Exhibit No. BGM-9
Dockets UE-170033/UG-170034
Witness: Bradley G. Mullins

BEFORE THE

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, Complainant, v. PUGET SOUND ENERGY Respondent.	)	DOCKETS UE-170033 and UG-170034 (Consolidated)

EXHIBIT NO. BGM-9

ARDMORE SUBSTATION PROJECT IMPLEMENTATION PLAN

PUGET SOUND ENERGY
The Energy To Do Great Things

ARDMORE SUBSTATION

Project Implementation Plan

REVISION 1:AUGUST 20, 2010
Project Manager/Barry Lombard

REVISION 2: SEPTEMBER 12, 2012
Current Project Manager: K. William Lane

REVISION 3: SEPTEMBER 13, 2013
Current Project Manager: K. William Lane

REVISION 4: DECEMBER 18, 2013
Current Project Manager: K. William Lane

TABLE OF CONTENTS:

Section 1. Document Revision History

Version	Date	Description	Contributor
1.0	03/07/10	Initiate document based on 2010 budget and "Study to Combine Interlaken Substation with Ardmore Substation"	Barry Lombard
2.0	09/12/2012	Update document to include pr 2012 Forecast and Actual costs	K. William Lane
3.0	09/13/2013	Budget Update	K.William Lane
4.0	12/18/2013	Update for completion of Condemnation Process and revised budget.	K. William Lane

SECTION A:

Executive Summary for Revision 2.0:

This document presents project plans developed for Ardmore Substation Project as the project proceeded from initial development to current status. These consist of a description and schedule for remaining transmission line scope, the plan used to manage construction of the project, and the initial Project Implementation Plan with minor revisions and updates.

Ardmore Substation was placed in service on June 15, 2012. Transfer of distribution circuits from other substations was completed on August 31, 2012. The Kennilworth to Lakeside Transmission Line was looped through the substation providing increase reliability to the transmission system in the area. This temporary arrangement will be removed when the permanent transmission line upgrades associated with the project

are expected to be completed by late 2013. The City of Redmond also requires the temporary loop to be removed within 2 years after installation. Real estate rights for the new transmission lines must be secured. The scope or work and risks associated with this remaining phase of the project are addressed below in the "August 22, 2012 Ardmore Substation Transmission Line Improvements Project and Construction Management Plan:.

SECTION B

ARDMORE SUBSTATION – Remaining Scope: Transmission Line Improvements and Interlaken Substation Decommissioning

UPDATED AS OF: December18, 2013

PROJECT NEED:

Electric service demand in the Redmond Overlake and eastern Bellevue Bel-Red area is approaching the capacity of existing electric utility infrastructure serving these areas. PSE is building the new Ardmore Substation as a combined distribution and transmission switching substation to ensure continued reliable electric service to these growing areas. See previous reports for addition details on project justification and general scope.
The construction project consists of assembling a GIS switchyard within an access and size constrained L-shaped section of property. The substation was energized on June 15th and circuits transfer from Interlaken and Kenilworth substations was completed by first week of August. Remaining work consists of completing the transmission portion of the project

SCOPE:

- Combined switching and distribution substation - Complete
- 2 twin metal clad switchgear units - Complete
- 2 25-MVA DY transformers - Complete
- 1 Modular Protection and Control (MPAC) - Complete
- Gas Insulated Switchgear (GIS) - Complete
- Duct and vaults for 24 distribution circuits including 12,600 feet of new trench - Complete
- Transmission line modifications including four new steel poles and new section of line - Partially Complete

ARDMORE BUDGET STATUS AS OF SEPTEMBER 2013

	2012 and Prior Actuals	2013	2014	TOTAL
Substation	$19,168,210	$ 500,000	$ 75,000	$19,243,710
Distribution	$ 8,969,356	$ 50,000	$ 2,000	$ 9,021,356
Property	$ 7,717,683	$ 320,000	$ 690,000	$ 8,722,683
Transmission	$ 309,081	$ 72,000	$1,350,000	$ 1,731,081
TOTAL	$36,164,330	$ 942,000	$2,117,000	$39,223,330

PUGET SOUND ENERGY	Puget Sound Energy	Rev 2.0
	Project Implementation Plan	Ardmore Substation 9/13/13

PLANNED RESOURCES

Transmission Construction will be completed by Potelco under unit price contract.

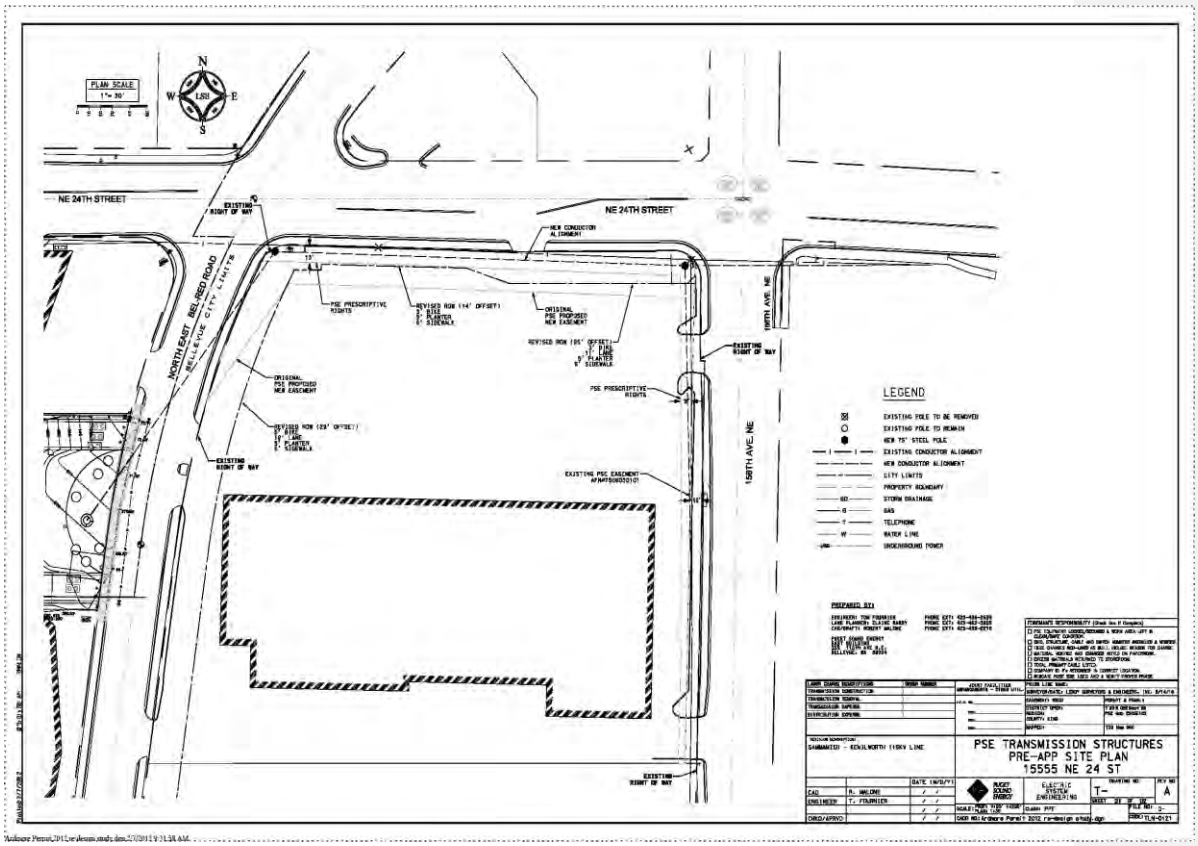
PROPERTY ACQUISITION PLAN

PSE began condemnation proceedings against Walgreens in mid-2013, and received a Use and Necessity judgment. However, since there was not a need to immediately install the transmission line it was decided to wait until the compensation to Walgreens was negotiated before starting installation. PSE successfully negotiated a settlement of $740,000 with Walgreens in November 2013. If PSE had not resolved negotiations with Walgreens, through mediation, then a jury trial will be required to determine compensation..

The key schedule date now is installation of final transmission lines prior to June, 2014 when is removal of the temporary transmission loop is required. Per agreement with the City of Redmond, this temporary loop was installed with the understanding that it will be removed within two years, or by June 2014. Due to a change in legal strategy, PSE will now provide compensation for previously held prescriptive rights, which have been dissolved by the expansion of the required easement. So compensation has increased compared to previous forecasts.

TRANSMISSION PLAN

The transmission section of Ardmore consists of connect three new spans of two lines into the substation at its east side on Bel-Red Road as shown in below sketch. The new lines will be in a stacked arrangement overhanging 24th street in order to reduce the easement required from the property owner and reduce easement acquisition costs.



PUGET SOUND ENERGY	Puget Sound Energy	Rev 2.0
	Project Implementation Plan	Ardmore Substation 9/13/13

SCHEDULE NARRATIVE

Current schedule for completing the transmission lines is attached Condemnation has been completed and construction of the transmission line in 2014 is remaining milestone.

Task	Start Date	Completion Date
Walgreens Rejects Proposal		09/20/2012
Condemnation Process Begins	12/10/12	
Possession and Use Granted		07/19/2013
Procure Transmission Poles	01/15/2014	05/15/2014
Construct Fdns and Erect Line	05/01/2014	06/13/2014
Energize Line		06/16/2014
Remove Temp Loop	06/17/2014	06/20/2014

REMAINING PROJECT RISKS

Remaining risk relates to fabrication and installation of transmission line Fabrication: Each structure is designed for specific loads. Lead time to fabricate is a minimum of four months, rejection of a structure after delivery will cause a lengthy delay

INTERLAKEN SUBSTATION REMOVAL

When the Transmission Line portion of the Ardmore Project is complete then Interlake Substation will be decommissioned. This will consist of removal of all major equipment, electrical assemble and the 3 spans of transmission line that tie this substation to the Lakeside – Sammamish line. Substation fence and all below ground structures will remain. Schedule is to remove transformer in late 2013, which was completed on December 12, 2013 and then remove remainder of substation in 2014.

Budget is a follows:

Year	Amount
2013	<$430,000> Credit
2014	$170,000

Project Manager
Kim William Lane

SECTION C

NOTE: As of current revision this portion of the project discussed below has been constructed. This section is retained for reference purposes only.

ARDMORE SUBSTATION
PROJECT & CONSTRUCTION MANAGEMENT PLAN

UPDATED AS OF: January 4, 2012

The construction project consists of assembling a GIS switchyard within an access and size constrained L-shaped section of property.

This work plan and report consists of the following:

- Planned Resources
- Work Segment Status
- Rolling 3 week schedule and near term items
- Project Risks and Critical Tasks
- Summary Project Schedule
- Summary Project Budget Status

PLANNED RESOURCES

Turner Construction is working under a firm bid contract and is responsible for site civil development such as cut and fill, retaining walls, architectural walls and foundations.
PSE Wire Crews consist of two 5 man crews and are denoted as Crew 1 and Crew 2.
Potelco is under a unit price contract responsible for installation of underground distribution circuits and overhead Transmission circuits into the substation.

WORK SEGMENTS

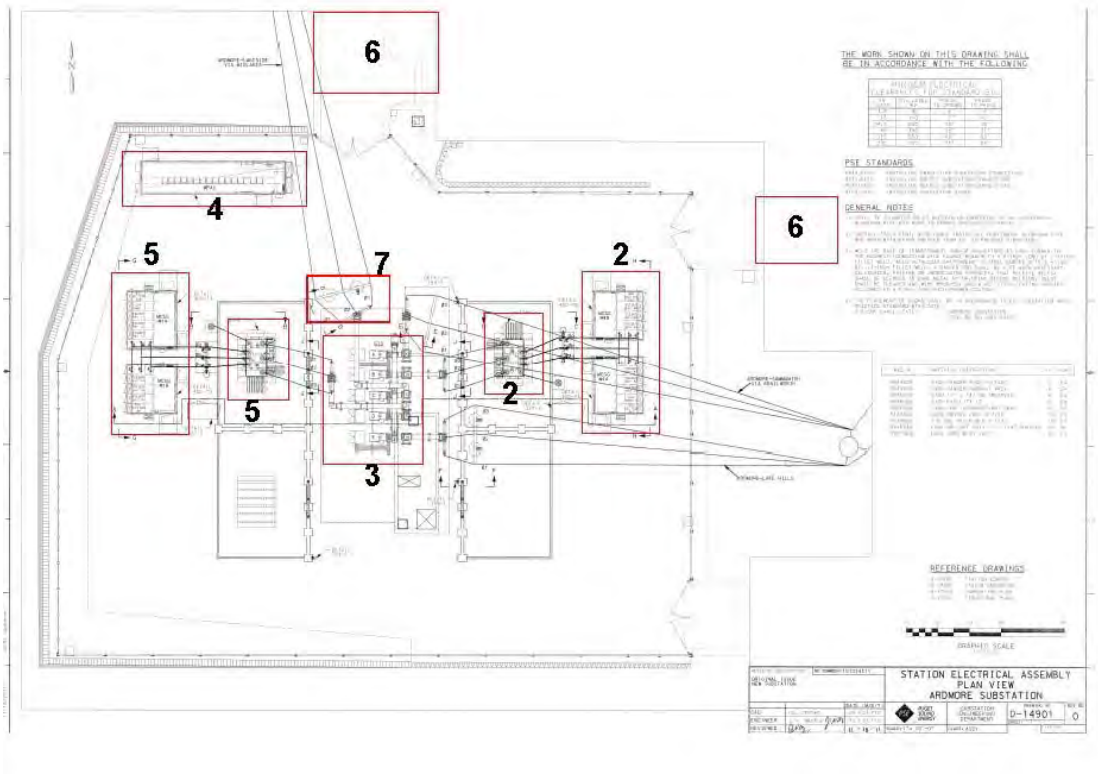
In order to efficiently manage the project, it has been divided into 13 discrete segments. Each segment can be completed and essentially made operational as a separate entity. This allows for accurate management and forecasting of the project. Certain activities, such as overall station testing and commissioning are necessary, but can be managed as separate entities as well. The work segments are as denoted in the table below.

WORK SEGMENT DESCRIPTIONS

Work Segment	Description	Prime Responsibility for Const/ Assembly	Start Date	Forecast End Date	% Cpt
1	Civil Structures	Turner Construction	Ongoing	February 28	
2	East Metal Clad Switchgear	PSE Wire Crew 2	Jan 25	Feb 27	
3	GIS	PSE Wire Crew 1	Jan 20	April 17	
4	MPAC Control House	PSE Wire Crew 2	Feb 29	April 30	
5	West Metal Clad Switchgear	PSE Wire Crew 1 PSE Wire Crew 2	April 18	May 15	
6	Distribution Underground	Potelco			
7	Transmission – Dead End Structures	Potelco	April 17		
8	Protection Circuits	PSE Relay Crew			
9	Information Technology and SCADA	PSE Communications Dept			
10	Transformer Bank 1		January 25	January 31	
11	Transformer Bank 4		Feb 28	March 6	
12	Transmission – Overhead Circuit	Potelco			
13	Substation Testing and Commissioning	PSE Relay Crews			

See below map for physical location of each work segment.

PUGET SOUND ENERGY	Puget Sound Energy	Rev 2.0
	Project Implementation Plan	Ardmore Substation 9/13/13



Ardmore Substation – Map of select Work Segments

This sketch provides the location or each work segment within the confines of the project site as discussed in the above table.

PUGET SOUND ENERGY	Puget Sound Energy	Rev 2.0
	Project Implementation Plan	Ardmore Substation 9/13/13

GENERAL SCHEDULE OF RESOURCE ALLOCATIONS

Resource	January	February	March	April	May	June	July
TURNER	GIS TENT Cpt Jan 20			GIS TENT Remove			
PSE WIRE CREW #1	GIS Assembly 21-Jan			14-Apr	Comm & Test	Cpt Commissioning June 15th	
PSE WIRE CREW #2	EAST 26-Jan		WEST March 7th	13-Apr	Comm & Test	Cpt Commissioning June 15th	
PSE WIRE CREW #3		MPAC Bldg Feb 8th		20-Apr			
PSE RELAY CREW		EAST	MPAC	WEST GIS	Comm & Test	Cpt Commissioning June 15th	
PSE COMM CREW							
POTELCO		STATION SVC DIST VAULTS		Trans Line Dead End Twrs			
POTTLE				FIREWALL SET GATES			

The above table presents a summary of how PSE crews, Turner Const., Potelco and Pottle and Sons will be integrated within the site. Resources will be allocated as predecessor activities such as concrete foundations are completed and equipment can be set. Construction Management will carefully manage the project to ensure that PSE crews can move to each segment as soon as possible.

SCHEDULE NARRATIVE

Segment 3: By January 20th Turner is completing transformer foundations and cable tray as well as all foundations in central work area to allow GIS tent to be erected. They will also complete yard course installation in south and east sectors to allow clean access and laydown for PSE crews.

PSE Crew #1 will move on site to begin assembly of GIS structure as soon as it is available on Jan 21st.

Segment 2: PSE Crew #2 will move to the West switchgear on site Jan 25th to install and assemble the Metal clad switchgear and East Transformer Bank.

Segment 5: PSE Crew will move to their sector upon completion of Segment 2 on March 7th

Segment 4: PSE is working with Turner to accelerate completion of the MPAC building foundation to allow for PSE Crew #3 starting work to wire this structure. PSE Crew #3 is expect to work until mid-April on MPAC structure to be followed by PSE Relay Crews

Segment 6: Potelco will install distribution vaults and getaways in February.

Segment 7: Potelco will install deadend tower and complete transmission lines to the station in April.

Segments 2 and 5: The contractor Pottle will install the transformer firewalls in April. These walls are not required to operate the substation, but must be installed while station is in unenergized condition.

General Work: During any phase of work PSE crews will perform general site assembly, such as erection of light standards, grounding installation, security system and other activities, so as to be efficiently utilized while on site.

Activities such as firewall installation, gate installation may be contracted or performed by PSE crews as determined to be most efficient use of resources.

Communication installation will also follow predecessor activities as soon as possible and will be carefully managed to eliminate any delays. Commissioning and Testing is expected to occur during the month of May and June with the station completed in mid-June.

KEY NEAR TERM ACTIVITIES
Need an actual three week schedule

1) Install mud sill over GIS and cabletray GIS tent Install – Jan 9th
2) Final Grade east section –Jan 8th and 9th
3) Pour small bus support foundations – Jan 11th
4) Complete GIS tent - Jan 20th
5) PSE Mobilizing 2 crews
6) Complete Yard Course in PSE area of Station – Cpt Jan 21st

Project Manager
Kim William Lane

7) Install South Arch. Wall – Jan 11th to Jan 14th
8) Complete Yard Course and vacate PSE area –January 21st
9) PSE begin assembly of East Metal Clad Switchgear –January 25th
10) PSE begin installation of Transformer Bank 1 – January 25th
11) Pour MPAC Bldg Foundation – earlier than end of January
12) Examine change of Station Service Transformer – Jan 11

IDENTIFIED PROJECT RISKS AND CRITICAL TASKS

GENERAL PROJECT RISKs

1) Civil Contractor
   a. Completion of Critical Civil Structures **–** Turner Construction is responsible for construction of the GIS Tent by Jan 20th to allow the PSE crews to start on time.
   b. Keeping Turner on task and schedule – Turner has not performed adequately and is operating under a recovery plan. The CM team monitors site activity daily and has an escalation plan with in Turner if problems arise.
   c. Completing Westside foundations and yard work – Turner needs to stay on schedule to deliver the west yard in February to allow concurrent electrical assembly to happen. The CM team will continue to monitor daily progress and utilize the escalation process with Turner if necessary.

2) GIS Assembly - The GIS's manufacturer's rep has a limited window of opportunity and is required to be on site during assembly of the GIS in order to validate the warranty. PSE crews are currently scheduled to work 6 – 10's during this operation to ensure we meet the representative's timeline.
3) Site access is limited – The site is constrained and access limited for the amount of work being completed in a short timeframe. The CM and Operations team are coordinating to ensure the site area is used efficiently, work tasks do not conflict and staging areas are well laid out.
4) Energize Station Service Padmount – Anticipated by mid-January to support electrical service to substation. Currently electrical service to assemble GIS structure is to be provided by portable electrical generators. Increase in transformer size is being examined to reduce the dependence and expense of diesel generators.
5) PSE crew availability and productivity – Currently three PSE wire crews are to be assigned to the project, providing adequate resources to support the current schedule. If for any reason PSE crews experience a labor shortage or fail to perform, arrangements have been made with VECA, an experienced electrical contractor, to provide resources necessary to maintain project schedule.
6) The majority of Project specific equipment and materials are secured and in storage for delivery to the project as required.

MAJOR EQUIPMENT AND MATERIAL ISSUES

All materials are on site and or expected to be delivered in a timely manner. Contingency plans for any anticipated material shortages will be developed in an ongoing manner.

WEATHER

The GIS tent is an engineered structure built to withstand anticipated typical wind and snow loads; however wind above 50 mph could affect use of the structure.

UNION LABOR ISSUE

None anticipated, however if an contractor is required to assist PSE crews then interface issues between the two will have to be managed to avoid potential conflict.

PROJECT SCHEDULE

The project schedule provides a detailed status of each work segment and the activities that control the project work flow. A summary of the project schedule is attached as well as a rolling 3 week schedule.

PROJECT BUDGET

The status of the Project Budget is summarized at the end of this report, as well as an earned value calculation for the project.

Additonal Risks Discussed at meeting 01 09 2012

GIS Tent – high winds
Weather

Errors in control wiring: Get control wiring in hands as soon as possible
Insure all panels are correctly assembled in MAC building: Ask Relay Techs to check out logic by end of the month. Check control prints- Need settings by March.

Materials –Pulled at Shuffle ton – inventory materials prior to delivery. Will have list of items pulled and those backordered by Jan 10th

Security on site to prevent theft and vandalism.

Site Logistics:

Access will primarily be from South entrance for GIS and PSE crews. North entrance is congested.
Trench sections will scheduled to not affect critical traffic sequences.

Crane picks will be discussed with crane vendor so as to have unforeseen interference with GIS tent.

PSE Crew Discussion Mtg Attendees:

Jeff Ross
Scott Tongue
Pete Maxwell

Eric Chritensen
Randy Walls
Chris Brown
Kim Lane

SECTION D

PROJECT IMPLEMENTATION PLAN

Section 2. Project Overview

2.1 Purpose:

Improve system capacity and reliability in the Redmond Overlake and Bellevue eastern Bel-Red areas.

Problem Statement:

Existing substations in southwest Redmond and northeast Bellevue are projected to overload due to anticipated growth. Existing load already prevents these substations from backing each other up during winter and summer peak times. In addition, the existing transmission line already serves too many substations for good reliability.

The Redmond Overlake and Bellevue eastern Bel-Red areas are presently served by four distribution substations: Evergreen, Kenilworth, Interlaken and Bridle Trails. Starting in about 2006 peak electrical loads approached – and in some cases exceeded – the capacity of some existing infrastructure. Today, during periods of peak service demand, loads at Evergreen, Kenilworth, and Interlaken substations can exceed transformer capacity ratings. Operating transformers above capacity ratings can reduce transformer life and risk equipment failure. Under these conditions there may not be sufficient reserve system capacity in the event a substation goes out of service. In addition, some circuits in the project area have become so heavily loaded that during summer and winter peak load periods they no longer have adequate reserve capacity to reliably backup surrounding circuit load. Existing electric utility infrastructure lacks adequate unused capacity to serve new development in these heavily loaded areas and increasingly jeopardizes service reliability and power quality to our existing customers.

New commercial development planned for the next 3 years in the Northeast Bellevue-Southeast Redmond (Ardmore) area will increase load on the Sammamish-Kenilworth-Lakeside 115 kV transmission line to the point of significantly impacting reliability. In 2006 the line peaked at 132 MW in the winter and 122 MW in the summer. At that time, the Sammamish-Kenilworth-Lakeside line was already the most heavily loaded 115 kV transmission line in PSE's service area for summer peak. The load was projected to increase by more than 10 MW in the subsequent three years, bringing it close to the recommended limit cap of 100-150 MW for double source

transmission lines. By 2009, the line peaked at 153 MW in winter and 142 MW in summer doubling the estimated increase. . With one of the highest loaded transmission lines in PSE's area, this area would receive better reliability for a large number of residential and commercial customers if it had a third transmission source.

The line presently serves over 22,000 customers, with 43% of the load commercial. Much of the commercial load is supplied to a major high-tech business that has considerable air conditioning requirements for its buildings. This situation has the net effect of increased load density, and necessitates using the 27 MW summer peak rating as the limiting factor, versus the 33 MW winter peak rating for the substation transformers on this line.

Three of the substations on the Sammamish-Kenilworth –Lakeside transmission line are Kenilworth, Evergreen and Interlaken. Over the next two years, loading served by existing circuits in these substations will take each of them to their peak capacities, thereby increasing the possibility that loss of a substation bank or bus cannot be picked up by surrounding substations.

Due to the high loading and important nature of customers on this transmission line, the line is already operating normally open at Kenilworth Substation. While this protects customers north of Kenilworth from exposure to faults south of Kenilworth, it does limit reliability options especially for customers south of Kenilworth. Without a breaker or switching station at Ardmore or Kenilworth, the load at Ardmore, Interlaken, and Lake Hills cannot be picked up by automatic switching. Interlaken and Lake Hills substations are already experiencing low transmission reliability. PSE has worked to establish automatic switching on all of its transmission lines that serve customer substations. This line stands as one of those less able to restore customer service following an outage, due to having too many substations between transmission circuit breakers.

Without another transmission line for redundancy, reliability to such a high load area is impacted by double-contingency outages. This scenario occurs when a section of the line is switched out for planned work, as frequently occurs in summer and fall. Then an unplanned outage occurs somewhere else on the transmission line, and all of the substations in between the two outages lose power. PSE strives to limit exposure to this type of outage to less than 100 MW of commercial load or four substations. This line exceeds both the number of substations and amount of load.

Solution:

1. Serving new load and improving transmission reliability in the area will require construction of a 3-line four bank 115 kV switching station at the Ardmore site in South Redmond. The ultimate development will include a fourth line from Westminster Substation. The plan involves combining nearby Interlaken Substation and the new Ardmore Substation into a single station on the same site. The Ardmore substation will need to be a switching station to address transmission reliability concerns that will remain for customers served by the Ardmore, Interlaken and Lake Hills substations. Connecting all three lines between Sammamish, Lakeside and Ardmore Substations will improve transmission capacity to the East Bellevue-South Redmond area, and the improved automatic switching will result in

reliability improvements to Spirit Brook, Evergreen, Interlaken, Midlakes, College, Phantom Lake and Lake Hills substations. The distribution bank at Ardmore will provide much needed capacity relief to the surrounding substation banks and feeders on Evergreen, Kenilworth, and Interlaken, as well as allow for some future growth in the area.

2. Combining Interlaken and Ardmore Substations on the same site will:
   - Eliminate the need to build a new transmission line between Interlaken and Ardmore
   - Allow the existing 1/8 mile tap to Interlaken on 152nd Avenue NE to be removed
   - Lower substation and transmission line presence in the immediate community
   - Improve reliability to all of the customers served by Ardmore
   - Avoid planned maintenance work at Interlaken Substation

PROJECT DETAIL

Ardmore Substation: Build an 8-element 115 kV ring bus ultimately serving 4 115 kV transmission lines and 4-25 MVA transformers. Initially 3 transmission lines and 2-25 MVA transformers will be installed. Sulfur hexafluoride (SF6) gas insulated switchgear (GIS) will be used for the 115 kV bus and circuit breakers. The GIS will be configured in a ring bus arrangement, with 5 circuit breakers initially and planned expansion to 8 circuit breakers in the future. Each transformer will have two smaller metalclad switchgear for the 12.5 kV circuits with bus ties between the metal clad structure to enable load transfer. The smaller metal clad will have additional bus tie and breaker compartment to allow future expansion to 40 MVA transformers and enable automatic load restoration due to banl outages within the substation. Four 12.5 kV capacitors will be required, one for each 25 MVA transformer. The equipment will be laid out to enable vehicle access to the major equipment. There will be 3 dead end towers for the first 3 transmission lines. The fourth line is planned to enter the substation underground, due to a congested line route and space constraints on the substation property.

Transmission Lines: The 115 kV line from Sammamish Substation will approach Ardmore Substation where it already exists along the south side of NE 24th Street coming from Kenilworth Substation. It will be terminated from the east side of the substation, having crossed Bel-Red Rd. The 115 kV line to Lake Hills Substation will approach Ardmore Substation along the south side of NE 24th St, where it will be double-circuited with the existing Kenilworth line from 156th Ave NE to Bel-Red Rd, and then into the east side of the substation. The 115 kV line from Lakeside Substation will enter the substation from the north, along PSE's driveway, from its existing location on the south side of NE 24th Street. The unused portion of the existing 115kV Lakeside-Kenliworth transmission line due north of the substation property on NE 24th St will be removed.

It should be noted that the benefits of connecting a third line at Ardmore depend on a separate project to build a new section of transmission line to connect Lake Hills and Phantom Lake Substations being completed successfully.

The fourth line is planned to go north on PSE's driveway, then west along NE 24th Street to the future Westminster Substation at NE 24th and approximately 138th Ave NE. This line is probably 10 years or more in the future.

Distribution System: The five existing distribution circuits at Interlaken will be transferred to Ardmore after Ardmore Substation is energized. The Interlaken Substation equipment may then be removed and the substation property sold as surplus if no longer needed. An additional five

new circuits will be built out from the newly installed second bank at Ardmore. At full build out there will be 24 circuits exiting Ardmore Substation along both NE 24th St and Bel-Red Rd.

Executive Summary:

Electric service demand in the Redmond Overlake and Bellevue eastern Bel-Red areas is approaching the capacity of existing electric utility infrastructure serving these areas. After careful study, PSE has determined that coordinated construction of a new distribution and transmission switching station together with transmission system improvements are needed to provide additional system capacity and ensure continued reliable electric service to existing and future customers. PSE proposes to build the new Ardmore Substation as a combined distribution and transmission switching substation to ensure continued reliable electric service to these growing areas.

Project Objectives:

During periods of peak service demand, loads at PSE's Evergreen, Kenilworth, and Interlaken substations can exceed transformer capacity ratings. Addition of the Ardmore Substation will alleviate this situation by adding needed substation capacity to serve the local area now and future local area load growth.

During periods of peak demand for electric service, loads on the existing transmission lines serving the local area will reach and exceed maximum designed operating capacity for certain contingencies. Three transmission lines connect at a single point near the substation site. The present configuration of these lines no longer provides adequate flexibility to adapt line operation to changing system needs and increasingly jeopardizes customer service reliability. Addition of the Ardmore substation including automatic switching and sectionalizing of transmission lines together with reconfiguration of the transmission lines will allow them to operate independently when necessary and will increase transmission system capacity, flexibility and reliability for both the local area and the transmission system in general.

Some circuits in the project area have become so heavily loaded that during summer and winter peak load periods they no longer have adequate reserve capacity. Thus, if a substation outage occurs during peak loading, customers may be exposed to extremely long outages due to the many switching steps necessary for restoration. Addition of new Ardmore distribution circuits will alleviate this situation by allowing redistribution of existing loads from other circuits and by providing additional circuit capacity to serve the local area now and future local area load growth.

2.2 Scope:

1. Purchase property to build a new substation in the general area of the inter-connection of three 115 kV transmission lines at NE 24th Street and 156th Avenue NE. (Done)
2. Purchase an easement for installation of two spans of double circuit transmission line along NE 24th St between 156th and Bel-Red Rd.
3. Build substation containing an 8-element 115 kV GIS ring bus ultimately serving 4-115 kV transmission lines and 4-25 or 4-40 MVA transformers.
4. Extend three existing overhead transmission lines into Ardmore Substation. In the future, bring a fourth new underground transmission line into Ardmore Substation from Westminster Substation.
5. Install 10 to 12 circuits for distribution system. Where a future cost savings can be realized, install conduits for the remaining 10 to 12 future distribution circuits.
6. Transfer Interlaken distribution circuits to Ardmore Substation.

7. Demolish existing Interlaken Substation.
8. Remove transmission tap to Interlaken Substation.

2.3 Project Assumptions:

1. Easements for transmission line improvements can be acquired.
2. Permits can be obtained.
3. Construction can start during dry summer months of 2011.

2.4 Project Constraints:

1. Civil construction and installation of GIS equipment should occur during dry weather from June to October.
2. The 24 distribution circuits exiting the station must avoid conflicts with existing underground utilities.
3. Space for a future underground transmission line on the substation property must be reserved.
4. Project must be constructed to accommodate the anticipated future road widening of both Bel-Red Rd and NE 24th St.

2.5 Project External Stakeholders

Terri Lien	Property Owner, Ramone Site
Mike Koenig	Belmoor Home Owners Association
Winston Lee	Belmoor Home Owners Association
Ken Schering	Sherwood Home Owners Association
Angelo S. Toppano	Property Owner, Angelos Site
Bank of America	Seller and Interim Tenant of Ardmore Substation property
Cornell Petrisor	Property Owner
Microsoft Campus	Redmond
Rob Odle	City of Redmond Planning
Steven Fischer	City of Redmond Planning
Kelsey Larson	City of Redmond Plannin
Lori Peckol	City of Redmond, Planning
Steve Sarkozy	Bellevue City Manager
Matt Terry	Bellevue Planning and Community Development Director
Carol Helland	Bellevue Land Use Director
Senator Maria Cantwell	United States Senator

Section 3. High Level Business Case and Milestones

3.0 See Section B for current Budget as of September 2013.

Revised Budget as of September, 2012

Ardmore	*2011 and Prior*	2012 Forecast	*2013 Forecast*	*Total Budget Forecast*
Substation	*13,111,498*	$6,321,000		*$19,432,000*
Distribution	*6,254,396*	$2,968,000		*$ 9,222,000*
Property	*7,645,784*	$ 447,000	*$ 200,000*	*$ 8,293,000*
Transmission	*2,837*	$ 333,000	*$1,177,000*	*$ 1,513,000*
Project Total	*27,014,514*	$10,066,000	*$1,377,000*	*$38,460,000,*

2012 Budget Actual compared to 2010 Budget

1. Substation Costs were much higher than anticipated due to cost to construct civil improvements.
2. Distribution Costs were also much higher than anticipated due to congested urban environment with deeper than anticipated trenching and in street routing due to not obtaining real estate rights through private property.
3. Installation of the Transmission Lines may require condemnation to acquire easement rights, with associated costs.

3.1 Estimated Budget as of August, 2010

BUDGET DETAIL Year	Planners Capital Estimate	Planners Expense Estimate	Capital Contributions	Expense Contributions
Itd thru 2009	$9,200,000	$0	$0	$0
2010	$1,200,000	$0	$0	$0
2011	$9,420,000	$670,000	$0	$0
2012	$4,155,000	$0	$0	$0

2013	$0	$0	$0	$0
Grand Total:	**$23,975,000**	**$670,000**	**$0**	**$0**

Description	Planners Estimate Capital	Planners Estimate OMRC
Property Purchase	$7,600,000	$600,000
Design/Permitting	$775,000	
Substation	$10,300,000	
Transmission Work	$500,000	$20,000
Distribution Work	$2,200,000	$50,000
ROW	$800,000	
Contingency	$1,800,000	
Grand Total	$23,975,000	$670,000

3.2A **Budget Assumptions**: List any statements that were used to determine the budget numbers.

1. Budget based on historical costs and engineering estimates.
2. Property purchase of approximately $7.6M and payment of $520K option are included in the lifetime budget assumptions.
3. Cost of major equipment is incorporated into budget including: GIS equipment including 5 circuit breakers is estimated at $2.8M; an MPAC (modular protection and control building) estimated at $700K; two transformers estimated at $1.4M (with two more future transformers not in estimate); four smaller metal clad switchgear estimated at $1.6M (with four more future metal clad switchgear not in estimate); and two 12.5 kV capacitors estimated at $50K (with two future capacitors not in estimate).
4. Of the budgeted equipment, one circuit breaker, one transformer, one metal clad switchgear and one capacitor will be installed to enable decommissioning of Interlaken Substation. All of these costs, except the capacitor, would have been required for maintenance at Interlaken. ($2.1M)
5. A 15-foot high retaining wall will be required at an estimated cost of $325K.

3.3 Benefits: List quantitative and qualitative benefits to executing the project.

Quantitative

1. Addition of the Ardmore substation including automatic switching and sectionalizing of transmission lines together with reconfiguration of the transmission lines will allow them to operate independently when necessary and will increase transmission system capacity, flexibility and reliability for both the local area and the transmission system in general.
2. Increases the 115 kV system reliability by installing five (5) 115 kV circuit breakers initially and three (3) additional breakers at full build out.

3. Additional distribution circuits from Ardmore Substation and reconfiguration of the surrounding distribution system will allow for the redistribution of loads on existing circuits and provide additional circuit capacity to serve the local area and future load growth.
4. The station will be designed to allow for future conversion to 40 MVA transformers if additional capacity is required.
5. The station will include bus tie capability between metalclad switchgear within the substation. This will enable one Ardmore transformer to pick up the other.
6. The station will include automatic restoration of distribution feeders via the metal clad switchgear bus ties. In the event of a bus or transformer bank outage the load will be automatically shifted to an adjacent transformer. This prevents the customer from seeing a prolonged outage and reduces operations costs by avoiding a callout for servicemen.

Qualitative

1. Project will incorporate lessons learned for design of metal clad switchgear; MPAC; and GIS equipment.
2. Use standardized approaches to design as much as possible.
3. Project will combine two substations and provide better reliability in a manner that minimizes the physical presence of substation and transmission line facilities in the community.

3.4 Alternatives

1. Underground Transmission Line to Ardmore:

There will be three new transmission lines to Ardmore if a switching station is built at Ardmore (or two to Ardmore and one to Kenilworth if Kenilworth is determined to be the switching station). There are plans to bring a future fourth line underground from Westminster Substation to Ardmore. Right of way for the fourth line would be through relatively dense commercial areas and may be difficult and costly to procure. Trench size requirements for underground transmission lines may complicate the situation. GIS equipment and the entire Ardmore Substation will need to be designed to accommodate an underground transmission line.

2. Defer switching station construction:

An alternative to building the switching station at this time would be to install a circuit breaker at Ardmore and defer the switching station until the 2nd bank is installed at Ardmore or Interlaken. While over 22,000 customers would continue to be at risk of a common mode contingency, the breaker would enable some level of automatic switching for an interim measure to address single contingency situations.

Full reliability benefits would not be realized if a single breaker is utilized at Kenilworth and Ardmore. In addition, there would not be the option to complete the line between Lake Hills and Phantom Lake without a switching station to terminate the line. This will eliminate or defer reliability improvements to Lake Hills, Phantom Lake, and College.

The switching station will be required within another 5-8 years, when the load grows beyond 150 MW on the Sammamish-Lochleven-Lakeside line. At that time, the project will require construction of the 3rd transmission line and construction of a ring bus at either Ardmore or Kenilworth.

This alternative is rejected due to reliability and cost considerations.

3.5 Milestones and Deliverables

Milestones and Deliverables	Description	Schedule Baseline Date	Approximate Date
	Feasibility	2007	Revised – April, 2010
	Property Purchase	Spring, 2008	December, 2009
	Develop Project Plan	May, 2008	Revised - June, 2010
	Detailed Design	December, 2010 (90%)	December, 2010 (90%)
	Order Material	April, 2009	August, 2010 (major equipment)
	Design and Permitting	Start December, 2009	Start December, 2009
	Construction	Start – May 2011	Start - August, 2011
	Commissioning Complete	April 2012	June, 2012
	Project Close-Out Complete	May, 2012	September, 2012

Section 4. Engineering and Permitting Criteria at 30% Design

4.1 Transmission

Three existing 115 kV transmission lines will be routed into the new station. Two of the lines will be routed from the east along NE 24th Street and will drop into the station off of NE Bel-Red Road. Two spans of double circuit will be required. The third 115 kV line will be routed into the station from the west along NE 24th Street and will drop into the station directly from NE 24th Street. Several steel poles on deep foundations will be required to route the existing three lines into the station.

A future fourth new line will be routed into the station from the west along NE 24th Street. This new line will originate at Westminster Substation and will enter the station underground.

4.2 Distribution

Distribution get-a-ways will be designed by PSE (Mike Copps). There will be a total of 24 circuits that will exit the station at full build out. Potelco will design the distribution system from the get-a-way vaults to the interconnection points with the existing system.

Distribution construction in City right-of-way will require half lane restoration. Consideration will be given to how much of the ultimate distribution system will be installed initially.

4.3 Station

A new combined 115 kV - 12 kV electric distribution and transmission switching substation to serve load in the South Redmond/Northeast Bellevue area of King County. The addition of the distribution substation will require taking action to relieve the transmission line loading. To relieve loading and maintain reliability on the transmission line, it will be necessary to build the Ardmore substation as a 3-line 115 kV switching station (with space and equipment designed to accommodate a future fourth line).

The substation property is located at 2245 NE Bel-Red Road, Redmond, WA 98052. The property is 65,801 square feet and is L-shaped with driveway access on both NE Bel-Red Road and NE 24th Street. The tax parcel number is: 2625059166.

The property has an approximate 40 feet elevation drop from the east property line to the west property line. Development of the station will require construction of a retaining wall, which will be approximately 15 foot high.

4.4 Equipment/Materials

1. One sulfur hexafluoride (SF6) gas insulated switchgear (GIS), which will be used for the 115 kV bus and circuit breakers. This equipment is on order through ABB, Inc.
2. One MPAC, which will be purchased through a competitive bid process.
3. Four small metal clad switchgear to be installed for the 12.5 kV circuits served by each transformers. The metal clad switchgear vendor will be selected through a competitive bid process.
4. Two DY 25 MVA transformers will need to be reserved by the Major Equipment Committee for installation at Ardmore Substation in 2011.
5. Firewalls between the transformers and the GIS equipment at a height of 14'.

4.5 Protection & Controls

1. Special considerations will be incorporated into the design to accommodate the planned 4 metalclad switchgear within the substation and provide adequate bus ties between the switchgears.
2. Consultant/Design Contractor – ABB may coordinate GIS controls and protection design with subcontractor – Phoenix Electric Corporation.

4.6 Permitting

1. The project will require permits from the Cities of Redmond and Bellevue.
2. The City of Redmond will require:

    - SEPA Review;
    - Demolition Permit;
    - PSCAA Notice of intent;

- Conditional Use Permit/PREP Process;
- Design Review;
- Building Permit;
- Grade and Fill Permit;
- NPDES Permit;
- Right of Way Use Permit.

3. The City of Bellevue will require:
    - Conditional Use or Administrative Decision (t-lines)
    - Right of Way Use Permit
4. GeoEngineers and Riddell Williams are assisting PSE with permitting.

Section 5. Coordination with Other Projects

5.1 In order for this project to be fully functional at ultimate build-out, a section of 115 kV transmission line must be build between Phantom Lake Substation and Lake Hills Substation. In addition, a fourth future transmission line must be brought into Ardmore Substation underground.

Approved By:

System Planner _____ Date _____

Project Manager _____ Date _____

Project Engineer _____ Date _____

Attachments/Appendix

Appendix A – Baseline Schedule

Appendix B - 10 Year Plan

Appendix C – Project Issues and Opportunities

Appendix D – Project Team

Appendix E – Project Record Register

Appendix F – Project Change Approval Record (CAR) Log

Appendix G – Project Change Request (PCR) History Log

Appendix H – Lessons Learned Document

Appendix I – Notification, WBS, Order Numbers

Appendix A Baseline Schedule

See page 11 of the link to the schedule below:

current_schedules_project.pdf

Appendix B 10 Year Plan

See the link to the System Planning website.

http://pseweb/TESP/Web%20Site%20documents/TESP_Files/North_King/King/2009%20MULTI-YEAR%2009%20PDF/09%202009%20Ardmore_Substation.pdf

Appendix C Project Issues and Opportunities (PROJECT HAS BEEN CONSTRUCTED)

#	ISSUE DESCRIPTION	RECOMMENDATION/CORRECTIVE ACTION	SEVERITY	OWNER	DUE DATE
1	Minimize presence or visibility of electric infrastructure in the local community	Combine Ardmore Substation with Interlaken Substation – remove Interlaken Substation and eliminate need for transmission line loop and transmission line tap	High	C. Jager J. Nedrud	
2	Permitting Schedule – The project must start during dry weather due to civil work on steep slope and need to install GIS equipment when humidity is low	The team is pursuing the PREP permit process and will look at feasibility of installing GIS in a tent	High	E. Babby B. Lombard	
3	An easement is required across nearby developer's property for overhang of transmission line	Start negotiations as soon as possible	High	G. Lertkantitham	
4	Engineering schedule – The project involves coordination of PSE engineering with engineering by ABB and its subcontactors	Ensure ABB has the inputs it needs to complete GIS engineering in a timely manner and ensure internal and external engineering is well coordinated	Medium	L. Thompson	
5	Outages may occur while PSE is in the process of designing, permitting and constructing this substation.	Include CR Manager to facilitate discussion with customers and business owners. Develop communications plan and an operations and maintenance plan.	Medium	J. Van Nort G. Aliabadi J. Boyer R. Lewis	
6	Distribution engineering and construction must be coordinated with Potelco. Easements may be required and construction work will impact city streets and may involve potential conflicts with other utilities.	Get Potelo on board as soon as possible to start distribution design, Have Real Estate complete rights review of preliminary design. Review design with City through permit process and resolve conflicts early.	Medium	B. Lombard G. Lertkantitham	

This section should identify which risks are likely to affect the project and document the characteristics of each risk. Characteristics of risks should include definition of the event, any mitigation plan, impact of the event, probability of occurrence of the event, and trigger date if known.

#	RISK	MITIGATION / CONTINGENCY PLAN	IMPACT	PROB.	COST IMPACT
1	Not acquiring transmission and distribution easements in accordance with project schedule	Proactively pursue easement acquisitions as soon as possible	High	Medium	Low
2	Procurement of major equipment including metal clad switchgear, GIS equipment and MPAC are on critical path	Start procurement as soon as possible	High	Medium	Medium

Probability of Risk Occurring		
Low 0-25%	Med 25-50%	High 50-100%

Appendix D Project Team

Name	Role Description
Kim William Lane	Project Manager
Carol Jaeger	System Planning/Transmission
Jennifer Boyer	System Planning/Distribution
Ray Hisayasu	System Planning/Distribution
Jens Nedrud	Electrical Engineering
Lynn Thompson	Civil Engineering
Tom Fournier	Transmission Engineering
Jeanne Harshbarger	Protection
KJ Lee	Substation Engineering/Controls
Eric Chon	Substation Engineering/Controls
Brad Stevenson	Telecom/Fiber
Ron Tornquist	Telecom/SCADA
George Lertkantitham	Real Estate
Jason Van Nort	Community Relations Manager/Redmond
Jim Hutchinson	Community Relations Manager/Bellevue
Andy Swayne	Municipal Liaison Manager
Angela Wingate	Municipal Liaison Manager
Elaine Babby	Municipal Land Planner/Permitting
Ed Wilson	Purchasing
Roxana Nilchian	Standards
Mike Copps	Substation Engineering/ Distribution

(Expand list to include internal and external resources and note when changes are made and associated impact on the project record register.)

Appendix E Project Record Register

#	Date	Change Description	Reason	Budget Impact	Schedule Impact	Approved by
1	xx/xx/10					

Appendix F Project Change Approval Record (CAR) Log

CAR Log not available at this time.

Appendix G Project Change Request (PCR) History Log

See the link in the project folder:

..\..\PM Budget Forecast\PCRs\PcrLog.xls

Field Code Changed

Appendix H Lessons Learned Document

To be developed as a project closing document.

Appendix I Notification, WBS, Order Numbers

SAP	Number
Notification Number:	10608353
Work Breakdown Structure:	S0766.01.01
Superior Order:	101034171
Pre-con Order:	101034172
Real Estate Internal Order:	153001988
Telecom Internal Order:	N/A