January 23, 2019

Randy Middaugh
Principal Planner
Snohomish County Planning and Development Services
3000 Rockefeller Ave M/S 604
Everett, WA 98201

RE:  Northwest Pipeline LLC’s Responses to Snohomish County’s Requests for Additional Information
County Project File No.: 18 100915 SHOR

Dear Mr. Middaugh,

This submittal responds to your requests made to Northwest Pipeline LLC (Northwest) on behalf of the County Planning and Development Services Department (PDS) regarding the North Seattle Lateral Upgrade Project (NSLU Project or Project).

Our responses to PDS’s requests are provided as separate attachments to this letter, as noted below. In each case, we have restated the specific PDS request being responded to just before our response. Additionally, we are providing a summary of mitigation measures included in Project plans, best practice commitments, and a supplemental Project Overview Map.

Responses to Section A., Need to Revise LDA:

(1) Staging Area (Pipe Yard).  An alternative pipe yard has been identified and is provided in the response to A.1 in Attachment A.
(2) Site disturbance within temporary extra work areas.  Please see the response to A.2 in Attachment A.

Responses to Section B., Issues Raised in Comments to [Subsequently Withdrawn] DNS:

(1) Public Safety.  Please see the responses to B.1 (a-f) in Attachment A.
(2) Greenhouse Gas Emissions.  Please see the responses to B.2 (a and b) in Attachment B. Additional Greenhouse Gas (GHG) information is provided below.

Summary of GHG Attribution Information.  Northwest understands that PDS has received public comment that focused on the GHG emission figures presented in the Federal Energy Regulatory Commission’s (FERC) Environmental Assessment for the Project (EA). As is typical for pipeline projects, the EA first identified GHG emissions expected to result from the Project itself. It then gave estimates of the GHG emissions that would
result from the end use of the gas delivered through the Project. The EA acknowledged that the Project would likely not, if its purpose was to address peak demand needs, transport much more gas than would flow through the existing North Seattle Lateral. But, instead of estimating the volume of increased gas usage actually associated with the Project, FERC simply assumed that all of the Project’s capacity would be fully used all the time. Accordingly, it identified volumes that, if correct, would have resulted in 3 -5% of the annual GHG emissions in all of Washington State. In fact, the Project is intended to address only peaking demand. That means that the gas transportation capacity it furnishes will only be used to supply gas at the (infrequent) times when need is at its highest, that is, during those hours of the coldest days when the area’s homes and businesses use the most gas for heating. As a result, annual emissions from furnaces, hot water heaters, and stoves in the region that burn the incremental gas will not be much more than would occur without the Project. Rather than the 3 - 5% of Washington’s annual GHG emissions assumed in the FERC EA, the annual increment associated with the additional gas transported through the Project will equate to about 0.0052% of the State’s GHG emissions in 2020 (and about 0.106% in 2048). The complete gas usage figures and associated GHG emission estimates underlying these projections, as provided by Puget Sound Energy, are detailed in Attachment B.

Mitigation Measures included in Project Plans and Best Practice Commitments

The NSLU Project includes many features that serve to minimize environmental effects. This section highlights some of those features, including those based on regulations and other plans developed to mitigate Project-specific impacts. Northwest refers to these plans collectively as “mitigation measures.”

Multiple layers of regulations provide a baseline to assure Project safety and minimize environmental impacts. At the federal level, the FERC regulates the construction of interstate natural gas pipeline systems, including this Project. Standard FERC requirements have been developed that reflected input from the public as well as from local, state, and federal agencies in addition to FERC itself. These pipeline-specific requirements have proven effective after many years’ experience in pipeline construction.

The Project also incorporates compliance with state and local codes and regulatory standards. These include standards that focus specifically on pipeline features as well as measures of a more general focus, such as regulatory codes protecting wetlands, streams and other environmentally sensitive areas.

In addition to compliance with the multiple layers of regulatory standards, the NSLU Project incorporates many project-specific analyses and mitigation measures. It provided these studies and plans to the County as supplements to the Project environmental checklist. The County has reviewed and considered them in its evaluation of the Project. Because the planning and
mitigation that goes into pipeline projects may be unfamiliar to other stakeholders, Northwest highlights them here. The table below lists the various submittals and summarizes the topics they cover. The submittals are referred to in the Project SEPA checklist as well. They are available for review at the County Planning office, and many are also posted on the FERC website for on-line review. They can be reviewed through the FERC’s Office of External Affairs at (866) 208-FERC or on the FERC website (www.ferc.gov). Under “Documents & Filings” select the “eLibrary” link, select “Docket Search” from the eLibrary menu, enter the selected date range and “Docket Number” excluding the last three digits (i.e., CP17-441), and select “Submit”. For assistance with access to eLibrary, the helpline can be reached at (866) 208-3676, TTY (202) 502-8659, or at FERCONlineSupport@ferc.gov.

### Plans and Reports Minimizing Project Effects

<table>
<thead>
<tr>
<th>Project Plan/Report</th>
<th>Date of Plan/Report</th>
<th>Submittal to County</th>
<th>Summary of Plan/Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erosion Control and Revegetation Plan</td>
<td>October 2017</td>
<td>SEPA/Appendix D (Jan 2018) Updated via email (Mar 2018)</td>
<td>Details Best Management Practices (BMPs) to be used during construction and restoration to prevent sedimentation/erosion and to ensure successful revegetation/restoration of disturbed areas following construction.</td>
</tr>
<tr>
<td></td>
<td>February 2018</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stream Fluming Procedures</td>
<td>May 2017</td>
<td>SEPA/Appendix E</td>
<td>Describes method to cross waterbodies in the dry while using a flume pipe or dam and pump to move the water continuously over or around the work area, to maintain downstream flows and to prevent/minimize turbidity effects.</td>
</tr>
<tr>
<td>Dam and Pump Procedures</td>
<td>May 2017</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spill Plan for Oil and Hazardous Materials</td>
<td>May 2017</td>
<td>SEPA/Appendix G</td>
<td>Details procedures to limit effects of spills and provides notification information for applicable company and agency personnel.</td>
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<td>Fish Salvage Plan</td>
<td>Not dated</td>
<td>SEPA/Appendix H (Jan 2018) Updated via email (Mar 2018)</td>
<td>Describes methods to safely salvage fish during waterbody crossings.</td>
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<tr>
<td>Project Plan/Report</td>
<td>Date of Plan/Report</td>
<td>Submittal to County</td>
<td>Summary of Plan/Report</td>
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<td>------------------------------------------------</td>
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<tr>
<td>Wetland and Waterbody Mitigation Plan</td>
<td>October 2017, February 2018</td>
<td>SEPA/Appendix F (Jan 2018) Updated via email (Mar 2018)</td>
<td>Details measures that will be implemented to minimize construction effects to wetlands and waterbodies; describes restoration/revegetation methods; and proposes mitigation for effects.</td>
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<tr>
<td>Wetland Mitigation Bank Use Plan</td>
<td>August 2018</td>
<td>County Data Request Response/Attachment 3 (Response document was Attachment A to the August 2018 submittal)</td>
<td>Proposes purchase of wetland credits to mitigate for impacts.</td>
</tr>
<tr>
<td>Environmental Alignment Sheets</td>
<td>October 2017</td>
<td>SEPA/Appendix B</td>
<td>Depicts limits of disturbance on aerial imagery as well as environmental resources and BMPs to protect those resources.</td>
</tr>
<tr>
<td>Unanticipated Discovery Plan</td>
<td>May 2017</td>
<td>Provided in FERC Filing</td>
<td>Describes measures to be implemented should cultural artifacts be found during construction.</td>
</tr>
<tr>
<td>Groundwater Supply Monitoring and Mitigation Plan</td>
<td>May 2017</td>
<td>Provided in FERC Filing</td>
<td>Details identification and sampling methods for groundwater wells and measures to prevent and mitigate impacts.</td>
</tr>
<tr>
<td>FERC Environmental Assessment</td>
<td>February 2018</td>
<td>Uploaded to ftp for County download (November 2018)</td>
<td>Federal National Environmental Policy Act document, which details the project, analyzes possible alternatives to the project; and describes the measures that will be utilized to avoid, minimize, mitigate, and restore effects from the project.</td>
</tr>
</tbody>
</table>
Northwest is committed to implementing the measures identified in these mitigation plans and procedures. As the chief federal regulator, FERC has already mandated compliance with these mitigation measures, through conditions on the certificate issued on July 19, 2018. FERC uses a standard process to make sure that its requirements are actually followed. No construction will be allowed until FERC issues its “notice to proceed,” which FERC uses as a check to ensure federal, state and local compliance just before construction begins. Finally, FERC requires the Project to have a third-party environmental inspector on-site during construction to observe the work and report any deviations. This inspector is a full-time position and is required to be present during all construction activities. The inspector has the authority to report any compliance issues and to stop work.

The FERC’s regulatory oversight and inspection procedures will ensure that Northwest follows the mitigation measures incorporated into the Project’s FERC certificate. Northwest has provided the mitigation documents to the County as well, and invites the County to also consider them as binding mitigation conditions on the Project under the County’s SEPA process or permit authorizations.

**Supplemental Project Overview Map**

Also included with this submittal is a map (Attachment C) that shows both the pipeline portion of the Project, the North Seattle/Everett Meter Station that would be improved, and the proposed pipe yard near Monroe, WA. Illustrations already submitted showed components of the Project separately, but this overview map depicts them together.

**Acknowledgement**

Northwest submits all of the information in this submittal as a supplement to its environmental checklist. My signature below affirms that, as with the responses to the County’s questions themselves, the information submitted with this letter is true and complete to the best of my knowledge, and I understand that the lead agency is relying on it to make its decision.

Sincerely,

Toby Schwalbe  
Sr Environmental Scientist  
Natural Resource Permitting

Attachments:

Attachment A – Pipe Yard/TEWAs/Pipeline Safety  
Attachment B - GHG Emissions Information  
Attachment C – Project Overview Map
ATTACHMENT A

Pipe Yard/TEWAs/Pipeline Safety
Northwest Pipeline Responses to A – B.1
of the Snohomish County November 30, 2018 Issues Letter
North Seattle Lateral Upgrade Project

A. Need to Revise LDA:

A.1 Upon further review of the staging area parcel that was omitted from the notice, PDS determined that a substantial portion of the identified parcel is located within a Channel Migration Zone (CMZ) which does not allow the intended use. Accordingly, please amend the Land Disturbing Activity (LDA) application to remove this parcel or portions of the parcel within the CMZ, or designate an alternative parcel for staging located outside of the CMZ.

Response: An alternative site has been identified and is shown on the Project Overview Map in Attachment C to the SEPA supplement letter. Its address is 15930 SR-2, Monroe, WA 98272. The site has been improved and graveled under previously issued permits, and would accommodate construction staging without modification. Should this site be unavailable for any reason, materials delivery and temporary storage will take place at another site (or sites) that is available for use during Project construction without further permitting or development.

A.2 By prior Review Comment Letter dated April 27, 2018, we requested the applicant to provide details on the area of site disturbance and volumes of soils to be excavated or deposited on all Temporary Work Area (TWA) sites. Please provide an itemized response to the above for each TWA identified on the applicable site plans.

Response: The total excavation volume for the Project (27,442 cubic yards) was provided on page 3 of the Land Disturbing Application and on the cover page of the Site Plans submitted on August 6, 2018 (this was the documentation method used on previous Northwest pipeline projects in Snohomish County). That total volume is accurate for the project as a whole. There will be, however, 64 temporary extra work areas (TEWA) located at different locations along the six-mile construction right-of-way so that they are well-positioned relative to construction activities they support. Accurate estimates of soil volumes to be temporarily managed at each TEWA or within the construction right-of-way would be infeasible. Due to space and time considerations, there will be multiple areas undergoing grading and excavation work simultaneously, and the construction contractor will need flexibility to make decisions in real time as to which designated areas to use for soil stockpiling that would cause the least disturbance and activity. These discrete work areas include:

- removal of the existing 8-inch pipeline and backfilling behind the removal work;
- re-excavation of the trench to install the 20-inch pipeline, and backfilling behind installation;
• construction of certain pipeline segments that must occur separate from the main pipeline removal and installation, including stream and road crossings; and
• work in areas where residential development is relatively close, where the contractor will need real time flexibility to choose soil stockpiling areas to minimize disturbance.

In light of these variables and other construction considerations, it is impractical to accurately predict the volume and location of soil that will be placed in each TEWA. For these same reasons, Northwest has planned that soil disturbance (in addition to storage) could occur anywhere within the designated TEWAs and the construction right-of-way. Whatever the volumes placed at, or surface area disturbed within, any particular TEWA, all spoil storage and disturbance will occur within the designated construction right-of-way or the designated TEWAs, and all spoil storage and surface disturbance areas will be managed under applicable mitigation standards during use and restored to standards afterward. Management and restoration techniques are detailed in the Project’s Erosion Control and Revegetation Plan, as provided in the SEPA checklist, Appendix D in January 2018 and updated via email transmittal in March 2018.

B. Issues Raised in Comments to [subsequently withdrawn] DNS:

B.1(a) In a single illustration, identify segments of the proposed pipeline classified as Class 1, segments classified as Class 3, and the overlay of what is identified as HCA;

Response: An illustration has been provided in Attachment 1.

B.1(b) explain why the entirety of the project area located adjacent to Class 3 pipeline is not designated HCA;

Response: Williams recognizes HCAs as defined in Federal Department of Transportation Code (DOT) 49 CFR 192.903 (2). This includes areas where the potential impact circle contains:

1. 20 or more buildings intended for human occupancy, unless the exception in paragraph (4) applies
2. An identified site, including: beaches, playgrounds, camp grounds, religious facilities, office buildings, day-cares, etc., that meet the criteria under DOT 49 CFR 192.903.

The Federal Code DOT 49 CFR 192.905 sanctioned method for identifying HCAs differs from identifying Class 3 areas – which are defined as:

1. Any class location unit that has 46 or more buildings intended for human occupancy
2. An area where the pipeline lies within 100 yards of either a building or a small, well-defined outside area that is occupied by 20 or more persons on at least 5 days a week for 10 weeks in any 12-month period.
In general class location analysis is used for front end design considerations including, selection of pipe, valve spacing, non-destructive testing (NDT) of welds, depth of cover requirements, and strength test parameters, whereas HCA analysis is used in determining requirements for ongoing maintenance, such as inspection intervals.

In practice HCAs are often located in areas already classified as Class 2 or 3 per Federal code. As a result, Williams performs in-line inspections for the entire segment of pipe containing HCAs, per the HCA re-inspection interval requirements. Therefore, Williams collects data beyond the extent of the HCA for the entire segment. As a prudent operator, Williams investigates anomalies in accordance with internal procedures and protocols to ensure the safety and integrity of the pipelines that it operates.

The NSLU Project is installing materials suitable for Class 3 operating areas along the entire length of the proposed pipeline. All pipe will be hydrostatically tested above the Federal requirement for Class 3 areas and will be inspected at the same intervals as HCA inspection requirements.

B.1(c) provide documentation contrasting the applicable DOT pipeline standards for pipe wall thickness, pipeline design pressures, hydrostatic test pressures, maximum allowable operating pressure, inspection and testing of welds, and frequency of pipeline patrols and leak surveys as between Class 1 pipe and Class 3 pipe, and verify design standards intended for the entirety of the proposed pipeline;

Response: Attachment 2 provides a summary of the Federal Code requirements in comparison to the North Seattle Lateral (NSLU) Project design. Documentation that covers the above referenced code requirements for differing class locations include the following internal Williams procedures, and meet or exceed DOT minimum code requirements:

1. Pipe Wall Thickness, Design Pressures
   ii. Williams Project Requirement Standard 40.05.01 “Pipeline Design – Steel.” For the NSLU Project, all pipe being installed is suitable for Class 3 operating areas, regardless of actual class designations less than Class 3 (20-inch, 0.375-inch wall thickness, with a yield strength of 52,000 psi (X52) which equates to a maximum allowable operating pressure (MAOP) of 960 psig).

2. Hydrostatic Test Pressures
   i. Federal Code DOT 49 CFR 192.505 provides requirements for testing pipe in a Class 3 area is a minimum 1.5 times multiplier for the test factor which would require a minimum test pressure of 1440 psig on the segment.
   ii. Williams Operating Requirement Standard 07.16.01.09 “Pressure Testing US Regulated Natural Gas Pipelines.” The NSLU Project will
utilize a higher factor (multiplier) of 1.80 for a minimum test pressure of 1728 psig.

3. Maximum Allowable Operating Pressure

i. Federal Code DOT 49 CFR 192 Subpart C covers MAOP. The pipe characteristics allow for an MAOP of 975 psig in Class 3 areas, 1170 psig in Class 2 areas, and 1404 psig in Class 1 areas.

ii. William’s Operating Requirement Standard 07.20.01.06 “Maximum Allowable Operating Pressure (MAOP) for Regulated Natural Gas Pipelines”. The actual MAOP for the NSLU Project will be set lower than the Federal standard in Class 3 areas to 960 psig.

4. Inspection and Testing of Welds

i. Federal Code DOT 49 CFR 192.243 covers inspection and testing of welds which is 100 percent unless unpractical in which case at least 90 percent of welds must be inspected.

ii. Williams Operating Requirement Standard 07.55.50.05 “Gas Pipes Nondestructive Testing of Welds.” The NSLU Project specific requirements include 100% NDT inspection of all field girth welds.

5. Pipeline Patrols

i. Federal code DOT 49 CFR 192.705 requires an instrumented leak survey over the right-of-way with patrols every 7½ months, with a minimum of twice annually and every 4½ months on highway and rail road crossing patrols with a minimum of 4 times in a calendar year.

ii. Williams Operating Requirement Standard 07.16.01.01 “Performing Pipeline Patrols.” In addition to the federal instrumented leak survey requirement stated in 5(i), Williams currently surveys the North Seattle lateral on a weekly basis, weather permitting, using aerial patrol to identify any potential encroachments and assess the condition of the right-of-way.

6. Leak Surveys


ii. Williams Operating Requirement Standard 07.16.01.02 “Performing Pipeline Leak Surveys.” Williams complies with federal code requirements for instrumented leak surveys at annual, semi-annual, or quarterly intervals depending on class location. For the NSLU Project, leak surveys are performed as stated response 5(ii).

7. Odorant

i. Puget Sound Energy injects odorant into the pipeline in accordance with Federal code DOT 49 CFR 192.625 at the North Seattle/Everett meter station for an additional safety measure.
B.1(d) identify any higher standards applicable to HCAs and what the proposed integrity management plan for the segment of the project identified as an HCA would provide by way of enhanced safety measures;

Response: HCAs dictate if pipeline segments must be inspected using in-line-inspection tools or direct assessment, and at what recurrence intervals. The NSLU Project incorporates new inspection tool facilities, and the entirety of the new construction will be assessed per the HCA inspection interval of 7 years.

B.1(e) provide analysis from a qualified professional explaining how compliance with the DOT pipeline standards enhance public safety in terms of reducing the potential for an accident and/or mitigating the potential harm resulting from an accident;

Response: DOT regulations for natural gas transmission pipelines represent decades of industry experience and oversight. These standards ensure a conservative pipeline design that will operate well within its maximum strength attributes. The standards establish provisions for the ongoing maintenance and protection of pipelines through continuous monitoring processes (including: right-of-way surveys, leak surveys, in-line inspection, cathodic protection management, etc.). Additionally, the Federal Pipeline and Hazardous Materials Safety Administration (PHMSA), and the State Level Washington Utilities and Transportation Commission (WUTC) have authority to enforce DOT regulations. These entities conduct regular audits and assesses penalties to violators.

B.1(f) compare pipeline safety standards for the proposed pipeline with the standards that applied to the existing pipeline.

Response: Both the existing and proposed pipeline meet or exceed all pipeline safety requirements for pipelines regulated under DOT 49 CFR 192.
ATTACHMENT 1

Project Class Location and HCA Figure
20" NORTH SEATTLE LATERAL UPGRADE PROJECT
NORTH SEATTLE LATERAL (2429)
CLASS LOCATIONS & HCA LOCATIONS
SNOHOMISH COUNTY, WASHINGTON

REFERENCE DRAWINGS

NORTHWEST PIPELINE LLC

DRAWING NO. | TITLE
---|---

REVISIONS

DRAWN BY: | REVISIONS
---|---

CHECKED BY: | CLASSES/HCA
---|---

APPROVED BY: | SHEET
---|---

SCALE: | NONE
---|---

DATE | NO.
---|---

12/5/2018 | 1

CLASS/HCA | DESCRIPTION
---|---

KLL | 20" NORTH SEATTLE LATERAL UPGRADE PROJECT

NORTH SEATTLE LATERAL (2429)
CLASS LOCATIONS & HCA LOCATIONS
SNOHOMISH COUNTY, WASHINGTON

LEGEND

Class #1: Location
Class #2: Location
HCA Division

APPROVED FOR PERMITTING

DATE | DESCRIPTION | R.O. NO. | APP.
---|---|---|---

12/5/2018 | 20" NORTH SEATTLE LATERAL UPGRADE PROJECT | 12345 | 6789

NO |
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1 | 20" NORTH SEATTLE LATERAL UPGRADE PROJECT | 12345 | 6789

CLASS/HCA | SHEET
---|---

1 | 1 |
ATTACHMENT 2

Federal Code Requirement Summary
<table>
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<tr>
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<td>Design Factor</td>
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<tr>
<td>Safety Factor</td>
<td>1.39</td>
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<td><strong>Code Allowable</strong></td>
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<tr>
<td>Calculated MAOP - psig (Based on Actual Pipe Characteristics)</td>
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<td>Minimum Required Wall Thickness - in. (20&quot; X-52 pipe)</td>
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<tr>
<td>Valve Spacing</td>
<td>20 miles</td>
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<tr>
<td>Non-Destructive Testing</td>
<td>10% of each day's field girth welds</td>
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<td>Minimum Depth of Cover</td>
<td>30&quot; soil, or 18&quot; rock</td>
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<tr>
<td>Strength Test Factors</td>
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<td>Test Pressures for 960 MAOP</td>
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<td>Aerial Patrols</td>
<td>If selected method: Annual, not to exceed 15 months</td>
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<td>Highway and RR Patrols and Leak Surveys</td>
<td>Semi-Annual, not to exceed 7-1/2 months</td>
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<td>ROW Patrols and Leak Surveys</td>
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<tr>
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ATTACHMENT B

GHG Emissions Information
Northwest Pipeline Responses to B.2 of the Snohomish County November 30, 2018 Issues Letter
North Seattle Lateral Upgrade Project

PDS’s November 30, 2018, letter requested that Northwest provide further information regarding greenhouse gas emissions associated with the NSLU Project. These requests focused not on emissions from the Project itself, but emissions that could be expected (estimated) based on the combustion of the gas transported through new pipeline capacity furnished by the Project (“Downstream Impacts,” under PDS’s terminology, as well as effects attributed to any additional natural gas production that might occur as a result of the Project’s additional transportation capacity, “Upstream Impacts”). Downstream and Upstream Impacts depend on changes in the level of gas consumption by end users. In this case, the end users are the customers of Puget Sound Energy (“PSE”), both residential and nonresidential. Responses to PDS’s questions regarding greenhouse gas emissions are provided below, using information furnished by PSE. Preceding those responses are text and illustrations that explain background information on gas pipelines and how the capacity to be furnished by new pipeline is planned and used.

I. BACKGROUND

Moving, Measuring and Delivery of Natural Gas to Washington State Customers

Natural gas is moved to customers through a system of pipelines, as well as compressors and regulators that are used to ensure adequate pressure. The gas is moved from distant production and storage areas through pipelines ranging from large interstate transmission pipelines to local distribution pipelines. A typical transmission pipeline is large-sized (usually 30” to 48”) to receive very large amounts of aggregated natural gas from the gathering lines and processing plants. The natural gas is moved long distances through transmission lines by using high-pressure (up to 1200 psi (pounds per square inch)).

These transmission pipelines deliver gas to local distribution company (LDCs) systems at ‘gate stations’, where the pressure of the gas is reduced, and the gas is scented for detection and measured to deliver the correct amounts to the LDCs. An LDC takes receipt of natural gas at gate stations and moves it at a relatively lower pressure through a grid of smaller pipes known as distribution pipelines in order to deliver the gas to customers through service connections to the point of use in a home or business. An LDC’s network of distribution lines is known as a distribution system. Laterals, such as North Seattle Lateral (NSL), can exist on the front end of the distribution system connecting the transmission pipeline to the distribution pipeline.

To make an analogy, natural gas flow can be compared to a car traveling down an interstate, exiting to a state highway and then turning onto a neighborhood street and arriving at a house.

The Federal Energy Regulatory Commission (FERC) authorizes and regulates the transmission and sale of natural gas for resale in interstate commerce. The safety
aspects of the U.S. natural gas system are regulated under and by the federal Pipeline and Hazardous Materials Safety Administration (PHMSA) and its state partners under 49 CFR Part 192.

The Washington Utilities and Transportation Commission (WUTC) regulates the in-state transport and sale of natural gas to Washington State customers by natural gas LDCs. Based upon delegation of authority from PHMSA, the WUTC oversees the LDCs’ safe operation of the distribution system. Each Washington LDC is required to “maintain its gas system in a condition that enables it to furnish safe, adequate, and efficient service.”

To accomplish this, each LDC must adopt and maintain a standard pressure of gas in various portions of its system. This standard pressure is then used to design the system, so that natural gas can be reliably delivered to the furthest customer on the distribution system.

Natural gas is measured by volume or heating value. The standard measure of volume for natural gas is the standard cubic foot. The standard measure of heating value in the English system of units is millions of British thermal units or “Btu.” Dekatherms (Dth) are also a standard unit of measurement within the natural gas industry. One million Btus (MMBtu) equals one Dekatherm (1 MMBtu = 1 Dth). Often for engineering design purposes, it is assumed that heating value and volume are equivalent such that one thousand cubic feet (Mcf) equals one MMBtu or one Dekatherm. Generally the capacity of a transmission pipeline is contracted in Dth per day, whereas the capacity of LDC systems and laterals are measured in cubic feet per hour as this allows practical units for designing and sizing distribution units.

Northwest Pipeline and PSE

Northwest Pipeline LLC (Northwest), owned by the Williams Companies, operates a FERC-authorized and regulated high-pressure transmission pipeline that runs generally in a north-south direction from British Columbia, Canada through the states of Washington, Oregon, Idaho, Wyoming, Utah and Colorado. An illustration of Northwest’s pipeline system is included as Attachment 1 to this document. Northwest’s pipeline moves gas from production areas and various storage facilities to multiple on and off-system markets, and has peak primary firm capacity of 3.8 million Dth. The Northwest system transports gas originating from production areas in British Columbia, Alberta and the US Rocky Mountain states and storage areas in Washington, Oregon and Utah.

PSE, a Washington LDC, operates a local distribution pipeline system solely within the state of Washington. All of the gas used by PSE’s gas customers is transported through the Northwest system before reaching PSE’s distribution system. PSE contracts with Northwest for approximately 550,000 Dth per day of gas transportation capacity from production areas and 450,000 Dth per day of transportation capacity from a gas storage facility, for a total pipeline capacity of approximately 1,000,000 Dth per day. Of this 1,000,000 Dth per day transmission capacity, the quantity of natural gas, as measured in cubic feet per hour, that can be delivered in a specific area within PSE’s distribution system depends on the diameter of the pipelines in that area and the pressure at which

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1 WAC 480-90-148(2)(d)
they operate. Consequently, while PSE can have plenty of transmission capacity on the Northwest system coming from production areas, it can at the same time have constraints on what volumes of natural gas can be delivered at any particular location due to smaller diameter pipelines serving those specific locations.

Using the roadway analogy, the interstate might have capacity to handle a certain volume of traffic from point A to B, but limitations of how much traffic the various exits in between can handle depends on the size of those roadways. Some might be state highways and some might be small country roads, so there could be significant traffic constraints off exits even if the interstate has sufficient capacity.

Gas Customer Demand, Consumption and Use

As regulated under tariffs approved by the WUTC, PSE has three types of natural gas customers: residential, commercial and industrial. Residential customers are considered firm customers, while commercial and industrial customers often have options on whether they want firm service, interruptible service or a mix of both. Firm customers pay for the highest level of natural gas service such that natural gas service is available on demand. Interruptible service customers pay a reduced rate and have a natural gas supply most of the times of the year but could have restrictions during certain peak demand events. In this way PSE does not have to upgrade the infrastructure to accommodate these customers during peak periods because these customers can be curtailed by PSE.

The quantity of natural gas molecules used by customers is referred to as ‘consumption,’ ‘load’ or ‘demand’. Normal daily use of natural gas is referred to as ‘non-peak’ consumption. On extremely cold days (and during a few hours within those days), residential and commercial consumption of gas (for heating) spikes far above a normal day’s (or hour’s) consumption level. This is known as ‘peak-day’ or “peak hour” consumption. Pipelines must be sized to accommodate the highest peak hourly usage, even though that usage level occurs very infrequently. Otherwise, they would be unable to deliver the volume of gas at the required pressure during demand peak.

By law, PSE must provide to its ‘firm’ residential and other customers (i.e., customers who pay a higher price to have natural gas available at all times) natural gas even on the coldest hour of the coldest day, that is, during the highest peak hour usage. This means the pipelines it uses to serve customers must be sized to handle the very large peak hourly rate gas used during the coldest period of the year. This is true even though this period could be as brief as one hour per year, or could perhaps not occur at all during warmer winters. To ensure this ability to supply gas, PSE designs its distribution system pipelines with capacity to provide reliable service to firm customers under design peak.

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2 This is analogous to a stormwater system: the stormwater pipes receive average (non-peak) amounts of stormwater from a community throughout the year. However, they are generally sized much larger because occasionally they receive extra-high volumes during floods from high rain events. Cities plan utility systems for projected growth and size pipes accordingly. Over time, as more impervious surface is created, the average (non-peak) amounts of stormwater flowing into the pipe will increase incrementally, but without the need to constantly upsize the stormwater pipes because they are built to handle a larger, “peak,” scenario such as the 100-year flood.

3 See WAC 480-90-148(3) (“The gas utility must make all reasonable efforts to avoid interruption of service and if an interruption occurs must endeavor to reestablish service with the shortest possible delay.”)
conditions. PSE’s indicates that its “design peak” is based on the design standard that ensures the company can deliver gas to meet firm loads on a 13-degree design peak day, which corresponds to a 52 Heating Degree Day (HDD). PSE’s HDD methodology is outlined in PSE’s 2017 Integrated Resource Plan, on file with the WUTC, in Appendix O.4

Through its distribution system, PSE delivers approximately 275,000 Dth per day on an average non-peak day during the year to its residential, commercial and industrial natural gas customers, but would expect to deliver under a design peak condition approximately 1,000,000 Dth for the day. Because of this extreme difference between non-peak and peak-demand energy efficiency can help reduce overall natural gas demand, but this percentage of reduction is much smaller for peak demand.

**Growth and North Seattle Lateral Upgrade**

Policies and decisions that affect growth and growth patterns are determined by state and local elected officials. Cities and counties in Washington, including Snohomish and King Counties and all municipalities within, develop Comprehensive Plans under the Growth Management Act (GMA), ch. 36.70A RCW, to plan for 20 years of projected growth based on population estimates developed by the Washington Office of Financial Management. Utilities such as PSE do not control growth. They must, however, “make all reasonable efforts to avoid interruption of service and, if an interruption occurs, must endeavor to reestablish service with the shortest possible delay.”5

Growth has occurred and is expected to continue to occur in the north King County – south Snohomish County area. PSE is the LDC that provides natural gas to residential, commercial and industrial customers in this area. To meet its duty to serve all customers when they request service,6 PSE cannot wait for growth to occur to install the infrastructure needed to serve it. It must plan and arrange for necessary infrastructure, including pipelines, to be in place before the customers request service.

To accomplish this, PSE’s gas system planners constantly monitor current load, new load and future load growth in the entire gas system to know when and where pipeline systems are in need of reinforcement to maintain 24/7/365 dependability. PSE develops long-range gas system models to predict future conditions to inform comprehensive system plans, which use a variety of inputs including: current load and customer information; peak design criteria; predictions for future growth (including current load approvals for new gas service and estimates from developers, as well growth forecasts from the Puget Sound Regional Council and PSE’s economic growth forecast used in the IRP process); and the beneficial impacts of energy efficiency measures.

PSE’s distribution network in the northern King and southern Snohomish County area (NSL Service Area, included as Attachment 2 to this document) is supplied with gas purchased by PSE and placed into the Northwest system. To get from Northwest’s mainline (north-south system) the gas must flow eleven miles west on Northwest’s NSL. The existing NSL lateral has capacity to deliver 10.5 million cubic feet per hour. This is

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4 The heating degree day standard was established in PSE’s 2005 IRP, Appendix I, Gas Planning Standard.
5 See footnote 3.
6 RCW 80.28.110 (“Every gas company … engaged in the sale and distribution of gas … shall, upon reasonable notice, furnish to all person and corporations who may apply therefor and be reasonably entitled thereto, suitable facilities for furnishing and furnish all available gas … as demanded.…”)
more than sufficient to meet non-peak day and hour demand in the NSL Service Area because annual average non-peak usage of the NSL is currently 4.25 million cubic feet per hour. The existing NSL is expected to continue to meet non-peak day and hour demand even with projected growth in Snohomish County, as well as King County, over the next 20 years, including 75,000 new homes for existing, new and in-migrating residents. The incremental growth in population will correlate to slowly increasing average non-peak hourly consumption, which is estimated to be 5.57 million cubic feet per hour by 2038.

However, this same growth also leads to an increase in peak hourly consumption (during the coldest periods). The existing NSL is not large enough to allow PSE to meet that demand. Consequently, PSE cannot reliably serve its customers during these peak hourly periods. The existing NSL was built in 1956 – pre-dating construction of Interstate 5 between Seattle and Everett and Boeing’s 747 plant at Paine Field. Over the last 30 years, the Puget Sound region has experienced significant economic growth including Snohomish and King Counties. Currently, PSE’s natural gas system in south Snohomish and north King counties serves more than 200,000 residential, commercial and industrial customers. Furthermore, the Puget Sound Regional Council predicts that by 2050 the area will have another 1.8 million people and 1.2 million more jobs. PSE reports that, in its service area, customers overwhelmingly choose to have natural gas in their homes, where available.

Based on the area’s population growth estimates, by the winter of 2019-2020, the NSL is expected to have insufficient capacity to meet the design peak demand -- estimated to be 12.9 million cubic feet per hour, which means a 2.4 million cubic feet deficit in capacity. In other words, the existing NSL lateral is big enough to accommodate projected population growth for non-peak demand, but, currently and in the future, the lateral does not have enough capacity to serve the peak day or peak hour demand for projected population growth. A shortfall in delivered gas would lead to service disruptions for some customers.

Due to gas pressure and related safety considerations, a gas outage, or service disruption, is much more complex than an electric outage. A service disruption means gas would no longer flow to some customers or would flow at an unacceptable pressure. If pressure drops to an unacceptable level in the distribution system, the gas valve on furnaces and water heating equipment will not open and service is completely disrupted. In the event of a gas outage, PSE is required by law to manually shut off all customers affected by such outage.7 Resolving such disruptions is complicated because it can take hours to multiple days to re-pressurize the system. Then, PSE must, by law, conduct house-by-house inspections before safely restoring service and re-lighting each home’s pilot light. The hardships associated with such outages can be compounded if they occur when it is very cold. Only when the system is sufficiently re-pressurized and deemed safe to operate can gas service be restored, one customer at a time. Consequently, a very short duration gas outage caused by a pressure drop can result in weeks or months of customers going without gas service, which could include the coldest days of the winter.

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7 WAC 480-90-128(2)(c) (“The utility may discontinue service without notice or without further notice when …:[t]he utility identifies a hazardous condition in the customer's facilities or in the utility's facilities serving the customer ….”). A gas company “must inspect and test service regulators and associated safety devices … when a customer experiences a pressure problem.” WAC 480-93-140(2).
At present, PSE manages the risk of outages or service disruptions in the NSL Service Area by using a series of temporary measures, including curtailing interruptible customers and manually bypassing automatic controls. These temporary measures taken in their entirety do not provide adequate reliability currently or on a long-term basis. These measures also lose their effectiveness as the population grows and the demand for gas service increases. As demand on the distribution line increases and the manual measures lose effectiveness, there is a corresponding pressure drop which increases the likelihood of an outage.

The least impactful, lowest cost and most reliable means to resolve this reliability issue is to increase the capacity of the NSL to ensure an adequate peak day and peak hour supply of natural gas. The proposed NSL pipeline upgrade (NSLU Project) will have the ability to deliver up to 17.2 million cubic feet in a one-hour period. This will provide adequate capacity for PSE to continue providing safe, reliable natural gas when customers need it most long into the future.

Figure 1 depicts PSE’s current gas usage in the NSL Service Area under both average (Annual Average Hourly) and peak hour (Design Peak Hour) conditions, as well as the increase in usage that will occur due to planned population growth over time. It also shows the gas transportation capacity that the NSLU Project would provide. The position of the Annual Average Hourly line (below the Current Capacity line) shows that the new capacity is only needed for peak situations. Most of the new capacity will only be used those few hours/days per year when demand spikes due to extreme cold weather. But, as explained above, because the consequences of not meeting these demand spikes would be unacceptable, the lateral must be large enough to handle such hours and days.
Figure 2 shows the estimated hours during the year that some portion of the incremental capacity is expected to be used to serve customers.

Figure 2

North Seattle Lateral Upgrade - Expected Hours of Some Use per Year

Note: Year equals 8,760 Hours
Figure 3 shows how much of the incremental transportation capacity created by the NSLU Project will be used by PSE annually: after 28 more years of growth, approximately 3.2% of the new capacity from the NSLU Project will be used on an annual basis. As shown in Figures 1 and 2, some of the new capacity is used for at least an hour each year and that amount is expected to increase each year. Regardless of how infrequently this could occur, pipes must be sized to handle the very large peak hourly rate gas used during the coldest period of the year.

**Figure 3**

North Seattle Lateral Upgrade - % of new capacity used per year
(totals volume of new capacity used in year/ new capacity x 365 days per year)
II. Snohomish County Requests for Additional Information

RFI B.2(a)(1): Based on the stated purpose of the project to enable PSE to serve projected population growth within the geographic service area of the pipeline, please provide an analysis of the actual reasonable foreseeable increase in end-use combustion of natural gas associated with the project.

The NSLU Project is needed to resolve PSE’s insufficient delivery capacity under peak conditions (peak demand days and hours) due to past and continuing population growth (new customers) within the NSL Service Area. In other words, PSE has the natural gas supply needed to meet peak demand but does not have the physical ability to move it in the NSL Service Area. While the existing NSL is more than sufficient to serve most PSE non-peak demand situations, there’s a shortfall in delivery capacity during design peaks that occur on cold winter days. Pipes must be sized to handle the very large peak hourly rate gas used during the coldest period of the year even though this period could be as brief as one hour per year.

As shown by Figure 3, only a small amount of the increased usage of natural gas by PSE is attributable to the increased capacity within the NSLU Project. The vast majority of the time, the NSL will be flowing significantly less than at peak conditions. Increasing the NSL’s capacity by constructing the NSLU Project will not change this fact.
Table A demonstrates the increased greenhouse gas (GHG) emissions resulting from PSE’s projected gas volumes that cannot be delivered through the existing NSL but which can be delivered through the NSLU Project.

<table>
<thead>
<tr>
<th>Year</th>
<th>Maximum Theoretical Impact (NSL Peak) Associated With End-Use Combustion</th>
<th>Percentage Increase in Emissions from New NSL Peak Capacity (End-Use Combustion)</th>
<th>Percentage Increase in WA State Emissions from New NSL Peak Capacity (End-Use Combustion)</th>
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<tr>
<td>Metric Ton CO₂</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2020</td>
<td>4,941</td>
<td>0.2%</td>
<td>0.0052%</td>
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<td>6,711</td>
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<td>2022</td>
<td>8,494</td>
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<td>0.009%</td>
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<td>2023</td>
<td>10,337</td>
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<td>0.011%</td>
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<td>12,786</td>
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<tr>
<td>2048</td>
<td>100,586</td>
<td>3.2%</td>
<td>0.106%</td>
</tr>
</tbody>
</table>

Notes:
1. End-use conversion factor: EPA 40 CFR 98 (0.0544 tonne CO₂/Mscf)
2. Washington State GHG Inventory, Department of Ecology; 2013
The NSLU Project is designed to accommodate maximum customer demand during peak hours (during cold winter days). Peak demand is episodic in nature and the pipeline will therefore not operate at full capacity year-round. In fact, even after 28 years of projected residential and business growth, the NSLU Project’s incremental capacity is not expected to be used during the vast majority of hours in the year (96.8%). See Figure 3 above. The amount of natural gas molecules that can be brought into Washington and combusted is limited by the size of Northwest’s main transmission pipelines. The NSLU Project won’t require an increase of that capacity. Northwest is upgrading the NSL to ensure adequate regional capacity and pressure so PSE can reliably serve its existing and incrementally growing customers in south Snohomish and north King counties during peak periods of cold winter days. Using the highway analogy, the NSLU Project would be similar to expanding a state highway exit to handle a traffic surge that is expected to happen once a year. Of course, in actuality a highway exit would not typically be expanded to accommodate a brief, once-yearly condition. Traffic can slow down in response to the temporary capacity shortfall, and the resulting inconvenience does not warrant the cost of expanding the exit to avoid it. As discussed above, though, gas pipelines have to be sized to handle that peak hour condition because the consequences of any delivery failure, however brief, would be so significant.

The population growth creating the increasing peak gas demand in the NSL Service Area is allowed by the area’s comprehensive plans, land use zoning and development regulations, and as limited by urban growth boundaries. These plans, ordinances, regulations and UGA boundaries are established by local jurisdictions. All of the actions taken by local governments to plan for and accommodate growth through land use plans, population targets, zoning rules, development regulations and UGA boundaries are subject to SEPA review before adoption. Utilities such as PSE do not make these decisions as to growth. They are, however, required to serve when that growth occurs and the new customers ask.

As regional customer peak demand for natural gas increases in the future, the NSLU Project will furnish the capacity necessary to safely and reliably meet the demand under design peak conditions. With or without the NSLU Project, emissions will not increase until additional customers are added.

If the demand growth occurs over the next 2-28 years, as predicted by PSE and shown in Figure 3, the incremental emissions attributed to the NSLU Project capacity would start at approximately 0.0052% of the annual Washington state carbon emission total and rise gradually to approximately 0.106% of that annual value over 28 years. (See Table above).

FERC’s Environmental Assessment for the NSLU Project has generated misunderstanding about the amount of GHG that could be emitted as a result of the additional gas transportation capacity. Because FERC did not have projections of the actual incremental amounts -- that is, the projected amounts provided in this submittal -- it simply assumed that the NSLU Project's capacity would be used fully all the time. As FERC acknowledged, that assumption overstated the actual amount, and yielded an estimate that would represent a 5% increase of the Washington State GHG emissions. As described above, the actual amounts will represent just a .0052% increase in Washington emissions in 2020, and 0.106% in 2048.
RFI B.2(a)(2): Confirm whether there are any new or proposed incremental loads within the geographical service area served by the North Seattle Lateral pipeline, other than increased residential and associated commercial consumptive use attributable to population growth, which could be facilitated by the project

PSE reports that it is not aware of any specific planned new industrial loads (demand) in the NSL Service Area beyond those accounted for in PSE’s general growth projections. If new industrial customers emerge, PSE would, as the regulated local gas distribution utility, provide service, subject to the terms of its tariff. PSE indicates that it is not, however, aware of any proposed new users whose gas needs would be above and beyond the planned-for growth.

RFI B.2(a)(3): Describe PSE’s conservation strategy related to natural gas consumption in the pipeline service area

PSE reports that there is no specific conservation strategy adopted for this particular area alone. PSE is required to achieve all cost-effective conservation per RCW 19.285. PSE follows the general strategy below:

PSE has provided conservation benefits (also called demand-side resources) to customers since 1993. These energy efficiency programs operate in accordance with requirements established as part of the stipulated settlement of PSE’s 2001 General Rate Case. (PSE’s 2001 General Rate Case, WUTC Docket Nos. UG-001571 and UE-011570). Through 1998, the programs primarily served residential and low-income customers. In 1999 the company expanded them to include commercial and industrial customer facilities. Between 1997 and 2016 PSE has saved a cumulative total of over 5 million Dth, which equates to approximately 300,000 metric tons of CO2 emissions. More than half of these emissions savings have been achieved since 2007. Energy savings targets and the programs to achieve those targets are established by the company every two years. The current conservation programs cycle is January 1, 2018 through December 31, 2019. The majority of gas energy efficiency programs are funded using gas “rider” funds collected from all customers.

For the 2018-2019 period, PSE has a two-year target of approximately 650,275 Dth in energy savings for its entire service territory. Savings of 361,330 Dth were achieved in 2017 for the entire service territory. The target savings are calculated using extensive analysis of savings potentials and are developed in collaboration with key external stakeholders represented by the Conservation Resources Advisory Group and Integrated Resource Plan Advisory Group.

RFI B.2(b)(1): Identify whether the project will be dependent upon or will require the introduction of additional natural gas into the mainline of the larger interstate pipeline system to service the increase capacity of the North Seattle Lateral pipeline, or whether the project primarily will allow redistribution of existing natural gas flow
within the mainline

The NSLU Project will not be dependent upon or require the introduction of additional natural gas into the existing Northwest system. PSE reports that it will use gas already available to it from the capacity it contracts for on the existing Northwest interstate transmission pipelines during off-peak periods (summer) at the regional market hub at Sumas, and then storing and redistributing it during the high gas use season.

RFI B.2(b)(2): Identify whether the project will require additional production or extraction of natural gas to serve the increased capacity of the North Seattle Lateral pipeline and, if so, identify whether there are existing sources of natural gas currently in production serving the mainline which have the capacity to meet this increased demand;

The NSLU Project will not require additional production or extraction of natural gas to serve the increased capacity of the NSL; see RFI (2)(b)(1), above. The incremental amounts added over a period of decades as shown in Figure 3 above are so small as compared to PSE’s existing transportation capacity that it already holds for peaking purposes that no increased production or extraction is expected. PSE indicates that it expects production to remain fairly constant on a year-round basis, as producers seek steady cash-flow for their product.

When there is lower demand in the Pacific Northwest for natural gas, the surplus production remains in the pipeline and flows via connecting pipelines into California, displacing more expensive supplies that would otherwise be obtained from other sources. PSE indicates that it utilizes storage resources that allow it to capture some of the surplus production in the summer months and store the gas for use in winter peak demand situations. Thus, PSE will use gas redistributed (both temporally and locationally) to serve increased consumption.

Table B demonstrates how growing demand on the NSL portion of PSE’s distribution system is accommodated by redistributing supply and increasing storage use, without increasing production.
PSE reports that it expects its natural gas supply will originate in British Columbia and will be acquired primarily in the summer months. It will then be stored for redistribution during later peak demand periods, allowing the avoidance of need for increased gas production.

**RFI B.2(b)(3):** Identify whether the project will require new sources of natural gas to meet the enhanced capacity created by the project and, if new sources will be required, the reasonably foreseeable sources to be developed for this purpose.

The NSLU Project will not require new sources of natural gas to meet the additional capacity created by the Project; see the response to RFI (2)(b)(2) above.
Attachment 1

Northwest’s Pipeline System Illustration
Northwest System – Strategically Located

> Low-cost, primary service provider in the Pacific Northwest
  – 3,900-mile system with 3.8 Bcf/d peak design capacity
  – ~120 Bcf of access to storage along pipeline, with high injection and deliverability capability in market area
  – Fully Contracted with > 9 year average contract life

> Bi-directional design
  – Provides flexibility (Rockies to market and Sumas to market)
  – Cheapest supply drives flow patterns
  – Provides operational efficiencies through displacement

> Numerous supply sources
  – 65 receipt points totaling 11.6 Bcf/d of supply from Rockies, Sumas, WCSB, San Juan, emerging shales

> Significant market options
  – 366 delivery points totaling 9.7 Bcf/d of delivery capacity

> Solution oriented
  – History of working with our customers both creatively and collaboratively to serve their needs
Attachment 2

North Seattle Lateral Service Area Illustration
ATTACHMENT C

Project Overview Map
NORTHWEST PIPELINE LLC
PROJECT OVERVIEW MAP
20" NORTH SEATTLE LATERAL UPGRADE PROJECT
SNOHOMISH COUNTY, WASHINGTON

Proposed Monroe Pipe Yard
Proposed 20" Pipeline
North Seattle/Everett Meter Station