



COUNTY OF ST. CLAIR

ENVIRONMENTAL SERVICES DEPARTMENT



Matthew Williams
Landfill/Resource Recovery Manager

February 6, 2024

Mr. Aaron Darling, Geologist
Department of Environment, Great Lakes and Energy
Materials Management Division
Southeast Michigan District Office
27700 Donald Court
Warren, Michigan 48092

**Subject: Smiths Creek Landfill (SCL)
Response to January 16, 2024 Violation Notice**

Mr. Darling:

This letter is being submitted to respond to the above referenced violation notice (VN) issued on January 16, 2024 by the Department of Environment, Great Lakes and Energy (EGLE) Materials Management Division (MMD). As indicated in the above referenced letter, this VN was issued based on staff findings during the Fiscal Year 2024, First Quarter Part 115 inspection and subsequent document review pertaining to previously identified third and fourth quarter 2023 violations.

We understand based on our discussions during the January 25, 2024 meeting at CTI and Associates, Inc. (CTI) office, that this letter represents outstanding items MMD would like to see addressed as part of our ongoing correspondence. Responses have been organized to address each of the issues cited in the VN.

The following issues relate to the third quarter 2023 MMD inspection:

Issue 1

R 299.4448(2)(d): The owner and operator shall close each type II landfill unit in a manner that minimizes all of the following: (d) The post-closure formation and release of leachate and explosive gases to air, groundwater, or surface water to the extent necessary to protect human health and the environment.

“On June 28, 2023, MMD staff observed landfill gas escaping the final cover of the certified closed area of the Facility in areas where there was no vegetation and standing liquid was present. The gas could be seen bubbling up from the final cover through the standing liquid at multiple locations. Environmental Information Logistics, L.L.C. (EIL) was contracted by the Facility to conduct a routine surface emission screening (SEM) event for the active, closed, and interim cover areas of the Facility on August 1 and 2, 2023. No detectable methane was identified in the certified closed area during this SEM event. Due to the lack of detectable methane during the SEM and review of the solar flare runtime data, it was suggested by the Facility that the gases escaping the certified closed area final cover indicate methane oxidation through the soil final cover and an increasing proportion of carbon dioxide in the landfill gas.

On October 18, 2023, the Air Quality Division (AQD) conducted an abbreviated SEM inspection covering the Facility's active, closed, and interim cover areas. Several locations within the certified closed area of the landfill had surface methane concentrations greater than 500 ppm above the background. The results of the AQD SEM event suggest that the portions of the certified closed area final cover may be inadequate, and/or the passive gas collection system may not be operating as designed. Additional evaluations are necessary to ensure that the final cover and passive venting system are operating effectively to prevent fugitive emissions of landfill gas."

Response: As has been indicated in our previous responses to VNs issued by the Air Quality Division (AQD), SEM scans of the certified closed area are conducted by a trained third-party technician (EIL) and conform to the NESHAP and EPA Method 21 requirements. EGLE staff performing the methane screening on October 18, 2023 selectively used a cone not included in EPA Method 21 specifications. As data collected using divergent methodologies may not allow for equivalent comparison, we look to EGLE for a demonstration that the method selected and implemented by staff is equivalent to that described in Method 21 and representative of ambient conditions.

Regardless of the differences in methodologies used during the event, detections >500 ppm of methane were addressed through the augmentation of final cover within the time constraints specified by 40 CFR 63.1960 and the locations were verified to be <500 ppm during each 10-day and one-month re-checks required by NESHAP and conducted using NESHAP specified procedures.

Waste acceptance in the certified closed area ceased approximately 35 years ago and the remaining gas generation potential is low. The passive gas collection and control system in place since 2002 consists of six solar flares which have provided adequate control as demonstrated by ongoing routine SEM results. Periodic methane detections above NESHAP thresholds have been addressed through additional cover placement and verified as required through follow-up monitoring. Functionality of the solar flares is verified through run-time tracking and routine inspection and maintenance.

On October 31, 2023 EGLE provided results of the abbreviated methane screening conducted by staff on October 18, 2023. The locations of detections were generally associated with areas of erosion and/or little or no vegetation. The areas were reviewed and marked in the field. These areas will be addressed by the certified closed area cap improvements detailed below to ensure that final cover continues to minimize fugitive emissions of landfill gas. Quarterly SEM scans will be conducted prior to, and following the cap repairs proposed in response to Issues 2 – 4 below.

Issue 2

R 299.4425(7) To prevent the ponding of water on completed fill surfaces, the grading contours shall be sufficient to prevent the development of local depressions due to postconstruction settlement.

"Ponding liquid was observed at multiple locations throughout the certified closed area of the Facility. These topographic low areas throughout the certified closed area require attention to prevent erosion and water infiltration. An annual flyover was scheduled for August 2023 to create a topographic survey of the certified closed area final cap surface to prepare localized grading adjustments to improve water flow from the final cap. The data from the survey was scheduled to be prepared in August 2023, with localized re-grading

occurring in September/October 2023. Documentation of the completion of re-grading activities must be submitted to MMD for review.”

Response: As has been discussed verbally with MMD staff, following the June 28, 2023 inspection and subsequent response letter submitted on August 11, 2023, a plan was developed to address areas of settlement on the certified closed area and resulting in water ponding in those areas. Implementation of the plan to address settlement began in August 2023. However, in September 2023, off-site odors unrelated to the closed area were identified and completion of the maintenance work in the certified closed area was postponed in order to focus staff and resources towards the time-critical effort associated with addressing conditions affecting the local community. Significant elements of the prioritized work included re-grading of a main header line, design, installation and operation of a supplemental blower and flare and construction of an interceptor trench to increase gas capture effectiveness from Cell 8.

The closed area cap repair efforts are scheduled to resume in second quarter 2024 as weather permits. Attachment 1 details the plan which includes three primary areas of regrading designed to improve drainage in areas where significant settlement has occurred over time. Documentation of the repairs and re-certification, where applicable, will be conducted in accordance with the approved closure. Documentation of repair activities will be provided to EGLE within 30 days of completion of the repair activities (no later than July 31, 2024).

Issue 3

R 299.4425(9) All final covered areas shall be stabilized using appropriate shallow-rooted vegetation for the soil type, slope, and moisture conditions present. Seed and mulch rates shall, at a minimum, be consistent with recommendations contained in the United States department of agriculture document entitled “Natural Resources Conservation Service Critical Area Planting Guide.” The natural resources conservation service critical area planting guide is adopted by reference in R 299.4141.

“Several areas without vegetation were observed throughout the certified closed area of the Facility. Re-vegetation was scheduled to occur in October 2023 after topographic low areas of the final cap were re-graded. These areas require seeding to establish vegetation that will minimize erosion of the final cover and water infiltration into the fill. Documentation of the completion of seeding activities must be submitted to MMD for review.”

Response: As noted above, the re-grading work previously scheduled for completion during 4th quarter of 2023 was postponed due to implementation of higher priority tasks to directly address off-site odor issues. Re-grading and subsequent re-vegetation is scheduled to be completed during the 2nd quarter of 2024 in conjunction with the regrading effort. At that time, seeding will be conducted in areas disturbed during the regrading effort. Other cap surfaces outside of the re-grading areas with little or no vegetation will similarly be re-seeded at that time. Seeding will be conducted using grass varieties suited to the local climate and soil conditions as recommended by the United States Department of Agriculture Natural Resources Conservation Service Critical Area Planting standard (Code 342, 2016) and stabilized with an appropriate mulch material. Documentation of this work will be submitted to EGLE no later than July 31, 2024.

Issue 4

R 299.4448(2)(b) The owner and operator shall close each type II landfill unit in a manner that minimizes all of the following: (b) erosion.

“Severe erosion of the final cover was observed in multiple areas of the certified closed area of the facility. Inspection of these eroded areas resulted in exposed waste being observed. Re-grading of the gas collection and control system header also disturbed the final cap of the certified closed area. These areas of the clay cap need to be repaired, and certification documentation that the final cover meets the requirements of Part 115 needs to be provided.”

Response: Erosion noted in the certified closed area during the time of EGLE’s inspection was determined to be the result of stormwater damage in areas of settlement. Three areas of significant erosion have been identified as the primary focus of the re-grading plan described above and in Attachment 1. Correction of settlement will simultaneously resolve current erosion and limit future erosion potential. The corrective measures are scheduled to be completed by the end of second quarter, 2024 as weather conditions permit. Documentation will be provided by July 31, 2024 as described previously.

The following issues pertain to the fourth quarter 2023 inspection:

Issue 5

R 299.4433(c) The gases generated by the facility do not create a nuisance and are not otherwise in violation of part 55 of the act at the property boundary.

“The AQD and MMD continue to receive complaints from residents in the vicinity of the Facility. The complaints have ranged from smelling intermittent, objectionable odors to severely bad odors that impacted residents’ ability to enjoy their property. The staff of AQD and MMD have performed several odor inspections in the areas of the numerous complainants’ homes and have noted landfill gas odor of various intensities at different times of the day. It has been determined that the Facility’s gas collection and control system has deficiencies that need to be adequately addressed to prevent the release of excessive landfill gas odors that migrate into the adjacent residents’ community.”

Response: As previously communicated to EGLE in discussions and formal responses, SCL has completed extensive improvements to the gas collection and control system (GCCS). Upgrades include addition of a 500 cfm supplemental blower/flare installed to maximize gas collection in Cell 8. The supplemental flare also serves to isolate gas generated from specific lateral collection lines with anomalously elevated hydrogen sulfide concentrations. Additionally, SCL has constructed an interceptor trench designed to capture LFG which may be encountered at the perimeter of Cell 8.

These improvements, in combination with header regrading and other actions previously described have significantly reduced odors both on-site and at off-site locations based on SCL staff observations. Additionally, SCL has procured a larger (1,000 cfm) supplemental blower and flare which is expected to allow SCL to connect additional lateral lines to more effectively isolate and collect gas with elevated hydrogen sulfide concentrations unique to Cell 8. Delivery of the unit is expected by the end of March 2024.

As was discussed during our meeting on January 25, 2024, the identification of a zone of sulfur bearing waste in lift 4 of Cell 8 is thought to be a contributing factor in the occurrence of intermittent detection of off-site odors. The odors associated with this waste have been particularly challenging to control due to the shallow nature of the waste and the proximity of the active working face which cannot reasonably be provided with interim cover. SCL will continue to make corrections and improvements until consistent resolution of the odor issue is achieved.

Issue 6

Section 11511(b)(5)(c)(iv) a Research, Development, and Demonstration Project (RDDP) must have "An active gas collection and control system. The system shall be of adequate size for the anticipated size for the anticipated methane production rates and to control odors. The system must be operational before the addition of any material to accelerate or enhance bio-stabilization of the solid waste."

"The MMD has reviewed the gas collection and control system as-built information and has raised concerns that the main gas header, providing vacuum from the gas-to-energy plant and primary flare station, may be undersized for the current gas generation of the landfill. In addition, the current location of the main gas header within the waste mass subjects it to settlement forces which are detrimental to its effective, long-term operation. Currently, the temporary flare/blower is providing additional vacuum to Cell 8. The interceptor trench collector has been installed, but minimal vacuum has been applied to the collector due to high oxygen and balance gas concentrations."

"A plan that addresses additional clay cover or, more preferably, the use of a flexible membrane cover over the interceptor trench collector is required. The plan should include a timeline for when the interceptor trench collector is expected to be fully functional and an evaluation of the potential area of influence under varying vacuum conditions. The plan should also describe the nature and extent of (enhanced) interim cover intended to be placed in the area of the interceptor trench to maximize its short-term effectiveness. For examples, to what distance upslope from the toe of slope will interim cover be placed to prevent air intrusion to the interceptor trench in an effort to increase its potential influence; for soil interim cover, what soil types are being used, how are they being compacted, what is the target thickness; what efforts have been undertaken to evaluate/pursue the use of a flexible membrane liner for enhanced interim cover over the interceptor trench."

Two separate issues have been described by EGLE, the first (Issue 6a) involves the adequacy of the GCCS, as designed, and the Second (Issue 6b) is focused on the mechanism(s) to maximize the effectiveness of the interceptor trench. The responses are provided separately below.

Response (6a):

In response to EGLE's assertion that the existing GCCS may be undersized for current gas generation rates/volumes, an engineering assessment was completed by qualified engineers at CTI and is currently being independently evaluated as described in the response to Issue 7 below. Evaluations to date, indicate that the system, as designed and installed, is capable of managing modeled gas generation rates. Further, actual generation rates are very similar to those predicted in data submitted to MMD in conjunction with the most recent construction permit application (2019). In a previous response dated January 6, 2024, we clarified that

the gas generation rate assumed by EGLE (9,178 acfm) is erroneous and is significantly higher than actual production rates (2,957 acfm).

EGLE has also indicated that the location of the header in waste mass offers the potential for settlement and maintenance issues. As system upgrades are considered to replace areas of aging infrastructure, SCL will consider options for moving certain header sections out of the waste mass where feasible. For header which remains in the waste mass, diligent tracking of operational data will be conducted, and repairs made when data indicates the potential for liquid build-up or other impedances in the system due to differential settlement.

Response (6b):

The interceptor trench was designed to provide as-needed supplemental gas capture for LFG that may not be fully captured in Cell 8 or that travels through the drainage layer to the perimeter of Cell 8.

The primary goal of the interceptor trench is to capture excess gas that may escape the existing lateral extraction system. Unlike traditional lateral gas extraction lines which rely on significant vacuum to draw gas from the waste mass, the interceptor is designed to be operated under relatively low vacuum to serve as a path of least resistance to gases which may circumvent the GCCS. Gas interception from the periphery of Cell 8 does not conform to standard methods of calculating radius of influence from gas lines which are centered in a waste mass.

To expedite operation of the interceptor trench, an 8" header system was connected to the east end of the trench to provide vacuum from the supplemental blower to offer added peripheral control via the supplemental flare. As was discussed during the January 25, 2024 meeting, the shallow depth of the trench increases the likelihood of air intrusion under vacuum. This has a direct relationship with the amount of vacuum that can be effectively applied without introducing significant balance gas into the system.

While the interceptor trench is not designed to operate under the same vacuum expectations as a standard GCCS, we agree that reasonable increases in vacuum may maximize its effectiveness. In order to optimize vacuum while controlling the potential for air intrusion, we have initiated two primary solutions which are further described in Attachment 2.

First, 6"-8" of on-site clay is being added to the outside slopes of Cell 8 and overlying the trench. This work has been initiated and will be completed in its entirety as weather conditions allow for safe operation of heavy equipment on slopes. The extent of enhanced clay application over the trench is detailed in Attachment 1. Should the addition of clay be insufficient to provide an adequate barrier for air intrusion under reasonable vacuum, the addition of FML will be considered. We anticipate that we will be able to evaluate performance of the system with added clay cover by February 23, 2024. and results of our findings will be communicated to EGLE at that time.

Secondly, additional vacuum was applied to the west end of the trench beginning on February 2, 2024, through connection to the primary blower system. This added vacuum directs collected gas from the west half of the trench into the primary GCCS system, which has greater buffer capacity for balance gas since more flow is directed through this system. Gas at the primary skid is being monitored for H₂S to ensure compliance with the 1,300 ppm H₂S limit established in the facility Renewable Operating Permit.

Issue 7

“The Facility has stated that a complete design and operational review is underway by EIL. This review is expected to focus on the sizing of the header lines, expected gas production rate, density and sizing of the lateral extraction lines, system and available vacuum, collection capacity, location of the future header system, and other design improvements that will be necessary to meet recent Part 115 requirements and rectify off-site odor nuisances.”

Response: EIL is completing a third-party design and operational review. Results of that review are anticipated by February 14, 2024. Recommended upgrades to the system including the location of future header system and other design improvements that may be necessary to meet recent Part 115 requirements will be included as part of the GCCS Design plan submittal by March 29, 2024.

Issue 8

“A comprehensive assessment of the lateral collector’s potential for settlement or liquid intrusion is also ongoing. A timeframe for completion of these evaluations and any proposed corrective measures resulting from these evaluations has not yet been provided.”

Response:

As discussed during our meeting on January 25, 2024, we are currently completing an evaluation of both vertical and lateral gas extraction lines. The vertical well evaluation is based on physical measurements and observations in the field to determine liquid levels or identify other obstructions. As the lateral lines cannot be evaluated in the same manner, we will rely on performance in comparison to remaining gas potential via modeling to determine whether any of the lateral lines may be compromised. The evaluation will be completed, and findings submitted to EGLE by February 29, 2024.

Summary and Conclusion

SCL and St. Clair County have made and continue to pursue significant strides toward restoration of sustainable control of landfill gas. We remain committed to instituting additional controls, system improvements and procedures as necessary to sustainably minimize off-site odor impacts in the future. We will continue to update EGLE weekly with details of our advancements. If you have questions regarding our progress or this submittal, please contact me at (810) 989-6979.

Sincerely,

Smiths Creek Landfill

A handwritten signature in black ink that reads "Matt Williams". The signature is written in a cursive, flowing style with a horizontal line extending to the right.

Matt Williams
Director, Smiths Creek Landfill

Cc/via e-mail:

Annette Switzer, EGLE

Christopher Ethridge, EGLE

Brad Myott, EGLE

Jenine Camilleri, EGLE

Joyce Zhu, EGLE

Robert Joseph, EGLE

Gina, McCann, EGLE

Mike Kovalchick, EGLE

Aaron Darling, EGLE

Mary Carnagie, EGLE

Kerry Kelly, EGLE

Matthew Karl, EGLE

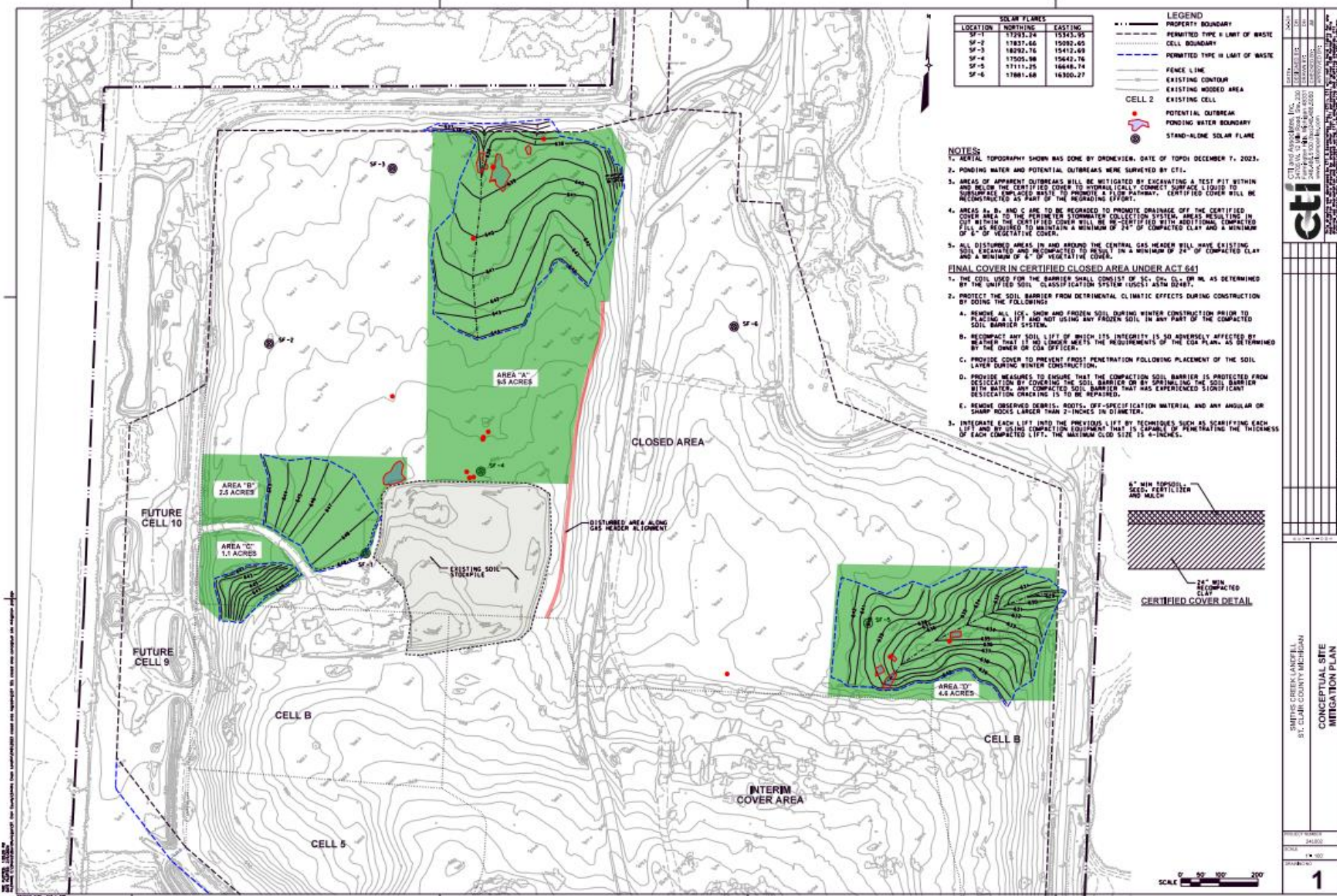
Erin Berish, CTI

Laura Niemann, EIL

Terri Zick, CTI

Attachments

Attachment 1: Closed Area Re-Grading Locations

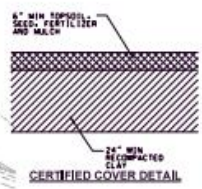


SOLAR FLARES		
LOCATION	NORTHING	EASTING
SF-1	17853.74	15543.95
SF-2	17837.66	15082.69
SF-3	18292.76	15412.69
SF-4	17505.98	15642.76
SF-5	17111.25	14648.74
SF-6	17881.68	16300.27

- LEGEND**
- PROPERTY BOUNDARY
 - PERMITTED TYPE II LANT OF WASTE
 - CELL BOUNDARY
 - PERMITTED TYPE III LIMIT OF WASTE
 - FENCE LINE
 - EXISTING CONTOUR
 - EXISTING WOODED AREA
 - CELL 2 EXISTING CELL
 - POTENTIAL OUTBREAK
 - PONDING WATER BOUNDARY
 - STAND-ALONE SOLAR FLARE

- NOTES**
- AERIAL TOPOGRAPHY SHOWN WAS DONE BY DRONEVIEWER, DATE OF TOPDI: DECEMBER 7, 2023.
 - PONDING WATER AND POTENTIAL OUTBREAKS WERE SURVEYED BY CTI.
 - AREAS OF APPARENT OUTBREAKS WILL BE MITIGATED BY EXCAVATING A TEST PIT WITHIN AND AROUND THE CERTIFIED COVER TO HYDRAULICALLY CORRECT SURFACE LOGIC TO IDENTIFY UNDESIRABLE WASTE TO PROMOTE A LOW PATHWAY. CERTIFIED COVER WILL BE RECONSTRUCTED AS PART OF THE REGRADING EFFORT.
 - AREAS A, B, AND C ARE TO BE REGRADED TO PROMOTE DRAINAGE OFF THE CERTIFIED COVER AREA TO THE PERIMETER STORMWATER COLLECTION SYSTEM. AREAS RESULTING IN COVER WITHIN THE CERTIFIED COVER SHALL BE RE-CERTIFIED WITH ADDITIONAL COMPACTED FILL AS REQUIRED TO MAINTAIN A MINIMUM OF 24" OF COMPACTED CLAY AND A MINIMUM OF 1" OF VEGETATIVE COVER.
 - ALL DISTURBED AREAS IN AND AROUND THE CENTRAL GAS HEADER WILL HAVE EXISTING SOIL EXCAVATED AND RECOMPACTED TO RESULT IN A MINIMUM OF 24" OF COMPACTED CLAY AND A MINIMUM OF 1" OF VEGETATIVE COVER.

- FINAL COVER IN CERTIFIED CLOSED AREA UNDER ACT 641**
- THE SOIL TYPES FOR THE BARRIER SHALL CONSIST OF SC, CH, CL, OR ML AS DETERMINED BY THE UNIFIED SOIL CLASSIFICATION SYSTEM (USCS) ASTM D2487.
 - PROTECT THE SOIL BARRIER FROM DETRIMENTAL CLIMATIC EFFECTS DURING CONSTRUCTION BY DOING THE FOLLOWING:
 - REMOVE ALL ICE, SNOW AND FROZEN SOIL DURING WINTER CONSTRUCTION PRIOR TO PLACING A LIFT AND NOT USING ANY FROZEN SOIL IN ANY PART OF THE COMPACTED SOIL BARRIER SYSTEM.
 - RECOMPACT ANY SOIL LIFT OF WHICH ITS INTEGRITY IS SO ADVERSELY AFFECTED BY WEATHER THAT IT NO LONGER MEETS THE REQUIREMENTS OF THE EGA PLAN, AS DETERMINED BY THE OWNER OR CDA OFFICER.
 - PROVIDE COVER TO PREVENT FROST PENETRATION FOLLOWING PLACEMENT OF THE SOIL LAYER DURING WINTER CONSTRUCTION.
 - PROVIDE MEASURES TO ENSURE THAT THE COMPACTED SOIL BARRIER IS PROTECTED FROM DESSICATION BY COVERING THE SOIL BARRIER OR BY SPRINKLING THE SOIL BARRIER WITH WATER, AND COMPACTED SOIL BARRIER THAT HAS EXPERIENCED SIGNIFICANT DESSICATION CRACKING IS TO BE REPAIRED.
 - REMOVE OBSERVED DEBRIS, ROOTS, OFF-SPECIFICATION MATERIAL AND ANY ANGULAR OR SHARP ROCKS LARGER THAN 2-INCHES IN DIAMETER.
 - INCORPORATE EACH LIFT INTO THE PREVIOUS LIFT BY TECHNIQUES SUCH AS SCARIFYING EACH LIFT AND BY USING COMPACTION EQUIPMENT THAT IS CAPABLE OF PENETRATING THE THICKNESS OF EACH COMPACTED LIFT. THE MAXIMUM GLOD SIZE IS 4-INCHES.



SMITHS CREEK LANDFILL
ST. CLAIR COUNTY, MICHIGAN

PROJECT NUMBER: 24-000
SCALE: 1" = 100'
DATE: 1/20/24

CONCEPTUAL SITE MITIGATION PLAN

1

Attachment 2: Interceptor Trench Enhanced Cover

