



October 8, 2025

Transmitted via email to: rbgrant@tacoma.gov

City of Tacoma
747 Market Street, Room 345
Tacoma WA 98402

Attn: Robin Bolster-Grant, Land Use Division Manager

**Re: Independent Third-party Review and Opinion
Mercy Housing Project Proposed Remedial Action
Tacoma, Washington
Landau Project No. 0094123.010**

Dear Ms. Bolster-Grant:

The City of Tacoma (City) retained Landau Associates, Inc. (Landau) to review remedial action documentation related to the Mercy Housing Northwest (Mercy Housing) Project and provide an independent third-party opinion on the likely protectiveness of the proposed environmental cleanup remedy specifically related to mitigation of landfill gas (LFG). Mercy Housing is proposing to construct a 5-story/80-unit affordable housing complex at the intersection of Pacific Avenue and South 35th Street on Pierce County Parcel No. 7470021282 (subject property). The proposed building will be slab-on-grade with no underground levels. The subject property has been designated as a cleanup site (Facility Site Identification [FSID] 100004234, Contaminated Site Identification [CSID] 17294) and is part of a larger cleanup site known as the 35th Street Landfill.

The subject property is located above a portion of a former deeply incised ravine that was filled with various soil materials and construction debris from the 1960s through the 1990s. The depth of the fill material ranges from approximately 80 feet (ft) thick on the west side of the subject property to 120 ft thick on the eastern side of the subject property. Contamination related to the fill material has been identified in an area of the subject property known as the “contaminated fill area”. In addition, organic debris within the landfill material is generating methane, and methane concentrations exceeding the lower explosive limit (5 percent by volume) have been recorded at the subject property.

Background and Document Review

In support of our assessment, Landau reviewed the following documents:

- Remedial Investigation / Feasibility Study and Cleanup Action Plan (Aspect 2025)
- Washington State Department of Ecology (Ecology) Corrected No Further Action (NFA) Likely Opinion (Ecology 2025a)

- Letter from Tacoma Pierce County Health Department (TPCHD) Re: Request for consult – LU25-0147 35th and Pacific Housing (TPCHD 2025)
- Letter from Ecology regarding comments on the pre-threshold consultation for 35th and Pacific Family Housing Project (Ecology 2025b)
- LU25-0147 Site Plan and Vicinity Map (1 page) (SMR Architects [SMR] 2025)
- Draft Environmental Covenant (EC) between MHNW 29 35th and Pacific LLLP and Ecology (Ecology 2025c).

The following sections provide a summary of the key findings from the document review.

Remedial Investigation/Feasibility Study/Cleanup Action Plan and Ecology Opinion Letter

In preparation for redevelopment of the subject property, Mercy Housing conducted a remedial investigation and feasibility study (RI/FS) and prepared a cleanup action plan (CAP). The RI/FS and CAP are documented in a report prepared by Aspect Consulting (Aspect) dated June 19, 2025 (Aspect 2025). The FS evaluated three potential cleanup alternatives: 1) institutional controls only consisting of a fence and signage, methane mitigation for future buildings; 2) removal of fill soil within the contaminated soil area to a depth of 15 ft, methane mitigation for future buildings; 3) and capping of contaminated soil and Institutional Controls in the form of an EC, methane mitigation for future buildings. The evaluation considered applicable cleanup criteria under the Model Toxics Control Act, including a disproportionate cost analysis, and other applicable rules and regulations. Alternative 3 was selected and Aspect presented a detailed summary of the CAP components. The CAP includes capping of the contaminated soil area with hardscapes or additional clean soil and the addition of a geotextile barrier to demarcate contaminated soil, institutional controls in the form of an EC, post-construction monitoring, installation of a sub-slab depressurization system/gas collection system and vapor barrier beneath the building to mitigate LFG hazard.

Mercy Housing submitted the RI/FS/CAP along with an Expedited Voluntary Cleanup Program application to Ecology seeking an opinion regarding the adequacy of the RI/FS and the proposed cleanup action. Ecology prepared an opinion letter indicating that the proposed cleanup, once implemented, would likely result in an NFA determination (Ecology 2025a). In their review, Ecology concluded the following:

- Soil appears to have been adequately characterized for the purpose of identifying appropriate cleanup actions.
- No surface water is present in the immediate vicinity of the subject property and petroleum hydrocarbon concentrations in surface water to the north appear to be unrelated to the subject property.
- Groundwater appears to have been adequately characterized and no further groundwater characterization is warranted.
- Ecology deferred to the appropriate local entity with respect to regulation of methane, but anticipated providing feedback to the local entity regarding the need for mitigation measures.

Ecology made the following requests related to implementation of the cleanup action:

- In playground areas, place a minimum of 3 ft of fill above a long-lasting geotextile fabric to demarcate the top of potentially contaminated soil. Alternatively, 1 ft of clean fill may be placed above the geotextile fabric if a resilient rubber playground mat is placed throughout the playground.
- Long-lasting geotextile fabric must be placed in landscaping areas where workers may be digging to place plant material.
- Vegetable gardening should only be conducted in raised beds filled with clean soil.
- The appropriate local entity should review and approve the design of the methane mitigation system.
- The EC to be recorded will have restrictions covering the entire subject property, not just the contaminated soil area.
- The EC will include Ecology notification requirements, prohibition of use of groundwater as drinking water, prohibition on growing crops within fill soil, and protection of the gas mitigation system.

Ecology anticipates requiring the following prior to issuing an NFA opinion:

- Written opinions and concurrence regarding the appropriate design of a methane mitigation system
- Preparation and submittal of a cap inspection plan to Ecology
- Recording of the EC with Pierce County
- Submittal of cap as-built documentation to Ecology.

State Environmental Policy Act Review

Mercy Housing prepared a State Environmental Policy Act (SEPA) checklist and the City, as the lead agency, provided the SEPA checklist to Ecology and the TPCHD for comment as part of a pre-threshold consultation. Ecology and the TPCHD provided comment letters to the City regarding the SEPA checklist (Ecology 2025b and TPCHD 2025, respectively).

In their comment letter, Ecology recommended cleanup of the property in compliance with Washington Administrative Code (WAC) 173-340 and testing of potentially contaminated media if encountered during construction. If additional contamination is identified during construction, Ecology notification is required.

The following summarizes comments and recommendations made by TPCHD with respect to LFG monitoring and mitigation:

- The TPCHD identified that higher methane concentrations are present within the 35th Street Landfill to the north of the subject property, and identified an abandoned utility corridor as a potential preferential pathway for LFG to migrate to the subject property. The letter did not contain a figure showing the location of the abandoned utility corridor nor sufficient information to identify its location.

- Elevated hydrogen sulfide levels have been detected in at least one LFG monitoring probe within the 35th Street Landfill that is outside of the subject property. The TPCHD recommended that monitoring for hydrogen sulfide be conducted on the subject property and that the proposed mitigation address potential issues from hydrogen sulfide.
- The TPCHD concluded that because of the methane concentrations north of the subject property, the proposed mitigation measures may not be sufficient to keep occupants and visitors safe, and in turn recommended the following four potential mitigation measures:
 1. Remove the fill material that is the source of the methane from the entire 35th Street Landfill site;
 2. Cap and vent the source of the methane at both the landfill site and the proposed development site;
 3. Cap and vent soils at the northern portion of the landfill site only where measured methane and hydrogen sulfide levels are the highest, potentially requiring a temporary flare; or
 4. Remove the abandoned utility trench to eliminate the preferential methane pathway from the northern portion of the landfill site to the subject property.
- The TPCHD acknowledged that their recommendations are cost-prohibitive and likely not economically feasible.

Opinion and Recommendations

After reviewing the available documentation, Landau agrees with Ecology's opinion that soil and groundwater at the subject property have been adequately characterized. The proposed cleanup action in the CAP in conjunction with the recommendations provided in Ecology's August 6 opinion letter are likely sufficient to protect future residents and workers from contaminated soil. With respect to LFG, Landau concurs with the TPCHD's recommendation to monitor hydrogen sulfide in the three existing vapor probes installed on the subject property. If hydrogen sulfide is found to be present at potentially hazardous levels, the proposed Gas Mitigation System should address both methane and hydrogen sulfide.

Landau disagrees with several of the conclusions and recommendations in the TPCHD's letter related to mitigation of LFG.

1. Source removal is not only cost-prohibitive, but also logistically impracticable. To remove all the fill material at the 35th Street Landfill would likely require moving more than 1.5 million cubic yards of material and placing it in a Subtitle D landfill. The FS evaluated a minor source removal action (21,111 cubic yards), which was found to be disproportionately costly relative to the benefit. The cost to conduct a source removal action of the scale suggested by the TPCHD would likely prohibit the proposed development of the subject property and this measure is unnecessary to protect human health and the environment.

2. Caping and venting the source of the methane on the northern portion of the landfill and the subject property would likely be effective at mitigating the LFG concentrations, but would require unnecessary costs when the proposed mitigation on the subject property alone is likely to be effective at mitigating the LFG hazard. The cost of caping and venting on the northern portion of the landfill and the subject property would likely prohibit the proposed development.
3. Methane data for the subject property provided in the RI/FS/CAP report does not clearly point to an offsite source as suggested by the TPCHD. Fill material on the subject property was found to contain organic material in the form of roots (below the active root zone), wood debris, and other organics, and it is likely that LFG generation is occurring on the subject property. Therefore, mitigating LFG on the offsite property to the north only is not likely to be an effective mitigation strategy. However, mitigating LFG on the subject property beneath structures and other impervious areas, with appropriate design considerations, testing, monitoring, and maintenance, is likely to be a successful mitigation strategy.
4. For the reasons stated in the preceding bullet, mitigating LFG migration by removing old utilities is not likely to be an effective mitigation strategy.

To promote the effectiveness and protectiveness of the LFG Mitigation System (including vapor barrier and gas collection system) that is proposed in the CAP, Landau offers the following recommendations.

Gas Mitigation System

- The Gas Mitigation System (including the vapor barrier and gas collection system) should be incorporated into design documents for review by the City Engineer.
- Design documentation should include a basis of design report, including a vapor intrusion conceptual model; selected mitigation technologies; results of pre-design studies, if conducted; a determination as to whether air permits or emission mitigation may be required; how vents placement was determined with consideration for preventing re-entrainment; inspection, testing, and monitoring procedures; and potential corrective actions.
- Design documents should include vapor barrier design, gas collection system layout, system components, air intake and venting/exhaust details, specifications, warranties, and construction quality assurance.
- An Operation, Maintenance, and Monitoring Plan (OM&M plan) should be prepared by the design Engineer. The plan should consider building management structure and available personnel for operation and maintenance.
- First floor indoor monitoring systems should be automated and use audible alarms to the maximum extent practicable, minimizing reliance on manual oversight to detect problems.

Vapor Barrier

- The selected vapor barrier should be rated for blocking methane and hydrogen sulfide with a permanence rating determined by ASTM International standard test method D1434 or an equivalent industry-approved testing method.
- Following installation of the sub-slab vapor barrier, leak testing should be performed in accordance with the manufacturer's specifications to confirm that all areas of the membrane, including seams, joints, and utility penetrations, are properly sealed. Acceptable testing methods include smoke testing or other equivalent procedures capable of detecting breaches in the membrane. Leak testing must be completed prior to placement of any overlying materials to ensure the integrity of the vapor barrier system.

Building Sub-slab Gas Collection System

- While a passive gas collection system may provide adequate mitigation, the system should be designed to accommodate at least one active blower in the event that monitoring data indicated the passive system is insufficient. Specifications and design for the blower(s) should be incorporated into the initial design and permitted so that they can be installed quickly in the event that air concentrations exceed acceptable levels. Blower(s) should be specifically designed with capacity to ventilate and create a negative pressure field beneath the entire building slab.
- System design must provide for subsurface monitoring of vapor concentrations and differential pressure to confirm sub-slab soil gas conditions and the adequacy of the mitigation system.
- The system should be tested and monitored under a range of atmospheric and heating, ventilation, and air conditioning (HVAC) operational conditions prior to building occupancy.

Building Monitoring

- All spaces on the first floor of the building should be outfitted with methane alarms.
- If problems arise with the performance of the gas collection system, consider outfitting upper floor apartment units with methane alarms.
- Monitoring and recording of the sub-slab conditions and in spaces on the first floor should be conducted quarterly for at least the first 2 years and reported to the appropriate regulatory authorities.

Utilities

- Trench dams or similar low-permeability material should be installed at appropriate locations along utility trenches to prevent migration of LFG.
- Cracks and joints along utility pipes should be sealed to prevent infiltration of LFG.
- Warning signs or plaques should be installed at the entrances to manholes and utility vaults to indicate the potential presence of explosive and hazardous gases, and to advise that air monitoring and intrinsically safe equipment is required prior to entrance.

Paved Areas

- Installation of a passive gas collection and venting system is recommended beneath paved areas larger than sidewalks or pathways or other impermeable barriers outside of the building footprint to prevent buildup of LFG. Alternatively, monitoring could be conducted in these areas to demonstrate that buildup of LFG above the lower explosive limit is not occurring.

Use of This Letter

This independent third-party review and opinion letter has been prepared for the exclusive use of the City of Tacoma for specific application to the Mercy Housing Project. No other party is entitled to rely on the information, conclusions, and/or recommendations included in this document without the express written consent of Landau. Further, the reuse of information, conclusions, and/or recommendations provided herein for extensions of the project or for any other project, without review and authorization by Landau, shall be at the user's sole risk. Landau warrants that within the limitations of scope, schedule, and budget, our services have been provided in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions as this project. We make no other warranty, either express or implied.

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This document was prepared by, or under the direct supervision of, the technical professionals noted below.

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References

Aspect. 2025. Remedial Investigation / Feasibility Study and Cleanup Action Plan : 35P Development South 35th Street & Pacific Avenue, Tacoma, Washington. Aspect Consulting. June 19.

Ecology. 2025a. Washington State Department of Ecology Corrected No Further Action (NFA) Likely Opinion Letter. Washington State Department of Ecology. August 6.

Ecology. 2025b. Letter from Ecology regarding comments on the pre-threshold consultation for 35th and Pacific Family Housing Project. Washington State Department of Ecology. August 20.

Ecology. 2025c. Draft Environmental Covenant (EC) between MHNW 29 35th and Pacific LLLP and Ecology. Washington State Department of Ecology.

SMR. 2025. LU25-0147 Site Plan and Vicinity Map. SMR Architects. April 15.

TPCHD. 2025. Letter from Tacoma Pierce County Health Department Re: Request for consult – LU25-0147 35th and Pacific Housing. Tacoma-Pierce County Health Department. August 20.