EXHIBIT NO. LEO-15
DOCKET NOS. UE-090704/UG-090705
2009 PSE GENERAL RATE CASE
WITNESS: LOUIS E. ODOM

BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, **Complainant,** **v.** **PUGET SOUND ENERGY, INC.,** **Respondent.**	**Docket No. UE-090704** **Docket No. UG-090705**

SECOND EXHIBIT (NONCONFIDENTIAL) TO THE PREFILED REBUTTAL TESTIMONY OF LOUIS E. ODOM ON BEHALF OF PUGET SOUND ENERGY, INC.

DECEMBER 17, 2009

BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

Docket Nos. UE-090704 and UG-090705
Puget Sound Energy, Inc.'s
2009 General Rate Case

WUTC STAFF DATA REQUEST NO. 177

WUTC STAFF DATA REQUEST NO. 177:

Re: Mint Farm Generation Facility

a. With regard to the Mint Farm Generation Facility, has the Company performed or obtained an assessment of the potential for liquefaction of the soils or other soil strength failures at the site during an earthquake? If so, please provide a copy of the assessment and any conclusions reached from that assessment. Please also explain if the assessment was utilized by PSE management and/or Board of Directors in evaluating whether or not to acquire Mint Farm.
b. Has the Company performed or obtained an assessment of the historical performance of the dike system along the Longview Reach of the Columbia River during flood conditions, including overtopping or breaching of the dike system? If so, please provide a copy of the assessment and any resulting conclusions. Please also explain if the assessment was utilized by PSE management and/or Board of Directors in evaluating whether or not to acquire Mint Farm.
c. Has the Company performed or obtained an assessment of the potential for damage to the dike system due to age or earthquake? If so, please provide a copy of the assessment and any resulting conclusions. Please also explain if the assessment was utilized by PSE management and/or Board of Directors in evaluating whether or not to acquire Mint Farm.
d. Does the Company have an emergency plan for the Mint Farm Generation Facility in the event of flooding at the site. If not, why not? If it does have a flood emergency plan, please provide a copy.
e. Does the Company have flood and/or earthquake insurance for the Mint Farm Generating Facility? If yes, what is the coverage and terms of the insurance? If not, please explain the rationale for that choice?

Response:

a. Attached as Attachment A to Puget Sound Energy, Inc.'s ("PSE") Response to WUTC Staff Data Request No. 177, please find a pre-purchase geologic hazards evaluation of the Mint Farm Generating Facility ("Mint Farm") site prepared by Shannon & Wilson, Inc., dated July 11, 2008. PSE retained Shannon & Wilson

to support its due diligence process prior to purchasing Mint Farm. The report indicates site structures were properly designed and the risks from site soil conditions are low.

b. and c. PSE did not specifically assess potential risks due to the Columbia River dike system during the pre-purchase due diligence process.

d. Attached as Attachment B to PSE's Response to WUTC Staff Data Request No. 177, please find "Appendix I, Attachment 6.3" from Mint Farm's Emergency Response Plan ("ERP"), effective October 7, 2008. Attachment 6.3 of the ERP specifically addresses flood response.

e. PSE has property insurance for all facilities, including Mint Farm, that includes replacement cost coverage related to earthquakes and floods.

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

ALASKA
CALIFORNIA
COLORADO
FLORIDA
MISSOURI
OREGON
WASHINGTON

July 11, 2008

Puget Sound Energy
P.O. Box 97034
PSE-09N
Bellevue, WA 98009-9734

Attn: Mr. Kim Lane

RE: PRE-PURCHASE EVALUATION, MINT FARM GENERATION FACILITY, LONGVIEW, WASHINGTON

At your request, we have performed a pre-purchase geologic hazards evaluation of the Mint Farm Generation Facility (MF site) in Longview, Washington. The purpose of our work was to evaluate subsurface conditions and potential geologic hazards that may affect the site, including earthquake hazards. Our evaluation is based on:

- A site-visit on May 21, 2008, to review available design documents and observe site conditions.
- A review of Shannon & Wilson files for projects in the immediate vicinity of the site.
- A review of published literature on potential geologic hazards in the area.

This work was done in general accordance with our proposal to you dated May 20, 2008.

The MF is a gas-fired electric generation facility located at the intersection of Industrial Way and Prudential Boulevard in Longview, Washington. Geotechnical explorations for design of the facility were performed in 2000 by Golder and Associates (Golder, 2000), and in 2001 by Stone and Webster. We understand that much of the construction, including foundations, was done by 2002; however, construction was not complete until 2007.

GEOLOGIC AND SUBSURFACE CONDITIONS

The site is located on the Columbia River floodplain, about ½ mile northeast of the river. Consequently, the topography at and adjacent to the site is flat, and geologic maps of the area

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(e.g., Livingston, 1966) indicate that the site is underlain by Holocene floodplain alluvium. This floodplain alluvium consists of sand, silt, clay, and peat deposited in recent channel, levee, overbank, lake, and marsh environments.

Subsurface conditions at the MF site were explored in 2000 by Golder Associates with four borings drilled to depths between 40 and 141.5 feet. In 2001, Stone and Webster drilled additional borings at the site, apparently up to 235 feet deep. The geotechnical report by Golder Associates, including the boring logs, was available for our review. However, neither the Stone and Webster geotechnical report nor boring logs were available for our review, but are referenced in vertical and axial pile capacity calculations we reviewed during our site visit.

Golder Associates and Stone and Webster characterized the subsurface conditions encountered in their borings as follows:

- 0 to 40 feet – Very soft to soft organic silt with scattered zones of fine sand and clay
- 40 to 120 - 160 feet – Interbedded soft to stiff organic or clayey silt with loose to medium dense fine sand
- 120 - 160 to 210 - 235 feet – Dense to very dense sand
- below 210 - 235 feet – Very dense gravel

Groundwater was typically observed in the explorations about 3 feet below the existing ground surface.

FOUNDATIONS

The design and construction documents we reviewed during our site visit, including foundation plans, selected pile driving records, and vertical and lateral pile capacity calculations, indicate that all major structures are supported on 12 ¾-inch-diameter, 0.312-inch wall, concrete-filled steel pipe piles. The records indicate that the pipe piles were driven closed-end into the dense to very dense sand below 120 -160 feet. The data we reviewed did not indicate the depth of penetration into the very dense sand. However, beneath the combustion turbine, the construction records indicate that the piles were driven to depths of about 150 to 185 feet.

The design documents indicate that allowable design axial capacities are 80 tons (compression) and 40 tons (uplift). The calculated compression axial capacity ignored any resistance in the upper 40 feet of the soil profile and includes an ultimate tip resistance of approximately 145 tons to which a factor of safety of 3 was applied in developing the allowable pile capacities. Vertical and lateral pile load tests were performed by Stone and Webster. For the vertical load test, the pile was loaded to 240 tons with 0.8 inch of settlement at the top of the pile. For the horizontal load test, the pile was loaded to 6 tons with 0.7 inch deflection at the top of the pile.

While at the site, we visually observed structure foundation mats. We did not observe signs of differential settlement of the foundations. It was reported that the entrance slab to the water treatment building had settled 1 to 2 inches. It was also reported that the slab is not supported on piles, and it was replaced last year. Part of the replacement included re-compaction of the slab subgrade. Additional settlement of the replaced slab has not been observed.

GEOLOGIC HAZARDS

We reviewed the potential for earthquake hazards which may affect the site. Based on our review, the principal hazards that could affect the site are soft-soil ground motion amplification and liquefaction (and associated effects, e.g., settlement, reduction in foundation capacities, lateral spreading, etc.). Other geologic hazards we reviewed included volcanic (lahar, mudflow, flooding), landslide, and fault rupture. The risks posed to the site by these other hazards are relatively low, in our opinion. Specifically, risks posed by volcanic inundation (lahar, mudflow, flooding) and ash fall are mapped as low or non-existent by Crandell and others (Crandell, 1973; Crandell, 1976; and Crandel and Mullineaux, 1978). The site is flat and so the risk posed by landslide is low (Fiksdal, 1989; Longview, Wash., 2003; and Wegmann, 2006). The risk posed by fault ground surface rupture is also low, in our opinion, as there are no known active faults within 5 kilometers of the site.

The relatively soft and loose soils at the site may cause amplification of ground shaking. To mitigate this risk, building codes classify sites based on subsurface conditions and stipulate ground motion amplification factors for the anticipated ground shaking levels and site soil conditions. Based on our review of the design documents, the MF was designed in accordance

with the 1997 Uniform Building Code, Zone 2b and Site Class E. In our opinion, designation of the site as Class E is appropriate. We note that for this site, the design ground motion levels in the 1997 UBC are generally equal to or slightly larger than stipulated in the current 2006 International Building Code for Site Class E at most structural periods.

Palmer et al. (2004) identify the floodplain on which the site is located as having a moderate to high liquefaction susceptibility. The Golder Associates report indicates that the interbedded sands between 40 and 120 - 160 feet are marginally liquefiable, and the underlying dense sands are not susceptible to liquefaction for the design ground motions. Based on our review of the boring and laboratory test information, it is our opinion that the organic silt from 0 to 40 feet is sufficiently plastic to preclude liquefaction; however, the fine sand zones in the organic silt are potentially liquefiable. Some of the Standard Penetration Tests (SPTs) in the interbedded sand layers between 40 and 120 -160 feet appear to indicate a factor safety of less than 1 against liquefaction; however, extrapolation of semi-empirical SPT/liquefaction potential relationships to soils below a depth of about 60 feet is tenuous.

In our opinion, the primary hazard of liquefaction at this site would be a reduction in foundation capacity and ground surface settlement. In our opinion, liquefaction-induced lateral spread poses a relatively low hazard to the site because:

- A lack of horizontal continuity of potentially liquefiable soil (liquefiable sand appears to occur in discontinuous sand zones in the upper 40 and in some interbeds below 40 feet).
- The large distance (½ mile) between the site and the most significant free face, the Columbia River.

Buildings with foundations supported above or within potentially liquefiable soils may suffer differential settlement and/or bearing capacity failures due to settlement and reduced soil shear strength associated with liquefied soils. At this site, it appears that much of the differential settlement and bearing capacity failure hazards are mitigated by the use of piles that penetrate through the soft silt and interbedded sand and bear in the dense to very dense sand between 120 - 160 to 210 - 235 feet. Down-drag forces on the piles may develop as a result of dissipation of liquefaction-induced pore pressures that could result in pile settlement. However, in our opinion,

the potential liquefaction-induced differential settlement beneath the pile-supported structures would be limited to a few inches for building code design motions, because:

- Ultimate tip capacities are estimated to be on the order of about 145 tons while the allowable capacity used in design is only 80 tons. A factor of safety of 3 was used to estimate the allowable pile design load. This factor of safety is sufficient to overcome negative skin friction caused by liquefied soils.
- Structure foundations are supported on multiple piles; reduced axial capacity and settlement in one pile would be distributed to other piles supporting the structure.

LIMITATIONS

The analyses and conclusions in this letter report are based on site conditions as disclosed by the borings and other design documents and further assume that the explorations are representative of the subsurface conditions throughout the site; that is, the subsurface conditions everywhere are not significantly different from those disclosed by the field explorations.

Within the limitations of scope, schedule, and budget, the analyses and conclusions presented in this letter report were prepared in accordance with generally accepted professional geotechnical/geologic engineering principles and practice in this area at the time this letter report was prepared. We make no other warranty, either express or implied. The conclusions are based on our understanding of the MF and site and subsurface conditions as described in this letter report.

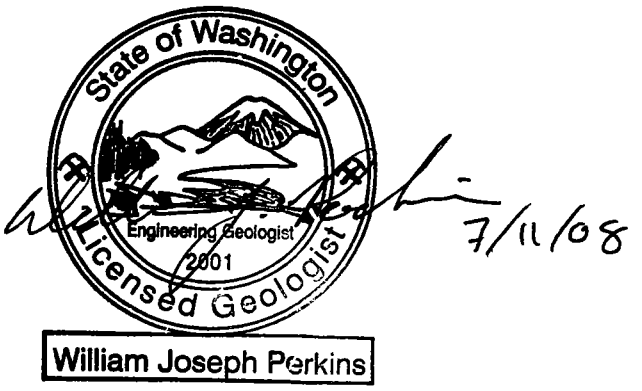
This letter report was prepared for the exclusive use of Puget Sound Energy in the pre-purchase evaluation of the MF. This letter report, conclusions, and interpretations should not be construed as a warranty of subsurface conditions.

The scope of our present work did not include environmental assessments or evaluations regarding the presence or absence of wetlands or hazardous or toxic substances in the soil, surface water, groundwater, or air, on or below or around this site, although we can provide these services if requested.

Shannon & Wilson, Inc. has prepared the enclosed, "Important Information About Your Geotechnical Report," to assist you and others in understanding the use and limitations of this letter-report.

Sincerely,

SHANNON & WILSON, INC.



William J. Perkins, L.E.G.
Associate

WJP:JW/wjp

Enclosures: Important Information About Your Geotechnical Report

REFERENCES

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Fiksdal, A.J., 1989, Slope stability of the Longview-Kelso urban area, Cowlitz County: Olympia, Wash., Washington State Division of Geology and Earth Resources, Open File Report 73-2, 3 p., 2 plates.

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Palmer, S.P., Magsino, S.L., Bilderback, E.L., and others, 2004, Liquefaction susceptibility and site class maps of Washington State, by county: Olympia, Wash., Washington State Division of Geology and Earth Resources, Open File Report 2004-20, 45 p., digital files.

Wegmann, K.W., 2006, Digital landslide inventory for the Cowlitz County urban corridor, Washington: Olympia, Wash., Washington State Division of Geology and Earth Resources, Report of Investigations 35, ver 1.0, 1 CD-ROM.

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

Attachment to and part of Report 21-1-21008-001

Date: July 11, 2008
To: Puget Sound Energy
Attn: Mr. Kim Lane

IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL/ENVIRONMENTAL REPORT

CONSULTING SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

Consultants prepare reports to meet the specific needs of specific individuals. A report prepared for a civil engineer may not be adequate for a construction contractor or even another civil engineer. Unless indicated otherwise, your consultant prepared your report expressly for you and expressly for the purposes you indicated. No one other than you should apply this report for its intended purpose without first conferring with the consultant. No party should apply this report for any purpose other than that originally contemplated without first conferring with the consultant.

THE CONSULTANT'S REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

A geotechnical/environmental report is based on a subsurface exploration plan designed to consider a unique set of project-specific factors. Depending on the project, these may include: the general nature of the structure and property involved; its size and configuration; its historical use and practice; the location of the structure on the site and its orientation; other improvements such as access roads, parking lots, and underground utilities; and the additional risk created by scope-of-service limitations imposed by the client. To help avoid costly problems, ask the consultant to evaluate how any factors that change subsequent to the date of the report may affect the recommendations. Unless your consultant indicates otherwise, your report should not be used: (1) when the nature of the proposed project is changed (for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one, or chemicals are discovered on or near the site); (2) when the size, elevation, or configuration of the proposed project is altered; (3) when the location or orientation of the proposed project is modified; (4) when there is a change of ownership; or (5) for application to an adjacent site. Consultants cannot accept responsibility for problems that may occur if they are not consulted after factors which were considered in the development of the report have changed.

SUBSURFACE CONDITIONS CAN CHANGE.

Subsurface conditions may be affected as a result of natural processes or human activity. Because a geotechnical/environmental report is based on conditions that existed at the time of subsurface exploration, construction decisions should not be based on a report whose adequacy may have been affected by time. Ask the consultant to advise if additional tests are desirable before construction starts; for example, groundwater conditions commonly vary seasonally.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical/environmental report. The consultant should be kept apprised of any such events, and should be consulted to determine if additional tests are necessary.

MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

Site exploration and testing identifies actual surface and subsurface conditions only at those points where samples are taken. The data were extrapolated by your consultant, who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates. Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent such situations, you and your consultant can work together to help reduce their impacts. Retaining your consultant to observe subsurface construction operations can be particularly beneficial in this respect.

A REPORT'S CONCLUSIONS ARE PRELIMINARY.

The conclusions contained in your consultant's report are preliminary because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site. Actual subsurface conditions can be discerned only during earthwork; therefore, you should retain your consultant to observe actual conditions and to provide conclusions. Only the consultant who prepared the report is fully familiar with the background information needed to determine whether or not the report's recommendations based on those conclusions are valid and whether or not the contractor is abiding by applicable recommendations. The consultant who developed your report cannot assume responsibility or liability for the adequacy of the report's recommendations if another party is retained to observe construction.

THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.

Costly problems can occur when other design professionals develop their plans based on misinterpretation of a geotechnical/environmental report. To help avoid these problems, the consultant should be retained to work with other project design professionals to explain relevant geotechnical, geological, hydrogeological, and environmental findings, and to review the adequacy of their plans and specifications relative to these issues.

BORING LOGS AND/OR MONITORING WELL DATA SHOULD NOT BE SEPARATED FROM THE REPORT.

Final boring logs developed by the consultant are based upon interpretation of field logs (assembled by site personnel), field test results, and laboratory and/or office evaluation of field samples and data. Only final boring logs and data are customarily included in geotechnical/environmental reports. These final logs should not, under any circumstances, be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process.

To reduce the likelihood of boring log or monitoring well misinterpretation, contractors should be given ready access to the complete geotechnical engineering/environmental report prepared or authorized for their use. If access is provided only to the report prepared for you, you should advise contractors of the report's limitations, assuming that a contractor was not one of the specific persons for whom the report was prepared, and that developing construction cost estimates was not one of the specific purposes for which it was prepared. While a contractor may gain important knowledge from a report prepared for another party, the contractor should discuss the report with your consultant and perform the additional or alternative work believed necessary to obtain the data specifically appropriate for construction cost estimating purposes. Some clients hold the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes that aggravate them to a disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY.

Because geotechnical/environmental engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, consultants have developed a number of clauses for use in their contracts, reports and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

The preceding paragraphs are based on information provided by the
ASFE/Association of Engineering Firms Practicing in the Geosciences, Silver Spring, Maryland

ATTACHMENT 6.2

HURRICANE

N/A TO MINT FARM ENERGY CENTER

ATTACHMENT 6.3

FLOOD

Flooding can occur as a result of either long-term, sustained precipitation or short-term intense weather events. Monitoring of emergency broadcasts is important to ensure proper preparation for such events.

1. Secure work area and turn off equipment and machines, if feasible
2. Evacuate the site, if conditions permit,
3. If unable to evacuate, move personnel to higher grounds,
4. Ensure safety of personnel