Appendix N: Historic and Cultural Resources Technical Report

For Programmatic Environmental Impact Statement on Utility-Scale Solar Energy Facilities in Washington State

By

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For the

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Washington State Department of Ecology

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Acronyms and Abbreviations List

ARPA	Archaeological Resources Protection Act
CFR	*Code of Federal Regulations*
DAHP	Washington State Department of Archaeology and Historic Preservation
Ecology	Washington State Department of Ecology
GEO	Washington State Governor's Executive Order
GLO	Government Land Office
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
PEIS	Programmatic Environmental Impact Statement
RCW	Revised Code of Washington
SEPA	State Environmental Policy Act
SHPO	State Historic Preservation Office
TCP	Traditional Cultural Property
THPO	Tribal Historic Preservation Office
USC	*United States Code*
WISAARD	Washington Information System for Architectural and Archaeological Records Data

Summary

This technical resource report describes the conditions of cultural resources in the study area. It also describes the regulatory context, potential impacts, and measures that could avoid or reduce impacts.

Cultural resources analyzed in this report include the following:

- Archaeological resources, both recorded and unrecorded
- Historic architectural buildings and structures listed or eligible for listing in a historic register
- Human remains and cemeteries
- Sacred sites
- Documented and undocumented Traditional Cultural Properties

Each cultural resource's significance is unique to that resource; therefore, the impact analysis will also be unique and would need to be conducted during future project-level review for facilities. Specific facilities and site-specific resources, impacts, and mitigation strategies are not addressed by the Programmatic Environmental Impact Statement (PEIS)—it is a planning document that takes a broad look at resources and impacts.

The significance of impacts to cultural resources specific to Tribes analyzed within this report can only be understood from within the cultural context of an affected Tribe. Accordingly, impact assessment and determinations of significance or non-significance to Tribal cultural resources would be done with engagement and in consultation with Tribes.

Crosswalk with Historic and Cultural Resources Technical Report for Utility-Scale Onshore Wind Energy

Two PEISs are being released at the same time, one for utility-scale solar energy facilities and one for utility-scale onshore wind energy facilities. This crosswalk identifies the areas with substantial differences between the historic and cultural resources technical reports for each PEIS.

Utility-Scale Solar Energy PEIS (this document)	Utility-Scale Onshore Wind Energy PEIS
• Differences in specific impact drivers associated with facilities	• Larger study area includes consideration of additional geographic regions • Differences in specific impact drivers associated with facilities

1 Introduction

This technical resource report describes analysis of probable impacts on cultural resources from utility-scale solar facilities that may be considered within the study area. Chapter 2 of the State Environmental Policy Act (SEPA) Programmatic Environmental Impact Statement (PEIS) provides a description of the types of facilities evaluated (alternatives).

This section provides an overview of the aspects of historic and cultural resources evaluated and lists relevant regulations that contribute to the evaluation of potential impacts.

1.1 Resource description

Cultural resources analyzed in this report include the following:

- Archaeological resources, both recorded and unrecorded
- Historic architectural buildings and structures listed or eligible for listing in a historic register
- Human remains and cemeteries
- Sacred sites
- Documented and undocumented Traditional Cultural Properties (TCPs)

The following resources could have impacts that overlap with impacts to cultural resources. Impacts on these resources are reported in their respective technical resource reports:

- **Tribal rights, interests, and resources:** Revised Code of Washington (RCW) 43.21C.535 directs the Washington State Department of Ecology (Ecology), as part of the nonproject environmental review process, to identify potential impacts on Tribal rights, interests, and resources. These rights, interests, and resources include Tribal cultural resources, archaeological sites, sacred sites, fisheries, or other rights and interests in Tribal lands and lands within which an Indian Tribe or Tribes possess rights reserved or protected by federal treaty, statute, or executive order and are described in the *Tribal Rights, Interests, and Resources Technical Report* (Appendix B). Certain information obtained by Ecology under this section is exempt from disclosure consistent with RCW 42.56.300.
- **Earth:** The *Earth Resources Technical Report* (Appendix D) details excavation, grading, and other disturbances to existing or native ground; ground disturbance has the potential to impact historic and cultural resources.
- **Noise and vibration:** Vibration from construction activities could result in impacts to adjacent historic structures or TCPs. Potential vibration impacts are detailed in the *Noise and Vibration Technical Resource Report* (Appendix J).

1.1.1 Washington State Department of Archaeology and Historic Preservation terminology

Historic properties are sites, buildings, structures, districts, and objects that are eligible for listing or listed in the National Register of Historic Places (NRHP).

The Washington State Department of Archaeology and Historic Preservation's (DAHP's) Washington Information System for Architectural and Archaeological Records Data (WISAARD) is the central repository for cultural resource data. Historic building information is publicly available. Archaeological, cultural, and sacred sites are not subject to public disclosure and some may only be known to a Tribal cultural resources department or official.

Historic properties that are **eligible for inclusion in the NRHP** are those that have formally been evaluated by staff at a federal or state agency in consultation with the State Historic Preservation Office (SHPO) and have been determined by evaluators to meet the criteria for listing in the NRHP.

An **archaeological site** is the location of objects that comprise the physical evidence of an Indigenous and subsequent culture, including material remains of past human life, such as monuments, symbols, tools, facilities, and technological byproducts. DAHP has established that an archaeological site must contain at least two archaeological objects; a single archaeological object is known as an archaeological isolate.

Archaeological or historic districts possess "a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development" (NPS 1997). Resources within historic districts that contribute to the district's character (called **contributing resources**) receive the same considerations and protections as individually listed properties.

A **TCP** is a property or a place that is inventoried or determined to be eligible for inclusion on the NRHP or the Washington Heritage Register because of its association with cultural practices and beliefs that are: 1) rooted in the community's history, and 2) important to maintaining the continuing cultural identity of the community's traditional beliefs and practices (DAHP 2017).

The term **sacred site** means any specific, discrete, narrowly delineated location on federal or state land that is identified by an Indian Tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion, provided that the Tribe or appropriately authoritative representative of an Indian religion has informed the lead federal agency under the National Historic Preservation Act (NHPA) or the lead state agency under Washington State Governor's Executive Order (GEO) 21-02 of the existence of such a site (Executive Order 13007).

Cemetery means any one or more of the following, in a place used, or intended to be used, for the placement of human remains and dedicated for cemetery purposes: a burial park, for earth

interments; a mausoleum, for crypt interments; a columbarium, for permanent niche interments; or for the purposes of Chapter 68.60 RCW only, "cemetery" means any burial site, burial grounds, or place where five or more human remains are buried. Unless a cemetery is designated as a parcel of land identifiable and unique as a cemetery within the records of the county assessor, a cemetery's boundaries shall be a minimum of 10 feet in any direction from any burials therein (RCW 68.04.040).

Integrity is "the ability of a property to convey its significance" (NPS 1997). There are seven aspects that comprise integrity: location, setting, materials, design, workmanship, feeling, and association. A resource's integrity is different than its condition; the former refers to the resource's ability to convey its significance, whereas the latter refers to its physical condition. A poor condition can lead to the deterioration of elements that contribute to a resource's integrity, but they are two distinctly different ways to describe a resource (NPS 1997).

1.2 Regulatory context

Potentially applicable federal, state, and local laws and regulations that address cultural resources and could apply to solar facilities are listed in Table 1.

Table 1. Applicable laws, plans, and policies

Regulation, statute, guideline	Description
Federal	
Antiquities Act of 1906 (54 *United States Code* [USC] 320301-320303, 18 USC 1866(b))	The Antiquities Act was enacted in 1906 and grants the President the authority to designate national monuments to protect significant natural, cultural, or scientific features. The goal of the act is to preserve public lands and cultural heritage, and it has played an important role in the formation of historic preservation policy. The act establishes a process of creating national monuments and protecting archaeological sites on federal land from looting and vandalism.
Preservation of American Antiquities (43 *Code of Federal Regulations* [CFR] 3)	These are implementing regulations for the Antiquities Act. The regulations establish the permitting process and the treatment of the archaeological objects collected as a result.
Archaeological and Historic Preservation Act (Moss-Bennett Act, Archaeological Recovery Act) (54 USC 312501-312508)	The act applies to all federal projects or federally assisted or licensed projects, activities, or programs. The act requires the preservation of significant scientific, precontact, historical, or archaeological data that would be irrevocably lost or destroyed by the activity. Then the federal agency must undertake the recovery, protection, and preservation of the data. This act can extend to private individuals, associations, or public entities if their project receives federal financial assistance.

Regulation, statute, guideline	Description
Archaeological Resources Protection Act (ARPA) (16 USC 470aa–mm)	Enacted in 1979 to safeguard archaeological resources on public and Indian lands. Key provisions of ARPA emphasize its role in preventing the excavation, removal, or damage of cultural artifacts and archaeological sites. The act creates the requirement for permits for archaeological activities, penalties for violations, and the collaborative efforts between government agencies, Tribes, and the public to protect and preserve archaeological resources. It also establishes the prohibition of public disclosure of sensitive information, specifically the description and location of archaeological sites.
Protection of Archaeological Resources (43 CFR 7)	Along with 43 CFR 3, these are the implementing regulations for ARPA. These regulations provide more detail regarding the permitting process, curation of archaeological objects, enforcement, and confidentiality of archaeological information. The regulations also establish the requirement to notify Tribes when a permit issued under the act may harm or destroy Indian Tribal religious or cultural sites on public lands and provides a definition of "sites of religious or cultural importance."
National Historic Preservation Act (NHPA) (54 USC 300101 et seq.)	The NHPA was signed into law on October 15, 1966, for the management and preservation of historical and archaeological sites. This act created the National Register of Historic Places (NRHP), National Historic Landmarks List, State Historic Preservation Office (SHPO), and Tribal Historic Preservation Office (THPO). Washington State's SHPO is the Washington State Department of Archaeology and Historic Preservation (DAHP), which is the state agency that administers NHPA compliance in Washington.
NRHP (54 USC 302101-302108)	This section of the NHPA establishes the NRHP, the authority to establish procedures for listing in the NRHP, and the right of the owner of the potential property to object to the listing in the NRHP.
Section 106 of the NHPA (54 USC 306108)	The procedures for implementing the NHPA are detailed in the Protection of Historic Places regulations. Section 106 of the NHPA requires federal agencies to consider the effects of project undertakings, project approvals, or project funding on historic properties. This process requires consultation with the relevant THPO, Indian Tribes, and Native Hawaiian organizations.
Section 110 of the NHPA (54 USC 306101-306114)	This section of the NHPA requires each federal agency to assume responsibility for the preservation of historic properties that they own or control. Part of this responsibility is to identify, evaluate, and protect historic properties.
36 CFR 60	This section of the regulations establishes the procedural requirements for listing on the NRHP.
36 CFR 61	This section of the regulations outlines the procedures and responsibilities for SHPOs, THPOs, and Certified Local Governments. This section also establishes the minimum professional qualifications for archaeology and historic preservation.
National Environmental Policy Act (NEPA) (42 USC 4321 et seq.)	NEPA requires that federal agencies assess the environmental impacts of proposed federal actions, including impacts on historic and cultural resources. The NEPA process is often completed alongside Section 106 of the NHPA.

Regulation, statute, guideline	Description
Native American Graves Protection and Repatriation Act (NAGPRA) (25 USC 3001-3013)	Enacted on November 16, 1990, NAGPRA establishes rights for lineal descendants, Native Americans and Tribes, and Native Hawaiian organizations to repatriate their culturally affiliated items, including human remains, associated and unassociated funerary objects, sacred objects, and objects of cultural patrimony. NAGPRA includes provisions for unclaimed and culturally unidentifiable Native American cultural items and the intentional and inadvertent discovery of Native American cultural items on federal and Tribal lands only.
American Indian Religious Freedom Act (42 USC 1996)	Establishes the policy to protect and preserve Tribal religions. The act requires that federal agencies managing federal land accommodate access to and ceremonial use of Indian scared sites and avoid adverse effects on the physical integrity of the sites.
Protection and Enhancement of the Cultural Environment (Executive Order 11593)	The 1971 executive order establishes the policy that federal agencies should administer federal projects in a way that preserves, restores, and maintains historic and cultural resources for future generations.
Indian Sacred Sites (Executive Order 13007)	The 1996 executive order directs federal agencies to manage federal lands to accommodate access to and ceremonial use of Indian sacred sites and avoid adverse effects on those sites. The executive order also establishes the importance of maintaining confidentiality of sacred sites.
Consultation and Coordination with Indian Tribal Governments (Executive Order 13175)	The 2000 executive order establishes principles for Tribal consultation that include supporting Tribal sovereignty and self-determination and interacting on a government-to-government level.
Preserve America (Executive Order 13287)	The 2003 executive order advances historic preservation policy by promoting the reuse of historic properties owned by the federal government and promoting intergovernmental cooperation regarding historic preservation.
State	
Chapter 27.53 Revised Code of Washington (RCW), Archaeological Sites and Resources	Relates to the conservation, preservation, and protection of archaeological sites and resources.
RCW 27.53.030, Professional Archaeologist Definition	Relates to the procedures of application for and review processes of archaeological excavations and removals; permits are issued by DAHP.
Chapter 25-48 Washington Administrative Code, Archaeological Excavation and Removal Permit	Establishes the procedures for application for and review processes of archaeological excavations and removals; permits are issued by DAHP.
RCW 42.56.300, Archaeological Site Public Disclosure Exemption	This section of the Public Records Act exempts records, maps, or other information identifying the location of archaeological sites and Traditional Cultural Places.
Archaeological and Cultural Resources (Washington State Governor's Executive Order [GEO] 21-02)	Enacted in 2021, GEO 21-02 requires state agencies to consider the impacts of project undertakings, project approvals, or project funding on significant cultural and historic properties. This process requires consultation with DAHP, the Governor's Office of Indian Affairs, and relevant Indian Tribes.

Regulation, statute, guideline	Description
RCW 19.27.120, Washington State Historic Building Code	Establishes the minimum standards for the restoration, rehabilitation, or strengthening of architecturally or historically significant buildings that are eligible or potentially eligible for listing in a historic register.
RCW 27.34.400, Heritage Barn Program	Relates to the preservation of heritage barns 50 years or older.
Chapter 27.44 RCW, Indian Graves and Records	Relates to the protection, management, and processes in the care of Indian Tribe cemeteries, historic graves, and related records.
Chapter 68.50 RCW, Human Remains	Relates to the protection, management, and processes in the care of human remains.
Chapter 68.60 RCW, Abandoned and Historic Cemeteries and Historic Graves	Relates to the preservation and protection of abandoned and historic cemeteries and graves, including human remains.
Chapter 43.376 RCW, Government-to-Government Relationship with Indian Tribes	This chapter establishes a requirement of state agencies to engage in government-to-government relationships with federally recognized Tribes.

1.2.1 Federal requirements

Section 106 of the NHPA requires federal agencies to consider the effects of their actions (including federally funded, permitted, or licensed projects) on properties listed in, or determined eligible for listing in, the NRHP. The Section 106 implementing regulations (36 *Code of Federal Regulations* Part 800) require the responsible federal agency (or their designee) to identify historic properties within a pre-determined project Area of Potential Effects. The consultation process also requires consultation with the SHPO, Tribal governments, and the public. When there is an adverse effect to a historic property, the federal agency must look for ways to avoid, minimize or mitigate harm.

1.2.2 State requirements

SEPA requires historic and cultural resources be evaluated in the environmental review process. The lead agency administering the SEPA action coordinates with DAHP, who is identified as an expert agency, and notifies potentially affected Tribes of probable adverse impacts from a proposed project. Additionally, RCW 43.21C.535 directs Ecology to identify probable impacts on Tribal rights, interests, and resources as part of the non-project environmental review process. Potential mitigation strategies are identified through consultation with DAHP and affected Tribes.

1.2.3 Local regulations

County and city governments throughout the state, including some within the study area for historic and cultural resources, have enacted laws protecting historic and cultural resources. These laws vary from establishing local historic registers, similar to the NRHP or Washington Heritage Register, to establishing pre-project review processes that must be completed before a local county or city agency issues a permit, similar to the NHPA Section 106 process.

1.2.4 Tribal consultation for cultural resources protection

Many federal, state, and local statutes and ordinances require notice and consultation with affected Tribes before, during, and after project review. Formal government-to-government consultation is between the federal government or the State of Washington with Tribal sovereign governments.

2 Methodology

2.1 Study area

The study area for historic and cultural resources includes the PEIS geographic scope of study for utility-scale solar energy facilities (Figure 1) and the surrounding areas. Facilities may have impacts localized to areas of construction and operation activities, or impacts may extend well beyond future proposed facility footprints, including cumulative impacts.

For projects on Tribal reservation lands, each federally recognized Tribe would determine use of their lands. Tribal reservation lands are not included in the PEIS geographic scope of study.

The PEIS geographic scope of study (Figure 1) includes various federal, state, and locally managed lands; however, Tribal reservation lands; national parks, wilderness areas, and wildlife refuges; state parks; and areas within cities and urban growth areas were excluded from the geographic scope of study. Some of these areas adjacent to the PEIS geographic scope of study are considered if they contain historic or cultural resources that may be impacted by facilities.

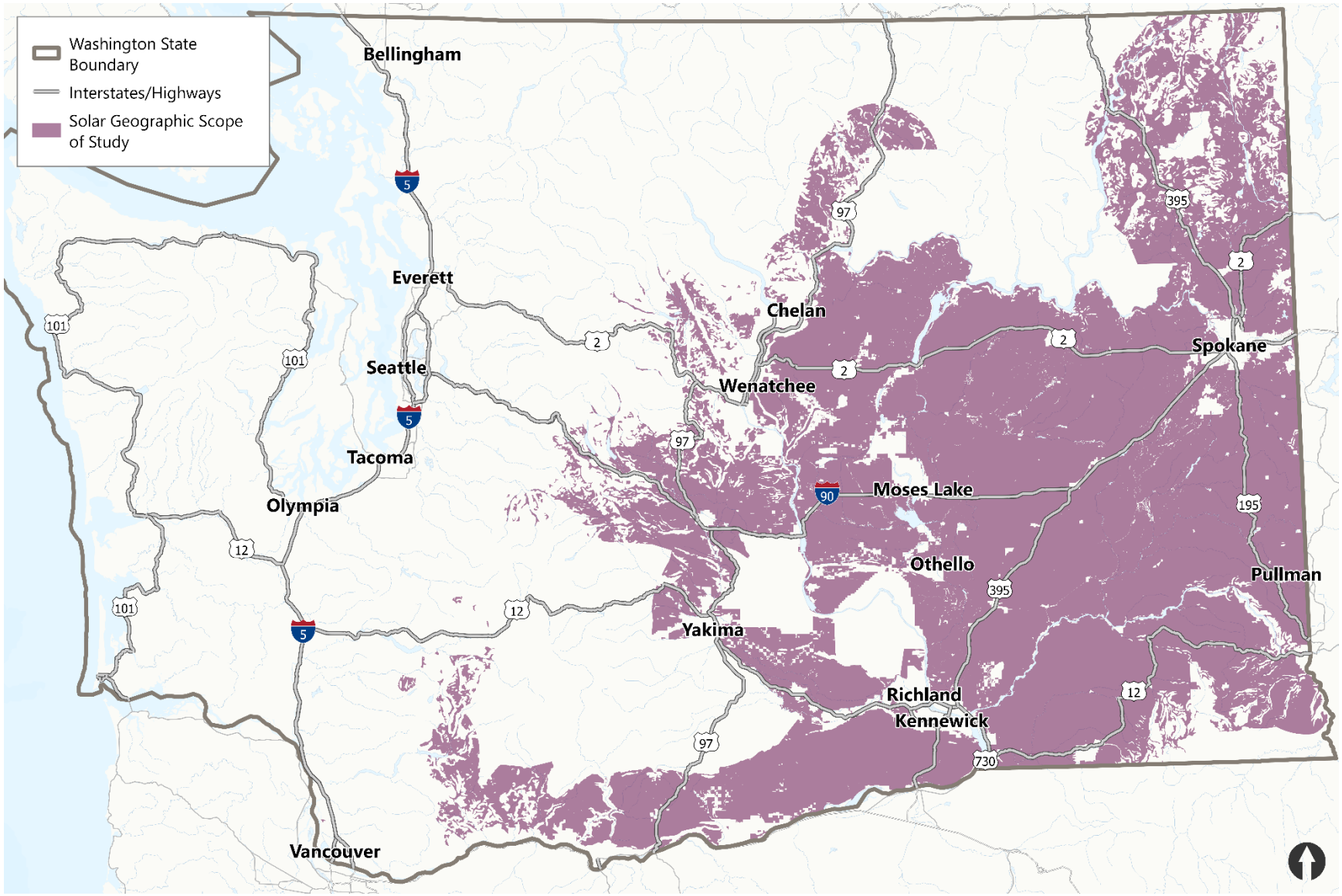

Figure 1. Solar Energy Facilities PEIS – geographic scope of study

2.2 Technical approach

This technical appendix provides information on broad potential impacts on cultural resources from utility-scale solar energy facilities for the PEISs. Cultural resources within the study area were analyzed using existing publicly available sources of information, as well as any information shared by Tribes during Ecology's Clean Energy Tribal Forums or review of draft resource information. Ecology invited early and meaningful engagement and offered consultation with any potentially affected federally recognized Tribe on the PEISs for the purpose of understanding, identifying, and mitigating, if possible, potential significant environmental impacts on Tribal rights, interests, and resources. These include Tribal cultural resources, archaeological sites, sacred sites, fisheries, or other rights and interests in Tribal lands and lands within which an Indian Tribe or Tribes possess rights reserved or protected by federal treaty, statute, or executive order. Sensitive information obtained by Ecology is exempt from disclosure consistent with RCW 42.56.300 and will be filed and labeled appropriately.

The impacts to cultural resources that could occur for the types of facilities considered in the PEISs are discussed based on common impacts that occur for utility-scale solar development facilities. These impacts could occur during site characterization, construction, operation, and decommissioning. Impacts could include disturbance, destruction, damage, alteration, and visual, atmospheric, or audible impacts. Each of these impacts is broadly characterized for each stage of development. However, each cultural resource's significance is unique to that resource; therefore, the impact analysis will also be unique and would need to be conducted during future project-level review for facilities. Specific facilities and site-specific resources, impacts, and mitigation strategies are not addressed by the PEIS—it is a planning document that takes a broad look at resources and impacts. Therefore, the analysis in this report focused on identifying historic and cultural resources and the impacts to those resources broadly.

The information presented in the next section is based on existing publicly available information. No new data gathering efforts, including archaeological and historic field surveys, TCP studies, or interviews, were conducted as part of this process. The authors acknowledge that these publicly available sources inherently contain deficiencies, and use of them is not intended to substitute or supersede knowledge held by Tribes.

The PEIS does not propose a process that would supersede the existing requirements provided for assessing historic or cultural resources under Section 106 of the NHPA, or Washington State laws and regulations. Site-specific data gathering efforts and engagement with Tribes and communities should be conducted on a project-by-project basis. The nature of those individual studies and efforts would be shaped by the regulatory requirements, location, and scale of the specific future project proposal. What should be common in all future projects is early and meaningful engagement with the Tribes and communities associated with the historic and cultural resources in the vicinity. This type of engagement, coordination, and consultation should be anticipated to continue throughout the life cycle of the projects.

2.2.1 Risk identification

2.2.1.1 Washington Information System for Architectural and Archaeological Records Data

DAHP maintains a digital database of recorded historic, archaeological, and traditional cultural properties. The database is known as WISAARD and is commonly used to identify the location of recorded archaeological sites, historic resources, cemeteries, historic districts, TCPs, NRHP-listed properties, and cultural survey reports. Some of the information is available to the public, but other information is restricted and requires DAHP's approval to access (Table 2). DAHP also hosts an archaeological predictive model that assesses the risk for finding an archaeological resource.

This information can be used to assist with site selection and facility design. In addition to data on specific past efforts and recorded historic and cultural resources, WISAARD contains important tools to help with understanding which Tribes have expressed the desire to be consulted in a given location, and the overall relative probability of encountering precontact archaeological resources in a given area. DAHP holds records of sensitive archaeological sites and TCPs that have restricted access. The details and locations of these restricted resources are shared on an as-needed basis through the consultation process.

Table 2. WISAARD layers

Data type	Public/restricted	Description
Property	Public	Inventoried historic built environment resources/Historic Property Inventory forms. Not all forms are complete. The layer also contains information on the historic register status of the building (unevaluated, eligible, or not eligible).
Register public	Public	Properties listed in the NRHP, the Washington State Heritage Register, and Heritage Barn Register.
Project/Area of Potential Effects	Public	Project areas shared with DAHP for consultation under the NHPA Section 106, GEO 21-02, the Washington SEPA, and Washington State Forest Practices rules.
Maritime	Public	Depicts the location of Maritime Heritage Area and maritime resources in Washington waters.
Tribal	Public	Compiled from several different sources, the layer contains historical treaty boundaries, Tribal reservation boundaries, and Tribal areas of interest for consultation, human remains, and oil spills.
Government Land Office (GLO) survey plat maps	Public	Digitized features based on the GLO survey plat map.
GLO images	Public	Georeferenced layer of select GLO survey maps.
Environmental	Public	Compiled from several different sources, the layer contains drainages, waterways, surface geology, and soil data.

Data type	Public/restricted	Description
Predictive model	Public	Statewide predictive model to predict the location of select archaeological sites.
Archaeological	Restricted	Archaeological sites, isolates, and districts recorded with DAHP.
Register	Restricted	Properties listed in the NRHP (including archaeological sites and districts), the Washington State Heritage Register, and Heritage Barn Register.
Cemeteries and human remains	Restricted	Recorded cemeteries throughout the state and location of human remains that were inadvertently discovered.
TCP	Restricted	TCPs recorded with DAHP made available by the Tribe or community who shared the information. May only be available to DAHP staff.
Cultural resources survey	Restricted	Cultural survey reports shared with DAHP written after 1995. Selected older studies are available but lack geospatial references.

Notes:
DAHP's use of "property" does not indicate eligibility and instead employs the common use of the term. Some NRHP-listed properties have Historic Property Inventory forms that identify the resource as unevaluated. This marker does not indicate the property is not listed or somehow remains unevaluated and listed; NRHP listing takes precedence.

2.2.1.2 DAHP archaeological predictive model

Archaeological resources are typically identified through archaeological survey work. The majority of the study area has not been archaeologically surveyed. According to DAHP, only a small percent of the state (less than 5%; DAHP 2020) has been surveyed for cultural resources at any level. Therefore, it should be assumed that potential facility sites have not been intensively surveyed. Tribal knowledge of specific areas may also contain information regarding the locations of precontact archaeological sites.

DAHP has created a predictive model to help determine the likelihood of precontact era archaeological sites being present based on environmental factors such as elevation, slope percent, aspect, distance to water, geology, soils, landforms as well as archaeological data including archaeological site locations, archaeological survey, and information depicted on Government Land Office (GLO) maps (DAHP 2010; Kauhi 2013). As indicated in Table 2, the predictive model can be found in DAHP's WISAARD database. The DAHP model uses five categories of prediction: low risk, moderately low risk, moderate risk, high risk, and very high risk. An updated predictive model will be available as of June 2025.

The varying levels of likelihood are associated with recommendations for archaeological survey in three categories:

- If a project area is very high risk or high risk, then DAHP would likely require an archaeological survey to be completed for the project.
- If an area is moderate risk, then DAHP would likely recommend an archaeological survey.

- If a project area is moderately low or low risk, then DAHP would likely only recommend a survey based on the project parameters.

The model's assessment of a location's probability to contain precontact period archaeological resources is based on the interplay between its constituent environmental and cultural variables. These variables reflect current environmental conditions and findings from initial GLO maps. An understanding of geomorphology and past land use and development is necessary to correctly apply and interpret the model. A full assessment of a location's probability to contain archaeological resources by a professional archaeologist may be higher or lower than the initial assessment provided by the DAHP model.

Using these assessments of probability to understand the likelihood of encountering cultural resources in a given location within the solar study area requires archival review of environmental and cultural sources. The model is intended to be used as an early planning tool to assist decision-makers, project managers, and planners in determining the level of effort that may be necessary to consider the archaeological resources that may be present. The model would be a helpful tool for planning potential solar facilities because it can guide which areas should be the focus of survey. Facility-level assessment could determine the level of effort that may be necessary to identify archaeological resources that may be present through background research into the environmental and cultural context of a given location. The results of this research would partially inform the specific methods and level of effort necessary to identify cultural resources. It is crucial to understand the level and type of both natural and anthropogenic disturbance a location has experienced when assessing the probability for a location to contain archaeological resources.

The predictive model is *not* a definitive assessment of a location's overall cultural resources sensitivity. Predictive models are only around 85% correct and do not account for cultural and sacred places. The model has less relevance for historic archaeological sites, TCPs, cemeteries, historic buildings, or areas of culturally significant plants or animals. The model is intended to provide a baseline risk assessment specifically for precontact archaeological sites and isolates. As a result, the model's results related to the probability for encountering precontact period archaeological resources is not intended to function as a definitive assessment of overall cultural resources sensitivity for an area. However, it is an effective early warning tool for understanding the baseline level of probability for encountering certain types of archaeological resources and assessing a general level of effort that may be needed for future studies.

A complete assessment of the probability for encountering all types of cultural resources requires a focused research effort into a wide range of archival resources, and consultation with affected Tribes. Tribes often hold detailed information about history of an area, which is a factor in assessing the probability of finding cultural resources in a given location. These ethnographic data are not incorporated into the DAHP predictive model, and often cannot be assessed by outside researchers without direct collaboration with Tribal knowledge holders. The Tribes contacted and archival resources reviewed as part of a full probability assessment would be unique to any particular location. The model's baseline probability assessments are

often considered in conjunction with archival research findings by researchers once a detailed archival effort has been conducted.

2.3 Impact assessment approach

The PEIS analyzes a timeframe of up to 20 years of potential project construction and up to 30 years of potential project operations (totaling up to 50 years into the future). General language about potential impacts to cultural resources is identified in the PEIS. This report includes consideration of the unique perspectives and specific impacts on a Tribe when evaluating impacts described in the PEIS. The significance of Tribal cultural resources analyzed within this report can only be understood from within the cultural context of an affected Tribe. Accordingly, the impact assessment and determinations of significance or non-significance of Tribal cultural resources would be determined with engagement and in consultation with Tribes on future projects.

3 Technical Analysis and Results

3.1 Overview

Cultural resources are unique, non-renewable resources. Utility-scale solar energy facilities could impact cultural resources in and around the areas where they are built. The potential for impacts is related to the amount of land disturbance and the location of the facility. Impacts include effects to the cultural landscape and reduction in accessibility to cultural site locations.

Historic properties is a federal term that includes archaeological or historic districts as well as historic and archaeological sites, structures, or objects that are listed in (or eligible for listing in) preservation registers such as the NRHP.

Cultural resources refer to a broad range of resources associated with human manipulation of the environment. These include all the resources that are potentially eligible for listing in the NRHP including sites, buildings, structures, districts, and objects.

Cultural resources include Tribal sites and TCPs, archaeological sites and other archaeological resources, historic properties, historic resources, homesteads, and landmarks. TCPs include locations that may be eligible for listing in the NRHP because of their association with cultural practices or beliefs of a living community. TCPs may be associated with Tribal ethnographic locations, such as villages, geographical features, and resource gathering areas. Tribal traditions are interwoven into the ecosystems in which Tribal members live, from hunting and gathering to sacred sites. Places and activities have spiritual and cultural meaning for Tribes.

Only a portion of the state has been mapped in detail for historic and cultural resources, and this report considers impacts at a broad level. Developers of future proposed projects would need to conduct site-specific cultural surveys to evaluate potential impacts in accordance with DAHP and federal requirements and guidance.

DAHP's databases identify the risk of potential cultural resources occurring in an area at a broad level, as well as identify known resources. Future facility developers would also incorporate review of publicly available published literature, anthropological reports, scoping comments, and consultation with Tribes to identify cultural resources. Tribal communities are the best sources of information about their cultural resources and potential impacts on such resources. Input from an affected Tribe regarding the potential impacts from utility-scale solar energy facilities will be relied upon to characterize impacts for that Tribe in the PEIS.

3.2 Affected environment

The affected environment represents existing conditions at the time this study was prepared. Throughout the study area there are lands, shorelines of major waterways, and their tributaries where Tribes have lived for thousands of years before present and continue to live and utilize these areas. Archaeological sites, historic properties, and Tribal place names are also present.

They include areas connected to spiritual practices and named places and are represented within oral tradition stories and historic documents.

The summaries presented below provide a simplified context for briefly introducing the human history of Washington state. This land has been utilized since before the retreat of the glaciers at the end of the Pleistocene. During the succeeding millennia, people have used a wide variety of strategies and approaches to interact with the landscape and its resources. As the environment has changed, so have those approaches. This has resulted in a history of human use and occupation that stretches across the entirety of the study area.

3.2.1 Precontact setting

The Western scientific approach to archaeology in Washington provides some information on the long and diverse history of the state. Only a very small portion of the state has been subject to any type of archaeological survey, yet the more than 37,000 archaeological sites that have been recorded demonstrate a variety of lifeways and cultural practices that coincide with many environments and landscapes in the state. The presence and age of archaeological sites in Washington state support a cultural continuity between today's Indigenous communities and the people associated with the archaeological sites. This section provides a broad summary of the current understanding of the archaeological record according to the Western scientific approach to archaeology and is largely based on DAHP's current State Historic Preservation Plan and DAHP's Field Guide to Washington Archaeology (DAHP 2003, 2020). Each Tribe may possess a distinct record, which may be publicly available or privately held, of their history that may differ from the chronology presented below.

3.2.1.1 Late Pleistocene/Early Holocene

Numerous archaeological sites in North America have been radiocarbon dated to older than 11,050 years ago; these sites are found in a wide variety of environments (Adovasio 2012; Erlandson et al. 2011; Kirk and Daugherty 2007; Lothrop 2015; Waters et al. 2007). The stone tools and archaeological features associated with these sites are unique from the later, more commonly observed archaeological sites. In Washington, this timeframe is referred to as Paleoindian, and the archaeological sites contain large fluted projectile points (Ames and Maschner 1999, Ames et al. 1998; Bergland 1983; Blukis Onat 1987; Burtchard 1998; Daugherty 1956; Leonhardy and Rice 1970; Mierendorf 1986; Kidd 1964; Schalk and Taylor 1988; Waters et al. 2011). During this time, glaciers began to retreat and humans began to utilize the majority of what is now Washington state. Site types would include small seasonal habitation sites related to resource gathering that would have occurred nearby (Ames and Maschner 1999; Mierendorf 1986; Waters et al. 2011). An archaeological site near East Wenatchee consisted of a large cache of Clovis points and other tools (Mehringer 1989). The Marmes Rockshelter Site, near Lyons Ferry, dates to more than 11,000 years ago and contains a diverse collection of artifacts that includes stone and bone tools, faunal and shell remains, storage pits, hearths, and burials (Hicks 2004).

3.2.1.2 Middle Holocene

The middle Holocene timeframe is often referred to as Olcott culture or the Cascade Phase (Ames and Maschner 1999; Ames et al. 1998; Blukis Onat 1987; Burtchard 1998; Chatters et al. 2011; Daugherty 1956; Kopperl et al. 2016; Leonhardy and Rice 1970; Miss and Campbell 1991; Kidd 1964; Reid and Gallison 1995; Schalk and Taylor 1988). The typical archaeological site types include small, seasonally occupied habitation areas; intensive resource gathering locations, such as upland hunting grounds; and quarry sites for stone tool manufacturing (Ames and Maschner 1999; Ames et al. 1998; McClure 1998). From 7,000 years ago to 6,000 years ago, the archaeological record shows a significant shift in subsistence and settlement patterns. This shift is characterized by a decrease in mobility and increase in resource utilization that coincided with a change to a warmer and drier climate, increase in population density, and resource abundance (Burtchard 1998; Kirk and Daugherty 2007; Mierendorf 1986; Schalk and Taylor 1988). The archaeological evidence points to the emergence of multi-season occupation at habitation sites by 6,000 years ago, indicating a less mobile lifeway. Also, marine resources appear more frequently in assemblages, and plant-based processing tools become more heavily used (Blukis Onat 1987). The stone tools from this timeframe included microblades and leaf-shaped projectile points, which are found across Washington (Greengo and Houston 1965; Hicks 2004).

3.2.1.3 Late Holocene

Another shift occurred in the archaeological record of the western part of the state around 3,000 years ago. The settlement pattern shifted to larger occupation sites that followed seasonal salmon fishing, and marine and terrestrial foraging and harvesting occurred at a greater frequency (Nelson 1990; Schalk and Taylor 1988; Stein 2000; Wessen 1988). Excavations at West Point in King County illustrate the cultural sequence from the middle to the late Holocene. West Point's function was not static, and the site conveys a shift in use at the location from a central habitation site to a resource extraction location over the approximately 5,000-year period this location was in use (Larson and Lewarch 1995).

On the east side of the state, this period is referred to by anthropologists as Phase II or the late Tucannon Phase and is characterized by winter-occupied pit houses and following a seasonal resource gathering strategy that revolved around salmon and seasonally available flora and fauna (Ames et al. 1998; Hicks 2004; Kennedy 1976; Leonhardy and Rice 1970). The archaeological record also shows an increase in the use of botanical materials, such as baskets, nets, cordage, and mats, but this increase in occurrence is likely due to preservation issues (Andrefsky 2004; Hicks 2004; Kirk and Daugherty 2007). During the late Holocene, the lifeways recorded by ethnographies appear to have developed (Ames and Maschner 1999). The precontact period is generally considered to end once Euro-American influence is observed in the archaeological record including Euro-American goods, diseases, and practices. The late Holocene was a period of resource intensification (e.g., salmon mass capture and storage), collector-like settlement patterns with winter village occupation, and complex social organization (Blukis Onat 1987; Burtchard 1998).

3.2.2 Ethnographic setting[1]

In Washington state, the ethnographic period is generally referred to by Western anthropologists as the time between the arrival of the first non-Indigenous people to the establishment of the treaties between the Tribes and the U.S. Government. In what is now Washington state, this is generally considered to be between 1792 and the 1850s.

Tribal knowledge, including oral traditions, supports the presence of people in what is now Washington state since time immemorial, and this is also supported by archaeological evidence as summarized previously. The provided information regarding the setting is general; additional detail can be obtained in existing materials such as those listed in, but not limited to, Section 4. The following discussion is largely based on the publicly available information prepared by Tribes, but also includes accounts prepared by non-Native ethnographers and travelers during the mid to late 1800s and into the early 1900s. The accuracy of these earlier accounts is less reliable, and they are presented without intention of superseding Tribal knowledge, but rather to provide references to other publicly available sources pertaining to the ethnographic setting in today's Washington state. Today, many Tribes have collected and published their own histories, some of which are publicly available, while other information is private or passed down through cultural practices.

Indigenous cultural groups on the western side of the state have been referred to by anthropologists as consisting of the following cultural groups: Central, Southern, and Southwestern Coast Salish, Makah, Quileute, Chinookans, Chemakum, and Kwalhioqua. The traditional languages of the western side of the state include Northern Straits, Nooksack, Halkomelem, Makah, Clallam, Chemakum, Quinault, Twana, Lushootseed, Quileute, Lower Chehalis, Upper Chehalis, Cowlitz, Lower Columbia Athapaskan, Lower Chinook, Cathlamet, Multnomah, and Kiksht.

Indigenous cultural groups on the eastern side of the state have been referred to by anthropologists as consisting of the following cultural groups: Thompson; Northern Okanagan, Lakes, and Colville; Middle Columbia River Salishans; Yakama and Neighboring Groups; Wasco, Wishram, and Cascades; Western Columbia River Sahaptins; Cayuse, Umatilla, and Walla Walla; Nez Perce; Palouse; Coeur d'Alene; Spokane; and Kalispel. The traditional languages of the eastern side of the state are part of the Salishan and Sahaptian language families.

[1] The information presented in this section was developed based on the following references: Baenen 1981; Ballard 1927, 1929, 1951; Barkan 1987; Bergland 1983; Beavert et al. 2009; Beavert 2012; Boyd 2013; Carpenter 1986; Carpenter et al. 2008; CTUIR 2022; Daehnke 2017; Gibbs 1854, 1877; Goertz 2018; Gould and Spinden 1917; Galloway and Richardson 1983; Gunther 1927; Hajda 1990; Haeberlin and Gunther 1930; Hilbert et al. 2001; Hollenbeck 1987; Hunn et al. 2014; Karson 2006; Kennedy and Bouchard 1998; Kinkade et al. 1998; Olson 1936; Ray 1933, 1936, 1942; Richardson and Galloway 2011; Ruby 1995; Schuster 1998; Silverstein 1990; Spier 1927; Smith 1940; Spinden 1908; Stern 1990; Storm and Capoeman 1990; Teit 1928; Uebelacker and Wilson 1984; Wray 2016; Zenk et al. 2016.

3.2.3 Historic setting

This section describes the time after the arrival of non-Indigenous people to the area that is now Washington state, into present day, which can be referred to in anthropology as the post-contact or historic period. This period began in the early 1790s with maritime expeditions sponsored by the Spanish, English, and U.S. governments, followed by terrestrial surveys sponsored by governments and private commercial interests (Kirk and Alexander 2001; Hudson et al. 2017). The most well-known early explorers were the expeditions led by Captain George Vancouver in 1792 followed by the Lewis and Clark Expedition in 1805. Following these expeditions, American, French, and English fur traders and the Hudson's Bay Company established forts and trade routes throughout the state, and religious groups established missions (Cox 1974; Ficken 1987; Phillips 1972). During the early 1800s the U.S. Government entered into treaties with some of the Tribes.

Some early industries during this time period included mining, timber, fishing, and agriculture. The Columbia River and deep harbors throughout Puget Sound provided shipping opportunities and contributed to the growth of major cities such as Seattle, Vancouver, and Tacoma.
A growing railroad network provided economic opportunity for inland regions, and the arrival of the transcontinental railway led to the further development of other cities like Spokane and Pasco (Carlson 2003). In 1889, Washington Territory became the 42nd state. During the turn of the nineteenth century, agriculture and urban commerce began to be the major drivers of the growth in population and economy of the state. The Great Depression impacted Washington's economy, but with the help of federally backed projects like the Grand Coulee Dam, construction helped the state recover (Kirk and Alexander 2001). While agriculture and logging continued to be important industries through the early and mid-1900s, the economy has since diversified to include airplane production, hydropower, and technology (Cox 1974; Hudson et al. 2017).

3.2.4 Geographical context

The study area includes a diverse range of geological formations, animals, and plants. The major geographic regions for the solar study area include the Columbia Basin, Okanogan Highlands, Blue Mountains, Northern Cascades, and Southern Washington Cascades. Each of these regions has a unique geological history that has formed the current landscape. Geographical regions are linked to unique geological conditions, which also play an important role in archaeological site formation. The presence of an archaeological site requires not only past human activity resulting in the deposition of physical objects or remains, but the geological conditions at the time of deposition and in subsequent years must allow for the preservation of those materials.

3.2.5 Archaeological resources

Archaeological resources are discussed based on broad cultural patterns and are referred to as precontact-era and historic-era sites.

Precontact-era archaeological sites are typically considered to be sites predating the 1790s, the widely accepted start of intensive colonization of the region. These sites encompass a variety of

materials, but typically have cultural contexts focused on past archaeological research, ethnography, and the natural environment. They are found both underwater and in terrestrial environments and include a wide variety of artifacts and archaeological features such as lithic scatters, tool stone quarries, bone or stone tools, and developed anthropogenic soils, known as middens, which are directly related to human activity.

These sites can represent single-use actions, such as kill processing; short-term or seasonal habitation locations, sometimes referred to as camps; or more permeant habitation sites, referred to as villages. Beneath these broad use categories are numerous other site types found across the landscape, such as petroglyphs, rock cairns, and culturally modified trees. Sites of each scale and type may be NRHP eligible, and all precontact archaeological sites are protected under Chapter 27.53 RCW (Archaeological Sites and Resources).

Historic-era archaeological sites are those dated after the 1790s. These sites can be a result of a variety of cultural groups, and broad cultural context themes may be relevant. The most common types of historic-era archaeological sites are concentrations of material artifacts such as refuse deposits, can scatters, or small landfills. Homesteads are often considered archaeological sites and include abandoned houses, barns, sheds, ditches, and outhouses. Railroad properties, including alignments, grades, campsites, berms, trestles in ruin, and associated structural remnants, are common throughout the study area. Logging-related archaeological sites include mills, flumes, chutes, and railroads, along with logging camps or abandoned equipment. Not all historic-era archaeological sites are considered NRHP eligible, but they all require evaluation by a professional archaeologist to collect the relevant data on the site's context and integrity. The data would be considered by the lead federal agency and/or DAHP in making a determination on a historic-era site's overall eligibility, and if it is protected under Chapter 27.53 RCW. All sites are considered eligible and are protected until this formal evaluation has occurred.

3.2.6 Historic architectural resources

Historic architectural resources include buildings, sites, structures, objects, or districts that have reached a particular age threshold to be considered eligible for listing in a historic register. The following is a partial list of these types of resources that might be within sites considered for solar energy facilities:

- Homesteads
- Agricultural structures like a barn, grain silo, storage building, or other outbuildings
- Irrigation features like canals, waterways, or ditches
- Intact railroad tracks, trestles, shelters, stations
- Institutional structures like schools, libraries, hospitals, and religious buildings
- Cultural landscapes, like parks and plazas
- Airports
- Residential housing
- Intact logging structures
- Bridges, functional roads

- Military installations
- Commercial and trade buildings
- Monuments, markers
- Intact dams and hydroelectric features
- Public works projects like water systems, sewer systems, tanks, power transmission lines, and power substations

3.2.6.1 Human remains and cemeteries

In Washington state, non-forensic human remains and cemeteries on private and state land are recorded as archaeological sites. These resources have protections relating to both archaeological sites and recorded cemeteries (Chapters 27.53 and 27.44 RCW). Human remains may be encountered in a variety of contexts and landforms.

Tribes often have records relating to the locations of and practices around human remains that are not publicly available. Human remains discovered on federal lands are under the jurisdiction of the federal agency managing those lands, and the requirements of the Native American Graves Protection and Repatriation Act apply.

On state and private lands, the remains become the jurisdiction of DAHP and the State Physical Anthropologist. DAHP has established procedures that include notification of all affected Tribes and, as appropriate, cemeteries. The State Physical Anthropologist will make a determination of whether the remains are Indian or Non-Indian and report that finding to any appropriate cemeteries and the affected Tribes. DAHP will then handle all consultation with the affected parties as to the future preservation, excavation, and disposition of the remains. On finds from state and private lands, DAHP takes the lead in consulting with Tribes and community groups regarding the treatment of these remains (DAHP 2024). Sites with human remains are most often considered to be NRHP eligible. These types of resources typically cannot be developed without an adverse effect determination requiring additional mitigation.

3.2.6.2 Documented Traditional Cultural Properties

A TCP is a property or a place that is inventoried or determined to be eligible for inclusion on the NRHP or the Washington Heritage Register because of its association with cultural practices and beliefs that are: 1) rooted in the community's history; and 2) important to maintaining the continuing cultural identity of the community's traditional beliefs and practices.

DAHP maintains a database of TCPs within Washington state, but very few are publicly disclosed. TCPs can be any location, landform, or object that has distinct association and importance to a group. The scale can be as large as an entire river, or mountain, or be confined to a single boulder. TCPs are often associated with cultural practices that groups may not wish to become widely known, such as spiritual practices. When a TCP is identified, it is often partially recorded to the degree necessary to determine if project impacts could result in an adverse effect on that TCP.

3.2.6.3 Sacred sites

Executive Order 13007 instructs federal agencies to facilitate access to and ceremonial utilization of sacred sites by Indian religious practitioners. The order requires that federal agencies provide Tribes notice of any proposed land-related actions or policies that might potentially limit future access to, ceremonial use of, or have adverse impacts on the physical integrity of sacred sites. Federal agencies also need to avoid any actions that could negatively impact these sites on federal land.

Sacred sites can be considered cultural resources when a historic property is also considered a sacred site by a Tribe. Sacred sites are also discussed in the *Tribal Rights, Interests, and Resources Technical Report*. The treatment of impacts on sacred sites is guided by federal policy established in executive orders and Memoranda of Understanding. The responsibility of federal agencies under Executive Order 13007 is to protect and improve Tribal access to sacred sites. Projects subject to GEO 21-02 must also avoid, minimize, or mitigate adverse effects to sacred sites.

3.2.7 Washington State Department of Archaeology and Historic Preservation archaeological predictive model results

As noted in Section 2.2.1.2, the DAHP predictive model uses five categories to help determine (at a planning level) the likelihood of precontact era archaeological sites being present based on environmental factors and some archaeological data. These categories of risk are associated with recommendations for archaeological survey, as detailed in Section 2.2.1.2.

The model results within the solar study area contain very high- to low-risk areas (Figures 2a and 2b). The very high- and high-risk areas are typically found along waterways, including the Columbia River and the bottom of the canyons that make up the complex drainages that occur throughout the study area. These assessments of probability match the archaeological expectations because there are numerous archaeological sites along the Columbia River and known settlement patterns focus on occupation near water sources. The model assigns a low risk for upland areas including buttes, hills, and areas of steep slopes. This area largely aligns with the massive Pleistocene-aged loess deposit that is found throughout the Columbia Plateau (Schuster 2005). However, several archaeological site types are common within these types of landforms and include precontact burials, rock cairns, talus features, pictographs, petroglyphs, and historic archaeological sites, including wagon roads, mining features, and homesteads.

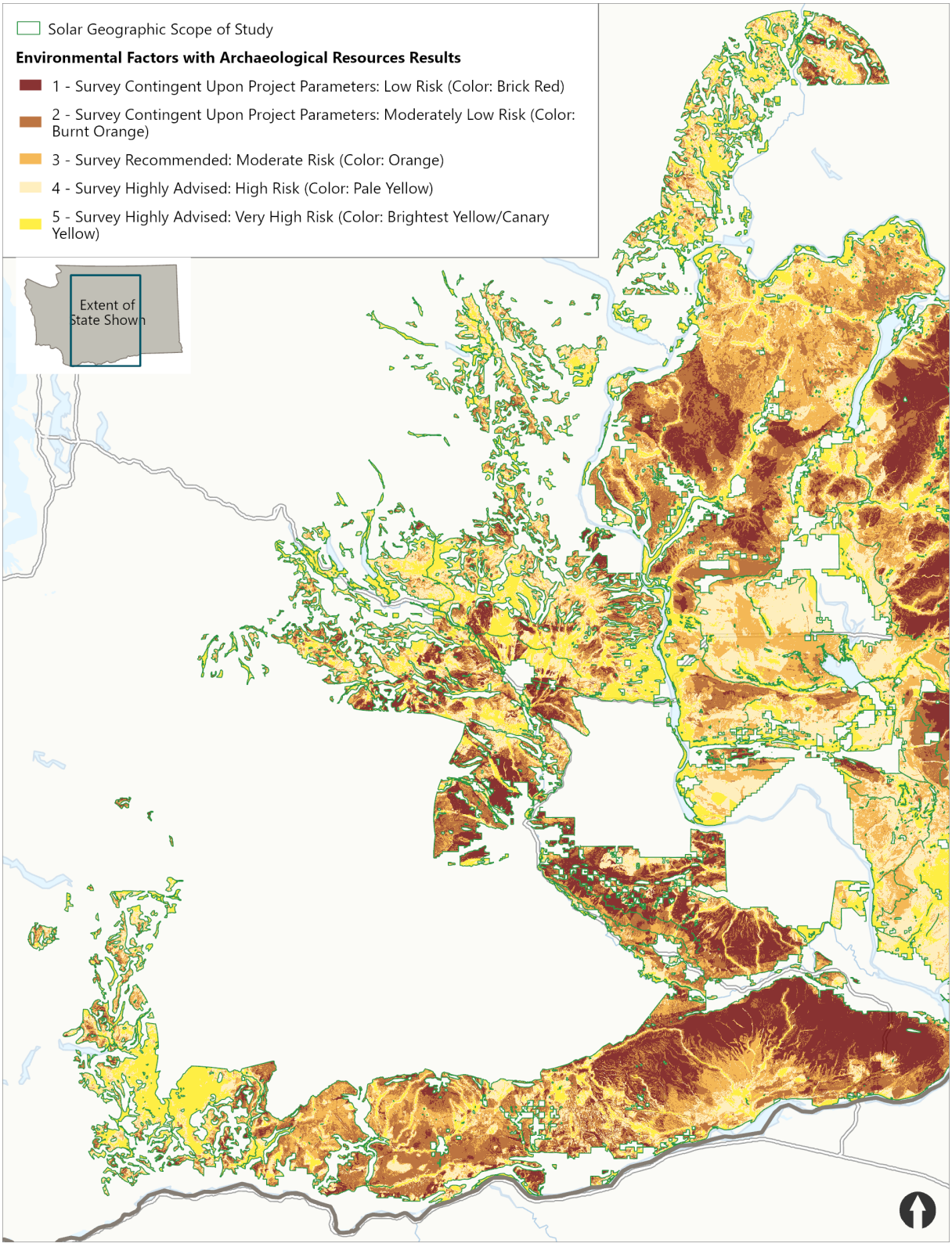

Figure 2a. DAHP Predictive Model results in solar geographic scope of study: western Washington

Note: Figure shows entire extent of geographic scope of study area in western Washington.
Data source: DAHP 2010

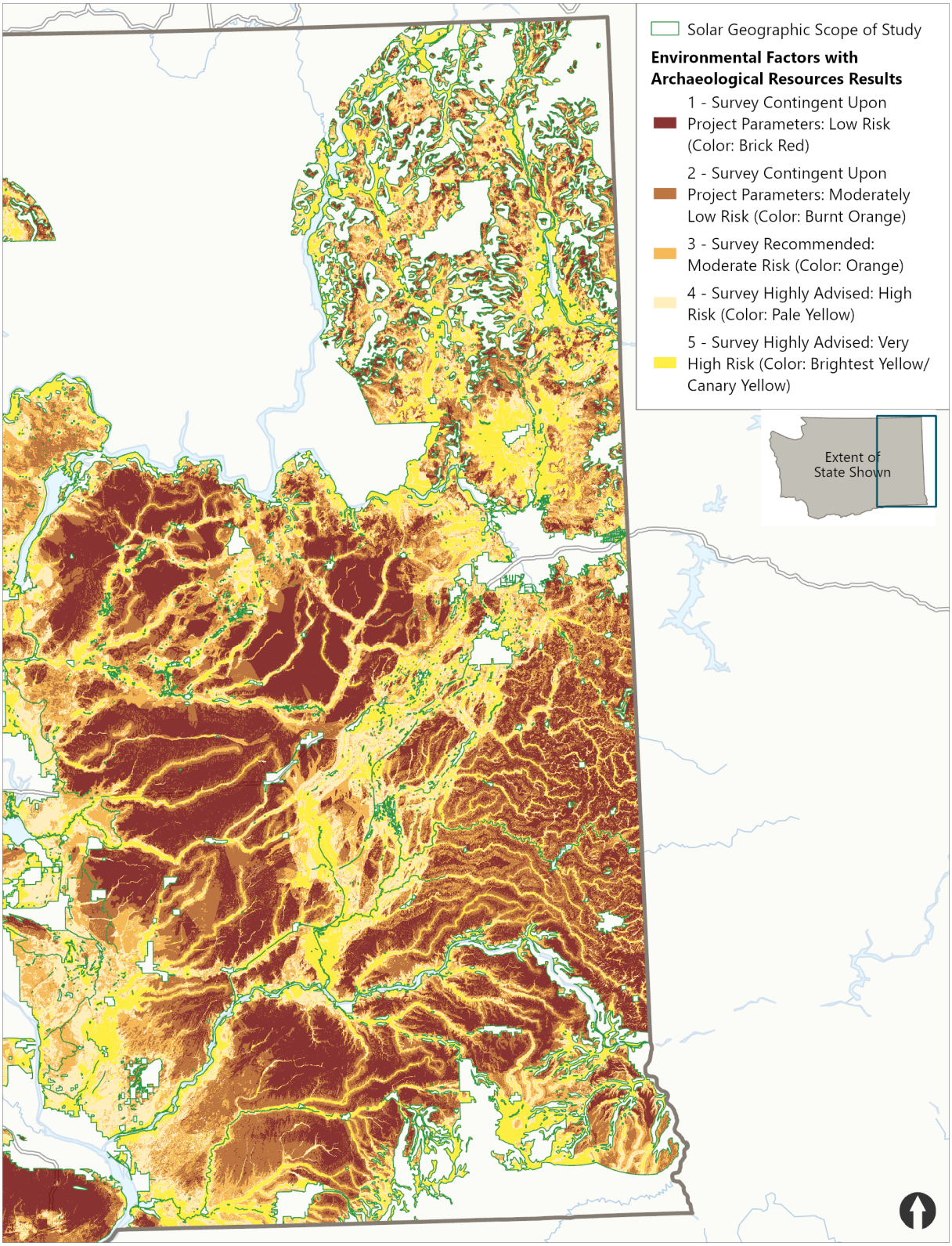

Figure 2b. DAHP Predictive Model results in solar geographic scope of study: eastern Washington

Data source: DAHP 2010

3.3 Potentially required permits and approvals

The following permits and approvals would potentially be required for investigation, construction, operation, or decommissioning of typical solar energy projects:

- **Archaeological Site Alteration and Excavation Permit (DAHP):** Required if any precontact archaeological site or NRHP-eligible historic-era archaeological site related to Tribal activities are impacted by a project.
- **NHPA Section 106 consultation (federal agency and Advisory Council on Historic Preservation):** A Section 106 consultation is required for actions that may affect historic properties and is typically completed along with other federal permitting or approval processes. However, Section 106 of the NHPA has its own separate process. The process includes consultation with interested and affected Tribes, the Advisory Council on Historic Preservation, and the SHPO.

3.4 Impact assessment

Although the specific impacts on cultural resources need to be assessed on a project-by-project basis, there are certain common activities related to solar energy development that have the potential to cause significant impacts to historic and cultural resources. The analysis focuses on the impacts that could result from the implementation of the types of facilities considered in the PEIS. Impacts will also need to be considered as part of subsequent project-level analyses for any facility.

3.4.1 Impacts from construction and decommissioning

The time needed to construct a solar facility after site characterization, environmental review, and permitting are completed will vary but is expected to be between 6 and 18 months. Facilities considered in the PEISs may be constructed anytime in the next approximately 20 years.

Most site characterization activities would involve little or no ground disturbance. However, some ground-disturbing activities, such as drilling deep soil cores and building access roads, could result in impacts on or inadvertent discoveries of cultural resources. In mountainous terrain, additional site grading as well as clearing and grubbing may be required if existing access routes are unavailable or unsuitable for the planned investigation equipment.

Construction activities that could impact historic and cultural resources include ground disturbance, degradation of visual quality, noise, and interruption of the landscape and habitat. A Tribes' spiritual practices could be interrupted by construction impacts on land areas and cultural or sacred sites, including degradation of visual quality, noise, and interruption of access.

Construction could result in damage or destruction of cultural resources from the clearing, grading, and excavation of the site for a facility and from construction of solar facilities and

associated infrastructure. Construction will likely include subsurface infrastructure (e.g., foundations, pilings, utility trenches). Ground disturbance during construction is likely to impact unrecorded archaeological resources due to the prevalence of such sites throughout the study area and the fact that the majority of the study area has not been archaeologically surveyed.

Degradation and destruction of cultural resources could result from the alteration of topography, alteration of hydrologic patterns, removal of soils, erosion of soils, runoff into and sedimentation of adjacent areas, and oil or other contaminant spills if sites are located on or near the site for a facility. Such degradation could occur within the facility footprint or in areas downslope or downstream. Erosion can also destabilize historic structures.

Increases in human access and subsequent disturbance (e.g., looting, vandalism, and trampling) of cultural resources could result from the establishment of corridors or facilities in otherwise intact and inaccessible areas. Increased human access exposes archaeological sites and historic structures and features to greater probability of impact from a variety of stressors.

Degradation of settings associated with significant cultural resources could result from the visual and noise changes associated with construction and associated land disturbances and ancillary facilities. The regular geometric forms and strong horizontal and vertical lines associated with solar infrastructure could contrast with the organic forms and colors of existing landform and vegetation. Construction visual changes, light, dust, and human presence could affect cultural resources for which visual integrity is a component of sites' significance, such as Tribal sacred sites and landscapes, historic structures, trails, and historic landscapes. Construction noise would depend on the activities, terrain, vegetation, and local weather conditions but may involve blasting and the use of equipment such as impact pile drivers and vibratory rollers, which can generate substantial noise and vibration. Cultural resources that are susceptible to noise impacts include TCPs or sacred sites because the cultural uses or practices that occur at these locations could be interrupted or diminished. Construction vibration could adversely affect cultural resources by toppling rock cairns and damaging other rock features or archaeological sites on the surface.

Impacts during facility decommissioning would involve similar types of activities to those discussed for facility construction. Foundations may be removed to a level of 3 feet or more below the ground surface, while cables, lines, or conduit that are buried 3 feet below grade or more are not expected to be removed. However, the depth to which facilities and infrastructure would be removed would likely depend on agreements with landowners and would need to be in accordance with applicable regulatory requirements. Service roads may be removed or may remain depending on agreements with the new or existing owner of the land. Site restoration activities may include recontouring, grading, scarifying, seeding and planting, and perhaps stabilizing disturbed surfaces. The types of impacts would be similar to those associated with facility construction.

3.4.2 Impacts from operation

For the PEIS, solar facilities are expected to have an operational life of approximately 30 years. This is the operations period after a facility is constructed. Operational activities that could affect historic and cultural resources include those identified as impacts under construction, as well as changes in access to natural and cultural resources and increased human activity with associated noise, light, dust, and human presence.

Following construction, ongoing operations and maintenance are anticipated to include little new ground disturbance, as the use of maintenance vehicles and equipment would generally be limited to access roads and designated areas that were developed during construction. Archaeological sites could still be impacted by the increase in activity during operation of a facility. This includes increased vehicle traffic, vegetation management, or other activities, as well as the presence of people who might disturb surface artifacts.

There is also a potential to impact unrecorded archaeological sites that are associated with TCPs. Ongoing ground disturbance could occur in areas where no archaeological sites have been identified during recent surveys, but there is still a potential for previously unrecorded sites to be identified during operation.

Visual degradation of settings associated with cultural resources could result from the presence of facilities and associated land disturbances. Visual changes associated with solar energy facilities could include photovoltaic panels in rectangular arrays; structures; security and other lighting; fencing; roads; vehicles; and workers conducting maintenance activities. These could affect cultural resources for which visual integrity is a component of sites' significance, such as Tribal sacred sites and landscapes, historic structures, trails, and historic landscapes.

Facility fencing and ongoing operations could impact accesses and travel paths traditionally utilized for significant historic and cultural resources. This is most likely to impact TCPs, sacred sites, cemeteries, or precontact period archaeological sites where setting, feeling, and association are key aspects of the site's significance. This type of impact is likely to increase in significance based on the amount of the landscape that is no longer freely accessible. The degree of impact from these restrictions is at least partially a result of the overall size of the individual facilities, and the overall density of individual facilities in a given area. Impacts from limiting access and travel are likely to be more significant cumulatively than on an individual project basis.

3.5 Measures to avoid, reduce, and mitigate impacts

Mitigation may be developed through consultation with affected Tribes as part of the SEPA process. Mitigation may also be developed under federal Section 106 of the NHPA; or through state permitting under RCW 27.53. The PEIS identifies a variety of measures to avoid, reduce, and mitigate impacts. These measures are grouped into five categories:

- **General measures:** The general measures apply to all projects using the PEIS.

- **Recommended measures for siting and design:** These measures are recommended for siting and design in the pre-application phase of a project.
- **Required measures:** These measures must be implemented, as applicable, to use the PEIS. These include permits and approvals, plans, and other required measures.
- **Recommended measures for construction, operation, and decommissioning:** These measures are recommended for the construction, operation, and decommissioning phases of a project.
- **Mitigation measures for potential significant impacts:** These measures are provided only in sections for which potential significant impacts have been identified.

3.5.1 General measures

- **Laws, regulations, and permits:** Obtain required approvals and permits and ensure that a project adheres to relevant federal, state, and local laws and regulations.

  ***Rationale*:** Laws, regulations, and permits provide standards and requirements for the protection of resources. The PEIS impact analysis and significance findings assume that developers would comply with all relevant laws and regulations and obtain required approvals.

- **Coordination with agencies, Tribes, and communities:** Coordinate with agencies, Tribes, and communities prior to submitting an application and throughout the life of the project to discuss project siting and design, construction, operations, and decommissioning impacts, and measures to avoid, reduce, and mitigate impacts. Developers should also seek feedback from agencies, Tribes, and communities when developing and implementing the resource protection plans and mitigation plans identified in the PEIS.

  ***Rationale*:** Early coordination provides the opportunity to discuss potential project impacts and measures to avoid, reduce, and mitigate impacts. Continued coordination provides opportunities for adaptive management throughout the life of the project.

- **Land use:** Consider the following when siting and designing a project:
  - Existing land uses
  - Land ownership/land leases (e.g., grazing, farmland, forestry)
  - Local comprehensive plans and zoning
  - Designated flood zones, shorelines, natural resource lands, conservation lands, priority habitats, and other critical areas and lands prioritized for resource protection
  - Military testing, training, and operation areas

  ***Rationale*:** Considering these factors early in the siting and design process avoids and minimizes the potential for land use conflicts. Project-specific analysis is needed to determine land use consistency.

- **Choose a project site and a project layout to avoid and minimize disturbance:** Select the project location and design the facility to avoid potential impacts to resources. Examples include the following:
    - Minimizing the need for extensive grading and excavation and reducing soil disturbance, potential erosion, compaction, and waterlogging by considering soil characteristics
    - Minimizing facility footprint and land disturbances, including limiting clearing and alterations to natural topography and landforms and maintaining existing vegetation
    - Minimizing the number of structures required and co-locating structures to share pads, fences, access roads, lighting, etc.

  ***Rationale*:** Project sites and layouts may differ substantially in their potential for environmental impacts. Thoughtful selection of a project site and careful design of a facility layout can avoid and reduce environmental impacts.

- **Use existing infrastructure and disturbed lands, and co-locate facilities:** During siting and design, avoid and minimize impacts by:
    - Using existing infrastructure and disturbed lands, including roads, parking areas, staging areas, aggregate resources, and electrical and utility infrastructure
    - Co-locating facilities within existing rights-of-way or easements
    - Considering limitations of existing infrastructure, such as water and energy resources

  ***Rationale*:** Using existing infrastructure and disturbed lands and co-locating facilities reduces impacts to resources that would otherwise result from new ground disturbance and placement of facilities in previously undisturbed areas.

- **Conduct studies and surveys early:** Conduct studies and surveys early in the process and at the appropriate time of year to gather data to inform siting and design. Examples include the following:
    - Geotechnical study
    - Habitat and vegetation study
    - Cultural resource survey
    - Wetland delineation

  ***Rationale*:** Conducting studies and surveys early in the process and at the appropriate time of year provides data to inform siting and design choices that avoid and reduce impacts. This can reduce the overall timeline as well by providing information to agencies as part of a complete application for environmental reviews and permits.

- **Restoration and decommissioning:** Implement a Site Restoration Plan for interim reclamation following temporary construction and operations disturbance. Implement a Decommissioning Plan for site reclamation at the end of a project. Coordinate with state and local authorities, such as the Washington Department of Fish and Wildlife, county

extension services, weed boards, or land management agencies on soil and revegetation measures, including approved seed mixes. Such plans address:
    - Documentation of pre-construction conditions and as-built construction drawings
    - Measures to salvage topsoil and revegetate disturbed areas with native and pollinator-supporting plants
    - Management of hazardous and solid wastes
    - Timelines for restoration and decommissioning actions
    - Monitoring of restoration actions
    - Adaptive management measures

  ***Rationale*:** Restoration and decommissioning actions return disturbed areas to pre-construction conditions, promote soil health and revegetation of native plants, remove project infrastructure from the landscape, and ensure that project components are disposed of or recycled in compliance with all applicable laws and regulations.

- **Cumulative impact assessment:** Assess cumulative impacts on resources based on reasonably foreseeable past, present, and future projects. Identify measures to avoid, reduce, and mitigate cumulative impacts. Consider local studies and plans, such as comprehensive plans.

  ***Rationale*:** Cumulative impacts can result from incremental, but collectively significant, actions that occur over time. The purpose of the cumulative impacts analysis is to make sure that decision-makers consider the full range of consequences under anticipated future conditions.

3.5.2 Recommended measures for siting and design

- Design and site projects to avoid impacts on cultural and historic resources. Begin with use of DAHP's WISAARD (including the predictive model), then refine through the development of site-specific environmental and cultural context and Tribal coordination.
- Contact potentially affected Tribes early in the siting process, ideally before land is acquired for a project or before permit applications are developed, and offer information relevant to Tribal technical staff to help identify potential impacts on Tribes.
- Consider potential impacts on Tribal treaty-reserved rights, Tribal reservations, off-reservation rights, trust lands, other Tribal-owned land, and other areas of significance to Tribes during project design and in siting decisions.
- Conduct a site-specific cultural survey to evaluate potential impacts in accordance with DAHP and federal requirements and guidance. To expedite the review process, DAHP and the affected Tribes should be given the opportunity to review the cultural resource survey methodology.
- Consider requiring a Tribal monitor for survey crews to provide input on Traditional Cultural Properties, sacred sites, and culturally significant sites during site selection.
- Provide cultural resource survey results to potentially affected Tribes for early review.
- Use previously disturbed lands and lands determined by archaeological inventories to be devoid of historic properties.

- In areas where homesteading was a prevalent historic activity, contact the local assessor's office and historical museums to determine if the area includes known homestead sites.

3.5.3 Required measures

This section lists permits and approvals, plans, and other required measures for use of the PEIS, as applicable. See Section 3.3 for more detailed information on potentially required permits and approvals.

- Archaeological Site Alteration and Excavation Permit (DAHP)
- NHPA Section 106 consultation (federal agency and Advisory Council on Historic Preservation)
- A developer must develop an Inadvertent Discovery Plan. In the event that unrecorded archaeological resources are identified during project construction or operation, work within 30 meters (100 feet) of the find must be halted and directed away from the discovery until it can be assessed in accordance with steps in the Inadvertent Discovery Plan.

3.5.4 Recommended measures for construction, operation, and decommissioning

- Many of the general measures and recommended measures for construction, operation, and decommissioning for other resources such as earth, noise and vibration, and aesthetics/visual quality may apply to historic and cultural resources. Additional project-specific measures would be determined after engagement and consultation with Tribes and DAHP.

3.5.5 Mitigation measures for potential significant impacts

- Implement training/educational programs for workers. Incorporate adaptive management protocols in plans to address changes over the life of the project, should they occur.

  ***Rationale*:** Training/education programs can reduce occurrences of disturbances, vandalism, and harm to historic and cultural resources.

- If a project requires federal permits or affects federal lands, mitigation measures would be developed in consultation with Tribes under Section 106 of the NHPA to avoid, reduce, or mitigate the potential for adverse impacts on significant cultural resources, if present. Section 106 consultations between the federal agencies, DAHP, affected federally recognized Tribes, and other consulting parties would be required.

  ***Rationale*:** Federal Section 106 process would include identification of mitigation.

- Address impacts to cultural resources by following the best available guidance and strategies developed by federal, Tribal, and state governments, including, but not limited

to, compensatory mitigation, formalized ongoing consultation between the state and Tribes to address new concerns and monitor long-term mitigation, and the development and maintenance of new technologies and geospatial analysis that help identify and avoid historic and cultural resources.

***Rationale*:** Consultation between agencies and Tribes will be used to address impacts.

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