Technical Memorandum

To: Khalil Alomari, Country Market
Date: March 28, 2025

From: Krysta Krippaehne-Stein, PE
Project No.: M2809.01.002

Re: Vapor Intrusion Mitigation System Work Plan, Country Market, 40490 Old Highway 30 (DEQ Site ID: 04-16-0669)

Introduction

Maul Foster & Alongi, Inc. (MFA), has prepared this technical memorandum on behalf of Country Market for the Country Market, formerly Hunt's Marketplace site located at 40490 Old Highway 30 in Astoria, Oregon (the Site) to present the work plan for design, construction, completion reporting, and performance monitoring of an active vapor intrusion mitigation system.

Background

The Site contamination is associated with an underground storage tank located on the north side of the Country Market that was identified during a geophysical survey in June 2015. Extensive subsurface investigations have been conducted at the Site to assess the nature and extent of contamination associated with the underground storage tank, as summarized in the Oregon Department of Environmental Quality (DEQ) staff memorandum for Leaking Underground Storage Tank site 04-16-0669 (DEQ 2023). In its staff memorandum DEQ stated that "Barring further cleanup, an E&ES [Easement and Equitable Servitude] that prohibits the construction of any new buildings for human occupation without DEQ's prior written approval would be needed to mitigate unacceptable vapor intrusion risks to the occupants of future buildings constructed at the Site." DEQ subsequently became aware that around 2020 Clatsop County approved the remodeling of an on-site commercial building to include a residential living space. This residential use, which is ongoing, resulted in DEQ requiring a vapor intrusion assessment.

MFA completed a vapor intrusion assessment in July and August 2024 and summarized the results of the assessment in a technical memorandum (MFA 2025). The detected concentrations of gasoline-range hydrocarbons and benzene in indoor air samples represent a hot spot that requires installation of an active vapor intrusion mitigation system. This work plan was prepared at the request of DEQ to summarize planned remedial action (DEQ 2025).

Based on conversations with Country Market, it is MFA's understanding that the residence is built on 1.5-foot-high floor joists that rest on top of a concrete slab. The north portion of the residence, associated with three bedrooms and a study, rests on joists that are oriented east-west, and the south portion, associated with the kitchen and dining room area, rests on joists oriented north-south. This configuration creates enclosed/isolated crawlspace "cells" between the concrete slab and the

floor of the residence. The perimeter of the residence rests on a concrete footer wall, about 1.5 feet high, that prevents access to the cells.

Remedial Action

The following subsections outline the design, completion reporting, performance monitoring, and schedule associated with the proposed remedial action.

Design

MFA will conduct a site visit to observe building construction and inform system design. An MFA Oregon-registered Professional Engineer will subsequently prepare plans and specifications for an active vapor intrusion mitigation system. The design for the vapor intrusion mitigation system will follow draft DEQ *Guidance for Assessing and Remediating Vapor Intrusion into Buildings* (DEQ 2024) and City of Los Angeles Department of Building and Safety methane mitigation standards (LADBS 2006). A preliminary design plan is included in the Attachment. The system components will include the following:

- 3-inch-diameter holes through the concrete footer wall on one side of each crawlspace cell.
- 2-inch-diameter pipe manifold connecting each crawlspace cell on the south half of the residence to a single 2-inch-diameter vent riser equipped with an inline centrifugal fan.
- 2-inch-diameter pipe manifold connecting each crawlspace cell on the north half of the residence to a single 2-inch-diameter vent riser equipped with an inline centrifugal fan.
- Each vent riser will be equipped with a monitoring port and a manometer to facilitate performance monitoring.

A final design package including plans and specifications will be submitted to the DEQ for review and approval.

Completion Reporting

Following construction of the vapor intrusion mitigation system, MFA will conduct a site visit to document system construction in conformance with the approved plans and specifications. Following the site visit, MFA will prepare a completion report to document system construction in conformance with approved system design. The completion report will include the following:

- A narrative summary of system construction.
- As-built drawings noting any deviations from design.
- A photographic log of system components.

The completion report will be submitted to the DEQ for review and approval.

Performance Monitoring

After operation of the active vapor intrusion mitigation system for one month, MFA will conduct an indoor air sampling event to evaluate the effectiveness of the vapor intrusion mitigation system. Seven-day samples will be collected at the same locations and using the same methods as described in MFA's *Vapor Intrusion Assessment Results* technical memorandum (MFA 2025). In addition, MFA will collect one sample from each vent riser. MFA will subsequently prepare a performance monitoring summary report that will include the following:

- A narrative summary of sampling methods and sample results.

- A site plan identifying sample locations.
- A summary table of analytical results compared to screening levels.
- Analytical laboratory reports and chain-of-custody documentation.

The performance monitoring summary report will be submitted to the DEQ for review and approval.

Schedule

A preliminary schedule for the remedial action design, construction, completion reporting, and performance monitoring is presented in the table below.

Table: Preliminary Remedial Action Schedule

Task	Schedule
Design[1]	2 – 4 weeks
Construction	3 – 4 weeks
Completion Reporting	2 – 3 weeks
Performance Monitoring[2]	3 – 4 weeks

Note
1. Design will begin immediately upon DEQ approval of this work plan.
2. Performance monitoring samples will be collected one month after construction completion.

Attachments

References

Limitations

Preliminary Design Plan

References

DEQ. 2023. Letter re: *Hunt's Market, LUST # 04-16-0669; Staff Memorandum in support of a No Further Action determination*. From Rebecca Digiustino, Project Manager, DEQ Northwest Region to DEQ project file. June 14.

DEQ. 2024. *Draft Guidance for Assessing and Remediating Vapor Intrusion into Buildings*. Oregon Department of Environmental Quality. March.

DEQ. 2025. Letter re: *DEQ Comments on Vapor Intrusion Assessment Results, Hunt's Market (04-16-0669), 40490 Old Highway 30, Astoria, Oregon 97103.* From Rebecca Digiustino, Project Manager, DEQ Northwest Region to David Weatherby. March 5.

LADBS. 2006. *Standard Plan: Methane Hazard Mitigation*. City of Los Angeles Department of Building and Safety. June 16. Revised March 8, 2010.

MFA. 2025. Technical Memorandum re: *Vapor Intrusion Assessment Results, Country Market, 40490 Old Highway 30 (DEQ Site ID: 04-16-0669)*. From Julie Pace to Khalil Alomari, Country Market. February 7.

Limitations

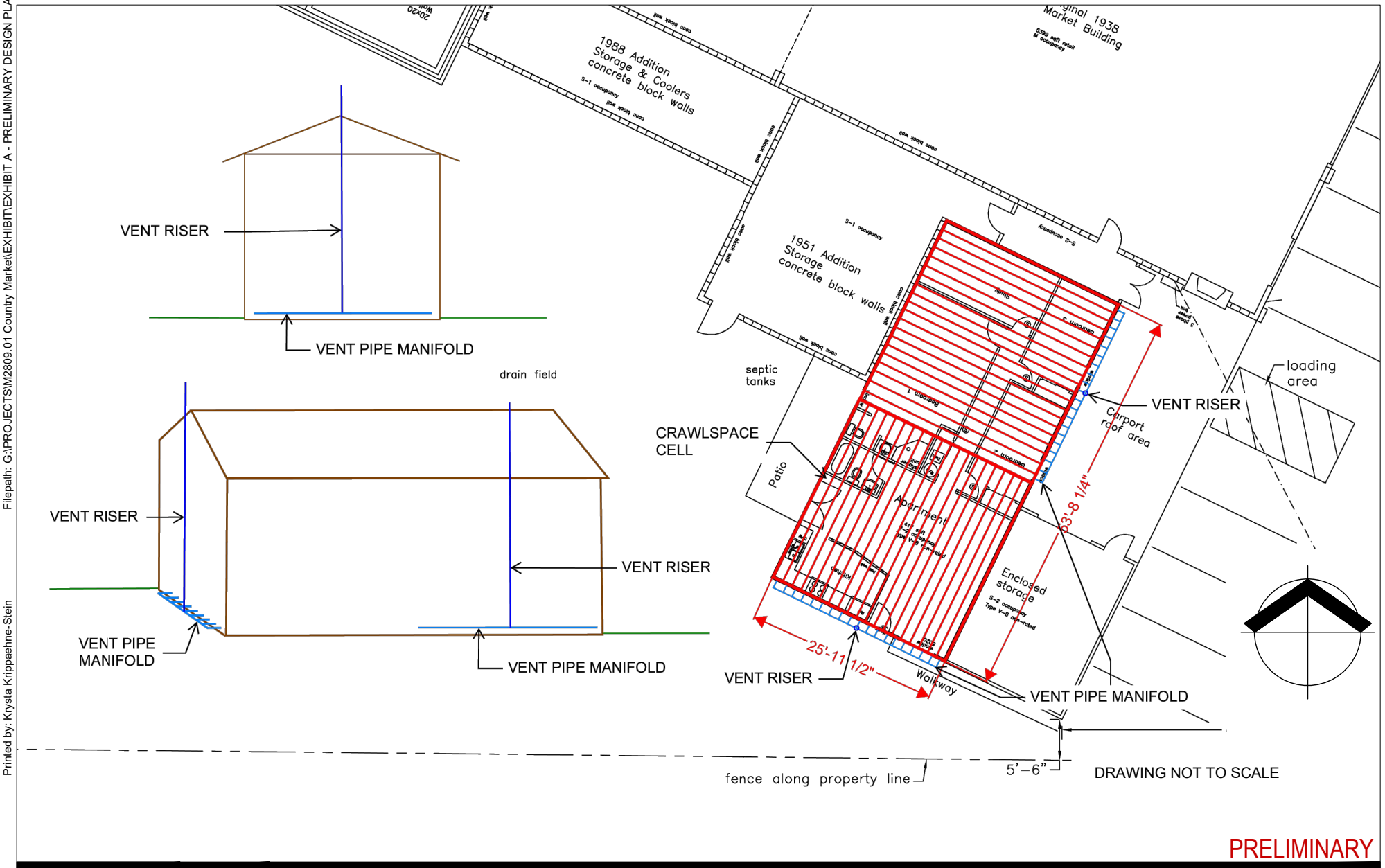
The services undertaken in completing this technical memorandum were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This technical memorandum is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this technical memorandum apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this technical memorandum.

Attachment

Preliminary Design Plan

MAUL
FOSTER
ALONGI



PRELIMINARY

MFA JOB #:	M2809.01.002
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PRELIMINARY DESIGN PLAN

VAPOR INTRUSION MITIGATION SYSTEM

COUNTRY MARKET

40490 OLD HIGHWAY 30, ASTORIA, OREGON

EXHIBIT A