

## PROJECT NARRATIVE

### An Avista Project

|                                |  |
|--------------------------------|--|
| Project Title                  | Westside 230 kV Substation Expansion   |
| Applicant                      | Avista Corporation<br>PO Box 3727 MSC -24<br>Spokane, WA 99220-3727<br>Michelle Anderson 509-495-2559<br>Aaron Henson 509-495-4550   |
| Project Location               | 7901 N Nine Mile Road<br>Spokane, WA 99026<br><br>Lat: 47.727981 N, Long: -117.504109 W, Elev: 1675 ft   |
| Legal Description              | NW/4, NE/4 Sec 28, T26N, R42E WM   |
| Parcel Number(s)               | 26281.0024   |
| Zone                           | Residential Single Family  |
| Land Use Plan                  | Conservation Open Space  |
| Comprehensive Plan Designation | Residential Single Family  |
| Site Size                      | 30.49 acres  |
| Flood Zone                     | None   |
| Proposal                       | This is project consists of the expansion of the existing electrical substation. The existing substation was built in 1971 and the equipment upgrades needed to meet reliability standards and capacity will require the footprint to be enlarged. The project is expected to take 6 years and interruption of service to electrical customers is not anticipated. |

## **SITE DESCRIPTION**

The existing substation site is located approximately 1.5 miles north of West Francis Avenue on highway 291 (North Nine Mile Road). The station is located about 1000 feet off of the highway and is out of view for most of the public. The site consists of one landlocked parcel that is 30.49 acres in size. Avista owns a second ¼-acre parcel that is 50 feet wide located at the northeast corner of the larger parcel and it provides access to the property from North Nine Mile Road. This is a private access road that is gated and services the Avista facilities.

The existing electrical substation was built in 1971 and has a 450' x 485' fenced yard located in the center of the property approximately 250 feet from the nearest residential property. Additionally, Avista has a natural gas substation at this site. The gas substation was built in 2009 and occupies ½-acre in the northwest corner of the property.

In 1986, the City of Spokane annexed the property and at that time it was zoned Residential Single Family (RSF). The adjacent property on the west and south sides is owned by Washington State Department of Parks and Recreation. The property to the north is owned by 7 Mile LLC and multiple single family residences are located on the east side of the parcel.

## **PURPOSE**

Avista is taking steps to reinforce the backbone of the electrical system in the Spokane area. The expansion of the Westside substation is a part of Avista effort to increase reliability of electrical service and to plan for future growth in the Spokane area. In order to keep this station in service while these upgrades are being made the existing footprint must be increased to work around the energized equipment. This is done to minimize the impact of the project, in the form of outages, to our electric customers. The final expanded substation will not generate more trips or traffic than the existing station.

## **FACILITY DESCRIPTION**

The expanded substation yard will consist of 565' x 630' fenced yard located in the center of the property. The yard will be expanded 70 feet to the north and south and 115 feet to the west. There will be no expansion of the yard toward the residential development east of the property. The new security fence will be a 9-foot high, anti-cut/anti-climb steel fence to prevent unauthorized access. The fence serves to protect the equipment inside the yard from vandalism and acts of terrorism as well as to protect public at large from the danger of electrocution. The gates to the yard are posted with the

Department access. Automatic alarming between the substation and Avista's Central Operating Facility will alert Avista in the event of such an emergency. Should Fire Department personnel arrive on scene first, they should wait for Avista personnel to secure the site prior to entry into any substation.

### CRITERIA AND STANDARDS

The following sections of the Spokane Municipal Code (SMP) apply to this application.

Table 17C.110-1 of the Spokane Municipal Code indicates that Utility use is an *Allowed* land use within the Residential Single Family Zone.

Section 17D.010 of the SMP requires the project to identify the impacts on the following services:

| <b>Service</b>          | <b>Impact</b>                                    |
|-------------------------|--|
| Transportation          | No additional impacts –<br>See statement below   |
| Public Water            | None – Facility does not<br>use public water     |
| Fire Protection         | No additional impacts                            |
| Police Protection       | No additional impacts                            |
| Parks & Recreation      | None   |
| Library                 | None   |
| Solid Waste & Recycling | None – Facility does not<br>generate solid waste |
| Schools                 | None   |
| Wastewater              | None – Facility does not<br>generate wastewater  |
| Public Utilities        | See Statement below                              |

#### Public Utilities:

The Westside 230 kV substation has provides an essential public service to the western Spokane area for the past 45 years. The substation expansion is needed for the purpose of improving the aging network infrastructure and adding capacity to service customer driven growth and demand. The existing equipment at the Westside 230 kV Substation does not meet the load demand or the reliability requirements needed for this region. In addition, newer equipment will provide more reliable service to residents and businesses in the area effectively reducing the impact of system outages.

The existing substation yard does not provide enough room for the installation of the new equipment while maintaining service therefore, the foot print of the station must be expanded. This will also allow for construction and change over to the new equipment without interruption of service. It will also take advantage of the existing transmission lines and prevent the need for relocating those lines to a new site. The expanded

name and address of the substation along with the emergency phone number. The perimeter of the fence is posted with signage that warns of the high voltage danger.

Main access to the yard will be via the existing 20-foot wide approach off of North Nine Mile Road and along Avista's private access road to the substation. Improvements to the existing approach are planned and Avista is working with Washington State Department of Transportation to develop an approved approach design.

The two existing transformers will be replaced with two new transformers of larger capacity. The transformers will be placed on an elevated concrete foundation and integrated secondary oil containment structures. The number of Circuit Breakers and Switches in the yard will be increased to provide redundancy in the system and increased capacity. All equipment and control cabinets are supported on steel stands that keep them elevated off the ground.

All supporting steel rests on foundations that have been designed for local wind, seismic loads in accordance with the National Electric Safety Code (NESC) which governs the design of high voltage utility facilities.

The existing transmission lines will enter the property as they do now but some will need to be moved within the property boundary to make room for the expanded footprint. No additional lines or easements are anticipated.

Avista will use current best management practices to control soil erosion during construction. The existing site is level and does not have existing drainage issues. The post construction site will be covered with pervious surfacing (gravel) and native grasses in order to keep storm water on site. As much of the native vegetation as possible will be kept as a part of the landscaping plan and the final runoff characteristics of the site will be similar to existing condition.

This is an unmanned, unoccupied facility; no sewer or water service is required for the operation of the facility. No septic system will be located on site.

#### Fire Department Lock Boxes

The gates into the substation yard will be secured with chains and locks keyed to Avista's standards. Avista respectfully requests a waiver from any requirement for Fire Department lock boxes. Avista's operations are governed by the National Electrical Safety Code (NESC). NESC Rule 110A1 state that areas containing energized electrical equipment must be kept locked in order to limit access by unauthorized personnel, of which Fire Department employees must be considered because they do not have the proper training to work around high voltage equipment.

If Fire Department access is required during an emergency, the inherent safety risks posed in any substation require qualified Avista personnel to be on-site prior to Fire

substation yard has been sized to fit within the boundaries of the parcel and meet all of the required setbacks.

From Table 17C.110-3 Development Standards

| Requirement          |          | Proposed  |
|----------------------|----------|---|
| Minimum Lot Size:    | 4,350 sf | 30.5 acres  |
| Max Building Height: | 35 feet  | Building height: 16 feet  |
| Setbacks:            |          | Setback requirements comply with the zoning ordinance:                                  |
| Front                | 20 feet  | Fence is located 250 feet from nearest residence and 90 feet from nearest property line |
| Side                 | 5 feet   |   |
| Street side Lot Line | 20 feet  |   |

### EXISTING WORK

Avista Corporation, formerly doing business as Washington Water Power, purchased the original 30.5 acre parcel in 1970. Since that time Avista has operated the existing electrical and gas substation and have taken care to ensure that the property has remained free of noxious weeds and trash from illegal dumping.

A pre-application conference with the City of Spokane Planning Department occurred on January 24, 2016 to discuss the plan for the substation. No issues of concern were identified beyond the expected considerations of compliance with the City's Comprehensive Plan.

A community meeting was held on April 19<sup>th</sup>, 2016 to present the project to the neighboring residents.

### IMPACT STATEMENTS

#### Traffic

During the initial construction phase which is expected to last approximately four months there will be periodic times of increased traffic at the site. This will consist of the mobilization and de-mobilization of the grading equipment, delivery vehicles and concrete trucks. Delivery of materials to the site will be several times during the week and will occur during normal working hours.

After the initial construction phase, traffic will be significantly reduced and consist of work crews (one to two trucks) entering and leaving the site periodically throughout the workday.

Once the station is operational, normal traffic to the site will be reduced to a single maintenance vehicle visiting the site on a monthly basis.

#### Noise and Lighting

During the initial construction phase it can be expected that there will be an increase in noise to a level consistent with a typical construction site. The increase in noise levels will occur during normal working hours.

An energized substation typically generates a low frequency noise that can be heard outside of the yard. This noise primarily originates from the transformer, but depending on weather conditions, may also be heard from the insulators supporting the rigid bus. Avista performs noise surveys of substations and has found that the average noise level is 45 dBA at the yard fence with a maximum noise levels not exceeding 55 dBA at the yard fence. The State of Washington's maximum permissible environmental noise levels (WAC 173-60-040) for residential zoned areas (EDNA class A to Class A for any time of day) is 55 dBA for noise level originating from a public facility. Based on our previous test levels and the State requirements, there are no plans for noise mitigation. See Table 1: Sound Levels, for a comparison of common noise levels.

The substation is equipped with yard lighting that is turned on only during times of emergency repairs.

The substation yard is covered in 4 to 6-inches of uncompacted crushed rock. There is approximately 1% impervious surface area in the yard.

#### Environmental

The Avista owned access road that leads to the site will be treated to control dust. Water trucks will be on site to comply with clean air requirements during the earthwork/grading operations.

The two 250 MVA transformers that will be used at this location contain approximately 11,000 gallons of non-PCB dielectric insulating oil (mineral oil, see attached Material Safety Data Sheet) used to regulate the temperature of each transformer. The transformers sit on a foundation that acts as secondary oil containment. In addition, the transformer is equipped with a continuous electronic monitoring system that will signal Avista's 24-hour manned Central Operations Center should there be a problem that could cause a significant leak. If that occurs, the Transformer can be taken off-line and crews dispatched to assess the problem. The response time for crews during such an event is less than two hours after a problem is identified.

A 125 volt DC battery bank consisting of 37 nickel-cadmium cells (see attached Material Safety Data Sheet) will be located inside the concrete panel house. The battery bank will provide backup power for substation monitoring equipment and remote control in the event of an AC station service failure. Approximately 0.48 gallons of liquid electrolyte

will be in each cell, for a total of 17.8 gallons. The electrolyte is composed of a mixture of Potassium Hydroxide and Lithium Hydroxide. Containment for the battery bank will be sufficient to hold more than 120% of the total electrolyte, should an unlikely spill occur.

A spill kit is located within substation yard near the panel house. Kits contain powder absorbent, pads, and other clean-up materials for containment of small to medium sized spills. The kits are inspected monthly to ensure they are properly stocked and in working order.

Avista has an annual weed prevention and control plan that is enforced at all of its substations. Weed control is undertaken in the late spring and early summer months. The access roads, gravel surfaced areas and the substation yard are sprayed by licensed applicators. In addition to the graveled areas, exposed cuts and other areas outside the fence that are designated as "Native Vegetation" will be included in the weed management plan to control the weeds identified as "noxious".

#### EMF

Low levels of electric and magnetic fields (EMF) are associated with all electric equipment whether they be utility equipment and lines or household appliances, lighting, heating and cooling equipment, etc. The EMF field strength produced by the equipment in a substation diminishes rapidly as the distance from the equipment increases. Outside the security fence, it can be expected that EMF levels will not be more than the existing the naturally occurring, or background level EMF. At this time, low levels of EMF are not considered dangerous, and the studies linking health risks to EMF are inconclusive.

### **TENTATIVE WORK SCHEDULE**

The following is an approximate time line for completion of milestones for this project. Dates are subject to change and are dependent on permitting, equipment lead times and scheduling with other projects.

| <u>Task</u>             | <u>Target Date</u>    |
|-------------------------|-----------------------|
| Site Grading            | July – September 2016 |
| Install Security Fence  | September 2016        |
| Begin Electrical Work   | Spring 2017           |
| Complete Work/ Energize | Fall 2018             |

### **CONCLUSION**

The foregoing narrative and accompanying documents and plans, together demonstrate that the plans for an Electrical Substation generally conform to applicable criteria and standards of the City's Code. Therefore, the applicant requests that the Planning Commission approve the application.



| Relative Sound Levels  |                    |                         |
|--|--------------------|-------------------------|
| Examples   | Sound Level<br>dBA | Comment                 |
| Jet aircraft @ 160-ft distance   | 140                |                         |
| Loud Hand Clap @ 3-ft  | 130                | Threshold of pain       |
| Referee's Whistle @ 3-ft   | 120                | Threshold of discomfort |
| Police Siren @ 30-ft   | 110                | 16x as loud as 70dB     |
| Chainsaw @ 3-ft distance   | 100                | 8x as loud as 70dB      |
| Gas Lawn Mower   | 90                 | 4x as loud as 70dB      |
| Diesel Truck @ 100-ft  | 85                 |                         |
| Garbage Disposal<br>Noisy urban daytime sound                              | 80                 | 2x as loud as 70dB      |
| Hair Dryer   | 70                 | Arbitrary Base Line     |
| Electric Typewriter  | 65                 |                         |
| Conversation in a Restaurant<br>AC unit @ 100-ft                           | 60                 | Half as loud as 70 dB   |
| <b>Maximum Substation Noise Level at<br/>Security Fence</b>                | <b>55</b>          |                         |
| Conversational speech,<br>Commercial Area                                  | 50                 | 1/4 as loud as 70 dB    |
| <b>Typical Transformer Noise Level at<br/>Security Fence</b><br>Bird Calls | <b>45</b>          |                         |
| Quite urban daytime sound  | 40                 | 1/8 as loud as 70 dB    |
| Quite urban night sound  | 35                 |                         |
| Library  | 30                 | 1/16 as loud as 70 dB   |
| Quite rural night sound  | 25                 |                         |
| Sound of Breathing @ 3-feet distance                                       | 10                 | Barely Audible          |

Table 1: Relative Sound Levels



Conditional Use Permit Narrative  
Avista's Westside 230 kV Substation  
May, 2016

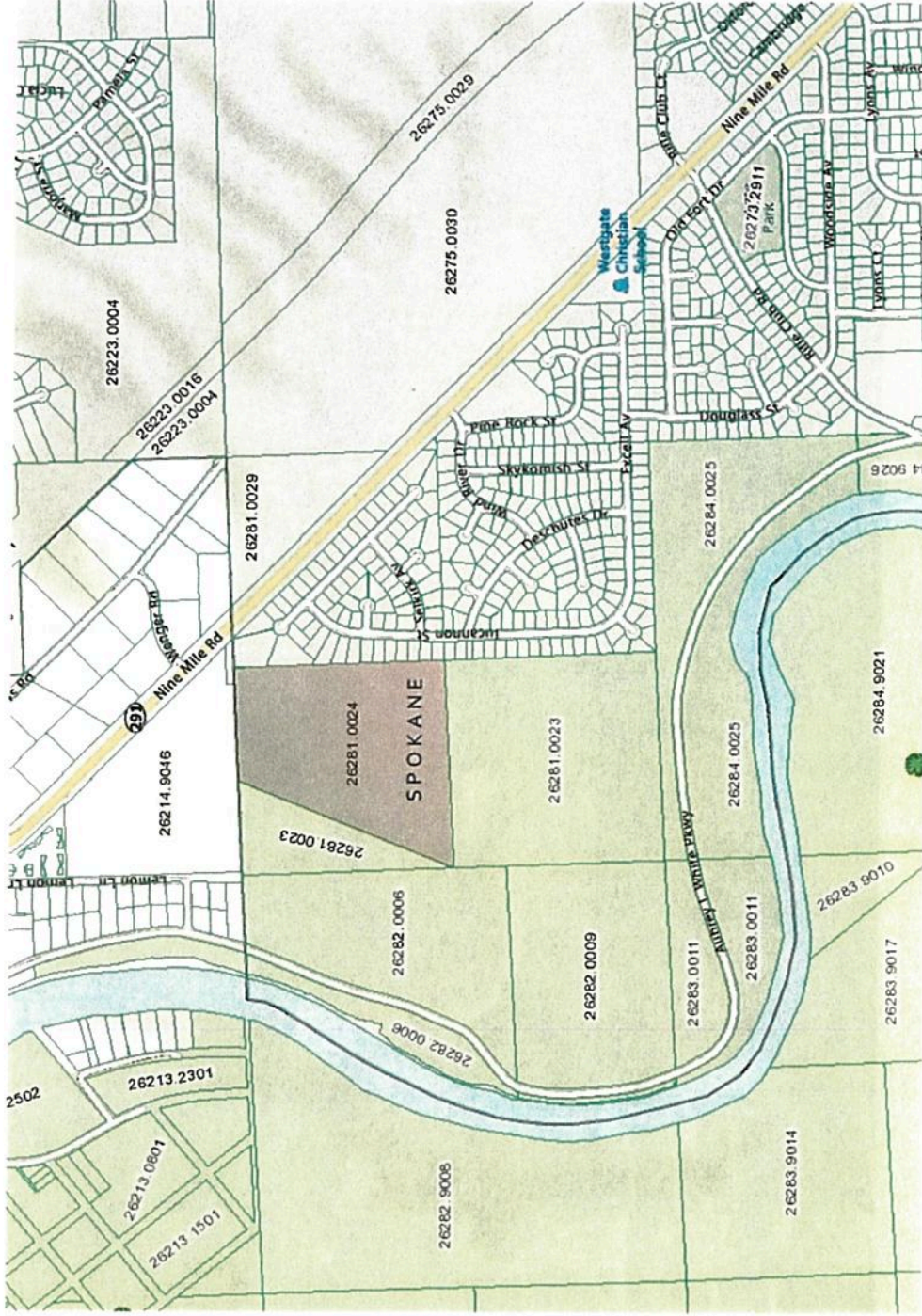


Figure 1: Site Location of the Westside 230 kV Substation