**EXHIBIT NO. \_\_\_(CAK-3C)  
DOCKETS UE-17\_\_\_/UG-17\_\_\_  
2017 PSE GENERAL RATE CASE  
WITNESS:  CATHERINE A. KOCH**

**BEFORE THE**

**WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION**

|  |  |
| --- | --- |
| **WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION,**  **Complainant,**  **v.**  **PUGET SOUND ENERGY,**  **Respondent.** | **Docket UE-17\_\_\_\_ Docket UG-17\_\_\_\_** |

**SECOND EXHIBIT (CONFIDENTIAL) TO THE**

**PREFILED DIRECT TESTIMONY OF**

**CATHERINE A. KOCH**

**ON BEHALF OF PUGET SOUND ENERGY**

**Redacted**

**Version**

**JANUARY 13, 2017**

**PUGET SOUND ENERGY**

**2017 AND 2018 ELECTRIC RELIABILITY PLAN**

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# INTRODUCTION

PSE proposes an Electric Reliability Plan that consists of two targeted areas: 1) accelerating underground cable replacement, and 2) addressing reliability of the Worst Performing Circuits.

The Electric Reliability Plan has two parts: 1) a Master Plan that defines the population and overall plan to address the full population, and 2) a Two-Year Plan that specifically identifies the projects and goals for the upcoming two-year period.

# ACCELERATING UNDERGROUND CABLE REPLACEMENT PLAN

## A. Background

PSE began installing high-molecular-weight (“HMW”) bare concentric neutral direct-bury underground cable just prior to 1965. Approximately 4,800 miles were installed through PSE territory until early 1985. PSE began experiencing failure of this HMW cable just after 20 years of service as the insulation of the direct-bury underground cable installed prior to 1982 became susceptible to the formation of “water trees” allowing ground water to migrate to the conductor and cause faults. Warm weather can increase the probability of failure (such as experienced during the hot summer of 2015).

By 1985 PSE began installing a cable with tree-retardant crosslinked polyethylene (“TRXLPE”), a more robust insulation, and a polyethylene jacket containing the neutral. By 1992 PSE had begun installing the majority of primary cables in conduit, and new non-high-molecular-weight cable which has experienced a longer life (40-60 years).

Since 1990, PSE has replaced or silicone injected approximately 2,500 miles of the failure prone cable and by the end of 2015 approximately 1,800 miles of this HMW direct-bury cable remained to be replaced.[[1]](#footnote-2)

## B. PSE Experience

In 1988, Puget Sound Power & Light studied this further and published the Underground Cable Failure Report which identified the occurrence of increasing failure of HMW insulated cables installed between 1964 and 1988 due to formation of water trees and corroded concentric neutrals. The report estimated that the average age of cables failing was 17 years with failure rates of 25 per 100 miles during the 1980s.

Today PSE experiences about 1,000 underground cable failures per year, of which 95% occur on HMW underground cable. About 450 failures per year are first time failures. The failure rate has increased over time to an average 40 failures per 100 miles depending on the summer’s temperature and amount of precipitation. In 2015, PSE experienced more than 50 failures per 100 miles. Between 2011 and 2013 PSE experienced a 4% failure rate. Between 2013 and 2015 there was an increase in the average failure rate up to 8%.

Underground cable failures result in lengthy outages because repairs require crews to locate the underground fault, dig up the location, and splice the cable or install new conduit. On average an underground cable failure results in a 57% longer outage than overhead equipment failure.

When an underground cable fails, PSE repairs, injects or replaces it based on specific criteria. During the 1990s, PSE began a cable silicone injection program to extend the life of underground cable but over time focused this alternative on only single phase cables due to cost of testing and implementation for three phase cables. Figure 1 below shows failure rate per 100 miles since 1990.

**Figure 1. Cable failures per 100 miles (1990-September 30, 2016)**

In 2016, after experiencing the increasing rate of failure, PSE embarked on accelerating the replacement of underground cable, replacing approximately 125 miles, which is up from 70 miles replaced in 2015.

## C. Industry Experience

The failure rate for these vintages of HMW cable is widely recognized by industry, with utilities across the nation implementing similar cable replacement programs. The cause of failure is generic to all HMW insulated cables as the technology is inferior compared to current cable design and not based on one particular manufacturer. Current industry studies show similar increasing failure rates on a per mile basis.

## D. Prediction of Useful Remaining Life

PSE has been tracking cable failures by type and year to aid in the estimation of remaining useful life. This, with standard industry data and performance, provides a guideline on the useful life of the cable, but there are many variables on an annual basis that impact results, including climate conditions. PSE estimates a conservative linear 4% failure rate recognizing that failure rate is likely not linear as the cable ages as indicated by PSE’s recent experience as noted above. Figure 2 below shows how cable failures will decrease with a proposed 10-year plan. The dotted line is the projected failures as if no acceleration was in place.

After all the HMW underground cable is replaced there will still be some cable failures due to either injected cables that are eventually failing or other types of cable issues.

**Figure 2. Projected cable failure**

## E. Risk

The deferred risk of not accelerating will be continued interruptions due to cable failure, customer dissatisfaction, and emergency expense for repairs. Once a cable fails, PSE has experienced an increase in subsequent failures resulting in continued disruption for customers, complaints and frustration.

## F. Master Plan

The objective of this plan as it relates to the Accelerating Underground Cable Replacement Plan is to more aggressively replace the remaining 1,800 miles of direct-bury distribution cable systems over approximately 10 years, specifically older vintage HMW insulated cables installed prior to 1982. The accelerated replacement plan began in 2016 at about 125 miles and will continue to ramp up to approximately 160-195 cable miles per year to meet this objective. PSE estimates replacement to total approximately $██ million ($██ million over the next five years), which will eliminate approximately 195,000 customer interruptions based on actual historical performance. PSE anticipates that the full benefit of replacement will be greater, as more cable is likely to fail before PSE is able to replace it. This will effectively reduce HMW preventable non-injected cable related outages to 0 over 10 years.

## G. Two-Year Plan

The Two-Year Plan identifies the specific locations and goals of 2017 and 2018 of the Master Plan.

### 1. Identification and Prioritization Criteria

Cable failures are identified on an ongoing basis as they occur through PSE’s asset management system, SAP, and the outage logs listed in the PSE outage management systems. The failures are verified using the GIS mapping system and documented by failure date, location, length and the number of customers connected to that same cable system.

Using this information, PSE will prioritize using a similar approach as today based on number of outages, vintage, neutral corrosion concerns, system configuration, cost, and number of customers. As PSE replaces all previously failed cables and moves to replacing cables prior to failure, PSE will develop a prioritization model that balances cost and risk and begins to analyze the probability for failure based on asset information.

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### 2. 2017 and 2018 Plan

Table 1 shows the planned replacement cable miles and expenditures of underground direct-bury HMW distribution cable from January 1 to December 31 for calendar years 2017 and 2018.

**Table 1. Planned Replacement Miles and Expenditures**

|  |  |  |
| --- | --- | --- |
| **Program Year** | **Planned Replacement Miles** | **Planned Expenditures[[2]](#footnote-3)** |
| 2017 | 134 | $ 39 million |
| 2018 | 134 | $ 42 million |

Appendix A provides a list of the 2017 and 2018 projects that PSE plans to undertake to meet this plan. Adjustments to projects will be made as required while managing to the Master Plan and overall system benefit. Project challenges such as permitting or access rights may hinder some projects from being completed within a scheduled timeframe. These risks will be managed over the Two-Year Plan and, if necessary, some projects will be moved forward to meet the calendar plan metrics. PSE also manages this risk by initiating projects for engineering that may be ready to construct should a scheduled project be affected by one of these circumstances, and not be able to be completed as scheduled in the Two-Year Plan.

## H. Benefits

PSE’s mission is to provide a safe, dependable and reliable system for all our customers. The new cable system is more resilient to deterioration and dig-ins, which improves the reliability for customers, results in fewer long outages and less disruption due to power outages, and enhances public safety. Neighborhoods will not be disrupted by PSE repair crews, and over time PSE will see a reduction in repair costs. Benefits are measured through the industry metrics of SAIFI and SAIDI.

Table 2 quantifies the historical failure impacts from the cables that will be replaced in 2017 and 2018 in terms of customer minute interruptions saved, customer interruptions saved, avoided outages and improvement in SAIDI and SAIFI performance as experienced today. In 2015, cable failures accounted for 12 non-major event SAIDI minutes. PSE estimates that over the next two years, it can reduce its SAIDI minutes by an average of 1.5 minutes per year by accelerating the replacement of the aging underground cable. This analysis is backwards looking only and does not factor in future outages avoided or the potential for greater frequency of outages as cables age. As a result, the benefits of the 2018 work will be higher when evaluated at the end of 2017, as additional outages are likely to occur on the cables planned for 2018 in the meantime.

**Table 2. Eliminated Historical Failure Impacts**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Program Year** | **Customer Minutes Interruptions** | **Customer Interruptions** | **Outages** | **SAIDI** | **SAIFI** |
| 2017 | 2.7 million | 86,000 | 150 | 2.38 | 0.008 |
| 2018 | 0.77million | 22,000 | 156 | 0.70 | 0.002 |

# III. WORST PERFORMING CIRCUIT PLAN

## A. Background

PSE has over 1,100 distribution circuits. For the past decade, PSE has identified its 50 worst performing circuits and developed projects to address the reliability issues on those circuits. The Commission-approved monitoring plan for the Service Quality and Electric Service Reliability Report has traditionally defined a worst performing circuit. As Service Quality Indices changed, this definition was modified. The list from this definition was updated annually based on the previous five years of outage history so there is movement on the list, e.g., some circuits drop off the list as others are added.

Over the past several years, PSE has had a focused effort on the 50 worst performing circuits and has been modestly successful in addressing the reliability on those circuits.

## B. PSE Experience

Historically, PSE has annually identified the 50 worst performing distribution circuits as those that have contributed the most customer minute interruptions to PSE’s “all-in” companywide annual SAIDI performance based on a five-year average ranking. PSE publishes this list in Appendix N of the annual Service Quality and Electric Service Reliability Report and the actions taken on these circuits are identified. Since 2011, 90 circuits have appeared on one or more of the annual lists.[[3]](#footnote-4) PSE has taken action on addressing 66 of these circuits over the past five years, investing $50 million on targeted reliability improvement. PSE recognizes that its current planning process does not favor projects on circuits that have a low or lower number of customers, which tend to be in heavily treed areas. As a result, the distribution circuits serving these customers experience the worst performance each year, and they land on the worst performing circuit list year after year. These circuits are challenged by characteristics such as topology, tree exposure and circuit configuration and as a result 45 circuits have appeared on three or more of the annual lists.

Adding to the historic view, PSE reviewed circuits with high circuit Customer Minute Interruptions (“CMI”), SAIDI[[4]](#footnote-5), and SAIFI since 2013[[5]](#footnote-6) to ensure the view of the worst performing circuits was complete. Additionally in some cases a lateral or part of the circuit is plagued with multiple outages, but this may not be evident in circuit level metrics. Customers Experiencing Multiple Interruptions (“CEMI”) is a measure that will be used to identify pockets of poorest reliability on a worst performing circuit, often times voiced through public comments and complaints. An additional 45 circuits were added to the list of worst performing circuits as a result of this further analysis. This analysis does not include transmission related outages.

## C. Risks

Disruptions to power systems pose more than an inconvenience in today’s technology-driven culture; customers depend on reliable, resilient, safe, and secure power systems to ensure vital necessities, including: operating cellular networks; running fuel pumps; providing business and consumer access to banking systems; maintaining home and business climate control, lighting, and security systems; and in rural areas on wells, providing access to water. Failure to address circuits with poor performance puts populations served by these circuits at a disadvantage. PSE expects reliability trends on these circuits would remain fairly stagnant if historic levels of reliability programs continued. The risk of not pursuing a more aggressive approach is that existing worst performing circuit programs alone will fail to adequately improve system performance enough to make any noticeable change in reliability indices.

## D. Master Plan

Of PSE’s 1,100 circuits, there are 135 circuits that have been identified as worst performing. This mechanism would cover investments made to any of these identified 135 circuits with the intent of improving their reliability by approximately 50% as measured by the metric that resulted in the circuit being on the worst performing circuit list. PSE plans to target about 40 circuits annually as it incrementally works to improve the broader 135 circuits. Appendix C includes a list of these 135 circuits.

The worst performing circuits will change over time as system conditions or configurations change and improvements to circuit reliability are achieved. It is the intent of this program to remain focused on the circuits as identified in Appendix C until reliability improvement is achieved. New poor performing circuits that may be identified will be considered for inclusion in the plan. PSE estimates investment of approximately $██ million from 2017-2021 to address these circuits and anticipates ramping up further over the next 5-10 year timeframe.

## E. Two-Year Plan

The Two-Year Plan identifies the specific locations and goals of 2017 and 2018 of the Master Plan.

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### 1. Identification and Prioritization Criteria

Circuits will be identified based on CMI, circuit SAIDI, circuit SAIFI, and CEMI. CEMI helps to identify pockets of poorest reliability within a worst performing circuit.

Specifically, the highest priority circuits are deemed those with more than 3 million customer minutes of interruption on non-major event days over three years or with more than 750,000 non-major event day customer minutes for at least two out of three years. This criteria tends to favor large circuits over smaller circuits experiencing long outages, so circuits with SAIDI greater than 300 minutes (five hours), circuits with SAIFI of two or more interruptions in two of three years, and circuits with CEMI of six or more interruptions per year for the last three years will be prioritized as well.

### 2. 2017 and 2018 Plan

Table 3 shows the planned number of worst performing circuits and expenditures from January 1 to December 31 for calendar years 2017 and 2018.

**Table 3. Planned Circuits and Expenditures**

|  |  |  |
| --- | --- | --- |
| **Program Year** | **Planned Circuits** | **Planned Capital Expenditures[[6]](#footnote-7)** |
| 2017 | 50 | $37.2 million |
| 2018 | 32 | $39.3 million |

Appendix B provides a list of the 2017 and 2018 projects that PSE plans to undertake to meet this plan. Adjustments to projects will be made as required while managing to the Master Plan and overall system benefit. Project challenges such as permitting and obtaining access rights may hinder some projects from being completed within a scheduled timeframe. These risks will be managed over the Two-Year Plan and, if necessary, some projects will be pulled forward to meet the calendar plan metrics. PSE also manages this risk by initiating projects for engineering that may be ready to construct should a risk occur with another project. A bulk of the projects included in the first Two-Year Plan are focused on those circuits identified as the worst performing circuits in the 2015 Service Quality and Electric Service Reliability Report due to their readiness. Moving forward projects will expand to the broader population and prioritization described.

## F. Benefits

PSE’s mission is to provide a safe, dependable and reliable system for all our customers. Addressing the worst performing circuits improves reliability for impacted customers; it will result in shorter and fewer outages and will improve system measurements of SAIDI, SAIFI, and CEMI. Neighborhoods will experience fewer disruptions by PSE repair crews, and over time PSE will see a reduction in repair costs.

Table 4 quantifies the historical failure impacts in terms of customer minute interruptions, customer interruptions, outages and improvement in SAIDI and SAIFI performance. In 2015, the worst performing circuits accounted for 53 non-major event SAIDI minutes. PSE estimates that over the next two years, addressing these circuits will reduce PSE’s non-major event SAIDI by an average of five minutes per year. The benefits are measured based on historical interruptions and outages as a result of the work that will be completed over the next two years. This analysis does not factor in future outages avoided that would result in higher benefits when evaluated at the end of each year for the next year.

**Table 4. Eliminated Historical Failure Impacts**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Program Year** | **Customer Minute Interruptions** | **Customer Interruptions** | **Outages** | **SAIDI Minutes** | **SAIFI Minutes** |
| 2017 | 6.4 million | 30,000 | 58 | 5.7 | 0.03 |
| 2018 | 5.9 million | 29,000 | 48 | 5.3 | 0.03 |

# RATE IMPACT

A discussion regarding the rate impact of the proposed work will be a normal element of the Electric Reliability Plan. Please refer to the Prefiled Direct Testimony of Katherine J. Barnard, Exhibit No. \_\_\_(KJB-1T), which outlines the calculation in detail. Ms. Barnard’s testimony concludes the rate impact based on the estimated 2017 and 2018 expenditures for replacing HMW cable and addressing the worst performing circuits would result in an average annual increase of ██% in overall customer rates.

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# APPENDIX A: ACCELERATING UNDERGROUND CABLE REPLACEMENT PLAN

Table A-1. 2017 Accelerating Underground Cable Replacement Plan

| **Project** | **City** | **Planned Replacement Footage** |
| --- | --- | --- |
| T Ave | Anacortes | 681 |
| Bowman Bay | Anacortes | 1,792 |
| Skyline | Anacortes | 8,517 |
| Mill Pond Apt NW | Auburn | 6,193 |
| Villa Del Riva | Auburn | 1,155 |
| 151st Pl SE | Auburn | 4,763 |
| 170th Ave SE | Auburn | 632 |
| Riverview Dr NE | Auburn | 5,688 |
| J St SE | Auburn | 2,775 |
| SE 293rd St | Auburn | 3,383 |
| Olympian Apts | Bainbridge Island | 668 |
| Westerly Ln | Bainbridge Island | 1,442 |
| Penny Place | Bainbridge Island | 2,930 |
| Toe Jam Hill Rd, to S Beach Rd | Bainbridge Island | 665 |
| Day Rd West | Bainbridge Island | 3,060 |
| Sunrise | Bainbridge Island | 1,895 |
| NE West Port Madison Rd | Bainbridge Island | 1,329 |
| Manitou | Bainbridge Island | 557 |
| Agate Pt | Bainbridge Island | 1,239 |
| Fletcher Bay Rd | Bainbridge Island | 1,283 |
| Crystal Springs Dr NE | Bainbridge Island | 818 |
| Hansen Rd | Bainbridge Island | 498 |
| Crossroad Apts | Bellevue | 3,482 |
| Colonial Manor | Bellevue | 3,546 |
| Donogh Condo | Bellevue | 2,726 |
| Woodside East | Bellevue | 2,997 |
| Forty one point five | Bellevue | 3,116 |
| Fontanelle Apartments | Bellevue | 2,602 |
| Eastgate Way | Bellevue | 866 |
| Skyridge | Bellevue | 2,315 |
| SE 46th ST | Bellevue | 884 |
| Bel-Red Rd | Bellevue | 2,873 |
| 127th Ave SE | Bellevue | 1,758 |
| SE 12th W Lk Samm | Bellevue | 420 |
| 158th pl NE | Bellevue | - |
| Horizon View | Bellevue | 6,327 |
| SE 51st St | Bellevue | 5,907 |
| 96th Ave SE | Bellevue | 788 |
| Somerset | Bellevue | 1,785 |
| Horizon Heights | Bellevue | 7,379 |
| Knox Ave | Bellingham | 414 |
| Viewcrest Rd | Bellingham | 371 |
| Maplewood | Bellingham | 294 |
| Polo Park Dr | Bellingham | 255 |
| Chuckanut Dr N | Bellingham | 1,931 |
| Douglas Ave | Bellingham | 3,267 |
| Whitecap Rd | Bellingham | 773 |
| Aldewood Ave | Bellingham | 465 |
| 31st ST | Bellingham | 1,199 |
| 21st St | Bellingham | 771 |
| Moore St | Bellingham | 206 |
| Lisa Lane | Bellingham | 999 |
| SE Mountain View Dr | Black Diamond | 2,625 |
| Delta Line Rd | Blaine | 2,493 |
| Haynie Rd | Blaine | 3,649 |
| Entwistle Rd E | Bonney Lake | 981 |
| School St | Bremerton | 2,349 |
| Shearwater Ln | Bremerton | 9,131 |
| Salt Springs | Bremerton | 1,224 |
| Nellita Rd | Bremerton | 1,652 |
| Nellita Rd | Bremerton | 795 |
| Rainier Glen | Buckley | 3,080 |
| Shamrock Ct | Buckley | 1,071 |
| Schuler Ave | Burlington | 2,360 |
| NE 45th | Carnation | 2,156 |
| NE 60th ST & 324th AVE NE | Carnation | 5,835 |
| Lk Langlois RD | Carnation | 4,275 |
| Able Lane | Concrete | 1,338 |
| SR 20 | Coupeville | 561 |
| Madrona Heights | Coupeville | 1,202 |
| Covington Park | Covington | 5,996 |
| Covington Properties | Covington | 4,077 |
| SE 262nd St | Covington | 6,398 |
| Mt. Baker Hwy | Deming | 2,346 |
| Silver Lake Rd | Deming | 2,535 |
| Brandywind Ave | Dupont | 2,950 |
| NE 161st | Duvall | 4,454 |
| Odell Rd | Duvall | 3,095 |
| Stampede Pass Rd | Easton | 6,135 |
| West Easton | Easton | 7,330 |
| Stampede Pass Rd | Easton | 825 |
| Cooper Pass Rd | Easton | 4,050 |
| 47th St Ct E | Edgewood | 363 |
| Umptanum Rd | Ellensburg | 1,227 |
| Williams Lake Rd | Everson | 2,163 |
| Teamousey Ln | Everson | 498 |
| Hannegan Rd | Everson | 893 |
| Mosquito Lake Rd | Everson | 3,678 |
| Rutsatz Rd | Everson | 2,856 |
| Hannegan Rd | Everson | 278 |
| Michael Rd | Everson | 2,270 |
| SE 46TH ST | Fall City | 7,815 |
| 274TH AVE SE | Fall City | 3,985 |
| Lookout Rd | Fall City | 7,838 |
| Westfair | Federal Way | 1,057 |
| S 320TH ST | Federal Way | 1,611 |
| SW Cemetary Dr | Federal Way | 975 |
| Oak Hill Blvd | Federal Way | 9,325 |
| S 320TH ST | Federal Way | 7,600 |
| S 314th St | Federal Way | 803 |
| S 320TH ST | Federal Way | 4,440 |
| SW 317th St | Federal Way | 4,272 |
| Wood Trails Village | Federal Way | 6,222 |
| SW 320th St | Federal Way | 150 |
| Hawthorne | Ferndale | 552 |
| W Smith Rd | Ferndale | 612 |
| Freeland Ave | Freeland | 731 |
| Sealawn | Freeland | 1,913 |
| 283rd ST | Graham | 1,641 |
| Orville Rd | Graham | 351 |
| Smugglers Cove Rd | Greenbank | 2,331 |
| Day Rd | Greenbank | 1,352 |
| Greenbank Dr | Greenbank | 1,049 |
| 11906 176th Ave SE | Issaquah | 2,547 |
| SE 146th | Issaquah | 1,275 |
| Riperian Apts | Issaquah | 503 |
| Sycamore Dr | Issaquah | 6,296 |
| Burnett Ave N | Issaquah | 6,760 |
| MacDonald Heights | Kenmore | 1,530 |
| 85 PL NE | Kenmore | 305 |
| Jaunita Drive | Kenmore | 333 |
| Inglewood NE Rd | Kenmore | 1,733 |
| NE 190th NE | Kenmore | 1,050 |
| 73rd Ave NE | Kenmore | 1,230 |
| Inglewood Village | Kenmore | 2,536 |
| North Lake Heights | Kenmore | 2,378 |
| Rainier View | Kent | 3,349 |
| Villa Trailor Park | Kent | 4,494 |
| Mcnalley Addition | Kent | 2,052 |
| Williams Condo | Kent | 329 |
| 108TH AVE SE | Kent | 1,176 |
| SE 268TH ST | Kent | 515 |
| 144th Ave SE | Kent | 2,468 |
| N 6th Ave S | Kent | 1,412 |
| Crystal Glen | Kent | 1,670 |
| Kingston Hts | Kingston | 3,408 |
| Juanita Estates | Kirkland | 2,253 |
| 4th Pl NE | Kirkland | 786 |
| 7th Ave S | Kirkland | 308 |
| 128th Ave NE | Kirkland | 1,733 |
| Kittitas Hwy | Kittitas | 3,615 |
| Nisqually Vista | Lacey | 1,125 |
| Carpenter | Lacey | 234 |
| Arrowhead | Lakewood | 3,782 |
| Far West | Lakewood | 1,080 |
| Veterans Dr | Lakewood | 309 |
| Holden | Lakewood | 183 |
| Murdock Rd | Langley | 4,793 |
| Roseberry St | Langley | 768 |
| Highview | Langley | 1,532 |
| Forest Ct | Lynden | 770 |
| Haveman Rd | Lynden | 876 |
| Cedar Shadows | Maple Valley | 5,462 |
| SE 208TH ST | Maple Valley | 2,541 |
| SE 262nd St | Maple Valley | 1,955 |
| SE 238th St | Maple Valley | 2,348 |
| SE 216th St | Maple Valley | 900 |
| SE 208th St | Maple Valley | 1,443 |
| SE 40th | Mercer Island | 245 |
| Eastbay | Mercer Island | 843 |
| Cherokee Lane | Mt Vernon | 1,709 |
| Old Hwy 99 | Mt Vernon | 893 |
| 25th St | Mt Vernon | 2,982 |
| Bulson Rd | Mt Vernon | 278 |
| Little Mt Road | Mt Vernon | 810 |
| Catalina | Oak Harbor | 495 |
| Lanyard Loop | Oak Harbor | 936 |
| Goldie Rd | Oak Harbor | 1,617 |
| Mt. Baker Circle | Oak Harbor | 3,125 |
| Glencoe St | Oak Harbor | 1,046 |
| Pioneer Way | Oak Harbor | 180 |
| NW Jib St | Oak Harbor | 257 |
| Surfcrest Beach | Oak Harbor | 7,542 |
| Oyster Bay Rd | Olympia | 3,534 |
| Sunwood Lakes | Olympia | 4,412 |
| Sunwood Lk | Olympia | 4,499 |
| Evergreen Pk | Olympia | 1,107 |
| Sunwood Lakes | Olympia | 4,263 |
| Seashore Villa | Olympia | 3,338 |
| Riverlea | Olympia | 6,896 |
| Fern Gully | Olympia | 2,402 |
| Conifer Village | Olympia | 1,724 |
| Rainbow Point | Olympia | 1,551 |
| Biscay Villa | Olympia | 1,692 |
| Maple Valley | Olympia | 5,004 |
| Muirhead Ave NW | Olympia | 63 |
| 42nd CT | Olympia | 749 |
| 79th Ave SE | Olympia | 3,087 |
| Cedar Flats Rd SW | Olympia | 680 |
| Tri-Way | Olympia | 359 |
| Sunrise Bch Rd | Olympia | 756 |
| Champion Dr SW | Olympia | 672 |
| Old Steamboat Isl Rd | Olympia | 396 |
| Miller Av | Olympia | 282 |
| Mason Way | Olympia | 2,270 |
| Susan Ct | Olympia | 2,183 |
| 211th St | Orting | 8,923 |
| Villa Carmel | Port Orchard | 6,014 |
| Overra Rd | Port Orchard | 5,658 |
| Hadfield | Port Orchard | 1,398 |
| Tall Firs Ln | Port Orchard | 2,438 |
| Salmonberry | Port Orchard | 1,470 |
| Jackson Ave | Port Orchard | 1,971 |
| SW Christmas Tree Ln | Port Orchard | 2,367 |
| SE Vanskiver Rd | Port Orchard | 480 |
| View Park Rd-- Beach | Port Orchard | 1,605 |
| Eastway Dr | Port Orchard | 1,502 |
| Old Wye Lake | Port Orchard | 423 |
| Kings End | Port Orchard | 650 |
| SE Willock Rd | Port Orchard | 909 |
| Wicks Lake Rd SW | Port Orchard | 570 |
| Hadfield Rd SE | Port Orchard | 372 |
| 11th Ave | Poulsbo | 479 |
| off Pugh Rd NE | Poulsbo | 1,154 |
| Mesford Rd | Poulsbo | 368 |
| SR 104 Pt Gamble | Poulsbo | 530 |
| Vista Key | Poulsbo | 203 |
| Lincoln Rd NE | Poulsbo | 450 |
| Lofall Rd | Poulsbo | 645 |
| Tahoma Vista Ests | Puyallup | 4,712 |
| Manorwood | Puyallup | 8,966 |
| Springfield | Puyallup | 2,331 |
| 74th Ave | Puyallup | 5,454 |
| 56th Ave Ct E | Puyallup | 5,683 |
| 154th St E | Puyallup | 4,649 |
| Bath Rd | Puyallup | 2,933 |
| Springfield | Puyallup | 3,969 |
| 11th Ave E and 126th St Ct E | Puyallup | 884 |
| 103rd Ave Ct E | Puyallup | 1,151 |
| 95th Ave | Puyallup | 1,103 |
| 23rd & Shaw | Puyallup | 851 |
| Meridian Rd | Puyallup | 345 |
| Vail Cut Off Rd SE | Rainier | 2,736 |
| 163RD AVE SE | Rainier | 3,765 |
| 220th Ave NE | Redmond | 546 |
| 224th Ave NE | Redmond | 770 |
| NE 58th St | Redmond | 3,728 |
| Bel-Red Rd | Redmond | 4,820 |
| Western View Estate | Redondo | 4,139 |
| S 272nd St | Redondo | 2,856 |
| S Either Rd | Renton | 5,635 |
| Fairwood Bluff Apt | Renton | 2,688 |
| W Spring Lake Dr SE | Renton | 839 |
| Weikswood | Rochester | 1,460 |
| Lenets Trlr Pk | Rochester | 1,974 |
| Crescent Park | Rochester | 1,716 |
| 176th Ave SW | Rochester | 1,383 |
| S 167th St & 51st Ave S | SeaTac | 813 |
| Wicker Rd | Sedro Woolley | 3,216 |
| Cedar Lane Mobile | Sedro Woolley | 3,398 |
| Orth Way | Sedro Woolley | 1,581 |
| Dana Dr | Sedro Woolley | 1,774 |
| Clearidge and Loretta Hts | Silverdale | 22,859 |
| Avante Dr | Silverdale | 4,175 |
| W M Rd NW | Silverdale | 3,537 |
| Warren Rd NW | Silverdale | 1,943 |
| Dickey Rd | Silverdale | 348 |
| Stavis Bay | Silverdale | 504 |
| NW Pioneer Rd | Silverdale | 201 |
| 63rd ST CT | Sumner | 1,596 |
| McElfresh | Tenino | 3,608 |
| Oakview Dr | Tenino | 1,064 |
| Fox Run | Tracyton | 756 |
| 29th Ave | Tumwater | 2,450 |
| Villa Granada | Tumwater | 4,573 |
| Tumwater Blvd SW | Tumwater | 1,221 |
| Delphi Rd | Tumwater | 252 |
| Sherman Valley Rd | Tumwater | 6,278 |
| Waddle Creek Rd | Tumwater | 1,185 |
| 76th Ave SW | Tumwater | 1,158 |
| Squire Estates | Tumwater | 2,018 |
| Vashon wy SW | Vashon | 3,075 |
| SW Bank Rd | Vashon | 857 |
| 111th and 220th | Vashon | 3,210 |
| Vashon Hwy SW | Vashon | 1,268 |
| SW 267th Ln | Vashon | 1,965 |
| Bayview Rd | Vashon | 1,064 |
| Westside Hwy | Vashon | 1,446 |
| Orchard Beach | Vashon | 381 |
| Vashon Hwy SW | Vashon | 848 |
| 107th Ave SW | Vashon | 915 |
| SW 232nd st | Vashon | 750 |
| Westside Hwy SW | Vashon | 1,904 |
| SW 240th St | Vashon | 983 |
| SW 112th St | Vashon | 1,895 |
| Portage-Dockton Rd | Vashon | 902 |
| 144th Ave NE | Woodinville | 692 |
| Brookside Acres | Woodinville | 6,135 |
| NE 202nd St | Woodinville | 1,701 |
| NE 137th St | Woodinville | 1,047 |
| NE 154th St | Woodinville | 2,115 |
| NE 159th St | Woodinville | 1,800 |
| 230th Ave NE | Woodinville | 450 |
| 232nd Ave NE | Woodinville | 1,200 |
| Reintree | Woodinville | 5,272 |
| Lake Tuck | Woodinville | 5,850 |
| North Glen | Woodinville | 7,203 |
| 22nd Ave S | Yelm | 569 |
| 368th St S | Yelm | 3,990 |
| 46th Ave | Yelm | 2,780 |
|  |  | **708,903 ft.** |

Table A-2. 2018 Accelerating Underground Cable Replacement Plan

| **Project Name** | **City** | **Planned Replacement Footage** |
| --- | --- | --- |
| Campbell Lake Rd | Anacortes | 780 | |
| Haddon Lane | Anacortes | 836 | |
| Skyline | Anacortes | 2,559 | |
| Birch Way | Anacortes | 246 | |
| Channel View Ln | Anacortes | 893 | |
| 132rd Ave SE | Auburn | 1,350 | |
| SE 364th St | Auburn | 2,309 | |
| Auburn-Enumclaw Hwy | Auburn | 885 | |
| Lk Holm Rd | Auburn | 2,685 | |
| 132nd Ave SE | Auburn | 540 | |
| SE Lake Holm Rd | Auburn | 833 | |
| Old Creosote Hill Rd | Bainbridge Island | 6,450 | |
| Wing Point North | Bainbridge Island | 3,855 | |
| Old Mill Rd | Bainbridge Island | 1,106 | |
| 94th Ave NE | Bellevue | 306 | |
| Brentwood Lane | Bellevue | 1,245 | |
| Crossroads Village Apt | Bellevue | 2,994 | |
| Lincoln Place | Bellevue | 3,005 | |
| NE 28th St | Bellevue | 602 | |
| NE 50th ST | Bellevue | 450 | |
| SE 24th ST | Bellevue | 1,077 | |
| 140th Ave NE | Bellevue | 560 | |
| 140th Ave NE | Bellevue | 722 | |
| Innis Glen Apts | Bellevue | 3,619 | |
| 124th Ave NE | Bellevue | 1,613 | |
| Midlakes Center | Bellevue | 480 | |
| 32nd St | Bellingham | 567 | |
| Kline Rd | Bellingham | 2,346 | |
| Mill wheel | Bellingham | 5,265 | |
| Old Samish Way | Bellingham | 1,253 | |
| W Smith Rd | Bellingham | 774 | |
| 32nd St | Bellingham | 512 | |
| Chuckanut Dr | Bellingham | 894 | |
| Forest View Dr | Bellingham | 879 | |
| Giarde Ln | Bellingham | 3,573 | |
| Guide Meridian | Bellingham | 1,769 | |
| Husky Dr | Bellingham | 1,709 | |
| Lake Whatcom Blvd | Bellingham | 1,646 | |
| Wahl Rd | Bellingham | 273 | |
| Yew St | Bellingham | 1,032 | |
| 206th Ave SE | Black Diamond | 1,644 | |
| Copeland | Black Diamond | 2,723 | |
| Blaine Rd | Blaine | 858 | |
| Birch Bay Lynden Rd | Blaine | 638 | |
| Brown Rd | Blaine | 501 | |
| Sweet Rd | Blaine | 1,893 | |
| Valley View Rd | Blaine | 435 | |
| Birch Bay Rd | Blaine | 3,008 | |
| 226th Ave E | Bonney Lake | 4,403 | |
| View Reyal Estates | Bonney Lake | 1,778 | |
| 207th AVE E | Bonney Lake | 3,960 | |
| SR 410 E | Bonney Lake | 840 | |
| High Cedars Ranch | Bonney Lake | 4,830 | |
| 103rd Ave NE | Bothell | 372 | |
| Norway Vista | Bothell | 4,568 | |
| 133rd Ct NE | Bothell | 630 | |
| Stafford | Bothell | 1,331 | |
| Meadowood | Bremerton | 4,715 | |
| Westmont Ln | Bremerton | 2,475 | |
| Varsity Ln | Bremerton | 2,987 | |
| 274th Ave E | Buckley | 2,103 | |
| Ambaum Blvd S | Burien | 864 | |
| SW 16th St | Burien | 1,757 | |
| Fernhaven | Burlington | 8,018 | |
| Old Hwy 99 | Burlington | 368 | |
| Peterson Rd | Burlington | 4,850 | |
| Alger Cain Lake Rd | Burlington | 1,998 | |
| Darrk Lane | Burlington | 303 | |
| Ida Dr | Burlington | 4,391 | |
| Lake Samish Dr | Burlington | 576 | |
| Prairie Lane | Burlington | 306 | |
| Shallow Shores Rd | Burlington | 461 | |
| 325th Ave NE | Carnation | 900 | |
| 1910 346th AVE | Carnation | 1,620 | |
| Lk Langlois Rd Ne | Carnation | 1,079 | |
| Lk Langlios Rd | Carnation | 1,118 | |
| John MacDonald Park | Carnation | 1,076 | |
| Upper Baker Dam | Concrete | 347 | |
| Hazzle CT | Coupeville | 3,512 | |
| Turkey hill | Coupeville | 1,656 | |
| Ft Ebey Rd | Coupeville | 765 | |
| Kennedy Lagoon Ct | Coupeville | 1,502 | |
| N Main St | Coupeville | 344 | |
| Monterey Dr | Coupeville | 945 | |
| Parker Rd | Coupeville | 345 | |
| Cathedral Drive | Coupeville | 3,272 | |
| Leisure St | Coupeville | 2,192 | |
| Summit Loop | Coupeville | 804 | |
| Forest Crest Estates | Covington | 450 | |
| Winter Woods Estate | Covington | 630 | |
| Silver Lake Rd | Deming | 924 | |
| Silver Lake Rd | Deming | 462 | |
| James Rd | Deming | 566 | |
| Mt Baker Hwy | Deming | 3,408 | |
| Marine View Dr SW | Des Moines | 758 | |
| 320th Ave NE | Duvall | 3,968 | |
| Radar Lake | Duvall | 2,175 | |
| 312th Ave NE | Duvall | 525 | |
| 320th Ave NE | Duvall | 1,485 | |
| NE 193rd St | Duvall | 1,440 | |
| 342nd Ave NE | Duvall | 1,262 | |
| Mountainview Rd | Duvall | 617 | |
| Batten Rd | Duvall | 975 | |
| Radar Lake | Ellensburg | 4,500 | |
| Crystal Mountain Condo | Enumclaw | 5,070 | |
| 191st Ave SE | Enumclaw | 900 | |
| 236th Ave SE | Enumclaw | 6,023 | |
| 208th Ave SE | Enumclaw | 2,190 | |
| Green Valley Rd | Enumclaw | 3,011 | |
| Forward Thurst Pool | Enumclaw | 1,244 | |
| SE 400th St | Enumclaw | 618 | |
| SE 380th St | Enumclaw | 2,003 | |
| SE 384th St | Enumclaw | 749 | |
| 336th Pl SE | Enumclaw | 2,537 | |
| 218th Ave SE | Enumclaw | 2,496 | |
| Western | Enumclaw | 1,590 | |
| 400th St SE | Enumclaw | 654 | |
| 312th Ave SE | Enumclaw | 342 | |
| SE 358th St | Enumclaw | 13,880 | |
| 257th Pl SE | Enumclaw | 1,278 | |
| Auburn-Enumclaw Hwy | Enumclaw | 1,271 | |
| Everson Goshen Rd | Everson | 1,764 | |
| Old Guide Rd | Everson | 1,350 | |
| Ten Mile Rd | Everson | 608 | |
| Ten mile Rd | Everson | 1,617 | |
| Bartlette Lane | Everson | 1,647 | |
| Beard Rd | Everson | 747 | |
| Noon Rd | Everson | 2,610 | |
| Pole Rd | Everson | 945 | |
| Roeder Lane | Everson | 2,348 | |
| Van Dyk Rd | Everson | 941 | |
| Rutsatz | Everson | 2,084 | |
| David Powell Rd | Fall City | 2,175 | |
| SE Red Fall City Way | Fall City | 543 | |
| SE 94th ST | Fall City | 1,200 | |
| 404th Ave SE | Fall City | 750 | |
| Weathervane | Fall City | 1,139 | |
| SE Issaquah Rd | Fall City | 867 | |
| 21ST Ave SW | Federal Way | 143 | |
| 289 PL & 13 PLS | Federal Way | 4,101 | |
| Haxton Way | Ferndale | 1,205 | |
| Lake Terrel Rd | Ferndale | 3,000 | |
| Mountain View Rd | Ferndale | 699 | |
| Norway Rd | Ferndale | 402 | |
| Serene Pl | Ferndale | 1,469 | |
| Trigg Rd | Ferndale | 668 | |
| Unick Rd | Ferndale | 872 | |
| Woodland Rd | Ferndale | 1,082 | |
| Enterprise Rd | Ferndale | 1,658 | |
| Lancaster Rd | Freeland | 1,805 | |
| Discovery Pl | Freeland | 3,165 | |
| Dolphin Dr | Freeland | 1,139 | |
| 110th Ave E | Graham | 1,500 | |
| 248th St Ct | Graham | 1,275 | |
| 288th St E | Graham | 969 | |
| 150th Ave E | Graham | 1,043 | |
| 260th St E | Graham | 3,743 | |
| Rehberg Rd | Greenbank | 645 | |
| Renton-Issaquah Rd | Issaquah | 2,775 | |
| SE 156th St | Issaquah | 1,095 | |
| 164th AVE SE | Issaquah | 300 | |
| 239th Ave SE | Issaquah | 2,985 | |
| 255th Ave SE | Issaquah | 755 | |
| SE 188TH ST | Issaquah | 1,575 | |
| SE 188th St | Issaquah | 591 | |
| Renton-Maple Valley Hwy | Issaquah | 797 | |
| Sycamore Dr | Issaquah | 7,505 | |
| 244th Ave | Issaquah | 840 | |
| Issaquah-Hobart Rd | Issaquah | 582 | |
| Tiger Moutain Way | Issaquah | 779 | |
| 84th Ave NE | Kenmore | 773 | |
| 62nd Ave NE | Kenmore | 1,110 | |
| 85th Ave NE | Kenmore | 483 | |
| 72nd Ave NE | Kenmore | 915 | |
| Auburn-Black Diamond Rd | Kent | 600 | |
| 156th Ave SE | Kent | 2,778 | |
| SE 330th St | Kent | 5,378 | |
| S 228th St | Kent | 627 | |
| SE 240th St | Kent | 663 | |
| Redwood Hill | Kent | 458 | |
| 94th Ave S | Kent | 1,313 | |
| 160th Ave SE | Kent | 2,630 | |
| S 261st St | Kent | 411 | |
| W Valley Hwy | Kent | 300 | |
| S 218th St | Kent | 2,033 | |
| Contemporary Structures | Kent | 1,758 | |
| Hancock | Kent | 644 | |
| Pactrust | Kent | 5,093 | |
| S 216th St | Kent | 458 | |
| Taree Blvd | Kingston | 2,363 | |
| 108th Ave NE | Kirkland | 300 | |
| Northpark | Kirkland | 498 | |
| NE 124th St | Kirkland | 1,628 | |
| 106th Ave NE | Kirkland | 2,867 | |
| Northpark | Kirkland | 536 | |
| Exit 110 and Rd 6 | Kittitas | 2,700 | |
| Denmark Rd | Kittitas | 590 | |
| Meridian Rd | Lacey | 780 | |
| Puget Beach Rd NE | Lacey | 1,893 | |
| 20th Ave | Lacey | 1,515 | |
| Ardenwood | Lakewood | 638 | |
| Bond Duplex | Lakewood | 212 | |
| Gravelly Lk | Lakewood | 1,439 | |
| Crawford Rd | Langley | 5,530 | |
| Ewing Rd | Langley | 797 | |
| Frog Water Rd | Langley | 4,404 | |
| Hwy 525 | Langley | 1,656 | |
| Olympic Marine View | Langley | 2,205 | |
| Deer Lake Road | Langley | 1,857 | |
| Kineth Point Pl | Langley | 3,635 | |
| Scatchet Head Dr | Langley | 518 | |
| Shokowakan Dr | Langley | 2,280 | |
| Wilkenson Rd | Langley | 1,001 | |
| Fiske Rd | Langley | 2,730 | |
| Axling Rd | Lynden | 1,454 | |
| Bradley Meadows | Lynden | 1,174 | |
| Birch Bay Lynden Rd | Lynden | 825 | |
| Birch Bay Lynden Rd | Lynden | 620 | |
| Bob Hall Rd | Lynden | 1,919 | |
| Bob Hall Rd | Lynden | 1,659 | |
| Lavender Lane | Lynden | 453 | |
| Loomis Trail Rd | Lynden | 671 | |
| Park Place | Lynden | 495 | |
| Loomis Trail Rd | Lynden | 672 | |
| SE 247th ST | Maple Valley | 732 | |
| 210th Ave SE | Maple Valley | 2,021 | |
| SE 200th St | Maple Valley | 542 | |
| SE 208th St | Maple Valley | 2,010 | |
| Canda | Maple Valley | 915 | |
| Cheryl Lee Heights | Maple Valley | 3,435 | |
| Dorre Don W | Maple Valley | 150 | |
| Tourangeau | Maple Valley | 897 | |
| Clydemoor & Woodside | Medina | 4,630 | |
| E Mercer Highlands | Mercer Island | 2,415 | |
| Eastbay | Mercer Island | 1,076 | |
| Ridgecrest Ln | Mercer Island | 462 | |
| Chuckanut Dr | Mt Vernon | 764 | |
| Doe Lane | Mt Vernon | 1,112 | |
| Doe Lane | Mt Vernon | 2,151 | |
| Burkland Rd | Mt Vernon | 300 | |
| Discovery Dr | Mt Vernon | 2,252 | |
| Old Day Creek Rd | Mt Vernon | 2,654 | |
| Bulson Rd | Mt Vernon | 651 | |
| Little Mt Rd | Mt Vernon | 810 | |
| Otter Pond | Mt Vernon | 366 | |
| Snee Oosh Rd | Mt Vernon | 1,118 | |
| SE 141st St | North Bend | 2,180 | |
| Balda Rd | Oak Harbor | 1,248 | |
| Ireland St | Oak Harbor | 554 | |
| Brideck Ln | Oak Harbor | 1,758 | |
| Cerullo Dr | Oak Harbor | 651 | |
| Cornet Bay Rd | Oak Harbor | 888 | |
| Goose Lane | Oak Harbor | 1,580 | |
| Hunt Rd | Oak Harbor | 725 | |
| Kettle St | Oak Harbor | 341 | |
| Monroe Landing | Oak Harbor | 399 | |
| Nubian Way | Oak Harbor | 581 | |
| Ponderosa Dr | Oak Harbor | 2,933 | |
| Rifle Rd | Oak Harbor | 3,879 | |
| Slater Rd | Oak Harbor | 788 | |
| Swantown Rd | Oak Harbor | 774 | |
| Thunder Lane | Oak Harbor | 1,151 | |
| W 3rd Ave | Oak Harbor | 405 | |
| W Beach Rd | Oak Harbor | 389 | |
| Wieldraayer Rd | Oak Harbor | 209 | |
| Windshake Ln | Oak Harbor | 390 | |
| Zylstra Rd | Oak Harbor | 2,769 | |
| Heller Rd | Oak Harbor | 1,814 | |
| Polnell Shores | Oak Harbor | 5,594 | |
| Shadowbrook Ln | Oak Harbor | 920 | |
| Boulder Ln | Olympia | 953 | |
| Cuyamaca Village | Olympia | 4,043 | |
| Forest Shores Dr | Olympia | 7,230 | |
| Hawks Prairie Rd NE | Olympia | 330 | |
| Lemon Rd | Olympia | 723 | |
| Sunset Dr | Olympia | 2,636 | |
| 48th Way | Olympia | 398 | |
| 95th LN SE | Olympia | 2,078 | |
| Ashram Ln NW | Olympia | 1,659 | |
| Boston Harbor | Olympia | 1,029 | |
| Cedar Flats Rd SW | Olympia | 1,463 | |
| Crestline Blvd NW | Olympia | 1,079 | |
| Drewry Rd | Olympia | 1,283 | |
| Englewood Dr SE | Olympia | 321 | |
| Fox Hall | Olympia | 1,985 | |
| Gull Harbor | Olympia | 1,712 | |
| Home Rd | Olympia | 2,087 | |
| Johnson Pt | Olympia | 236 | |
| Johnson Pt Rd | Olympia | 494 | |
| Lorraine Dr | Olympia | 897 | |
| Old Tilley Rd | Olympia | 2,163 | |
| 73rd Ave SE | Olympia | 525 | |
| Sleater Kinney | Olympia | 1,700 | |
| South Bay Road NE | Olympia | 605 | |
| Sunset Dr NW | Olympia | 608 | |
| Tilley Rd | Olympia | 903 | |
| 36th Ave | Olympia | 900 | |
| Landau Ave | Olympia | 2,679 | |
| Summit Lake | Olympia | 252 | |
| 221st St E | Orting | 1,910 | |
| 230th St E | Orting | 1,575 | |
| 154th Ave | Orting | 747 | |
| Clifton Rd | Port Orchard | 612 | |
| Sedgwick Rd | Port Orchard | 1,350 | |
| SW Pine Rd | Port Orchard | 473 | |
| Long Lake Rd SE | Port Orchard | 1,110 | |
| Blake Island State Park | Port Orchard | 2,520 | |
| Bothwell St | Port Orchard | 563 | |
| S Pine Rd | Port Orchard | 1,020 | |
| Mile Hill Dr | Port Orchard | 2,978 | |
| SW Spruce Rd | Port Orchard | 1,148 | |
| Vandecar Rd | Port Orchard | 2,354 | |
| Gatewood Manor | Port Orchard | 890 | |
| Gold Mountain | Port Orchard | 6,071 | |
| Central Valley Rd | Poulsbo | 1,227 | |
| Hansville rd | Poulsbo | 1,275 | |
| Brownsville | Poulsbo | 1,452 | |
| Emerald Ln | Poulsbo | 1,253 | |
| NE Highland Blvd | Poulsbo | 345 | |
| James Way | Poulsbo | 1,620 | |
| Front St NE | Poulsbo | 335 | |
| Lindvog Rd | Poulsbo | 1,425 | |
| SR 3 & Scenic | Poulsbo | 344 | |
| South Keyport Rd | Poulsbo | 783 | |
| 31st St E | Puyallup | 1,920 | |
| Canyoncrest East | Puyallup | 1,519 | |
| Heritage Glen | Puyallup | 4,663 | |
| 113th Ave Ct E | Puyallup | 453 | |
| 80th Ave | Puyallup | 533 | |
| 9th Ave | Puyallup | 834 | |
| Cameron Add | Puyallup | 1,946 | |
| 110th Ave E | Puyallup | 1,703 | |
| 26th Ave Ct SW | Puyallup | 1,457 | |
| 19th Ave SE | Puyallup | 623 | |
| Clarks Creek | Puyallup | 4,704 | |
| Sundridge | Puyallup | 9,098 | |
| Horizon Pioneer | Rainier | 1,209 | |
| Jade St | Rainier | 252 | |
| Moses Rd | Rainier | 1,244 | |
| Reichel Rd | Rainier | 374 | |
| Waddle Rd | Rainier | 1,043 | |
| Reichel Rd SE | Rainier | 4,539 | |
| 228th Ave NE | Redmond | 750 | |
| Bellewood | Redmond | 2,925 | |
| 224th Ave NE | Redmond | 885 | |
| NE 80th and 169th AVE | Redmond | 1,898 | |
| 173rd Ave NE | Redmond | 359 | |
| NE 107th Pl | Redmond | 401 | |
| Redondo Beach Dr S | Redondo | 1,106 | |
| SE 213th St | Renton | 6,765 | |
| Sunset Boulevard | Renton | 215 | |
| SE 128th St | Renton | 429 | |
| Dale Shows Tracts | Renton | 1,671 | |
| SE 192nd St | Renton | 1,610 | |
| SE Petrovitsky Rd | Renton | 1,704 | |
| SW 16th St | Renton | 180 | |
| Sunset Hwy | Renton | 3,638 | |
| Monteray Ave | Renton | 1,473 | |
| Mountain View Ave | Renton | 768 | |
| 185th Ave SW | Rochester | 1,260 | |
| Hwy 12 SW | Rochester | 825 | |
| James Rd | Rochester | 756 | |
| Jordan St SW | Rochester | 1,022 | |
| Old 99 | Rochester | 1,020 | |
| Independence | Rochester | 3,080 | |
| 228th Ave NE | Sammamish | 3,878 | |
| SE 4th ST | Sammamish | 794 | |
| NE 11th | Sammamish | 488 | |
| NE 25th | Sammamish | 903 | |
| NE Red Facll City Rd | Sammamish | 1,302 | |
| 243rd Ave NE | Sammamish | 2,522 | |
| NE 14th St W | Sammamish | 4,035 | |
| NE 6th Pl | Sammamish | 2,745 | |
| S 212th St | SeaTac | 400 | |
| S 200th St | SeaTac | 1,622 | |
| Internatioanl Blvd | SeaTac | 848 | |
| SR 20 | Sedro Woolley | 1,232 | |
| Hoehn Rd | Sedro Woolley | 1,700 | |
| Nature View Rd | Sedro Woolley | 2,289 | |
| Owens Lane | Sedro-Woolley | 1,277 | |
| S Skagit Hwy | Sedro-Woolley | 293 | |
| Walberg Rd | Sedro-Woolley | 203 | |
| Dawn Park Estates | Silverdale | 2,895 | |
| Clear Crk | Silverdale | 492 | |
| Nuthatch | Silverdale | 573 | |
| NE 197th Pl | Skykomish | 707 | |
| Little Creek Rd | South Cle Elum | 4,416 | |
| South Pass Rd | Sumas | 1,098 | |
| 23rd St SE | Sumner | 465 | |
| 159th Ave | Sumner | 956 | |
| 185th Ave SE | Tenino | 2,348 | |
| Bucoda Hwy SE | Tenino | 1,620 | |
| 142nd Ave SW | Tenino | 474 | |
| Bronson St SE | Tenino | 3,795 | |
| Coal Rd SE | Tenino | 1,361 | |
| Northcraft Dr SE | Tenino | 450 | |
| Old Hwy 99 | Tenino | 224 | |
| Tilley Rd SW | Tenino | 633 | |
| Cedar Hills | Tracyton | 1,088 | |
| Meadow Ln | Tracyton | 986 | |
| Creekwood Dr SE | Tumwater | 870 | |
| Littlerock Rd SW | Tumwater | 567 | |
| Raintree | Tumwater | 2,664 | |
| 107th Ave SW | Vashon | 1,035 | |
| 131 Ave SW | Vashon | 1,050 | |
| 99th Ave SW | Vashon | 1,500 | |
| 99th Ave SW | Vashon | 675 | |
| 91st Ave SW | Vashon | 263 | |
| 87th Ave SW | Vashon | 1,554 | |
| 238th Ave E | Wilkeson | 758 | |
| Carbo-S. Prairie Rd | Wilkeson | 1,688 | |
| 184th Ave NE | Woodinville | 807 | |
| Wood Red Rd | Woodinville | 600 | |
| NE 152nd St | Woodinville | 893 | |
| Brookside Acres | Woodinville | 6,713 | |
| 161st Ave NE | Woodinville | 1,845 | |
| 156th PL NE | Woodinville | 1,125 | |
| 199th Ave NE | Woodinville | 1,010 | |
| Carriage Estates Highlands | Woodinville | 1,103 | |
| Few Firs | Woodinville | 674 | |
| Gold Creek Heights | Woodinville | 1,568 | |
| NE 202nd Pl | Woodinville | 1,091 | |
| NE 185th St | Woodinville | 875 | |
| 148th Ave NE | Woodinville | 3,456 | |
| 74th Ave S | Yelm | 4,665 | |
| Bald Hills Rd | Yelm | 2,925 | |
| Smith Prairie Rd SE | Yelm | 1,206 | |
| Harris Rd | Yelm | 2,234 | |
| 63rd Ave S | Yelm | 1,613 | |
| Allen Rd | Yelm | 405 | |
| 382nd St S | Yelm | 1,760 | |
| Harts Lake Loop Rd S | Yelm | 2,175 | |
| Harts Lake Rd S | Yelm | 857 | |
| Locke Dr | Yelm | 1,575 | |
| McKenna Rd | Yelm | 338 | |
| Rathburn Rd | Yelm | 527 | |
|  |  | **705,255 ft.** |

# APPENDIX B: WORST PERFORMING CIRCUITS PLAN

Table B-1. 2017 Worst Performing Circuit Plan

| **Project Description** | **City** | **Planned Circuit Work** |
| --- | --- | --- |
| Airport-23 | Maytown | Tree Wire |
| Airport-23 | Olympia | Tree Wire |
| Alger-12 | Burlington | Upgrade Overhead System |
| Alger-12 | Burlington | Upgrade Overhead System |
| Alger-12 | Burlington | New Underground Feeder |
| Alger-15 | Sedro Woolley | Improve Overhead Reliability and Underground Conversion |
| Big Rock-15 | Mount Vernon | Tree Wire |
| Big Rock-15 | Mount Vernon | New Underground Feeder and Upgrade Overhead System |
| Big Rock-15 | Mount Vernon | Tree Wire |
| Birch Bay-15 | Bellingham | Upgrade Overhead System |
| Black Diamond-13 | Black Diamond | Tree Wire |
| Blaine-13 | Blaine | Tree Wire |
| Blumaer-16 | Tenino | Tree Wire |
| Central Kitsap-14 | Silverdale | Tree Wire |
| Chico-12 | Silverdale | Improve Underground Reliability |
| Cottage Brook-13 | Woodinville | Tree Wire |
| Duvall-16 (feeder tie to Duvall-15) | Duvall | Upgrade Underground System |
| Easton-13 | Easton | Tree Wire |
| Eld Inlet-25 | Olympia | Tree Wire |
| Eld Inlet-27 | Olympia | Tree Wire |
| Eld Inlet-27 | Olympia | Tree Wire |
| Fernwood-16 | Port Orchard | Tree Wire |
| Fragaria-12 | Olalla | Overhead System Rebuild |
| Fragaria-15 | Port Orchard | Tree Wire |
| Fragaria-16 | Olalla | Tree Wire |
| Gravelly Lake-15 | Lakewood | Tree Wire |
| Greenbank-13 | Greenbank | Tree Wire |
| Griffin-13 | Olympia | Tree Wire |
| Griffin-13 | Olympia | Distribution Automation |
| Happy Valley-16 | Bellingham | Underground Conversion |
| Hickox-16 | Mount Vernon | Distribution Automation |
| Hobart-15 | Hobart | Replace old vintage conductor |
| Hobart-15 | Ravensdale | Distribution Automation |
| Inglewood-13 | Bothell | Distribution Automation |
| Inglewood-13 | Bothell | Distribution Automation |
| Kenmore-23 | Kenmore | Tree Wire |
| Kenmore-26 | Kenmore | Tree Wire |
| Kingston-24 | Hansville | Overhead System Rebuild |
| Kingston-24 | Hansville | Overhead System Rebuild |
| Lake Louise-17 | Bellingham | Underground System Rebuild |
| Longmire-17 | Yelm | Tree Wire |
| Longmire-17 | Yelm | Tree Wire |
| Longmire-25 | Roy | Overhead System Rebuild |
| Longmire-25 | Roy | Tree Wire |
| Marine View-13 | Auburn | Distribution Automation |
| Mottman-14 | Olympia | Tree Wire |
| Mottman-14 | Olympia | Tree Wire |
| Pickering-21 | Issaquah | Tree Wire |
| Pickering-21 | Issaquah | Improve Underground Reliability and Tree Wire |
| Point Roberts-14 | Point Roberts | Tree Wire and Upgrade Underground System |
| Port Madison-12 | Bainbridge Island | Overhead System Rebuild |
| Poulsbo-15 | Poulsbo | Overhead System Rebuild |
| Prine-13 | Olympia | Distribution Automation |
| Prine-13 | Tumwater | Tree Wire |
| Sherwood-18 | Auburn | Replace old vintage conductor |
| Silverdale-13 | Silverdale | Tree Wire |
| Silverdale-15 | Seabeck | Overhead System Rebuild |
| Silverdale-15 | Seabeck | Tree Wire and Underground System Rebuild |
| Silverdale-15 | Seabeck | Tree Wire |
| Silverdale-15 | Seabeck | Tree Wire |
| Silverdale-15 | Silverdale | Upgrade Overhead System |
| Silverdale-16 | Silverdale | Tree Wire |
| Sinclair Inlet-25 | Port Orchard | Overhead System Rebuild |
| Sinclair Inlet-25 | Port Orchard | Overhead System Rebuild |
| Snoqualmie-13 | Snoqualmie | Tree Wire |
| Soos Creek-25 | Auburn | Tree Wire |
| Soos Creek-25 | Auburn | Distribution Automation |
| Vashon Substation getaways | Vashon Island | Underground Conversion |
| Vashon-12 | Vashon Island | Overhead System Rebuild |
| Vashon-12 | Vashon Island | Distribution Automation |
| Vashon-13 | Vashon Island | Tree Wire |
| Vashon-23 | Vashon Island | Tree Wire |
| Vashon-23 | Vashon Island | Tree Wire |
| **Total Number of Projects** |  | **73** |
| **Total Number of Circuits** |  | **50** |

Table B-2. 2018 Worst Performing Circuit Improvement Plan

| **Project Name** | **Planned Circuit Work** |
| --- | --- |
| Airport-23 and Blumaer-13, Olympia | New Overhead Feeder |
| Airport-23, Olympia | Improve Underground Reliability |
| Baker River Sw-24, Rockport | Underground System Rebuild |
| Big Rock-15, Mount Vernon | Overhead System Rebuild |
| Blaine-13, Blaine | Tree Wire |
| Brooks Hill-15, Langley | Improve Overhead Reliability and New Overhead Feeder |
| Eld Inlet-27, Olympia | Tree Wire |
| Fernwood-17, Port Orchard | Tree Wire and Upgrade Underground System |
| Fragaria-13, Port Orchard | Tree Wire |
| Fragaria-13, Port Orchard | Tree Wire |
| Friendly Grove-24, Olympia | Tree Wire |
| Greenwater-13, Enumclaw | Tree Wire |
| Hamilton-15, Concrete | Improve Overhead Reliability |
| Hobart-15, Maple Valley | Tree Wire |
| Hobart-15, Ravensdale | Tree Wire |
| Kendall-12, Kendall | Tree Wire |
| Kingston-24, Hansville | Tree Wire |
| Kingston-24, Kingston | Overhead System Rebuild |
| Knoble-11, Bonney Lake | Tree Wire |
| Long Lake-21, Port Orchard | Overhead System Rebuild |
| Maxwelton-11 (feeder tie to Langley-16), Langley | New Overhead Feeder |
| McAllister Springs-15, Lacey | Tree Wire |
| Miller Bay-22, Kingston | Overhead System Rebuild |
| Norlum-15, Sedro Woolley | Overhead System Rebuild |
| Orting-22, Graham | Tree Wire |
| Orting-26 (formerly Orting-22), Graham | Tree Wire |
| Port Gamble-12, Poulsbo | Tree Wire |
| Port Gamble-12, Poulsbo | Overhead System Rebuild |
| Rainier View-13, Rainer | Tree Wire |
| Serwold-13, Poulsbo | Tree Wire |
| Serwold-13, Poulsbo | Overhead System Rebuild |
| Silverdale-13, Silverdale | Tree Wire |
| Silverdale-16, Silverdale | Tree Wire |
| Summit Park-21, Anacortes | Overhead System Rebuild |
| Vashon-12, Vashon Island | Tree Wire |
| Vashon-12, Vashon Island | Overhead System Rebuild |
| Vashon-12, Vashon Island | Tree Wire |
| Vashon-13, Vashon Island | Overhead System Rebuild |
| Vashon-13, Vashon Island | Overhead System Rebuild |
| Wilson-16, Bow | Improve Underground Reliability |
| Winslow-13, Bainbridge Island | Overhead System Rebuild |
| Woburn-23, Bellingham | Distribution Automation |
| **Total Number of Projects** | **42** |
| **Total Number of Circuits** | **32** |

# APPENDIX C: ELECTRIC RELIABILITY PLAN WORST PERFORMING CIRCUITS

| **[[7]](#footnote-8)Electric Reliability Plan Worst Performing Circuits[1]** | | |
| --- | --- | --- |
| 1 | Airport-23 | |
| 2 | Alger-12 | |
| 3 | Alger-15 | |
| 4 | Avondale-15 | |
| 5 | Baker River Sw-24 | |
| 6 | Belmore-26 | |
| 7 | Big Rock-15 | |
| 8 | Birch Bay-15 | |
| 9 | Black Diamond-13 | |
| 10 | Blaine-12 | |
| 11 | Blaine-13 | |
| 12 | Blumaer-16 | |
| 13 | Blumaer-17 | |
| 14 | Burrows Bay-13 | |
| 15 | Central Kitsap-14 | |
| 16 | Chambers-13 | |
| 17 | Chambers-15 | |
| 18 | Chico-12 | |
| 19 | Christensens Corner-22 | |
| 20 | Christensens Corner-23 | |
| 21 | Christopher-22 | |
| 22 | Cle Elum-11 | |
| 23 | Cottage Brook-13 | |
| 24 | Cottage Brook-15 | |
| 25 | Dieringer-15 | |
| 26 | Duvall-12 | |
| 27 | Duvall-15 | |
| 28 | Easton-13 | |
| 29 | Eld Inlet-25 | |
| 30 | Eld Inlet-27 | |
| 31 | Evergreen-13 | |
| 32 | Fall City-15 | |
| 33 | Fernwood-16 | |
| 34 | Fernwood-17 | |
| 35 | Four Corners-14 | |
| 36 | Fragaria-12 | |
| 37 | Fragaria-13 | |
| 38 | Fragaria-15 | |
| 39 | Fragaria-16 | |
| 40 | Freeland-12 | |
| 41 | Freeland-13 | |
| 42 | Freeland-15 | |
| 43 | Friendly Grove-24 | |
| 44 | Gardella-16 | |
| 45 | Goodes Corner-15 | |
| 46 | Gravelly Lake-15 | |
| 47 | Greenbank-13 | |
| 48 | Greenwater-13 | |
| 49 | Greenwater-16 | |
| 50 | Griffin-13 | |
| 51 | Griffin-16 | |
| 52 | Hamilton-15 | |
| 53 | Happy Valley-16 | |
| 54 | Hickox-16 | |
| 55 | Hobart-15 | |
| 56 | Hobart-16 | |
| 57 | Hyak-13 | |
| 58 | Inglewood-13 | |
| 59 | Inglewood-15 | |
| 60 | Kendall-12 | |
| 61 | Kenmore-23 | |
| 62 | Kenmore-26 | |
| 63 | Kingston-24 | |
| 64 | Knoble-11 | |
| 65 | Lake Leota-13 | |
| 66 | Lake Louise-17 | |
| 67 | Lake Meridian-15 | |
| 68 | Lake Tapps-17 | |
| 69 | Lake Tapps-18 | |
| 70 | Lake Wilderness-14 | |
| 71 | Langley-12 | |
| 72 | Langley-15 | |
| 73 | Langley-16 | |
| 74 | Lea Hill-17 | |
| 75 | Long Lake-21 | |
| 76 | Long Lake-23 | |
| 77 | Longmire-17 | |
| 78 | Longmire-25 | |
| 79 | Luhr Beach-14 | |
| 80 | Manchester-15 | |
| 81 | Marine View-13 | |
| 82 | Marine View-17 | |
| 83 | McAllister Springs-15 | |
| 84 | Mckinley-17 | |
| 85 | Miller Bay-17 | |
| 86 | Miller Bay-22 | |
| 87 | Miller Bay-23 | |
| 88 | Mottman-14 | |
| 89 | Norlum-15 | |
| 90 | Nugents Corner-26 | |
| 91 | Orchard-13 | |
| 92 | Orting-22 | |
| 93 | Patterson-15 | |
| 94 | Pickering-21 | |
| 95 | Point Roberts-14 | |
| 96 | Point Roberts-16 | |
| 97 | Port Gamble-12 | |
| 98 | Port Gamble-13 | |
| 99 | Port Gamble-16 | |
| 100 | Port Madison-12 | |
| 101 | Poulsbo-13 | |
| 102 | Poulsbo-15 | |
| 103 | Prine-13 | |
| 104 | Rainier View-13 | |
| 105 | Semiahmoo-13 | |
| 106 | Sequoia-16 | |
| 107 | Serwold-13 | |
| 108 | Sheridan-16 | |
| 109 | Sherwood-18 | |
| 110 | Silverdale-13 | |
| 111 | Silverdale-15 | |
| 112 | Silverdale-16 | |
| 113 | Sinclair Inlet-25 | |
| 114 | Skykomish-23 | |
| 115 | Skykomish-25 | |
| 116 | Slater-16 | |
| 117 | Snoqualmie-13 | |
| 118 | Snoqualmie-17 | |
| 119 | Soos Creek-25 | |
| 120 | South Keyport-22 | |
| 121 | South Mercer-12 | |
| 122 | Southwick-15 | |
| 123 | Summit Park-21 | |
| 124 | Tolt-15 | |
| 125 | Vashon-12 | |
| 126 | Vashon-13 | |
| 127 | Vashon-23 | |
| 128 | Wayne-15 | |
| 129 | West Olympia-23 | |
| 130 | Wilson-16 | |
| 131 | Winslow-12 | |
| 132 | Winslow-13 | |
| 133 | Winslow-15 | |
| 134 | Woburn-23 | |
| 135 | Yelm-27 | |
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|  | |  |
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# APPENDIX D: ABBREVIATIONS AND ACRONYMS

CEMI Customers Experiencing Multiple Interruptions

CMI Customer Minutes of Interruption

HMW High Molecular Weight

OMS Outage Management System

PSE Puget Sound Energy

SAIDI System Average Interruption Duration Index

SAIFI System Average Interruption Frequency Index

TRXLPE Tree-Retardant Crosslinked Polyethylene

1. There is approximately 500 miles additional of HMW cable in conduit. [↑](#footnote-ref-2)
2. Planned expenditures do not include AFUDC. [↑](#footnote-ref-3)
3. The circuit count does not include a Jefferson County circuit. [↑](#footnote-ref-4)
4. SAIDI is calculated using the SQI No. 3 calculation agreed to by the parties and approved by the Commission in 2016 in Docket UE-072300, Order 29. [↑](#footnote-ref-5)
5. SAIFI is calculated using performance after 2013, when PSE implemented its outage management system (“OMS”). [↑](#footnote-ref-6)
6. Planned expenditures do not include AFUDC. [↑](#footnote-ref-7)
7. [1] Does not include a Jefferson County circuit that appeared on the 2011 Worst Performing Circuit List [↑](#footnote-ref-8)