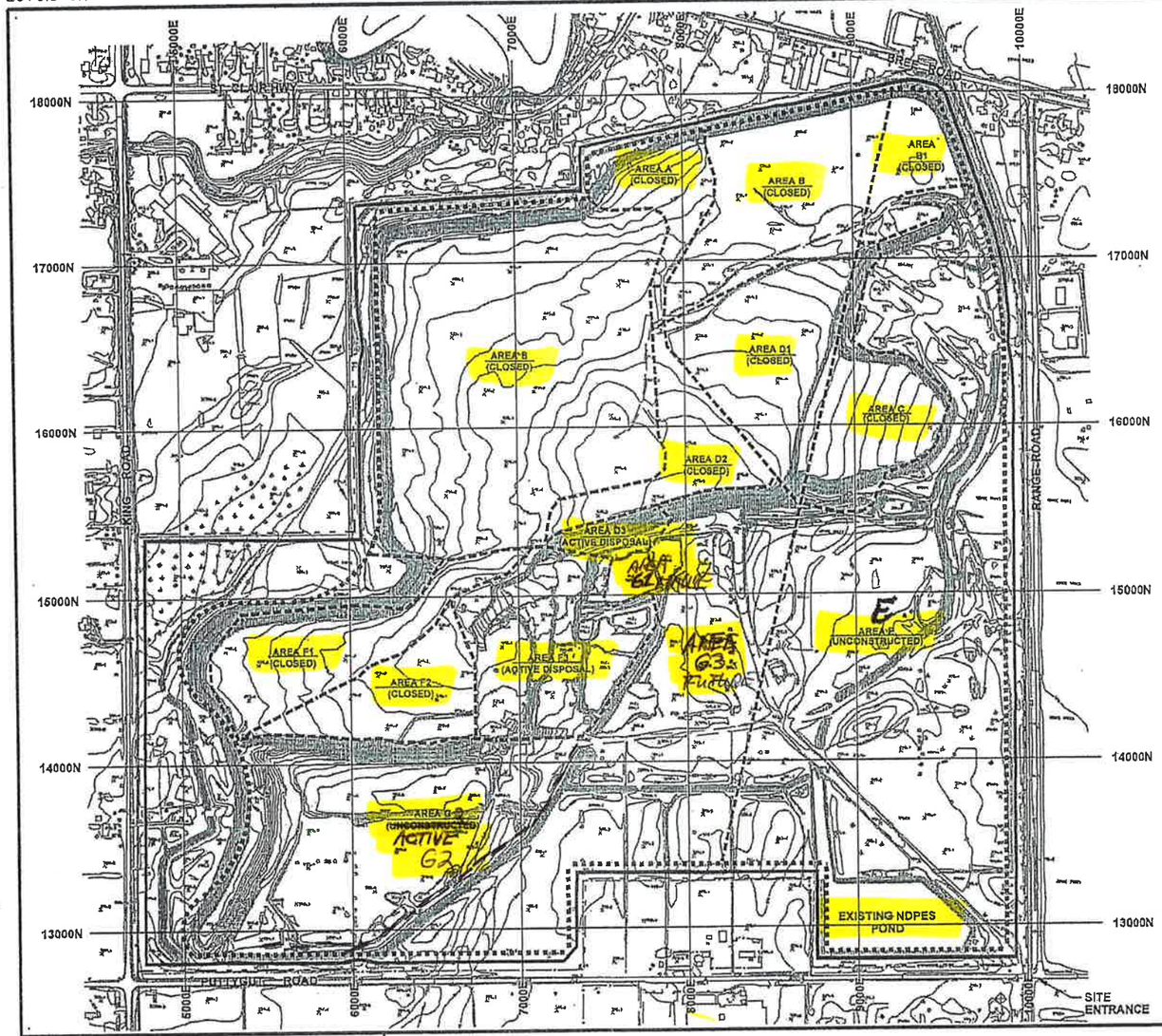
(3)
(4) 1-63



LEGEND

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

NOTES

1. BASE MAP DEVELOPED FROM AERIAL SURVEY PERFORMED BY KUCERA INTERNATIONAL, INC., WILLOUGHBY, OHIO. DATE FLOWN: 4/27/2013.
2. GRID SYSTEM IS ON-SITE GRID - BELLE RIVER PLANT/RANGE ROAD PROPERTY SYSTEM.

SITE PHASING LEGEND

Area	Status	Size (Acres)	Material Under Waste	Comments
A	Closed	7	Clay	Certified Closed. May 17, 2002
B	Closed	102	Clay	Certified Closed prior to September 2, 1999
B1	Closed	9	Sand	Certified Closed prior to September 2, 1999
C	Closed	16	Sand	Certification Report Approved by MDEQ, August 25, 2009
D1	Closed (interim cover on southern sideslopes)	21	Clay	Certification Report Approved by MDEQ, August 25, 2009
D2	Closed	10	Clay	Certification Report Approved by MDEQ, August 25, 2009
D3	Active Disposal	3	Clay	
E	Unconstructed	117	Sand	Can be authorized to receive fill once a remediation plan is implemented
F1	Closed	17	Clay	Certification Report Approved by MDEQ January 4, 2010
F2	Closed	12	Clay	Certification report approved by MDEQ February 28, 2013
F3	Active Disposal	22	Clay	
G	Unconstructed	110	Clay	Future

0 1000
SCALE: 1"=1000'

TRC

FIGURE 1

LANFILL WORK AREA PHASING PLAN

DRAWN BY:	lstormer
APPROVED BY:	V. BUENING
PROJECT NO.	212568.0000
FILE NO.	212568.0000.01.plt
DATE:	MARCH 2014

FIGURE 1

ATTACHMENT A

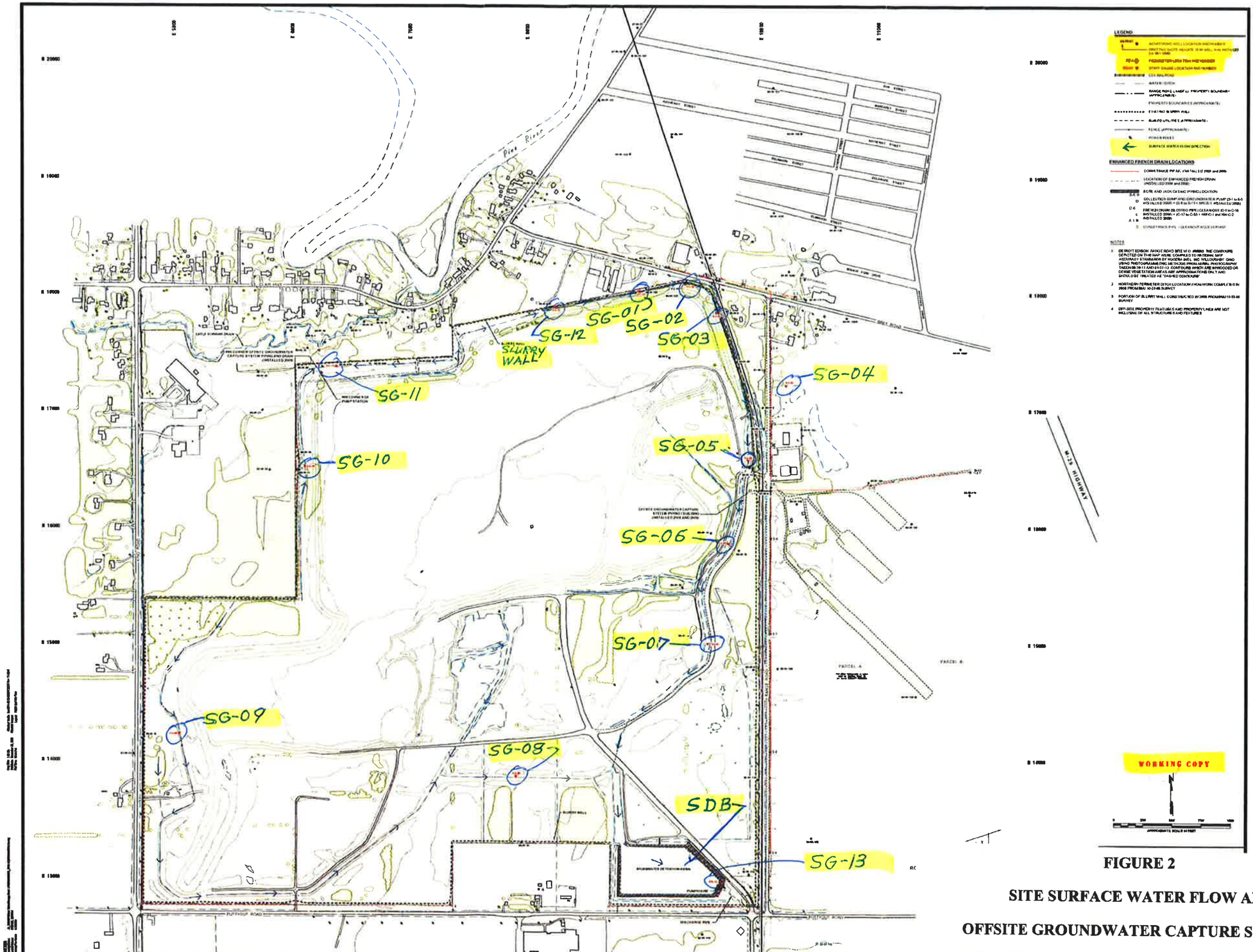


FIGURE 2

SITE SURFACE WATER FLOW AND

OFFSITE GROUNDWATER CAPTURE SYSTEMS

APPENDIX A

Resume of the Qualified Professional Engineer

Geosyntec
consultants

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
West Virginia, P.E. Number 14279
Colorado, P.E. Number 47434

CAREER SUMMARY

Mr. Bodine has over 45 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 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 Amos Fly Ash Dam, 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 document review and comment and attended site review meetings. Design was complete, but site redevelopment has expanded, and barrier wall construction was put off until 2018. New construction team has proposed different method of slurry wall construction and is in the process of preparing new work plans, drawings and specifications. Construction will be in two or three phases with first phase beginning in June 2018. Site was location of former refinery and review and comments were well received by 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 closed landfill clay cover. Monitoring well 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 raise 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 for Shell Oil Company. 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 (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 now 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.

US Forestry Holden Mine Barrier Wall, U.S. Forestry, Chelan, WA. Working through USF Consultant, Hart Crowser, 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 the middle of a national forest. Work included review for agency 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.

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 has been approved and owner waiting for formal permit to be issued in early 2014. A separate construction package for Stage 1 & Stage 2 construction of the landfill expansion has also been prepared and issued to the owner for bid and initial construction beginning in late 2014.

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 and 2018.

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.

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 recommendations for critical dike re-evaluations.

Sylvan Lake Dam Evaluation, RCCD**,** Rome City, In. Performed dam and spillway inspections and report for 2004 through 2016 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 and 2016. Prepared the project O&M Manual and provided owner training and annual inspection activates 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 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 structure for safe discharge of the 100-year and PMF storm flows. Mr. Bodine is the Engineer of Record for the dam modification.

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 has been 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.

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 contaminates 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 Navel 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.

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

Detroit Edison 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: 29 March 2018, 7:30-3 pm

Weather: Cloudy with Occasional Light Rain; Temperature 40°-45 F, Light Wind

Previous P.E. Annual Inspection Date: 2 Oct. 2017

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	☒	☐	☐	Visitor Sign in	Gates locked, except active ash haul road entrance near Guard.
2. Security Fence / Gates	☒	☐	☐	Gates 21, 89	Good, some recent repaired cut openings N & NW side per DTE.
3. Signs and Markers	☒	☐	☐	21,89,	Signs/markers were present at gates and entrance.
4. Access Roads and Construction Site Roads	☒	☐	☐	6,15,17,20,26, 37,39,56,66,67, 103	All very good except ramp up to top of landfill (Photo 103). DTE to discuss erosion and repair with contractor. Access to SE corner along perimeter ditch by foot due to very wet conditions.
5. Traffic Flow and Waste Unloading	☒	☐	☐	111	Haul Trucks appeared moving and unloading in safe manner.
6. AST Inspection	☐	☒	☐	None provided	Observed, and containment provided with fire extinguisher.
7. Universal Waste (properly labelled, container condition, less than one (1) year from accumulation start date)	☒	☐	☐	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	☒	☐	☐	None provided	No new training documents provided at time of inspection.
9. Ash Hauling Contractor Equipment Condition/Adequacy	☐	☒	☐	None provided	Ash hauling equipment appeared adequate. Traffic was very light. Observed equipment tire loading for offsite repair.
10. Ash Hauling Contractor Filling Active Area to Appropriate Grade	☒	☐	☐	81,82,110,111	Observed Filling Area G2 Phase I. Improved filling procedures observed during 2017 inspection in accordance with filling plan. Grading not in progress during observation, although dozer onsite.
11. Waste Condition (i.e. - waste from approved source, no recyclables, no MSW, no liquids, no hazardous wastes, etc.)	☒	☐	☐	82,110,111	Sources noted in LDP and Waste Filling Sequence Memo. Operating License was Updated to Remove Cargill Salt Co. CCR from List.
12. Noise Level	☒	☐	☐		Covered in LDP. No contractor noise heard during 2018 perimeter ditch inspection and inspection of closed landfill cover areas.
13. Dust Control	☒	☐	☐		Dust Control Plan and Annual Reports available. No complaints and no action needed. Nov. 22, 2017 Annual Report Reviewed.

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14. Adequacy of Interim Cover and Interim Stockpile Cover	☐	☒	☐	65,68,69,100, 101,102	Closed or final cover area slopes joining active areas appeared stable. Final seeded cover in Area F2 observed and photographed. Seeding may have not been completed late last fall in Active Areas F2, F3 and D3. Erosion observed on temporary slope shown in Photos 102 and 103 at haul road, otherwise interim cover judged very good.
Final Cover					
15. Landfill Side Slope Condition (i.e.-no seeps, no cracking, no settling, no burrows, adequate vegetation)	☐	☒	☐	31,41,43,44,47, 48,49,50,53,56, 57,60,61,66,70, 71,74,107,109, 110	No erosion noted except one downchute and road slope discussed above. Trees on N, NE, NW sides approved to stay and did not appear to cause any observable stability problems. Early spring inspection allows for more complete observations of slopes with Tree growth. Other woody vegetation noted in areas not yet developed and is planned to be removed when future construction starts. Trees and brush noted in Several Photos.
16. Final Cover Top Condition	☒	☐	☐	54,55,58,59,62, 63,64,71,73, 104,105	Top and slope final cover areas were well vegetated. Some small woody vegetation previously noted was removed in 2017. 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)	☒	☐	☐	1,2,3,4 & 5	Quality appeared good. Pump run & lights appeared in good condition. Flow meter working and Pump #1 running.
18. Stormwater Detention Pond Side Slope Condition (erosion, riprap, vegetation) and any other operating observations not in 17 above.	☒	☐	☐	1,2 & 3	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	☐	☒	☐	32,33,34,35	New pumps & sump level controls were installed in late 2017. Pumps and switches were checked (DTE person) and all appeared operating correctly except for run lights. Run switches were left in the Hands-On position. DTE to clarify why. High Alarm Reset plastic button cover missing.
20. NW Corner Lift Station Operating Condition	☐	☒	☐	32,33,34,35	See also Item 19 above. Both pumps operated when checked. Flow from collection ditch intake partially blocked significantly reducing flow until unblocked by DTE. See flow comparison in photos 32 and 34. Flow in 34 reduces as ditch WL head reduces.

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21. NE Off-site French Drain Operating Condition	☐	☐	☐	12,13, & 14	Zone 1 Pump operating. All run switches in Auto mode.
22. NW Off-site French Drain Operating Condition	☐	☐	☐		Offsite, not Inspected; Covered in TRC reports. Item 20 discusses lift station and pump conditions.
23. NE/NW Off-site French Drain Outfall Water Quality	☐	☐	☐		Not part of this CCR inspection. Covered in other reports.
24. Perimeter Slurry Wall Marker Condition	☐	☒	☐	15,17,20,26	Slurry wall below Grade and Surrounds Entire Landfill at/near Property Line. Barrier to any below grade GW Flow. Markers show Alignment. Many markers have been removed for road installation. 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)	☒	☐	☐	9,11,13,16,19, 22,23,24,35,40, 45,	Some flow observed but less than 2017 inspection. Staff gauge elevations summarized in tables for the 4th quarter 2017 data were reviewed and confirmed designed gradient flow in system. Culvert at road crossing at east side near MW 16-03 blocked (Photo 18). DTE to clear vegetation.
26. Perimeter Ditch System (Slope & Bottom Conditions); Includes Internal Ditch if a Main Discharge to Perimeter Ditch	☐	☒	☐	7,8,10,13,15, 16,17,18,28,29, 30,36,37,39,42, 44,46,75,7683, 84,85,86,87,88, 90,9293,94,95, 96,97,98,99, 100,109	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. Flow appears to be maintained. DTE Indicates that non-woody vegetation has been approved to remain as long as flow maintained. DTE has a rotating 3-year vegetation maintenance program in effect. One culvert blockage due to cut vegetation blocking entrance is shown in Photo 18 at road crossing near MW 16-03. DTE indicated they will clear out vegetation.

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1. Storm Water Detention Basin (SWDB), South and West Sides. Slopes are Protected with Stone. No Visible Slope Erosion. Vegetation Cut on Slopes.

2. SWDB, North and East Sides. Slopes are Protected with Stone Within Water Level Range. No Visible Slope Erosion. Vegetation Cut on Slopes.

3. 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 Pump Flow.

4. Pump Control Panel. Pump #1 Running. Pumps Cycle for Each Run Unless Higher Pond Level Needs More Pumps On.

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5. View of SWDB Pump Flow Meter. One Pump On at Time of Photo, Therefore Flow Rate Shown at 837 gal/min. Total Flow Pumped is Given.

6. Vies of Landfill Entrance Road and Location of 16-01. Vehicle is Consultant InProgress of Conduction Monitoring. Light Rain Falling.

7. Looking Northeast at Drainage Ditch Draining to Canal in Photo 8. Vegetation Present, but Flow was not Blocked and Ditch Slopes Appeared Stable.

8. View of North/South Drainage Canal Leading to SWDB from Perimeter Ditch System.

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9. Looking at Perimeter Ditch Staff Gauge SG-07. Flow Observed Within Ditch.

10. Looking at Perimeter Ditch Where Ditch Maintenance and Vegetation Removal Occurred Late Last Year (2017).

11. Looking at Perimeter Ditch Staff Gauge SG-06. No Flow Visualized.

12. View of Control Panel in NE Off-Site GW Capture System Building. Zone 1 Pump Operating. All Run Switches in Auto Mode.

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13. View of Discharge Flow into Perimeter Ditch from NE Off-Site GW Capture System at 11:47AM. Also Ditch Slope Vegetation Cleared Late Last Year

14. Looking at Trickle of Flow (09:08 AM) from Discharge from Pump in Building and Controls Shown in Photos 13 and 12, Respectively.

15. Perimeter Ditch Along NE Side of Landfill. Vegetation Maintenance. Piez. PZ-2 Shown. Ditch Culvert Entrance Open. No Slurry Wall Markers Present.

16. Closeup View of Culvert at Crossing and Staff Gauge SG-5.

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17. Looking at Recent Maintenance Along East Side Perimeter Ditch. Road Remains in Good Condition. No Slurry Wall Markers Shown. New Road.

18. Clogged Culvert Entrance at Road Crossing Along East Side. DTE Indicated Removal of Vegetation will be Scheduled. MW 16-03 Shown.

19. Looking at SG-03. Some Ditch Flow Observed.

20. Close-up of Monitoring Well 16-04 and Perimeter Road Along Ditch. Ditch and Road Maintenance has been Performed. No Slurry Wall Markers.

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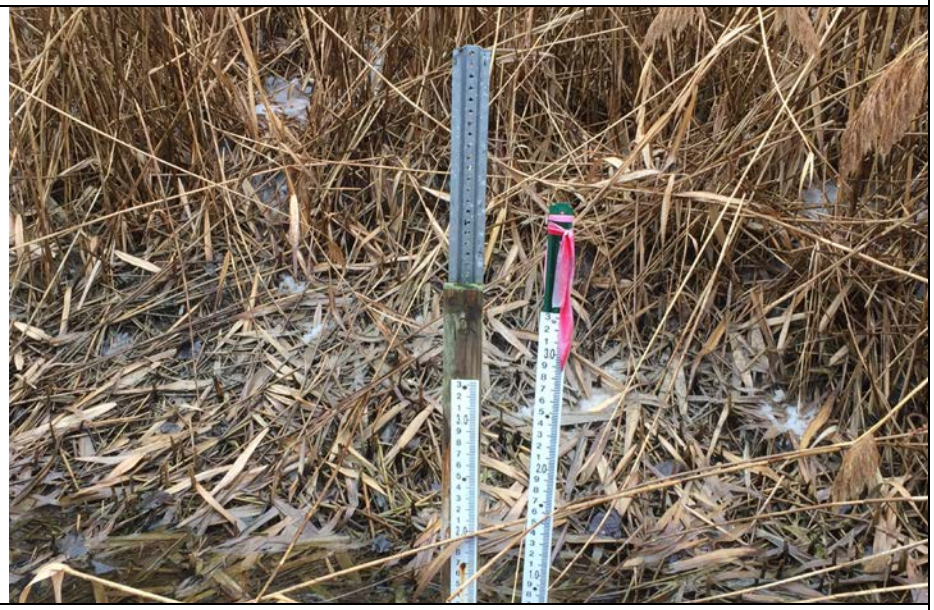
21.View of East Side Gate (Locked) and Piezometer PZ-96-2R.

22. Looking at Perimeter Ditch Staff Gauge SG-02 and Piezometer PZ-1R. No Visible Flow in Ditch.

23. Looking at Perimeter Ditch and Staff Gauge SG-01. Very Little Flow, Approximately 1-2 inches/minute.



24. Close-up of Staff Gauge SG-12 and Perimeter Ditch with Heavy Vegetation. WL at Bottom of Photo. No Visible Flow.

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25. View of Outside Slope of Historically Closed Area of Landfill. Trees Present Have not Resulted in Any Visible Slope Stability Problems.

26. View of Perimeter Road Left Side Ditch. Road was Up-graded Making Maintenance/Monitoring More Accessible. Slurry Wall Marker Shown.

27. View of Monitoring Well MW 16-06 and Perimeter Road.

28. View of Culvert and Perimeter Ditch with Heavy Bottom Ditch Vegetation.

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29. View of East Side Ditch Crossing Culvert with Heavy Vegetation at Flow Entrance. Road Crossing to Access Top of Landfill.

30. View of Culvert Further North at Ditch and Riprapped Downchute, both Along East Side.

31. View of East Side Slope where Little to None Woody Tree Growth Present. Slope Uniform and Appearing Very Stable.

32. View of Sump, Pump Piping and Flow Pipe Entering Sump from Collection Ditch Shown in Photo 35.

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33. Control Panel at NW GW Capture System. No Pumps Currently Running, but Later Pumps were Checked for Correct Operation. Alarm Reset Cover Missing.

34. Sump Showing Increased Flow from Collection Ditch (See Photo 35) after Blocking Vegetation Removed by DTE During Inspection.

35. Collection Ditch and Intake to Sump at NW Groundwater Capture System. Vegetation Debris was Removed at Intake to Increase Flow to Sump.

36. Perimeter Ditch where Vegetation Maintenance Completed in Late 2017. Culvert Beneath Road Crossing Clear of Vegetation.

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37. Looking East Along North Side of Perimeter Road and Ditch. Road and Slope in Good Condition.

38. View of Closed Landfill Slope with Trees and Brush on Slope. A Riprap Downchute Visible. No Slope Erosion Noted During Close-up Inspection.

39. Perimeter Ditch Vegetation and Riprap Along Slope. Road in Good Condition. Slurry Trench Marker on Side of Road.

40. View of Perimeter Ditch at SG-01. No Visible Flow Noted.

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41. Tree Growth Heavy Along Closed Landfill Toe, Less on Slope. No Stability or Erosion Problems Noted on Slope. Top of Slope Inspected Later in Day.

42. View of Perimeter Ditch with Little or No Water Flow. Slopes Appeared Stable and Culvert Not Blocked.

43. Heavy Brush and Tree Vegetation Along and Outside of Slope of Closed Landfill Area B, NW Side.

44. Vegetated Landfill Slope West Side of Area B. Lateral Ditch Draining Downstream Area. No Visible Slope Stability Problems.

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45. View of Stoned Slope and Staff Gauge SG-09 Located West Side of Closed Area F1.

46. Looking South at Perimeter Ditch. Far Slopes at Top of Photo is Un developed Portion of Landfill. Ditch Slopes were Stable and Erosion Free.

47. Major Riprapped Downchute Near West Corners of Closed Landfill Areas F1 and F2. Close Inspection Indicated Chute Stable & No Change Since 2015.

48. View of West Side Landfill Slopes of Closed Areas. Slopes Well Vegetated and Free of Any Significant Woody Vegetation.

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49. Looking at East Slope of Closed Area D1. Slope Appeared Stable, Some Small Woody Vegetation and Person Standing at Top of Ditch in Photo 50.

50. Close-up of Drainage Ditch Cut to Drain Landfill Surface Water. Ditch Appeared Stable and Well Vegetated.

51. Fill Surface East of Closed Area D1 Near Piezometer 96-W-14.

52. Looking North from Outside of Waste Area Toward Closed Area B1. Nearest Trees and Brush are Outside of Closed Area.

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53.. Looking from Top of Landfill at Some of the Largest Trees on North End of Closed Area B Slope. Inspection of Slope Appeared Stable and Erosion Free.

54. Typical View of Top of Landfill Surface Areas at the Northern Half of Landfill. Areas Erosion Free and Generally Free of Nuisance Vegetation.

55. Typical View of Top of Landfill Surface Areas at the Northern Half of Landfill. Areas Erosion Free and Generally Free of Nuisance Vegetation

56. Looking Downslope at Downchute of North Slope of Closed Area B.

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57. Looking Downslope Appearing from Road Below to be a Significant Erosion Gully, was Actually a Minor Gully at the Top and a Deer Run Down the Slope.

58. View of Top of a Closed Landfill Area Containing Some Minor Small Woody Vegetation. Top Well Vegetated and Free of Erosion.

59. Landfill Surface Collection Swale Draining into Downchute Pipe. Pipe Grate Open. Bottom Slope Discharge Area of Pipe Inspected by DTE.

60. Looking South at Corner of West Landfill Slope Near Intersection of Closed Areas B and F1. Slope Appeared Stable and Well Vegetated.

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61.View of Outside Slope of Northeast Side of Landfill. Area downslope is Not a Closed, Active or Future Landfill Area. Minor Woody Vegetation on Slopes.

62.Looking NE from Closed Area F2 at Southeast Side of Seeded Final Cover of Area F3. Seeding Completed Late in 2017,

63. Another View of Seeded Final Cover of Area F3. No Visible Surface Erosion.

64. Another View, Left of Photo 63, of Seeded Final Cover of Area F3. No Visible Significant Surface Erosion, Although Small Tire Ruts Noted.

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65. Portion of the North End of Areas F3 and/or D3 where Seeding and Final Grading May Not be Completed. No Visible Surface Erosion. Edge Berm Shown.

66. Looking North at Slope of Closed Area D2. Slope Appears Stable and Well Vegetated.

67.Looking East at Internal Stormwater Pond and Seeded Fill Stockpile (Top Left) and Area F3 Interim Seeded Slope (Top Right). No Significant Erosion Along Road.

68. Internal Haul Road and Area F3 Interim Seeded Slope. Photo Right Side Match to Photo 67. Some Erosion Gully into Pond in Center of Photo 67.

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69. Close-up View of Seeded Fill Stockpile Shown in Photo 67. Erosion Gully Draining Runoff to Pond Also Visible.

70. Another Close-up View of Slope of Closed Area D2 Shown in Photo 66. Slope Appeared Stable and Well Vegetated.

71. Looking South at Slope and Surface of Closed Area C. Slope and Surface Well Vegetated.

72. Looking North at Slope of NE Side of Closed Area D1 and Far South End Slope of Area B1. Slopes Well Vegetated with Some B1 Woody Vegetation.

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73. Collection Swale & Berm with Downslope Drainage Pipe with Steel Grate. No Blockage but Some Minor Wheel Ruts in Surface Area.

74. DTE Person Checking Outlet of Downslope Drainage Pipe. No Blockage and Acceptable Flow Conditions Reported.

75. Ditch Maintenance Clearing Vegetation and Flow Grades.

76. New Internal Drainage Ditch, Culvert and Riprap Check Dam Draining Flow from Internal Ponds. Ditch Connects with Landfill Perimeter Ditch.

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77. Pond Side of New Outlet Culvert with Riprap Check Dam. Culvert Discharge Side Shown in Photo 76.

78. Previous Location of Old Culvert and Discharge from Pond in Photo 77. New Culvert Crossing Beneath Main Haul Road Installed Late 2017.

79. Discharge Location of Old Culvert Beneath Haul Road. Some Previous Road Slope Erosion.

80. Old Drainage Ditch Transferring Discharge from Old Culvert.

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81. Active Area G2 Phase I where an Abandoned Gas or Oil Well was Located.

82. View of Active G2 Phase I Waste Placement Area. Bottom Area is Composed of Existing Clay Soil.

83. Landfill Perimeter Drainage Ditch at South End of Landfill. New Road Along Side of Ditch. Vegetation Cut Along Road Side. Silt Fence is Perimeter Marker of Future Area G.

84. Looking Northeast at Ditch Shown in Photo 83.

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85. Perimeter Ditch Alongside G2 Area. Right Side Gully Filled with Riprap from Previous Repair. New Pipe Discharge Chute from G2 Surface Runoff Flow.

86. Looking NE at Perimeter Ditch and G2 Area. Ditch Slopes were Reconstructed in 2010, Appear Stable, and Well Vegetated.

87. Looking Southwest at Perimeter Ditch at West Side of Area G2. Ditch Slopes Appeared Stable and Well Vegetated. Slope Vegetation Cut Late 2017 or Early 2018.

88. Looking West at Perimeter Ditch. Slope Vegetation Has been Cut and Slopes Appear Stable and Well Vegetated. Site Road Crosses Ditch at Top.

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89. GW Monitoring Well 16-05 and Site Fencing and Gate Along Puttygut Road. Fence Fabric is Strung Across Chained Opening Blocking Unauthorized Entry.

90. Looking West at Perimeter Ditch West of Gate Location. Slopes Stable and Well Vegetated. Ditch Slopes were Reconstructed in 2010.

91. Stake Located on SW Corner End of Unconstructed Portions of Area G2. Slope Woody Vegetation Planned to be Removed when Future Construction Started.

92. End of Concrete Pipe Installed as Ditch Replacement where Ditch Could Not Have Slopes Flattened Due to Adjacent Steep Slope. Flow Noted.

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93. Upstream End of Concrete Pipe Shown in Photo 92.

94. Landfill Perimeter Ditch at Southwest Corner of the Site. No Road Construction Alongside of Ditch. Slopes Stable and Well Vegetated.

95. Looking North Along Portion of Perimeter Ditch Parallel to King Road and Reconstructed in 2010. Couple of Slope Erosion Gullies at Far End Photographed.

96. Culvert and Riprap Check Dam with Flow Draining into Perimeter Ditch. Some Slope Runon Erosion Noted Along Ditch.

97. Photo of Ditch Bottom Slope Erosion Shown in Photo 96.

98. Portion of Ditch Near Gas Piping Fence Enclosure that has been Graded. Slope Appeared Stable but Vegetation is Sparse and May Regrow in Spring.

99. View of Erosion Gully Along Landfill Side of Perimeter Ditch at SW Corner Parallel to King Road. Additional Gully Repair Recommended.

100. View of the New Internal Ditch from Point of Intersection with Perimeter Ditch. New Ditch Also Shown in Photo 76.

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101. Pool of Water from Internal Drainage Pond. Future Slope Work Required.

102. Significant Runoff Erosion Gully Present on Fill Slope Alongside Road to Top of Landfill at Area F3. DTE to Discuss Repair with Contractor.

103. Top of Erosion Gully Shown in Photo 102. Runoff from Cover Surface Flow from Area F3. Haul Road Shown at Top of Photo with Gully Flow Across Road. Repair Needed

104. Final Cover Surface in Area F2. Drainage to F3 Corner that Drains to Fill Slope Shown in Photo 103.

105. Another View of Grading and Final Cover Seeding at Area F2.

106. View of Construction Survey Monument Top of Closed Area F1 Along the West Slope.

107. Looking South at West Area Outside of Landfill Storage. Landfill Lateral Drains into Perimeter Ditch Right Side of Photo. Occasional Tree Along G2 Slope to be Removed.

108. View of Riprapped Filled Swale at Top of Closed Area F2 as the Swale Approaches the Downchute Shown in Photo 110. Water in Middle.

109. Area F2 Downchute Filled with Riprap and Screened Drains into Riprapped Perimeter Ditch. Road Crossing Right Side with Culvert. Slope & Chute Stable.

110. Looking SE at Active Area G2 Phase 1. Waste Placed at Bottom Slope, but Not Graded or Compacted Yet. Steep F1 Slope Cemented and Stable.

111. Waste Unloading InProgress. Piles Placed at Western Edge of Active G2 Phase 1 Area. Removal of Surface Vegetation at Western Edge Appears Not Required.