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April 25, 2013

***VIA ELECTRONIC FILING***

Public Utility Commission of Oregon
550 Capitol Street, N.E., Suite 215
P.O. Box 2148
Salem, Oregon 97308-2148

Attn: Filing Center

Re: **LC 51**: NW Natural's 2013 Annual Update to its 2011 Modified Integrated Resource Plan

In compliance with OAR 860-027-0400(8), Northwest Natural, dba NW Natural, herewith submits one original and two copies of its Annual Update to its 2011 Modified Integrated Resource Plan that was previously filed on September 1, 2011 in Docket LC-51.

Attached is a Certificate of Service verifying that this filing has been electronically sent to all parties to the subject docket.

Please call me if you have any questions regarding this Update.

Sincerely,

*/s/ Tamy Linver*

Tamy Linver

Enclosure

NW Natural

**CERTIFICATE OF SERVICE**

I hereby certify that I have this day electronically served the foregoing ANNUAL UPDATE TO NW NATURAL'S 2011 MODIFIED IRP to all parties to the LC 51 proceeding.

| | |
|---|---|
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DATED at Portland, Oregon, this 25th day of April 2013.

*/s/ Jennifer Gross*

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# 2013
# Oregon LC 51
# Integrated Resource Plan
# Update

NW Natural®

## Forward-Looking Statements

This planning document contains forward-looking statements. Forward-looking statements include statements concerning plans, objectives, goals, strategies, future events and other statements that are other than statements of historical facts. NW Natural's expectations, beliefs and projections are expressed in good faith and are believed to have a reasonable basis. However, each such forward-looking statement involves uncertainties that could cause the actual results to differ materially from those projected in such forward-looking statements.

All subsequent forward-looking statements, whether written or oral and whether made by or on behalf of NW Natural also are expressly qualified by these cautionary statements. Any forward-looking statement speaks only as of the date on which such statement is made. New factors emerge from time to time and it is not possible for NW Natural to predict all such factors, nor can it assess the impact of each factor or the extent to which any factor, or combination of factors, may cause results to differ materially from those contained in any forward-looking statements.

The forecasts and projections included in this document have been developed for the purposes of integrated resource planning and should not be used for investment decisions. Disclosure of this information or use of the information for investment purposes could constitute a violation of federal securities laws.

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## CHAPTERS



## APPENDIX

# Chapter One:

# Executive Summary

## 1. Introduction

The Company's 2011 Modified Integrated Resource Plan (IRP) was filed September 1, 2011 and acknowledged by the Commission in Order No. 12-161, dated May 9, 2012. The methodology used in the 2011 plan has not changed; however, two items in particular are new to the IRP: first, a more explicit examination of reliability and the resulting preferred resource portfolio from a risk management perspective and, second, new scoping criteria to be used to determine those distribution system planning projects that should be included in future IRPs. Further, the Company has benefitted from recent Commission clarifications of its expectations relative to the IRP process and desires to increase its transparency relative to major utility investments. To this end and in addition to updating the action items, the Company briefly discusses the Corvallis Loop Project, the Mid-Willamette Valley Feeder project, gas reserves, and Newport LNG for informational purposes.

NW Natural is submitting this annual update in compliance with Oregon Administrative Rule (OAR) 860-027-400(8) and requests the Commission's acknowledgement of this update and specifically of newly revised Action Item 2.3.

### A. Reliability-Risk Analysis and Cross-Cascades Pipeline

In its most recently acknowledged IRP, the Company discussed its sole reliance on Northwest Pipeline (NWP) for delivery of interstate gas supplies and proposed mitigating this risk by subscribing for capacity on a new cross-Cascades pipeline.[1] As part of its Multi-Year Action Plan, the Company revised Action Item 2.3 to commit to performing further analysis on the costs, benefits, and risks associated with development of a cross-Cascades pipeline.[2] Additionally, the Company and Commission Staff agreed that for future IRPs, the Company would perform various cost analyses on any proposed cross-Cascades pipeline and would perform a risk-benefit analysis of all resource portfolios.[3] The Company included this type of analysis in its recent 2013 IRP filing with the Washington Utility and Transportation Commission on March 28, 2013. To address its Oregon IRP action item commitment, the Company is including this same analysis along with a detailed discussion of the project steps in this update.

In conjunction with seeking acknowledgment from the Commission regarding newly revised Action Item 2.3, the Company desires to enter into a Precedent Agreement with the cross-Cascades pipeline project sponsors. This project is currently the only new cross-Cascades pipeline being proposed. NWP has dropped their initial Blue Bridge project that would have built a second pipeline through the Columbia Gorge and replaced it with what is now called the Northwest Market Area Expansion ("N-MAX), which would bundle capacity from 1) the

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1 *See* page 3.14 of the Company's Modified IRP filed September, 2011.

2 *See* Order No. 12-161 at 4.

3 *See* Order No. 12-161 at 5.

interconnection of the NWP and Gas Transmission Northwest (GTN) systems at Stanfield, Oregon, moving gas southward to the vicinity of Madras, Oregon, using a NWP subscription to mainline transmission service on GTN, and 2) a NWP subscription on a cross-Cascades pipeline originating in the vicinity of Madras and terminating at Molalla, Oregon, with 3) an incremental expansion on NWP's existing system to move gas north from Molalla. NW Natural's entering into a Precedent Agreement would enable two concurrent open seasons: 1) cross-Cascades for Madras – Molalla direct capacity and 2) NWP for their N-MAX project. Holding an open season is the only way for the cross-Cascades project sponsors to determine whether sufficient shipper support exists at this time to proceed with long lead time permitting and eventual construction. Holding an open season is also a project step required by FERC. Any financial commitments made by NW Natural on behalf of its customers would be contingent on the results of the open season. While NW Natural is requesting acknowledgement now of newly revised Action Item 2.3 so that signing a Precedent Agreement and holding the open seasons may move forward, the Company understands that the Commission will have additional opportunities to review NW Natural's participation in the project prior to its being built—including after the signing of a Precedent Agreement and following completion of the open seasons if they are successful.

**B. Distribution System Planning**

NW Natural has benefitted from the Commission clarifying its expectation in a recent ruling with respect to being kept informed about anticipated major utility investments [4] as well as from its own recently concluded rate case.[5] To this end, the Company intends to begin using the following two criteria on a prospective basis for determining what transmission and distribution projects should be addressed within the IRP Process:

1) High pressure transmission projects required to move gas supplies to a discrete load center. (Transmission and distribution projects needed to move gas within a load center would not be included unless they meet the second criteria.)

2) Any system reinforcement project over $10 million.

Two projects in Oregon fall within the new IRP scope criteria: the Mid-Willamette Valley Feeder and the Corvallis Loop projects. This filing discusses both projects to increase transparency with respect to the Company's distribution system planning activities.

**C. Gas Reserves**

Gas reserve arrangements similar to the Company's arrangement with Encana may offer utility customers long-term price stability. This appears to be a developing trend and is briefly discussed below.

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[4] Order No. 12-493 in Docket No. UE 246 at 33.

[5] Order No 12-437, in Docket No. UG 221, footnote 44 at 17.

**D. Newport LNG**

Both of NW Natural's LNG facilities were designed for a 25 to 30 year life and are now each beyond their respective design life. In particular, Newport LNG is 36 years old and the Company is experiencing issues that negatively impact the plant's reliability and operability. In an effort to increase transparency, NW Natural provides a high-level discussion of Newport LNG below.

**E. Multi-Year Action Plan**

Following the specific sections provided below, the Company presents the Multi-Year Action items identified in its 2011 Modified IRP and the Company's responses to date on fulfilling these action items. As required by OAR 860-027-0400(8), the responses detail: a) the actions the Company has taken to acquire the preferred portfolio identified in its 2011 Modified IRP; b) an assessment of changes subsequent to the 2011 Modified IRP; and c) a justification for any deviation from the action plan contained in the 2011 Modified IRP. In general, the Company's efforts relative to the action plan are ongoing and will be more specifically addressed in its next IRP filing.

As previously noted, the cross-Cascades Action Item is an exception to the above. NW Natural respectfully requests Commission acknowledgement of newly revised Action Item 2.3 at this time.

# Chapter Two:
# Reliability-Risk Analysis
# And cross-Cascades Pipeline

## A. Purpose of Filing

Commission Order No. 12-161 in Docket No. LC 51 included that, with respect to the Palomar/Blue Bridge Pipeline discussed in NW Natural's 2011 Modified Integrated Resource Plan, the Company "…may reassess and request acknowledgement of this or other similar pipelines in future IRPs."[6] Consistent with its action plan, NW Natural is considering reserving capacity rights on the cross-Cascades pipeline, and anticipates signing a Precedent Agreement, which will be a matter for separate Commission review. NW Natural would expect to file such a Precedent Agreement following receipt of an acknowledgement of this update and the associated action plan revision.

NW Natural has benefitted from the Commission clarifying its expectation in a recent ruling with respect to being kept informed about anticipated major utility investments.[7] Acquisition of subscription rights on the cross-Cascades pipeline ("cross-Cascades") involves NW Natural's resource portfolio and a substantial financial commitment. The preferred means of delivery from cross-Cascades requires construction of additional NW Natural facilities. For these reasons the Company submits this filing under OAR 860-027-0400 and requests the Commission's acknowledgement of these activities at this time.

This request is supported by the analysis discussed in this filing, much of which NW Natural performed using the SENDOUT® resource planning least cost optimization software with which the Commission is familiar. The cross-Cascades discussion in this filing responds to the 2011 Modified IRP's Action Items 2.1, 2.3, and 4.1.

## B. Existing Supply-side Resources and Reliability Risks

NW Natural's supply-side resources are highly concentrated, as shown in Figure 2.1 (following). The Company is currently dependent for 80 percent of its peak day gas supplies on two resources—Northwest Pipeline and Mist Storage. Approximately 50 percent of the Company's current peak day supply-side resources are off-system and involve gas delivered by NWP. NWP's pipeline through the Columbia River Gorge ("NWP Gorge") transports about 32 percent of these on-peak supplies, including those from the Plymouth LNG storage facility and a portion of the Company's recallable supplies from certain industrial and power generation end-users. Approximately 18 percent, including gas from the Jackson Prairie storage facility and the remainder of NW Natural's recallable supplies comes to the Company's system from the north on NWP's pipeline down the I-5 corridor in Washington ("NWP I-5 Corridor").

Regarding current on-system supply-side resources, Mist Storage represents about 30 percent of NW Natural's total supply-side resource base. The Newport LNG and Portland LNG ("Gasco")

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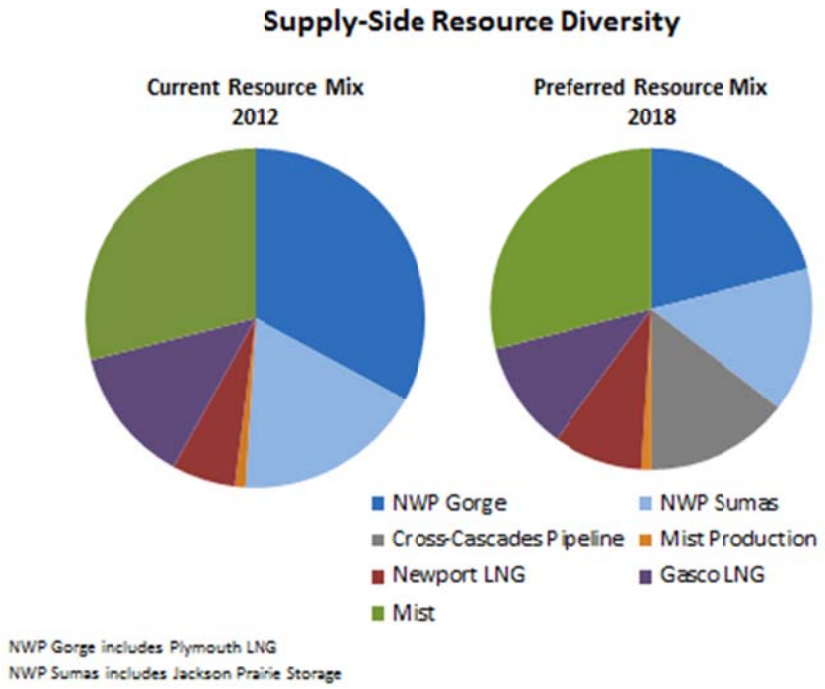
6 At page 4.

7 *See* Order No. 12-493 in Docket No. UE 246 at 33.

storage facilities together represent about 19 percent. The small remaining supply is from local natural gas production in the Mist field.

**Figure 2.1**




NW Natural's customers are, as a result of this very high concentration of supply-side resources, particularly exposed to the risk of forced outages during cold weather.

NW Natural has experience with resource outages due to disruptions in pipeline supply. Because these events were non-coincident with major cold weather episodes, NW Natural's experience over the past 20 years has been more "near-misses" and has not translated into major firm customer outages. There were five significant incidents over this timeframe involving gas delivered by NWP. These are somewhat generically identified as "Castle Rock," "Jackson Prairie," "Kalama," "Stevenson," and "Sumner." All but the 2009 Jackson Prairie storage facility incident wholly involved NWP facilities. The Jackson Prairie incident resulted in an outage for over 300 NW Natural customers in Clark County, Washington. Of the four NWP incidents, only the Stevenson incident resulted in outages for NW Natural firm customers, affecting a relatively small number of customers.

The Stevenson incident illustrates the risk associated with NWP Gorge. The incident resulted from earth movement near the pipeline in the vicinity of the community of North Bonneville. The Columbia River Gorge is unique in a number of ways and the nature of an almost sea level

corridor through the Cascade mountain range is the aspect that produces much of the risk associated with NWP Gorge. This geographic feature has high levels of winter precipitation[8] in its western portion due to the orthographic lift effect of the Cascade Mountains, and evidence of past incidents of land movement is obvious to even the casual observer.

NW Natural's update more explicitly examines reliability and the resulting preferred portfolio vis-à-vis risk management than have previous IRPs. The Company views reducing reliance on NWP's Columbia River Gorge pipeline for peak day supply as essential to reducing customers' risk of a large scale forced outage event.

This update to NW Natural's 2011 Modified IRP discusses alternative means by which to reduce the Company's dependency on highly concentrated supply-side resources and thereby reduce customers' risk of a forced outage. NW Natural concluded from the analytical results that acquiring cross-Cascades pipeline capacity is the preferred solution for reducing customers' risk associated with supply-side resources. While the Company previously identified the need for capacity on a cross-Cascades pipeline for diversifying its resource mix, it did not provide an accompanying risk management analysis.

### C. Resource – Risk Analysis

The Company analyzed two basic approaches to reducing customer risk associated with supply-side resources:

1) Increase resource redundancy by increasing the reliance on Mist Storage recall combined with relatively modest amounts of cross-Cascades capacity and satellite LNG; and
2) Increase resource diversity by replacing a portion of the current NWP Gorge capacity with cross-Cascades capacity.

### D. SENDOUT® Analysis and Optimization Results

NW Natural performed substantial analysis in the course of preparing the Company's 2013 Washington IRP and concluded from the SENDOUT® analysis that, of the two approaches, increasing resource diversity is the preferred resource solution for addressing reliability given NW Natural's current situation, as described above.

NW Natural created two resource outage scenarios to examine risk and alternative means of risk management. Each scenario consists of a one-time outage event at one of the Company's two

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[8] Annual precipitation varies from approximately 45 inches in the Portland/Vancouver metropolitan area to 100 inches or more in the heart of the Columbia River Gorge per the Northwest Power and Conservation Council (accessed April 18, 2013 at http://www.nwcouncil.org/history/climate/ ).

key resources. The two scenarios are modeled as occurring at different points of time within the 20-year planning period. The two scenarios are:

1) A NWP Gorge pipeline outage; and

2) A partial Mist Storage outage.

Simulating a NWP Gorge outage is in some ways analogous to the "N-1" planning standard used by electric utilities for transmission planning.[9] A key distinction, however, is that electric utilities typically have a network of transmission lines and a frequent result is the capability to use multiple transmission paths. If one circuit fails (an N-1 contingency), such systems may still be capable of delivering energy. In strong contrast, a single pipeline—NWP—transports gas from external supply sources to NW Natural's system. This pipeline has two directional feeds into the Company's system: 1) from Sumas South through Washington's I-5 corridor and 2) from east to west through the Columbia River Gorge. The Gorge outage event simulates an outage on NW Natural's most important pipeline segment from the perspective of providing customers with reliable service. In other words, an outage on the NWP Gorge pipeline is perhaps *the* critical contingency for NW Natural.

To model the Gorge outage, NW Natural reduced gas flows by the amount of the resource's capability under three different weather condition cases constructed using consecutive three-day periods from the design weather series, with one of these cases including the peak design day itself.[10] Flows on NWP south from Sumas and Jackson Prairie were left at full capability.

The Mist Storage outage event is more analogous to forced outages associated with multiple electric generation units because Mist has multiple compressors and three separate transmission pipelines to transport gas withdrawn from storage. A full outage of a compressor or pipeline will only partially constrain deliveries from the entire facility. As a result, the Mist Storage outage was modeled as a partial outage.

To model a Mist Storage partial outage, the Company reduced gas flows by 25 percent for existing Mist core deliverability, reasonably reflecting the diversity of pipeline and compression resources providing takeaway capability. Mist Storage recall selected by the model was reduced 50 percent, where the higher percentage reflects increasingly less diversity of takeaway capabilities, as pipeline capacity and compression are not added as more Mist Storage recall is taken. NW Natural timed each outage, in separate years, for the three-day peak in early February. NW Natural chose the peak event timing for each outage so that optimization results

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[9] In this nomenclature, N-0 refers to the condition of a system in which all elements are functional. A single contingency condition (N-1) refers to a system in which one element (or several physically-related elements) is non-functional. See the 2007 NERC Reliability Concepts document, accessed April 18, 2013, at http://www.nerc.com/files/concepts_v1.0.2.pdf .

[10] The peak days include HDD from February 2nd through the 4th, 1989. The pre-peak days include HDD from January 31st – February 2nd and the post-peak days include HDD from February 4th – 6th.

of the SENDOUT® model for each outage would include a resource selection materially resolving a near worst-case scenario as applied to the Company's most exposed supply-side resources. Additionally, while that risk exposure currently exists and will in the near future, NW Natural chose 2019 as the year of the Gorge outage to coincide with the date by which the Company believes a resource capable of resolving the issue will first be available. The Company modeled the Mist Storage partial outage in 2025.

NW Natural analyzed each resource outage scenario under three alternative sets of winter demand conditions (weather variations):

1) Peak Design Day
2) Portland load center Near Peak / Willamette Valley load centers warmer
3) Portland load center warmer / Willamette Valley load centers Near Peak

NW Natural conducted the SENDOUT® analysis two different ways, one for each of the two basic approaches outlined above for reducing customers' risk. First, the model was left unconstrained and able to select resource additions that optimized costs under these scenarios and served all demand. This is the "Resource Redundancy" approach to reliability mentioned above—where coverage of the shortfall due to the resource outage is accomplished by simply adding reserve margin. This approach results in an extremely large amount of Mist Storage recall as well as cross-Cascades capacity, satellite LNG storage, and Newport LNG takeaway upgrades. Mist Storage recall is the primary resource in this reserve margin resource mix because its fixed capital costs are lower than those of the other options. A significant downside to this Resource Redundancy approach is that it requires very large reserve margins: 31 percent under Peak Design Day conditions and 21 percent under the two variations of Near Peak conditions. Additionally, this approach leaves the Company dependent upon two resources for over 80 percent of its gas supplies.

The second step rationalizes NW Natural's pipeline capacity within the SENDOUT® model by adding cross-Cascades capacity as a resource option. Adding this capacity allows the Company to turn back 77 MDT per day of existing NWP Gorge capacity. The resulting cost savings partially offset the cost of adding cross-Cascades capacity. Importantly, adding the new capacity also lowers reserve margin requirements, as the Company reduces its dependence on NWP Gorge capacity, its largest current supply-side resource. NW Natural refers to this as a "Resource Diversity" approach to reliability.

NW Natural used two alternative subscription levels of cross-Cascades pipeline capacity, each of which the Company priced using indicative rates[11] provided by the cross-Cascades pipeline sponsors:

[11] Indicative pricing provided by the cross-Cascades sponsors at the NW Natural capacity of 110 MDT per day requires 190 MDT per day (total of 300 MDT per day) subscribed capacity by other shippers.

1) 110 MDT per day ("cross-Cascades 110"), which the sponsors have communicated is NW Natural's minimum contract volume; and

2) 165 MDT per day ("cross-Cascades 165"), using the lower indicative rates provided by the sponsors resulting from an upsizing of the pipeline's capacity following a highly successful open season.

Each of the 110 and 165 cross-Cascades cases results in a lower net present value (NPV) of optimized costs than obtained by reliance on Mist Storage recall and less cross-Cascades capacity. The cross-Cascades 165 case using the indicative rates has the lowest NPV in each outage weather scenario. The cross-Cascades 165 option also reduces the necessary reserve margin to 23 percent under Peak Design Day conditions and to 13 percent under Near Peak conditions, as the Company is diversifying its supply-side resource base as well as benefiting from the supply diversity presented by the three pipeline feeds currently available east of the Cascades, with supplies from Alberta, from the Rockies via NWP, and from the Rockies via the Ruby pipeline. Table 2.1 (following) summarizes the net present values associated with NW Natural's SENDOUT® reliability modeling.

**Table 2.1**

| **Optimized Resource Costs<br>1-in-20 Year Resource Outage Events<br>Net Present Values in $Billions** | | | |
|---|---|---|---|
| | Peak | Portland Near Peak and Valley Warmer | Valley Near Peak and Portland Warmer |
| Add Reserves with Storage (Resource Redundancy) | $7.436 | $7.316 | $7.338 |
| Rationalize Pipeline Capacity – 110 (Resource Diversity) | $7.335 | $7.309 | $7.308 |
| Rationalize Pipeline Capacity – 165 (Resource Diversity) | $7.319 | $7.290 | $7.289 |

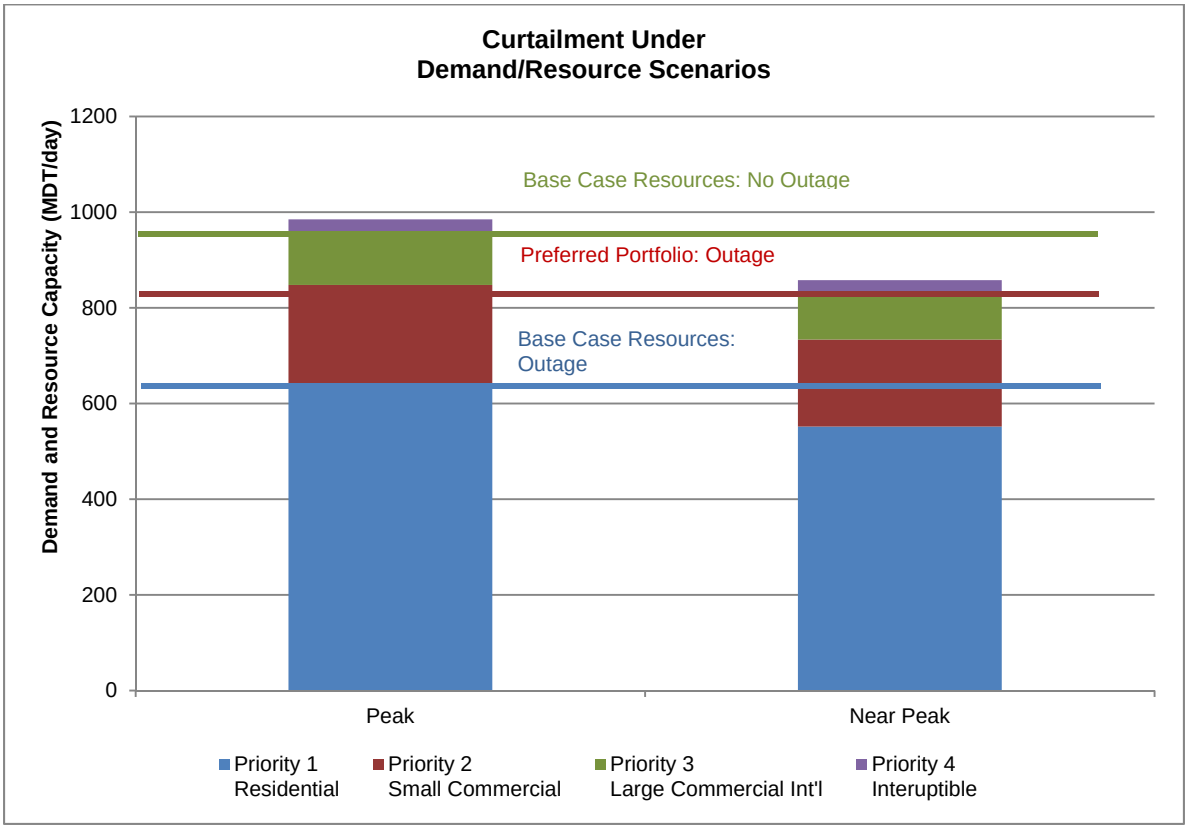
Indicative pricing at the NW Natural capacity of 165 MDT per day requires 285 MDT per day (total of 450 MDT per day) participation by other shippers. These indicative rates ($/DTH) for the cross-Cascades pipeline are the same or higher than the vintage rate NW Natural currently pays for capacity on NWP.

## E. Resource Portfolio Implications for Customer Curtailment

Figure 2.2 (following) shows customer curtailment implications associated with the Base Case Resource Portfolio versus the Preferred Resource Portfolio[12] under Peak Design Day and Near Peak demand conditions. The Base Case Resources are sufficient to meet all firm load requirements under Peak conditions assuming 100 percent resource availability, as only interruptible customers (Priority 4) would be curtailed. However, all Priority 2 and 3 customers (commercial and industrial) would face curtailment with a resource outage under Peak conditions. Under Near Peak conditions, all Priority 3 and approximately one-half of Priority 2 customers would face curtailment. Additionally, there would be significant curtailments of Priority 1 – Residential, as these customer segments are geographically comingled and some geographic segments of NW Natural's system would experience larger pressure drops than others.

[12] The Base Case Resource Portfolio and the Preferred Resource Portfolio refer to two of the resource portfolios NW Natural developed for the 2013 Washington IRP.

**Figure 2.2**




The Preferred Resource Portfolio, which is sized corresponding with the lower Near Peak reserve margin, contrasts with the Base Case Resource Portfolio in that the former exposes only Priorities 3 and 4 customers to curtailments under Peak and Near Peak demand conditions. Sufficient supplies would be available for Priorities 1 and 2 customers.

The Company concluded from this analysis that, from a reliability risk management perspective, considering key resource forced outages is appropriate when planning for Near Peak demand conditions. Applying an "N-1" type of planning standard to a Peak Design Day is extreme and unnecessary for satisfactorily protecting high priority customers from curtailment under an array of possible conditions. The Near Peak level of demand is about 10 percent less than that for the Design Day peak.

NW Natural notes that many in the natural gas industry are working to develop more robust reliability standards, primarily in response to the increased reliance of power generation on the natural gas system. One recent example is a reliability analysis conducted by ICF International examining gas supply adequacy for the ISO-NE region. ICF summarized their results in a July 22, 2012 presentation at the NARUC Summer Meetings held in Portland, Oregon. Their contingency

event impact analysis suggested applying N-1 contingencies under assumed 90/10 load conditions as one viable option for examining resource adequacy. While not identical, the resulting basic approach and final 90/10 parameters adopted by the Company in the 2013 Washington IRP have similarities to ICF's approach. Given the accelerating convergence and interdependencies between the gas and electric industries, NW Natural believes it is a natural and logical outcome for the gas industry to move toward borrowing and adapting reliability analysis concepts from the electric industry.

### F. Additional Resource Portfolio Implications

NW Natural evaluated two basic alternatives for delivery of gas from the pipeline into the Company's load centers associated with the cross-Cascades options. The first is direct service with deliveries to NW Natural's system at Molalla. This delivery alternative requires a new transmission facility to deliver gas into the east side of the Portland load center ("Eastside Loop"). The SENDOUT® reliability modeling results include the estimated costs associated with capacity subscription on this new transmission line.

Somewhat analogously, the large volume of Mist Storage recall necessary under the resource redundancy approach requires the Eastside Loop for viability, due to the currently limited ability to move Mist Storage gas to the east side of the Portland load center. Because the Eastside Loop is a new requirement, NW Natural must conduct additional engineering analysis before the Company can commit in any generic sense to the need for an Eastside Loop, including investigating potentially lower cost options for increasing the capability to move gas from the South Mist Pipeline Extension ("SMPE") to the east side of the Portland load center.

The second delivery alternative is acquiring capacity on NWP's proposed Northwest Market Area Expansion (N-MAX) project, which bundles cross-Cascades capacity with an expansion on NWP's existing system north of Molalla. This option allows the Company to retain the gate deliveries associated with the Gorge capacity it turned back and avoid the need for a new transmission loop; i.e., this delivery option does not require the Eastside Loop.

### G. Summary of Analytical Results

The SENDOUT® analysis revealed cross-Cascades with direct service (Eastside Loop) to be the least cost option. As part of NW Natural's Preferred Resource Portfolio, cross-Cascades will transport approximately 15 percent of the Company's gas supply.

**Table 2.2**[13]

**SENDOUT® Reliability Runs with Cost and Selected Resources**

| Reliability Run Number | Name[14] | NPV ($Billions) | Cross-Cascades | Mist Recall | Newport LNG Compressor | Satellite Storage |
|---|---|---|---|---|---|---|
| | | | | | | |
| 1529 | Out Peak Open | $ 7.436 | 73 | 201 | 40 | 11 |
| 1530 | Out Peak CC 110 | $ 7.335 | 110 | 168 | 40 | - |
| 1531 | Out Peak CC 165 | $ 7.319 | 165 | 113 | 40 | - |
| 1533 | Out Pre Open | $ 7.316 | 23 | 157 | 40 | - |
| 1535 | Out Pre CC 110 | $ 7.309 | 110 | 125 | 40 | - |
| 1536 | Out Pre CC 165 | $ 7.290 | 165 | 28 | 40 | - |
| 1534 | Out Post Open | $ 7.338 | 28 | 136 | 40 | 11 |
| 1537 | Out Post CC 110 | $ 7.308 | 110 | 125 | 40 | - |
| 1538 | Out Post CC 165 | $ 7.289 | 165 | 28 | 40 | - |
| | | | | | | |
| Note: volumes are for the final year of the model run (2031-2032) | | | | | | |

Table 2.2 (above) provides a summary of resource and cost results from the SENDOUT® reliability modeling runs for each weather variation, ranked by NPV. The table lists cross-Cascades and other resource options selected in the run as part of the run's least cost solution. Cross-Cascades, Mist Storage recall, and the Newport LNG Compressor project were each selected in all reliability modeling runs. NW Natural included cost variations involving cross-Cascades using each of the two rate and capacity alternatives discussed above. The 165 MDT per day subscription level results in a modest cost reduction when compared to the lower capacity subscription, assuming other shippers collectively subscribe at the higher level.

The resource portfolio with the lowest NPV of costs in each weather variation included cross-Cascades at the 165 MDTH per day subscription level.

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[13] Please see Appendix 2.1 for the SENDOUT® model reliability results.

[14] The specific weather variation is indicated within the name of the run: "Pre" refers to the three days prior to the peak day; "Post" refers to the three days following the peak day; and "Peak" refers to the peak day, the day before, and the day after. See also the earlier footnote regarding dates.

## H. Non-quantified Benefits of cross-Cascades Capacity

Acquisition of cross-Cascades capacity provides additional benefits not included in the SENDOUT® analysis. These benefits include a) reduced dependency on a single supply-side resource (NWP); b) lower system reserve margin requirements; c) benefits accruing due to supply optionality; and d) increased scalability of system delivery capabilities required for serving significantly higher loads, such as those associated with the Emerging Markets[15] discussed in NW Natural's 2013 Washington IRP. Each of these benefits reduces the risk to which NW Natural's customers are exposed.

As an example of supply optionality, securing cross-Cascades capacity increases NW Natural's source flexibility and may decrease the Company's supply price. The Company currently sources gas from three primary pricing points: Opal, representing the U.S. Rockies; AECO in Alberta, Canada; and Station 2/Sumas in British Columbia, Canada. Cross-Cascades makes possible a new supply point option at the terminus of the Ruby pipeline at the southern Oregon hub of Malin. Ruby connects U.S. Rockies supply with northern California via Malin. Gas could potentially be backhauled up the GTN to Madras and on cross-Cascades to NW Natural's system in the Willamette Valley. NW Natural notes that GTN already has one small firm backhaul agreement in place with a customer.

## I. The Preferred Resource Portfolio

There are three key dimensions to NW Natural's preferred resource plan, as presented in the recently filed 2013 Washington IRP:

1. Meet base case forecasted system load growth over the next five years with Mist Recall.
2. Support development of a cross-Cascades pipeline project which will increase reliability and diversify the Company's resource base.
    a. Enter into a Precedent Agreement with the cross-Cascades project sponsors to enable an open season and determine the project's economic viability.
    b. Support initiation of the critical path FERC permitting process by the project sponsors, contingent upon the results of the open season.
3. Be capable of meeting potentially higher load growth from Emerging Markets through a mix of additional Mist Recall and cross-Cascades pipeline capacity.

A new cross-Cascades pipeline must be developed as a regional project in order to be economically viable. NW Natural can act as a catalyst for this development, but—based on the Company's resource requirements—subscribing for 35 to 40 percent of the overall estimated project capacity appears to be the maximum level that is economically efficient for the Company and its customers. Analysis in the Company's 2013 Washington IRP focused on the costs and

[15] Emerging Markets here refers to additional load from power generation, transportation, and other industrial uses. Please see NW Natural's Washington 2013 IRP UG-120417 at page 2.16 for a detailed discussion of emerging markets.

benefits to NW Natural customers assuming this level of subscription. Should NW Natural enter into a Precedent Agreement with the project's sponsors for capacity on a cross-Cascades pipeline, such a pipeline's ultimate viability will likely be determined by the results of a subsequent open season conducted by the project's sponsors.

NW Natural believes meeting the region's future needs requires investment in regional natural gas pipeline infrastructure over the next five to seven years in order to serve demand growth resulting primarily from increased requirements in the power generation and industrial sectors. The Company strongly believes the current time presents an opportunity to materially improve the reliability of the larger natural gas supply system of regional LDCs and pipelines for both the near- and longer-terms and that relying only on incremental expansions of existing infrastructure may create a "lost opportunity." NW Natural can, by serving as a catalyst, facilitate taking advantage of this window of opportunity for improving the future welfare of the region. Assessing this opportunity in a timely manner, given the long lead time from concept to construction to completion that these types of projects often require, is in the best interests of the region and of NW Natural's customers.

As it relates to development of a new cross-Cascades pipeline, the process has at least three points in time that provide the Commission opportunity for review. First, this IRP update, which allows the Commission to review NW Natural's supporting analysis and newly revised action plan, as discussed below. Second, once the Company signs a Precedent Agreement (PA) with the cross-Cascades project sponsors. This agreement will require Commission approval as an affiliated interest transaction. Third, when the results of the project's open season become available. The Company would not be financially obligated on behalf of its customers unless the results are consistent with the assumptions used in the IRP analysis and PA review.

### J. Implications for the Multi-Year Action Plan

Commission Order No. 12-161, which acknowledged the Company's 2011 Modified IRP, revised Action Item 2.3 to:

*Continue to perform further analysis on the costs, benefits, and risks associated with the development of a cross-Cascades pipeline.*

As discussed above, an open season allows the project sponsors and—subsequently—the Company to more accurately assess the demand for this pipeline and, in turn, the costs and risks associated with its development. To that end, NW Natural proposes modifying the action item to read:

*Continue to perform further analysis on the costs, benefits, and risks associated with the development of a cross-Cascades pipeline. Support the development of a regional cross-Cascades pipeline from a reliability – risk management standpoint and to diversify the current resource portfolio. Negotiate and sign an acceptable Precedent Agreement with the cross-Cascades pipeline sponsors for Commission review and approval. Proceed with participation in the project as a shipper depending on the results of the open season.*

# Chapter Three:

# Distribution System Planning

## A. Introduction

NW Natural has benefitted from the Commission clarifying its expectation in a recent ruling with respect to being kept informed about anticipated major utility investments [16] as well as from the Company's recently concluded rate case.[17] To this end, the Company intends to begin using the following two criteria on a prospective basis to determine which transmission and distribution projects should be addressed within the IRP Process:

1) High pressure transmission projects required to move gas supplies to a discrete load center. (Transmission and distribution projects needed to move gas within a load center would not be included unless they meet the second criteria.)

2) Any system reinforcement project over $10 million.

In Oregon, the Mid-Willamette Feeder Project (MWVF) and the Corvallis Loop Project fall within the new IRP scope criteria. Both projects are described below. The Company needs to perform additional analyses, but provides the following description of the MWVF Project for informational purposes. The Company does not plan to submit the project analysis for the Corvallis Loop as part of a formal IRP process because the project is already under construction and, hence, no longer prospective. Instead, NW Natural will provide an equivalent IRP-quality analysis at the time it actually seeks rate recovery. However, the Company includes a discussion of this project for informational purposes.

## B. Mid-Willamette Valley Feeder Project

The Mid-Willamette Valley Feeder (MWVF) Project is a major combined system reinforcement and bare steel replacement project between Perrydale, on the Central Coast Feeder, and the Albany – Corvallis Feeder. The overall objective for the MWVF Project is the capability to move high pressure gas south from the Central Coast Feeder near Perrydale to a connection on the Albany – Corvallis Feeder east of Corvallis near Riverside Drive and at the location of the north end of the Corvallis Loop Project.

NW Natural's overall objective for the Project has multiple components. First, the Project increases winter delivery capability to the Albany – Corvallis Feeder, thereby addressing certain existing system limitations to providing reliable service to customers downstream of the Albany – Corvallis Feeder. Second, the Project moves NW Natural significantly closer to attaining the Company's safety goal of replacing the remaining bare steel in its Oregon distribution system. This corridor has 8.5 miles of bare steel main, and NW Natural will replace 7.3 miles as part of the MWVF Project under the Company's System Integrity Program (SIP). NW Natural installed

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[16] Order No. 12-493 in Docket No. UE 246 at 33.

[17] Order No 12-437, in Docket UG 221, footnote 44 at 17.

portions of the existing 6-inch diameter system as early as 1931, and—due to its age and condition—NW Natural operates this part of the Company's system at pressures of 60 pounds per square inch gauge (psig). Removing the bare steel in this area provides the opportunity to reinforce delivery capacity along the corridor from Salem south to Albany, Corvallis, and Philomath. Third, completion of the MWVF Project extends on-system storage delivery capability from Mist and Newport LNG to as far south as the Corvallis service area, reducing NW Natural's reliance on NWP's Grants Pass Lateral for meeting peak day delivery requirements, and partially mitigating the potential consequences of a NWP service disruption.

NW Natural offers two examples of the impact on reliability and the potential for service interruption associated with NWP's Grants Pass Lateral. Two major unplanned service reductions on Northwest Pipeline's Grants Pass Lateral have occurred—one on February 5, 1990 and one on January 4, 2004—as a result of compressor failures at Eugene and Oregon City, respectively. NW Natural maintained firm service during each event, but doing so required rapid curtailment of all interruptible service. Had either event occurred on a peak day, the Company's ability to provide service to residential and commercial customers south of the Portland metropolitan area would have been severely compromised. A likely outcome should such an interruption occur on a peak day is the loss of service to large groups of customers in NW Natural service areas from Salem to Coos Bay.

NW Natural designed the project as a 12-inch diameter, 720 psig transmission system; establishing four phases for the project as a result of timelines for permitting and easement acquisition along the route, with one phase specifically focused on the removal of bare steel main.

**T**he first phase installs transmission line from a location just north of Monmouth to a location at the intersection of Haley Road and Albany Road (the Granger – Independence Highway) south of Independence. The first phase extends existing transmission line running from State Highway 18 at Rickreall south to a location just north of Monmouth.

The Project's second phase installs transmission line from the existing Central Coast Feeder located east of Perrydale south along U.S. Highway 99 West to Rickreall. The second phase provides a critical connection of the MWVF to the Central Coast Feeder.

The third phase installs transmission line from the intersection of State Highway 20 and the Granger – Independence Highway; crossing the Willamette River and connecting to the existing Albany – Corvallis Feeder at the north end of the Corvallis Loop Project.

The Project's fourth phase installs transmission line from the Albany Road location south of Independence to the intersection of Highway 20 and the Granger – Independence Highway. This phase includes replacing multiple segments of bare steel main along the Granger – Independence Highway.

NW Natural received direction from the Commission regarding the Company's analysis of constructing this project at the time of the Company's recent rate case proceeding based on analysis in the Company's 2011 Modified IRP.

In response to the Commission's recent decision in the rate case, NW Natural will continue to assess the total system costs and benefits with and without the MWFV project available to serve incremental load growth and improve system reliability. NW Natural will present a quantitative analysis of this project at a future Technical Working Group meeting and seek feedback on the analytical approach used as well as guidance regarding additional analysis.

### C. Corvallis Loop Project

The Corvallis Loop Project is a distribution infrastructure project which will reduce the risk of outage for Corvallis/Philomath area firm customers as well as provide the capacity to accommodate future load growth in this area.

The genesis of the Corvallis Loop Project was a necessary reinforcement of the high pressure distribution feeder system serving customers in the Corvallis/Philomath area, where NW Natural currently serves approximately 14,000 residential, 1,700 commercial, and 40 industrial customers. NW Natural initiated the Corvallis Loop reinforcement project in 2010 to address the need for increased firm delivery capacity to reliably serve residential, commercial, and firm industrial load, as well as to provide capacity to meet requirements associated with long-term growth in this area. The project addresses an operating result indicating there is insufficient firm capacity on the Company's system in this area to accommodate current firm demand requirements under design peak conditions.[18]

NW Natural constructed the existing infrastructure providing delivery capacity to the area in 1963. The existing feeder consists of a 10-inch diameter, 400 psig transmission line from the Albany gate station to a point in northeast Corvallis, which then sequentially becomes an 8-inch and a 6-inch, 225 psig transmission line serving Corvallis and Philomath. Residential, commercial, and industrial customer load growth over the intervening 50 years has, at this point, consumed nearly all of the existing pipe's capacity to deliver reliable service to firm customers during design day conditions.

Current winter loads in the Corvallis/Philomath area result in large pressure drops on both the 400 psig maximum allowable operating pressure (MAOP) and 225 psig MAOP pipeline sections. Pressure drop (with some interruptible load on line) on the Corvallis to Philomath pipe has exceeded 55 percent. It is of paramount importance that this occurred at temperatures warmer than the design day weather conditions of 53 heating degree days (HDD).

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[18] The Corvallis Loop Project analysis that follows frequently uses NW Natural's design day peak as a reference point for peak load. The pressure drop issue is present at warmer than design day temperatures, as discussed below.

Currently, at design day temperatures and with all interruptible customers curtailed, NW Natural expects use on this pipe segment to exceed 90 percent of capacity. This is an important result, as it leaves critically low capacity to accommodate load growth in the area served by this facility.

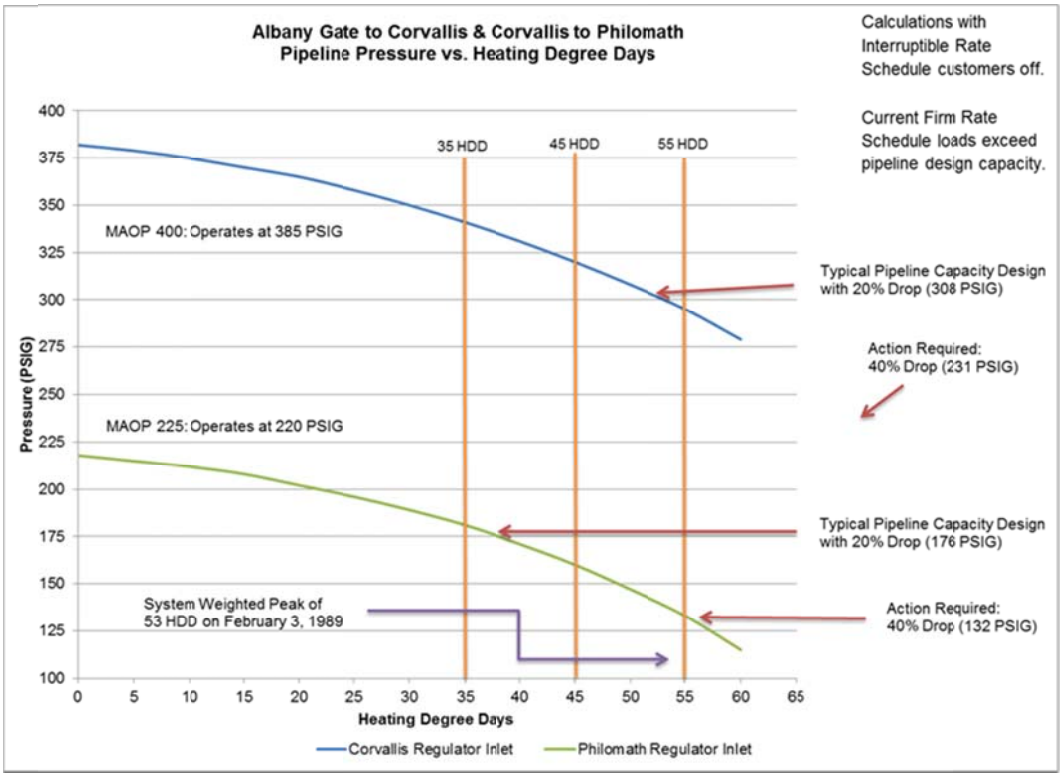
Figure 3.1 (following) depicts the relationship between pipeline pressures and heating degree days at the Corvallis and Philomath primary regulator stations *using firm customer load requirements only*. Figure 3.1 shows there is inadequate firm delivery capacity to meet the Company's current firm capacity requirements as evidenced by pressure drops exceeding 20 percent along this feeder during the winter. The analysis shows that pressure drops occurring on the existing system *exceed the 20 percent design pressure drop guideline at temperatures considerably warmer than those of the design day*, beginning at 35 heating degree days for Philomath and at 45 heating degree days for Corvallis. As NW Natural designs the Company's system to reliably operate in a cold weather event of 53 heating degree days, a pressure drop exceeding 20 percent—especially when occurring at temperatures much warmer than those of the 53 HDD design day—implies providing reliable service to firm customers during a cold weather event is at considerable risk. NW Natural uses curtailment of interruptible customers to manage load on the Corvallis to Philomath pipeline segment as firm service requirements dictate, but the temperature at which curtailment occurs is rising over time as load growth occurs. Moreover, there is a limited amount of interruptible load to curtail. With even minor growth, NW Natural will have difficulty serving firm customers in the Corvallis/Philomath area under design day conditions.

To date, NW Natural has employed demand-side management (DSM) as the primary tool for a temporary solution to meeting firm capacity delivery requirements. The Company currently uses Class 3 DSM (pricing and "buy-back" programs) as the primary "tool" by which the Company manages firm customers' risk of outage. The Company currently curtails Corvallis/Philomath area customers on interruptible schedules when pressure drops indicate load reduction is necessary to reduce the risk of outages for firm customers. NW Natural reviewed the amount of energy efficiency DSM deployment incremental to that planned by the Energy Trust of Oregon ("ETO") necessary to resolve the issue and concluded this is not a feasible solution in the necessary timeframe.

NW Natural's engineering staff developed a solution that solved the pressure drop issue being experienced in the Corvallis/Philomath area. The solution solved the pressure drop issue in the near-term and provided the capability of meeting forecasted future local delivery requirements, including those for the foreseeable future assuming either completion of the MWVF project or procurement of a suitable alternative source of gas supply into the Albany load center.

**Figure 3.1**[19]

**Corvallis/Philomath Area Pipeline Pressures at Current Load Levels**

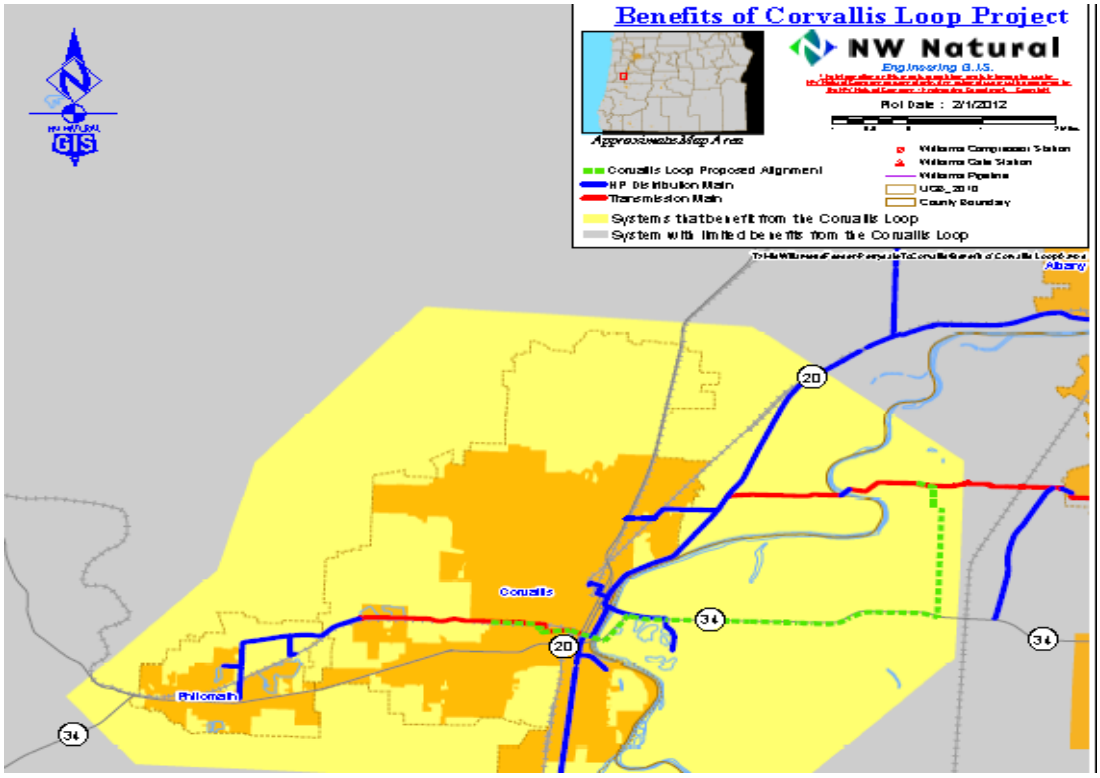



The Corvallis Loop Project Route has two segments, as shown in Figure 3.2 (following). The first is a 12-inch diameter, 720 psig transmission line connecting to the existing 10-inch diameter Albany–Corvallis feeder near Riverside Drive and running south to State Highway 34. The second segment is a 12-inch diameter, 400 psig transmission line running west along State Highway 34, crossing the Willamette River and connecting to the existing distribution system serving the west side of Corvallis and Philomath.

Most of the Corvallis Loop Project's route uses a new right-of-way. Because of this, the project not only solves the low pressure issue and provides for future delivery requirements in this area; it also reduces the risk of outage by providing route diversity for the benefit of Corvallis/Philomath area customers.

[19] Figure 3.1 is a revised version of the chart appearing as Attachment 1 to NW Natural's response to Staff Data Request No. 274 in Docket No. UG 221.

**Figure 3.2**


Benefits of Corvallis Loop Project
NW Natural
Engineering G.I.S.
Plot Date : 2/1/2012
Approximate Map Area
Corvallis Loop Proposed Alignment
HP Distribution Main
Transmission Main
Systems that benefit from the Corvallis Loop
System with limited benefits from the Corvallis Loop
Albany
Corvallis
Philomath
20
34

# Chapter Four:

# Gas Reserves

In April 2011, the Company entered into agreements with Encana Oil & Gas (USA) Inc. (Encana), under which the Company and Encana agreed to participate in a joint venture to develop gas reserves located in the Jonah Field of the Green River Basin in Sublette County, Wyoming.[20] Under these agreements, the Company pays a portion of the costs of drilling in the Jonah Field, and in return receives rights to the production of gas from certain sections of the field. Under the agreement, Encana markets the gas for the Company, which then purchases gas at another location, and applies the proceeds from the sale by Encana to the purchase costs.

Such transactions offer benefits that are not likely to be secured through other traditional supply options. Future similar transactions may be desirable to both increase the percentage of the Company's portfolio that is characterized by long-term price certainty and to levelize over time the percentage of the portfolio that is secured through these arrangements.

The Company is currently in the process of evaluating the appropriate proportion of its portfolio that should be secured through arrangements like the one with Encana. While the Company has some preliminary findings from this work, it believes further analysis is needed before providing such an evaluation in an IRP or IRP update. Consequently, the Company intends to develop more specific gas supply parameters for use in evaluating potential gas reserve acquisitions and address these in a future IRP.

It is worth noting that NW Natural is not the only utility looking for such long-term price certainty. For example, PacifiCorp issued a Request for Proposal (RFP) in May 2012 seeking proposals for fixed-price physical supply and/or financial hedges for terms of 4 to 10 years.[21]

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[20] On April 28, 2011, the OPUC issued an order finding the Company's actions prudent in entering into a joint venture with Encana to develop gas reserves on behalf of its Oregon customers. *See* Order No. 11-176 in Docket No. UM 1520.

[21] *See* page 1 of "2012 Natural Gas RFP Main Document" (MS Word file), accessed April 18, 2013 at http://www.pacificorp.com/sup/rfps/2012NatGasRFP.html.

# Chapter Five:

# Newport LNG

NW Natural owns and operates two liquefied natural gas ("LNG") peak shaving facilities. The facility located in Newport, Oregon, consists of a 1,000,000 Dth capacity storage tank, liquefaction facilities capable of processing approximately 5,500 Dth per day, and has a vaporization capacity of 100,000 Dth per day ("Newport"). Chicago Bridge and Iron constructed this facility, which NW Natural commissioned in 1977. The LNG facility located in Portland, Oregon, consists of a 600,000 Dth capacity storage tank, liquefaction facilities capable of processing approximately 2,150 Dth per day, and has a vaporization capacity of 120,000 Dth per day ("Gasco"). Chicago Bridge and Iron also constructed this facility, which NW Natural commissioned in 1969. The facilities and major process components of these LNG plants were designed for a nominal 25 to 30 year life.

NW Natural requires high levels of availability, reliability, and productivity from the Company's LNG plants, as they are storage assets used specifically for meeting peak demand. Newport and Gasco are now 36 and 44 years old, respectively, and the Company is considering a major refurbishment of each facility. NW Natural is evaluating different options for modifying each plant to enhance its reliability, reduce maintenance costs, and extend the operational life expectancy an additional 25 to 30 years.

Newport's refurbishment includes addressing issues with the liquefaction process, which differs from the liquefaction process used at Gasco. The primary issue involves carbon dioxide ($CO_2$) from the incoming natural gas stream that has been very gradually accumulating in the storage tank and settling on its floor in solid form commonly known as dry ice. NW Natural recently contracted for the services of an engineering firm specializing in LNG plant modifications to develop a conceptual design, cost estimate, and project plan for Newport's refurbishment. The project's scope includes a separate engineering analysis of the costs, timelines, and risks associated with complete removal of the asset; as well as an engineering analysis of the effects of operating Newport without removing the $CO_2$ or modifying the existing liquefaction or vaporization processes in any way. Essentially there are two phases to the analysis: first, the immediate needs related to $CO_2$ that are negatively impacting plant reliability and operability, and second, what longer term alternatives from a refurbishment standpoint should NW Natural consider. NW Natural will include the Newport refurbishment study, if it is both relevant and material, as part of NW Natural's multi-year action plan in a future IRP.

# Chapter Six:

# Multi-Year Action Plan

Northwest Natural's status report on its multi-year action plan, as filed in its 2011 Modified Integrated Resource Plan (IRP or Plan) and modified in accordance with Order No. 12- 161, is itemized below.

## 1.0 Demand Forecasting

**1.1 Continue to review appropriate statistical probabilities in developing design year and peak day demand levels through stochastic analysis. The coldest daily event over the past 20 years date back to 1989, so absent extreme cold weather in the near future, firm peak-day requirements could drop noticeably in the next IRP.**

The Company used February 3, 1989 as part of a 'coldest-in-20-years' peak day planning standard in prior IRPs. Because there has been an absence of any meaningful extreme cold weather events in the most recent 20-year period of November, 1992, through October, 2012, NW Natural retained the February 3, 1989 weather event for planning purposes. At this point the Company has effectively moved to a "coldest in 25 years" standard. NW Natural will continue to reassess this approach, particularly given that most other LDCs use more robust peak day standards.[22]

**1.2 Recalibrate forecast for changes in gas usage equations and expected customer gains following each heating season.**

The Company continues to update its gas usage forecast.

**1.3 Regularly review price volatility and the associated risks within the market. Closely monitor current economic conditions and environmental legislation for potential impacts to future load growth.**

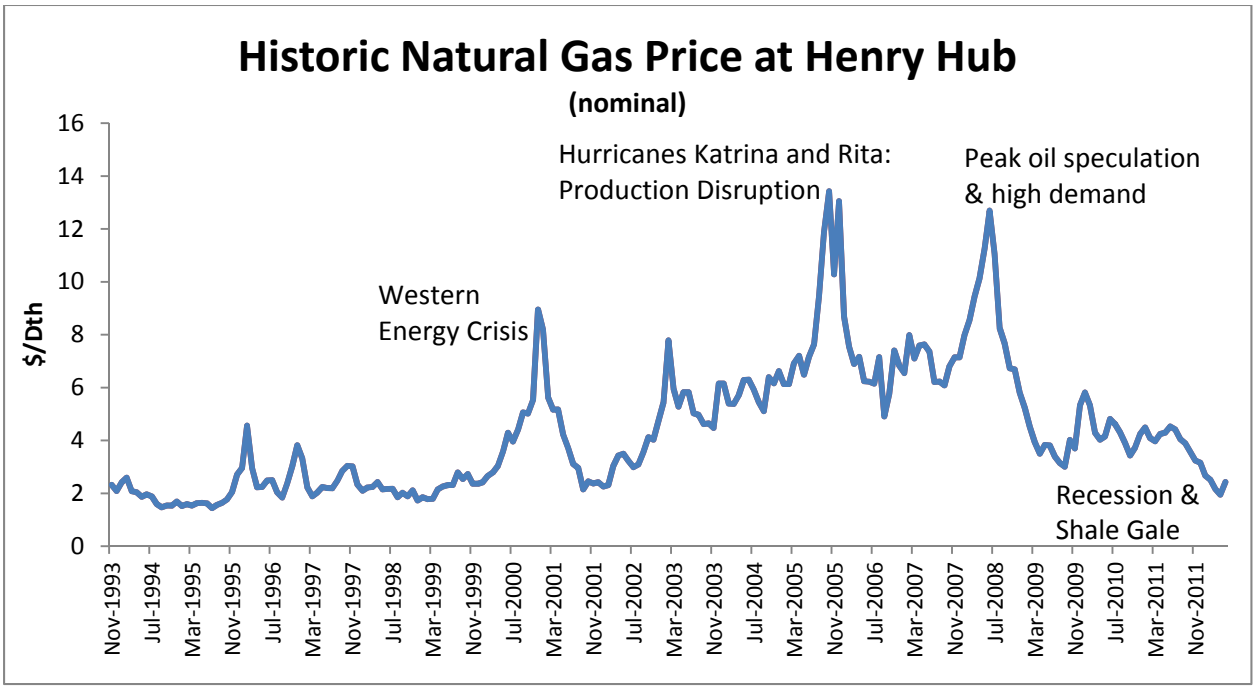
The combination in recent years of low demand and increased natural gas supplies has kept gas prices relatively low. Improved drilling technologies have opened up vast quantities of "unconventional" gas from shale deposits in multiple regions of North America. An atypically slow recovery from the economic recession that began in 2007 continues to restrain levels of natural gas demand below that which would otherwise be expected. Henry Hub spot prices dipped below $4 per dekatherm (Dth) in 2009, while

[22] As one example, see Avista's 2012 Natural Gas IRP, Chapter 3, page 3.6, including that "Utilizing a peak planning standard of the coldest temperature on record may seem aggressive…Given the potential impacts of an extreme weather event on our customers' personal safety and property damage…, we believe it is a prudent planning standard." Another example is on page 30 of Intermountain Gas Company's 2010 IRP: "Intermountain determined that the company-wide 50 year probability event…would be appropriate to use for the design weather model."

Rockies and Canadian spot prices dropped below $3 per Dth. According to IHS CERA Chairman Daniel Yergin, "As recently as 2007 it was widely thought that natural gas was in tight supply and the U.S. was going to become a growing importer of gas. But this outlook has been turned on its head by the shale gale."

Figure 6.1 illustrates the volatile nature of natural gas prices. As recently as June, 2008, prices at the Henry Hub surpassed $12 per Dth. Henry Hub is the reference pricing point for the North American natural gas market. Hurricanes Katrina and Rita drove prices up over $13 per Dth in late 2005. The Western energy crisis in 2000 – 2001 previously spiked prices over $8.

**FIGURE 6.1**




NW Natural continues to monitor spot market prices as well as economic conditions and market risks.

## 1.4 Review the demand forecast methodology for accuracy.

NW Natural reviews forecast accuracy by robustness testing, using the load forecast model factors to predict historic use and comparing the results to actual use.

**1.5 Investigate data collection requirements to analyze demand forecast error regionally.**

NW Natural is investigating multiple aspects of the Company's demand forecasting methodologies, including an assessment of data requirements and availability.

**1.6 Consider expanding forecasting methods to include environmental scanning, deliberative polling, neural networks, or others that may have value.**

Multiple forecasting methodologies may be reviewed for potential contribution to the robustness of NW Natural's forecasting methodologies.

## 2.0 Supply-Side Resources

**2.1 Review cost estimates, on an ongoing basis, for resources under consideration to identify potential changes in the composition of previously selected resource mixes.**

In addition to considerations regarding the cross-Cascades pipeline discussed in this filing, NW Natural continues to review the dynamics of other supply-side resources' cost estimates.

**2.2 Recall daily and annual underground storage capacity from the interstate storage gas market to core market service as needed.**

Mist Storage recall of 150,000 therms/day of deliverability, along with 3,339,890 therms of associated working gas capacity, was made effective May 1, 2012. There is no recall planned for 2013. A decision regarding Mist recall to be effective May 1, 2014 (if any) will be made during the summer of 2013.

**2.3 Continue to perform further analysis on the costs, benefits and risks associated with the development of a cross-Cascades pipeline.** ***Support the development of a regional cross-Cascades pipeline from a reliability risk management standpoint and to diversify the current resource portfolio. Negotiate and sign an acceptable Precedent Agreement with the cross-Cascades pipeline sponsors for Commission review and approval. Proceed with participation in the project as a shipper depending on the results of the open season.***

NW Natural respectfully requests Commission acknowledgement of this newly revised[23] action item as a result of this filing. Chapter 2 of the 2013 IRP Update discusses the Company's analysis of acquiring capacity on the cross-Cascades pipeline.

**2.4 Monitor LNG terminal developments and evaluate the implications of there being an export LNG terminal in either British Columbia (Kitimat) or Oregon (e.g. Jordan Cove).**

NW Natural contracted with Black & Veatch to perform a regional analysis to include the impact of LNG exports from British Columbia. The Company expects that study will be completed in 2013. The likelihood of LNG exports from an Oregon facility continues to decline. The implications of such an export facility have not been recently studied in any detail.

**2.5 Refine cost estimates, conduct more detailed system modeling, and investigate siting/permitting constraints on satellite LNG facilities and the specific NW Natural distribution system investments—including the Willamette Valley Feeder and Newport LNG Compressor project—identified as potential cost-effective resources in this IRP.**

NW Natural continues to refine its cost estimates.

## 3.0 Demand-side Resources

**3.1 Work with the Energy Trust to acquire all cost-effective therm savings in both Oregon and Washington.**

The ETO continues to be the delivery channel for NW Natural's Oregon and Washington energy efficiency programs. The ETO acquired approximately 5.5 million therm savings from Oregon customers in 2012.

NW Natural has identified materially less potential DSM due to the following:

- Lower savings are being acquired per measure than previously assumed;
- The load forecast is down due to reduced rates of customer growth;
- Some conservation in the previous DSM forecast has already been acquired;
- Modeling refinements have been made;

[23] The italicized language has been added to Action Item 2.3 of NW Natural's 2011 Modified IRP, as revised by Order No. 12-161 in Docket No. LC 51.

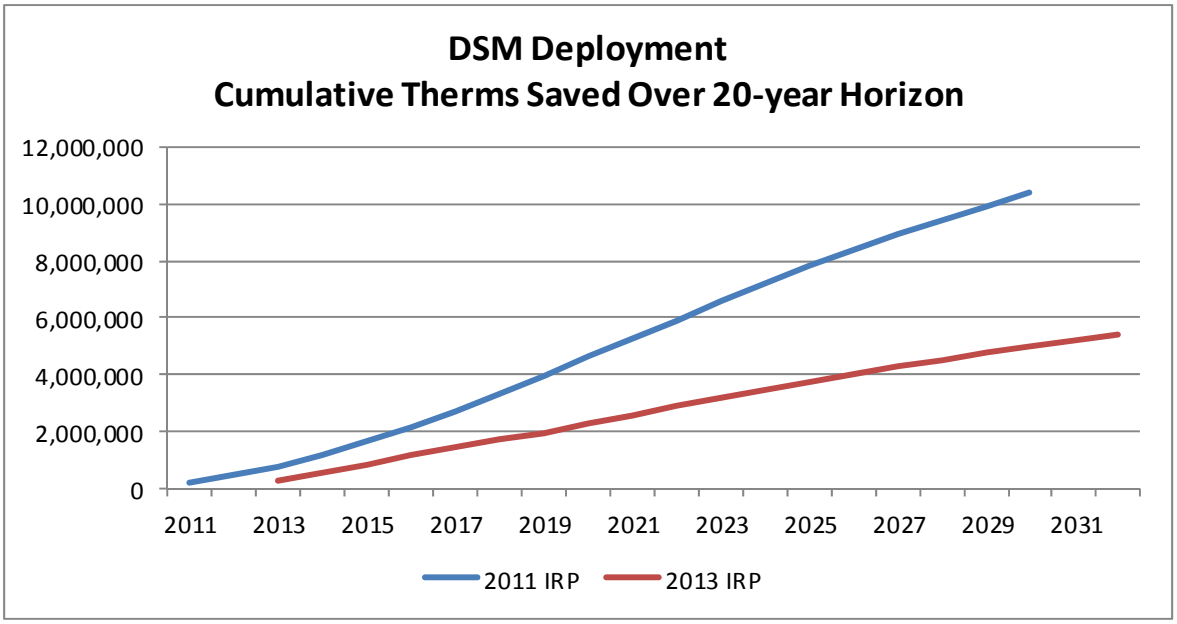
- Changes to codes and standards have reduced savings opportunities; and
- Project costs are not declining.

Figure 6.2 illustrates the difference in the DSM technical potential deployment schedule as presented in the Company's 2011 Modified IRP verses the deployment schedule identified in this plan.

**FIGURE 6.2**

**DSM DEPLOYMENT**

**2011 MODIFIED IRP AND 2013 WASHINGTON IRP**




**3.2 In Oregon this requires annually assessing forecast collections of the Company's Public Purpose charge to assure that program funding is adequate.**

NW Natural continues to work annually with Energy Trust to ensure that collections under Schedule 301, Public Purpose Funding are sufficient to acquire all available cost effective DSM. The Company filed Advice No. 12-16 in 2012 to ensure that Energy Trust would have the $23.7 million necessary to acquire 3.48 therms in 2013. The Commission approved the filing with an effective date of November 1, 2012.

## 4.0 SENDOUT® Model and Resource Plan Integration

**4.1 Update and enhance the optimization model to capture changes in market conditions, refinements of incremental resources, and changes in system characteristics. The SENDOUT® model needs to be regularly updated to address changing market conditions, new pipeline proposals, and other changing characteristics of NW Natural's gas delivery system. The model will also be further refined with additional information about the potential route and cost characteristics of incremental supply-side projects as such details are developed.**

NW Natural has refined the SENDOUT® model for analysis performed associated with the 2013 Washington IRP. See also the Company's description of cross-Cascades pipeline capacity in this filing.

### 4.2 Acquire resources consistent with the Preferred Portfolio.

**Over the next three planning years, NW Natural will acquire resources in a manner that is consistent with the analysis conducted in the 2011 Modified IRP. Under the Base Case scenario, the Company will target to acquire Demand Side Management as depicted in Table 6.1 (following), and Recall from Mist amounts that will not exceed those listed in Table 6.1:**

**TABLE 6.1**

| Calendar Year | Incremental DSM Savings in Oregon Therms/Year |
|---|---|
| 2012 | 4,200,048 |
| 2013 | 4,564,178 |
| 2014 | 5,468,808 |
| **Gas Year** | **Recall from Mist Storage Therms/Day** |
| 2012 – 2013 | 320,457 |
| 2013 – 2014 | 320,457 |
| 2014 – 2015 | 387,342 |

The Company continues to work with the Energy Trust of Oregon to maximize its DSM savings in Oregon.

The Company recalled 100,000 therms/day of Mist deliverability in 2011 and 150,000 therms/day in 2012, along with associated working gas capacity. No recall will be made in 2013.

# 5.0 Avoided Cost Determination

**5.1 As regulation of greenhouse gas emissions and other items develop, NW Natural will update its environmental adder levels and costs and assess their impact on demand-side resource decisions.**

NW Natural continues to track developments in state and Federal environmental regulation. When NW Natural filed the 2011 Modified IRP the Company believed enactment of comprehensive federal greenhouse gas (GHG) legislation was possible, which would have impacted the Company's operations and the cost of providing service to its customers. While GHG reduction requirements have not been codified in federal legislation as yet, policy discussion at the state level continues. The Company plans to more exhaustively examine, in a manner consistent with state energy policy and any new legislative developments, GHG and other environmental externalities in its next Oregon IRP.

# 6.0 Public Involvement

**6.1 Conduct Technical Working Group meetings as part of the development of the 2013 IRP.**

Public Involvement is a requirement of the IRP process. The Company will continue to invite interested parties and customers to participate in its IRP processes.

# APPENDIX 2.1:

# Reliability Linear Programming Results

| 1529 - Out Peak Open | 2012-2013 | 2013-2014 | 2014-2015 | 2015-2016 | 2016-2017 | 2017-2018 | 2018-2019 | 2019-2020 | 2020-2021 | 2021-2022 | 2022-2023 | 2023-2024 | 2024-2025 | 2025-2026 | 2026-2027 | 2027-2028 | 2028-2029 | 2029-2030 | 2030-2031 | 2031-2032 | NPV - 5.16% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 0.0516 |
| **DEMAND (MDT)** | | | | | | | | | | | | | | | | | | | | | |
| Forecast Demand | 79,519 | 80,884 | 82,603 | 84,311 | 85,313 | 86,368 | 87,426 | 88,915 | 89,804 | 91,006 | 92,200 | 93,901 | 94,828 | 96,242 | 97,735 | 99,716 | 101,003 | 102,808 | 104,853 | 105,329 | |
| Forecast DSM | 266 | 640 | 960 | 1,267 | 1,501 | 1,725 | 1,949 | 2,188 | 2,409 | 2,634 | 2,855 | 3,081 | 3,275 | 3,478 | 3,681 | 3,890 | 4,064 | 4,238 | 4,406 | 4,578 | |
| Forecast Demand (net DSM) | 79,253 | 80,244 | 81,643 | 83,045 | 83,811 | 84,642 | 85,476 | 86,727 | 87,395 | 88,373 | 89,345 | 90,819 | 91,552 | 92,764 | 94,055 | 95,826 | 96,940 | 98,569 | 100,446 | 100,751 | |
| Served Demand | 79,253 | 80,244 | 81,643 | 83,045 | 83,811 | 84,642 | 85,470 | 86,727 | 87,395 | 88,373 | 89,345 | 90,819 | 91,552 | 92,764 | 94,055 | 95,826 | 96,940 | 98,569 | 100,446 | 100,751 | |
| Unserved Demand | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Peak Day Demand (net DSM) | 923.2 | 923.7 | 929.0 | 933.5 | 940.5 | 949.1 | 958.2 | 965.5 | 976.0 | 985.6 | 995.4 | 1,006.1 | 1,018.2 | 1,030.4 | 1,041.8 | 1,055.2 | 1,069.8 | 1,084.7 | 1,100.1 | 1,098.9 | |
| Peak Day Demand Served | 923.2 | 923.7 | 929.0 | 933.5 | 940.5 | 949.1 | 952.2 | 965.5 | 976.0 | 985.6 | 995.4 | 1,006.1 | 1,018.2 | 1,030.4 | 1,041.8 | 1,055.2 | 1,069.8 | 1,084.7 | 1,100.1 | 1,098.9 | |
| Peak Day Demand Unserved | - | - | - | - | - | - | 6.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| **COST ($000 Nominal)** | | | | | | | | | | | | | | | | | | | | | |
| Supply Fixed Costs | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | |
| Supply Variable Costs | 247,873 | 291,375 | 319,736 | 342,620 | 355,741 | 396,550 | 383,977 | 392,069 | 401,086 | 424,830 | 441,594 | 462,211 | 478,225 | 496,092 | 520,929 | 546,301 | 574,444 | 609,548 | 638,621 | 642,625 | |
| Total Supply Costs | 247,934 | 291,436 | 319,797 | 342,681 | 355,802 | 396,611 | 384,037 | 392,130 | 401,147 | 424,890 | 441,654 | 462,272 | 478,286 | 496,153 | 520,990 | 546,362 | 574,505 | 609,608 | 638,681 | 642,686 | **5,394,420** |
| Transport Fixed Costs | 92,499 | 93,332 | 93,332 | 93,332 | 94,829 | 95,129 | 113,779 | 112,769 | 112,769 | 112,769 | 112,769 | 112,769 | 113,452 | 112,769 | 112,769 | 112,821 | 113,226 | 114,594 | 114,690 | 114,744 | **1,360,252** |
| Transport Variable Costs | 2,946 | 2,961 | 3,036 | 3,113 | 3,099 | 3,462 | 3,061 | 3,431 | 3,523 | 3,539 | 3,704 | 3,768 | 3,657 | 3,871 | 3,920 | 3,973 | 3,895 | 3,757 | 3,610 | 3,588 | |
| Total Transport Cost | 95,445 | 96,294 | 96,368 | 96,445 | 97,928 | 98,592 | 116,840 | 116,200 | 116,292 | 116,308 | 116,472 | 116,536 | 117,109 | 116,640 | 116,688 | 116,793 | 117,121 | 118,351 | 118,300 | 118,332 | **1,404,346** |
| Storage Fixed Cost | 24,959 | 25,324 | 25,441 | 25,510 | 25,588 | 31,362 | 35,216 | 35,216 | 35,216 | 35,216 | 35,216 | 35,216 | 35,216 | 35,216 | 35,216 | 35,216 | 35,216 | 35,216 | 35,216 | 35,216 | |
| Storage Variable Cost | 1,332 | 1,218 | 1,231 | 1,398 | 1,410 | 1,651 | 2,055 | 1,726 | 2,131 | 2,042 | 2,049 | 2,174 | 2,364 | 2,338 | 2,364 | 2,452 | 2,580 | 2,540 | 2,641 | 2,934 | |
| Total Storage Cost | 26,291 | 26,542 | 26,672 | 26,909 | 26,998 | 33,014 | 37,271 | 36,942 | 37,347 | 37,258 | 37,265 | 37,390 | 37,580 | 37,554 | 37,581 | 37,668 | 37,796 | 37,756 | 37,857 | 38,150 | **432,047** |
| DSM Annual Utility Cost | 9,945 | 10,776 | 10,232 | 11,529 | 13,700 | 15,853 | 17,218 | 19,362 | 19,316 | 19,250 | 19,225 | 18,970 | 18,970 | 18,884 | 18,884 | 18,600 | 18,574 | 18,285 | 18,239 | 18,029 | |
| Total Levelized Utility Cost | 255 | 614 | 921 | 1,209 | 1,439 | 1,653 | 1,867 | 2,086 | 2,306 | 2,519 | 2,730 | 2,934 | 3,130 | 3,323 | 3,516 | 3,700 | 3,880 | 4,046 | 4,205 | 4,351 | |
| Total Costs | 379,616 | 425,047 | 453,068 | 477,563 | 494,428 | 544,069 | 555,367 | 564,634 | 574,101 | 597,707 | 614,617 | 635,169 | 651,945 | 669,231 | 694,143 | 719,423 | 747,996 | 784,001 | 813,077 | 817,197 | **7,436,389** |
| **Key Resource Decisions (increm. MDT/day)** | | | | | | | | | | | | | | | | | | | | | |
| Alberta path (1) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Alberta path (1) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Alberta path (1) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Alberta path (1) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Eastside Loop | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Cross-Cascades | - | - | - | - | - | - | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 73 | 73 | |
| GTN Malin to Madras | - | - | - | - | - | - | 18 | - | - | - | - | - | 41 | - | - | - | - | 27 | 29 | 30 | |
| GTN Stanfield to Madras | - | - | - | - | - | - | 55 | - | - | - | - | - | - | - | - | 1 | 12 | 12 | 12 | 12 | |
| Increase NWP Mainline | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| GTN Malin to Stanfield | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Newport LNG Delivery | - | - | - | - | - | - | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | |
| N-MAX | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Ruby Pipeline | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| South WVF | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| NWP Gorge Capacity | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Mist Storage Expansion | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Mist Storage Recall | - | - | 1 | 6 | 6 | 9 | 201 | 201 | 201 | 201 | 201 | 201 | 201 | 201 | 201 | 201 | 201 | 201 | 201 | 201 | |
| Satellite LNG Albany | - | - | - | - | - | - | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | |
| Satellite LNG Eugene | - | - | - | - | - | - | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | |
| Satellite LNG Salem | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| | | | | | | | | | | | | | | | | | | | | | |
| **NW Natural Transmission** | | | | | | | | | | | | | | | | | | | | | |
| North WVF (POR to SAL) | 30.9 | 30.6 | 31.3 | 28.2 | 32.7 | 25.8 | 62.2 | - | - | 1.4 | 2.8 | 0.1 | - | - | - | - | 21.5 | - | 26.4 | 26.1 | |
| Harrisburg River Crossing (ALB to EUG) | 8.0 | 8.0 | 8.0 | 4.5 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | |
| MWVF | - | - | 13.4 | 9.9 | 11.9 | - | 41.0 | 14.8 | 13.5 | 0.6 | 1.4 | 11.3 | 4.6 | - | - | 6.6 | 26.6 | 0.5 | 27.4 | 27.9 | |
| **Storage** | | | | | | | | | | | | | | | | | | | | | |
| GASCO LNG | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | |
| JP | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 45.3 | 45.3 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | |
| MIST | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 98.6 | 107.7 | 188.1 | 135.4 | 133.7 | 252.1 | 158.9 | 170.6 | 184.5 | 199.5 | 196.5 | 209.9 | 199.0 | |
| NEWPORT LNG | 58.0 | 58.0 | 58.0 | 58.1 | 58.2 | 58.3 | 98.6 | 98.5 | 98.7 | 98.8 | 99.2 | 99.1 | 99.6 | 99.4 | 99.6 | 99.8 | 100.0 | 100.0 | 100.0 | 100.0 | |
| PLYMOUTH LNG | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 0.5 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | |
| March Point | - | - | - | - | 12.2 | 12.2 | - | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | |
| **Peak Day Resources-Recall Agreements** | | | | | | | | | | | | | | | | | | | | | |
| Recall 1 | 25.4 | 25.9 | 30.0 | 30.0 | 26.0 | 30.0 | 16.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Recall 2 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Recall 3 | 1.0 | 1.0 | 1.0 | 1.0 | - | 1.0 | 1.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | |

| 1530 - Out Peak CC 110 | 2012-2013 | 2013-2014 | 2014-2015 | 2015-2016 | 2016-2017 | 2017-2018 | 2018-2019 | 2019-2020 | 2020-2021 | 2021-2022 | 2022-2023 | 2023-2024 | 2024-2025 | 2025-2026 | 2026-2027 | 2027-2028 | 2028-2029 | 2029-2030 | 2030-2031 | 2031-2032 | NPV - 5.16% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 0.0516 |
| **DEMAND (MDT)** | | | | | | | | | | | | | | | | | | | | | |
| Forecast Demand | 79,519 | 80,884 | 82,603 | 84,311 | 85,313 | 86,368 | 87,426 | 88,915 | 89,804 | 91,006 | 92,200 | 93,901 | 94,828 | 96,242 | 97,735 | 99,716 | 101,003 | 102,808 | 104,853 | 105,329 | |
| Forecast DSM | 266 | 640 | 960 | 1,267 | 1,501 | 1,725 | 1,949 | 2,188 | 2,409 | 2,634 | 2,855 | 3,081 | 3,275 | 3,478 | 3,681 | 3,890 | 4,064 | 4,238 | 4,406 | 4,578 | |
| Forecast Demand (net DSM) | 79,253 | 80,244 | 81,643 | 83,045 | 83,811 | 84,642 | 85,476 | 86,727 | 87,395 | 88,373 | 89,345 | 90,819 | 91,552 | 92,764 | 94,055 | 95,826 | 96,940 | 98,569 | 100,446 | 100,751 | |
| Served Demand | 79,253 | 80,244 | 81,643 | 83,045 | 83,811 | 84,642 | 85,452 | 86,727 | 87,395 | 88,373 | 89,345 | 90,819 | 91,552 | 92,764 | 94,055 | 95,826 | 96,940 | 98,569 | 100,446 | 100,751 | |
| Unserved Demand | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Peak Day Demand (net DSM) | 923.2 | 923.7 | 929.0 | 933.5 | 940.5 | 949.1 | 958.2 | 965.5 | 976.0 | 985.6 | 995.4 | 1,006.1 | 1,018.2 | 1,030.4 | 1,041.8 | 1,055.2 | 1,069.8 | 1,084.7 | 1,100.1 | 1,098.9 | |
| Peak Day Demand Served | 923.2 | 923.7 | 929.0 | 933.5 | 940.5 | 949.1 | 944.7 | 965.5 | 976.0 | 985.6 | 995.4 | 1,006.1 | 1,018.2 | 1,030.4 | 1,041.8 | 1,055.2 | 1,069.8 | 1,084.7 | 1,100.1 | 1,098.9 | |
| Peak Day Demand Unserved | - | - | - | - | - | - | 13.5 | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| **COST ($000 Nominal)** | | | | | | | | | | | | | | | | | | | | | |
| Supply Fixed Costs | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | |
| Supply Variable Costs | 247,873 | 290,588 | 318,972 | 342,178 | 355,455 | 392,544 | 387,877 | 397,311 | 401,649 | 427,765 | 444,693 | 463,766 | 482,607 | 499,345 | 524,292 | 550,563 | 576,558 | 611,784 | 640,408 | 644,679 | |
| Total Supply Costs | 247,934 | 290,649 | 319,033 | 342,239 | 355,516 | 392,604 | 387,938 | 397,372 | 401,710 | 427,826 | 444,754 | 463,827 | 482,668 | 499,406 | 524,353 | 550,624 | 576,619 | 611,845 | 640,469 | 644,740 | **5,411,997** |
| Transport Fixed Costs | 92,499 | 94,306 | 94,358 | 94,358 | 95,855 | 96,155 | 102,193 | 101,722 | 101,722 | 101,722 | 101,722 | 101,722 | 102,239 | 101,722 | 101,722 | 101,722 | 101,767 | 102,835 | 102,835 | 102,835 | **1,278,800** |
| Transport Variable Costs | 2,946 | 2,921 | 2,996 | 3,073 | 3,058 | 3,322 | 2,469 | 2,374 | 2,762 | 2,823 | 2,827 | 2,808 | 2,759 | 2,916 | 2,954 | 2,994 | 2,801 | 2,690 | 2,750 | 2,761 | |
| Total Transport Cost | 95,445 | 97,227 | 97,354 | 97,431 | 98,912 | 99,476 | 104,662 | 104,096 | 104,484 | 104,545 | 104,548 | 104,530 | 104,998 | 104,638 | 104,676 | 104,715 | 104,568 | 105,525 | 105,585 | 105,596 | **1,315,880** |
| Storage Fixed Cost | 24,959 | 25,306 | 25,411 | 25,480 | 25,558 | 29,198 | 31,395 | 31,395 | 31,395 | 31,395 | 31,395 | 31,395 | 31,395 | 31,395 | 31,395 | 31,395 | 31,395 | 31,395 | 31,395 | 31,395 | |
| Storage Variable Cost | 1,332 | 1,208 | 1,257 | 1,394 | 1,406 | 1,613 | 1,856 | 1,740 | 2,000 | 1,946 | 2,036 | 2,225 | 2,429 | 2,467 | 2,561 | 2,607 | 2,641 | 2,493 | 2,745 | 3,049 | |
| Total Storage Cost | 26,291 | 26,514 | 26,668 | 26,874 | 26,964 | 30,812 | 33,251 | 33,135 | 33,395 | 33,341 | 33,431 | 33,620 | 33,824 | 33,862 | 33,956 | 34,002 | 34,036 | 33,888 | 34,140 | 34,444 | **401,238** |
| DSM Annual Utility Cost | 9,945 | 10,776 | 10,232 | 11,529 | 13,700 | 15,853 | 17,218 | 19,362 | 19,316 | 19,250 | 19,225 | 18,970 | 18,970 | 18,884 | 18,884 | 18,600 | 18,574 | 18,285 | 18,239 | 18,029 | |
| Total Levelized Utility Cost | 255 | 614 | 921 | 1,209 | 1,439 | 1,653 | 1,867 | 2,086 | 2,306 | 2,519 | 2,730 | 2,934 | 3,130 | 3,323 | 3,516 | 3,700 | 3,880 | 4,046 | 4,205 | 4,351 | |
| Total Costs | 379,616 | 425,166 | 453,287 | 478,073 | 495,093 | 538,745 | 543,068 | 553,965 | 558,905 | 584,962 | 601,959 | 620,948 | 640,461 | 656,791 | 681,869 | 707,942 | 733,797 | 769,544 | 798,433 | 802,810 | **7,334,691** |
| **Key Resource Decisions (increm. MDT/day)** | | | | | | | | | | | | | | | | | | | | | |
| Alberta path (1) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Alberta path (1) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Alberta path (1) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Alberta path (1) | - | - | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| Eastside Loop | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Cross-Cascades | - | - | - | - | - | - | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | |
| GTN Malin to Madras | - | - | - | - | - | - | 98 | 77 | 77 | 77 | 77 | 77 | 109 | 77 | 77 | 77 | 78 | 99 | 99 | 99 | |
| GTN Stanfield to Madras | - | - | - | - | - | - | 12 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| Increase NWP Mainline | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| GTN Malin to Stanfield | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Newport LNG Delivery | - | - | - | - | - | - | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | |
| N-MAX | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Ruby Pipeline | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| South WVF | - | - | - | - | - | - | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| NWP Gorge Capacity | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Mist Storage Expansion | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Mist Storage Recall | - | - | 0 | 5 | 5 | 8 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | |
| Satellite LNG Albany | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Satellite LNG Eugene | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Satellite LNG Salem | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| | | | | | | | | | | | | | | | | | | | | | |
| **NW Natural Transmission** | | | | | | | | | | | | | | | | | | | | | |
| North WVF (POR to SAL) | 24.3 | 24.4 | 25.3 | 18.4 | 32.2 | 33.7 | 62.2 | - | - | - | 67.3 | 34.6 | 69.8 | - | - | - | 0.9 | 43.0 | 78.8 | 45.2 | |
| Harrisburg River Crossing (ALB to EUG) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | |
| MWVF | - | - | - | - | - | - | 41.0 | 16.1 | 1.5 | 14.2 | 41.0 | 41.0 | 41.0 | 9.4 | 7.9 | 5.2 | 6.0 | 41.0 | 41.0 | 41.0 | |
| **Storage** | | | | | | | | | | | | | | | | | | | | | |
| GASCO LNG | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | |
| JP | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | |
| MIST | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 136.2 | 147.1 | 221.2 | 167.2 | 178.3 | 244.2 | 203.5 | 215.2 | 228.3 | 241.3 | 233.7 | 248.6 | 247.4 | |
| NEWPORT LNG | 58.0 | 58.0 | 58.0 | 58.1 | 58.2 | 58.3 | 98.4 | 98.5 | 98.7 | 98.8 | 99.0 | 99.1 | 99.3 | 99.4 | 99.6 | 99.8 | 100.0 | 100.0 | 100.0 | 100.0 | |
| PLYMOUTH LNG | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 0.5 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | |
| March Point | - | - | - | - | 12.2 | 12.2 | - | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | |
| **Peak Day Resources-Recall Agreements** | | | | | | | | | | | | | | | | | | | | | |
| Recall 1 | 26.4 | 26.9 | 30.0 | 30.0 | 25.0 | 30.0 | 16.0 | - | - | - | - | - | 19.4 | - | - | - | - | - | - | - | |
| Recall 2 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | - | - | - | - | - | 8.0 | - | - | 0.7 | 1.9 | 3.2 | 4.5 | 4.4 | |
| Recall 3 | - | - | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | |

| 1531 - Out Peak CC 165 | 2012-2013 | 2013-2014 | 2014-2015 | 2015-2016 | 2016-2017 | 2017-2018 | 2018-2019 | 2019-2020 | 2020-2021 | 2021-2022 | 2022-2023 | 2023-2024 | 2024-2025 | 2025-2026 | 2026-2027 | 2027-2028 | 2028-2029 | 2029-2030 | 2030-2031 | 2031-2032 | NPV - 5.16% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 0.0516 |
| **DEMAND (MDT)** | | | | | | | | | | | | | | | | | | | | | |
| Forecast Demand | 79,519 | 80,884 | 82,603 | 84,311 | 85,313 | 86,368 | 87,426 | 88,915 | 89,804 | 91,006 | 92,200 | 93,901 | 94,828 | 96,242 | 97,735 | 99,716 | 101,003 | 102,808 | 104,853 | 105,329 | |
| Forecast DSM | 266 | 640 | 960 | 1,267 | 1,501 | 1,725 | 1,949 | 2,188 | 2,409 | 2,634 | 2,855 | 3,081 | 3,275 | 3,478 | 3,681 | 3,890 | 4,064 | 4,238 | 4,406 | 4,578 | |
| Forecast Demand (net DSM) | 79,253 | 80,244 | 81,643 | 83,045 | 83,811 | 84,642 | 85,476 | 86,727 | 87,395 | 88,373 | 89,345 | 90,819 | 91,552 | 92,764 | 94,055 | 95,826 | 96,940 | 98,569 | 100,446 | 100,751 | |
| Served Demand | 79,253 | 80,244 | 81,643 | 83,045 | 83,811 | 84,642 | 85,452 | 86,727 | 87,395 | 88,373 | 89,345 | 90,819 | 91,552 | 92,764 | 94,055 | 95,826 | 96,940 | 98,569 | 100,446 | 100,751 | |
| Unserved Demand | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Peak Day Demand (net DSM) | 923.2 | 923.7 | 929.0 | 933.5 | 940.5 | 949.1 | 958.2 | 965.5 | 976.0 | 985.6 | 995.4 | 1,006.1 | 1,018.2 | 1,030.4 | 1,041.8 | 1,055.2 | 1,069.8 | 1,084.7 | 1,100.1 | 1,098.9 | |
| Peak Day Demand Served | 923.2 | 923.7 | 929.0 | 933.5 | 940.5 | 949.1 | 944.7 | 965.5 | 976.0 | 985.6 | 995.4 | 1,006.1 | 1,018.2 | 1,030.4 | 1,041.8 | 1,055.2 | 1,069.8 | 1,084.7 | 1,100.1 | 1,098.9 | |
| Peak Day Demand Unserved | - | - | - | - | - | - | 13.5 | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| **COST ($000 Nominal)** | | | | | | | | | | | | | | | | | | | | | |
| Supply Fixed Costs | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | |
| Supply Variable Costs | 247,873 | 290,588 | 318,972 | 342,178 | 355,455 | 386,402 | 387,846 | 399,224 | 401,146 | 428,238 | 445,074 | 463,622 | 483,097 | 499,826 | 525,041 | 550,411 | 576,695 | 611,924 | 640,430 | 644,997 | |
| Total Supply Costs | 247,934 | 290,649 | 319,033 | 342,239 | 355,516 | 386,462 | 387,907 | 399,285 | 401,206 | 428,299 | 445,135 | 463,683 | 483,158 | 499,887 | 525,102 | 550,472 | 576,756 | 611,984 | 640,491 | 645,058 | **5,409,723** |
| Transport Fixed Costs | 92,499 | 94,306 | 94,358 | 94,358 | 95,855 | 96,155 | 103,122 | 101,923 | 101,923 | 101,923 | 101,923 | 101,923 | 103,367 | 102,115 | 102,142 | 102,487 | 102,897 | 103,982 | 103,992 | 103,992 | **1,283,421** |
| Transport Variable Costs | 2,946 | 2,921 | 2,996 | 3,073 | 3,058 | 3,233 | 2,456 | 2,444 | 2,809 | 2,848 | 2,876 | 2,860 | 2,707 | 2,906 | 3,015 | 2,968 | 2,808 | 2,659 | 2,753 | 2,761 | |
| Total Transport Cost | 95,445 | 97,227 | 97,354 | 97,431 | 98,912 | 99,387 | 105,578 | 104,366 | 104,732 | 104,771 | 104,799 | 104,783 | 106,074 | 105,021 | 105,157 | 105,455 | 105,705 | 106,641 | 106,745 | 106,753 | **1,320,556** |
| Storage Fixed Cost | 24,959 | 25,306 | 25,411 | 25,480 | 25,558 | 27,963 | 29,286 | 29,286 | 29,286 | 29,286 | 29,286 | 29,286 | 29,286 | 29,286 | 29,286 | 29,286 | 29,286 | 29,286 | 29,286 | 29,286 | |
| Storage Variable Cost | 1,332 | 1,208 | 1,257 | 1,394 | 1,406 | 1,577 | 1,761 | 1,677 | 1,907 | 1,788 | 1,903 | 2,027 | 2,334 | 2,349 | 2,383 | 2,525 | 2,472 | 2,347 | 2,546 | 2,853 | |
| Total Storage Cost | 26,291 | 26,514 | 26,668 | 26,874 | 26,964 | 29,539 | 31,047 | 30,963 | 31,193 | 31,074 | 31,189 | 31,313 | 31,620 | 31,635 | 31,669 | 31,811 | 31,758 | 31,633 | 31,832 | 32,139 | **383,176** |
| DSM Annual Utility Cost | 9,945 | 10,776 | 10,232 | 11,529 | 13,700 | 15,853 | 17,218 | 19,362 | 19,316 | 19,250 | 19,225 | 18,970 | 18,970 | 18,884 | 18,884 | 18,600 | 18,574 | 18,285 | 18,239 | 18,029 | |
| Total Levelized Utility Cost | 255 | 614 | 921 | 1,209 | 1,439 | 1,653 | 1,867 | 2,086 | 2,306 | 2,519 | 2,730 | 2,934 | 3,130 | 3,323 | 3,516 | 3,700 | 3,880 | 4,046 | 4,205 | 4,351 | |
| Total Costs | 379,616 | 425,166 | 453,287 | 478,073 | 495,093 | 531,242 | 541,750 | 553,977 | 556,447 | 583,394 | 600,348 | 618,750 | 639,823 | 655,427 | 680,813 | 706,338 | 732,793 | 768,544 | 797,307 | 801,978 | **7,319,031** |
| **Key Resource Decisions (increm. MDT/day)** | | | | | | | | | | | | | | | | | | | | | |
| Alberta path (1) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Alberta path (1) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Alberta path (1) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Alberta path (1) | - | - | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| Eastside Loop | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Cross-Cascades | - | - | - | - | - | - | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 | |
| GTN Malin to Madras | - | - | - | - | - | - | 105 | 77 | 77 | 77 | 77 | 77 | 164 | 77 | 78 | 84 | 92 | 114 | 114 | 114 | |
| GTN Stanfield to Madras | - | - | - | - | - | - | 60 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| Increase NWP Mainline | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| GTN Malin to Stanfield | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Newport LNG Delivery | - | - | - | - | - | - | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | |
| N-MAX | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Ruby Pipeline | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| South WVF | - | - | - | - | - | - | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| NWP Gorge Capacity | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Mist Storage Expansion | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Mist Storage Recall | - | - | 0 | 5 | 5 | 8 | 113 | 113 | 113 | 113 | 113 | 113 | 113 | 113 | 113 | 113 | 113 | 113 | 113 | 113 | |
| Satellite LNG Albany | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Satellite LNG Eugene | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Satellite LNG Salem | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| | | | | | | | | | | | | | | | | | | | | | |
| **NW Natural Transmission** | | | | | | | | | | | | | | | | | | | | | |
| North WVF (POR to SAL) | 24.3 | 24.4 | 25.3 | 18.4 | 32.2 | 33.7 | 62.2 | - | - | - | 67.3 | 34.6 | 69.8 | - | - | - | 0.9 | 43.0 | 78.8 | 45.2 | |
| Harrisburg River Crossing (ALB to EUG) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | |
| MWVF | - | - | - | - | - | - | 41.0 | 16.1 | 1.5 | 14.2 | 41.0 | 41.0 | 41.0 | 9.4 | 7.9 | 5.2 | 6.0 | 41.0 | 41.0 | 41.0 | |
| **Storage** | | | | | | | | | | | | | | | | | | | | | |
| GASCO LNG | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | |
| JP | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | |
| MIST | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 194.0 | 204.9 | 258.7 | 224.9 | 236.0 | 245.3 | 259.2 | 270.4 | 275.0 | 275.0 | 274.1 | 275.0 | 275.0 | |
| NEWPORT LNG | 58.0 | 58.0 | 58.0 | 58.1 | 58.2 | 58.3 | 98.4 | 98.5 | 98.7 | 98.8 | 99.0 | 99.1 | 99.3 | 99.4 | 99.6 | 99.8 | 100.0 | 100.0 | 100.0 | 100.0 | |
| PLYMOUTH LNG | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 0.5 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | |
| March Point | - | - | - | - | 12.2 | 12.2 | - | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | |
| **Peak Day Resources-Recall Agreements** | | | | | | | | | | | | | | | | | | | | | |
| Recall 1 | 26.4 | 26.9 | 30.0 | 30.0 | 25.0 | 30.0 | 16.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Recall 2 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | - | - | - | - | - | - | - | - | 0.7 | 1.9 | 3.2 | 4.5 | 4.4 | |
| Recall 3 | - | - | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | |

| 1533 - Out Pre Open | 2012-2013 | 2013-2014 | 2014-2015 | 2015-2016 | 2016-2017 | 2017-2018 | 2018-2019 | 2019-2020 | 2020-2021 | 2021-2022 | 2022-2023 | 2023-2024 | 2024-2025 | 2025-2026 | 2026-2027 | 2027-2028 | 2028-2029 | 2029-2030 | 2030-2031 | 2031-2032 | NPV - 5.16% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 0.0516 |
| **DEMAND (MDT)** | | | | | | | | | | | | | | | | | | | | | |
| Forecast Demand | 79,519 | 80,884 | 82,603 | 84,311 | 85,313 | 86,368 | 87,426 | 88,915 | 89,804 | 91,006 | 92,200 | 93,901 | 94,828 | 96,242 | 97,735 | 99,716 | 101,003 | 102,808 | 104,853 | 105,329 | |
| Forecast DSM | 266 | 640 | 960 | 1,267 | 1,501 | 1,725 | 1,949 | 2,188 | 2,409 | 2,634 | 2,855 | 3,081 | 3,275 | 3,478 | 3,681 | 3,890 | 4,064 | 4,238 | 4,406 | 4,578 | |
| Forecast Demand (net DSM) | 79,253 | 80,244 | 81,643 | 83,045 | 83,811 | 84,642 | 85,476 | 86,727 | 87,395 | 88,373 | 89,345 | 90,819 | 91,552 | 92,764 | 94,055 | 95,826 | 96,940 | 98,569 | 100,446 | 100,751 | |
| Served Demand | 79,253 | 80,244 | 81,643 | 83,045 | 83,811 | 84,642 | 85,470 | 86,727 | 87,395 | 88,373 | 89,345 | 90,819 | 91,549 | 92,764 | 94,055 | 95,826 | 96,940 | 98,569 | 100,446 | 100,751 | |
| Unserved Demand | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Peak Day Demand (net DSM) | 923.2 | 923.7 | 929.0 | 933.5 | 940.5 | 949.1 | 958.2 | 965.5 | 976.0 | 985.6 | 995.4 | 1,006.1 | 1,018.2 | 1,030.4 | 1,041.8 | 1,055.2 | 1,069.8 | 1,084.7 | 1,100.1 | 1,098.9 | |
| Peak Day Demand Served | 923.2 | 923.7 | 929.0 | 933.5 | 940.5 | 949.1 | 958.2 | 965.5 | 976.0 | 985.6 | 995.4 | 1,006.1 | 1,014.6 | 1,030.4 | 1,041.8 | 1,055.2 | 1,069.8 | 1,084.7 | 1,100.1 | 1,098.9 | |
| Peak Day Demand Unserved | - | - | - | - | - | - | - | - | - | - | - | - | 3.6 | - | - | - | - | - | - | - | |
| **COST ($000 Nominal)** | | | | | | | | | | | | | | | | | | | | | |
| Supply Fixed Costs | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | |
| Supply Variable Costs | 247,873 | 291,303 | 319,660 | 342,561 | 355,694 | 391,684 | 384,826 | 397,353 | 396,830 | 424,869 | 441,825 | 462,906 | 479,585 | 496,729 | 521,690 | 547,223 | 575,125 | 610,882 | 640,010 | 644,111 | |
| Total Supply Costs | 247,934 | 291,364 | 319,720 | 342,622 | 355,754 | 391,744 | 384,887 | 397,413 | 396,891 | 424,929 | 441,886 | 462,967 | 479,645 | 496,790 | 521,751 | 547,284 | 575,186 | 610,943 | 640,071 | 644,172 | **5,396,360** |
| Transport Fixed Costs | 92,499 | 93,332 | 93,384 | 93,384 | 94,880 | 95,181 | 100,629 | 101,597 | 101,597 | 101,597 | 101,597 | 101,597 | 101,988 | 101,597 | 101,597 | 101,597 | 102,357 | 102,783 | 102,783 | 102,783 | **1,272,926** |
| Transport Variable Costs | 2,946 | 2,961 | 3,036 | 3,113 | 3,098 | 3,345 | 3,180 | 3,481 | 3,442 | 3,527 | 3,634 | 3,742 | 3,663 | 3,832 | 3,899 | 3,991 | 3,948 | 3,921 | 3,740 | 3,770 | |
| Total Transport Cost | 95,445 | 96,293 | 96,420 | 96,497 | 97,978 | 98,525 | 103,809 | 105,078 | 105,039 | 105,125 | 105,231 | 105,339 | 105,651 | 105,430 | 105,496 | 105,589 | 106,306 | 106,704 | 106,522 | 106,553 | **1,317,129** |
| Storage Fixed Cost | 24,959 | 25,306 | 25,411 | 25,480 | 25,558 | 28,959 | 30,935 | 30,987 | 30,987 | 30,987 | 30,987 | 30,987 | 30,987 | 30,987 | 30,987 | 30,987 | 30,987 | 30,987 | 30,987 | 30,987 | |
| Storage Variable Cost | 1,332 | 1,217 | 1,231 | 1,397 | 1,408 | 1,627 | 1,918 | 1,693 | 2,084 | 1,971 | 1,979 | 2,083 | 2,205 | 2,261 | 2,293 | 2,387 | 2,446 | 2,468 | 2,539 | 2,828 | |
| Total Storage Cost | 26,291 | 26,523 | 26,642 | 26,878 | 26,966 | 30,586 | 32,853 | 32,679 | 33,070 | 32,958 | 32,966 | 33,069 | 33,191 | 33,248 | 33,280 | 33,373 | 33,433 | 33,455 | 33,525 | 33,815 | **397,139** |
| DSM Annual Utility Cost | 9,945 | 10,776 | 10,232 | 11,529 | 13,700 | 15,853 | 17,218 | 19,362 | 19,316 | 19,250 | 19,225 | 18,970 | 18,970 | 18,884 | 18,884 | 18,600 | 18,574 | 18,285 | 18,239 | 18,029 | |
| Total Levelized Utility Cost | 255 | 614 | 921 | 1,209 | 1,439 | 1,653 | 1,867 | 2,086 | 2,306 | 2,519 | 2,730 | 2,934 | 3,130 | 3,323 | 3,516 | 3,700 | 3,880 | 4,046 | 4,205 | 4,351 | |
| Total Costs | 379,616 | 424,956 | 453,014 | 477,525 | 494,399 | 536,709 | 538,768 | 554,533 | 554,316 | 582,262 | 599,308 | 620,346 | 637,458 | 654,351 | 679,411 | 704,845 | 733,499 | 769,387 | 798,358 | 802,569 | **7,316,204** |
| **Key Resource Decisions (increm. MDT/day)** | | | | | | | | | | | | | | | | | | | | | |
| Alberta path (1) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Alberta path (1) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Alberta path (1) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Alberta path (1) | - | - | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| Eastside Loop | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Cross-Cascades | - | - | - | - | - | - | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | |
| GTN Malin to Madras | - | - | - | - | - | - | 23 | - | - | - | - | - | 23 | - | - | - | 15 | 23 | 23 | 23 | |
| GTN Stanfield to Madras | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Increase NWP Mainline | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| GTN Malin to Stanfield | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Newport LNG Delivery | - | - | - | - | - | - | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | |
| N-MAX | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Ruby Pipeline | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| South WVF | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| NWP Gorge Capacity | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Mist Storage Expansion | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Mist Storage Recall | - | - | 0 | 5 | 5 | 8 | 157 | 157 | 157 | 157 | 157 | 157 | 157 | 157 | 157 | 157 | 157 | 157 | 157 | 157 | |
| Satellite LNG Albany | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Satellite LNG Eugene | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Satellite LNG Salem | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| | | | | | | | | | | | | | | | | | | | | | |
| **NW Natural Transmission** | | | | | | | | | | | | | | | | | | | | | |
| North WVF (POR to SAL) | 30.9 | 30.6 | 30.5 | 27.5 | 30.9 | 25.8 | 85.0 | - | - | 0.1 | 2.1 | 3.5 | - | - | - | - | 13.2 | 2.4 | 18.6 | 18.3 | |
| Harrisburg River Crossing (ALB to EUG) | 8.0 | 8.0 | 8.0 | 4.5 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | |
| MWVF | - | - | 12.6 | 9.1 | 11.1 | - | 33.3 | 1.1 | 13.8 | 0.6 | 1.6 | 15.3 | 5.6 | 2.6 | 3.2 | 6.6 | 18.2 | 5.2 | 19.6 | 20.1 | |
| **Storage** | | | | | | | | | | | | | | | | | | | | | |
| GASCO LNG | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | |
| JP | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 45.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | |
| MIST | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 151.0 | 160.1 | 176.7 | 179.2 | 190.3 | 244.5 | 215.5 | 226.1 | 238.8 | 237.1 | 242.7 | 257.6 | 256.4 | |
| NEWPORT LNG | 58.0 | 58.0 | 58.0 | 58.1 | 58.2 | 58.3 | 95.9 | 98.5 | 98.7 | 98.8 | 99.0 | 99.1 | 99.3 | 99.4 | 99.6 | 99.8 | 100.0 | 100.0 | 100.0 | 100.0 | |
| PLYMOUTH LNG | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 14.3 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | |
| March Point | - | - | - | - | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | |
| **Peak Day Resources-Recall Agreements** | | | | | | | | | | | | | | | | | | | | | |
| Recall 1 | 25.4 | 25.9 | 30.0 | 30.0 | 25.0 | 30.0 | - | - | - | - | - | - | 30.0 | - | - | - | - | - | - | - | |
| Recall 2 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | - | - | - | - | - | - | 8.0 | - | 1.0 | 2.2 | 3.4 | 4.6 | 5.9 | 5.8 | |
| Recall 3 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | - | - | - | - | - | - | 1.0 | - | - | - | - | - | - | - | |

| 1534 - Out Post Open | 2012-2013 | 2013-2014 | 2014-2015 | 2015-2016 | 2016-2017 | 2017-2018 | 2018-2019 | 2019-2020 | 2020-2021 | 2021-2022 | 2022-2023 | 2023-2024 | 2024-2025 | 2025-2026 | 2026-2027 | 2027-2028 | 2028-2029 | 2029-2030 | 2030-2031 | 2031-2032 | NPV - 5.16% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 0.0516 |
| **DEMAND (MDT)** | | | | | | | | | | | | | | | | | | | | | |
| Forecast Demand | 79,519 | 80,884 | 82,603 | 84,311 | 85,313 | 86,368 | 87,426 | 88,915 | 89,804 | 91,006 | 92,200 | 93,901 | 94,828 | 96,242 | 97,735 | 99,716 | 101,003 | 102,808 | 104,853 | 105,329 | |
| Forecast DSM | 266 | 640 | 960 | 1,267 | 1,501 | 1,725 | 1,949 | 2,188 | 2,409 | 2,634 | 2,855 | 3,081 | 3,275 | 3,478 | 3,681 | 3,890 | 4,064 | 4,238 | 4,406 | 4,578 | |
| Forecast Demand (net DSM) | 79,253 | 80,244 | 81,643 | 83,045 | 83,811 | 84,642 | 85,476 | 86,727 | 87,395 | 88,373 | 89,345 | 90,819 | 91,552 | 92,764 | 94,055 | 95,826 | 96,940 | 98,569 | 100,446 | 100,751 | |
| Served Demand | 79,253 | 80,244 | 81,643 | 83,045 | 83,811 | 84,642 | 85,470 | 86,727 | 87,395 | 88,373 | 89,345 | 90,819 | 91,551 | 92,764 | 94,055 | 95,826 | 96,940 | 98,569 | 100,446 | 100,751 | |
| Unserved Demand | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Peak Day Demand (net DSM) | 923.2 | 923.7 | 929.0 | 933.5 | 940.5 | 949.1 | 958.2 | 965.5 | 976.0 | 985.6 | 995.4 | 1,006.1 | 1,018.2 | 1,030.4 | 1,041.8 | 1,055.2 | 1,069.8 | 1,084.7 | 1,100.1 | 1,098.9 | |
| Peak Day Demand Served | 923.2 | 923.7 | 929.0 | 933.5 | 940.5 | 949.1 | 958.2 | 965.5 | 976.0 | 985.6 | 995.4 | 1,006.1 | 1,016.3 | 1,030.4 | 1,041.8 | 1,055.2 | 1,069.8 | 1,084.7 | 1,100.1 | 1,098.9 | |
| Peak Day Demand Unserved | - | - | - | - | - | - | - | - | - | - | - | - | 1.8 | - | - | - | - | - | - | - | |
| **COST ($000 Nominal)** | | | | | | | | | | | | | | | | | | | | | |
| Supply Fixed Costs | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | |
| Supply Variable Costs | 247,873 | 291,303 | 319,660 | 342,561 | 355,694 | 389,372 | 384,300 | 397,680 | 397,188 | 425,040 | 442,038 | 463,180 | 479,598 | 496,975 | 521,982 | 547,451 | 575,190 | 611,006 | 640,256 | 644,295 | |
| Total Supply Costs | 247,934 | 291,364 | 319,720 | 342,622 | 355,754 | 389,433 | 384,361 | 397,741 | 397,249 | 425,101 | 442,099 | 463,241 | 479,659 | 497,036 | 522,042 | 547,512 | 575,251 | 611,067 | 640,316 | 644,356 | **5,395,677** |
| Transport Fixed Costs | 92,499 | 93,332 | 93,384 | 93,384 | 94,880 | 95,181 | 103,120 | 102,650 | 102,650 | 102,650 | 102,650 | 102,650 | 103,120 | 102,692 | 102,692 | 102,770 | 103,666 | 104,064 | 104,064 | 104,064 | **1,282,546** |
| Transport Variable Costs | 2,946 | 2,961 | 3,036 | 3,113 | 3,098 | 3,332 | 3,145 | 3,495 | 3,443 | 3,540 | 3,641 | 3,758 | 3,663 | 3,839 | 3,911 | 3,993 | 3,936 | 3,906 | 3,756 | 3,741 | |
| Total Transport Cost | 95,445 | 96,293 | 96,420 | 96,497 | 97,978 | 98,513 | 106,266 | 106,145 | 106,093 | 106,190 | 106,291 | 106,408 | 106,783 | 106,531 | 106,604 | 106,763 | 107,602 | 107,971 | 107,820 | 107,805 | **1,326,740** |
| Storage Fixed Cost | 24,959 | 25,306 | 25,411 | 25,480 | 25,558 | 29,857 | 32,668 | 32,668 | 32,668 | 32,668 | 32,668 | 32,668 | 32,668 | 32,668 | 32,668 | 32,668 | 32,668 | 32,668 | 32,668 | 32,668 | |
| Storage Variable Cost | 1,332 | 1,217 | 1,231 | 1,397 | 1,408 | 1,611 | 1,889 | 1,626 | 2,007 | 1,939 | 1,937 | 2,047 | 2,144 | 2,197 | 2,234 | 2,333 | 2,400 | 2,408 | 2,440 | 2,734 | |
| Total Storage Cost | 26,291 | 26,523 | 26,642 | 26,878 | 26,966 | 31,468 | 34,557 | 34,294 | 34,676 | 34,607 | 34,606 | 34,716 | 34,812 | 34,866 | 34,902 | 35,002 | 35,069 | 35,077 | 35,109 | 35,402 | **410,246** |
| DSM Annual Utility Cost | 9,945 | 10,776 | 10,232 | 11,529 | 13,700 | 15,853 | 17,218 | 19,362 | 19,316 | 19,250 | 19,225 | 18,970 | 18,970 | 18,884 | 18,884 | 18,600 | 18,574 | 18,285 | 18,239 | 18,029 | |
| Total Levelized Utility Cost | 255 | 614 | 921 | 1,209 | 1,439 | 1,653 | 1,867 | 2,086 | 2,306 | 2,519 | 2,730 | 2,934 | 3,130 | 3,323 | 3,516 | 3,700 | 3,880 | 4,046 | 4,205 | 4,351 | |
| Total Costs | 379,616 | 424,956 | 453,014 | 477,525 | 494,399 | 535,266 | 542,402 | 557,542 | 557,334 | 585,149 | 602,221 | 623,335 | 640,225 | 657,317 | 682,432 | 707,877 | 736,496 | 772,400 | 801,484 | 805,592 | **7,338,240** |
| **Key Resource Decisions (increm. MDT/day)** | | | | | | | | | | | | | | | | | | | | | |
| Alberta path (1) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Alberta path (1) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Alberta path (1) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Alberta path (1) | - | - | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| Eastside Loop | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Cross-Cascades | - | - | - | - | - | - | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | |
| GTN Malin to Madras | - | - | - | - | - | - | 28 | - | - | - | - | - | 28 | - | - | 2 | 19 | 27 | 27 | 27 | |
| GTN Stanfield to Madras | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| Increase NWP Mainline | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| GTN Malin to Stanfield | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Newport LNG Delivery | - | - | - | - | - | - | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | |
| N-MAX | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Ruby Pipeline | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| South WVF | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| NWP Gorge Capacity | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Mist Storage Expansion | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Mist Storage Recall | - | - | 0 | 5 | 5 | 8 | 136 | 136 | 136 | 136 | 136 | 136 | 136 | 136 | 136 | 136 | 136 | 136 | 136 | 136 | |
| Satellite LNG Albany | - | - | - | - | - | - | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | |
| Satellite LNG Eugene | - | - | - | - | - | - | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| Satellite LNG Salem | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| | | | | | | | | | | | | | | | | | | | | | |
| **NW Natural Transmission** | | | | | | | | | | | | | | | | | | | | | |
| North WVF (POR to SAL) | 30.9 | 30.6 | 30.5 | 27.5 | 30.9 | 25.8 | - | - | - | - | - | - | - | - | 2.7 | - | 6.3 | - | 11.8 | - | |
| Harrisburg River Crossing (ALB to EUG) | 8.0 | 8.0 | 8.0 | 4.5 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | |
| MWVF | - | - | 12.6 | 9.1 | 11.1 | - | - | 9.4 | 13.5 | - | - | 9.9 | 3.3 | - | - | 6.6 | 11.3 | - | 12.8 | 1.8 | |
| **Storage** | | | | | | | | | | | | | | | | | | | | | |
| GASCO LNG | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | |
| JP | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 44.7 | 44.9 | 46.0 | 45.3 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | |
| MIST | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 170.2 | 179.3 | 187.6 | 196.1 | 205.2 | 244.7 | 226.3 | 238.0 | 250.3 | 246.6 | 252.7 | 267.6 | 266.4 | |
| NEWPORT LNG | 58.0 | 58.0 | 58.0 | 58.1 | 58.2 | 58.3 | 97.4 | 98.5 | 98.8 | 98.8 | 99.0 | 99.1 | 99.3 | 99.4 | 99.6 | 99.8 | 100.0 | 100.0 | 100.0 | 100.0 | |
| PLYMOUTH LNG | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 14.3 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | |
| March Point | - | - | - | - | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | |
| **Peak Day Resources-Recall Agreements** | | | | | | | | | | | | | | | | | | | | | |
| Recall 1 | 25.4 | 25.9 | 30.0 | 30.0 | 25.0 | 30.0 | - | - | - | - | - | - | 30.0 | - | - | - | - | - | - | - | |
| Recall 2 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | - | - | - | - | - | - | 8.0 | - | - | - | 0.5 | 1.8 | 3.1 | 3.0 | |
| Recall 3 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |

| 1535 - Out Pre CC 110 | 2012-2013 | 2013-2014 | 2014-2015 | 2015-2016 | 2016-2017 | 2017-2018 | 2018-2019 | 2019-2020 | 2020-2021 | 2021-2022 | 2022-2023 | 2023-2024 | 2024-2025 | 2025-2026 | 2026-2027 | 2027-2028 | 2028-2029 | 2029-2030 | 2030-2031 | 2031-2032 | NPV - 5.16% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 0.0516 |
| **DEMAND (MDT)** | | | | | | | | | | | | | | | | | | | | | |
| Forecast Demand | 79,519 | 80,884 | 82,603 | 84,311 | 85,313 | 86,368 | 87,426 | 88,915 | 89,804 | 91,006 | 92,200 | 93,901 | 94,828 | 96,242 | 97,735 | 99,716 | 101,003 | 102,808 | 104,853 | 105,329 | |
| Forecast DSM | 266 | 640 | 960 | 1,267 | 1,501 | 1,725 | 1,949 | 2,188 | 2,409 | 2,634 | 2,855 | 3,081 | 3,275 | 3,478 | 3,681 | 3,890 | 4,064 | 4,238 | 4,406 | 4,578 | |
| Forecast Demand (net DSM) | 79,253 | 80,244 | 81,643 | 83,045 | 83,811 | 84,642 | 85,476 | 86,727 | 87,395 | 88,373 | 89,345 | 90,819 | 91,552 | 92,764 | 94,055 | 95,826 | 96,940 | 98,569 | 100,446 | 100,751 | |
| Served Demand | 79,253 | 80,244 | 81,643 | 83,045 | 83,811 | 84,642 | 85,470 | 86,727 | 87,395 | 88,373 | 89,345 | 90,819 | 91,542 | 92,764 | 94,055 | 95,826 | 96,940 | 98,569 | 100,446 | 100,751 | |
| Unserved Demand | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Peak Day Demand (net DSM) | 923.2 | 923.7 | 929.0 | 933.5 | 940.5 | 949.1 | 958.2 | 965.5 | 976.0 | 985.6 | 995.4 | 1,006.1 | 1,018.2 | 1,030.4 | 1,041.8 | 1,055.2 | 1,069.8 | 1,084.7 | 1,100.1 | 1,098.9 | |
| Peak Day Demand Served | 923.2 | 923.7 | 929.0 | 933.5 | 940.5 | 949.1 | 958.2 | 965.5 | 976.0 | 985.6 | 995.4 | 1,006.1 | 1,008.1 | 1,030.4 | 1,041.8 | 1,055.2 | 1,069.8 | 1,084.7 | 1,100.1 | 1,098.9 | |
| Peak Day Demand Unserved | - | - | - | - | - | - | - | - | - | - | - | - | 10.0 | - | - | - | - | - | - | - | |
| **COST ($000 Nominal)** | | | | | | | | | | | | | | | | | | | | | |
| Supply Fixed Costs | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | |
| Supply Variable Costs | 247,873 | 290,588 | 318,972 | 342,178 | 355,455 | 381,792 | 388,098 | 399,902 | 401,908 | 428,581 | 445,448 | 472,810 | 482,576 | 499,784 | 525,124 | 550,494 | 576,724 | 612,140 | 640,696 | 645,140 | |
| Total Supply Costs | 247,934 | 290,649 | 319,033 | 342,239 | 355,516 | 381,852 | 388,159 | 399,963 | 401,969 | 428,642 | 445,509 | 472,871 | 482,637 | 499,845 | 525,184 | 550,555 | 576,784 | 612,201 | 640,757 | 645,200 | **5,413,079** |
| Transport Fixed Costs | 92,499 | 94,306 | 94,358 | 94,358 | 95,855 | 96,155 | 101,139 | 101,086 | 101,086 | 101,086 | 101,086 | 101,086 | 101,604 | 101,086 | 101,086 | 101,361 | 101,768 | 102,681 | 102,681 | 102,698 | **1,274,652** |
| Transport Variable Costs | 2,946 | 2,921 | 2,996 | 3,073 | 3,058 | 3,166 | 2,504 | 2,469 | 2,853 | 2,828 | 2,915 | 2,905 | 2,791 | 2,914 | 2,999 | 2,989 | 2,796 | 2,674 | 2,756 | 2,763 | |
| Total Transport Cost | 95,445 | 97,227 | 97,354 | 97,431 | 98,912 | 99,321 | 103,643 | 103,555 | 103,938 | 103,914 | 104,001 | 103,991 | 104,395 | 104,000 | 104,085 | 104,351 | 104,564 | 105,355 | 105,437 | 105,460 | **1,311,908** |
| Storage Fixed Cost | 24,959 | 25,306 | 25,411 | 25,480 | 25,558 | 27,007 | 27,603 | 27,655 | 27,655 | 27,655 | 27,655 | 28,874 | 29,735 | 29,735 | 29,735 | 29,735 | 29,735 | 29,735 | 29,735 | 29,735 | |
| Storage Variable Cost | 1,332 | 1,208 | 1,257 | 1,394 | 1,406 | 1,564 | 1,682 | 1,641 | 1,825 | 1,674 | 1,843 | 2,065 | 2,337 | 2,377 | 2,445 | 2,555 | 2,527 | 2,389 | 2,605 | 2,900 | |
| Total Storage Cost | 26,291 | 26,515 | 26,668 | 26,874 | 26,964 | 28,572 | 29,286 | 29,296 | 29,480 | 29,329 | 29,498 | 30,939 | 32,072 | 32,112 | 32,180 | 32,290 | 32,262 | 32,124 | 32,340 | 32,635 | **378,259** |
| DSM Annual Utility Cost | 9,945 | 10,776 | 10,232 | 11,529 | 13,700 | 15,853 | 17,218 | 19,362 | 19,316 | 19,250 | 19,225 | 18,970 | 18,970 | 18,884 | 18,884 | 18,600 | 18,574 | 18,285 | 18,239 | 18,029 | |
| Total Levelized Utility Cost | 255 | 614 | 921 | 1,209 | 1,439 | 1,653 | 1,867 | 2,086 | 2,306 | 2,519 | 2,730 | 2,934 | 3,130 | 3,323 | 3,516 | 3,700 | 3,880 | 4,046 | 4,205 | 4,351 | |
| Total Costs | 379,616 | 425,166 | 453,287 | 478,073 | 495,092 | 525,598 | 538,306 | 552,176 | 554,703 | 581,135 | 598,234 | 626,771 | 638,074 | 654,841 | 680,334 | 705,796 | 732,184 | 767,965 | 796,773 | 801,325 | **7,308,822** |
| **Key Resource Decisions (increm. MDT/day)** | | | | | | | | | | | | | | | | | | | | | |
| Alberta path (1) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Alberta path (1) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Alberta path (1) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Alberta path (1) | - | - | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| Eastside Loop | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Cross-Cascades | - | - | - | - | - | - | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | |
| GTN Malin to Madras | - | - | - | - | - | - | 109 | 77 | 77 | 77 | 77 | 77 | 109 | 77 | 77 | 82 | 90 | 108 | 108 | 109 | |
| GTN Stanfield to Madras | - | - | - | - | - | - | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| Increase NWP Mainline | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| GTN Malin to Stanfield | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Newport LNG Delivery | - | - | - | - | - | - | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | |
| N-MAX | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Ruby Pipeline | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| South WVF | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| NWP Gorge Capacity | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Mist Storage Expansion | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Mist Storage Recall | - | - | 0 | 5 | 5 | 8 | 70 | 70 | 70 | 70 | 70 | 70 | 125 | 125 | 125 | 125 | 125 | 125 | 125 | 125 | |
| Satellite LNG Albany | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Satellite LNG Eugene | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Satellite LNG Salem | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| | | | | | | | | | | | | | | | | | | | | | |
| **NW Natural Transmission** | | | | | | | | | | | | | | | | | | | | | |
| North WVF (POR to SAL) | 30.9 | 30.6 | 30.5 | 31.0 | 32.2 | 25.8 | 82.6 | - | - | 66.8 | 67.3 | 35.2 | - | - | - | - | 41.4 | 2.4 | 45.4 | 79.2 | |
| Harrisburg River Crossing (ALB to EUG) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | |
| MWVF | - | - | 12.6 | 12.6 | 12.3 | - | 41.0 | 16.7 | 15.3 | 41.0 | 41.0 | 41.0 | 6.4 | 9.4 | 3.2 | 6.6 | 41.0 | 5.2 | 41.0 | 41.0 | |
| **Storage** | | | | | | | | | | | | | | | | | | | | | |
| GASCO LNG | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | |
| JP | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | |
| MIST | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 238.7 | 249.5 | 259.5 | 269.6 | 275.0 | 244.9 | 248.9 | 259.6 | 266.6 | 272.2 | 267.8 | 275.0 | 275.0 | |
| NEWPORT LNG | 58.0 | 58.0 | 58.0 | 58.1 | 58.2 | 58.3 | 95.9 | 98.5 | 98.7 | 98.8 | 99.0 | 99.1 | 99.3 | 99.4 | 99.6 | 99.8 | 100.0 | 100.0 | 100.0 | 100.0 | |
| PLYMOUTH LNG | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 14.3 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | |
| March Point | - | - | - | - | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | |
| **Peak Day Resources-Recall Agreements** | | | | | | | | | | | | | | | | | | | | | |
| Recall 1 | 25.4 | 25.9 | 30.0 | 30.0 | 25.0 | 30.0 | - | - | - | - | - | - | 30.0 | - | - | - | - | - | - | - | |
| Recall 2 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | - | - | - | - | - | - | 8.0 | - | 1.0 | 2.2 | 3.4 | 4.6 | 5.9 | 5.8 | |
| Recall 3 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | - | - | - | - | - | - | 1.0 | - | - | - | - | - | - | - | |

| 1536 - Out Pre CC 165 | 2012-2013 | 2013-2014 | 2014-2015 | 2015-2016 | 2016-2017 | 2017-2018 | 2018-2019 | 2019-2020 | 2020-2021 | 2021-2022 | 2022-2023 | 2023-2024 | 2024-2025 | 2025-2026 | 2026-2027 | 2027-2028 | 2028-2029 | 2029-2030 | 2030-2031 | 2031-2032 | NPV - 5.16% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 0.0516 |
| **DEMAND (MDT)** | | | | | | | | | | | | | | | | | | | | | |
| Forecast Demand | 79,519 | 80,884 | 82,603 | 84,311 | 85,313 | 86,368 | 87,426 | 88,915 | 89,804 | 91,006 | 92,200 | 93,901 | 94,828 | 96,242 | 97,735 | 99,716 | 101,003 | 102,808 | 104,853 | 105,329 | |
| Forecast DSM | 266 | 640 | 960 | 1,267 | 1,501 | 1,725 | 1,949 | 2,188 | 2,409 | 2,634 | 2,855 | 3,081 | 3,275 | 3,478 | 3,681 | 3,890 | 4,064 | 4,238 | 4,406 | 4,578 | |
| Forecast Demand (net DSM) | 79,253 | 80,244 | 81,643 | 83,045 | 83,811 | 84,642 | 85,476 | 86,727 | 87,395 | 88,373 | 89,345 | 90,819 | 91,552 | 92,764 | 94,055 | 95,826 | 96,940 | 98,569 | 100,446 | 100,751 | |
| Served Demand | 79,253 | 80,244 | 81,643 | 83,045 | 83,811 | 84,642 | 85,476 | 86,727 | 87,395 | 88,373 | 89,345 | 90,819 | 91,546 | 92,764 | 94,055 | 95,826 | 96,940 | 98,569 | 100,445 | 100,751 | |
| Unserved Demand | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | |
| Peak Day Demand (net DSM) | 923.2 | 923.7 | 929.0 | 933.5 | 940.5 | 949.1 | 958.2 | 965.5 | 976.0 | 985.6 | 995.4 | 1,006.1 | 1,018.2 | 1,030.4 | 1,041.8 | 1,055.2 | 1,069.8 | 1,084.7 | 1,100.1 | 1,098.9 | |
| Peak Day Demand Served | 923.2 | 923.7 | 929.0 | 933.5 | 940.5 | 949.1 | 958.2 | 965.5 | 976.0 | 985.6 | 995.4 | 1,006.1 | 1,011.5 | 1,030.4 | 1,041.8 | 1,055.2 | 1,069.8 | 1,084.7 | 1,098.8 | 1,098.8 | |
| Peak Day Demand Unserved | - | - | - | - | - | - | - | - | - | - | - | - | 6.7 | - | - | - | - | - | 1.3 | 0.1 | |
| **COST ($000 Nominal)** | | | | | | | | | | | | | | | | | | | | | |
| Supply Fixed Costs | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | |
| Supply Variable Costs | 247,873 | 290,588 | 318,972 | 342,178 | 355,455 | 376,382 | 387,869 | 400,511 | 402,596 | 429,029 | 446,166 | 465,480 | 483,137 | 500,949 | 525,985 | 551,435 | 577,579 | 612,708 | 639,069 | 646,547 | |
| Total Supply Costs | 247,934 | 290,649 | 319,033 | 342,239 | 355,516 | 376,443 | 387,930 | 400,572 | 402,657 | 429,090 | 446,227 | 465,541 | 483,198 | 501,010 | 526,046 | 551,496 | 577,640 | 612,769 | 639,130 | 646,608 | **5,408,383** |
| Transport Fixed Costs | 92,499 | 94,306 | 94,358 | 94,358 | 95,855 | 96,155 | 102,064 | 101,568 | 101,761 | 101,761 | 101,761 | 101,761 | 102,846 | 102,736 | 103,308 | 103,986 | 104,727 | 105,856 | 105,856 | 105,856 | **1,286,392** |
| Transport Variable Costs | 2,946 | 2,921 | 2,996 | 3,073 | 3,058 | 3,110 | 2,452 | 2,502 | 2,873 | 2,845 | 2,906 | 2,922 | 2,750 | 2,825 | 2,959 | 2,811 | 2,686 | 2,481 | 2,599 | 2,619 | |
| Total Transport Cost | 95,445 | 97,227 | 97,354 | 97,431 | 98,912 | 99,265 | 104,516 | 104,070 | 104,633 | 104,606 | 104,667 | 104,683 | 105,596 | 105,560 | 106,267 | 106,797 | 107,413 | 108,337 | 108,455 | 108,475 | **1,323,195** |
| Storage Fixed Cost | 24,959 | 25,306 | 25,411 | 25,480 | 25,558 | 25,905 | 25,722 | 25,774 | 25,774 | 25,774 | 25,774 | 25,774 | 25,774 | 25,774 | 25,774 | 25,774 | 25,774 | 25,931 | 26,042 | 26,042 | |
| Storage Variable Cost | 1,332 | 1,208 | 1,257 | 1,394 | 1,406 | 1,523 | 1,590 | 1,564 | 1,682 | 1,596 | 1,706 | 1,858 | 2,014 | 2,070 | 2,016 | 2,203 | 2,119 | 2,131 | 2,258 | 2,572 | |
| Total Storage Cost | 26,291 | 26,515 | 26,668 | 26,874 | 26,964 | 27,428 | 27,312 | 27,338 | 27,456 | 27,370 | 27,480 | 27,632 | 27,788 | 27,844 | 27,790 | 27,977 | 27,892 | 28,061 | 28,300 | 28,613 | **353,193** |
| DSM Annual Utility Cost | 9,945 | 10,776 | 10,232 | 11,529 | 13,700 | 15,853 | 17,218 | 19,362 | 19,316 | 19,250 | 19,225 | 18,970 | 18,970 | 18,884 | 18,884 | 18,600 | 18,574 | 18,285 | 18,239 | 18,029 | |
| Total Levelized Utility Cost | 255 | 614 | 921 | 1,209 | 1,439 | 1,653 | 1,867 | 2,086 | 2,306 | 2,519 | 2,730 | 2,934 | 3,130 | 3,323 | 3,516 | 3,700 | 3,880 | 4,046 | 4,205 | 4,351 | |
| Total Costs | 379,616 | 425,166 | 453,287 | 478,073 | 495,092 | 518,989 | 536,977 | 551,341 | 554,062 | 580,316 | 597,598 | 616,826 | 635,553 | 653,299 | 678,987 | 704,869 | 731,520 | 767,453 | 794,124 | 801,725 | **7,290,347** |
| **Key Resource Decisions (increm. MDT/day)** | | | | | | | | | | | | | | | | | | | | | |
| Alberta path (1) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Alberta path (1) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Alberta path (1) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Alberta path (1) | - | - | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| Eastside Loop | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Cross-Cascades | - | - | - | - | - | - | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 | |
| GTN Malin to Madras | - | - | - | - | - | - | 115 | 83 | 83 | 83 | 83 | 83 | 163 | 102 | 113 | 126 | 141 | 163 | 163 | 163 | |
| GTN Stanfield to Madras | - | - | - | - | - | - | 50 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| Increase NWP Mainline | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| GTN Malin to Stanfield | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Newport LNG Delivery | - | - | - | - | - | - | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | |
| N-MAX | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Ruby Pipeline | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| South WVF | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| NWP Gorge Capacity | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Mist Storage Expansion | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Mist Storage Recall | - | - | 0 | 5 | 5 | 8 | 21 | 21 | 21 | 21 | 21 | 21 | 21 | 21 | 21 | 21 | 21 | 21 | 28 | 28 | |
| Satellite LNG Albany | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Satellite LNG Eugene | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Satellite LNG Salem | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| | | | | | | | | | | | | | | | | | | | | | |
| **NW Natural Transmission** | | | | | | | | | | | | | | | | | | | | | |
| North WVF (POR to SAL) | 30.9 | 30.6 | 30.5 | 31.0 | 32.2 | 25.8 | 64.7 | - | - | 65.8 | 66.3 | 35.2 | - | 30.6 | - | - | 40.4 | 1.4 | 44.4 | 78.2 | |
| Harrisburg River Crossing (ALB to EUG) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | |
| MWVF | - | - | 12.6 | 12.6 | 12.3 | - | 41.0 | 16.7 | 15.3 | 41.0 | 41.0 | 41.0 | 6.4 | 41.0 | 3.2 | 7.6 | 41.0 | 5.2 | 41.0 | 41.0 | |
| **Storage** | | | | | | | | | | | | | | | | | | | | | |
| GASCO LNG | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | |
| JP | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | |
| MIST | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 235.5 | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | |
| NEWPORT LNG | 58.0 | 58.0 | 58.0 | 58.1 | 58.2 | 58.3 | 98.4 | 98.5 | 98.7 | 98.8 | 99.0 | 99.1 | 99.3 | 99.4 | 99.6 | 99.8 | 100.0 | 100.0 | 100.0 | 100.0 | |
| PLYMOUTH LNG | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 32.7 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | |
| March Point | - | - | - | - | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | |
| **Peak Day Resources-Recall Agreements** | | | | | | | | | | | | | | | | | | | | | |
| Recall 1 | 25.4 | 25.9 | 30.0 | 30.0 | 25.0 | 30.0 | - | - | - | 4.8 | 14.4 | 26.1 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 22.9 | 30.0 | 30.0 | |
| Recall 2 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | - | - | 4.4 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | |
| Recall 3 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | - | - | - | 1.0 | 1.0 | - | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | |

| 1537 - Out Post CC 110 | 2012-2013 | 2013-2014 | 2014-2015 | 2015-2016 | 2016-2017 | 2017-2018 | 2018-2019 | 2019-2020 | 2020-2021 | 2021-2022 | 2022-2023 | 2023-2024 | 2024-2025 | 2025-2026 | 2026-2027 | 2027-2028 | 2028-2029 | 2029-2030 | 2030-2031 | 2031-2032 | NPV - 5.16% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 0.0516 |
| **DEMAND (MDT)** | | | | | | | | | | | | | | | | | | | | | |
| Forecast Demand | 79,519 | 80,884 | 82,603 | 84,311 | 85,313 | 86,368 | 87,426 | 88,915 | 89,804 | 91,006 | 92,200 | 93,901 | 94,828 | 96,242 | 97,735 | 99,716 | 101,003 | 102,808 | 104,853 | 105,329 | |
| Forecast DSM | 266 | 640 | 960 | 1,267 | 1,501 | 1,725 | 1,949 | 2,188 | 2,409 | 2,634 | 2,855 | 3,081 | 3,275 | 3,478 | 3,681 | 3,890 | 4,064 | 4,238 | 4,406 | 4,578 | |
| Forecast Demand (net DSM) | 79,253 | 80,244 | 81,643 | 83,045 | 83,811 | 84,642 | 85,476 | 86,727 | 87,395 | 88,373 | 89,345 | 90,819 | 91,552 | 92,764 | 94,055 | 95,826 | 96,940 | 98,569 | 100,446 | 100,751 | |
| Served Demand | 79,253 | 80,244 | 81,643 | 83,045 | 83,811 | 84,642 | 85,465 | 86,727 | 87,395 | 88,373 | 89,345 | 90,819 | 91,542 | 92,764 | 94,055 | 95,826 | 96,940 | 98,569 | 100,446 | 100,751 | |
| Unserved Demand | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Peak Day Demand (net DSM) | 923.2 | 923.7 | 929.0 | 933.5 | 940.5 | 949.1 | 958.2 | 965.5 | 976.0 | 985.6 | 995.4 | 1,006.1 | 1,018.2 | 1,030.4 | 1,041.8 | 1,055.2 | 1,069.8 | 1,084.7 | 1,100.1 | 1,098.9 | |
| Peak Day Demand Served | 923.2 | 923.7 | 929.0 | 933.5 | 940.5 | 949.1 | 958.2 | 965.5 | 976.0 | 985.6 | 995.4 | 1,006.1 | 1,008.1 | 1,030.4 | 1,041.8 | 1,055.2 | 1,069.8 | 1,084.7 | 1,100.1 | 1,098.9 | |
| Peak Day Demand Unserved | - | - | - | - | - | - | - | - | - | - | - | - | 10.0 | - | - | - | - | - | - | - | |
| **COST ($000 Nominal)** | | | | | | | | | | | | | | | | | | | | | |
| Supply Fixed Costs | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | |
| Supply Variable Costs | 247,873 | 290,588 | 318,972 | 342,178 | 355,455 | 380,599 | 387,817 | 400,079 | 402,101 | 428,695 | 445,601 | 474,362 | 482,576 | 499,784 | 525,124 | 550,494 | 576,724 | 612,140 | 640,696 | 645,140 | |
| Total Supply Costs | 247,934 | 290,649 | 319,033 | 342,239 | 355,516 | 380,660 | 387,878 | 400,140 | 402,161 | 428,756 | 445,662 | 474,423 | 482,637 | 499,845 | 525,184 | 550,555 | 576,784 | 612,201 | 640,757 | 645,200 | **5,413,254** |
| Transport Fixed Costs | 92,499 | 94,306 | 94,358 | 94,358 | 95,855 | 96,155 | 101,604 | 101,086 | 101,086 | 101,086 | 101,086 | 101,086 | 101,604 | 101,086 | 101,086 | 101,361 | 101,768 | 102,681 | 102,681 | 102,698 | **1,274,995** |
| Transport Variable Costs | 2,946 | 2,921 | 2,996 | 3,073 | 3,058 | 3,156 | 2,528 | 2,480 | 2,863 | 2,837 | 2,921 | 2,914 | 2,791 | 2,914 | 2,999 | 2,989 | 2,796 | 2,674 | 2,756 | 2,763 | |
| Total Transport Cost | 95,445 | 97,227 | 97,354 | 97,431 | 98,912 | 99,311 | 104,132 | 103,566 | 103,949 | 103,923 | 104,007 | 104,000 | 104,395 | 104,000 | 104,085 | 104,351 | 104,564 | 105,355 | 105,437 | 105,460 | **1,312,291** |
| Storage Fixed Cost | 24,959 | 25,306 | 25,411 | 25,480 | 25,558 | 26,768 | 27,247 | 27,247 | 27,247 | 27,247 | 27,247 | 28,705 | 29,735 | 29,735 | 29,735 | 29,735 | 29,735 | 29,735 | 29,735 | 29,735 | |
| Storage Variable Cost | 1,332 | 1,208 | 1,257 | 1,394 | 1,406 | 1,548 | 1,688 | 1,626 | 1,805 | 1,658 | 1,817 | 2,065 | 2,337 | 2,377 | 2,445 | 2,555 | 2,527 | 2,389 | 2,605 | 2,900 | |
| Total Storage Cost | 26,291 | 26,514 | 26,668 | 26,874 | 26,964 | 28,316 | 28,935 | 28,872 | 29,052 | 28,905 | 29,064 | 30,770 | 32,073 | 32,112 | 32,180 | 32,290 | 32,262 | 32,124 | 32,340 | 32,635 | **376,588** |
| DSM Annual Utility Cost | 9,945 | 10,776 | 10,232 | 11,529 | 13,700 | 15,853 | 17,218 | 19,362 | 19,316 | 19,250 | 19,225 | 18,970 | 18,970 | 18,884 | 18,884 | 18,600 | 18,574 | 18,285 | 18,239 | 18,029 | |
| Total Levelized Utility Cost | 255 | 614 | 921 | 1,209 | 1,439 | 1,653 | 1,867 | 2,086 | 2,306 | 2,519 | 2,730 | 2,934 | 3,130 | 3,323 | 3,516 | 3,700 | 3,880 | 4,046 | 4,205 | 4,351 | |
| Total Costs | 379,616 | 425,166 | 453,287 | 478,073 | 495,093 | 524,140 | 538,163 | 551,941 | 554,478 | 580,834 | 597,958 | 628,164 | 638,075 | 654,841 | 680,334 | 705,796 | 732,185 | 767,964 | 796,773 | 801,325 | **7,307,709** |
| **Key Resource Decisions (increm. MDT/day)** | | | | | | | | | | | | | | | | | | | | | |
| Alberta path (1) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Alberta path (1) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Alberta path (1) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Alberta path (1) | - | - | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| Eastside Loop | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Cross-Cascades | - | - | - | - | - | - | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | |
| GTN Malin to Madras | - | - | - | - | - | - | 109 | 77 | 77 | 77 | 77 | 77 | 109 | 77 | 77 | 82 | 90 | 108 | 108 | 109 | |
| GTN Stanfield to Madras | - | - | - | - | - | - | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| Increase NWP Mainline | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| GTN Malin to Stanfield | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Newport LNG Delivery | - | - | - | - | - | - | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | |
| N-MAX | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Ruby Pipeline | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| South WVF | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| NWP Gorge Capacity | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Mist Storage Expansion | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Mist Storage Recall | - | - | 0 | 5 | 5 | 8 | 60 | 60 | 60 | 60 | 60 | 60 | 125 | 125 | 125 | 125 | 125 | 125 | 125 | 125 | |
| Satellite LNG Albany | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Satellite LNG Eugene | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Satellite LNG Salem | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| | | | | | | | | | | | | | | | | | | | | | |
| **NW Natural Transmission** | | | | | | | | | | | | | | | | | | | | | |
| North WVF (POR to SAL) | 24.3 | 24.4 | 25.3 | 18.4 | 32.2 | 33.7 | 28.8 | - | - | - | 67.3 | 34.6 | 68.6 | - | - | - | - | 43.0 | 78.8 | 45.2 | |
| Harrisburg River Crossing (ALB to EUG) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | |
| MWVF | - | - | - | - | - | - | 41.0 | 16.1 | 0.1 | 14.2 | 41.0 | 41.0 | 41.0 | 9.4 | 7.9 | 6.0 | 4.5 | 41.0 | 41.0 | 41.0 | |
| **Storage** | | | | | | | | | | | | | | | | | | | | | |
| GASCO LNG | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | |
| JP | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | |
| MIST | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 249.8 | 260.7 | 270.6 | 275.0 | 275.0 | 244.9 | 248.9 | 259.6 | 266.6 | 272.2 | 267.8 | 275.0 | 275.0 | |
| NEWPORT LNG | 58.0 | 58.0 | 58.0 | 58.1 | 58.2 | 58.3 | 98.4 | 98.5 | 98.7 | 98.8 | 99.0 | 99.1 | 99.3 | 99.4 | 99.6 | 99.8 | 100.0 | 100.0 | 100.0 | 100.0 | |
| PLYMOUTH LNG | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 14.3 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | |
| March Point | - | - | - | - | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | |
| **Peak Day Resources-Recall Agreements** | | | | | | | | | | | | | | | | | | | | | |
| Recall 1 | 26.4 | 26.9 | 30.0 | 30.0 | 25.0 | 30.0 | - | - | - | - | - | - | 30.0 | - | - | - | - | - | - | - | |
| Recall 2 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | - | - | - | - | - | 3.0 | 8.0 | - | 1.0 | 2.2 | 3.4 | 4.6 | 5.9 | 5.8 | |
| Recall 3 | - | - | 1.0 | 1.0 | 1.0 | 1.0 | - | - | - | - | - | - | 1.0 | - | - | - | - | - | - | - | |

| 1538 - Out Post CC 165 | 2012-2013 | 2013-2014 | 2014-2015 | 2015-2016 | 2016-2017 | 2017-2018 | 2018-2019 | 2019-2020 | 2020-2021 | 2021-2022 | 2022-2023 | 2023-2024 | 2024-2025 | 2025-2026 | 2026-2027 | 2027-2028 | 2028-2029 | 2029-2030 | 2030-2031 | 2031-2032 | NPV - 5.16% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 0.0516 |
| **DEMAND (MDT)** | | | | | | | | | | | | | | | | | | | | | |
| Forecast Demand | 79,519 | 80,884 | 82,603 | 84,311 | 85,313 | 86,368 | 87,426 | 88,915 | 89,804 | 91,006 | 92,200 | 93,901 | 94,828 | 96,242 | 97,735 | 99,716 | 101,003 | 102,808 | 104,853 | 105,329 | |
| Forecast DSM | 266 | 640 | 960 | 1,267 | 1,501 | 1,725 | 1,949 | 2,188 | 2,409 | 2,634 | 2,855 | 3,081 | 3,275 | 3,478 | 3,681 | 3,890 | 4,064 | 4,238 | 4,406 | 4,578 | |
| Forecast Demand (net DSM) | 79,253 | 80,244 | 81,643 | 83,045 | 83,811 | 84,642 | 85,476 | 86,727 | 87,395 | 88,373 | 89,345 | 90,819 | 91,552 | 92,764 | 94,055 | 95,826 | 96,940 | 98,569 | 100,446 | 100,751 | |
| Served Demand | 79,253 | 80,244 | 81,643 | 83,045 | 83,811 | 84,642 | 85,465 | 86,727 | 87,395 | 88,373 | 89,345 | 90,819 | 91,546 | 92,764 | 94,055 | 95,826 | 96,940 | 98,569 | 100,445 | 100,751 | |
| Unserved Demand | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | |
| Peak Day Demand (net DSM) | 923.2 | 923.7 | 929.0 | 933.5 | 940.5 | 949.1 | 958.2 | 965.5 | 976.0 | 985.6 | 995.4 | 1,006.1 | 1,018.2 | 1,030.4 | 1,041.8 | 1,055.2 | 1,069.8 | 1,084.7 | 1,100.1 | 1,098.9 | |
| Peak Day Demand Served | 923.2 | 923.7 | 929.0 | 933.5 | 940.5 | 949.1 | 958.2 | 965.5 | 976.0 | 985.6 | 995.4 | 1,006.1 | 1,011.4 | 1,030.4 | 1,041.8 | 1,055.2 | 1,069.8 | 1,084.7 | 1,098.8 | 1,098.8 | |
| Peak Day Demand Unserved | - | - | - | 0.0 | - | - | - | - | - | - | - | - | 6.8 | - | - | - | - | - | 1.3 | 0.1 | |
| **COST ($000 Nominal)** | | | | | | | | | | | | | | | | | | | | | |
| Supply Fixed Costs | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | |
| Supply Variable Costs | 247,873 | 290,588 | 318,970 | 342,178 | 355,089 | 374,923 | 387,640 | 400,676 | 402,867 | 429,264 | 446,425 | 467,592 | 483,162 | 500,947 | 525,982 | 551,400 | 577,609 | 612,750 | 639,069 | 646,547 | |
| Total Supply Costs | 247,934 | 290,649 | 319,031 | 342,239 | 355,149 | 374,984 | 387,701 | 400,737 | 402,928 | 429,325 | 446,486 | 467,652 | 483,223 | 501,008 | 526,043 | 551,461 | 577,670 | 612,811 | 639,130 | 646,608 | **5,408,622** |
| Transport Fixed Costs | 92,499 | 94,306 | 94,358 | 94,358 | 95,855 | 96,265 | 102,559 | 101,830 | 102,022 | 102,022 | 102,022 | 102,354 | 102,846 | 102,747 | 103,320 | 103,998 | 104,738 | 105,856 | 105,856 | 105,856 | **1,287,890** |
| Transport Variable Costs | 2,946 | 2,921 | 2,996 | 3,073 | 3,054 | 3,092 | 2,448 | 2,495 | 2,865 | 2,837 | 2,889 | 2,896 | 2,750 | 2,824 | 2,958 | 2,811 | 2,686 | 2,481 | 2,599 | 2,619 | |
| Total Transport Cost | 95,445 | 97,227 | 97,354 | 97,431 | 98,908 | 99,356 | 105,008 | 104,325 | 104,887 | 104,859 | 104,911 | 105,250 | 105,596 | 105,571 | 106,278 | 106,808 | 107,424 | 108,337 | 108,455 | 108,475 | **1,324,632** |
| Storage Fixed Cost | 24,959 | 25,306 | 25,410 | 25,480 | 25,480 | 25,480 | 25,142 | 25,142 | 25,142 | 25,142 | 25,142 | 25,507 | 25,765 | 25,765 | 25,765 | 25,765 | 25,765 | 25,927 | 26,042 | 26,042 | |
| Storage Variable Cost | 1,332 | 1,208 | 1,257 | 1,394 | 1,403 | 1,485 | 1,570 | 1,527 | 1,623 | 1,555 | 1,659 | 1,814 | 2,009 | 2,065 | 2,011 | 2,197 | 2,113 | 2,125 | 2,253 | 2,566 | |
| Total Storage Cost | 26,291 | 26,514 | 26,668 | 26,873 | 26,883 | 26,965 | 26,711 | 26,669 | 26,765 | 26,697 | 26,801 | 27,321 | 27,774 | 27,830 | 27,776 | 27,963 | 27,878 | 28,052 | 28,295 | 28,608 | **350,329** |
| DSM Annual Utility Cost | 9,945 | 10,776 | 10,232 | 11,529 | 13,700 | 15,853 | 17,218 | 19,362 | 19,316 | 19,250 | 19,225 | 18,970 | 18,970 | 18,884 | 18,884 | 18,600 | 18,574 | 18,285 | 18,239 | 18,029 | |
| Total Levelized Utility Cost | 255 | 614 | 921 | 1,209 | 1,439 | 1,653 | 1,867 | 2,086 | 2,306 | 2,519 | 2,730 | 2,934 | 3,130 | 3,323 | 3,516 | 3,700 | 3,880 | 4,046 | 4,205 | 4,351 | |
| Total Costs | 379,616 | 425,166 | 453,284 | 478,072 | 494,641 | 517,158 | 536,639 | 551,093 | 553,896 | 580,132 | 597,424 | 619,194 | 635,564 | 653,294 | 678,982 | 704,832 | 731,547 | 767,486 | 794,119 | 801,720 | **7,289,159** |
| **Key Resource Decisions (increm. MDT/day)** | | | | | | | | | | | | | | | | | | | | | |
| Alberta path (1) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Alberta path (1) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Alberta path (1) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Alberta path (1) | - | - | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| Eastside Loop | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Cross-Cascades | - | - | - | - | - | - | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 | |
| GTN Malin to Madras | - | - | - | - | - | - | 124 | 88 | 88 | 88 | 88 | 94 | 163 | 102 | 113 | 126 | 141 | 163 | 163 | 163 | |
| GTN Stanfield to Madras | - | - | - | - | - | - | 42 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| Increase NWP Mainline | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| GTN Malin to Stanfield | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Newport LNG Delivery | - | - | - | - | - | 3 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | |
| N-MAX | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Ruby Pipeline | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| South WVF | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| NWP Gorge Capacity | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Mist Storage Expansion | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Mist Storage Recall | - | - | 0 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 21 | 21 | 21 | 21 | 21 | 21 | 28 | 28 | |
| Satellite LNG Albany | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Satellite LNG Eugene | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Satellite LNG Salem | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| | | | | | | | | | | | | | | | | | | | | | |
| **NW Natural Transmission** | | | | | | | | | | | | | | | | | | | | | |
| North WVF (POR to SAL) | 24.3 | 24.4 | 25.3 | 18.4 | 32.2 | 30.2 | 28.9 | - | - | - | 66.4 | 33.7 | 68.6 | - | - | - | - | 42.0 | 77.8 | 38.2 | |
| Harrisburg River Crossing (ALB to EUG) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | |
| MWVF | - | - | - | - | - | - | 41.0 | 16.0 | 0.1 | 15.1 | 41.0 | 41.0 | 41.0 | 10.4 | 8.9 | 7.0 | 4.5 | 41.0 | 41.0 | 41.0 | |
| **Storage** | | | | | | | | | | | | | | | | | | | | | |
| GASCO LNG | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | 120.0 | |
| JP | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | |
| MIST | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 235.6 | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | 275.0 | |
| NEWPORT LNG | 58.0 | 58.0 | 58.0 | 58.1 | 58.2 | 61.8 | 98.3 | 98.4 | 98.6 | 98.7 | 98.9 | 99.0 | 99.3 | 99.4 | 99.6 | 99.8 | 100.0 | 100.0 | 100.0 | 100.0 | |
| PLYMOUTH LNG | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 23.7 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | 60.1 | |
| March Point | - | - | - | - | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | |
| **Peak Day Resources-Recall Agreements** | | | | | | | | | | | | | | | | | | | | | |
| Recall 1 | 26.4 | 26.9 | 30.0 | 30.0 | 25.0 | 30.0 | - | - | 6.8 | 16.3 | 25.9 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 23.1 | 30.0 | 30.0 | |
| Recall 2 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | - | 7.3 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | |
| Recall 3 | - | - | 1.0 | 1.0 | 1.0 | 1.0 | - | - | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | |