May 17, 2024
File No. 04224030.19

Mr. Mike Davis
Ms. Tina Kendall
Clark County Public Health
Solid Waste Operations
1601 E. Fourth Plain Blvd. Building 17
Vancouver, WA 98661

Subject: Work Plan for Landfill Liner Investigation to Address Surface Water Management Issues, Northeast Corner of Closed Leichner Landfill, Clark County, Washington

Dear Mike and Tina:

SCS Engineers is pleased to present this work plan to Clark County Public Health (CCPH) outlining the scope of work to investigate stormwater management issues encountered at the northeast corner of the Closed Leichner Landfill (Landfill) in Clark County, Washington during December 2023. The purpose of this work is to investigate the conditions that caused the observed stormwater accumulation problems. Information gathered during this investigation will be used to (1) develop methods to manage the various sources of water in this area so that the integrity of the landfill's cover system is preserved and (2) support repair options to the stormwater control system in this area of the Landfill.

As part of the recent NE 99th Street Extension across the north end of the Landfill property, stormwater drainage was installed, including a geomembrane between the existing landfill cover geomembrane at the northern extent of the Landfill grade and the stormwater outlet structure, located northeast of the Landfill. During December 2023, the area experienced significant rainfall (5 inches over six days). Stormwater collected under the new geomembrane near the stormwater outlet, causing the geomembrane to float. In addition, there were significant erosional features created on some of the slopes off the Landfill.

Other erosional features were noted, including soil piping and flowing subsurface fine-grained soils. Collectively, the stormwater impacts were attributed, in part, to suspected subsurface water drainage infrastructure and the separation of the two geomembranes, causing the observed issues where subsurface waters are not directed toward a drainage outlet.

FIELDWORK ACTIVITIES

Information on subsurface conditions will be collected using two methods. The first method will be a non-invasive ground penetrating radar (GPR) survey. The second method will be a test pit investigation in select locations, following analysis of the GPR results. Both methods are discussed below.

TASK 1 – GROUND PENETRATING RADAR

SCS has subcontracted Geopotential Residential & Locates (Geopotential) to conduct a GPR survey of the area in the northeast corner of the Landfill. The equipment used for the survey is a MALA HDR Ground Penetrating Radar, which will scan the subsurface along multiple transects across the area and produce a feedback signal. Geopotential will attempt to locate any subsurface piping that potentially directs water from the Landfill to the northeast corner. Any piping found will be traced as far as possible within the area of interest. In addition, Geopotential will attempt to locate the original geomembrane cover for the Landfill, and the depth of the geomembrane, as well as any other features that may influence or direct subsurface water. Anything that is found but cannot be identified will also be marked and noted.

Any potential pipes and/or features will be marked out in the field with labeled flagging and/or stakes as reference for the next step in the investigation. SCS personnel will be onsite during the survey to direct and document any discoveries. Geopotential will also provide a report of the survey documenting the field methods used and identifying any targets that were found during the survey.

TASK 2 – TEST PIT INVESTIGATION

Test pit locations will be established based on (1) the results of the GPR survey, (2) observations (e.g., soil piping, erosion features) made during and after the December 2023 storm event, and (3) previous cover system work completed on the north end of the Landfill. Tentative, initial locations will be identified in the field before the excavation activities are started.

All digging will be conducted using a small excavator with a flat edged shovel. No teeth or sharp-edged buckets will be used to excavate the test pits. In addition, SCS field staff will be on site to direct the excavator and to do any hand shoveling, as necessary. Extreme caution will be used to make sure the liner is not damaged during this investigation. Should the liner be encountered, the depth and location will be noted in field notes and marked in the field with a flag or stake. Any pipe run or open-ended pipe found buried in this area will be marked in a similar manner. During the investigation, SCS personnel will document the findings in each of the test pits with photographs and in the field notes.

Once the necessary information has been obtained, the soil will be replaced in the test pit and compacted as much as possible. Anything that will require surveying will be flagged and/or staked and clearly labeled. Once the test pits are finished, areas will be reseeded as necessary.

A professional surveyor will record northings, eastings and elevations of various points, as necessary, based on the information found in the above two steps.

SCHEDULE AND REPORTING

The GPR survey will be completed in a single day. A written report will be provided by Geopotential within 5 business days of completing the work. The test pit investigation will be scheduled based on the GPR survey results, weather, and access conditions for the investigation area. The test pit investigation will require one to three days to complete, depending on observations and discoveries during the investigation.

Within 15 days of completing the final field work activities, a letter report summarizing the findings will be prepared for CCPH's review.

Sincerely,

Barbara E. Lary, LG
Project Manager
SCS Engineers

Louis Caruso, LG, LHG
Project Director
SCS Engineers

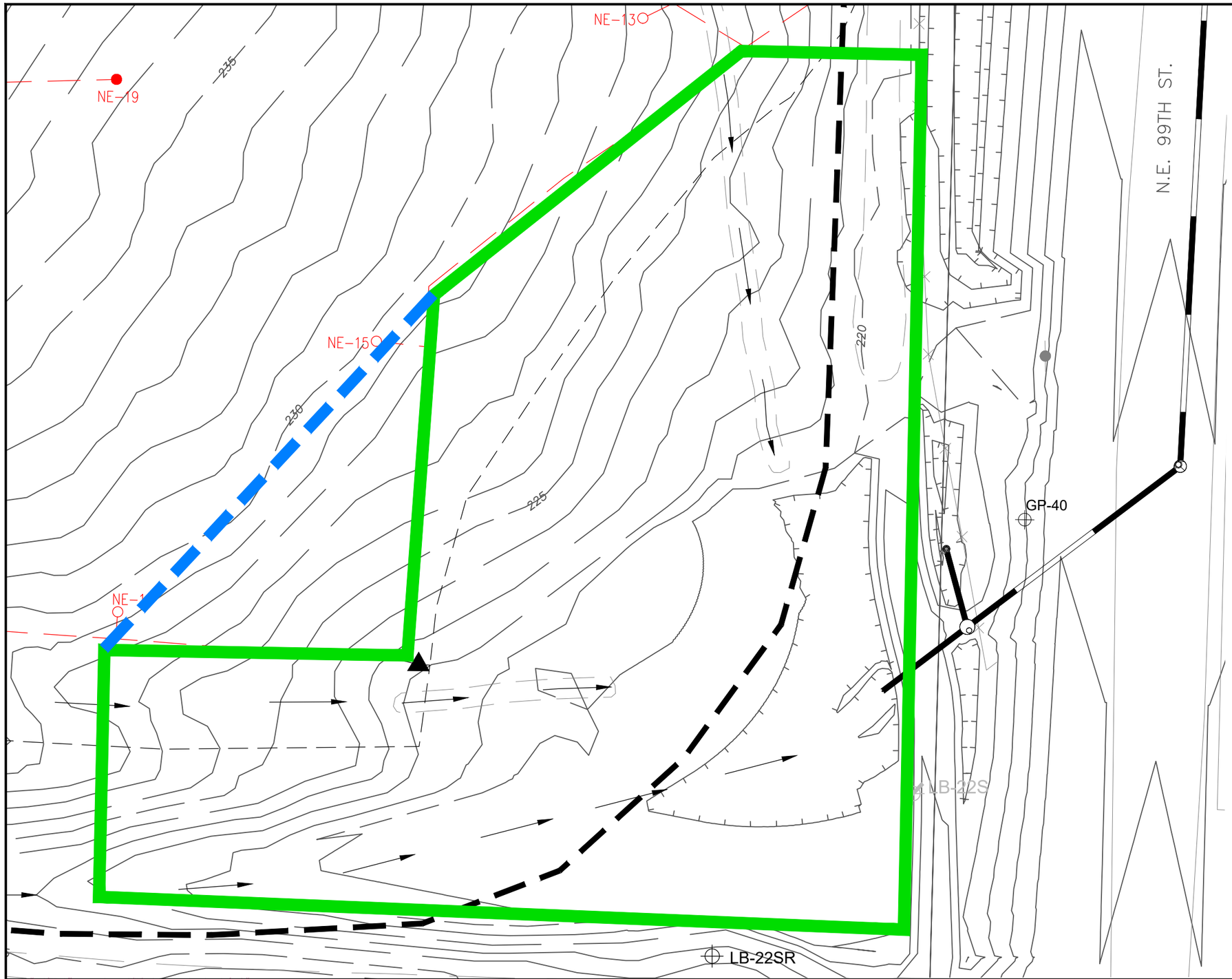
BEL/JC

cc: Alan Melnick and Melissa Sutton, CCPH
Andrew Smith and Danielle Gibson, Washington Department of Ecology
Mike Gallagher, Washington Department of Ecology

Attachments: Figure 1 – Area of Investigation

ATTACHMENT 1

FIGURE 1 – AREA OF INVESTIGATION



LEGEND:

- Property Boundary
- Contour Lines
- Drainage Path
- Drainage Area Boundary
- Stormwater Drain (Design Layout)
- GP-32 — Compliance Landfill Gas Monitoring Probe Location
- LB-22S — Decommission Landfill Gas Monitoring Probe Location
- NE-19 — Vertical Landfill Gas Extraction Well
- Condensate Sump
- Gas Collection Piping
- Condensate Piping
- Investigation Area
- Additional Investigation Limit (If Necessary)

NOTES:

1. Topography taken from Clark County GIS, December 2023.

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SCALE
0 40 80 FEET

PROJECT NO. 04223030.14	DES BY B.R.
SCALE AS SHOWN	CHK BY B.L.
CAD FILE FIGURE 1	APP BY L.C.

SITE MAP

LEICHNER LANDFILL
VANCOUVER, WASHINGTON

DATE MAY 2024
FIGURE 1