

CONSTRUCTION QUALITY ASSURANCE REPORT

GO EAST LANDFILL

May 20, 2022

Rev. June 15, 2022

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PACE Engineers, Inc.

11255 Kirkland Way, Suite 300

Kirkland, Washington 98033

PROJECT CERTIFICATION

In accordance with the project CQA Plan, the undersigned professional engineer states that:

Designated representatives working under the supervision of the following professional engineer was present during construction to observe construction activities, and that the responsible professional engineer/individual for the specific construction activities have reviewed the results of the field testing of materials, and to the best of their knowledge, and belief, the following project, Go East Landfill was constructed in accordance with the approved construction documents and materials used in construction were in general conformance with the specifications. Based on the forgoing, the project can begin post-closure requirements.

Those responsible for oversight and who are registered professionals licensed in the State of Washington are listed on page 3 of this document. Furthermore, various Reports, Memorandums, and documents referenced in this COA Report, and/or include in the Appendices contain their professional seals.

Principal Engineer, with overall Project oversight. DRAFT



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GO EAST LANDFILL CLOSURE CONSTRUCTION QUALITY ASSURANCE REPORT

1 INTRODUCTION

This construction quality assurance report is for the Go East Landfill. It has been prepared by PACE Engineers, Inc., under the review of Martin Penhallegon, PE, as the project engineer of record, and with the assistance of the team of consultants assembled to facilitate the successful closure of the landfill. The closure was accomplished in accordance with the Go East Landfill Closure Plan (LFCP) that was approved by Snohomish Health District under their Solid Waste Facility Permit # SW-027 and revised and approved on 3/10/2020. The following report describes the actions undertaken and the documentation that the landfill closure was accomplished in general conformance with the approved Land Disturbance Permit (LDA # 1) issued by Snohomish County with last update approved on 6/23/2021, and this report also documents work, and reports completed to comply with Ecology's MTCA requirements.

2 PROJECT BACKGROUND

The Go East property consists of an approximately 41-acre parcel, located at 4330 108th Street Southeast, Everett, Washington. The historical background regarding the property is included on page 13 of the Go East Landfill Closure Plan. Briefly, back in the mid-1970s and early 1980s a landfill consisting of wood, mineral, and concrete solid materials, but not garbage or putrescibles, and lesser amounts of landfill materials consisting of tires, cardboard, paper, and other waste, was constructed in a ravine on the property. The stream in the ravine was diverted and the ravine was filled in cells with landfill materials and covered with the local sands available on the property. In 1983 the landfill ceased accepting waste and pursued closure activities with the requirements in place at that time. A fire that broke out in later 1983 continued until it was extinguished by 1986, and the property and landfill have sat fallow since that time. By the time the fire burned itself out, landfill closure requirements had changed and, as a result, the approval of the closure was never attained.

The landfill portion of the parcel occupied about 10 acres of the property, and the site has been subject to several environmental and other studies performed from the early 1980s to 2021. The current approved Landfill Closure Plan consists of reducing the landfill size to about 6 acres by excavating the edges of the landfill and relocating the landfill material found there to the landfill area to remain. This excavated portion was designated as the "Wedge" area where the excavation would be refilled with site sands and imported material as needed. The remaining landfill area was closed in accordance with current standards and codes in compliance with the various permits and approvals. This report documents the construction, oversight, and testing that was accomplished to achieve the landfill closure in compliance with the permits and approvals.

3 MULTI-JURISDICTIONAL PROJECT PERMITTING AND COORDINATION

The approval for the Go-East landfill involved Snohomish Health District and Snohomish County agreeing to work in unison in processing and approving the various approvals and permits needed to jointly close the landfill and create the Bakerview subdivision that funded the landfill closure. Because the two adjacent HOAs opposed the project, final approvals required an additional appeal hearing in front of the County Hearing Examiner, and then with the appeal of the Landfill Closure Permit issued

by the Health District, a further appeal was held at the State of Washington Pollution Control Hearings Board in Olympia. All appeals were denied, and approvals upheld. To ensure the landfill would be properly closed the Hearing Examiner conditioned the project approval as a two-phase process. The initial phase required the property owner to accomplish all work as needed to obtain approval of the landfill closure (LDA #1) and then phase 2, the completion of the subdivision work could proceed (LDA #2). The adjacent HOAs then appealed the Landfill Closure approval to Ecology and requested the “No Further Action” status be rescinded, which Ecology did without notification to the property owner. When notified of this action and to prevent further delays, the property owner agreed voluntarily to an Agreed Order to comply with the Ecology’s MTCA program. This new approval process brought in the requirement of complying additional regulations, including an Interim Action Work Plan that complements the Approved Landfill Closure Plan that then needed to be developed. The Interim Action Completion Report (IACR) dated 11/23/2021 was approved by Ecology and SHD for the project. The IACR included the following documents:

- Pre-Construction Sampling Memorandum
- Data Validation Report and Laboratory Analytical Data
- Soil Disposal Documentation
- Asbestos-Containing Material Disposal Documentation
- Pacific Rim Environment Report
- Lot Exploration Plan Execution Memorandum

LDA #1 (Land Disturbance Approval) included not only the landfill closure work, but also the mass grading of the site to obtain cover material, grading of the subdivision lots lying outside the closed landfill, diverting an existing stream, and creating surface water controls for the entire site. Surface improvements of the closed landfill including a final 1-foot of cover and seeding, creating playfields, kiddy toys, detention pond, piping, fencing, emergency access road, trails, etc., are included mostly in LDA #2 work. Some of the final surface improvements on the closed landfill will not be completed until LDA #2 is completed.

4 DESIGN, CONSTRUCTION QUALITY ASSURANCE DOCUMENTS, AND PROJECT TEAM

To ensure compliance with the landfill closure requirements and oversight requirements by the Snohomish Health District and Department of Ecology, a “Construction Quality Assurance Plan” (“CQAP”) for the Go East Landfill Closure Plan was developed in June 2015 and updated thereafter on several occasions. Its final revision is dated October 5, 2018, reflecting the evolving changes and updates dictated by the various reviewing governmental authorities and their respective permits. The following describes the compliance by the contractor and the engineering services with the Construction Quality Assurance Plan that occurred in closing the Go East Landfill. The latest version of the “Construction Quality Assurance Plan” is included in Appendix A of this document.

A. Construction Documents (Plans & Specifications)

Construction plans were developed and revised and approved on several occasions for the Landfill Closure. The initial closure permit issued by SHD was appealed by neighboring HOAs to the County’s Hearing Examiner and subsequently to the Washington State Pollution Control Hearing Board, resulting in more revisions as described in the prior section. Also, onsite conditions discovered during construction resulted in additional updates to incorporate needed

changes based on these unanticipated site conditions. The primary changes that were discovered during construction were significant increased depth of the landfill wedge area (edge area of the landfill where landfill materials were being removed and consolidated on the landfill to remain) in two areas. One near the southeast side of the landfill that required the closed landfill limits to be expanded south about 15 to 20 feet south for a couple hundred-foot area, and the area of the west wedge which required a clay barrier be constructed along the west limit of the closed landfill for a couple hundred feet to contain any gas migration. The final plans approved by Snohomish County that incorporated these revisions and approved by SHD were incorporated into the landfill closure plans and specifications dated June 23, 2021. One final revision that needed to be constructed as part of LDA # 2 is to change the alignment of the detention pond pipe to run to the south off the landfill, instead of discharging at the toe of the landfill slope. This was necessitated due to issues encountered in constructing the access to the toe of the (NE) landfill slope. This change is not shown on the as-built drawings as the piping change has not yet been made. References in the plans include the approved SHD permit (SW-027) and the Landfill Closure Document. See Appendix B for the Approved Plans and Specifications and Landfill Closure Plan.

B. Construction Quality Assurance Team

The Construction Quality Assurance Team that assisted with the oversight, monitoring, and documentation of the landfill closure plan is provided below:

Permitting Agency	Snohomish Health District supported by Washington State Department of Ecology.
Owner	P&GE LLC, C/O PACE Engineers, 11255 Kirkland Way, Kirkland WA 98033, 425-827-2014
Owner's Representative/ Engineer of Record	Martin Penhallegon, PE, Sr. Principal, PACE Engineers (also partner of P&GE, LLC); 11255 Kirkland Way, Kirkland, WA 98033, 425-827-2014
Geotechnical Engineer	Robert Metcalf, PE, GeoEngineers, 17425 NE Union Hill Road, Suite 250, Redmond, WA 98052, 425-861-6000
Licensed Geologist	Garrett Leque, LG, GeoEngineers, 2101 4th Avenue, Suite 950, Seattle, WA 98121, 206-728-2674
Onsite Certified Professional	Pacific Rim Environmental, 6510 Southcenter Blvd. Suite 40, Tukwila, WA 98188, 206-244-8865
Environmental Gas Engineer	Victor O. Okereke, Ph.D., PE, DEE, CLSS, VIKER Environmental Engineers, LLC, 23309 100 th Avenue West, Edmonds, WA 98020-5075, 206-629-5934
Wetland/Sensitive Areas	Scott Brainard, PWS, Wetland Resources, 9505 19th Ave SE # 106, Everett, WA 98208, 425-337-3174
Surveyor of Record	Aaron Blaisdell, PLS, PACE Engineers, Inc., 11255 Kirkland Way, Suite 300, Kirkland WA, 98033, 425-827-2014
Site Engineer/CESCL	Jay Pullen, CESCL, PACE Engineers, Inc., Suite 300, 11255 Kirkland Way, Kirkland WA, 98033, 425-827-2014

C. General Contractor, Subcontractors, and Others

- General Contractor** Aero Construction Company, PO Box 295, Snohomish, WA, 98291, 425-334-0082
- Dynamic Compaction Contractor** Malcolm Drilling Company, Inc. 8701 S. 192nd Street, Kent, WA 98031, 253-395-3300
- Contaminated Soil Contractor** Wrecking Ball Demolition & Abatement, 3310 Chestnut St., Everett WA 98201, 425-339-3111
- Well Driller** Holt Services Inc., P.O. Box 1659, Milton, WA 98354, 253-604-4878

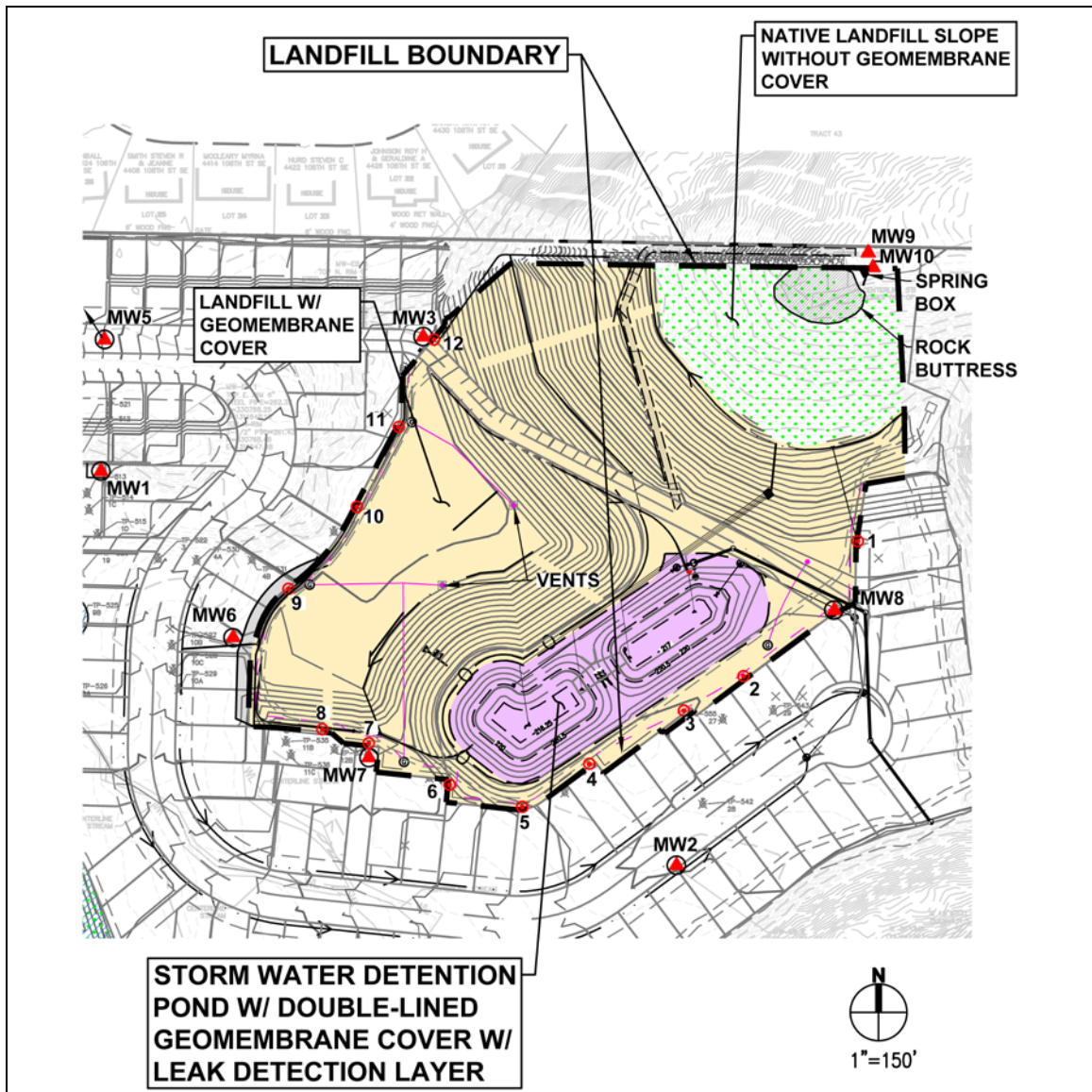


Figure 1: Landfill and Geomembrane Boundaries

5 CONSTRUCTION ACTIVITIES IN IMPLEMENTING THE LANDFILL CLOSURE

5.1 Schedule and Documentation of Construction Activities

A. Schedule of Work

Construction for the landfill closure plan started in March 2021 with the installation of the water line and fire hydrant required to be constructed onsite. Construction continued through 2021 as documented in the weekly meeting notes. The 12 gas probes were installed in November 2021, and the final two wells (9 & 10) in March 2022 due to access challenges. The landfill received its final geomembrane cover and initial overlying soils in January thru March of 2022. Placement of final topsoil on the landfill and the construction of the stormwater conveyance structures above the landfill cover will be completed under LDA # 2 after SHD's approval of this CQA Report, as required by Snohomish County Planning and Development Services.

B. Meetings and Documentation of Meetings

The project kick-off meeting for the onsite water main and hydrant construction was held on March 19, 2021, and the kickoff for the Landfill Closure was held on March 29, 2021. Weekly coordination meetings were held on Mondays nearly every week during the construction activities. These meetings were attended by representatives of Snohomish Health District, Department of Ecology, Snohomish County Planning and Development Services, as well as other interested parties such as project consultants, owner representatives, field engineers, site contractor, and others. A weekly agenda and minutes of the prior week's meeting were made available to all attendees. All inquiries about the progress of the project were considered and answered. Minutes of these meetings are included in Appendix C.

5.2 Final Grading and Site Layout

A. Clearing and Grading

The first phase of the site work included removal of the site vegetation including trees that were all hauled offsite for disposal which started in March of 2021. The site was then graded including excavation relocation of the "Wedge" landfill material as discussed in Section 3 of the LFCP. The West Hill was graded to the 2:1 slope as shown on the design plans with the stream located at the toe of this slope. The Wedge excavation landfill material was relocated to the portion of the landfill to remain as shown on the approved plans. This relocation of material was observed by a full-time professional monitoring for any hazardous materials. After excavation of the landfill, remaining native soils were tested per Ecology-approved interim action levels to ensure no contaminated soils remained before filling the lot areas. These tests are included in Appendix C of the IACR. The Wedge area in two locations was significantly deeper and more extensive than expected, resulting in the required import of 30,000 to 40,000 yards (in-place volume) of import sands and structural fill. Additionally, because the landfill material was deeper than expected in the west excavation, clay materials were imported to create a gas barrier for an area along the edge of the closed landfill in that area. The overall final grading for the finished landfill grades were similar to expectations and grades shown on the design plans. The as-built plans show approximate final grades.

Prior to construction, the wedge area had additional testing completed as discussed in the LFCP on page 29. As described in the LFCP, one sample for every 500 cubic yards for the first 2,500 cubic yards, and then one sample taken approximately every 2,500 cubic yards

thereafter resulted in about 25 soil samples. 29 samples of Wedge landfill material were actually sampled and analyzed per the Table G.4 to be conservative. Additional waste characterization was required by the Interim Action Completion Report (IACR) and was accomplished per Section 4.1.3 (Supplemental Landfill Material Sampling). The result of this testing is contained in Appendix A of the IACR. The following sections describe the waste relocation oversight and process in consolidating and final grading the landfill area.

B. Wedge Area Excavation and Confirmation Sampling

The following discussion section include direct quotes from the Interim Action Completion (IACR) prepared by GeoEngineers, the onsite geotechnical and environmental engineering firm employed by the project owner. (The IACR was submitted to the Department of Ecology and the Snohomish Health District.)

To reduce the size of the closed landfill from about 10 acres to about 6 acres, the edges around the landfill were excavated. The wedge area excavated was authorized by LDA # 1 and the LFCP and confirmation soil sampling in the wedge area was performed in accordance with the LFCP and the Interim Action Work Plan, Section 4.1.5. Any perceived contaminated materials were set aside and sent out for testing. Excavation of the landfill material within the wedge area was performed between April 27 and June 23, 2021. One large roof structure was determined to have asbestos and was covered and contained onsite until it was removed by Wrecking Ball Demolition offsite for disposal. When any exceedance of contamination of the excavation was determined by the certified asbestos professional overseeing the wedge excavation, it was relocated onsite and enclosed until relocated offsite by Wrecking Ball. Documentation of material removed for disposal off site is shown in Appendix C of the IACR.

AERO Construction excavated the landfill wedge material and consolidated the excavated material within the main landfill mass. GeoEngineers personnel were onsite to observe wedge area excavation work in accordance with the Interim Action Work Plan (IAWP) and LFCP. A certified asbestos professional from Pac Rim was also onsite to observe for evidence of suspected asbestos-containing material (ACM) and/or lead-based paint (LBP) materials, and to perform sampling in accordance with the IAWP and LFCP. This documentation is included in Appendix E of the IACR.

Landfill material was confirmed to be entirely removed from the wedge area, and it was confirmed that only native soil remained in the base and distal sidewalls of excavated areas. The removed material was also observed for anomalous soil staining, odors, or unexpected wastes such as drums. None were observed. In general, landfill material observed was consistent with observations in previous site investigations and included wood, mineral, and concrete solid materials; tires; plastic; and apparent construction/demolition material such as vinyl tiles and roofing materials. Wood was mostly wood waste (e.g., stumps and branches), with some dimensional lumber observed as well.

The vertical and lateral extents of the landfill and/or wedge area were approximately as anticipated with two exceptions. The As-Built/Record Drawings (see Appendix O) depict the final configuration of the landfill closure and minor modifications to the lot configurations.

- The depth of the landfill/wedge area was deeper than the anticipated depth of approximately 50 feet in the southeastern portion of the project. Accordingly, the final landfill limit was moved approximately 15-30 feet to the southeast with the future residential lot lines adjusted accordingly.

- The lateral extent of the wedge area in the southeastern portion of the project did not extend as far to the southeast as anticipated. The area was approximately 20 to 30 feet narrower than anticipated.

Native soil was field-screened following confirmation that landfill materials were removed from within the wedge excavation area. Confirmation soil samples were then collected by environmental professionals with GeoEngineers from the native soil for chemical analysis to evaluate soil conditions; a total of 59 confirmation soil samples were collected. Nine additional samples were collected as “re-samples,” for a total of 68 soil confirmation samples collected for chemical analysis. Areas were approved for backfill where confirmation soil sampling indicated no analytes exceeded Interim Action Levels (IALs). There were nine samples that contained at least one analyte that exceeded an IAL and soil was over-excavated in these areas and soil resampled. No re-sampled soil contained any analytes exceeding IALs. The over-excavated soil was temporarily stockpiled onsite and subsequently disposed of offsite as discussed later. (A more detailed description of the Wedge work is contained in the Interim Action Completion Report (IACR) prepared by GeoEngineers. See Appendix A of the IACR for Pre-Construction Soil Sampling activities and laboratory packages for the soil confirmation sampling and data validation reports.)

C. Soil and ACM Disposal

As stated above, areas within the Wedge were over-excavated where initial soil confirmation sampling indicated an exceedance of an “interim action level” and the over-excavation soil was temporarily stockpiled on the site. Stockpiles were lined beneath and covered with plastic when soil was not being added to the piles. The soil was profiled for disposal as nonhazardous waste. Wrecking Ball Demolition and Abatement loaded and transported the stockpiled soil from the Site to Regional Disposal Company’s Intermodal Facility in Seattle. The total weight of soil transported was 94.52 tons based on the disposal records. Disposal documentation is included in Appendix C of the IACR.

Suspected ACM (asbestos-containing material) observed during wedge excavation by the certified professional (Pacific Rim Environmental) included primarily roofing materials. The materials were sampled by the certified asbestos professional with the confirmed ACM being segregated and temporarily stockpiled onsite. The stockpile was lined beneath and covered with plastic when ACM was not being added to the pile. Wrecking Ball Demolition and Abatement loaded and transported a total of 247 tons of ACM from the site to Regional Disposal Company’s Intermodal Facility in Seattle. Disposal documentation is included in Appendix D of the IACR. One cement tile was suspected of containing lead-based paint based on visual inspection. However, testing of the tile indicated the tile did not contain lead-based paint.

The Pacific Rim Environment Report is provided in Appendix E of the IACR.

D. Survey

PACE Engineers’ licensed surveyors performed the many surveys for the layout of the site improvements and landfill limits and provided as-built survey documents for the landfill closure features. See Appendix O for record drawings of the closed landfill.

E. Backfilling Wedge Area

It was anticipated that the project would roughly generate enough onsite soil for structural filling purposes during project planning. However, additional import of structural fill was necessary to complete site grading to approved grades. Although some of these grades could have been adjusted to reduce the import needed, a new regulation of having to grade all lots and street areas to within a foot of finish grades, prevented any grade adjustments. Therefore, fill was imported from two main properties to provide soils sufficient to grade all lot and street areas to approximately the final grades shown on approved LDA # 1 drawings.

- ◆ Vacant Parcel southwest of the intersection of NE 124th Street and Willows Road, Kirkland, Washington. The vacant parcel is owned by the City of Kirkland based on information provided. This property is located on King County parcel number 2726059026. Approximately 20,000 cubic truck yards of fill were imported from this property.
- ◆ 8201 Evergreen Way, Everett, Washington. This is a former commercial property (formerly a K-Mart shopping center) located on Snohomish County parcel number 28050700307000. Approximately 30,000 cubic truck yards of fill were imported from the property according to records.

Samples of the imported fill were collected to evaluate the fill sources for potential contamination. Imported fill source soil analytical data are presented in the IACR, Table 2. There were no exceedances of IALs on any of the testing, except one zinc sample that exceeded by 1 mg/kg that was considered insignificant and inconsequential.

F. Lot Exploration Outside Landfill

A “Lot Exploration” was performed outside the landfill in the southeast portion of the site as required by a condition of the approve LFCP and requirement stated on sheet 4 of the approved plans and as described in IACR Section 5.7/5.8 and the Exploration Plan Report is also provided in Appendix F of the IACR. The purpose was to observe and confirm there was no buried landfill material in that portion of the Site which had not been excavated for other purposes. The exploration was performed, and no buried landfill material was observed. The various government oversight agencies all reviewed the area as part of the confirmation process. The results are provided in the Lot Exploration Plan Report, Appendix F of the IACR and Appendix D of this document.

There was some minor landfill material observed continuing to the west of lots 84 and 85 that was not removed. This area is the stream and wetland parcel which is to remain undisturbed and confined in a sensitive area tract. The material was observed at depths of over five feet of non-landfill cover or native soils. In that this area contains a small wetland pond and is within the buffer areas that require future enhancement, it was decided to not excavate further at this time. Furthermore, adjacent testing showed no contamination of any samples taken downstream and in the adjacent Wedge area.

5.3 Final Cover System

A. Landfill Cover Installation

1. **Geomembrane** – The cover design of the closed landfill is shown on the plans and specifications contained in Appendix B. GeoEngineers, in a report titled “Construction Summary Report (LDA #1), Go East Landfill Closure (PFN 20 118246 LDA) (Appendix E)

provide a detailed description of the construction of the Landfill Cover System on pages 3 thru 5 with extensive testing results included in the appendix of the report. GeoEngineers provided complete oversight of the placement and approval of the cover system installed for the closed landfill. (See Appendix F for Geotechnical Field Reports.) This included preparing the top of the landfill material ready for the 6-inch sand layer, installing the anchor trenches, placing and testing of the Solmax 40-mil LLDPE double-sided textured geomembrane and related seam testing. They oversaw the geocomposite drainage layer, and backfilling of the anchor trench. The Geomembrane liner was supplied and installed by ACF West in compliance with the liner layouts shown in Appendix G, the QA/QC Manual by SOLMAX, the supplier of the material. There were two configurations for the geomembrane cover system. Cover 1 as described above and Cover System 2 which consisted of two geomembrane and two geocomposite drainage layers. The geomembrane panels were all welded together with the field seaming process overseen by GeoEngineers. Please see Appendix E for GeoEngineers Report addressing the final landfill closure and compliance with the LFCP. With the installation of the geomembrane the landfill is closed as no rain or surface water can continue to infiltrate down through the landfill material and become contaminated. This greatly reduces the flow from the landfill area that reaches the spring at the toe of the NE slope which should have a positive impact on water quality in the spring water. Additionally, the stream contributing to this former ravine was also diverted away from the landfill further reducing flow thru the landfill.

2. **Geomembrane Cover Material** – Spread over the geomembrane is to be a minimum of two (2) feet of soils. The first foot of depth consisted of local sands excavated from the West Slope and lot areas outside the landfill in addition to imported sands as needed. The placement of this initial 12-inch layer is described in detail in the GeoEngineer's report described in the prior section on page 5. Over the top of the sand layer consisting of at least one foot of depth of vegetative type material including site topsoil from the areas outside the landfill and imported topsoil. The final 12-inch vegetative layer is to be placed as weather allows, during the post landfill closure period, (LDA #2 construction) by June 17th as spelled out in SHD's April 27, 2022, letter for proceeding with LDA #2 work. Cover soils in depths greater than two feet are allowed and can be placed as long as positive drainage is provided on the closed landfill. Once the final vegetative layer is placed the surface of the landfill is to be vegetated with grass hydro-seeding. Additionally features such as the detention pond, storm lines, pedestrian paths, fencing, emergency access road and other features are to be constructed on top of the closed landfill as part of LDA #2 work. In the future play areas, sports fields for local recreation are planned to be constructed on top of the closed landfill, all to be maintained by the local HOA as required by Snohomish County project approvals. Shallow rooted shrubs and other landscaping can be placed and maintained on the landfill as long as the geomembrane is not impacted.

Again, refer to GeoEngineers "Construction Summary Report (LDA #1) dated April 7, 2022, for detailed description monitored/oversight, wedge excavations and filling, and construction of the wedge, buttress fill, cover, and other aspects of the landfill cover construction for material depths, placement requirements, geomembrane seaming, etc., and compaction. Daily geotechnical reports prepared by GeoEngineers are provided in a separate document. For descriptions and documentation of testing results for the

excavated and relocated landfill material refer to the IACR appendices. All imported soils were tested for any contamination and the documentation is included in the IACR.

5.4 Stormwater Improvement/Erosion & Sedimentation Control

A. Construction Stormwater

The Site maintained coverage under the Ecology” Construction Stormwater General Permit,” an Administrative Order, and Snohomish County requirements as contained on the approved LDA # 1 design drawings and specifications. The LDA # 1 plans and specs provided specific Temporary Erosion Control features that were required to be in place and maintained throughout the landfill closure activities. PACE’s site engineer was a certified CESCL and oversaw the day-to-day updates needed to maintain erosion control features and prevent any surface landfill runoff from leaving the site (Appendix H). This was done by directing any surface water to the temporary detention pond constructed on the landfill (as shown in the LDA # 1 plans) and by using native sand subgrades in the areas around the landfill. All surface water/groundwater encountered during the interim action work on the landfill was infiltrated and no surface water from the landfill or wedge area was known to have run off the site. It was assumed the infiltration eventually exited the site as “spring water” that emanates from the toe of the northeast slope as the site is underlain by 150 feet or more of very dense and low permeable soils.

A mud flow occurred with material being placed on the northeast steep access, liquefying during a heavy rainstorm and flowing down and covering a portion of the wetland area below the landfill. This unfortunate event did not affect the landfill itself in any way. However, after this event, surface water that flowed down the access was collected at the toe of the slope was pumped back up into Baker tanks and held until it was tested and treated prior to discharging it from the site. During this period some of the water being pumped was runoff from uncovered landfill areas which may have been contaminated and was pumped to the future cul-de-sac/lot area for infiltration and temporary holding until it could be tested and treated prior to release. Clear Water of Everett provided the treatment facility for treating any water that may have been contaminated. Infiltration continued to be the primary method of dealing with surface water that came in contact with landfill material. The soils underlying the cul-de-sac/lot area where this water was temporally held is to be sampled and tested to confirm soils are not contaminated. The soil confirmation sampling results for the cul-de-sac/lot area will be reported in an Interim Action Completion Report Addendum.

Daily project reports were kept by the PACE site engineer to record activity. These reports are included in Appendix H.

B. Permanent Stormwater

The entire development consisting of the closed landfill and adjacent 96-lot subdivision was designed based on the surface water regulation in place at the time of project approval. The permanent stormwater includes a two-cell detention pond located on the landfill, and over the top of the Cover System 2 area. These ponds are designed to be year around ponds for treatment of the site runoff. The detention pond is sized to provide, detain, and control discharge from the entire site and has been enlarged to compensate for any bypass areas that are too low to directly discharge to the ponds. The closed landfill has been designed and constructed with slopes and swales to direct surface areas directly to the detention ponds. Those areas that have increased runoff due to the geomembrane cover system, which are

too low to discharge to the ponds have been included in compensating storage in the pond sizing, such that this area does not increase discharge off the site. Much of the area below the access road running across the closed landfill, directs any surface and ground water runoff to a swale and collection pipe running along the east edge of the Cover system 1. From there runoff flows down the rock access to the toe of the slope and Spring Box located at the toe of the NE slope. Construction of the detention ponds and related, controls, and piping are all included in LDA #2 construction.

5.5 Deep Dynamic Compaction Requirements Under Detention Pond

To preclude any significant settlement that might possibly occur under the detention pond, which is located on the landfill, deep dynamic compaction was completed by Malcolm Construction under the direction of GeoEngineers. (See Appendix I – Dynamic Compaction Specification and Report by Malcom Drilling.) The work was accomplished in accordance with the work plan attached in Appendix C of GeoEngineers “Construction Summary Report” that depicts the drop pattern. The compaction effort consisted of 297 drop locations with an 8-foot-diameter weight of 25 tons being dropped from a height of 40 feet. The ground surface typically was lowered about 4 feet by dropping the weight five times per location and some holes were as much as about 6 feet. Please refer to Appendix E for GeoEngineer’s description of this work on page 8 of the “Construction Summary Report (LDA #1) and observation included in Appendix C of their report.

5.6 Landfill Gas Control

The landfill gas collection system consists of features as detailed in the approved LDA #1 drawings contained in Appendix B and described as follows:

- ◆ Because the closed landfill is capped with a geomembrane, methane gas that may form in the landfill can no longer rise and be discharged into the atmosphere. As the geomembrane wraps the edge of the landfill and is extended down into native soils, the gas is trapped. Instead, the gas will rise and be picked up in the 6-inch sand layer underlying the geomembrane. Any gas would then travel upward and outward to the perimeter of the landfill where a gravel gas trench has been installed around the upper outer edge of the landfill and which also contains a 2-inch perforated collection pipe. The pipe directs any gas to one of four manhole structures where the gas level is monitored. These four locations will have installed gas monitors that monitor methane gas 24/7 as described in the Landfill Closure Plan and as further described in the “Landfill Gas Monitoring and Contingency Plan” (Appendix J). The 2-inch gas collection piping is then directed to one of three discharge pipes lying over 100 feet from any lot and with a discharge of 10 feet above the ground level as required in the LFCP.
- ◆ Additionally, two gravel trenches have been constructed at the top of the 3:1 slope of the landfill and any gas collected is directed to the gas discharge piping and discharged at 10 feet above grade.
- ◆ Just outside the closed landfill and in the area between the geomembrane extending to native soils and the lot lines, twelve gas probes have been installed. Their purpose is to monitor any gas levels just outside the closed landfill. This monitoring is to be accomplished per a “Landfill Gas Monitoring and Contingency Plan,” Appendix J, as authored by Vikek Environmental Engineer, LLC and dated March 18, 2022. Their design is shown on sheet 8 of the project as-built drawings and in detail in “Technical Memorandum” prepared by Vikek Environmental Engineering LLC and dated March 15,

2022, contained in Appendix K. Details on the construction for the 12 gas probes is included in Technical Memorandum for the Landfill Gas Probe Installation prepared by Vikek Environmental Engineers, LLC and included in Appendix K.

- ◆ Future homebuilders are responsible for the requisite design and construction of home gas mitigation systems for future homes build within 1000 feet of the landfill

5.7 Northeast Landfill Slope

Construction related to the Northeast Landfill Slope involved completing a number of tasks from observing the slope lying below elevation about 190 feet for hazardous materials that was left in its current natural stable state, to installing a buttress fill at the toe of the slope, to channeling various seeps into the a spring box for testing the spring water emanating from the toe, to verifying any contamination related to the slope in the access to the toe. A Memorandum prepared by GeoEngineers addresses all of these issues in a document dated April 7, 2022, "Go East Landfill Northeast Slope Reconnaissance and Observations," (Appendix L) from an environmental perspective and from a geotechnical aspect on pages 7 and 8 in the "Construction Summary Report (LDA #1) (Appendix E). Nothing hazardous was discovered either on the undisturbed NE slope or during the work in constructing the buttress slope or installing the spring box or wells at the toe of the slope.

6 PROJECT CLOSEOUT AND POST-CLOSURE REQUIREMENTS

Once the Landfill Closure receives approval from Snohomish Health District, the Post-Closure period begins. Snohomish Health District is issuing a landfill post-closure care permit following closure of the landfill. The landfill permit specifies the monitoring activities for the landfill.

A. Groundwater Monitoring Wells

A total of 10 wells will have been installed related to the Go East Landfill closure. Six of the wells are as described and shown in the LFCP. Four additional wells have been added as related to the MTCA process. Well logs 1 thru 4 are shown in the LFCP Appendix B. Well 4 has been decommissioned due to it being a dry well and never producing water. (Decommissioning documentation is contained in Appendix M.) The wells are to be tested for two purposes, one to meet the LFCP requirements of quarterly testing and the second to meet the MTCA testing requirements. The current well installations and testing are overseen by GeoEngineers. Please refer to Appendix N for well logs and testing results of the wells.

B. Spring Box and Surface Water Monitoring

The landfill post-closure permit requires surface water monitoring/testing at the spring box. The box is depicted on the Record drawings contained in Appendix O. Construction of the Spring Box is described on page 7 and 8 of GeoEngineers' "Construction Summary Report" contained in Appendix E. This water is a combination of flow that occurs directly under the closed landfill area and would include any flows from the former stream at the bottom of the landfill, and seeps that flow from the sides of the ravine from adjacent lands. The former stream that originally flowed in the ravine, has been diverted to the south and no longer provides surface water to this basin. On the west end of the closed landfill a clay barrier was constructed to limit any water entering the closed landfill except for an area of gravel placed in the former stream channel under the bottom of the clay barrier.

C. Landfill Gas Probes and Monitoring Manholes

Landfill gases are monitored post-closure in two ways. First there are installed four (4) manhole-type structures that are to house 24/7 monitoring devices. These devices will monitor gas that is collected along the inside edge and under the geomembrane in the gravel trench and 2-inch-diameter collection piping. The monitoring equipment being utilized is Wi-Fi capable of monitoring and reporting gas levels. Please see Appendix J for the specifications on this gas monitoring equipment. Additionally, 12 gas probes are located just outside the landfill cover system to monitor gas levels at the edge of the residential lots as describe in the “Technical Memorandum” prepared by Vikek Environmental (Appendix K). Gas monitoring is to be done as presented the Vikek’s “Landfill Gas Monitoring and Contingency Plan (Appendix J).

D. Interim Action Completion Report

An Interim Action Completion Report has been prepared under Ecology’s direction and per an Agreed Order (DE 18121) documenting the activities completed related to the landfill closure. The Plan, which was prepared by GeoEngineers, is contained on Ecology’s website for the Go East Landfill closure.

E. Environmental Covenant and Future Landfill Surface Uses

The surface of the closed landfill contains current and future improvements for the benefit of Bakerview, a 96-lot subdivision that surrounds the closed landfill. Some of the improvements previously discussed such as the stormwater detention pond, control structure, piping, ditching, and an emergency access, must be operated and maintained in compliance with Snohomish County requirements on the landfill. Others, such as play areas, open space, paths and trails, fencing, surface maintenance, landscaping, etc., must be maintained by the community to Snohomish Health District and County standards and will be a requirement on the recorded plat. An Environmental Covenant is required and being prepared to address future landfill surface uses. Initially the property owner is responsible for these amenities and the landfill closure parcel. Maintenance related to the landfill surface, surface water features, and other items are detailed in Appendix F of the LFCP. These improvements do not include the initial Post-Closure requirements related to methane gas, surface water, and groundwater monitoring describe in the previous section.