



RESPONSIVENESS SUMMARY

ST Services NuStar Energy LP

August 18 – September 18, 2008 Public Comment Period

Agreed Order for Remedial Investigation and Feasibility Study

**Prepared by
Washington State Department of Ecology
Southwest Regional Office
Toxics Cleanup Program
Lacey, Washington**

November 2008

TABLE OF CONTENTS

Site Information	3
Site Background	3
Site Map	4
Comment #1: Doug Quinn, Clark Public Utilities	5

Site Information

Address: 5420 NW Fruit Valley Road

Site Manager: Rod Schmall

Public Involvement Coordinator: Meg Bommarito

Ecology and NuStar Terminals Operations Partnership L.P. (a subsidiary of NuStar Energy L.P.) (NuStar) entered into an Agreed Order (legal agreement) to begin cleanup of contamination at the ST Services NuStar Energy LP Tank Farm (NuStar Tank Farm) site in northwest Vancouver.

The Agreed Order requires NuStar to:

- Complete a Remedial Investigation to determine nature and extent of contamination.
- Complete a Feasibility Study to examine cleanup options.
- Monitor groundwater for chemical contaminants.

The comment period for this agreed order ran from August 18 through September 18, 2008. Public comments and Ecology's responses are summarized in this document.

Site Background

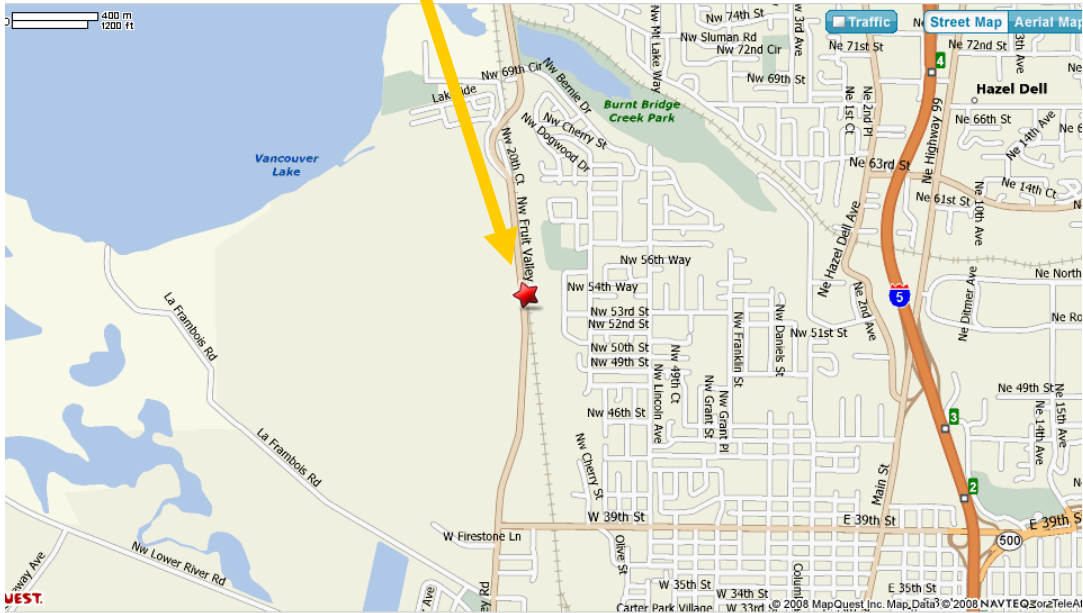
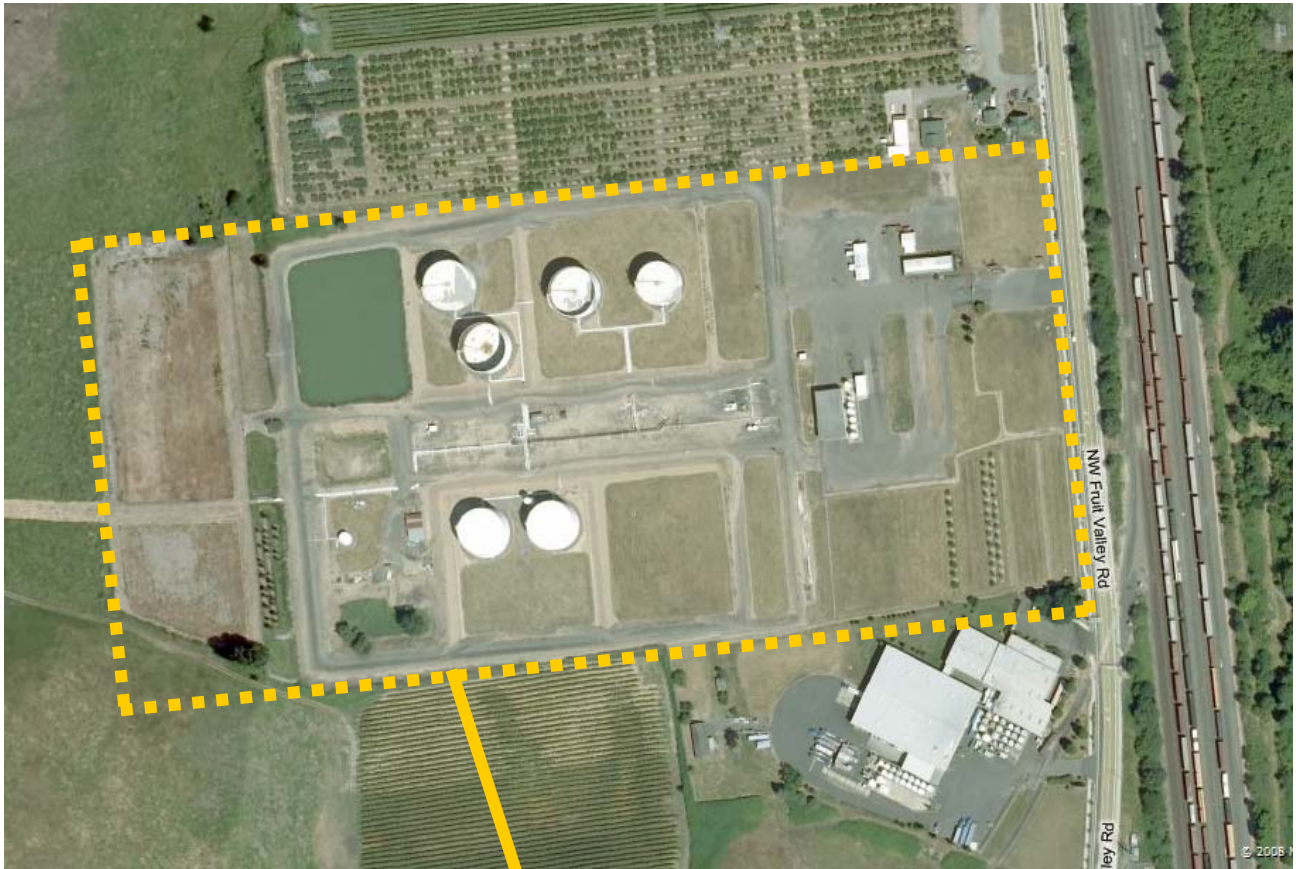
The site property, 5420 NW Fruit Valley Road, has been used for storing and handling petroleum products since it was developed in 1957. In 2001, then-owners Cenex discovered evidence of petroleum contaminated soils while shutting down an underground gasoline vapor recovery tank. Also in 2001, a gasoline spill from an underground storage tank was reported to Ecology. Benzene and other petroleum chemicals have been documented at levels above state cleanup standards in groundwater.

The site was added to Ecology's database of "Confirmed and Suspected Contaminated Sites" in 2005. Based on a site hazard assessment conducted in 2006, the site was given a Washington Ranking Method risk rank of 2 (a rank of 1 indicates the greatest risk to human health and the environment. A rank of 5 indicates the lowest risk).

A 2008 report based on three quarterly sampling events in 2007 indicated that the subsurface contaminants are contained within the boundaries of the NuStar property. The levels of contaminants have decreased significantly since their discovery. However, some contaminants remain above MTCA cleanup standards.

Ecology considered the comments received on the proposed Agreed Order and concluded the requirements of the Washington State Model Toxics Control Act (MTCA) will be adequately addressed by the Order's provisions. The Order will therefore not be revised. When reviewing and setting conditions for the work plans required by the Order, Ecology will remain aware of comments received regarding the sufficiency of previous independent investigations conducted at the site. Results of the Remedial Investigation and Feasibility Study will guide the selection of the final cleanup remedy.

Site Map



Comment #1: Doug Quinn, Clark Public Utilities



Commissioners

Nancy E. Barnes
Carol J. Curtis
Byron H. Hanke

*Chief Executive Officer/
General Manager*

Wayne W. Nelson

September 16, 2008

SEP 22 2008

Project No. 0352.01.01

Mr. Rod Schmall
Washington State Department of Ecology
2108 Grand Boulevard
Vancouver, WA 98661-4622

Re: Proposed Remedial Action Measure - NuStar Terminals Operations Partnership L.P.
5420 NW Fruit Valley Road, Vancouver, Washington

Dear Mr. Schmall:

Clark Public Utilities (CPU) has developed the following comments regarding the Agreed Order (the Order, No. 08-TC-S DE5250) executed between the Washington State Department of Ecology (Ecology) and NuStar Terminals Operations Partnership L.P. (NuStar) regarding the proposed remedial action (RA) at the above-referenced site.

In general, CPU is concerned with the projected schedule for implementation of the work required in the Order. It is critical that remedial actions take place in a timeline that will allow CPU to develop the groundwater resource from the Pleistocene Alluvial Aquifer (PAA) as water demand increases in accordance with the Clark County population projections. This aquifer was identified in Chapter 173-592 WAC, Reservation of Future Public Water Supply for Clark County. CPU will need to access this aquifer within six to ten years.

CPU has additional concerns regarding data gaps related to incomplete characterization of the nature and extent of known or potential soil and groundwater impacts. Additional investigation, both within and beyond the property boundary, is warranted and should take into account known or presumed materials handled and stored at the facility as well as future groundwater flow patterns resulting from the future use of groundwater from the Pleistocene Alluvial Aquifer by CPU. Detailed comments prepared by our consultant Maul Foster & Alongi, Inc. are attached.

Sincerely,

Doug Quinn
Director of Water Services

Enclosure



3121 SW Moody Avenue, Suite 200 | Portland, Oregon 97239 | Phone 971.544.2139 | Fax 971.544.2140 | www.MFAinc.org

September 16, 2008
Project No. 0352.01.01

SEP 22 2008

Mr. Doug Quinn
Director of Water Services
Clark Public Utilities
P.O. Box 8900
Vancouver, Washington 98668

Re: Proposed Remedial Action Measure
NuStar Terminals Operations Partnership L.P.
5420 NW Fruit Valley Road, Vancouver, Washington

Dear Mr. Quinn:

At your request, Maul Foster & Alongi, Inc. (MFA) has reviewed the documents provided by Clark Public Utilities (CPU) regarding the proposed remedial action (RA) at the above-referenced site. The objective of MFA's review was to:

- Evaluate the scope of work (SOW) summarized in the Agreed Order (the Order, No. 08-TC-S DE5250) executed between the Washington State Department of Ecology (Ecology) and NuStar Terminals Operations Partnership L.P. (NuStar).
- Evaluate the adequacy of site characterization (e.g., nature and extent of contamination in soil and/or groundwater).
- Evaluate known and potential impacts to the groundwater resource for drinking water purposes.

MFA understands that CPU intends to develop groundwater resources in the area of the NuStar site and that the presence of contamination could limit CPU's ability to do so in the future. The Order identifies the SOW that needs to be performed by NuStar, and has been published for public comment. MFA has prepared the following comments on behalf of CPU.

General Comments

MFA reviewed the Order, as well as portions of the January 28, 2008 *Quarterly Groundwater Monitoring Report* (the quarterly report), prepared by Ash Creek Associates, Inc. (ACA). The Order provides findings of fact, including a summary of the site history and known releases; a summary of the nature and extent of soil and groundwater impacts; and a summary of soil and groundwater data. The quarterly report provides the most recent groundwater monitoring data.

The Order includes the following facts:

- Petroleum products were stored and handled at the site “for decades”, and presumably since site development in 1957. MFA notes that current site use appears to include storage and handling of petroleum products in several large aboveground storage tanks (AST).
- Only one known release has been reported to Ecology, consisting of a leak from an underground storage tank that occurred in September 2001.
- In 2001, evidence of petroleum-impacted soil was encountered by the previous operator (Cenex) during decommissioning of an underground gasoline vapor recovery tank.
- Soil and groundwater contamination associated with the known and potential releases has been documented. Groundwater samples collected in 2002 contained concentrations of petroleum constituents “well above” Ecology’s Model Toxics Control Act (MTCA) Method A cleanup levels for groundwater.
- ACA concluded that soil and/or groundwater impacts are contained below the surface and within the boundaries of the NuStar property.

The Quarterly Report prepared by ACA includes the following data and conclusions:

- Sampling conducted in 2007 by ACA demonstrated that concentrations of most petroleum constituents had fallen below MTCA Method A cleanup levels for groundwater, with the exception of benzene and methyl-tert butyl ether (MTBE). During the most recent sampling event, benzene had fallen below the MTCA Method A level for groundwater, but MTBE was still present above the MTCA Method A level.
- Groundwater elevation data suggest that groundwater flows toward the south.

The proposed CPU well field is located less than approximately 600 feet north of the NuStar site. Development of the groundwater resource (i.e., groundwater extraction) from the shallow Pleistocene Alluvial Aquifer could result in mobilization, extraction, and distribution of impacted groundwater from the NuStar site. This is an undesirable outcome for CPU. Further evaluation of the nature and extent of groundwater impacts and site hydrogeology is required to evaluate the potential threat to the groundwater resource from the NuStar site.

Specific Comments

1. It is not clear from the documents reviewed that the entire history of known or potential releases has been completed. MFA notes that according to the American Petroleum Institute (API), standard practice for AST maintenance included periodic manual removal of sludge (tank bottoms), with “immediate” burial for sludges from

- leaded gasoline tanks.¹ Review of past operational procedures for the facility is strongly recommended. If these documents are unavailable or off-site disposal of tank bottom sludge cannot be verified, additional soil and groundwater sampling is warranted.
2. It is not clear from the documents reviewed that adequate sampling for lead has been completed. Potential releases of leaded gasoline or sludges could have resulted or could result in elevated lead in groundwater. Historical review of products stored and handled at the facility is recommended. If these documents are unavailable, additional soil and groundwater sampling for lead is warranted.
 3. The laboratory analytical data suggest that groundwater impacts could be being attenuated, likely by a combination of physical and biological processes. However, an alternative explanation is that the dissolved plume has migrated downwards and/or away from the monitoring network. The phenomenon of "plume diving" has been documented by API as a potential confounding factor for site investigations.² The remedial investigation (RI) should include data collection efforts designed to evaluate this potential.
 4. The attenuation processes identified in the previous comment are not as effective for MTBE, which still exceeds the MTCA Method A cleanup level for groundwater. Compared to other petroleum constituents (e.g., benzene, ethylbenzene, xylene), MTBE is more soluble in water and more resistant to degradation. As such, the nature and extent of MTBE at petroleum sites can be significantly larger. Additional investigation beyond the property boundaries for MTBE and other petroleum constituents is warranted.
 5. The attenuation processes may not continue to be as effective within a groundwater flow regime established by groundwater extraction wells installed during development of the shallow Pleistocene Alluvial groundwater resource by CPU. The potential capture zone and radius of influence should be evaluated by NuStar in order to assess the potential for petroleum impacts to migrate to extraction wells during pumping. Additional groundwater sampling and between the NuStar property and the CPU wellfield should be completed, with sample locations and intervals based upon the predicted capture zones.
 6. The Order requires NuStar to complete remedial actions, including "Remedial Investigation (RI) site characterization activities necessary to determine the nature and extent of contamination at the Site." As cited in the Order, the Site is defined by the extent of contamination caused by the release of hazardous substances from this NuStar operations location. While data collected within the property boundary suggest that impacts may be limited, the absence of off-site data is a significant data

¹ Due to the high flammability of leaded petroleum sludges. See for example various API publications from 1931 to 1975 generally titled "API Manual on Cleaning Petroleum Storage Tanks".

² As described in *Downward Solute Plume Migration: Assessment, Significance, and Implications for Characterization and Monitoring of "Diving Plumes"* API Soil and Groundwater Technical Task Force Bulletin 24, April 2006.

gap, especially in light of the intended well field development. As noted in comment #4, offsite data collection is recommended.


7. Exhibit D of the Order includes a project schedule for the RI and subsequent activities (including risk assessment, interim actions, and feasibility studies). It is not clear from this schedule that implementation of the RI and subsequent activities will result in restoration of the shallow Pleistocene Alluvial groundwater resource within the expected timeframe of development. MFA recommends that Ecology incorporate CPU's schedule for development of the shallow Pleistocene Alluvial groundwater resource into the project schedule.

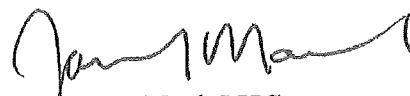
Conclusion

While previous investigations have focused on known releases and impacts, the RI of the NuStar facility should address the data gaps related to nature and extent identified in the preceding comments. Additional investigation both within and beyond the property boundary is warranted, and should take into account known or presumed materials handled and stored at the facility. Data collection efforts should be designed to anticipate future groundwater flow patterns resulting from the future use of groundwater from the Pleistocene Alluvial Aquifer by CPU, as predicted during previous modeling work by others. The RI and subsequent projects should be implemented on a schedule that results in restoration of the Pleistocene Alluvial Aquifer consistent with CPU's requirements.

Please contact either of us at (360) 694-2691 if you have any questions.

Sincerely,
Maul Foster & Alongi, Inc.


James G.D. Peale, LHG
Senior Hydrogeologist


James J. Maul, LHG
President and Principal Hydrogeologist

Ecology Response



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

MS: S-70 • 2108 Grand Boulevard • Vancouver, Washington 98661-4622 • (360) 690-7171

October 30, 2008

Certified Mail / Return Receipt Requested-- USPS
7008 0500 0002 0023 5338

Mr. Douglas Quinn
Director of Water Services
Clark Public Utilities
P.O. Box 8900
Vancouver, WA 98668

SUBJECT: Response to 9/16/87 CPU Comments on Agreed Order No. 08-TC-S DE5250 between the Washington State Department of Ecology and NuStar Terminals Operations Partnership L.P. ISIS Site Name: *ST Services NuStar Energy LP* -- ISIS FSID: 61862781 (Tank Farm) 5240 NW Fruit Valley Road – Vancouver, WA 98660

Dear Mr. Quinn:

On September 22, 2008 Ecology received your 9/16/08 letter commenting on the above-referenced Agreed Order (AO). CPU expressed concern over the project schedule, indicating groundwater withdrawals from the shallow portion of the aquifer (Pleistocene Alluvial Aquifer – PAA) would occur within six to ten years to satisfy public water needs. You also commented on existing data gaps and the need to include materials known to be—or presumably were—handled/stored in the contaminant investigation, as well as a need to extend the investigation “beyond the property boundary.”

Attached to your letter was a brief letter report prepared by Maul Foster Alongi (MFA) assessing the site contamination situation in terms of potential implications to CPU’s planned groundwater withdrawals. MFA also commented on what it considered current characterization inadequacies and what it believed should be required in the AO-stipulated Remedial Investigation that NuStar will conduct. This Ecology letter is a response to CPU’s—and MFA’s— comments.

Ecology agrees in general with nearly all of the comments made by CPU and by MFA on CPU’s behalf regarding this site. That is why Ecology activated it for agency involvement and designated it a Formal site having AO-specified requirements (including a schedule) with substantial agency oversight instead of a Voluntary Cleanup Program site with limited oversight and an indefinite schedule.

Project Timing

The project—even if generous agency review periods are assumed for Work Plans and draft reports related to this Agreed Order and the subsequent AO for the Cleanup Action Plan (CAP) — would consume approximately two years to produce a CAP. Hence, if physical implementation of the CAP commences even as much as six months after its finalization, the remediation approach will be underway for 3½ to 7½ years prior to the estimated time of CPU’s need to withdraw from the PAA. Ecology believes significant contaminant concentration reductions would occur before PAA use begins.

Inadequate Characterization

Although satisfactory for purposes intended at the time, available data—created by multiple investigators over an extended time period—were not obtained under a comprehensive, Ecology-approved Remedial



Investigation (RI). Not surprisingly, there are information gaps precluding definitive characterization. The requirement for a Remedial Investigation of the site is a part of the subject Agreed Order specifically to determine the nature and extent of contamination. Ecology will diligently review NuStar's RI Work Plan to ensure that the RI will provide adequate characterization. This may very well include off-property examination and inclusion of additional contaminants in sample analyses as CPU and MFA have suggested.

Capture Zone Analysis

Both your letter and MFA's comments suggest that NuStar's consultant should take into account the proximate groundwater flow pattern(s) resulting from future withdrawal from the PAA. This is a logical inclusion for any contaminant migration prediction effort; however, Ecology assumes that the actual flow pattern (capture zone details) have—or will be—modeled by CPU or its groundwater consultant and would be made available to Nustar for use in an impact analysis. Ecology does not expect NuStar to have a capture zone flow pattern analysis performed for CPU's operations.

NuStar and Ash Creek associates (ACA) are well aware of the potential for contaminant migration induced by CPU withdrawals from the shallow aquifer. Based on an ACA review of then-available data, NuStar expressed concern to Ecology in May of 2007. It requested coordination between Ecology's Toxics Cleanup and Water Resources Programs relative the agency's deliberations on CPU's water rights request for the Fruit Valley Road site. NuStar is in likely agreement with CPU regarding groundwater flow inducement by shallow CPU withdrawals. Based on the latest contaminant concentration data, however, NuStar could provide a plausible argument that the contaminant levels in the groundwater may now be too low to cause a significant impact on the quality of withdrawn water. The results of a completed comprehensive RI will help in determining probable impacts. All the parties involved in this issue want to avoid having unacceptable levels of contaminants present in the public drinking water supply.

Contaminant Completeness

MFA's comment number 1 notes the possibility that an adequate determination has not been made of probable materials used/stored and the tank residue management practices employed. NuStar and ACA have already reviewed information that is available to them, but Ecology will request reasonable diligence in a pursuit of more information via communication with former owners/operators. The extent of soil and groundwater sampling would be determined in part by such information.

Analysis for Lead

MFA's comment number 2 states that it's not clear if there has been adequate sampling for lead in groundwater. Lead was not an analyte in the analysis of most samples from the site. However, groundwater samples from all four monitoring wells were non-detect for lead in May of 2002 (12/30/02 report referenced in Section V-F of the AO and available at Ecology's Southwest Regional Office Central Files). Ecology will request that the RI plan include a sufficient number of lead analyses to determine if it is present and, if so, to what extent.

Plume Diving

MFA's comment number 3 suggests that the potential for "plume diving" of the petroleum contaminants be examined. Ecology will request a determination of potential be made with respect to the subsurface conditions present at the site.

MTBE Migration / Off-Property Sampling

MFA's comment number 4 suggests that the higher solubility and lower biodegradability of MTBE relative to the other petroleum compounds could cause it to migrate farther in groundwater and that samples obtained for its analysis should be collected from areas beyond the property line. NuStar/ACA and

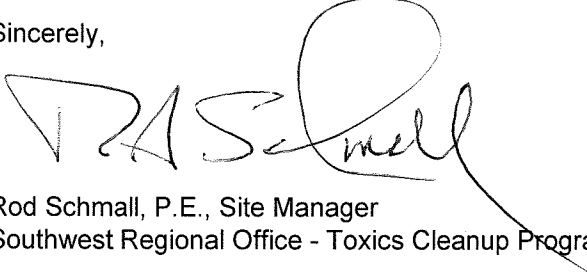
Ecology are familiar with MTBE characteristics and recognize it's being the most likely to persist and migrate in groundwater. Its degree of migration will be addressed as part of the RI. Other suspected contaminants would be secondary target analytes in the primary MTBE-based sampling conducted outside the property line.

MFA Comments 5, 6, and 7

The need to assess the effects of groundwater flow changes related to future CPU withdrawals from the PAA, the need for off-property sampling, and project time have been address elsewhere in this letter.

Please contact me if you have questions (360-690-4798 // rosc461@ecy.wa.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "Rod Schmall". The signature is written in a cursive style with a large loop at the end.

Rod Schmall, P.E., Site Manager
Southwest Regional Office - Toxics Cleanup Program - Vancouver Field Office

cc: Rebecca S. Lawson, P.E., LHG, TCP Section Manager
Lisa Pearson, P.E., Ecology
Craig Rankine, P.G., P.Hg., Ecology
Ivy Anderson, Office of the Attorney General