May 2, 2024

Oregon Department of Environmental Quality
700 NE Multnomah Street, Suite 600
Portland, OR 97232

Attention: Ryan Lewis

Basis of Design and Engineering Approach
2800 NE 82nd Avenue
Portland, Oregon
Project: SOJ-7-05

INTRODUCTION

This basis of design and engineering approach outlines measures that Bird Alliance of Oregon Inc. and Bird Alliance of Oregon Nature and Wildlife Care Center, LLC (together, Bird Alliance) agree to perform under the prospective purchaser agreement (PPA) with the Oregon Department of Environmental Quality (DEQ) for the property located at 2800 NE 82nd Avenue in Portland, Oregon (subject property). The 12.49-acre property consists of Tax Lot 400 of Multnomah County Tax Map 1N2E28BC and occupies the approximately west half of the approximately 26-acre former H.G. LaVelle Landfill (Landfill). The subject property is currently owned by Skidmore Limited Partnership, an Oregon limited partnership ("Owner") and is occupied by a former golf driving range, including covered tee boxes and a vacant building, a cell tower, and a portion of a landfill gas control system (LGCS).

Bird Alliance intends to construct a state-of-the-art wildlife care center at the subject property using sustainable and wildlife-friendly building practices. The new facility may include an approximately 5,000-square-foot wildlife care center and up to 34 open-air animal enclosures that will total approximately 19,000 square feet. Subject property redevelopment is anticipated to occur in separate construction phases, a schedule for which has not yet been established.

We anticipate that this basis of design and engineering approach will be included with the PPA as an attachment.

BACKGROUND

The following sections describe the subject property's historical use, historical regulatory interaction, and previous environmental studies.

HISTORICAL USE

The subject property was first developed with a gravel quarry operated by Rose City Sand & Gravel Co. with associated structures and access roads from at least 1936 through 1972. In 1957, a structure was constructed on the west portion of the subject property. Between 1972 and 1982, the former gravel quarry, which was present on a majority of the subject property, on the adjacent property north of the subject property (currently occupied by the Asian American Plaza), and on the adjacent property north and east of the subject property (currently occupied by Dharma Rain Zen Center [Dharma Rain]), functioned as the Landfill and was backfilled with soil and construction and demolition debris. The debris included inert material such as brick, metal, and concrete; appliances; and organic material, including plants and wood. In addition, a limited amount of household waste was disposed of at the Landfill, contrary to DEQ permit requirements. By 1975, the structures associated with the former Landfill operations at the subject property had been removed, except for the 1957 structure. In 1979, the LGCS was installed at the subject property. In 1982, the Landfill ceased operation and was capped with fill soil. By 1990, a golf driving range was constructed on the subject property. By 2000, a radio tower was present on the southwest portion of the subject property. By 2005, the golf driving range was no longer operating, but the structures associated with the driving range (including covered tee boxes and the 1957 structure) remained on the subject property. In 2007, the existing radio tower was converted to a cell tower. In 2009, the LGCS was expanded, including two new extraction wells along the south subject property boundary.

HISTORICAL REGULATORY INTERACTION

Post-closure maintenance of the subject property is managed under a Solid Waste Disposal Site Closure Permit, Construction and Demolition Landfill, Permit No. 211, issued to Mike Hashem and PSFM Limited Partnership, an Oregon limited partnership (together, "Hashem"), effective November 14, 2011, to August 31, 2021 ("Closure Permit"). The Closure Permit has been administratively extended by DEQ. The DEQ-issued Closure Permit authorizes the permittee to conduct operation and maintenance of the LGCS, landfill gas monitoring, maintenance of the soil cap (covering the landfill portion of the subject property), surface-water controls, and inspections, among other measures to ensure the subject property is protective of human health, ecological receptors, and the environment. The Owner and Hashem have not been and, as of the date of this basis of design and engineering approach, are not in compliance with the Closure Permit. DEQ has previously brought enforcement actions against Hashem. As a result of the Owner's and Hashem's non-compliance, the LGCS does not currently meet the requirements of the Closure Permit and DEQ's laws and regulations. Moreover, the owner/operator of the subject property shut down the LGCS without approval from DEQ, in violation of the Closure Permit.

It is our understanding that, upon acquiring the subject property, Bird Alliance will become the permittee for the new solid waste landfill Closure Permit and assume responsibility for operating, inspecting, monitoring, and maintaining the LGCS. The requirements of the Closure Permit are separate from the requirements under the PPA. It is our understanding that DEQ will provide

public notice and opportunity to comment on a proposed certification decision once Bird Alliance has completed the work outlined in this basis of design and engineering approach regardless of whether the Closure Permit is still in effect. Within 90 days after receiving Bird Alliance's closeout report and consideration of public comment, DEQ will issue a final Certificate of Completion.

PREVIOUS ENVIRONMENTAL STUDIES

In connection with Bird Alliance's environmental due diligence, NV5 conducted the following environmental studies: 1) a Phase I environmental site assessment (ESA) dated October 11, 2023, and 2) a Phase II ESA and landfill gas extraction system assessment dated April 26, 2024. The Phase II ESA and landfill gas extraction system assessment was conducted in accordance with a DEQ-approved work plan dated December 14, 2023.

Extensive sampling of soil and soil gas at the subject property during the Phase II ESA indicates that the primary concern of impacts to human health and the environment is the potential for methane migration. Soil gas sampling activities in the interior of the subject property identified methane in soil gas at concentrations up to 6.80 percent by volume (pbv) and identified gasoline-range hydrocarbons and benzene in soil gas at concentrations greater than the DEQ Vapor Intrusion into Buildings—Chronic risk-based concentration (RBC) for commercial receptors.

Environmental characterization of subsurface conditions also identified limited impacts to the soil cap material and shallow and deeper solid waste at the subject property from petroleum hydrocarbons, volatile organic compounds (VOCs), metals, polycyclic aromatic hydrocarbons (PAHs), and/or pesticides. Contaminants present in the soil cap and shallow solid waste throughout the subject property (the upper 5 feet of soil) do not exceed applicable DEQ RBCs for human health but do exceed DEQ clean fill screening levels (CFSLs). Additionally, contaminants present in the upper 5 feet of soil throughout the subject property exceed DEQ Ecological RBCs that may be applicable to birds and mammals that may occupy future open-air enclosures.

Groundwater results from samples collected in March 2001 from two down-gradient monitoring wells (GWMW-1 and GWMW-2) north of the subject property on the adjoining Dharma Rain site and Asian American Plaza site did not indicate the presence of VOCs or semi-volatile organic compounds (including PAHs), except for Bis(2-ethylhexyl) phthalate. Several total metals were detected at concentrations greater than the current DEQ Ingestion & Inhalation from Tapwater RBCs. The groundwater results of leachate parameters were not indicative of leachate impact to groundwater. The depths to groundwater measured in monitoring wells GWMW-1 and GWMW-2 in March 2001 were approximately 191 and 202 feet below ground surface, respectively, indicating a significant vertical buffer of presumed clean soil between the bottom of the Landfill and the water table. A beneficial water use determination did not identify water supply wells at the subject property, or within 0.25 mile of the subject property. Potable water is supplied to the surrounding properties by the Portland Water Bureau, which sources water from the Bull Run watershed and the Columbia South Shore Wellfield. Groundwater in the subject property vicinity is neither currently nor reasonably likely in the future to be developed for municipal or community consumptive use. Consequently, the DEQ Leaching to Groundwater exposure pathway is considered incomplete.

BASIS OF DESIGN

OBJECTIVES

With respect to methane mitigation and mitigation of other volatile contaminants in soil gas at the subject property, the primary objectives for the basis of design will be as follows:

- Mitigate potential for methane to accumulate in a confined space or structure at concentrations exceeding 25 percent of the lower explosive limit (i.e., 1.25 pbv).
- Mitigate potential for gasoline-range hydrocarbons and VOCs to migrate into a structure at concentrations greater than acute and chronic air RBCs for commercial receptors.
- Ensure that the proposed improvements do not exacerbate existing conditions on the subject property; for example, resulting in or increasing off-site methane/vapor migration through utility corridors or by accumulation beneath paved areas on the subject property.
- Ensure that any disturbances to the current LGCS are minimal and/or temporary.

Soil cap material contains contaminants exceeding DEQ Ecological RBCs and/or CFSLs, but not DEQ human health RBCs. Therefore, soil cap material can be reused on site without restriction. With respect to the soil cap on the subject property, the primary objectives of the basis of design will be as follows:

- Mitigate future facility wildlife exposure to contaminated soil exceeding ecological RBCs within the open-air enclosures.
- Mitigate human health exposure to solid waste within the Landfill at the subject property.
- Maintain the soil cap's integrity after construction is complete.

MITIGATION AND OTHER MEASURES

The landfill gas mitigation measures that Bird Alliance agrees to perform under the PPA to meet the above objectives include the following:

1. Implement engineering controls in the form of active or passive ventilation mitigation systems incorporated into the development plans that will address the potential for unacceptable methane accumulation within the interiors of future enclosed spaces.
2. Implement engineering controls in the form of trench dams within utility corridors to prevent migration of methane off site through utility trench backfill materials.

Other measures that Bird Alliance agrees to perform under the PPA are as follows:

3. Implement an institutional control in the form of an Easement and Equitable Servitudes (EES) to be recorded with Multnomah County, restricting the use of groundwater and restricting activities that would compromise the engineering controls.
4. Mitigate human health exposure to the solid waste within the landfill by maintaining the soil cap's integrity after all phases of development are complete. Mitigate exposure of future facility wildlife that will inhabit the open-air enclosures to contaminated soil exceeding ecological RBCs by placing at least three feet of imported substrate material at

the bottoms of the enclosures or, if the substrate material is less than three feet thick, placing a substrate barrier between the substrate material and the contaminated soil exceeding ecological RBCs.

5. Submit the following documents to DEQ during various phases of the redevelopment activities:
    - Soil and Solid Waste Management Plan (SSWMP)
    - Health and Safety Plan (HSP)
    - Methane mitigation engineering plans and specifications
    - Inspection and progress reports

In addition, Bird Alliance will submit a final closure report after all phases of construction are complete.

DESIGN CONCEPTS

NV5 will assist the development team by preparing methane mitigation engineering plans and specifications that will be submitted to DEQ for approval and may also be used for bidding and construction purposes. The plans will define the extent of the methane mitigation design elements, locate the trench dams, and provide engineering details. Specifications will describe the required materials, installation procedures, and testing requirements for the design elements.

At this time, conceptual design elements have been developed for measures 1 and 2 described above. Preliminary design recommendations for measures 1 and 2 are described below. In addition, details pertaining to measures 3 through 5 are described below.

Measure 1

Based on our understanding of the subject property's conditions, methane is present in the subsurface at the Landfill. The proposed development includes structures on the subject property in areas over the Landfill. The LGCS present around the perimeter of the landfill has historically demonstrated that it successfully mitigates off-site migration of methane to adjoining parcels.

The landfill material has been in place for at least 30 years. While methane generation has apparently decreased over time, the possibility of methane migrating into future enclosed spaces and accumulating at concentrations greater than 1.25 pbv (25 percent of methane's lower explosive limit) and thus becoming an explosion hazard cannot be ruled out. Therefore, engineering controls in the form of active or passive ventilation mitigation systems should be incorporated into the development plans and specifications that will address the potential for unacceptable methane accumulation under structures and confined spaces during and after development of the subject property.

Various foundation and structural design concepts are currently being evaluated. Preliminary designs for the development include a 5,000-square-foot wildlife care center with deep pile foundations and 34 open-air animal enclosures with deep pile foundations. The wildlife enclosures may be grouped together to minimize the number of piles needed. To ensure that future building occupants and wildlife will not be exposed to unacceptable risk due to methane,

we recommend the enclosed structures include one of the following design options: 1) maintain a clear height above grade of at least 12 inches to girder, 18 inches to floor joist, and 24 inches to structural floors with ventilation openings of the under-floor crawl space of either 1 percent of the under-floor area or openings of not less than 1.5 square feet per 25 linear feet of exterior wall; 2) include active mechanical ventilation of the building crawl spaces, possibly controlled with a methane detector; or 3) install sub-slab passive venting systems and low permeable membranes beneath the floor slabs. The low permeable membrane should consist of a 60-mil, spray-applied membrane or high-density polyethylene membrane. Either membrane type should be installed and inspected by qualified personnel. The vent systems should consist of flat vent piping or perforated PVC piping beneath the low-permeable membrane that would then be vented vertically through the structure's roof. Since the project is still in the early stages of planning, with only conceptual designs underway, the methane mitigation design elements cannot be presented until other discipline designs (primarily architectural and structural) are further developed.

The current soil cap allows some level of atmospheric venting of methane. During development, construction of less permeable surfaces such as pavement or concrete could exacerbate current conditions and allow methane to accumulate to unacceptable levels. Therefore, landscaped areas should be incorporated into the less permeable areas to facilitate continued atmospheric venting from beneath newly paved or hardscaped covered areas (including structures). If paved areas exceed 5,000 contiguous square feet and are within 15 feet of the exterior wall of the wildlife care center, landscaped areas that are at least two feet wide will be installed immediately adjacent to the building's exterior walls, covering at least 80 percent of the building's perimeter as recommended in the Los Angeles Department of Building and Safety Methane Mitigation Standard Plan. Additional enhancements that may be warranted beneath these areas could include installation of passive vent piping in a grid array beneath the pavement to enhance venting beneath the less permeable areas.

Measure 2

As part of the development, utility corridors for storm sewer, sanitary sewer, and other utilities will likely extend off site to existing trunk systems in the city right-of-way. To mitigate potential for uncontrolled migration of methane through relatively permeable trench backfill and potentially off site, trench dams typically consisting of cement-bentonite, other concrete mixes, or compacted native soil are recommended at all locations where utilities extend off site and also immediately adjacent to building footings such that methane/vapors do not migrate beneath planned structures. In addition, utility vaults should be equipped with vented covers and penetrations should be sealed. In the event electrical power will be installed underground, underground electrical conduits should be sealed where they daylight before entering electrical panels or junction boxes, where potential ignition sources could be present. We also recommend that electrical devices/equipment within enclosed structures be intrinsically safe such that they are incapable of producing heat or spark sufficient to ignite an explosive atmosphere.

Since current development plans are not final, it is possible that future buildings may be constructed at locations that may require slight modification of the extraction system layout, such as removal and replacement of extraction wells, monitoring probes, vents, or some combination of these. Modifications to the extraction system layout should be conducted by

qualified personnel and verification testing (confirming vacuums and flow are present, as expected) should be conducted after modification to ensure proper operation.

Measure 3
Bird Alliance will record with Multnomah County Clerk an EES and will provide DEQ a file-stamped copy of the EES within five working days of recording. The EES will stipulate restrictions for property use, engineering controls to be implemented and maintained, and expected inspection and reporting requirements. It is likely the EES will restrict groundwater use, restrict land use, and restrict penetration of the soil cap and vapor barriers (if present). Each restriction and engineering control contained in the EES will run with the land until such time as the restriction and engineering control can be removed by written certification from DEQ (Certificate of Completion) and recorded in the deed records of Multnomah County, certifying that restrictions or engineering controls are no longer required to ensure the subject property is protective of human health, ecological receptors, and the environment.

Measure 4
Bird Alliance has assumed that the owner will conduct all work necessary to bring the soil cap and stormwater control features into compliance with the permit before the closing date of the property's sales transaction, including (1) removing all fire hazards and overgrown vegetation, (2) removing debris and litter, (3) removing ponded water (to deter leachate production), (4) grading the soil cover surface to achieve contours of at least 2 percent (to minimize leachate generation), and (5) repairing the stormwater controls used to divert stormwater away or around the perimeter of the landfill (such as surface water diversion ditches) so that they function correctly and do not result in wells associated with the LGCS to be buried in sediment. In addition, Bird Alliance has assumed that the owner will repair the perimeter fencing to control public access and prevent unauthorized entry, as also stipulated in the permit, prior to the closing date.

If any of the above permit-compliant stipulations are compromised during redevelopment activities, Bird Alliance will repair and restore the compromised stipulation(s) to pre-disturbed conditions. As noted above, Bird Alliance assumes that the pre-disturbed conditions will have been in compliance with the permit before potential disturbance and/or compromise during redevelopment activities.

Bird Alliance will mitigate exposure of future facility wildlife that will inhabit the open-air enclosures to contaminated soil exceeding ecological RBCs by placing at least three feet of imported substrate material at the bottoms of the enclosures or, if substrate material is less than 3 feet thick, by placing a substrate barrier such as fiberglass mesh or pervious concrete between the substrate material and the underlying contaminated soil exceeding ecological RBCs.

NV5 also recommends that, to the extent practical, efforts be made to avoid or limit excavations through the existing soil cap cover during installation of catch basins, storm sewer piping, or other required improvements. Excavation work within the soil cap or that will extend through the soil cap into the solid waste should be conducted by personnel with the appropriate health and

safety training in accordance with the pending SSWMP. All excavations should be properly backfilled and compacted in accordance with geotechnical recommendations to adequately restore covered conditions.

Measure 5
If DEQ determines modifications to the work specified in this document are necessary, Bird Alliance anticipates preparing a written revision to this basis of design and engineering approach and submitting the additional following documents to DEQ during various phases of the redevelopment activities: SSWMP, HSP, methane mitigation engineering plans and specifications, inspection and progress reports, and final closure report.

Soil and Solid Waste Management Plan
An SSWMP will be prepared and submitted to DEQ for review within 60 days before the initial phase of redevelopment. The SSWMP will summarize methods to be employed for the management (handling and disposal) of soil and solid waste that may be encountered during earthwork activities and describe soil cap restoration measures to be implemented upon completion of earthwork and final grading activities. In addition, the SSWMP will (1) outline standard procedures for the evaluation of imported and exported fill soil; (2) outline procedures for the identification and management of unforeseen waste material that may be encountered during portions of site earthwork; (3) provide the earthwork subcontractor with guidance related to the identification, notification, and handling of potential unforeseen waste; (4) establish a decision structure supporting the management of potential unforeseen waste; and (5) present contractor reporting requirements.

Health and Safety Plan
NV5 will prepare a site-specific HSP for its employees and employees of subcontractors contractually bound to NV5 for their site activities. Other consultants, agencies, and contractors not under the direction of NV5 will be responsible for developing and implementing their own HSP. The site-specific HSP will present a description of existing site conditions and responsibilities of project personnel and will describe the criteria for hazard and risk evaluation, levels of personal protection, air monitoring procedures, decontamination procedures, safety rules, emergency response procedures, training requirements, and standards for routine healthcare monitoring.

Methane Mitigation Engineering Plans and Specifications
NV5 will prepare engineering plans (drawings) and specifications to help mitigate the hazards posed by methane and development on the former landfill. The engineering plans and specifications will incorporate the design concepts described in this basis of design and engineering approach and will mitigate potentially unacceptable concentrations of methane to levels protective of receptors occupying proposed future enclosed structures. The plans and specifications will be submitted to DEQ for review and approval and can also be used for bidding and construction purposes. The plans will define the extent of the methane mitigation design elements, location of trench dams, and provide engineering details. The specifications will describe the required materials, installation procedures, and testing requirements for the design elements. The engineering design recommendations for the proposed development will be

sufficiently conservative and protective of human health and, in our professional opinion, will mitigate potential for methane to accumulate under an enclosed structure at concentrations exceeding 1.25 pbv regardless of future operation of the LGCS.

Inspection and Progress Reports

Periodic inspection and progress reports will be submitted to DEQ to document the results of all activities conducted during the redevelopment phases related to methane mitigation and soil cap and stormwater control features restoration and maintenance activities. At this time, we propose submitting progress reports on a quarterly basis. More frequent reporting may be necessary if monitoring activities during construction show upward-trending methane concentrations or if changed site conditions cause increased risk to public health and safety.

Final Closure Report

Within 90 days after Bird Alliance's obligations under the PPA have been met, a final closure report will be submitted to DEQ for review. The final closure report will summarize all of the monitoring, maintenance, and operation activities completed during the redevelopment activities and will rationalize why a Certificate of Completion is warranted for the subject property. The final closure report will also document the final methane screening results before occupancy of confined spaces and indoor air and vent systems (if applicable) sample results, to confirm that the enclosed structures and subject property are safe for occupancy and that the installed engineering controls are working effectively and as designed. As described above, if DEQ agrees that the measures described in this basis of design and engineering approach are no longer required to ensure the subject property is protective of human health, ecological receptors, and the environment, DEQ will provide public notice and opportunity to comment on a proposed certification decision. Within 90 days after receiving Bird Alliance's closeout report and consideration of public comment, DEQ will issue a final Certificate of Completion.

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We appreciate your continued assistance and support on this project. Please call if you have questions regarding this submittal or if we may be of assistance in any regard.

Sincerely,

NV5

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