Prepared for

DTE Electric Company
One Energy Plaza
Detroit, Michigan 48226

2023 ANNUAL INSPECTION REPORT SIBLEY QUARRY LANDFILL

TRENTON CHANNEL POWER PLANT

Trenton, Michigan

Prepared by

Geosyntec consultants
Geosyntec Consultants of Michigan

3011 West Grand Blvd, Suite 2300
Detroit, MI 48202

CHE8242V

January 2024

Geosyntec consultants
Geosyntec Consultants of Michigan

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF APPENDICES

1. INTRODUCTION

1.1 Overview

This 2023 Annual Inspection Report (AIR) was prepared by Geosyntec Consultants of Michigan, Inc. (Geosyntec) for DTE Electric Company's (DTE's) Sibley Quarry Landfill (Landfill). The inspection was performed to comply with the United States Environmental Protection Agency (USEPA) Coal Combustion Residual (CCR) Rule published on April 17, 2015, as amended July 30, 2018 (40 CFR Parts 257 and 261), August 28, 2020 (Part A Rule), and November 12, 2020 (Part B Rule). Under the CCR Rule, the Landfill is an "existing CCR 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 in Trenton, Michigan. The Landfill is an inactive limestone quarry that was operated since the mid-nineteenth century and mined to more than 300 feet below ground surface (bgs) in some areas. The Landfill is currently licensed as a coal ash landfill under the provisions of Michigan Part 115, Solid Waste Management, of the Natural Resource and Environmental Protection Act (NREPA), 1994 Public Act (PA) 451, as amended.

1.2 Purpose

The objective of the inspection is to detect indications of instability in time to allow planning, design, and implementation of appropriate mitigation measures. 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 the 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 an 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 inspections (and photo-documentation) of the Landfill, review of the previous inspection, and discussions with site personnel about the history of the site and general operations at the Landfill. Observations from the visual inspection, document review, and discussions are summarized in an inspection report. The inspection report addresses the following under the CCR Rule [40 CFR 257.84(b)(2)]:

(i) Any changes in geometry of the structure since the previous annual inspection;

(ii) The approximate volume of CCR contained in the unit at the time of the inspection;

(iii) Any appearances of an actual or potential structural weakness of the CCR unit, in addition to any existing conditions that are disrupting or have the potential to disrupt the operation and safety of the CCR unit; and

(iv) Any other change(s) which may have affected the stability or operation of the CCR unit since the previous annual inspection.

1.3 Report Organization

The remainder of this report is organized as follows:

- Section 2 - The Site History and Current Operations: provides information on the history of the Landfill and DTE's current operations.
- Section 3 - Observations from Annual Inspection: summarizes visual observations recorded during the 2023 inspection of the Landfill.
- Section 4 - Evaluation of Observations: based on the inspection results, evaluates if the design, construction, operation, and maintenance of the Landfill are consistent with recognized and generally accepted good engineering standards.
- Section 5 - Conclusions: provides the overall conclusions of the annual inspection and certification of the AIR.

1.4 Terms of Reference

The annual visual inspection was performed on May 8, 2023, by Dr. Clinton Carlson, Ph.D., P.E.[1] and Dr. Jorge Romaña Giraldo, Ph.D. of Geosyntec, with assistance from DTE Staff.

This report was prepared by Dr. Carlson and Dr. Romaña Giraldo and reviewed by Mr. John Seymour, P.E. of Geosyntec.

[1] Clinton Carlson, Ph.D., P.E. is the qualified professional engineer per the requirements of §257.53 of the CCR Rule. He has nine years of experience with coal ash related projects. His resume is provided in Appendix B.

2. THE SITE HISTORY AND CURRENT OPERATIONS

The site originally operated as a limestone quarry beginning in the 1800s. The site was acquired by DTE in 1951 and has operated as a landfill since. Over the life of the Landfill, it received CCR from various DTE power plants, and other local approved power plants, including Wyandotte Power Plant (mainly fly ash with some bottom ash). At the time of inspection, the Landfill was receiving CCR from DTE's Monroe Power Plant, along with inert material generated from DTE projects in Michigan. In addition, CCR and inert material from the top of the northern slopes of the quarry is being excavated and hauled to the bottom of the Landfill. The Trenton Channel Power Plant retired in June 2022 and no longer sends CCR to the Landfill. Currently, the Landfill accepts materials generated only by DTE.

The approximate disposal rate is 50,000 cubic yards (cy) of CCR and 50,000 cy of inert material per year; however, this rate can vary significantly based on market conditions for the beneficial use of CCR. Additionally, DTE is closing the Monroe Power Plant Bottom Ash Impoundment by removal; it is anticipated that approximately 1,000,000 tons of excavated CCR will be disposed of at the Landfill between 2021 and 2024.

There are no construction or design documents available for the original quarry. Based on a review of current and historical maps, and correspondence with DTE personnel, limestone and dolomite were mined from the site to a depth of approximately 300 feet bgs, with multiple setbacks/benches.

The current site plan is provided in Figure 1. The site is approximately 207 acres, of which approximately:

(i) 98 acres is currently licensed as an active landfill area;

(ii) 90 acres have received final cover approved by the Michigan Department of Environment, Great Lakes, and Energy (EGLE); and

(iii) the remaining 19 acres are not used for disposal.

The operations at the site consist of three main activities:

(i) placement of CCR;

(ii) continuous pumping of groundwater and stormwater; and

(iii) treatment of pumped water before discharging into the Detroit River through a National Pollutant Discharge Elimination System (NPDES) permit.

The amount of CCR disposed of in the Landfill is currently estimated to be approximately 13,570,000 cy. CCR and inert material are hauled by trucks and placed at the bottom of the Landfill in progressive lifts over the drainage collection layer.

Groundwater is continuously pumped from the lowest point of the quarry to maintain a consistent groundwater level below the CCR. Therefore, the steady-state groundwater level is maintained below the lowermost area of the quarry. The pumping rate of the chimney sump at the bottom of the quarry is approximately 1.6 million gallons per day (mgd) based on discussions with DTE personnel. Groundwater is pumped into two ponds located at the top of the quarry (referred to as "upper ponds") and treated. Treated water from the upper ponds discharges into a conveyance channel. The conveyance channel is approximately one-half mile long and conveys water to settling ponds. A pump house at the southern end of the settling ponds pumps the water to the Detroit River. The water is discharged to the Detroit River, consistent with NPDES permit requirements. Water samples are collected weekly from the pump house. The water samples are tested, and analytical results are compared to the limits provided in the NPDES permit.

Dust at the site is controlled in accordance with the site-specific Fugitive Dust Plan. Per the plan: (i) vehicular speed is limited to a maximum of 15 mph; (ii) paved surfaces are frequently swept with wet broom equipment; and (iii) unpaved roads are wetted during landfill operations, as necessary. Unpaved roads are also treated with an acrylic cement emulsion two times per year. In the Annual Fugitive Dust Report dated November 17, 2023, DTE reported that there were no citizen complaints about fugitive dust between November 2022 and October 2023.

3. OBSERVATIONS FROM ANNUAL INSPECTION

Inspection results and photographs from the annual inspection are provided in Appendix A. The key observations from the inspection are summarized below.

1) The following capital improvements have been implemented at the site since the 2022 inspection.

    a. The discharge pipe to the Detroit River was relocated within the right of way. This allows any future maintenance to be carried out without causing major disruptions.

    b. The chimney sump was raised in height by 40 feet with respect to the previous year. This change is consistent with the filling progression of the Landfill. Additional raises are expected in the future to keep the top of the chimney sump tower above the top of CCR as more CCR is placed.

2) The CCR placement consists of excavating the top of the northern CCR slopes and hauling this material to the bottom of the quarry (Photographs #1, #2). In addition, CCR is hauled from the DTE's Monroe Power Plant and placed at the bottom of the quarry.

3) CCR is disposed of in the Landfill by end-dumping and spreading, consistent with previous inspections (Photographs #3, #4, #5,# 9, #10, #12, #15). Trucks haul CCR to the active filling area at the bottom of the Landfill using the haul road called Switchback 2 (Photographs #18, #29).

4) The groundwater and stormwater flow by gravity and collect in the chimney sump at the bottom of the quarry through the leachate collection and filter layers (Photographs #6, #7). Drainage channels, check dams, and diversion berms were visible along the access roads, guiding water towards the bottom of the quarry and sump (Photographs #13, #16, #18). No stormwater management features are present on the northern CCR slopes at the top of quarry (Photographs #19, #20); stormwater flows over the surface of these slopes.

5) Erosion rills and gullies were observed on the Switchback 2 and northern CCR slopes during the inspection (Photographs #14, #17, #19, #20). Due to the incised nature of the Landfill, these erosion features do not represent an existing concern to the safety and operation of the Landfill.

6) A boundary ridge surrounds the area and prevents run-on for events up to and exceeding a 25-year, 24-hour storm in accordance with the Run-on Run-off Control Plan for the Landfill.

7) Fractures in the bedrock sidewalls lead to groundwater inflow at multiple locations (Photographs #8, #9); however, any inflow is collected at the bottom of the quarry in the leachate collection layer and directed to the chimney sump. The fractures in the quarry sidewalls also present a potential safety concern with rock falls. DTE has taken measures to address this safety concern by keeping a minimum of 20 feet between the sidewalls and a safety berm during filling operations (Photograph #11).

8) The sump pumps discharge approximately 1.6 mgd to keep the groundwater elevation at or below 309 feet above mean sea level.

9) Both upper ponds, the conveyance channel from the upper ponds to the settling ponds, and Settling Ponds #3 and #4 were flowing properly during the inspection (Photographs #21 through #28). Water discharging from the conveyance channel to Settling Pond #4 had a clear, light grey-blue color (Photograph #26).

10) Outfalls of the pipes from the upper ponds into the conveyance channel (Photograph #24), the conveyance channel to Settling Pond #4 (Photograph #26), and Settling Pond #4 to Settling Pond #3 (Photograph #27) were observed to have some erosion of the riprap and surrounding soils.

11) The ash conveyor system on the southeast edge of the quarry, constructed in 2022, was not being used at the time of the inspection (Photograph #29).

4. EVALUATION OF OBSERVATIONS

The Landfill includes a former quarry where any eroded material, groundwater, and stormwater within flow to the bottom of and are either contained or collected in the chimney sump and pumped to the upper ponds. The sidewalls of the quarry act as a containment system for the Landfill, preventing release of CCR into areas beyond the footprint of the Landfill

The Landfill was not observed to have any existing structural weaknesses or conditions disrupting the operation and safety during the annual inspection. However, there are multiple conditions that should be addressed by DTE.

1) The observed erosion rills and gullies on the northern CCR slopes and Switchback 2 slopes are not considered to represent a structural weakness due to the incised nature of the Landfill (i.e., eroded material is transported to the bottom of the Landfill). However, if additional rills and gullies form or existing features expand, these features have the potential to disrupt the operation and safety of the Landfill as eroded material or slope instabilities could block Switchback 2.

2) Eroded sediments were noted behind the check dams in the drainage channel at the bottom of the Switchback 2 slopes. While it currently does not pose an issue, these sediments might restrict the flow of water to the bottom of the quarry or cause water to flow over the Switchback 2 roads over time.

3) There are diversion berms at the top of the Switchback 2 slopes. Cuts in the berms are used to direct some flow down the slopes with coir logs placed at the top of slopes to assist with erosion control. Some coir logs were damaged or not present during the inspection. In their current condition, they are less effective in limiting erosion, and other rills and gullies could develop on these slopes and accumulate sediment behind the check dams.

4) Erosion of the riprap and surrounding soils was observed below the pipe outfalls from the upper ponds, conveyance channel, and Settling Pond #4. If erosion is allowed to continue, the leachate collection, conveyance, and treatment features could be compromised over time.

While these issues are considered less crucial, they could be addressed to improve the overall efficiency of the Landfill. Geosyntec provides the following recommendations to address observed conditions.

1) The northern CCR slopes and Switchback 2 slopes should continue to be monitored to assess the need for maintenance/repair of expansion of rills and gullies. If these erosion features continue to develop or expand, Geosyntec recommends DTE work with a professional engineer to develop additional stormwater management measure(s).

2) As much of the sediments behind the check dams in the drainage channel at the bottom of the Switchback 2 haul road should be removed as possible without comprising the check dams or toe of the slopes. This will allow stormwater to flow within the drainage channel to the bottom of the quarry and prevent water from flowing over the Switchback 2 haul road.

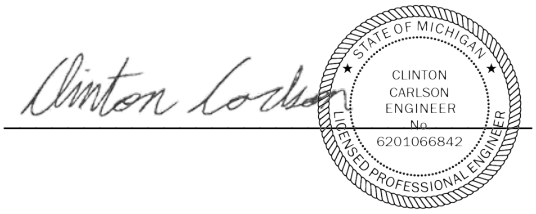
3) Damaged coir logs at the top of the diversion berm along the Switchback 2 haul road should be replaced to prevent uncontrolled flow on the haul road slopes and limit soil erosion and the formation of rills and gullies, which could decrease the stability of the slopes.

4) Additional riprap, gravel, and sand should be placed below the pipe outfalls from the upper ponds, conveyance channel, and Settling Pond #4 to replace eroded material and limit continued erosion in these areas.

5. CONCLUSIONS AND CERTIFICATION

The design, construction, operation, and maintenance of the Landfill is generally consistent with recognized and generally accepted good engineering standards in accordance with the CCR Rule [40 CFR 257.84(b)(1)]. The 2023 annual visual inspection did not identify any structural instabilities that would cause CCR to release into the areas outside the footprint of the Landfill. Geosyntec identified some conditions that require continued monitoring and maintenance. Recommendations to address these maintenance conditions and continue monitoring are provided in Section 4 for DTE's consideration.

Certified by:

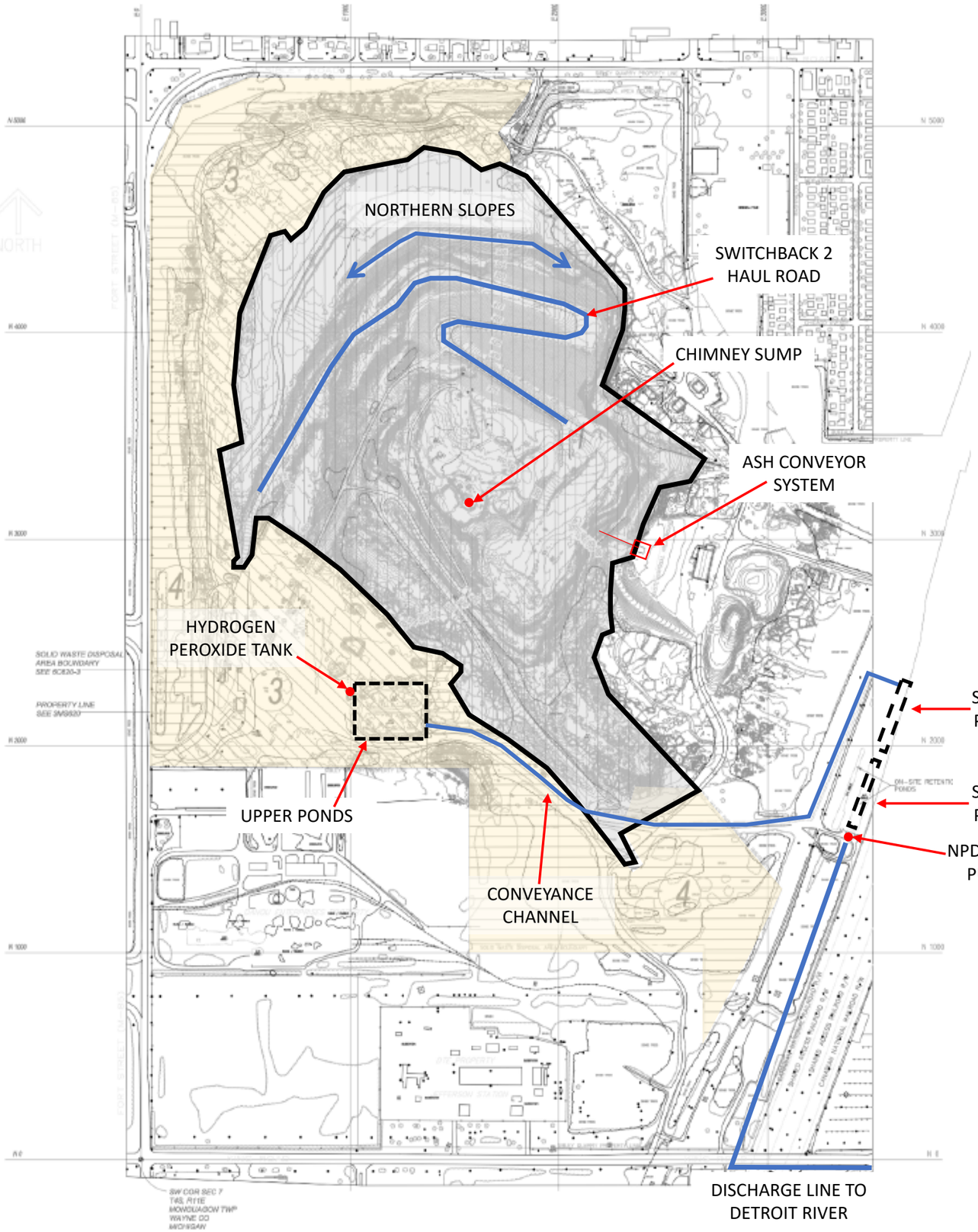


Date January 9, 2024

Clinton Carlson, Ph.D., P.E.

Michigan License Number 6201066842

Project Engineer



NOTE:
TOPOGRAPHIC INFORMATION
GENERATED FROM AERIAL PHOTOGRAPHY
DATED MAY 16, 2023, BY PEA GROUP

PERMITTED FILL AREA

APPROXIMATE LANDFILL AREA THAT
RECEIVED CLAY COVER

N

SIBLEY QUARRY LANDFILL
SITE PLAN

Geosyntec consultants
Geosyntec Consultants of Michigan
DETROIT, MICHIGAN

FIGURE
1

PROJECT: CHE8242V | JANUARY 2024

APPENDIX A

Resume of Clinton Carlson, Ph.D., P.E.
(Qualified Professional Engineer)

Clinton P. Carlson, PhD, PE

Qualifications

Dr. Carlson is a geotechnical engineer with nine years of experience on projects related to design and remediation of landfills and coal combustion residual impoundments, dam safety, and geotechnical instrumentation. He is a Project Engineer with Geosyntec and part of the firm's dams and levees practice area. His work has included managerial responsibilities for project budgets and schedules and has primarily supported federal and power clients for both small and large projects. Clinton has managed and supported projects for risk assessments, slope stability analyses, and instrumentation for landfills and dams.

Specialties

Landfill and CCR Design and Remediation
Dam Safety
Geotechnical Instrumentation

Education

PhD, Civil Engineering, University of Michigan, Ann Arbor, MI, 2014
MSE, Civil Engineering, University of Michigan, Ann Arbor, MI, 2010
BSE, Civil & Environmental Engineering, University of Michigan, Ann Arbor, MI, 2009

Licenses/Certifications

Professional Engineer: MI

Relevant Project Experience

Annual Inspections of CCR Units, Confidential Client, Southeast Michigan | Inspections of CCR units are conducted annually as part of the CCR Rule to identify any site conditions that pose a concern to the safe operation and stability of the CCR units. Project manager in charge of financials and engineer in charge of performing annual inspections for three CCR units for a client in Southeast Michigan. Prepared inspection reports to summarize observed conditions at the three CCR units. Interacted with client representatives to discuss necessary actions to address potential concerns. (Mar. 2022–Present)

Monitoring and Maintenance for CCR Units, Confidential Client, Southeast Michigan | Project manager in charge of financials and engineer in charge of overseeing inspections, monitoring, and maintenance of geotechnical instrumentation system of two CCR units for a client in Southeast Michigan. The geotechnical instrumentation system included multiple monitoring wells, settlement plates, vibrating wire piezometers, manual inclinometers, and ShapeArray inclinometers. Instrumentation data were evaluated to identify near real-time concerns for the safe operation and stability of the CCR units. Provided monthly summary reports to the client representatives and met with them to discuss the monitoring data on a bi-monthly basis. Conducted site inspections of observed conditions posing concerns for the safe operation and stability of the CCR units on at the request of the client. (Mar. 2022–Present)

FERC Part 12D Periodic Inspections for Barton and Superior Dams, City of Ann Arbor, Ann Arbor, MI | The City of Ann Arbor owns and operates the Barton and Superior Hydroelectric Projects (Barton and Superior Dams) in Ann Arbor, Michigan. Barton and Superior Dams are used by the City of Ann Arbor for power generation and thus, are under regulation by the Federal Energy Regulatory Commission (FERC). FERC regulations require dam safety inspections are performed every five years by Independent Consultant (IC) Teams. Geosyntec served as the IC Team for the City of Ann Arbor for the Ninth FERC Part 12D Periodic Inspections of Barton and Superior Dams performed in 2023. Served as the project manager and point-of-contact with the City of Ann Arbor on behalf of the IC Team. Member of the IC Team (geotechnical engineering support and field inspection team) that performed the document review, developed the Inspection Plans, prepared the Pre-Inspection Preparation Reports, performed the field inspections, and prepared the Periodic Inspection Reports. The Periodic Inspection Reports were completed and submitted to FERC before the December 2023 deadline. (Jan. 2023–Dec. 2023)

Landfill Stability Evaluation, Confidential Client, Southeast US | Contacted by the client to evaluate an instability at an existing landfill including the implementation of instruments to measure and evaluate progression of instability. Project manager in charge of financials and engineer in charge of developing instrumentation plan and evaluating measurements of instrumentation. Conventional surveying stakes

and an automated monitoring total station were implemented to measure progression of instability. Evaluation of measurements was used to inform the client on progression of instability and provide recommendations for implementation of mitigation measures. Weekly summary reports of instrumentation measurements were provided to the client while implementing mitigation measures. Additional support was provided to the client in discussions with the state regulator. The monitoring systems were also utilized to provide additional safety measures during the staged temporary removal of a buttress berm in order to tie-in liner systems for new landfill cells to the existing liner system. Monitoring data are currently summarized in monthly reports and provided to the client. (Aug. 2019–Present)

Landfill Design Projects for Power Company, Confidential Client, Southeast US | Engineer in charge of coordinating and performing the geotechnical analyses for the permitting and closure of multiple sites for a power company. Geotechnical analyses performed for the sites included subsurface investigation and geotechnical material properties interpretation, slope stability analyses (including veneer and liner stability), settlement calculations for liner and cover systems, and hydrologic evaluations for liner and cover systems. The computer programs Slide and HELP were used to perform the slope stability analyses and hydrologic evaluations, respectively. (June 2015–Present)

Portsmouth Gaseous Diffusion Plant On-Site Waste Disposal Facility, Fluor-BWXT Portsmouth, Piketon, OH | The Department of Energy's Portsmouth On-Site Waste Disposal Facility is being constructed for the disposal of on-site hazardous waste materials. Engineer that aided geotechnical analyses for the design and construction of the facility. Geotechnical analyses performed during the design phase included slope stability analyses (including veneer and liner stability), settlement calculations for liner and cover systems under variable loads, and foundation design for leachate conveyance systems. During construction, performed slope stability analyses for excavation conditions and geo-structural calculations and reinforcement detailing for reinforced concrete valve houses constructed as part of a leachate transmission system and a footing for an interim transfer ramp. The computer program Slide was used to perform the slope stability analyses. (Apr. 2015–Present)

Inspections and Mitigation for CCR Landfill, Confidential Client, Southeast Michigan | Probabilistic slope stability analyses for a CCR landfill in Southeast Michigan identified unsatisfactory conditions for existing slopes that required mitigation measures. Project manager in charge of project financials and schedule and engineer in charge of developing inspection and construction plans to mitigate unsatisfactory conditions. Developed an inspection plan to identify indicators of slope instabilities and allow for safe operation conditions. The inspection plan was carried out by site personnel prior to and during construction and supported by Geosyntec. Developed a construction plan to regrade the slopes and mitigate the unsatisfactory conditions. Performed site inspections and met with client representatives and contractors during construction to verify safe working conditions and satisfactory slope conditions were achieved. (Feb. 2022–May 2022).

Probabilistic Slope Stability Assessment for CCR Landfill, Confidential Client, Southeast Michigan | Previous site inspections identified potentially unstable slopes at a CCR landfill in Southeast Michigan, so probabilistic slope stability analyses were performed to evaluate the reliability of the slope conditions given limited site information. Engineer that aided in review of probabilistic slope stability analyses and slope stability assessment report. Recommendations were developed and provided to the client to address unsatisfactory conditions for existing slopes identified in the probabilistic site response analyses. (Nov. 2021–May 2022).

Quantitative Risk Assessment for Dam in Southeast US, Confidential Client, Southeast US | The project further refines estimates of risk developed from previous potential failure mode analyses and semi-quantitative risk analyses performed for an embankment dam and its primary and auxiliary spillways located in the Southeastern U.S. Project manager in charge of financials and schedule for the Quantitative Risk Assessment (QRA) of the dam. The main objectives of the QRA are to estimate the risk, in terms of annual failure probabilities and downstream consequences, for seismic, internal erosion, and spillway hydrologic failure modes and the uncertainties associated with the risks. Actively participated in the expert elicitation process to develop risk models and meetings with the client to present the models and results of the QRA. Prepared calculation packages and reports summarizing the methods used in the

QRA and the results for the client. Aided in the ground motion selection, internal erosion evaluation, and evaluation of the erodibility of the embankment soils. (May 2018–Apr. 2022)

Field Investigation of Primary Spillway for Dam in Southeast US, Confidential Client, Southeast US | Field engineer for oversight of a visual inspection and investigation of the foundation of the primary spillway slabs and control structure for a dam in the Southeast U.S. Observations from the field investigation were used to inform a QRA performed for the dam and its spillways. The visual inspection was performed to identify vertical offsets and gaps in the joints between the slabs of the primary spillway. A field investigation consisting of shallow cores through the concrete slabs of the spillway and deep borings into competent rock below the control structure was performed to evaluate the foundation materials of the primary spillway and the presence of voids. (Jan. 2021–May 2021)

Landfill Stability Evaluation, Confidential Client, Southeast US | Contacted by the client to evaluate an instability at an existing landfill including the root cause of the instability. Project manager in charge of financials and engineer in charge of coordinating and performing slope stability analyses. Slope stability analyses were performed to evaluate the root cause of the instability and mitigation measures required to stabilize the landfill. Results of the analyses were used to support the client in discussions with the state regulator and advise the client on a path forward for stabilizing the landfill. A facility-wide stability plan was also developed based on the stability of the landfill for the existing conditions and the final planned conditions. Analyses were also performed for a staged temporary removal of a buttress berm in order to tie-in liner systems for new landfill cells to the existing liner system. Aiding in ongoing annual landfill stability assessments. (Aug. 2019–Dec. 2020)

Onondaga Lake Geotechnical Monitoring, Honeywell, Syracuse, NY | Contaminated sediments were dredged from Onondaga Lake and consolidated within geotextile tubes at an off-site landfill as part of a Superfund project. Geotechnical instrumentation systems were implemented to monitor (i) a sheetpile wall around a portion of the Lake dredged for remediation and (ii) a landfill closure comprised of geotextile tubes filled with sediments dredged from the Lake. Manager in charge of financials and engineer in charge of monitoring the instrumentation data. The monitoring systems included manual and automated inclinometers, settlement cells, vibrating wire piezometers, and surface monitoring points. (Feb. 2015–Oct. 2018)

Stability and Internal Erosion Assessment of Clear Creek Dam and Beaver Creek Dam, Tennessee Valley Authority, Bristol, TN and VA | Static and seismic stability of two earthen embankment dams in the twin cities of Bristol, TN and VA, Clear Creek Dam (BTC) and Beaver Creek Dam (BTB), were assessed along with the internal erosion for potential failure modes identified in the Potential Failure Mode Analyses (PFMA). Engineer in charge of seismic site response analyses and internal erosion evaluations for two earthen embankment dams. Performed seismic response analyses and used the results to perform the liquefaction potential evaluation. The seismic response analysis was performed using the computer program Strata. Internal erosion evaluations were performed for the critical potential failure modes identified by the project team for each dam. (Mar. 2017–Sept. 2017)

Onondaga Lake Capping and SCA Design, Honeywell, Syracuse, NY | Contaminated sediments were dredged from Onondaga Lake and consolidated within geotextile tubes at an off-site landfill as part of a Superfund project. Engineer that aided in slope stability analyses and hydrologic evaluations for: (i) a sheetpile wall around a portion of the lake dredged for remediation and (ii) a landfill closure comprised of geotextile tubes filled with sediments dredged from the lake. Stability analyses for the sheetpile wall included the internal stability (i.e., overturning and bending) of the sheetpile wall adjacent to the dredged lakebed and the global stability of the wall under the loading of an adjacent railroad line. The stability analyses of the landfill closure included the veneer stability of the liner and cover systems and the internal, interface, and global stability of the stacked geotextile tubes. The computer programs ShoringSuite, Slide, and HELP were used to perform the internal stability analyses for the sheetpile wall, global stability analyses of the wall and landfill closure, and the hydrologic evaluations, respectively. (Feb. 2015–May 2016)

APPENDIX B

2023 Annual Inspection Forms and Photos

Sibley Quarry - CCR Landfill
2023 Annual Inspection Report

Name of CCR Landfill: Sibley Quarry Landfill **Qualified Professional Engineer:** Clinton Carlson, PhD, PE
Owner: DTE Electric Company **Date:** 5/8/2023 **Time:** 1 pm to 4 pm
Weather: Partly sunny, 60s **Precipitation (past week):** 0.35 in.
Site Conditions: Dry

I. Landfill Perimeter, Side Walls and Access Ramps

1. How would you describe the vegetation at the Site? (Check all that apply)

___ Recently Mowed
X Overgrown
X Good Cover
___ Sparse
X Paved
X Gravel

Other (describe): Most of the area outside of the active filling area has a good cover of grass and trees. There are trees on the northern cover slopes and above the quarry sidewalls. Asphalt roads are used around the trailers and truck wash. Gravel is used for access roads around the rest of the site including the main haul road (switchback two).

2. Are there any areas of hydrophilic (lush, water-loving) vegetation? X Yes ___ No
If 'Yes', describe (size, location, severity, etc.)
Areas where water tends to flow through the landfill have phragmites. This vegetation is not on CCR slopes, but around the upper ponds, settlement ponds and along conveyance channel (Photographs #21 through #28).

3. Are there any trees or other undesired vegetation? X Yes ___ No
If 'Yes', describe (type of vegetation, size, location, etc.)
There are trees of varying size on the northern cover slopes. Some trees of varying size are also present above the western and southern quarry sidewalls (Photographs #5, #6, #8, #9). However, these trees do not affect the existing safety and operation of the Landfill.

4. Is there an access ramp in the landfill? X Yes ___ No
If 'Yes', describe (good condition, numerous cracks, newly paved, stone uniformly distributed, etc.)
Switchback 2 was being used and was in good condition with minimal rutting (Photographs #13, #18, #29). There is another access road to the bottom of the quarry that can be used in an emergency (Photograph #29).

5. Are there any depressions, ruts, or holes on the access ramp or road? ___ Yes X No
If 'Yes', describe (size, location, etc.)

6. Are there any fractures on side walls? X Yes ___ No
If 'Yes', describe (length and width, location and direction of cracking, slough, or distress, etc.)
There are bedrock fractures on the quarry sidewalls. Safety measures are in place to keep a 20-foot buffer between the sidewalls and personnel working in the bottom of the quarry (Photographs #8, #9, #11).

7. Are there wet areas that indicate seepage through the side walls? X Yes ___ No
If 'Yes', describe (size, location, etc.)
Multiple areas on the quarry sidewalls show damp conditions or natural groundwater seepage (Photographs #8, #9). Seepage within the ash is collected by the drainage collection layer then pumped from the chimney sump (Photograph #7) to the upper ponds (Photograph #21).

8. Other observations, changes since last inspection:

Sibley Quarry - CCR Landfill
2023 Annual Inspection Report

Name of CCR Landfill: **Sibley Quarry Landfill** **Qualified Professional Engineer:** Clinton Carlson, PhD, PE
Owner: **DTE Electric Company** **Date:** 5/8/2023 **Time:** 1 pm to 4 pm

II. Stormwater Conveyance Structures

1. Describe what types of stormwater conveyance structures there are at the site (e.g. drop inlets, downchutes, benches, ponds, outlet structures, etc.).

Stormwater within the footprint of the landfill drains by gravity to the chimney sump at the bottom of the quarry (Photograph #7). Drainage channels, check dams, and diversion berms were observed along the access roads, conveying water to the bottom of the quarry and chimney sump (Photograph #13 through #18). No stormwater management features are present on the northern slopes at the top of the quarry (Photographs #19, #20); stormwater flows over the upper northern slope surface.

2. Describe the condition of stormwater structures mentioned above. (Are they in working condition? Is there any erosion in or around the structures, sings of leakage or movement, etc.?)

The chimney sump and pumps appeared to be functioning properly. The slopes along the switchback two haul road show some erosion rills and the eroded material has collected behind the check dams within the lower drainage channel (Photograph #14). The top of these slopes have cuts in the diversion berm with coir logs to control surface stormwater flow (Photograph #16); however, some cuts have damaged coir logs, which likely contribute to the erosion rills on the slopes (Photograph #17). Erosion rills and gullies are present on the northern CCR slopes above the quarry (Photographs #19, #20). None of these observations affect the existing safety and operation of the landfill.

III. Landfill Conditions

1. Describe operations in the landfill (disposal, reclamation, general operational activities):

CCR and inert materials from DTE locations is hauled to and placed at the bottom of the quarry on the prepared drainage collection and filter layer (Photographs #3, #4, #5, #9, #10, #12, #15). CCR and inert material is being excavated from the top of the northern slopes and hauled to the bottom of the quarry (Photographs #1, #2).

2. Are any stormwater controls obstructed? X Yes ____ No

If 'Yes', describe (type of debris, reason for obstruction, etc.)

Eroded sediments from the switchback two haul road slopes have accumulated behind the check dams within the drainage channel at the bottom of the slopes (Photograph #14). The existing condition of the check dams does not affect the existing safety and operation of the landfill.

3. Are there indications of erosion on the landfill slopes? X Yes ____ No

If 'Yes', describe what type and its condition (rill, gully, dimensions, etc.)

Several erosion rills and gullies were observed on the northern slopes (Photographs #13, #18, #19). Run-off flows alongside switchback two haul road (Photographs #12, #13, #14) to the bottom of the quarry and the chimney sump. The erosion features do not represent an existing condition disrupting the operation and safety of the landfill because eroded material is transported to the bottom of the landfill within the footprint of the landfill (Photograph #15).

4. Is the leachate collection system functioning (describe discharge color, quantity)?

The drainage collection and filter layers located at the bottom of the quarry are considered as the leachate collection system (Photograph #7). The upper ponds act as the leachate treatment ponds (Photographs #21, #22, #23). Groundwater and CCR contact water that accumulate at the bottom of the quarry is pumped to the upper ponds for treatment. The leachate collection system and treatment ponds were flowing properly during the inspection.

Name of CCR Landfill: Sibley Quarry Landfill **Qualified Professional Engineer:** Clinton Carlson, PhD, PE
Owner: DTE Electric Company **Date:** 5/8/2023 **Time:** 1 pm to 4 pm

5. How is the leachate stored? Comment on the condition of the structure.
See Item 4.

6. Other observations around the landfill (changes since last inspection, etc.):
CCR has been placed over the leachate collection and filter layer over the entire footprint at the bottom of the quarry (Photograph #15) and the top of the northern slopes have been excavated (Photographs #1, #2).

IV. Leachate Pond Spillways

1. What types of spillways does the leachate pond have (concrete, earth, riprap, etc.)?
Principal Spillway: See description below Emergency Spillway:
Other: Leachate flows from the upper ponds after being treated, through the conveyance channel and settling ponds before being discharged into the Detroit River (Photographs #21 through #28).

V. Repairs, Maintenance, Action Items

1. Has any routine maintenance been conducted since the last inspection? X Yes No
If 'Yes', describe.
Routine maintenance related to fugitive dust control (e.g., wetting roads and treating slopes) and mowing of the upper ponds, conveyance channel, settling ponds, and discharge have been conducted since the last inspection.

2. Have any repairs been made since the last inspection? X Yes ____ No
If 'Yes', describe.
Damage to a pipe used for dust control on the top of the northern slopes above the quarry was repaired (Photograph #2). The chimney sump was raised approximately 40 feet to keep the top of the sump tower above the top of the CCR (Photograph #7).

3. Are there any areas of potential concern? X Yes ____ No
If 'Yes', describe.
If additional erosion rills and gullies develop or existing erosion features continue to expand (Photographs #14, #17, #19, #20), they could potentially develop into a structural weakness or have the potential to disrupt the safety and operation of the landfill (e.g., block switchback two haul road). There was a concern regarding potential rock falls in the bottom of the quarry from the sidewalls (Photographs #3, #4, #8, #9, #11), but DTE has taken measures to address this safety concern by keeping a minimum of 20 feet between the quarry walls and a safety berm.

Sibley Quarry - CCR Landfill
2023 Annual Inspection Report

Name of CCR Landfill: **Sibley Quarry Landfill** **Qualified Professional Engineer:** Clinton Carlson, PhD, PE
Owner: **DTE Electric Company** **Date:** 5/8/2023 **Time:** 1 pm to 4 pm

4. Has this inspection identified any need for repair or maintenance? X Yes ____ No

If 'Yes', describe and state the urgency of maintenance. "Urgent" for maintenance that should be conducted as soon as possible, "Moderate" for maintenance that should be conducted within three months, and "Not Urgent" for maintenance that can be conducted in a year.

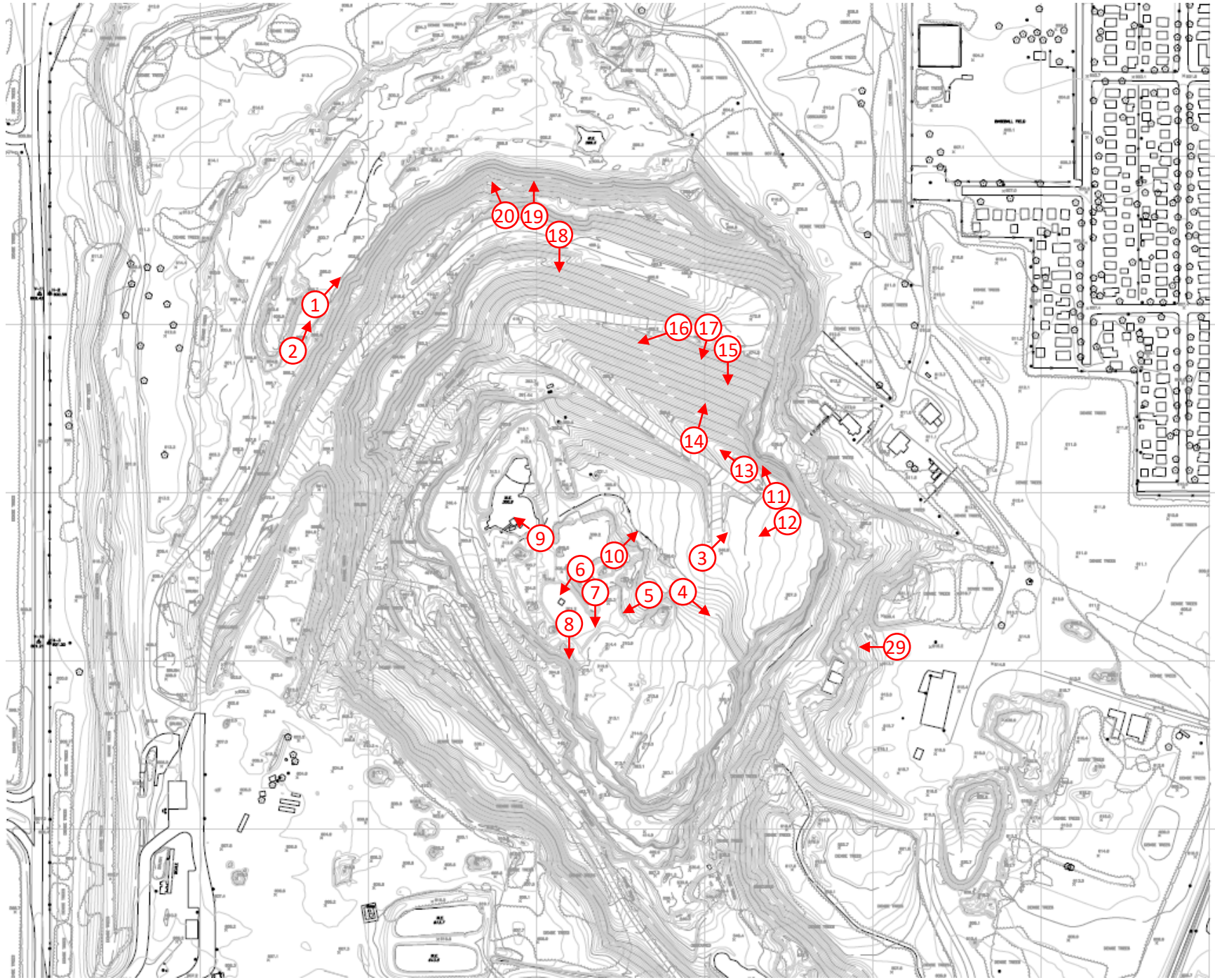
Not Urgent - Monitor CCR slopes for the formation of additional or expansion of existing erosion rills and gullies.
Not Urgent - Clear sediment accumulated behind the check dams in the drainage channel along the switchback two haul road. Sediments can be placed at the bottom of the quarry.

Not Urgent - Replace damaged coir logs at the cuts in the diversion berm along the top of the switchback two haul road slopes.
Not Urgent - Place additional riprap, gravel, and sand below the pipe outfalls from the upper ponds, conveyance channel, and Settling Pond #4.

VI. Photographs

Photographs can be taken of notable features. List of photographs:

	Location	Direction of Photo	Description
i.	SEE THE ATTACHED PHOTO LOG.		
ii.			
iii.			
iv.			
v.			
vi.			
vii.			



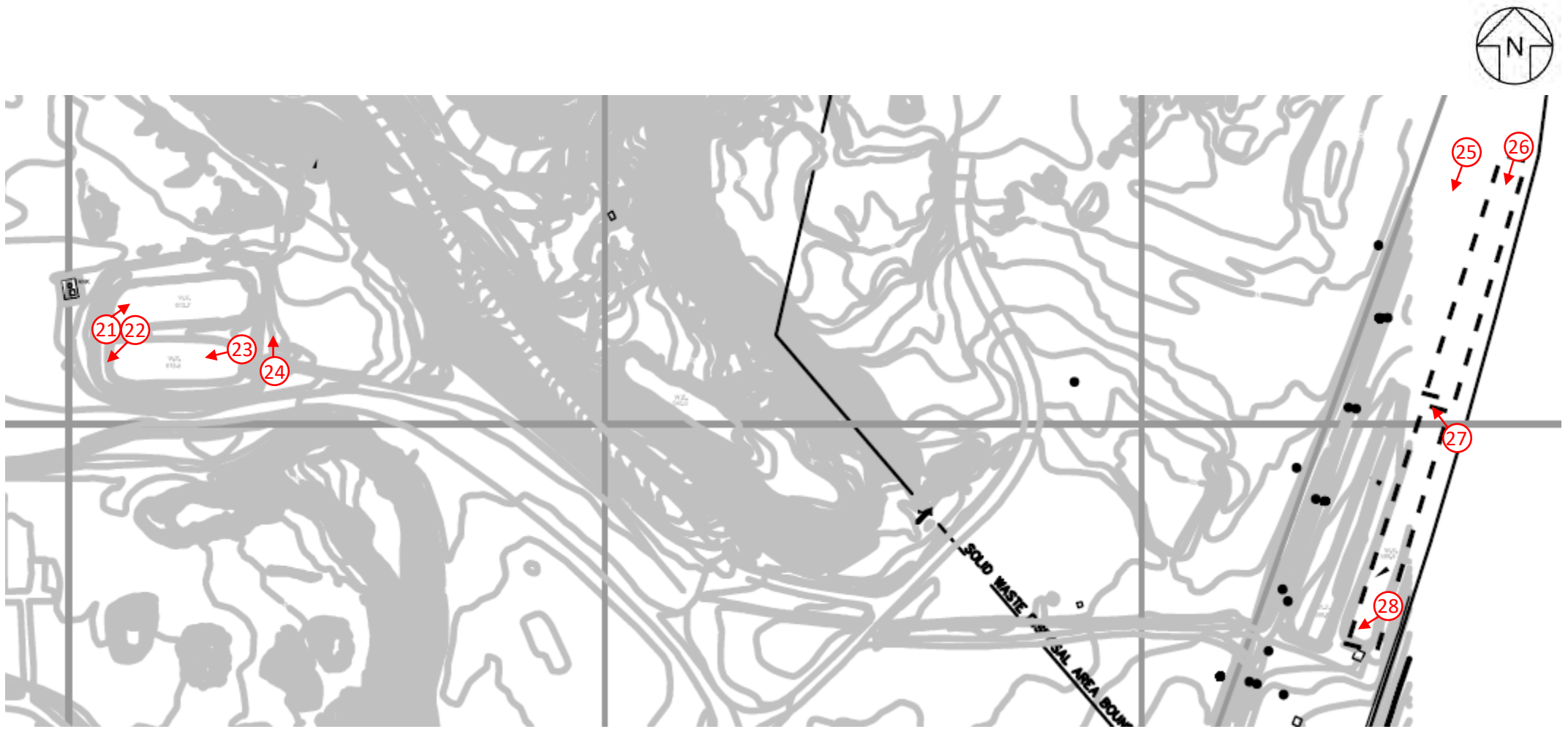
1 — DIRECTION OF PHOTO / PHOTO NUMBER

SIBLEY QUARRY
PHOTO LOG 1

Geosyntec consultants
DETROIT, MICHIGAN

PROJECT: CHE8242V | JANUARY 2024

FIGURE
A1



1
DIRECTION OF PHOTO
PHOTO NUMBER

SIBLEY QUARRY
PHOTO LOG 2

Geosyntec consultants
DETROIT, MICHIGAN

PROJECT: CHE8242V

JANUARY 2024

FIGURE
A2

DTE ELECTRIC COMPANY

Photographic Record

Client:	DTE Electric Company	Project Number:	CHE8242V
Site Name:	Sibley Quarry Landfill	Site Location:	Trenton, MI

Photograph 1 Date: 5/8/2023 Comments: Excavation occurring at the top of the northern CCR slopes. The excavated material is being hauled to the bottom of the quarry. (Northeast)	
Photograph 2 Date: 5/8/2023 Comments: Pipe used to convey water for fugitive dust control system. (Northeast)	

DTE ELECTRIC COMPANY

Photographic Record

Client:	DTE Electric Company	Project Number:	CHE8242V
Site Name:	Sibley Quarry Landfill	Site Location:	Trenton, MI

Photograph 3

Date: 5/8/2023

Comments: Active filling area at the bottom of the quarry and northeast bedrock wall. (Northeast)

Photograph 4

Date: 5/8/2023

Comments: Active filling area at the bottom of the quarry and southeast bedrock wall. Construction equipment shown spreading material hauled to the bottom of the quarry. The ash conveyor system is shown in the background at the top of the quarry. (Southeast)

DTE ELECTRIC COMPANY

Photographic Record

Client:	DTE Electric Company	Project Number:	CHE8242V
Site Name:	Sibley Quarry Landfill	Site Location:	Trenton, MI

Photograph 5

Date: 5/8/2023

Comments: Active filling area at the bottom of the quarry and chimney sump. Southwest bedrock wall is also shown. (Southwest)

Photograph 6

Date: 5/8/2023

Comments: Sump pumps installed at the bottom of the quarry. Two pumps operating during the inspection. (Southwest)

DTE ELECTRIC COMPANY

Photographic Record

Client:	DTE Electric Company	Project Number:	CHE8242V
Site Name:	Sibley Quarry Landfill	Site Location:	Trenton, MI

Photograph 7

Date: 5/8/2023

Comments: Chimney sump at the bottom of the quarry and drainage collection and filter layer. (South)

Photograph 8

Date: 5/8/2023

Comments: Bedrock side wall and groundwater inflow. (South)

DTE ELECTRIC COMPANY

Photographic Record

Client:	DTE Electric Company	Project Number:	CHE8242V
Site Name:	Sibley Quarry Landfill	Site Location:	Trenton, MI

Photograph 9

Date: 5/8/2023

Comments: Active filling area at the bottom of the quarry and the northwest bedrock wall. (Northwest)

Photograph 10

Date: 5/8/2023

Comments: Bottom ash placed at the bottom of the quarry. CCR slopes along the switchback two haul road and northeast bedrock wall also shown. (Northeast)

DTE ELECTRIC COMPANY

Photographic Record

Client:	DTE Electric Company	Project Number:	CHE8242V
Site Name:	Sibley Quarry Landfill	Site Location:	Trenton, MI

Photograph 11

Date: 5/8/2023

Comments: Rock debris from the northeast bedrock wall. Debris is restricted to within the 20-foot-wide buffer zone from the base of the bedrock walls. (Northwest)

Photograph 12

Date: 5/8/2023

Comments: Stockpile material for drainage collection layer and around the sump at the bottom of the quarry. (Southwest)

DTE ELECTRIC COMPANY

Photographic Record

Client:	DTE Electric Company	Project Number:	CHE8242V
Site Name:	Sibley Quarry Landfill	Site Location:	Trenton, MI

Photograph 13

Date: 5/8/2023

Comments: Drainage channel adjacent to the lower slope of the Switchback 2 haul road. (Northwest)

Photograph 14

Date: 5/8/2023

Comments: Erosion rills on the lower slope of the Switchback 2 haul road and eroded materials behind a check dam. Erosion features should continue to be monitored. Eroded materials should be cleared from the check dam. (Northeast)

DTE ELECTRIC COMPANY

Photographic Record

Client:	DTE Electric Company	Project Number:	CHE8242V
Site Name:	Sibley Quarry Landfill	Site Location:	Trenton, MI

Photograph 15

Date: 5/8/2023

Comments: Overview of landfill operations. (South)

Photograph 16

Date: 5/8/2023

Comments: Coir log installed at cut in the diversion berm for soil erosion control along the switchback two haul road. (Southwest).

DTE ELECTRIC COMPANY

Photographic Record

Client:	DTE Electric Company	Project Number:	CHE8242V
Site Name:	Sibley Quarry Landfill	Site Location:	Trenton, MI

Photograph 17

Date: 5/8/2023

Comments: Top of erosion rills observed on the lower slope of the Switchback 2 haul road. Coir logs were damaged at this cut in the diversion berm. (Southwest)

Photograph 18

Date: 5/8/2023

Comments: Drainage channel and diversion berm along the Switchback 2 haul road. (South)

DTE ELECTRIC COMPANY

Photographic Record

Client:	DTE Electric Company	Project Number:	CHE8242V
Site Name:	Sibley Quarry Landfill	Site Location:	Trenton, MI

Photograph 19

Date: 5/8/2023

Comments: Erosion rills observed on northern CCR slopes above the quarry. (North)

Photograph 20

Date: 5/8/2023

Comments: Erosion rills and gully on the northern CCR slopes above the quarry. (Northwest)

DTE ELECTRIC COMPANY

Photographic Record

Client:	DTE Electric Company	Project Number:	CHE8242V
Site Name:	Sibley Quarry Landfill	Site Location:	Trenton, MI

Photograph 21

Date: 5/8/2023

Comments: North upper pond. Water used as supply for fugitive dust control. (Northeast)

Photograph 22

Date: 5/8/2023

Comments: Discharge into south upper pond. (Southwest)

DTE ELECTRIC COMPANY

Photographic Record

Client:	DTE Electric Company	Project Number:	CHE8242V
Site Name:	Sibley Quarry Landfill	Site Location:	Trenton, MI

Photograph 23

Date: 5/8/2023

Comments: South upper pond and silt curtains. (Southwest)

Photograph 24

Date: 5/8/2023

Comments: Discharge from upper ponds into conveyance channel. Some erosion is observed beneath the pipe. (North)

DTE ELECTRIC COMPANY

Photographic Record

Client:	DTE Electric Company	Project Number:	CHE8242V
Site Name:	Sibley Quarry Landfill	Site Location:	Trenton, MI

Photograph 25

Date: 5/8/2023

Comments: Conveyance channel west of the settling ponds. Channel geometry consistent with the previous inspection. (Southwest)

Photograph 26

Date: 5/8/2023

Comments: Discharge from conveyance channel into Settling Pond #4. Some erosion is observed beneath the pipe. (Southwest)

DTE ELECTRIC COMPANY

Photographic Record

Client:	DTE Electric Company	Project Number:	CHE8242V
Site Name:	Sibley Quarry Landfill	Site Location:	Trenton, MI

Photograph 27

Date: 5/8/2023

Comments: Culvert connecting Settling Pond #4 to Settling Pond #3. Some erosion is observed beneath the pipe. (Northwest)

Photograph 28

Date: 5/8/2023

Comments: Aerators in Settling Pond #3. (Southwest)

DTE ELECTRIC COMPANY

Photographic Record

Client:	DTE Electric Company	Project Number:	CHE8242V
Site Name:	Sibley Quarry Landfill	Site Location:	Trenton, MI

Photograph 29

Date: 5/8/2023

Comments: Ash conveyor system at top of quarry on the southeast side.