# GOLDENDALE ENERGY STORAGE HYDROELECTRIC PROJECT

**Federal Energy Regulatory Commission Project No. 14861**

**Klickitat County, Washington**

# FINAL LICENSE APPLICATION
# Appendix J: Aesthetic Resources Study Report

**For:**

FFP Project 101, LLC

**June 2020**

# TABLE OF CONTENTS

## List of Figures



## List of Tables



## List of Attachments

## Acronyms and Abbreviations

| | |
|---|---|
| 3D | three-dimensional |
| Applicant | FFP Project 101, LLC |
| BLM | Bureau of Land Management |
| BPA | Bonneville Power Administration |
| CGA | Columbia Gorge Aluminum |
| CRGNSA | Columbia River Gorge National Scenic Area |
| DLA | Draft License Application |
| DNR | Washington Department of Natural Resources |
| DTM | Digital Terrain Model |
| EOZ | Energy Overlay Zone |
| ERM | Environmental Resources Management |
| FOV | field of view |
| GIS | geographic information system |
| GPS | Geographic Positioning System |
| KOP | key observation point |
| LED | light emitting diode |
| Project | Goldendale Energy Storage Project No. 14861 |
| USFS | United States Department of Agriculture Forest Service |
| VRM | Visual Resource Management |
| WSDOT | Washington State Department of Transportation |

# 1.0 INTRODUCTION

An Aesthetic Resources Study was completed to inventory and document baseline visual resource conditions associated with the proposed Goldendale Energy Storage Project (Project). The study was designed to evaluate the potential effects to visual resources in the areas with possible views of the Project infrastructure that may result from the construction and operation of the Project. The impacts described are preliminary and are based on the data, engineering design information, and Project information currently available. Recommendations are presented to help reduce visual resource impacts.

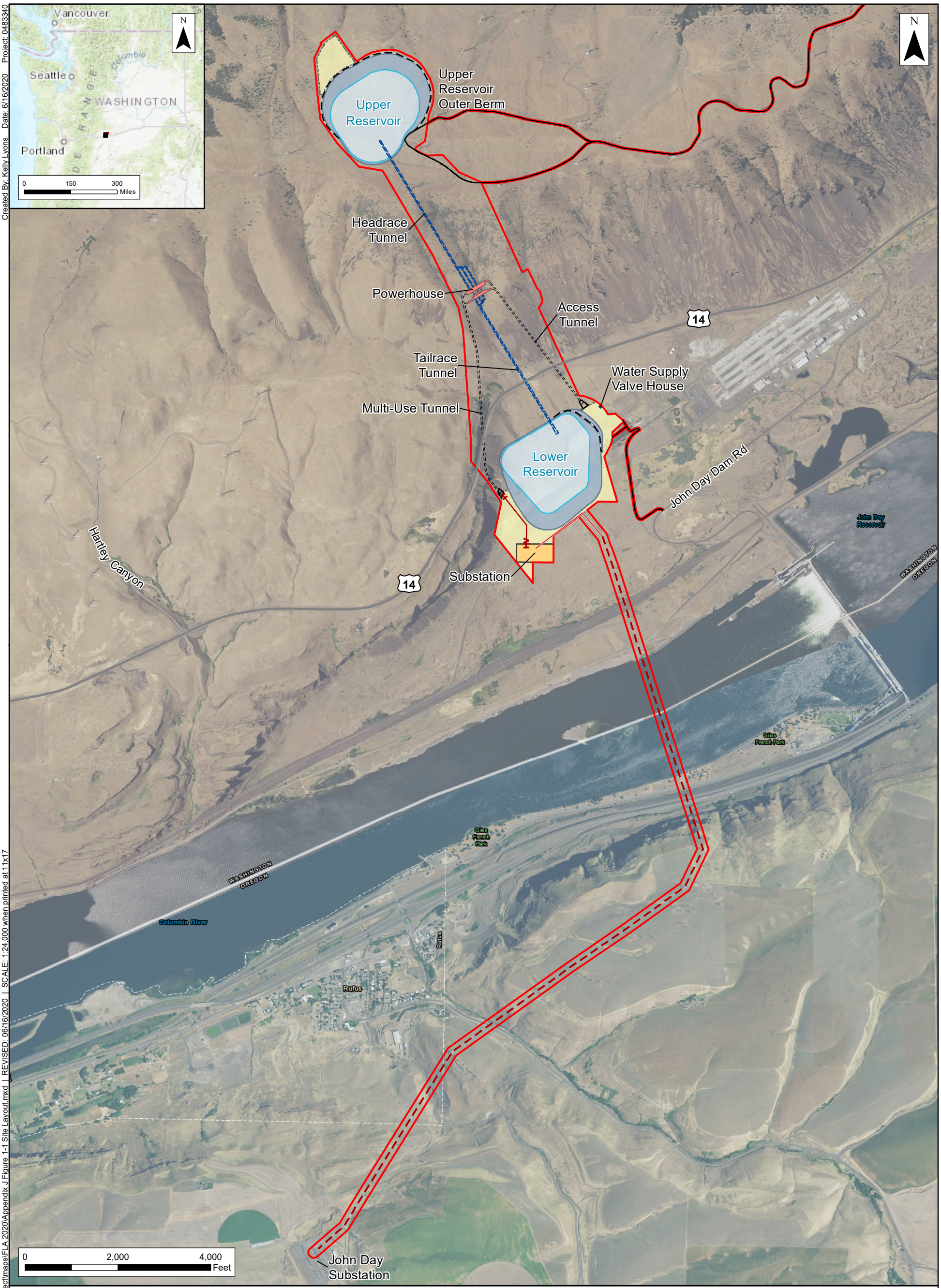
The aesthetic resources study was originally conducted by Environmental Resources Management (ERM) in 2015 for the JD Pool Pumped Storage Hydroelectric Project for Klickitat Public Utility District. It was updated by ERM for FFP Project 101, LLC (the Applicant) with new photos and to reflect the current proposed Project in 2019. The location of the proposed Project is shown on Figure 1.1-1.

## 1.1 Existing Environment

The proposed Project will be located approximately 8 miles southeast of the City of Goldendale in Klickitat County, Washington. The Project is a closed-loop pump storage facility with the lower reservoir off-stream of the Columbia River near the John Day Dam on the Washington (north) side of the Columbia River, as described in detail in the Project's Draft License Application (DLA).

A portion of the land within the proposed Project Boundary is occupied by the former Columbia Gorge Aluminum (CGA) smelting facility. The surrounding area includes wind farms and rangeland. The Project is located approximately 10 miles west of the Columbia River Gorge National Scenic Area (CRGNSA). Several recreation areas exist adjacent to and within 10 miles of the proposed Project area. These areas consist of a trail managed by Bureau of Land Management (BLM), a state park, state fish and wildlife areas, and national forest lands, as well as a Wild and Scenic River, a Scenic and Recreational Highway, a National Landscape Conservation System, and a National Historic Trail. Recreation resources in the vicinity of the Project are described in more detail in the DLA.

The viewshed of the Project area encompasses approximately 158,500 acres, as shown on Figure 1.1-2. The Project study area spans multiple sections within Township T3 North, Range R17 East on the Rufus U.S. Geological Survey 7.5-minute quadrangle map. The upper reservoir and appurtenant features will be located on the Columbia Hills adjacent to a high desert plateau approximately 2,500 feet above the Columbia River (upper plateau). The lower reservoir, underground powerhouse, access tunnel portal, and appurtenant features will be located on a former flood plain plateau 580 feet above the Columbia River (lower plateau).




**Legend**

- Project Boundary
- Proposed Infrastructure
  - Access Road
  - High Voltage Cable
  - Transmission Line
- Transmission Co-Located with Existing BPA ROW
- Existing Access Road
- Reservoir
- Reservoir Berm Outer Slope
- Laydown Area
- Powerhouse
- Substation
- Water Supply Valve House
- Access Tunnel
- Access Tunnel Portal
- Headrace/Tailrace Tunnel

**Figure 1.1-1**
**Proposed Site Layout**
Final License Application
FFP Project 101, LLC
Goldendale Energy Storage Project
Goldendale, WA

Environmental Resources Management
www.erm.com

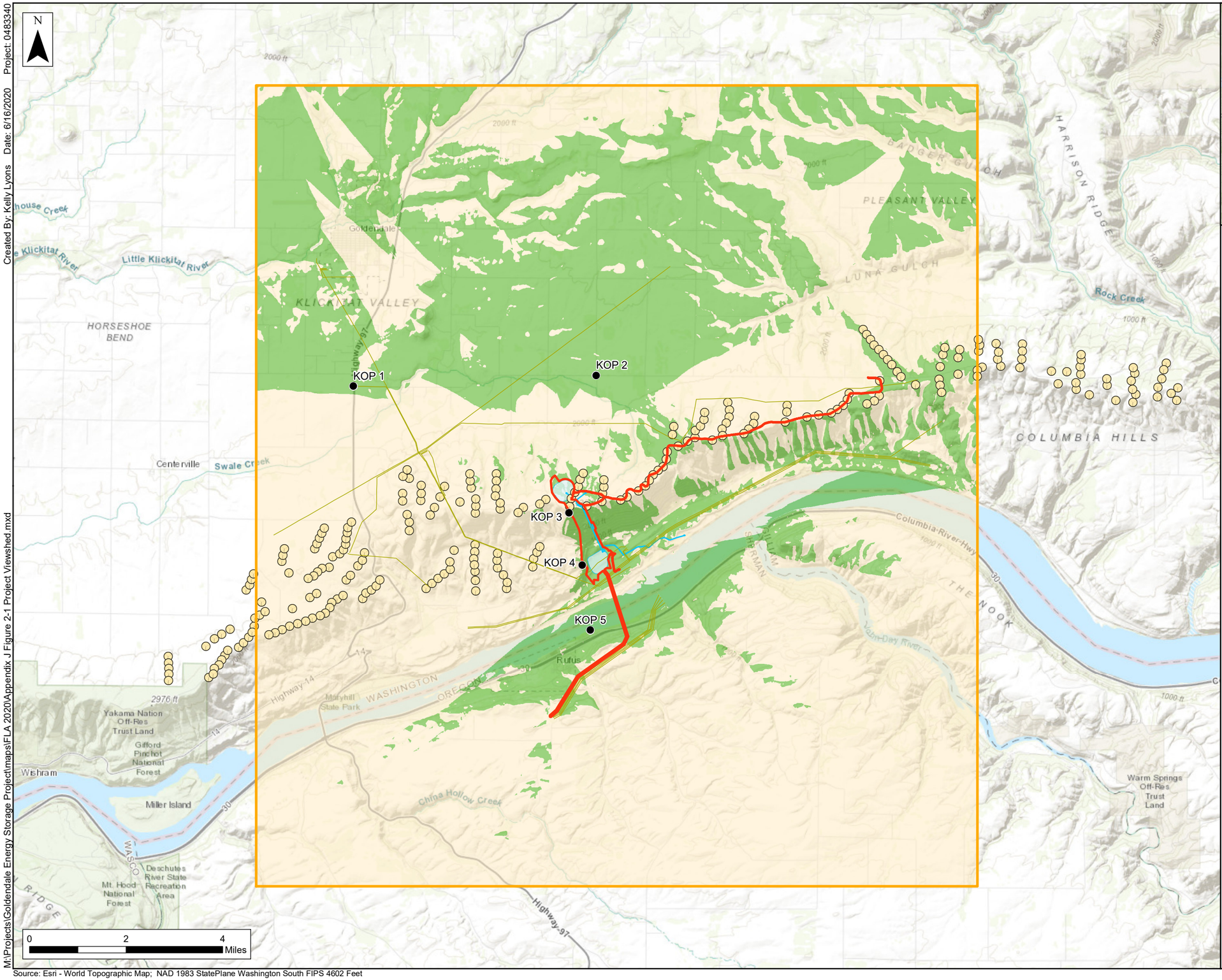
Source: National Agricultural Imagery Program, July 2017, flown 1m per pixel; NAD 1983 HARN StatePlane Washington South FIPS 4602 Feet

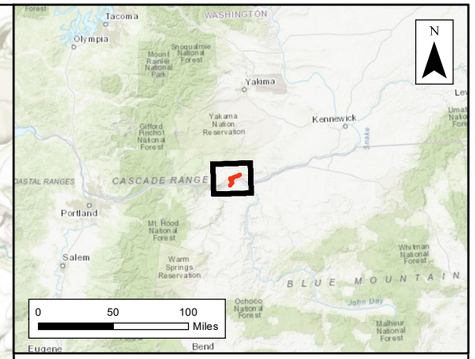
FILE: M:\Projects\Goldendale Energy Storage Project\maps\FLA 2020\Appendix J Figure 1-1 Site Layout.mxd | REVISED: 06/16/2020 | SCALE: 1:24,000 when printed at 11x17

Created By: Kelly Lyons Date: 6/16/2020 Project: 0483340

Created By: Kelly Lyons Date: 6/16/2020 Project: 0483340

M:\Projects\Goldendale Energy Storage Project\maps\FLA 2020\Appendix J Figure 2-1 Project Viewshed.mxd




## Legend

- Key Observation Points
- Project Viewshed Boundary
- Proposed Project Boundary
- Transmission Lines in Project Vicinity
- Wind Turbines
- Proposed Penstock and Intake
- Proposed Reservoirs

Bare Earth Viewshed Analysis

- Project Infrastructure Visible
- Project Infrastructure Not Visible

**Figure 1.1-2**
**Project Viewshed Analysis and KOPs**
Final License Application
Goldendale Energy Storage Project
Goldendale, WA

Environmental Resources Management
www.erm.com

Source: Esri - World Topographic Map; NAD 1983 StatePlane Washington South FIPS 4602 Feet

## 1.2 Regional Setting and Landscape Character

The Project is located in the southern margin of the Columbia Hills adjacent to the Columbia River within the Columbia Plateau physiographic province. The Columbia Plateau covers an area of approximately 63,000 square miles, within which the ground surface ranges in elevation from approximately 200 to 3,000 feet. Mountains surround the plateau on all sides: the Cascade Range to the west, the Okanogan Highlands to the north, the Clearwater Range to the East, and the Blue Mountains to the south (Shannon & Wilson, Inc. 2002).

The Project area contains many existing human modifications, including rural residences and communities, agricultural fields and structures, highways and other roads, substations, transmission lines, wind turbines, a large hydroelectric dam, and a liquefied natural gas pipeline. Communities within a few miles of the Project viewshed include Rufus, Oregon (population 249), and Goldendale, Washington (population 3,485). The majority of the Project viewshed is privately owned by individuals and NSC Smelter, LLC, and is characterized by wind farms, agricultural activities (e.g., irrigated crops), and range land used for grazing (U.S. Census Bureau 2010).

The proposed Project area and surrounding vicinity consists of the rolling terraces and rangeland in the hills above the Columbia River. The upper and lower reservoir areas have distinctly different visual settings. In the vicinity of the lower reservoir, the visual setting is dominated by current and historic industrial activities related to the John Day Dam, Bonneville Power Administration (BPA) transmission rights-of-way, and the former CGA smelter. The vicinity of the area associated with the upper reservoir is a mix of large areas of grasslands interspersed with wind turbine generators and an associated road network, as well as limited areas of oak woodlands.

## 1.3 Regulatory Framework

The following section outlines federal, state, and local laws, polices, and regulations that apply to the Project study area and were taken into consideration in development of the visual resource assessment.

### 1.3.1 Federal and State Regulations

Washington State Department of Transportation (WSDOT) regulates scenic byways under the Scenic and Recreational Highway Act of 1967 (Revised Code of Washington Chapter 47.39), with a focus on recognition rather than regulation. Washington implements outdoor advertising controls, thus preserving the scenic quality of the roadside. The Federal Highway Administration's National Scenic Byway Program will only award transportation dollars to projects along routes that adhere to the Federal Highway Beautification Act of 1965. Federal law 23 United States Code 131 bans billboards along Federal Interstate and Federal-aid Primary

routes designated as scenic byways. Locally, Washington's law is the Scenic Vista's Act enacted in 1971, Revised Code of Washington 47.42.

Scenic designations in the area include two scenic roadways (State Route 14 and U.S. Route 97) and the CRGNSA. The CRGNSA is located approximately 10 miles west of the Project area. The 1986 CRGNSA Act assigned the U.S. Department of Agriculture Forest Service (USFS) and the Columbia River Gorge Commission management responsibility of the lands in the CRGNSA to protect and enhance natural resources in the area (USFS 2014). U.S. Route 97 is approximately 8 miles west of the proposed Project area, with an average traffic count of 5,297 vehicles per day near its intersection with State Route 142 (WSDOT 2016). State Route 14, also referred to as the Lewis and Clark Highway, runs through the Project Boundary at the base of the Columbia Hills below the upper reservoir and adjacent to the lower plateau and the lower reservoir. Average daily traffic counts on State Route 14 east of its intersection with U.S. Route 97 are 2,177 vehicles per day (WSDOT 2016). In addition to these scenic routes, approximately 15,500 vehicles per day travel along Interstate 84 just south of the Columbia River, in the vicinity of the interchange with Oregon Highway 206 (ODOT 2018).

### 1.3.2 Local Regulations

The proposed Project area lies within the Klickitat County Energy Overlay Zone (EOZ), and is subject to EOZ aesthetic ordinances, including:

- Minimizing security lighting;
- Directing lighting fixtures away from adjacent properties;
- Keeping facilities free of debris;
- Storing unused or damaged equipment offsite;
- Color restrictions/coordination; and
- Using non-reflective paint.

## 2.0 VISUAL RESOURCE INVENTORY METHODS

There are no prescribed methodologies for completing visual resource assessments in the Project area. As such, the visual resources inventory relied on methodologies developed by other management agencies, and by professional experience with aesthetic studies for hydropower projects. The most widely used methodologies in the United States for aesthetic resource studies have been developed by the BLM and the USFS. The BLM developed the Visual Resource Management (VRM) system (BLM 1984) as a way to characterize existing landscapes on lands under their jurisdiction, identify and evaluate scenic values, determine visual impacts from projects, and ultimately determine the appropriate level of management of visual resources on BLM lands.

The BLM's VRM methodology is comprised of two components: inventory (the "visual resources inventory") and analysis (the "visual resources contrast rating"). The inventory stage involves identifying the visual resources of an area and assigning them to one of four inventory classes using BLM's visual resource inventory process (BLM 1984).

The Project is not located on or near lands managed by the USFS or the BLM, but it is located near areas of land managed by the BLM in the Prineville District of Oregon State. Since no prescribed methodology exists for assessing visual resources within the Project viewshed, the BLM's system was used to assess visual resources in the Project area because (1) the nearest managed land is under BLM's jurisdiction and (2) the methodology is used for documenting visual resources in similar landscapes.

The following steps were used to analyze the visual resources inventory on private and public lands in the Project viewshed:

- Review relevant agency management objectives and guidelines;
- Complete a desktop viewshed analysis with field verification;
- Collect photographs to document regional setting and landscape characteristics;
- Develop visual simulations of proposed Project features; and
- Complete the visual resource assessment.

## 2.1 Visual Resource Management Classes

The BLM visual management objectives are the result of merging visual sensitivity, scenic quality, and Project visibility from viewpoints. The BLM divides lands into four VRM Classes for managing visual resources. These classifications delineate the amount of visual impact allowed in the preexisting landscape. BLM has not established VRM Classes within the Project viewshed.

The analysis involved determining whether the potential visual impacts from the proposed Project will meet management objectives established for the area, or whether design adjustments will be required. A visual contrast rating process is used for this analysis, which involves comparing the proposed Project features with the major features in the existing landscape using the basic design elements of form, line, color, and texture. The steps in the contrast rating process are outlined in BLM's Visual Resources Contrast Rating manual (BLM 1986).

## 2.2 Distance Zones

The BLM VRM system divides lands into three distance zones: foreground-middle ground, background, and seldom-seen. These zones are built on the scale and nature of the landscape

being viewed, perception thresholds, and the viewing environment. Table 2.2-1 describes these zones and the boundaries between them.

**Table 2.2-1: Distance Zone Description and Boundaries**

| Zone | Description of Acceptable Modifications to Landscape |
|---|---|
| Foreground/middle ground | These areas can be seen from a travel route and generally extend between 0 and 5 miles. The boundary between this distance zone and background is typically the point where form and texture details are no longer apparent. |
| Background | These areas can be seen from a travel route generally up to 15 miles. Distant lands only visible by form and outline should not be included in the background. Vegetation should be visible and at least distinguishable and light and dark patterns. |
| Seldom seen | These areas are not visible within the other two zones and includes areas beyond the background. |

Source: BLM 2019

## 2.3 Visual Contrast

The BLM VRM system starts the visual contrast rating process by dividing landscapes into three groups: landform/water, vegetative, and structural. Typical landform/water features include geologic landforms, existing roads, mining facilities, landfills, water impounds, and gravel pits. Vegetative features include vegetative manipulations, grazing systems, agricultural fields, and timber harvests. Structural features include the buildings, transmission lines, water tanks, and recreation facilities. These groups are then described and analyzed based on form, line, color, and texture. Views from each of five key observation points (KOPs) will be rated based on current landscape conditions and simulations of what the view will look like if the Project were to be built.

- **Form**: Mass and shape are used to describe form for the purposes of visual contrast. Mass is an object with volume that is contrasted against the surrounding landscape. An example of mass is a large hill in an otherwise flat landscape. Shape is the contrast (in texture or color) of one area against an adjacent area, which creates a two-dimensional shape to the viewer. An example of shape contrast is a river flowing through a valley. Other elements are involved in analyzing form contrast including complexity, geometry, and orientation.

- **Line**: Edge is the most commonly used element to describe line contrast. There are many descriptive types of edge including butt edge, transitional edge, band, and diffuse edge. Complexity, boldness, and orientation are other elements involved in analyzing line contrast.

- **Color**: Hue, chroma, and value are the key elements used in describing color contrast. Hue is the color of the landscape, chroma is the deepness or brilliance of color, and value is the level of light or dark in a color. Variable effects play a role in all contrast elements but are more noticeable with color. Variable effects include distance direction of lighting, weather, and time of day.

- **Texture**: Light-shade and color combinations are used to describe texture contrast. Light-shade is the contrast created by variances in lighting on a surface or forms. Color

combinations are small-scale color contrasts that give the appearance of texture. Density, grain, contrast, and regularity are other elements used to analyze texture contrast.

## 2.4 Visual Contrast Levels

The BLM VRM system designates four levels of visual contrast ratings: none, weak, moderate, and strong (Table 2.4-1). A score from 0 to 3 is applied to each level of visual contrast, which will be applied to each element of the group for a total contrast rating score.

**Table 2.4-1: Distance Zone Description and Boundaries**

| Level | Description of Acceptable Modifications to Landscape | Score |
|---|---|---|
| None | Contrast is not visible or perceived | 0 |
| Weak | Contrast can be seen however it does not attract attention to the viewer | 1 |
| Moderate | Contrast starts to attract attention to the viewer and starts to dominate the landscape character | 2 |
| Strong | Contrast attracts attention to the degree that it cannot be overlooked and also dominates the landscape character | 3 |

Source: BLM 2019

## 2.5 Scenic Quality Evaluation

Scenic quality is a measure of the overall impression or appeal of an area created by the physical features of the landscape, such as natural features (landforms, vegetation, water, color, adjacent scenery, and scarcity) and built features (roads, buildings, railroads, agricultural patterns, and utility lines). These features create the distinguishable form, line, color, and texture of the landscape composition that can be judged for scenic quality using criteria such as distinctiveness, contrast, variety, harmony, and balance. Using the BLM VRM Manual (BLM 1984), scenic quality was determined for each KOP by seven visual qualities (Table 2.5-1): landform, vegetation, water, color, influence of adjacent scenery, scarcity (common versus rare), and cultural modifications (changes made by humans). All but the cultural modifications (changes made by humans) are scored on a scale of 5 to 1, with 5 representing the most dramatic visual presence and 1 the least. Cultural modifications are scored on a scale from 2 to 4 based upon their ability to harmonize or detract from the surrounding landscape. Those areas with the most variety and most harmonious composition have the greatest scenic value.

**Table 2.5-1: Rating Criteria for Scenic Quality Evaluation Based on the BLM Visual Resource Management Manual**

| Component | Rating Criteria and Score | | |
|---|---|---|---|
| Landform | High vertical relief as expressed in prominent cliffs, spires, or massive rock out-crops; or severe surface variation or highly eroded formations including major badlands or dune systems; or detail features dominant and exceptionally striking and intriguing such as glaciers | Steep canyons, mesas, buttes, cinder cones, and drumlins; or interesting erosional patterns or variety in size and shape of landforms; or detail features which are interesting though not dominant or exceptional | Low rolling hills, foothills, or flat valley bottoms; or few or no interesting landscape features |
| | 5 | 3 | 1 |
| Vegetation | A variety of vegetation types as expressed in interesting forms, textures, and patterns | Some variety of vegetation, but only one or two major types | Little or no variety or contrast in vegetation |
| | 5 | 3 | 1 |
| Water | Clear and clean appearing, still, or cascading white water, any of which are a dominant factor in the landscape | Flowing, or still, but not dominant in the landscape | Absent, or present, but not noticeable |
| | 5 | 3 | 0 |
| Color | Rich color combinations, variety or vivid color; or pleasing contrasts in the soil, rock, vegetation, water, or snow fields | Some intensity or variety in colors and contrast of the soil, rock, and vegetation, but not a dominant scenic element | Subtle color variation, contrast, or interest; generally mute tones |
| | 5 | 3 | 1 |
| Adjacent Scenery | Adjacent scenery greatly enhances visual quality | Adjacent scenery moderately enhances overall visual quality | Adjacent scenery has little or no influence on overall visual quality |
| | 5 | 3 | 0 |
| Scarcity | One of a kind; or unusually memorable, or very rare within region. Consistent chance for exceptional wildlife or wild-flower viewing, etc. | Distinctive, though somewhat similar to others within the region | Interesting within its setting, but fairly common within the region |
| | 5+ | 3 | 1 |
| Cultural modifications | Modifications add favorably to visual variety while promoting visual harmony | Modifications add little or no visual variety to the area, and introduce no discordant elements | Modifications add variety but are very discordant and promote strong disharmony |
| | 2 | 0 | -4 |
| Scenic Quality Ranking | A = 19 or more | B = 12 to 18 | C = 11 or less |

An important premise of the evaluation is that all public lands have scenic value, but areas with the most variety and most harmonious composition have the greatest scenic value. The evaluation of scenic quality is done in relationship to the natural landscape. This does not mean that manmade (cultural) features within a landscape necessarily detract from the scenic value. Manmade features that complement the natural landscape may enhance the scenic value, such as split rail fences or log cabins. Table 2.5-2 presents the VRM scenic quality rating components that are evaluated to arrive at one of three scenic quality ratings (A, B, or C) for a given landscape. Each landscape component is scored; a score of 19 or higher results in a Class A scenic quality rating; a score of 12 to 18 results in a Class B scenic quality rating; and a score of 11 or less results in a Class C scenic quality rating.

**Table 2.5-2: Scenic Quality Class Definitions**

| Scenic Quality Class | Scenic Quality Class Definition |
|---|---|
| Class A | Landscapes are represented by unique lands of outstanding or distinctive diversity or interest, including high-relief mountains, escarpments, highly dissected canyons, monumental landforms, and scenic rivers. |
| Class B | Landscapes are lands of above-average diversity of interest and consist of rolling, vegetated hills and valleys, mesas, buttes, and unique landforms that define the environment. |
| Class C | Landscapes are primarily common and of minimal diversity, such as high desert plateaus and desert plains areas with few distinguishing features. |

## 3.0 VIEWSHED ANALYSIS AND VISUAL RESOURCE ASSESSMENT

### 3.1 Viewshed Analysis

A viewshed analysis was completed in 2015 and reviewed in 2019 to determine sensitive viewing areas where Project features may be seen by individuals. Culturally significant and/or sensitive areas were field-verified by professionals with experience completing hydropower viewshed analyses to determine if the proposed Project could actually be viewed from these locations. KOP locations were selected based on the following criteria:

- The location provides the most representative view of the Project for a given area and portion of the Project;
- The location provides the greatest potential number of receptors (i.e., potential viewers) that will be able to actually see the Project;
- The location is a relatively common and/or sensitive view within the study area that could be affected by the Project; and
- It is a relatively good location that can be used to measure anticipated change in visual resources resulting from the Project.

KOP locations differ by landscape analysis factors (i.e., distance from the Project, predominant angle of observation, dominant use, duration of view, and common or sensitive receptors).

A map of the viewshed analysis area and location of KOPs is shown on Figure 1.1-2.

The viewshed analysis was completed using a combination of field data and desktop analysis using a geographic information system (GIS). The field component included field verification of the initial viewshed analysis results and the selection of final KOP locations for gathering documentation of visual characteristics. The extent of the Project viewshed was determined by extending a 6-mile buffer from the Project study area to include all areas with a line-of-sight view of Project infrastructure and features that will be classified as foreground-middle ground, based on the BLM Distance Zone methodology. The boundary between the foreground and background distance of 6 miles was field verified, as well as the visual characteristics of the views from each KOP. Field data collection was completed by two field personnel over the course of 2 and a half days to verify the desktop assessment of areas with views of the Project. The field data was imported into the GIS to complete the viewshed analysis. A summary description of the views from each KOP is provided in Section 3.2.

### 3.1.1 Photograph and Video Documentation

Still photographs and live videos were collected in the field as a part of the study using a combination of Nikon D7100, an integrated Nikon Geographic Positioning System (GPS) unit, Nikon 24- to 70-millimeter zoom lens, Rode Stereo VideoMic Shotgun on-camera microphone, and a tripod with a swivel mount in 2015. The Nikon D7100 is a full-frame camera with a 1.5 crop factor. In 2019 for retaking the KOP 5 photos, a Canon Electro-Optical System digital single-lens reflex camera was used with a 55-millimeter lens and 1.6 crop factor.

Photo and video documentation was completed for each KOP by setting the tripod at the designated location for the particular KOP, and taking photographs in a minimum of three sweeping panoramas from left to right (top, middle, and lower) to cover the complete field of view (FOV) of the Project infrastructure and features visible from that particular vantage point. Images were recorded at a focal length of 34 millimeter (51-millimeter lens with 1.5 crop factor). The images were recorded in high resolution to allow large poster-size images to be printed later if required. Videos were collected at the 34-millimeter focal length (51-millimeter lens with crop factor of 1.5) in a locked position (lock-shot) to document conditions including sound at each KOP location. Additional landscape photographs were collected at various locations to capture views of the broader landscape, including mountains. The latter images are not intended to document the human eye FOV for the respective KOP locations, but rather to provide context to the broader background landscape surrounding the KOP focus point.

Field locations for each KOP were recorded using a hand-held GPS unit Garmin GPSMAP 62s and a GPS-enabled digital camera (Nikon D7100). The integrated Nikon GPS unit was used to record the precise location of the KOP and direction of view for each photograph. Location data

from the integrated GPS was used to correlate each photograph with the location from the handheld GPS unit, as well as site features identified on the maps and in the tables. Field data were also hand drawn on paper maps and recorded in a field notebook during the field events.

### 3.1.2 Visual Simulation

Visual simulations were developed using photographs collected in the field from KOP locations. The visual simulations of Project infrastructure (photomontages) were prepared using a panorama of digital still photos of existing baseline conditions, rendered with simulated Project infrastructure from three-dimensional (3D) models. Photomontages are high-resolution still images of an existing view taken from a KOP. They are then digitally edited (rendered) to illustrate proposed Project infrastructure and features in a realistic manner, depicting the structures, textures, colors, and finishes, which appear realistic to the human eye. During the simulation process, Project components, including Project infrastructure and/or other Project features, were digitally overlaid on photographs in accordance with best practices for visual simulations recommended by the New Zealand Institute of Landscape Architects Best Practice Guide for Visual Simulations (NZILA 2010). The resulting visual simulations portray—in a realistic manner and context—a two-dimensional photographic view of the Project, which was then used to evaluate the effects the Project will have on the visual resources within the study area.

Visual simulations were prepared using a panorama of digital still images of existing baseline aesthetic conditions stitched together and combined (montaged) with 3D models of Project components and then rendered into an image (photomontage) that accurately represents Project components within the existing landscape. The high-resolution still images taken from the five KOPs were digitally stitched together using a Digital Terrain Model (DTM) and visual landmarks to obtain a wide-angle panoramic photograph of existing conditions that accurately represent how the terrain will appear without distorting the image. The DTM provides a wide-angle digital representation of the existing landscape that is the same landscape as what is visible in the original single-frame photographs. The panoramic photomontages follow the New Zealand Institute of Landscape Architects best practices and do not exceed the 124-degree horizontal or 55-degree vertical primary FOV of the human eye.

The DTM is a 3D digital representation of the bare earth elevation (terrain), existing structures, and 3D models of Project infrastructure and features within the Project viewshed. Vegetation cover was not included due to the sparse nature of vegetation within the Project viewshed. During the photomontage process, the Project models were first illustrated as 3D line drawings (wireframe models) representing the location of Project components, both visible and non-visible. The wireframe models were then digitally edited (rendered) to illustrate visible Project components in a realistic manner depicting the structures, textures, colors, and finishes, which appear realistic to the human eye.

After rendering the panoramic photomontages, a section of the photomontage was cropped and enlarged to produce a visual simulation that accurately portrays the Project components at a representative scale within the existing landscape. The images were cropped to 40 degrees horizontal and 27 degrees vertical to provide a single frame image representative of the central FOV visible from a particular location. When printed on an 11- by 17-inch piece of paper and positioned at approximately 20 inches from a viewer's face, the resulting visual simulations accurately and realistically illustrate the approximate scale and context of Project components as seen from the perspective of a person standing at the specific KOP from which the original photographs were taken.

## 3.2 Results of Visual Resource Assessment

The Applicant conducted a visual resource assessment including a review of the visual resources inventory process and a preliminary assessment of the visual impact of the Project infrastructure and features including the upper and lower reservoirs, buried powerhouse, buried transmission line, and tunnel portal. The assessment was conducted in accordance with the BLM VRM Inventory and Contrast Rating System using the regional setting and landscape character types describe in Section 1.2. The visual resource inventory and evaluation is relevant to the current stage of planning and design, which is still preliminary at this time.

The Applicant reviewed landforms in the study area via aerial photographs, topographic maps, and field visits. These landforms were then categorized into landscape character types. Landscape character is defined as the distinct, constant, and identifiable configuration of elements in a landscape that make one landscape differ from another. These configurations of elements can be natural (e.g., landform, soil type, waterbodies) or manmade (e.g., cities and rural communities).

The aesthetic character of the lands that will be directly affected by the Project is currently made up of the following landscape character types: river valley landscape, plateau, waterbody, and developed area. See photographs in Attachment 1 for examples of the landscape types.

### 3.2.1 Key Observation Points—Existing Character

A total of five KOPs were selected from a list of potential vantage points along roadways and accessible locations with public and private access within the Project viewshed. These five KOPs were selected based on criteria consisting primarily of the level of traffic, angle of view, distance, and duration for those areas with representative views of Project infrastructure and features within the Project viewshed. The KOPs were originally photographed in 2015 and revisited in 2019 at which time KOP 5 was re-photographed. ERM confirmed that no major changes to the landscape or viewshed have taken place since 2015. BLM VRM worksheets were completed at each KOP in 2015, and were updated in 2019 (Attachment 2). A photomontage assembled for each KOP is included as Attachment 3.

### *3.2.1.1 KOP 1*

KOP 1 is located in a grassy median west of the intersection of Hoctor Road and U.S. Route 97 (Attachment 1, Photo 7). This KOP was selected because it represents potential views of the upper reservoir available to the public from a segment of the heavily travelled U.S. Route 97 (traffic count of 5,297 vehicles per day, WSDOT 2016) south of Goldendale at the intersection of Hoctor Road. The landscape consists of a flat plateau and rolling/undulating Columbia Hills to the south. Irrigated agricultural fields dominate the foreground in the immediate area, with grassland, shrub steppe, and oak woodlands dominating middle-ground along the hills near the Project. The land in the immediate vicinity of this KOP is predominantly private land on either side of U.S. Route 97. Human activity visible from the KOP includes agriculture, wind farms, and a major transportation corridor. Existing visible structures include wind turbines, power poles, transmission lines, Old Highway 97, U.S. Route 97, Hoctor Road, a small Northwest Pipeline Corporation facility, and residential structures including farm houses and barns. No VRM Class has been designated by the BLM for lands within the vicinity of KOP 1.

### *3.2.1.2 KOP 2*

KOP 2 is located along the side of road at the intersection of Willis Road and Hoctor Road facing south (Attachment 1, Photo 8). This KOP was selected because it represents potentially prominent views of the location for the upper reservoir for residents and the general public that travel along Hoctor Road. Views of the landscape at this location are primarily the rolling/undulating Columbia Hills, with the beginning of a flat plateau adjacent and to the south of KOP 2. Land use visible from KOP 2 includes primarily privately owned farmlands used for agricultural and power generation from wind turbines. Irrigated agricultural fields dominate the area adjacent to the KOP, and the hills in the foreground are vegetated by grassland, shrub steppe, and western juniper and ponderosa pine woodlands. Existing visible structures from this KOP include wind turbines, power poles, transmission lines, irrigation lines, Hoctor Road, Willis Road, and residential structures including farm houses and barns. No VRM Class has been designated by the BLM for lands within the vicinity of KOP 2.

### *3.2.1.3 KOP 3*

KOP 3 is located at the top of the Columbia Hills at Juniper Point looking south at the proposed location of the lower reservoir (Attachment 1, Photo 9). The KOP is located approximately 300 feet on the downslope side from the radio tower. The KOP is on NSC Smelter property and is currently not accessible to the general public. This location was selected because it provides a good vantage point overlooking the proposed location of the lower reservoir from Juniper Point, which has been identified as a sensitive cultural location for tribes in the area (see DLA Section 4.0). At an elevation of 3,000 feet above mean sea level, the location of the KOP is approximately 2,500 feet higher than the site for the lower reservoir. The landscape consists of the Columbia Gorge with a view of the Columbia River below basalt cliffs, the mouth of the

John Day River, and an expansive plateau spreading out above the river. Land use includes a mixture of publicly managed land (BLM, DNR, USACE, and WSDOT) and privately owned land (NSC Smelter and individual properties), as well as agricultural lands on the flat plateau. Existing visible structures include the town of Rufus, The John Day Dam, Interstate 84, State Route 14, the former CGA smelter, wind turbines, and transmission lines. No VRM Class has been designated by the BLM for lands within the vicinity of KOP 3.

#### *3.2.1.4 KOP 4*

KOP 4 is located on a gravel pullout adjacent to the southeast side of State Route 14 above the proposed location of the lower reservoir (Attachment 1, Photo 10). The location is on public land associated with State Route 14. It was selected for the ease of public access, close proximity to the Project, and for cultural significance of the Lewis and Clark Trail Highway and as a Scenic and Recreational Highway. KOP 4 provides a close-up vantage point for the scale and size of the Project facilities associated with the lower reservoir and powerhouse. The landscape consists of talus slopes associated with the Columbia Hills to the east, basalt cliffs that abruptly transition into the Columbia River to the South, and the flat floodplain adjacent to the river. Land use in the surrounding area consists of a mixture of private NSC Smelter and individual properties) and publicly managed land (BLM, USACE, and WSDOT) currently used for power generation, transportation, and recreation, with evidence of historic industrial use associated with the former CGA smelter. Existing visible structures at this location include State Route 14 and Interstate 84, the former CGA smelter, the John Day Dam, transmission lines, wind turbines, railroad tracks, campers and other evidence of recreational use by the public along the bank of the river. No VRM Class has been designated by the BLM for lands within the vicinity of KOP 4.

#### *3.2.1.5 KOP 5*

KOP 5 is located near the town of Rufus along the bank of the Columbia River in Giles French/John Day Dam Park facing north across the river toward the lower plateau and the location of the lower reservoir (Attachment 1, Photo 11). This location was selected because it is publically accessible and it represents the views from the public park along the banks of the Columbia River as well as similar views from the town of Rufus and Interstate 84. The landscape consists of large talus slopes associated with the Columbia Hills on the north side of the Columbia River and prominent basalt cliffs that abruptly transition into the Columbia River. The surrounding land use consists of a mixture of private NSC Smelter and individual properties) and publicly managed land (BLM, DNR, USACE, and WSDOT) currently used for power generation, transportation, and recreation, with some evidence of historic industrial use associated with the former CGA smelter. Existing visible structures include commercial and residential buildings in the town of Rufus, Interstate 84 and State Route 14, the John Day Dam, transmission lines, structures associated with the former CGA smelter, wind turbines, and campers along with other evidence of recreation on both banks of the river. No VRM Class has been designated by the BLM for lands within the vicinity of KOP 5.

## 3.3 Potential Impacts

Project infrastructure and features have the potential to alter the visual characteristics of the existing landscape within the vicinity of the Project. Specifically, six groups of observers could be affected by the construction and operation of the Project:

- Motorists on State Route 14;
- Motorists on Interstate 84;
- Motorists on U.S. Route 97;
- Motorists on Hoctor Rd;
- Residents and landowners adjacent to the Project area; and
- Temporary visitors to areas adjacent to the Project, including the John Day Dam (Giles French / John Day Dam Park, Oregon).

## 3.4 Viewshed Impacts

Visibility of the Project infrastructure and features on the lower plateau extend east and west along both the north and south banks of the Columbia River. The north bank of the river includes prominent views of the lower reservoir and portal tunnel access building from Juniper Point and State Route 14 (KOP 3 and KOP 4 respectively), as well as partial views from State Route 14 as it continues upstream alongside the former CGA smelter. Views of the Project are lost in the areas adjacent to the Columbia River and below the lower plateau due to sharp elevation changes and the existing rail road berm. Views are limited immediately downstream of KOP 4 due to the steep topographic relief. The Oregon side of the Columbia River includes prominent views of the Project from the parks and recreation sites along the south bank of the Columbia River (Giles French / John Day Dam Park), Interstate 84 and the town of Rufus (represented by KOP 5). Partial views of the lower reservoir will likely be available from Interstate 84 near the confluence of the John Day and Columbia Rivers. However, local topography along both sides of the Columbia River will make viewing the lower reservoir only possible as brief glimpses from higher vantages along the highway.

The Project will be visible on the upper plateau in a rough line that extends from the east to the west along Hoctor Road represented by views from KOP 1 and KOP 2. Visibility of the Project is lost along much of the area south of Hoctor Road due to the topography of the Columbia Hills in the immediate foreground when looking south toward the Project. Visibility is restored further up the slope in close proximity to the upper reservoirs. Visibility on U.S. Route 97 west of the Project is largely blocked by local topography; however, the Project is visible for a segment of the highway near KOP 1 at the intersection of Hoctor Road and U.S. Route 97. Views of the upper reservoirs on the upper plateau will extend to the north and west. Views from the nearest community of Goldendale will be largely blocked by a series of rolling hills east of U.S.

Route 97. In addition, the Project is distant enough from Goldendale (less than 3 to 5 miles) that it will be classified as within the "background" for the limited areas with visibility, based on BLM Distance Zone methodology. Views of the Project on the upper plateau at distances of less than 15 miles are categorized as seldom seen using the BLM methodology.

The Project is located approximately 10 miles west of the CRGNSA. The Project will not be visible from the CRGNSA based on distance and topographic relief. The CRGNSA is within the background distance classification based on BLM Distance Zone methodology.

## 3.5 Construction Impacts

Visual impacts that are the direct result of Project construction are considered temporary, will be restored to pre-existing conditions where practicable, and will include the application of mitigation measures planned to reduce impacts to the visual aesthetic landscape during both construction of the Project and following construction activities where necessary.

During construction, equipment such as transmission tower components, large trucks, drilling and grading equipment, cranes, and equipment for stringing the transmission line on BPA's existing structures will be present in the Project area. Construction activities, including clearing, grading, and staging of Project areas, are all considered short-term impacts to visual resources. Staging and construction areas may need temporary construction lighting supplied by light buggies or trailers.

Temporary visual impacts include any construction laydown areas and increased clutter and activity during Project construction. The first will be located immediately adjacent to the northwest corner of the upper reservoir on the upper plateau, and the second will be located immediately adjacent to the southwest corner of the lower reservoir on the lower plateau. Temporary visual impacts on the upper and lower plateaus will be minimal due to the natural topography, viewing distances, and the visual impacts of existing industrial land use.

## 3.6 Operations and Maintenance Impacts

The permanent Project features will be visible within the Project viewshed given the large mass of the reservoirs. Views of these Project features cannot be completely avoided due to their large size and the open landscape of the Project area. However, several of the Project features will be underground, so no visual impacts will occur for these (e.g., powerhouse, tunnels, penstock, and some of the transmission line).

Lighting will be required at some Project features, and the Applicant will minimize Project exterior lighting to protect the currently dark night sky from light pollution.

Impacts from the proposed Project on the selected KOPs were determined through field visits, completing the visual contrast rating worksheets (Attachment 2), and completing photograph simulations (Attachments 3).

The subsections below discuss results of the scenic quality and visual contrast rating evaluation, including a description of visible Project features and the visual impact rating for each KOP.

## 3.7 KOP Impacts

This section includes the results of the scenic quality and visual contrast ratings, including a description of visible Project features and the visual impact rating for each KOP. A contrast rating was assigned for each KOP as weak (0 to 7), moderate (8 to 16), and strong (17 to 20). A scenic quality rating (A, B, or C) was also assigned for each KOP according to the descriptions included in Table 2.5-2 above.

Table 3.7-1 shows the scenic quality ratings for each KOP. Photomontages for each KOP showing how proposed Project features are situated within each landscape are included in Attachment 3.

**Table 3.7-1: Scenic Quality Ratings for Each Key Observation Point**

| KOP | Scenic Quality Component | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Landform | Vegetation | Water | Color | Adjacent Scenery | Scarcity | Cultural Modifications | Total Score | Ranking |
| 1 | 2 | 2 | 0 | 3 | 3 | 1 | 2 | 13 | B |
| 2 | 2 | 2 | 0 | 2 | 2 | 1 | -1 | 8 | C |
| 3 | 5 | 2 | 4 | 3 | 3 | 2 | -3 | 16 | B |
| 4 | 4 | 3 | 3 | 3 | 2 | 1 | -3 | 13 | B |
| 5 | 4 | 2 | 3 | 2 | 3 | 2 | 1 | 17 | B |

See Tables 2.5-1 and 2.5-2 for descriptions of scenic quality ratings.

### 3.7.1 KOP 1

KOP 1 received a scenic quality score of 13 and a B ranking, meaning that the landscape is of above-average diversity of interest. The east face of the Project's upper reservoir will be approximately 5 miles southwest from the viewpoint. The reservoir berm will appear as a small tan-brown mass along the top of the gently rolling ridge, creating a horizon line that blends with the ridge. Because of the distance from the viewpoint and the subtle form of the reservoir wall, the contrast rating score for this site was 1 (weak contrast). Besides revegetation management of temporarily disturbed areas, no further mitigation is proposed.

### 3.7.2 KOP 2

KOP 2 received a scenic quality score of 8 and a C ranking, meaning that the landscape is primarily common to the region and offers minimal diversity and distinguishing characteristics. The upper reservoir berm will appear as a brown mass along the top of the gently rolling ridge, creating a horizon line that blends in with the ridge at a distance of about 2 miles. Due to the distance of the reservoir berm and the similarity of the berm to the existing ridgetop, the contrast rating for the site was 1 (weak contrast). Besides revegetation management of disturbed areas, no further mitigation is proposed.

### 3.7.3 KOP 3

KOP 3 received a scenic quality score of 16 and a B ranking, meaning that the landscape is of above-average diversity of interest. The Project's lower reservoir, substation, and transmission line will be visible to the south approximately 1 mile from the viewpoint, in a vista that includes the Columbia River, the John Day Dam, locks, the BPA transmission line, and the former CGA smelter in a landscape of a steep rocky cliff and rolling hills. Due to the size of the reservoir, the visual contrast rating is 2 (moderate) where contrast starts to attract attention to the viewer and starts to dominate the landscape character. The proposed Project is consistent with existing development in the area, and no further mitigation is proposed except for revegetation management of disturbed areas.

### 3.7.4 KOP 4

KOP 4 received a scenic quality score of 13 and a B ranking, meaning that the landscape is of above-average diversity of interest. The Project's lower reservoir is prominent in the views foreground while the substation, and transmission line will be visible to the south and east approximately 0.13 mile in the middle ground and background. The overall vista includes the Columbia River, the John Day Dam, Locks, BPA transmission line, and the former CGA smelter in a landscape of a steep rocky cliff and rolling hills. Due to the prominence of the lower reservoir, the visual contrast rating is 3 (strong) where contrast attracts attention to the viewer and dominates the landscape character. The proposed Project is consistent with existing development because of the dominance of industrial development (NSC Smelter) in the area. No further mitigation is proposed except for revegetation management of disturbed areas.

### 3.7.5 KOP 5

KOP 5 received a scenic quality score of 17 and a B ranking, meaning that the landscape is of above-average diversity of interest. The reservoir berm will appear as a short and wide brown mass tucked in among the cliffs of the steep slope between the upper and lower reservoir at a distance of about 1.2 miles, creating a horizon line that blends with other ridges slopes nearby. Because of the distance from the viewpoint and the subtle form of the reservoir wall, the contrast

rating score for this site was 2 (weak). Besides revegetation management of temporarily disturbed areas, no further mitigation is proposed.

## 4.0 CONCLUSIONS

The Applicant aims to minimize the potential visual impacts of the Project and maintain the surrounding aesthetic quality of the landscape. Major Project features are located in areas with existing industrial infrastructure, but all efforts will be taken to mitigate visual impacts. The Project design is preliminary and will consider the need to include engineering controls and mitigation measures to blend in with current visual elements in the area and reduce visual impacts from the Project. The amount of modification upon visual resources is dependent upon the blending of Project features with existing landscape features within the Project viewshed. The Applicant will work with agencies and stakeholders to minimize visual impacts through the refinement and design of Project features.

Proposed measures to reduce visual impacts include the following:

- Engineering controls will be included during the design process, where practicable, to reduce contrasts visible between the existing landscape and the proposed Project from sensitive viewing areas.
- Minimize footprints or aboveground features to the furthest extent possible.
- Ensure facilities are free of debris and store unused or damaged equipment offsite pursuant to the requirements of Klickitat County's EOZ. During construction, the Applicant will monitor the Project area for construction-related debris. Where practical, designated locations will be established for the temporary storage of debris from construction.
- Minimize contrast through natural paint colors and surfacing materials that match the surrounding landscape and dulling reflective surfaces that cannot be painted.
- Native vegetation and/or trees could be planted to break up the lines of roads and facilities and soften the visual effect on the landscape.
- Design, install, and maintain facility lighting to prevent casting of light into adjacent native habitat. Incorporate directional lighting; light hoods, low pressure sodium bulbs or light emitting diode (LED) lighting; and operational devices in final design to allow surface night-lighting in the central Project area to be turned on as needed for safety.
- Install fully shielded low-pressure sodium lighting to reduce lighting impacts to protect the current dark sky conditions from light pollution.
- Minimize lighting to the extent possible through the use of lamp types, covers, timers, motion sensors, or other means. Class II lamp source and shielding requirements will be used where outdoor lighting is necessary.

## 5.0 REFERENCES

BLM (United States Department of Interior, Bureau of Land Management). 1984. *Manual 8400 Visual Resource Management*. Accessed January 25, 2918. https://www.blm.gov/sites/blm.gov/files/program_recreation_visual%20resource%20management_quick%20link_BLM%20Manual%20Section%208400%20-%20Visual%20Resource%20Management.pdf

_____. 1986. *Manual 8431 - Visual Resource Contrast Rating*. Accessed November 6, 2019. http://blmwyomingvisual.anl.gov/docs/BLM_VCR_8431.pdf

_____. 2019. Bureau of Land Management Visual Resource Management Classes. Accessed January 25, 2018. http://blmwyomingvisual.anl.gov/vr-mgmt/blm/.

NZILA (New Zealand Institute of Landscape Architects). 2010. Best Practice Guide – Visual Simulations. February 11. Accessed November 6, 2019. https://nzila.co.nz/media/uploads/2017_01/vissim_bpg102_lowfinal_gQFss9X.pdf

ODOT (Oregon Department of Transportation). 2018. 2017 Transportation Volume Tables. Accessed December 2018. https://www.oregon.gov/ODOT/Data/Documents/TVT_Complete_2017.pdf.

Shannon & Wilson, Inc. 2002. *Geotechnical Report, Cliffs Project, Goldendale, Washington*. Submitted to Goldendale Aluminum Company. 12 March 2002.

United States Census Bureau. 2010. 2010 Census: Washington. Accessed October 2014. http://data.spokesman.com/census/2010/washington/address/?q=Goldendale.

USFS (United States Department of Agriculture Forest Service). 2014. Letter to Klickitat PUD, File Code 1900. Letter Response to Request for Information Addressed to Brian Skeahan, Signed by Lynn Burditt, Area Manager on October, 28 2014.

WSDOT (Washington State Department of Transportation). 2016. *2016 Annual Traffic Report*. Accessed December 2018. https://www.wsdot.wa.gov/mapsdata/travel/pdf/Annual_Traffic_Report_2016.pdf.

**ATTACHMENT 1:**

**PHOTO LOG**

Photo 1: View of Proposed Lower Reservoir Area from State Route 14

Photo 2: View in Vicinity of the Proposed Upper Reservoir

Photo 3: View Near the Lower Reservoir Location Looking Southwest.

Landscape photograph showing the river valley, plateau, waterbody, and developed area from lower plateau near the proposed location of the lower reservoir looking southwest toward the town of Rufus.

Photo 4: View Near the Upper Reservoir Location Looking Southwest.

Landscape photograph showing the river valley, plateau, waterbody, and developed area from Juniper Point near the proposed location of the upper reservoir looking southwest.

Photo 5: View Near the Proposed Upper Reservoir Looking Southeast.

Landscape photograph showing the river valley, plateau, waterbody, and developed area from Juniper Point near the proposed location of the upper reservoir looking southeast.

Photo 6: View Near the Proposed Upper Reservoir Looking Northwest.

Landscape photograph showing the upper plateau and developed area from the Columbia Hills near the proposed location of the upper reservoir looking northwest toward the town of Goldendale.

Photo 7: KOP 1, taken April 2015

| X Coord NAD 83 | Y Coord NAD 83 | Z Coord NAD 83 | Latitude | Longitude |
|---|---|---|---|---|
| 1557940.703 | 161950.8873 | 1719.01416 | 45.77697 | -120.823 |

Photo 8: KOP 2, taken April 2015

| X Coord NAD 83 | Y Coord NAD 83 | Z Coord NAD 83 | Latitude | Longitude |
|---|---|---|---|---|
| 1584477.104 | 163145.8012 | 1908.345093 | 45.780501 | -120.719242 |

Photo 9: KOP 3, taken April 2015

| X Coord NAD 83 | Y Coord NAD 83 | Z Coord NAD 83 | Latitude | Longitude |
|---|---|---|---|---|
| 1581528.709 | 148092.5996 | 3019.478516 | 45.739198 | -120.730625 |

Photo 10: KOP 4, taken April 2015

| X Coord NAD 83 | Y Coord NAD 83 | Z Coord NAD 83 | Latitude | Longitude |
|---|---|---|---|---|
| 1582956.895 | 142387.7089 | 950.127563 | 45.723565 | -120.724968 |

Photo 11: KOP 5, taken May 2019

| X Coord NAD 83 | Y Coord NAD 83 | Z Coord NAD 83 | Latitude | Longitude |
|---|---|---|---|---|
| 1583867.404 | 135269.8411 | 176.56311 | 45.704053 | -120.721325 |

**ATTACHMENT 2:**

**VRM WORKSHEETS**

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
**VISUAL CONTRAST RATING WORKSHEET**

**Date:** April 24, 2015 and May 16, 2019
**District/ Field Office:** Prineville/Spokane
**Resource Area:** Spokane
**Activity (program):** Goldendale Pumped Storage

SECTION A. PROJECT INFORMATION

| | | |
|---|---|---|
| **1. Project Name:** John Day Pump Storage<br>**2. Key Observation Point:** 1<br>**3. VRM Class:** N/A<br>**Elevation:** 1719’ | **4. Location**<br>**Township:** T3N<br>**Range:** R17E<br>**Section:** S4 | **5. Location details/Sketch:** Intersection of HW 97 and Hoctor Road  |

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

| | 1. LAND/WATER | 2. VEGETATION | 3. STRUCTURES |
|---|---|---|---|
| FORM | Undulating foothills, flat plateau. | Smooth hills, patches of trees, smooth and gentle fields | Linear roads, wind turbines, power poles, rectangular buildings |
| LINE | Rolling horizon line, smooth hill slopes, flat plateau | Geometric agriculture, butt edge, irregular patches on hills | Horizontal and perpendicular road bands, vertical wind turbines and power poles |
| COLOR | Dull soft earth tones | Natural tan, light green, and dark green on hills, light green agriculture | Yellow, grey, red, blue, and white buildings, white turbines, brown power poles, grey roads |
| TEX-TURE | Smooth undulating hills with grooves, smooth flat plateau | Smooth agricultural fields, smooth hills, uneven | Clustered buildings, smooth directional roads, rough power poles and wind turbines |

SECTION C. PROPOSED ACTIVITY DESCRIPTION

| | 1. LAND/WATER | 2. VEGETATION | 3. STRUCTURES |
|---|---|---|---|
| FORM | Crest of upper reservoir, indistinct, rectangular, linear | Unchanged | Unchanged |
| LINE | Regular, indistinct, converging with horizon line | Unchanged | Unchanged |
| COLOR | Dull tan, subtle earth monotone | Unchanged | Unchanged |
| TEX-TURE | Fine, uniform, continuous | Unchanged | Unchanged |

SECTION D. CONTRAST RATING __SHORT TERM _X_ LONG TERM

| 1. DEGREE OF CONTRAST | | FEATURES: LAND/WATER BODY (1) STRONG | MODERATE | WEAK | NONE | VEGETATION (2) STRONG | MODERATE | WEAK | NONE | STRUCTURES (3) STRONG | MODERATE | WEAK | NONE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ELEMENTS | FORM | | | X | | | | | X | | | X | |
| | LINE | | | X | | | | X | | | | X | |
| | COLOR | | | | X | | | | X | | | | X |
| | TEXTURE | | | | X | | | X | | | | X | |

2. Does project design meet visual resource management objectives? _X_ Yes ___No (Explain on reverses side)

3. Additional mitigating measures recommended ___Yes _X_ No (Explain on reverses side)

| Evaluator’s Names | Date |
|---|---|
| M. Alves and G. Turner | 4/24/2015 |
| C. Shoemaker and J. Moffett | 5/16/2019 |

Form 8400-4

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
**VISUAL CONTRAST RATING WORKSHEET**

**Date:** April 24, 2015 and May 16, 2019

**District/ Field Office:** Prineville/Spokane

**Resource Area:** Spokane

**Activity (program):** Goldendale Pumped Storage

## SECTION A. PROJECT INFORMATION

**1. Project Name:** John Day Pump Storage
**2. Key Observation Point:** 2
**3. VRM Class:** N/A
**Elevation:** 1908'

**4. Location**
**Township:** T3N
**Range:** R17E
**Section:** S6

**5. Location details/Sketch:** Intersection of Hoctor Road and Willis Road

## SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

| | 1. LAND/WATER | 2. VEGETATION | 3. STRUCTURES |
|---|---|---|---|
| FORM | Undulating foothills, flat plateau. | Patches of sparse and coarse forest, smooth and gentle fields | Linear road, fences, irrigation lines, rectangular barn, and vertical wind turbines. |
| LINE | Rolling horizon line, smooth hill slopes, flat plateau | Geometric agriculture, butt, digitate, and diffuse edge, irregular patches | Linear road, fences, and irrigation lines, geometric buildings, vertical wind turbines and power poles |
| COLOR | Dull soft earth tones | Natural tan, light green, dark green | White, grey, brown, red |
| TEX-TURE | Smooth undulating hills with grooves, smooth flat plateau | Smooth fields, stippled and smooth hills, patches, uneven and sparse | Smooth, rough, coarse |

## SECTION C. PROPOSED ACTIVITY DESCRIPTION

| | 1. LAND/WATER | 2. VEGETATION | 3. STRUCTURES |
|---|---|---|---|
| FORM | Crest of upper reservoir, rectangular, linear | Unchanged | Unchanged |
| LINE | Linear horizon line, converging with hill slope | Unchanged | Unchanged |
| COLOR | Dull tan, subtle earth monotone | Unchanged | Unchanged |
| TEX-TURE | Uniform, fine surface, adds roughness to hills | Unchanged | Unchanged |

## SECTION D. CONTRAST RATING __SHORT TERM X LONG TERM

| 1. DEGREE OF CONTRAST | | FEATURES: LAND/WATER BODY (1) STRONG | MODERATE | WEAK | NONE | VEGETATION (2) STRONG | MODERATE | WEAK | NONE | STRUCTURES (3) STRONG | MODERATE | WEAK | NONE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ELEMENTS | FORM | | X | | | | | X | | | | X | |
| | LINE | | X | | | | | X | | | | X | |
| | COLOR | | | X | | | | X | | | | X | |
| | TEXTURE | | | X | | | | X | | | | X | |

2. Does project design meet visual resource management objectives? X Yes ___No
(Explain on reverses side)

3. Additional mitigating measures recommended
___Yes X No (Explain on reverses side)

| Evaluator's Names | Date |
|---|---|
| M. Alves and G. Turner | 4/24/2015 |
| C. Shoemaker and J. Moffett | 5/16/2019 |

Form 8400-4

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
**VISUAL CONTRAST RATING WORKSHEET**

**Date:** April 24, 2015 and May 16, 2019

**District/ Field Office:** Prineville/Spokane

**Resource Area:** Spokane

**Activity (program):** Goldendale Pumped Storage

## SECTION A. PROJECT INFORMATION

**1. Project Name:** John Day Pump Storage
**2. Key Observation Point: 3**
**3. VRM Class:** N/A
**Elevation:** 3020'

**4. Location**
**Township:** T3N
**Range:** R173
**Section:** S28

**5. Location details/Sketch:** View of lower reservoir from Juniper Point

## SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

| | 1. LAND/WATER | 2. VEGETATION | 3. STRUCTURES |
|---|---|---|---|
| FORM | Flat Plateau, undulating hills, linear and curved river, abrupt cliffs | Geometric agriculture, sparse patches of trees | Random diffuse, linear, massive |
| LINE | Linear, flat, vertical, horizontal | Geometric, diffuse, random | Linear, geometric, random, clustered |
| COLOR | Brown, red, blue | Brown, green, tan | Grey, white |
| TEX-TURE | Smooth, medium, rough | Smooth | Smooth, coarse, rough |

## SECTION C. PROPOSED ACTIVITY DESCRIPTION

| | 1. LAND/WATER | 2. VEGETATION | 3. STRUCTURES |
|---|---|---|---|
| FORM | Flat, large, prominent, regular, rounded, small slopes and stepped slopes | Unchanged | Linear, horizontal |
| LINE | Curved, simple, bold, geometric, horizontal, butt edge, diagonal. | Unchanged | Weak, linear bands |
| COLOR | Dark red and cool monotone blue | Unchanged | Grey |
| TEX-TURE | Uniform, fine, medium grain stepped slope | Unchanged | Fine |

## SECTION D. CONTRAST RATING __SHORT TERM _X_ LONG TERM

| 1. DEGREE OF CONTRAST | | FEATURES | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | LAND/WATER BODY (1) | | | | VEGETATION (2) | | | | STRUCTURES (3) | | | |
| | | STRONG | MODERATE | WEAK | NONE | STRONG | MODERATE | WEAK | NONE | STRONG | MODERATE | WEAK | NONE |
| ELEMENTS | FORM | | X | | | | | X | | | | X | |
| | LINE | | X | | | | | X | | | | X | |
| | COLOR | | | X | | | X | | | | | X | |
| | TEXTURE | | | X | | | X | | | | | X | |

2. Does project design meet visual resource management objectives? _X_ Yes ___ No (Explain on reverses side)

3. Additional mitigating measures recommended ___ Yes _X_ No (Explain on reverses side)

| Evaluator's Names | Date |
|---|---|
| M. Alves and G. Turner | 4/24/2015 |
| C. Shoemaker and J. Moffett | 5/16/2019 |

Form 8400-4

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
**VISUAL CONTRAST RATING WORKSHEET**

**Date:** April 24, 2015 and May 16, 2019

**District/ Field Office:** Prineville/Spokane

**Resource Area:** Spokane

**Activity (program):** Goldendale Pumped Storage

## SECTION A. PROJECT INFORMATION

**1. Project Name:** John Day Pump Storage
**2. Key Observation Point:** 4
**3. VRM Class:** N/A
**Elevation:** 950'

**4. Location**
**Township:** T3N
**Range:** R173
**Section:** S28

**5. Location details/Sketch:** View of lower plateau from pullout on Highway 14

## SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

| | 1. LAND/WATER | 2. VEGETATION | 3. STRUCTURES |
|---|---|---|---|
| FORM | Sloped and undulating hills, linear and curved river, flat plateau, abrupt cliffs | Random and irregular patches of trees, regular ground cover | Linear, broad flat, vertical |
| LINE | Linear, horizontal, vertical, curved | Digitate and diffuse edges, irregular patches, even ground cover | Horizontal, vertical, geometric |
| COLOR | Red, dull earth tones, brown | Light and dark green, brown | Grey, white, red |
| TEX-TURE | Smooth, coarse | Smooth, fine grain, medium roughness | Smooth, medium, coarse |

## SECTION C. PROPOSED ACTIVITY DESCRIPTION

| | 1. LAND/WATER | 2. VEGETATION | 3. STRUCTURES |
|---|---|---|---|
| FORM | Flat, large, prominent, regular, rounded, small slopes and stepped slopes | Unchanged | Horizontal |
| LINE | Curved, simple, bold, geometric, parallel, butt edge, diagonal | Unchanged | Linear bands |
| COLOR | Monotone blue, dark red | Unchanged | Grey |
| TEX-TURE | Uniform, fine, medium grain stepped slope | Unchanged | Fine, smooth |

## SECTION D. CONTRAST RATING __SHORT TERM _X_ LONG TERM

| 1. DEGREE OF CONTRAST | | FEATURES: LAND/WATER BODY (1) STRONG | MODERATE | WEAK | NONE | VEGETATION (2) STRONG | MODERATE | WEAK | NONE | STRUCTURES (3) STRONG | MODERATE | WEAK | NONE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ELEMENTS | FORM | | X | | | | X | | | | X | | |
| | LINE | | | X | | | X | | | | X | | |
| | COLOR | | X | | | X | | | | | X | | |
| | TEXTURE | | | X | | X | | | | | X | | |

2. Does project design meet visual resource management objectives? _X_ Yes ___No (Explain on reverses side)

3. Additional mitigating measures recommended ___Yes _X_ No (Explain on reverses side)

| Evaluator's Names | Date |
|---|---|
| M. Alves and G. Turner | 4/24/2015 |
| C. Shoemaker and J. Moffett | 5/16/2019 |

Figure Form 8400

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
**VISUAL CONTRAST RATING WORKSHEET**

**Date:** April 24, 2015 and May 16, 2019

**District/ Field Office:** Prineville/Spokane

**Resource Area:** Spokane

**Activity (program):** Goldendale Pumped Storage

SECTION A. PROJECT INFORMATION

| | | |
|---|---|---|
| **1. Project Name:** John Day Pump Storage<br>**2. Key Observation Point:** 5<br>**3. VRM Class:** N/A<br>**Elevation:** 177’ | **4. Location**<br>**Township:** T3N<br>**Range:** R173<br>**Section:** S28 | **5. Location details/Sketch:** Intersection of Highway 97 and Hoctor Road<br>  |

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

| | 1. LAND/WATER | 2. VEGETATION | 3. STRUCTURES |
|---|---|---|---|
| FORM | Sloped and undulating hills, linear, flat, abrupt cliffs | Medium, sparse, gradation | Even, clustered, sparse |
| LINE | Linear, undulating, horizontal, vertical | Digitate and diffuse edge, uneven, random | Vertical, horizontal, random |
| COLOR | Red, brown, dull earth colors, tan | Dark and light green, tan, brown | Grey, white |
| TEX-TURE | Smooth, coarse grain, rough | Medium grain, smooth | Rough, coarse and medium grain |

SECTION C. PROPOSED ACTIVITY DESCRIPTION

| | 1. LAND/WATER | 2. VEGETATION | 3. STRUCTURES |
|---|---|---|---|
| FORM | Flat, sloped, regular | Unchanged | Unchanged |
| LINE | Simple, horizontal butt edge, diagonal slope | Unchanged | Unchanged |
| COLOR | Dark red | Unchanged | Unchanged |
| TEX-TURE | Fine grain, smooth | Unchanged | Unchanged |

SECTION D. CONTRAST RATING __SHORT TERM _X_LONG TERM

| 1. DEGREE OF CONTRAST | | FEATURES: LAND/WATER BODY (1) STRONG | MODERATE | WEAK | NONE | VEGETATION (2) STRONG | MODERATE | WEAK | NONE | STRUCTURES (3) STRONG | MODERATE | WEAK | NONE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ELEMENTS | FORM | | | X | | | | X | | | | | X |
| | LINE | | | X | | | | X | | | | | X |
| | COLOR | | | | X | | | X | | | | | X |
| | TEXTURE | | | | X | | | X | | | | | X |

2. Does project design meet visual resource management objectives? _X_Yes ___No (Explain on reverses side)

3. Additional mitigating measures recommended ___Yes _X_No (Explain on reverses side)

| Evaluator’s Names | Date |
|---|---|
| M. Alves and G. Turner | 4/24/2015 |
| C. Shoemaker and J. Moffett | 5/16/2019 |

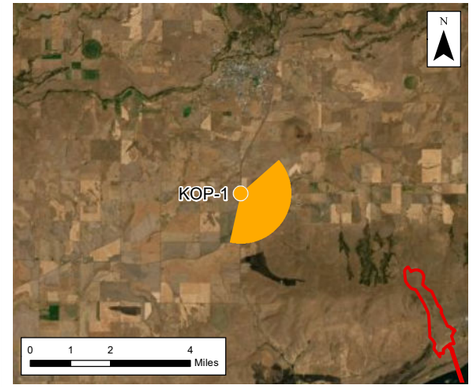
**ATTACHMENT 3:**

**PHOTOMONTAGE**


Existing View


Wireframe


Visual Simulation




**Legend**

- Key Observation Point (KOP) and View Angle

KOP-1
West of the intersection of Hoctor Road and Highway 97

Latitude: 45.776974
Longitude: -120.823225
State Plane Northing: 161,948.70 ft
State Plane Easting: 1,557,944.26 ft
Elevation: 1719.01 ft
Orientation: ESE
Date: 5/15/2019
Vertical Field of View: 28°
Horizontal Field of View: 144°

**Figure A-1**
**KOP 1: Master Sheet**
Final License Application
Goldendale Energy Storage Project
Goldendale, WA

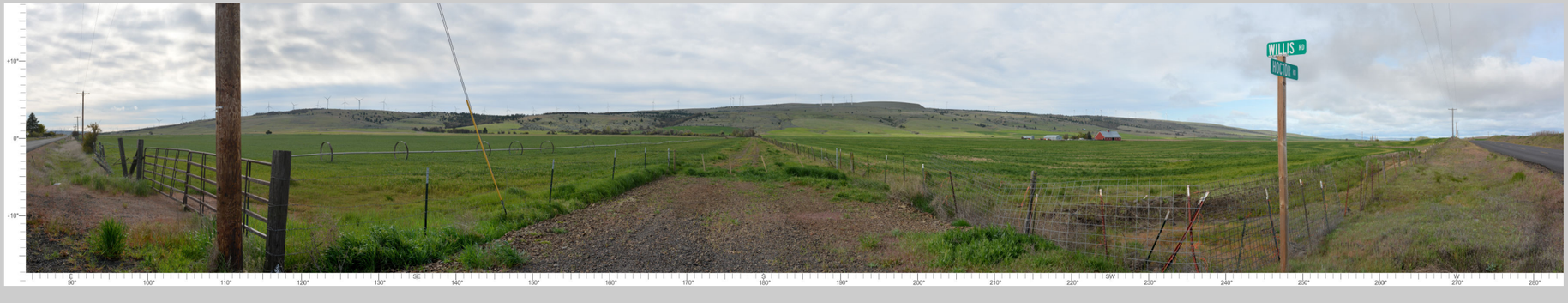
Environmental Resources Management
www.erm.com
ERM

FILE: M:\Projects\Goldendale Energy Storage Project\maps\DLA 2019\Exhibit E Section 8 Photomontage Mastersheets.mxd, REVISED: 10/29/2019 , SCALE: 1:240,000 when printed at 11x17 Created By: Kelly Lyons Date: 10/29/2019 Project: 0483340

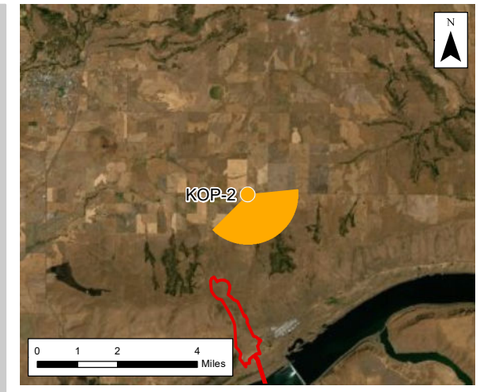
NAD 1983 StatePlane Washington South FIPS 4602 Feet


Existing View


Wireframe




Visual Simulation




**Legend**

- Key Observation Point (KOP) and View Angle

KOP-2
Intersection of Willis Road and Hoctor Road facing south

Latitude: 45.780501
Longitude: -120.719242
State Plane Northing: 163,143.61 ft
State Plane Easting: 1,584,480.68 ft
Elevation: 1908.35 ft
Orientation: S
Date: 5/15/2019
Vertical Field of View: 34°
Horizontal Field of View: 141°

**Figure A-2**
**KOP 2: Master Sheet**
**Final** License Application
Goldendale Energy Storage Project
Goldendale, WA

Environmental Resources Management
www.erm.com
ERM

Created By: Kelly Lyons Date: 10/29/2019 Project: 0483340

FILE: M:\Projects\Goldendale Energy Storage Project\maps\DLA 2019\Exhibit E Section 8 Photomontage Mastersheets.mxd, REVISED: 10/29/2019 , SCALE: 1:240,000 when printed at 11x17

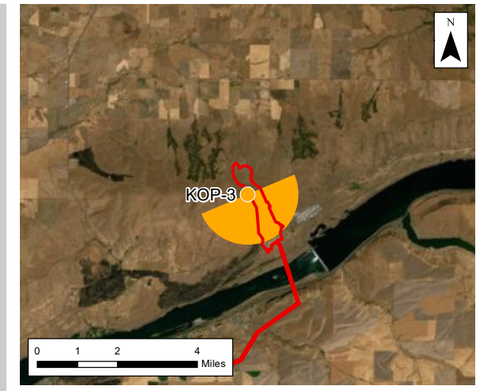
NAD 1983 StatePlane Washington South FIPS 4602 Feet

FILE: M:\Projects\Goldendale Energy Storage Project\maps\DLA 2019\Exhibit E Section 8 Photomontage Mastersheets.mxd, REVISED: 10/29/2019 , SCALE: 1:240,000 when printed at 11x17 Created By: Kelly Lyons Date: 10/29/2019 Project: 0483340

Existing View

Wireframe

Visual Simulation




**Legend**

- Key Observation Point (KOP) and View Angle

KOP-3
At the top of the Columbia Hills at Juniper Point looking south

Latitude: 45.739198
Longitude: -120.730625
State Plane Northing: 148,090.41 ft
State Plane Easting: 1,581,532.27 ft
Elevation: 3019.48 ft
Orientation: SSE
Date: 5/15/2019
Vertical Field of View: 35°
Horizontal Field of View: 180°

**Figure A-3**
**KOP 3: Master Sheet**
**Final** License Application
Goldendale Energy Storage Project
Goldendale, WA

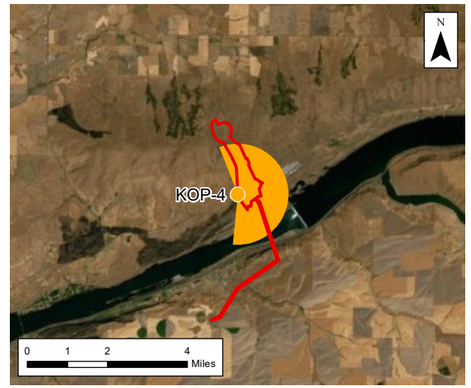
Environmental Resources Management
www.erm.com
ERM

NAD 1983 StatePlane Washington South FIPS 4602 Feet

Existing View

Wireframe

Visual Simulation




**Legend**

- Key Observation Point (KOP) and View Angle

KOP-4
On gravel pullout adjacent to the southeast side of Highway 14

Latitude: 45.723565
Longitude: -120.724968
State Plane Northing: 142,385.52 ft
State Plane Easting: 1,582,960.48 ft
Elevation: 950.13 ft
Orientation: ENE
Date: 5/15/2019
Vertical Field of View: 50°
Horizontal Field of View: 208°

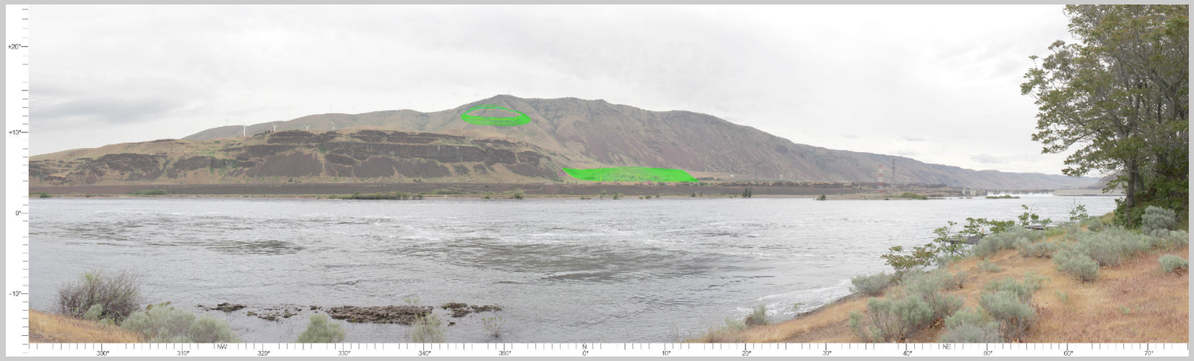
**Figure A-4**
**KOP 4: Master Sheet**
**Final** License Application
Goldendale Energy Storage Project
Goldendale, WA

Environmental Resources Management
www.erm.com

FILE: M:\Projects\Goldendale Energy Storage Project\maps\DLA 2019\Exhibit E Section 8 Photomontage Mastersheets.mxd, REVISED: 10/29/2019 , SCALE: 1:240,000 when printed at 11x17 Created By: Kelly Lyons Date: 10/29/2019 Project: 0483340

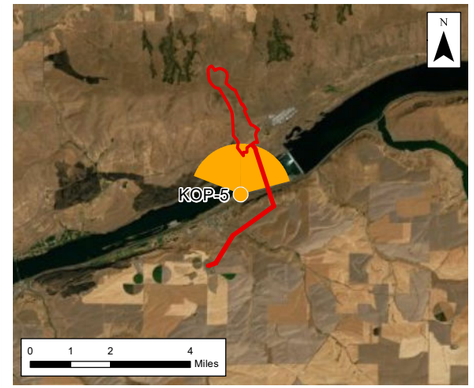
NAD 1983 StatePlane Washington South FIPS 4602 Feet

Existing View



Wireframe

Visual Simulation




**Legend**

- Key Observation Point (KOP) and View Angle

KOP-5
Near the town of Rufus along the bank of the Columbia River in Giles French/John Day Dam Park

Latitude: 45.704053
Longitude: -120.721325
State Plane Northing: 135,267.64 ft
State Plane Easting: 1,583,870.98 ft
Elevation: 176.56 ft
Orientation: N
Date: 5/15/2019
Vertical Field of View: 40°
Horizontal Field of View: 144°

**Figure A-5**
**KOP 5: Master Sheet**
Final License Application
Goldendale Energy Storage Project
Goldendale, WA

Environmental Resources Management
www.erm.com

NAD 1983 StatePlane Washington South FIPS 4602 Feet