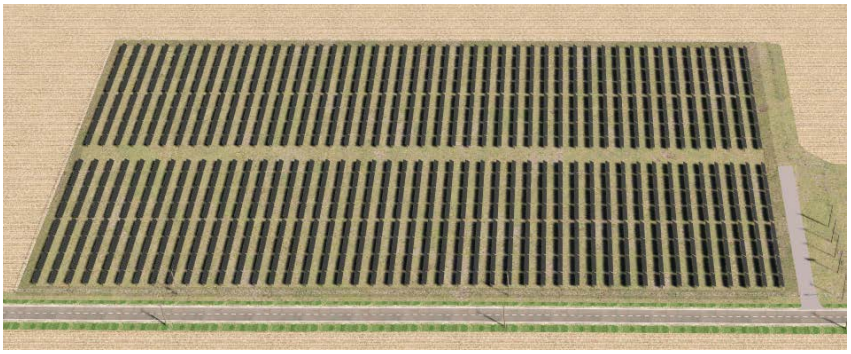
Final Environmental Assessment

U.S. Department of the Interior
Bureau of Indian Affairs
February 2021

Approval of Business Lease Between Confederated Tribes of the Umatilla Indian Reservation and Tutuilla Solar LLC for Construction/Operation of the Tutuilla Solar Electric Generation Facility
Tribal Trust Tract T2103-C
Umatilla Indian Reservation
Umatilla County, Oregon



Lead Agency:
USDI Bureau of Indian Affairs
Umatilla Agency
P.O. Box 520
Pendleton, OR 97801

Cooperating Agency:
Confederated Tribes of the
Umatilla Indian Reservation
46411 Timíne Way
Pendleton, OR 97801

Responsible Official:
MICHAEL T. JACKSON, Superintendent
Umatilla Agency
Pendleton, OR 97801
(541)278-3786

For Further Information Contact:
Confederated Tribes of the
Umatilla Indian Reservation
Department of Economic and Community Development
46411 Timíne Way
Pendleton, OR 97801
(541)276-3447

Prepared by:
Confederated Tribes of the
Umatilla Indian Reservation
Department of Economic and Community Development
46411 Timíne Way
Pendleton, OR 97801

Table of Contents

List of Figures

List of Tables

List of Acronyms and Abbreviations

AC	Alternating Current
BIA	Bureau of Indian Affairs
CAA	Clean Air Act
CCRP	Cultural Resources Protection Program
CWA	Clean Water Act
CTUIR	Confederated Tribes of the Umatilla Indian Reservation
DECD	Department of Economic and Community Development
DNR	Department of Natural Resources
DC	Direct Current
EA	Environmental Assessment
EPA	Environmental Protection Agency
EFH	Essential Fish Habitat
ESA	Endangered Species Act
FEIS	Final Environmental Impact Statement
FONSI	Finding of No Significant Impact
IDA	Inter-Departmental Agreement
kV	Kilovolt
MW	Megawatt
MSL	Mean Sea Level
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act

NHPA	National Historic Preservation Act
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollution Discharge Elimination System
NAGPRA	Native American Grave Protection and Repatriation Act
ODEQ	Oregon Department of Environmental Quality
ODFW	Oregon Department of Fish and Wildlife
ODOT	Oregon Department of Transportation
PV	Photovoltaic
ROD	Record of Decision
SWPPP	Storm Water Pollution Prevention Plan
STP	Shovel Test Pits
TERF	Tribal Environmental Recovery Facility
THPO	Tribal Historic Preservation Office
TMDL	Total Maximum Daily Load
TFE	Tribal Farming Enterprise
UIR	Umatilla Indian Reservation
USFWS	U. S. Fish and Wildlife Service
UTPD	Umatilla Tribal Police Department
WQMP	Water Quality Management Plan

1.0 Purpose and Need for Action

Background Information

The Umatilla Indian Reservation (UIR) established by the Treaty of June 9, 1855, 12 Statue 945, between the United States and the Cayuse, Umatilla, and Walla Walla Tribes lies along the foothills of the Blue Mountains in northeastern Oregon immediately east of Pendleton (Figure 1). The UIR covers a variety of terrain and land uses including rough uneven forest and rangelands, gently sloping agricultural fields, and long narrow floodplains supporting riparian vegetation.

The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) have a responsibility to provide for the needs of its members through the development of a strong diversified economy. To achieve this goal, the CTUIR have developed, in the years since 1994, the Wildhorse Casino and Resort, which now include a casino, hotel and restaurant, golf course, RV park, Tamastslikt Cultural Institute, bowling alley and cinema complex. CTUIR member employment increased through the resort development and through subsequent expansion of essential governmental services. Although the new jobs and enterprises have brought more stability to the UIR economy, which previously relied on federal grants, transfer payments, and agricultural income, the service and governmental sectors are the main economic foundation of the Reservation. These sectors have historically been subject to unpredictable swings due to political and economic changes at the state, national, and international level.

In the 1996 Comprehensive Plan, the CTUIR established the economic development goal of improving and diversifying the overall economy of the UIR while respecting traditional cultural values. Specific objectives for achieving this goal included the acquisition and development of suitable lands for commercial and industrial uses. In a deliberate effort to assert sovereignty and actively manage the rate and type of economic growth on the Reservation, the CTUIR established a goal of controlling growth at the intersection of Interstate 84, Highway 331, and South Market Road. In 1997, the CTUIR purchased over 700 acres of land at the intersection of Interstate 84, Highway 331, and South Market Road (Exit 216) with the intention of providing a location for business development.

At the request of and in cooperation with the CTUIR, the Bureau of Indian Affairs (BIA) conducted an environmental review under auspices of the National Environmental Policy Act (NEPA) for the development and lease of sites within Coyote Business Park South for light industrial and warehouse uses beginning in 2003 and culminating in release of a Final Environmental Impact Statement (FEIS) and Record of Decision (ROD) in 2007. The BIA must approve the lease and operation of such facilities by the CTUIR to any other entity. Such approval is subject to a review of potential environmental impacts under provisions of NEPA. The preferred alternative (Alternative E) envisioned development on 142 acres. Other alternatives evaluated included No Action (Alternative A) and development of 21 acres (Alternative B) or 68 acres (Alternatives C and D). The difference between Alternatives C and D was due to the utility infrastructure to be developed. The uses envisioned for Coyote Business Park South included but were not limited to manufacture of hay products, straw board, trailers, and speciality foods as well as operation of warehouses, laboratories, distribution centers and vehicle repair facilities.

Figure 1. Umatilla Indian Reservation

This Environmental Assessment (EA) was prepared to evaluate the potential impacts of the lease of a site within Coyote Business Park South for construction and operation of a solar electric generation facility on the biological, physical, and human environment and determine if there would be any significant impacts that are not described in the Coyote Business Park South FEIS.

Setting

Land Ownership

The Cayuse, Umatilla, and Walla Walla Tribes believed they had reserved approximately 800 square miles or 512,000 acres as a homeland in the Treaty of June 9, 1855. However, as surveyed in 1871, the UIR encompassed 384 square miles or 245,699 acres. The difference in size of the UIR between what the Tribes believed was intended and as actually surveyed may be attributed to the true location of "Lee's Encampment". Whether its location was at Meacham where a Major Lee of the Oregon Militia once camped or a place by Five Points Creek in the Grande Ronde drainage where Jason Lee, the Missionary, once wintered has never been resolved (CTUIR 2010). The 1871 survey used Meacham as the location of “Lee’s Encampment”.

The UIR was further reduced to 236 square miles (157,982 acres) by the Slater Act of 1885, 23 Statute 340. The present boundary is termed the “diminished reservation”. In addition to the lands within the diminished reservation, the CTUIR owns 14,140 acres outside the diminished reservation but within the 1871 surveyed reservation boundary. This land was acquired through a special act of Congress in 1939, 53 Statute 1351, that restored unclaimed land to Tribal control. Pursuant to the Secretary of Interior Order of Restoration dated March 20, 1940, these lands were “added to and made a part of the Umatilla Indian Reservation” and are referred to as the Johnson Creek Restoration Area. The Blue Mountains border the reservation to the east and the city of Pendleton lies to the west.

Today, the land ownership pattern on the UIR is a checkerboard of parcels falling into three main classes: (1) deeded land held in fee simple estate by non-Indians, Indians, and the CTUIR; (2) Tribal trust land with legal title held by the United States and the beneficial or equitable title held by the CTUIR; and (3) allotted trust land with legal title held by the United States and the beneficial or equitable title held by an individual Indian allottee or his or her heirs.

The combination of deeded land interspersed with trust land has produced a checkerboard pattern of land ownership on the UIR. The CTUIR has adopted a policy of purchasing non-Indian lands and individual interests in allotted lands held by individual Indians as property becomes available and funds permit.

Topography

The landforms of the UIR can be divided into four groups: the *Pendleton Plains*, the *Blue Mountain Slope*, the *Blue Mountain Uplands*, and the *Stream Bottomlands*. The Pendleton Plains are a slightly dissected plateau characterized by gently rolling slopes favorable to crop production and are found between 1,200 to 2,000 feet above mean seal level (msl). The Blue Mountain Slope,

located between 2,000 and 3,000 feet above msl, is a series of steep walled canyons ascending to the more plateau like Blue Mountain Uplands. The Blue Mountain Uplands are an area of meadows and forested land. Approximately one-third of the UIR is within this subdivision with elevations ranging from 3,000 feet above msl to approximately 4,100 feet above msl. The Stream Bottomlands are found along the Umatilla River, McKay Creek and Patawa Creek which dissect other landforms and are characterized by moderately flat floodplains edged by moderate to steep slopes (Gonthier and Harris 1977).

Climate

The entire UIR falls within Oregon's North Central Climatic Zone (Zone 6) (Johnson and Clausnitzer 1992). Weather is predominately influenced by Pacific Ocean air masses. The major influences to the regional climate are the Cascade Mountains which form a barrier against warm moist fronts from the Pacific Ocean (Johnson and Clausnitzer 1992). The Columbia Gorge provides a break in the curtain of the Cascade Mountains and occasionally allow moisture laden marine air to penetrate into the northern Blue Mountains. This climate is called temperate oceanic and differs significantly from temperate continental. During the winter, the temperate oceanic climate has grater cloudiness, increased precipitation, and higher relative humidity with less fluctuation in temperatures.

The UIR experiences strong seasonal fluctuations in both temperature and precipitation. During summer, the UIR experiences a continental climate with warm days, cool nights, and little precipitation. Winters exhibit short periods of extreme cold intermixed with milder temperatures. Heavy fog with visibility less than 1,200 feet is very common during the winter months along the valley bottoms when high pressure conditions are present. Precipitation also changes dramatically with the seasons, with most precipitation occurring during the fall, winter, and spring. The climate of the UIR is also strongly influenced by elevation. Precipitation falls mainly as rain at lower elevations. Average annual precipitation is markedly higher at higher elevations in the Blue Mountains with much of this occurring as snow (Johnson and Clausnitzer 1992).

Weather records obtained by the National Oceanic and Atmospheric Administration (NOAA) stations at Pendleton and Meacham, Oregon reflect the elevation change between the western and eastern portions of the UIR. The Pendleton station is located at 1,482 feet msl and the Meacham station is located at 4,050 feet msl. Mean annual temperatures for Pendleton and Meacham are 52.3° Fahrenheit (F) and 43.7° F, respectively (30-year period of record). Mean precipitation levels Are 12.2 inches and 32.7 inches at the Pendleton and Meacham stations respectively.

Soils

The structural deformation of thousands of feet of Miocene basalt and its subsequent erosion created the varied topography of the Blue Mountains. Soils are a product of basalt weathering, silt sized particles deposited by wind, and volcanic ash. The soils of south-facing upland slopes typically consist of loamy skeletal mixed Lithic Agrixerolls that are shallow and well drained. Volcanic ash originally deposited on steep north-facing (leeward) slopes has since eroded. The soils formed in colluvium, residuum and loess consist of Pachic Ultic Haploxerolls that are moderately deep and well drained. Soils on plateaus that may be moderately deep or deep and

well drained consist of Typic Vitrandepts formed in volcanic ash, loess, and residuum. Other soils that are moderately deep or deep consist of Ultic Argixerolls that have not been greatly influenced by windblown ash or loess. These soils formed mainly in material weathered from basalt and colluvium (Johnson and Makinson 1988).

The Proposed Action and Activities

The United States Government owes a trust obligation to Indian Tribes. This trust obligation doctrine imposes fiduciary standards on the conduct of the federal government. The Secretary of Interior, through delegation of authority to the BIA must protect and preserve Indian trust assets from loss, damage, unlawful alienation, waste, and depletion. The BIA also must assure that any management of Indian trust assets that the Secretary of Interior has an obligation to undertake promotes the interest of the beneficial owner and supports to the extent it is consistent with the government's trust responsibility the beneficial owner's intended use of the property.

The BIA has received a request from the CTUIR for the development and approval of a business lease that would allow the construction and operation of the Tutuilla Solar Electric Generation Project. The project will consist of 5850 seventy-two (72) cell photovoltaic (PV) panels made of high efficiency monocrystalline or polycrystalline silicon and twenty-six (26) 60 kW inverters for a total nameplate output of 1.56 MW. This Environmental Assessment (EA) documents the results of the environmental analysis conducted for the proposed approval/issuance of a business lease of approximately 14.5 acres within Coyote Business Park South under provisions of the National Environmental Policy Act of 1969 as amended, Title 42 U.S.C. § 4321-4375 et seq and associated regulations (Title 40 Code of Federal Regulations Part 1500-1508, Title 43 Code of Federal Regulations Part 46). The federal action (Title 40 Code of Federal Regulations Part 1508.18) is the BIA approval/issuance of a business lease.

This EA meets BIA's NEPA responsibilities. Upon completion of the environmental analysis, the next step will be one of the following actions:

- Take no action at this time (defer activities).
- Issue a Finding of No Significant Impact (FONSI) in association with the EA.
- Require the development of an Environmental Impact Statement (EIS). This decision is based on a review of the environmental consequences section of this document and a determination of whether or not the proposed project has a significant impact on the environment.

Relationship to Other Federal Statutes

National Historic Preservation Act of 1966: Title 16 U.S.C. § 470 et seq. and Title 54 U.S.C. § 300101 et seq.

Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended, and its implementing regulations found at Title 36 Code of Federal Regulations Part 800, require federal

agencies to consider impacts that an undertaking will have on historic properties. The significance of the resources must be evaluated using established criteria outlined at Title 36 Code of Federal Regulations Part 60.4. If a resource is determined to be a historic property, Section 106 of the NHPA requires that effects of the undertaking on the resource be determined. A historic property is: "…any prehistoric or historic district, site, building, structure or object included in, or eligible for inclusion in the National Register of Historic Places, including artifacts, records, and material remains related to such a property…" (NHPA, Section 301[5]). Potentially adverse effects on the historic properties must be avoided, minimized or mitigated.

Pursuant to Section 101(d)(2) of NHPA, the Tribal Historic Preservation Office (THPO) assumed responsibilities of the State Historic Preservation Office within the UIR. All federal undertakings are reviewed by THPO.

Archeological Resources Protection Act of 1979; Title 16 U.S.C. § 470aa et seq.

The Archeological Resources Protection Act of 1979 (ARPA), as amended protects archeological resources on public and Indian lands by establishing criminal and civil penalties for unlawful excavation, removal, or destruction of such resources and sets up permitting policies through the appropriate land manager.

Native American Graves Protection and Repatriation Act; Title 25 U.S.C. § 3000 et seq.

The Native American Graves Protection and Repatriation Act of 1990 (NAGPRA), as amended, protects Native American burials during the planning and implementation of projects on all lands within the external boundaries of the UIR. In the event of a known burial, the project must address treatment of the burial in consultation with the CTUIR. In the event of an inadvertent discovery of Native American human remains, all work in the immediate vicinity of the burial must cease in order to develop a Plan of Action under NAGPRA to address treatment of the remains in conformance with NAGPRA regulations, Title 42 Code of Federal Regulations Part 10.1 et seq.

Endangered Species Act of 1973; Title 16 U.S.C. § 1531 et seq.

The Endangered Species Act (ESA) of 1973, as amended, provides a means for the protection of all endangered and threatened plant and animal species. It is comprehensive in that it also provides for the protection of critical habitats on which these species depend for survival. Section 7 of ESA and its implementing regulations found at Title 50 Code of Federal Regulations Part 402, requires federal agencies, in consultation with the U.S. Fish and Wildlife Service (USFWS) and/or the National Oceanic and Atmospheric Administration Fisheries Service (NOAA Fisheries), to insure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of such species.

Clean Air Act of 1970; Title 42 U.S.C. § 7401 et seq.

The Clean Air Act (CAA) of 1970, as amended, was originally enacted to protect the quality of the nation's air resources and the public health and welfare. The second purpose of the CAA is to

initiate a research and development program to achieve the prevention and control of air pollution. The final goal of the CAA is to encourage the development of regional air pollution prevention and control programs.

The law authorizes the Environmental Protection Agency (EPA) to establish National Ambient Air Quality Standards (NAAQS) to protect health and public welfare and to regulate emissions of hazardous air pollutants. Federal agencies must comply with all federal, state and tribal air quality standards and requirements for smoke management.

Clean Water Act of 1972; Title 33 U.S.C. § 1251 et seq.

The Clean Water Act (CWA) of 1972, as amended, established the basic structure for regulating discharges of pollutants into the waters of the United States and establishing quality standards for surface waters. In accordance with provisions of this statute, the CTUIR and the EPA have developed Total Maximum Daily Loads (TMDL) and a Water Quality Management Plan (WQMP) for the UIR.

Relationship to CTUIR Plans

Comprehensive Plan

In 2010, the CTUIR, through Board of Trustees Resolution Number 10-079, adopted an updated Comprehensive Plan that set forth the long-range goals of its members as they relate to treaty reserved rights, both on and off the Umatilla Indian Reservation, and the current and future needs of the people. The plan specified the following goals: (1) recruit commercial and industrial businesses to provide general fund revenue; (2) diversify the economy through investment in energy production; and (3) plan for long-term economic security in face of national and global environmental and economic conditions.

Water Code, Total Maximum Daily Load, and Water Quality Management Plan

In 2003, The CTUIR Board of Trustees adopted Resolution Number 03-100, enacting a Comprehensive Water Code integrating Water Quality Implementing Provisions and Stream Zone Alteration Regulations in its text. The new Water Code established an anti-degradation policy to provide for the maintenance and protection of waters of the Umatilla Indian Reservation. The Water Code further provided that any person who performs any activity that alters streamflow, water quality, ground contours, or perennial vegetation in several named stream zones on the UIR first had to obtain a valid Stream Zone Alteration Permit.

In 2004, The CTUIR Board of Trustees adopted Resolution Number 04-73, enacted a TMDL "to restore water quality and cultural integrity" of the waters of the UIR. The TMDL set water quality restoration targets for two pollutants, temperature and turbidity. The TMDL seeks to reduce late summer stream temperatures and the amount of stream fine sediments as much as possible.

The Water Commission of the CTUIR adopted a WQMP in 2008 that identifies best management practices necessary to achieve the water quality objectives. These best management practices

include but are not limited to establishment of streamside (riparian) management zones and road management.

Primary Issues and Concerns

A preliminary list of issues and concerns were identified based on the issues and concerns addressed in the FEIS for the Coyote Business Park in 2006, the EA for the Coyote Commercial Park in 2010, and the EA for the Verizon Monopole Telecommunications Tower in 2020. Input was also solicited from staff in the Department of Natural Resources (DNR) and Department of Economic and Community Development (DECD) as well as staff in the Tribal Planning Office of the CTUIR. These issues and concerns were refined during preparation of the EA. Criteria for evaluating effectiveness in addressing significant issue and concerns were also identified. A listing of individuals who have provided into the development of the EA is in Chapter 7.0.

The following issues and concerns were identified as important to the proposed action:

Water Quality/Instream Fisheries Habitat

1. How do we protect or improve water quality and fish habitat?

This is an issue due to:

a. The loss of riparian shrubs and trees leads to loss of shading, changes in stream morphology, and reduction in filtration of fine sediments.

b. Soil disturbance could lead to an increase in sediment yields to Patawa Creek.

Human activities have significantly affected streams on the UIR. The Oregon Department of Environmental Quality (ODEQ) and the CTUIR list several streams on the UIR as water quality limited under Section 303(d) of the Clean Water Act of 1973 due to elevated water temperatures, increased rates of sedimentation, and/or modifications to stream habitat. The CTUIR has developed and approved a TMDL and WQMP on the UIR for temperature and turbidity to improve water quality to a level that supports existing and designated beneficial uses (CTUIR 2005; CTUIR 2008).

The loss of riparian vegetation and establishment and/or construction of roads from human activities have led to elevation of water temperatures and a decrease in pool habitat especially on lower gradient biologically productive areas. The amount of fine sediment (sediment less than 0.25 in.) is an important aspect of habitat quality that is influenced by management. Roads significantly affects surface fines leading to changes in channel sediment characteristics.

How will this be addressed?

a. Changes in stream temperatures, streambank stability, and fine sediment loads.

b. Changes in stream morphology.

Development of Renewable Electric Energy Source/Economic Return to the Landowners

2. Does the proposed project diversify the economy through development of renewable energy production and what is the potential economic return to the landowners?

This is an issue due to:

a. The potential for development of a relatively small scale renewable solar energy project that addresses the increasing demand for electricity while avoiding detrimental impacts to salmon and steelhead.

b. The potential for significant economic return to the CTUIR.

The CTUIR has watched demand for electricity grow while struggling with the detrimental impacts of hydropower on salmon and steelhead in the Columbia River and its tributaries. The Treaty of 1855 provided the right for the CTUIR to harvest salmon and steelhead as well as other fish at all usual and accustomed sites. The CTUIR has become actively involved in efforts to reduce global warming through development of renewable energy projects as well as energy conservation projects in general. The CTUIR are also committed to diversifying the economy through all feasible aspects of energy including power production,

How will this issue be addressed?

a. By estimating the amount of electricity produced.

b. By estimating the potential economic return to the landowners.

Native Vegetation/Invasive Weeds

3. How do we prevent the spread of invasive weeds?

This is an issue due to:

a. The presence of invasive weeds on or adjacent to the solar electric generation site.

b. The potential to spread invasive weed seeds from the solar electric generation site to other areas on the UIR not presently infested with invasive weeds.

Invasive weeds are defined as any non-native plant species that is injurious to public health, crops, livestock, land, or other natural resources. The occurrence and spread of invasive weeds are a major problem over vast areas of the Pacific Northwest including the UIR. The negative impacts of invasive weed infestations on crop lands, forage for wildlife and domestic livestock, natural biological diversity, ecosystem health, recreational values, and soil productivity are well documented. The increased economic and environmental costs for controlling invasive weeds transcend land uses and ownership. Without increased invasive weed management control efforts,

these plants will continue to infest new lands with corresponding loss of economic and cultural benefits and ecosystem health.

Invasive weeds can infest new areas in a number of ways. Examples of invasive weed vectors may include but are not limited to: (1) seed transport and dispersal along roadways from vehicles, (2) seed transport and dispersal from contaminated hay, (3) seed dispersal by domestic, feral, and wild grazers, (4) expansion of infestations from adjacent, untreated lands, and seed transport and dispersal from railcars. Sites in poor ecological condition are more susceptible to invasion. However, even sites in good ecological condition can be invaded due to the extremely competitive nature of some of these exotic plant species.

Once invasive weed populations are established, they tend to expand at an exponential rate. These weed populations are free from the natural controls in their native range. Invasive weeds negatively impact the environment in a number of ways:

1. Reduces biodiversity by out-competing native plant species.

2. Decreases palatable forage for wildlife and domestic livestock.

3. Diminishes soil stability by overtaking native plants that have better soil holding characteristics.

4. Reduces land values by affecting forage quality and quantity.

5. Increases land management costs due to the need to control invasive weeds.

6. Affects the aesthetic value of the resource by displacing native species.

7. Increases risk to large mammals due to the toxicity of some invasive weeds.

The BIA and CTUIR have and will continue to expend significant monetary resources and manpower in an effort to limit the spread of and cultural impact of these plant species. The CTUIR has identified the restoration of native plant communities as an important goal for natural resource management on the UIR.

How will this issue be addressed?

a. Control invasive weeds through use of manual treatment (e.g. hand pulling, digging, and grubbing), mechanical methods (e.g. weed whackers and mowers), biological controls (plant eating insects, nematodes, mites and pathogens), and/or approved herbicides applications to eliminate the plants and/or prevent production of seed.

b. Use weed free material for construction activities (e.g. gravel).

c. Re-establish native vegetation on bare ground where appropriate and feasible.

Visual Environment

4. What impact will the Tutuilla Solar Electric Generation Facility have on the visual environment of the area?

This is an issue due to:

a. The likely visual impact that would result when a new visual element strongly contrasts with the existing landscape.

b. Change in visual quality of the landscape due to construction of the Tutuilla Solar Electric Generation Facility.

Visual impacts depend on how a new development relates to the surrounding landscape. A description of the landscape before and after a new development allows any impact to be described qualitatively. Descriptions of visual scenes can include topography, vegetation, land uses and buildings.

How will this issue be addressed?

a. Assessment of view quality before and after construction of the Tutuilla Solar Electric Generation Facility.

b. Consistency of the Tutuilla Solar Electric Generation Facility development with existing and planned land uses.

Threatened and Endangered Species

5. Will any habitat for threatened and endangered species be impacted?

This is an issue due to:

a. The legal requirements of the Endangered Species Act of 1973.

b. The importance of salmon and steelhead to the culture of the CTUIR.

As part of the decision-making process, federal agencies must consider the effects of their actions on listed or proposed to be listed threatened and endangered plant and animal species. ESA requires federal agencies to ensure that all actions are not likely to jeopardize the continued existence of any threatened or endangered species. The BIA is required to consult both informally and formally with NOAA Fisheries or the USFWS for those actions which may or will affect listed species prior to implementing the actions.

Based on a biological evaluation or assessment, the BIA may conduct an informal consultation with NOAA Fisheries and/or the USFWS if a proposed activity may affect a federally listed

species. If such informal consultation with NOAA Fisheries and/or USFWS results in a determination that the proposed activity is not likely to adversely affect the listed species or its habitat, no formal consultation is required.

Under Section 7 of ESA, the BIA must enter into formal consultation with NOAA Fisheries and/or the USFWS when it determines an action may or will adversely affect a listed species or its habitat. The formal consultation follows statutory and regulatory timeframes and procedures and results in a written biological opinion of whether the proposed action is likely to result in jeopardy to a listed species of adverse modification of designated critical habitat. The formal consultation may also result in the issuance of an incidental take statement by NOAA Fisheries and/or USFWS.

The BIA has not developed policy regarding the designation of sensitive plant and animal species. A sensitive species could be defined as those plant and animal species for which population viability is a concern as evidenced by: (1) significant current or predicted downward trend in population numbers or density or (2) significant current or predicted downward trend in habitat that would reduce a species existing distribution.

How will this issue be addressed?

a. The BIA will prepare a biological evaluation or assessment only if the proposed activities may affect and not likely to adversely affect or may affect and are likely to adversely affect federally listed species.

b. The BIA will consult either informally or formally with NOAA Fisheries and/or USFWS on any proposed activity that may adversely affect federally listed species.

Historic Properties/Traditional Uses

7. How will the need to protect cultural sites be met?

To comply with Section 106 of NHPA, all federally approved, funded, licensed or permitted undertakings must be evaluated for their effects on historic properties. The cultural analysis uses tools such as file and literature sources, oral histories, and field investigations to determine the nature and extent of such resources within the area of potential effect.

In 1996, the Department of the Interior, National Park Service, selected the CTUIR to assume historic preservation management review on the UIR under the 1992 amendments to NHPA. Prior to the commencement of any federal undertaking, the Cultural Resources Protection Program (CRPP), Department of Natural Resources, of the CTUIR and the THPO must be consulted to determine what, if any, impacts will occur to historic properties. All known or discovered cultural and archeological resources must be addressed in the Section 106 and CTUIR Historic Preservation Code processes. In the event that previously unknown cultural resources are discovered during project activities, these activities must be suspended until the impacts to historic properties can be addressed.

Other Issues and Concerns

In addition to the primary issues and concern, there were other issues and concerns considered in preparation of this EA. These issues and concerns were determined to be insignificant in determining what action, if any, should be taken.

Air Quality

The EPA has regulatory authority over air quality on the UIR. Regulations and standards of the Clean Air Act are applicable to sources of air emissions on the UIR. Air emissions are generally classified into: (1) area sources, (2) point sources, or (3) mobile sources. Identified area sources include fugitive dust, stationary sources too small or numerous to account for individually, residential wood burning, and forest and agricultural prescribed fires. Point sources are those that can be identified from a specific fixed point in space while mobile sources are tailpipe emissions from automobiles. Point sources on the UIR include the Mission Grain Elevator, Arrowhead Truck Plaza, Wildhorse Resort and Casino, and the Tribal Environmental Recovery Facility.

Although lacking in information on emissions from some known point sources and agricultural practices, the CTUIR (2006) developed a rough and incomplete estimate of the air emissions on the UIR from data updated in 2000. The UIR is in a Class II Area in attainment with the National Air Ambient Quality Standards. There are no major point sources of air emissions regulated under Title III, Title IV, or Title V of the Clean Air Act. It is unlikely that the cumulative impact to air quality due to the Tutuilla Solar Electric Generation Facility would violate National Air Ambient Quality Standards.

Hazardous Materials

The PV cell manufacturing process includes a number of hazardous materials, most of which are used to clean and purify the semiconductor surface. These chemicals, similar to those used in the general semiconductor industry, include hydrochloric acid, sulfuric acid, nitric acid, hydrogen fluoride, 1,1,1-trichloroethane, and acetone. The amount and type of chemicals used depends on the type of cell, the amount of cleaning that is needed, and the size of silicon wafer. Workers also face risks associated with inhaling silicon dust. Thus, PV manufactures must follow U.S. laws to ensure that workers are not harmed by exposure to these chemicals and that manufacturing waste products are disposed of properly.

Thin-film PV cells contain a number of more toxic materials than those used in traditional silicon photovoltaic cells, including gallium arsenide, copper-indium-gallium-diselenide, and cadmium-telluride. If not handled and disposed of properly, these materials could pose serious environmental or public health threats. However, manufacturers have a strong financial incentive to ensure that these highly valuable and often rare materials are recycled rather than thrown away.

The CTUIR and Tutuilla Solar LLC have agreed that Tutuilla Solar LLC must comply with all federal and tribal environmental laws and regulations regarding hazardous materials and must complete site restoration to pre project conditions upon termination or expiration of the lease.

Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, environmental justice concerns, including disproportionately high and adverse human health or environmental effects on minority and/or low-income populations Must be addressed. According to the U.S. Census Bureau, tribal populations are considered minority populations. There are no identified disproportionately high and adverse human health or environmental effects on minority and low-income populations.

Permits Required

Development Permit – The proposed site for the Tutuilla Solar Electric Generation Facility is within the 1-D, Industrial Development Zone under the Land Development Code of the CTUIR. The CTUIR Tribal Planning Office (TPO) would need to issue a development permit as required by the Land Development Code. The Tribal Planning Office must also approve and inspect the structural, mechanical, and electrical plans for the Tutuilla Solar Electric Generation Facility.

Storm Water Discharge Permit – Under the CWA and the National Pollution Discharge Elimination System (NPDES) general construction permit Tutuilla Solar LLC must prepare a Stormwater Pollution Protection Plan (SWPPP) incorporating best management practices for runoff and erosion control. The EPA would then need to approve a storm water discharge permit for construction activities (construction activities are not part of the federal action under review by the BIA). Application can be made online.

Construction of Road Approaches onto County and Public Roads Permit – Tutuilla Solar LLC proposes that access to the proposed site for the Tutuilla Solar Electric Generation Facility be provided by a gravel driveway approximately 20 feet wide directly off Tutuilla Church Road. Tutuilla Church Road is a public road under the jurisdiction of Umatilla County. Pursuant to Oregon Revised Statutes 374.305 through 374.325, the Umatilla County Public Works Department must issue a construction of road approaches permit. Any access road must intersect the county road at a right angle and must be at least 200 feet from any existing access.

2.0. Alternatives Including the Proposed Action

Two alternatives are analyzed in this document. Alternative A (No Action) is a requirement of NEPA and BIA planning procedures. Alternative B (Proposed Action) could reasonably be expected to meet the goals and objectives of the CTUIR relating to the construction and operation the Tutuilla Solar Electric Generation Facility.

Alternative A – No Action

The BIA would not approve a business lease for the construction and operation of the Tutuilla Solar Electric Generation Facility from the CTUIR to Tutuilla Solar LLC.

Alternative B-Approval of a Business Lease from CTUIR to Tutuilla Solar LLC

The BIA would approve a business lease for construction and operation of the Tutuilla Solar Electric Generation Facility from the CTUIR to Tutuilla Solar LLC. The approximately 14.5-acre site is located south of Interstate 84 approximately six miles east of Pendleton, Oregon (Figure 2). The site is part of Tribal Trust Tract T2103-C and is located in Lot 15, Section 21, Township 2 North, Range 33 East, Willamette Meridian, Umatilla County, Oregon. The site is bound by the South Market Road to the east, Tutuilla Church Road to the south, undeveloped farmland to the west, and other undeveloped lands in Coyote Business Park to the north (Figure 3).

The term proposed business lease would be for an initial term of 21 years. The proposed business lease further provides the lessor may extend the lease term for an additional two 5-year intervals immediately upon expiration of the original lease period. Under terms of the proposed business lease the lessor must pay the CTUIR an annual payment on the first (1^{st}) day of each year. The proposed business prohibits the lessor from generating, manufacturing, using, or discharging any hazardous substance. The proposed business also requires the development of a site restoration plan setting forth obligations to remove permanent improvements and to restore premises to pre lease conditions upon expiration or termination of the lease.

Solar Panels

The proposed business lease would allow installation of approximately 5,850, 72-cell 400watt modules (Figure 4). The modules would be solar photovoltaic (PV) panels made of high-efficiency monocrystalline or polycrystalline silicon. The solar panel array would generate electricity directly from sunlight, collect it to a single 12ft x 20ft panelboard and step transformer within the project area, and interconnect the power to the PacifiCorp's 12 kilovolt (kV) distribution line adjacent to the site for delivery to customers.

The system would incorporate high-efficiency commercially available Underwriters Laboratories (UL)-listed solar PV panels that are made from monocrystalline or polycrystalline silicon modules, anti-reflective glass, aluminum frame, and copper electrical wires with plastic sheathing. By design, the solar PV panels would absorb sunlight to maximize electrical output and use anti-reflective glass, resulting in approximately half the reflectance of standard residential and

commercial glass. Due to the limited rotation angles, the solar PV panels have low potential for reflecting the sun's rays upon any ground-based observer. These panels would be protected from impact by tempered glass and would have factory applied ultraviolet and weather resistant quick connect wire connectors.

Solar Panel Array

Two solar panel arrays (North and South) would contain 39 rows of panels on E-W single axis tracker racking each approximately 7.2 acres in size. Each array would contain 13 string inverters connecting 3 rows of panels, and each row containing 75 panels. Individual PV panels and rows would be electrically connected together in series to carry direct current (DC) electricity to the interior end of the row, called DC strings. Each string has wiring above ground into 24in x 36in string inverters mounted on a post along interior driveway (Figure 5). Each inverter converts DC to AC electricity.

Tracker Units

Each 750-kW array is on tracker racking that rotate the rows of solar PV panels from east to west throughout the day following the sun to maximize exposure to sunlight, thereby maximizing electrical output. The rows of each tracker unit would be linked together and rotated in unison by an industrial-grade system controller and drive unit, all above grade and on the center post for each row. The tracker units would include four major components, described below.

Drive Unit. Within a tracker unit, multiple rows of solar PV panels would be linked by a steel drive strut, which would be oriented perpendicular to the axis of rotation. Each row would be connected to the drive strut by a torque arm, which acts as a lever, enabling the drive strut to rotate the rows together as the drive unit moves the strut forward and backward. The drive unit typically is mounted at the first row in a tracker unit and consists of a 0.5-horsepower bi-directional AC motor that rotates the drive strut via an industrial-grade screw jack. The drive unit would be connected to an industrial-grade variable-frequency drive that translates commands from the control computer into AC signals that apply power to the motor, the screw jack, and finally to the drive strut and rows.

Tracker Controller. The tracker controller is a self-contained industrial-grade control computer that would incorporate all of the software needed to operate the system. The controller would include a liquid crystal display (LCD) monitor that displays a combination of calibration parameters and status values, providing field personnel with a simple user-friendly configuration and diagnostic interface. The LCD would enable field adjustment, calibration, and testing.

Steel Tracking Structure. The steel tracking structure would be able to withstand high-wind conditions (up to 145 km [90 miles] per hour), site-specific wind gust and aerodynamic pressure effects, and seismic events. The frame would be elevated to approximately 1.8 m (6 feet) above ground and would consist of long horizontal beams atop vertical piles.

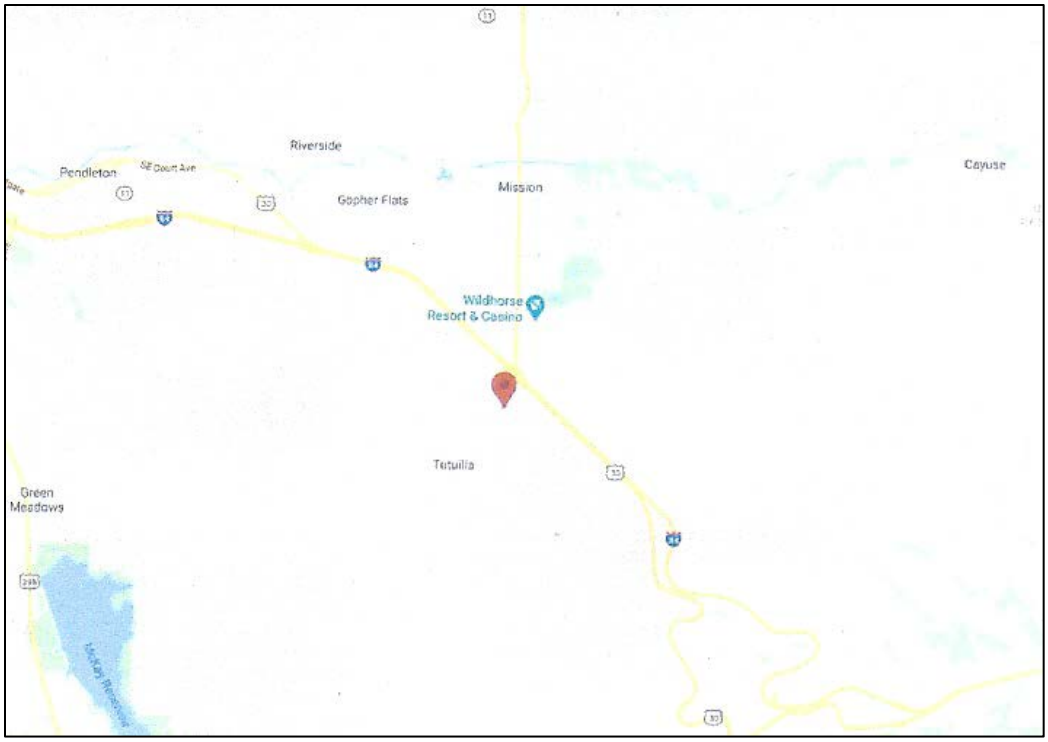


Figure 2. Tutuilla Solar Electric Generation Facility Vicinity Maps

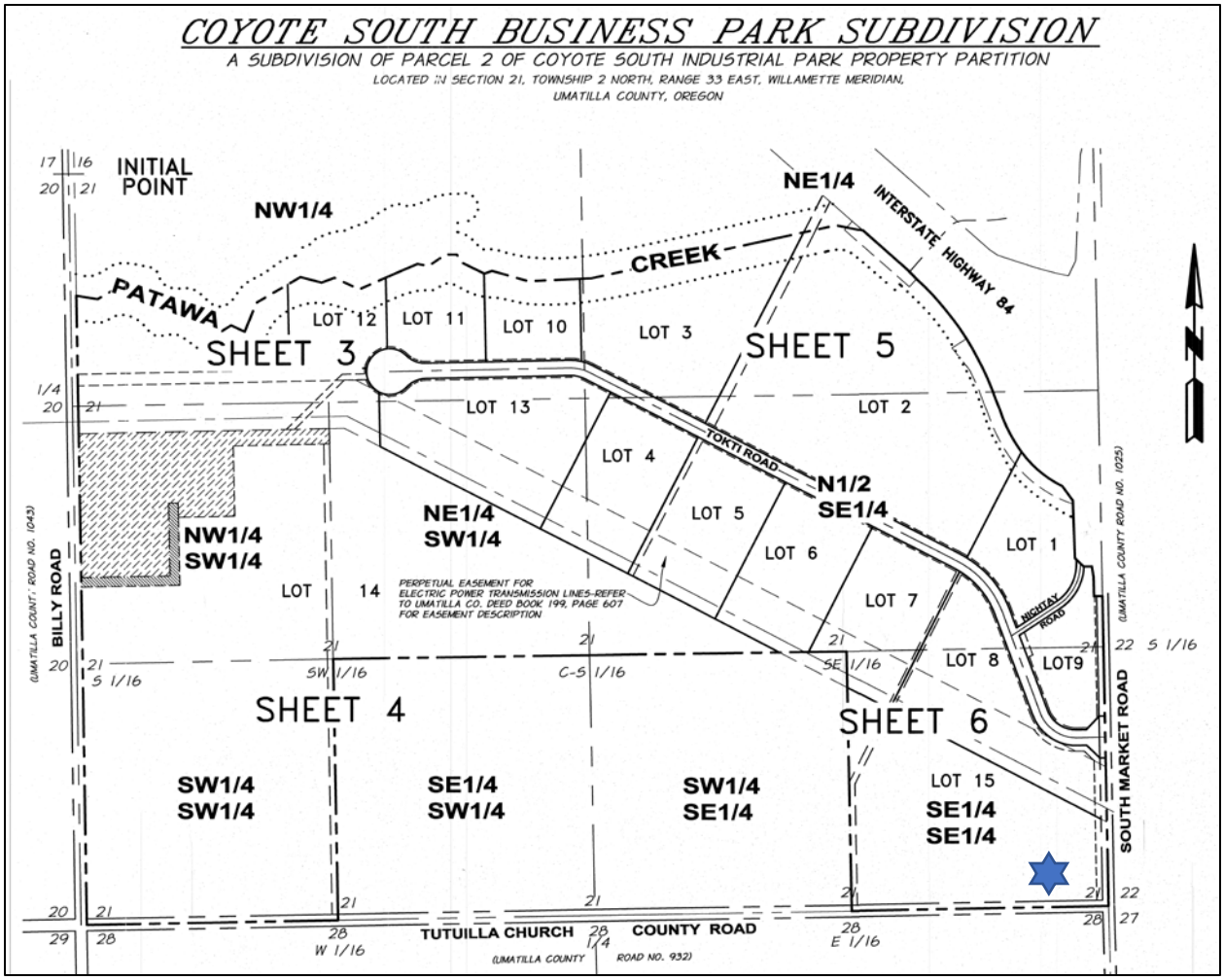
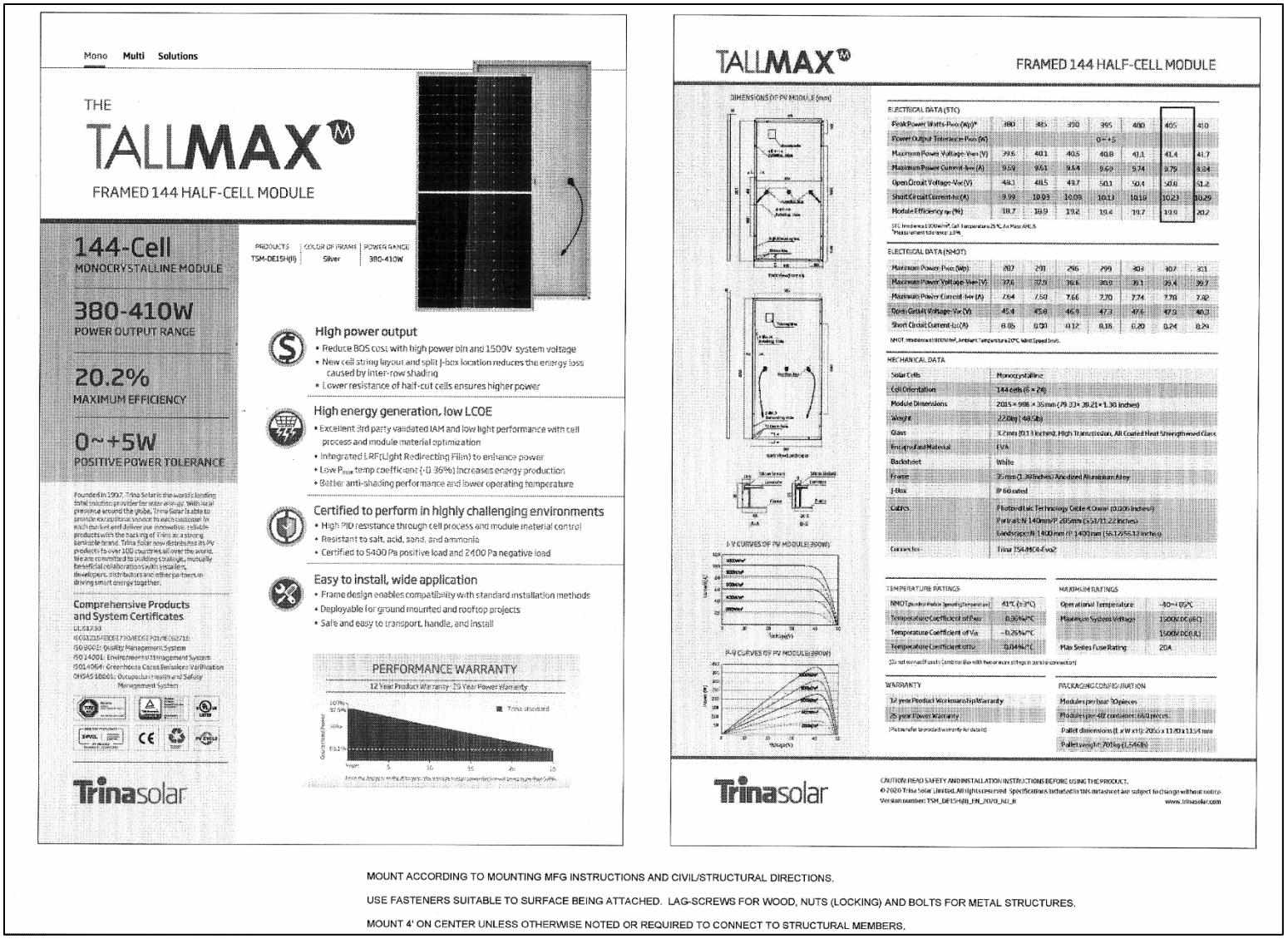


Figure 3. Tutuilla Solar Electric Generation Facility Site Map

Steel Tracking Structure. The steel tracking structure would be able to withstand high-wind conditions (up to 145 km [90 miles] per hour), site-specific wind gust and aerodynamic pressure effects, and seismic events. The frame would be elevated to approximately 1.8 m (6 feet) above ground and would consist of long horizontal beams atop vertical piles.

The depth of the 17,280 proposed piers that support the tracking structure, not including the drive piers described above, would be approximately 1.83 to 3.05 m (6–10 feet) deep. For the greater depths of approximately 3.05 m (10 feet), 114-mm (4.5-inch) outside diameter galvanized steel-bearing pedestals would likely be used as the driven pier foundation. For the lesser depths of 1.8 to 2.4 m (6–8 feet), 30- to 60-cm (12- to 24-inch) driven piers would be the preferred pier type. Concrete piers would be used as the cast-in-drilled-hole (CIDH) foundation only as necessary based on local soil conditions. A finish grade would occur at each of the driven pier and CIDH foundations.



MOUNT ACCORDING TO MOUNTING MFG INSTRUCTIONS AND CIVIL/STRUCTURAL DIRECTIONS.

USE FASTENERS SUITABLE TO SURFACE BEING ATTACHED. LAG-SCREWS FOR WOOD, NUTS (LOCKING) AND BOLTS FOR METAL STRUCTURES.

MOUNT 4' ON CENTER UNLESS OTHERWISE NOTED OR REQUIRED TO CONNECT TO STRUCTURAL MEMBERS.

Figure 4. Solar Photovoltaic Panels for Tutuilla Solar Facility

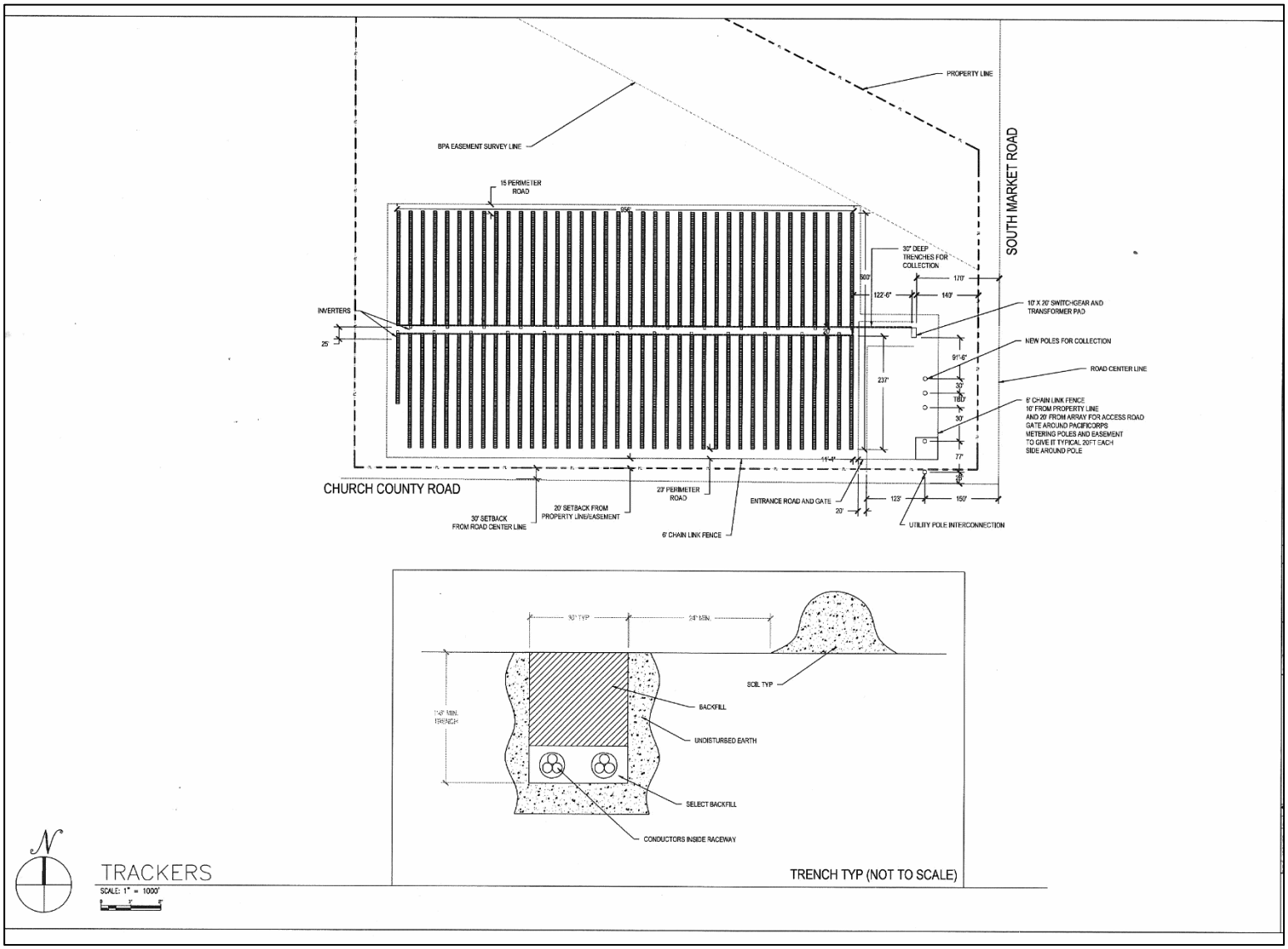


Figure 5. Tutuilla Solar Facility Solar Array and Inverter Layout

DC–AC Inverter. The inverter would change the electrical current from DC, which is produced in the solar cells, to AC, which would be fed into the utilities power line.

Distribution Gear and Transformer

The AC electricity from each inverter will run in underground PVC conduit to a single distribution panel and step-up transformer on a concrete pad on east side of the arrays. The cables run in trench along the north or south side of the interior road, then collect into a single trench on the east end to run to the equipment pad. Power is converted to 12 kV by a 6 feet x 6 feet pad transformer. From there, the collection circuit would then travel up a riser and over four poles for metering and connect to PacifiCorp's existing distribution line adjacent to the site along the north side of Tutuilla Church Road (Figure 6).

Access Roads

A gravel driveway approximately 20 feet wide directly off a paved road, Tutuilla Church Road, will provide access to the proposed site for the Tutuilla Solar Electric Generation Facility. The proposed site is directly adjacent to Tutuilla Church Road, so it is 20 feet to the to the fence setback. There will be interior access roads approximately 16 ft wide between the two solar panel arrays and on the south, east, and north sides of the arrays.

Construction Activities

The PV modules (i.e., solar panels), solar trackers (i.e., the devices for orienting the solar panel toward the sun), and associated appurtenances (i.e., combiner boxes, inverters, switchgear and monitoring system) for the solar facilities would be manufactured off-site and delivered to the proposed site by truck. Upon their arrival, the PV modules, solar trackers, and appurtenances would be inspected, stored, and assembled in a temporary staging area.

The following measures are required during construction:

1. Observe and comply with all federal, state, and tribal laws, ordinances and regulations which in any manner affect conduct or safety of work. All work shall conform to the CTUIR Land Development Code which has adopted the International Building Code.

2. Notify the Department of Natural Resource, CRPP/THPO a minimum of 72-hours prior to any site excavation. A cultural resource monitor must be on site during ground disturbing activities.

3. If, in the course of work, cultural resources are observed, immediately suspend any operations within 100 feet of the find and notify CRPP and THPO. The CRPP will assess the find in consultation with THPO. The THPO and appropriate consulting parties will determine the next steps. Activities in the area of the find may resume only after approval from THPO.

4. If, in the course of work, human remains or existence of burial indicators are encountered, work will cease within 100 feet of the find and the Umatilla Tribal Police Department (UTPD), CRPP, THPO, and BIA must be immediately contacted. There shall be no collection of human

remains, funerary objects, sacred objects, or cultural resources unless, in consultation with the THPO and CRPP, it is determined that there is an immediate need to do so. No photographs should be taken unless requested by THPO or UTPD. The THPO, in consultation with the Cultural Resources Committee, shall develop a plan of action in accordance with CTUIR Policy and Procedures Manual for the Repatriation of Ancestral Human Remains and Funerary Objects. Activity in the discovery area may resume upon written clearance from the Tribal Historic Preservation Officer.

5. Prepare a storm water pollution prevention plan (SWPPP) and install and maintain necessary temporary erosion and sedimentation control (TESC) best management practices. Control wind born dust by continuous watering of disturbed ground.

6. Restore disturbed areas outside facility footprint to existing or better condition when work in immediate area is complete.

Surface Disturbance

The total area of surface soil disturbance would be approximately 1.35 acres (Table 1)

Table 1. Surface Disturbance for the Tutuilla Solar Electric Generation Facility

	Disturbance Area	**Disturbance Depth**
Tracker Posts	• 2.96 sq. in. per post • 780 posts • 16 sq. ft.	6–14 feet (depending on post type)
Electrical Trenches	• 2 trenches • 16 in. wide, 1000 ft long • 2,670 sq. ft.	Average 2 ft deep and backfilled with native dirt
Inverter Pads	• 12 ft. x 25 ft. sq. ft. per pad • 26 inverter pads • 7,800 sq. ft.	5 feet maximum excavation for electrical wiring with 8 in-deep concrete
Switch Gear and Transformer Pad	• 10 ft x 20 ft • 200 sq. ft.	8-24 Inch Concrete Slab
Main Access Road Interior Access Roads	• 20 ft. wide x 20 ft long • 400 sq. ft. • 16 ft. wide x 2512 ft long • 55,488 sq. ft.	4–8 inches of 1 inch minus gravel directly over weed barrier and existing ground
Security fence	• Approximately 3300 ft. of 8 ft. tall security fence • 330 posts x .785 sq. ft. per post • 259 sq. ft.	Metal fence posts would be set in 12 in. diameter by 3 ft. depth concrete pier

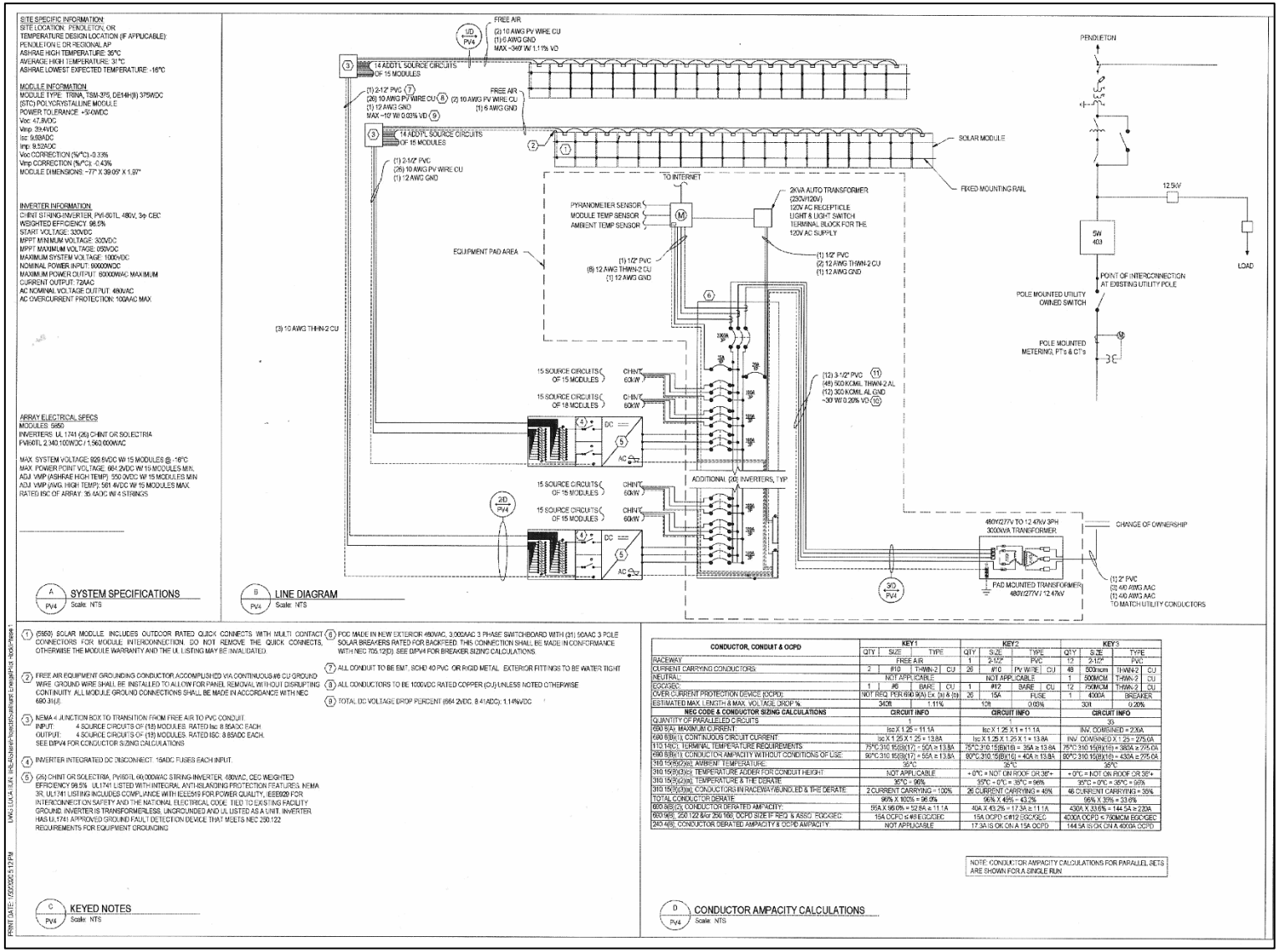


Figure 6. Tutuilla Solar Facility Line Diagram

Evaluation and Comparison of Alternatives

A detailed analysis of the environmental consequences or impacts of implementing each of the two alternatives appears in Section 4.0. Table 2 is intended to be a concise summary.

Table 2. Comparison of Alternatives Issuance of Business Lease Tribal Trust Tract T2103-C

Issue/Concern	Alternative A No Issuance of Business Lease	Alternative B Issuance of Business Lease
Water Quality/Instream Fisheries Habitat	No Change in Water Quality or Instream Fisheries Habitat	Minor Potential for Adverse Impacts to Water Quality or Fisheries Habitat. Mitigation Measures in Place.
Development of Renewable Energy/Economic Return to Landowners	No Development of Renewable Energy and No Economic Return to CTUIR	Relatively Small Scale Solar Electric Production Developed. Estimated Present Value to Landowners of $210,000
Native Vegetation/Invasive Weeds	. No Change to Extent of Native Vegetation or Invasive Weeds	Minor Potential to Establish Native Vegetation
Visual Environment	No Change in Visual Quality	Moderate Change in Visual Quality
Threatened, Endangered and Candidate Fish and Wildlife	No Effect on Listed Species/Habitats	No Effect on Listed Species/Habitats
Cultural Resources/Traditional Uses	No Potential for Impacts to Cultural Resources	Minor Potential for Impacts to Cultural Resources Based on Completed Fieldwork

3.0 Affected Environment

Introduction

This section describes the environment as it now exists. The information presented will serve as the environmental baseline for the comparisons made in Section 4.0 – Environmental Consequences.

Water Quality/Instream Fisheries Habitat

Hydrology

Originating at nearly 6,000 feet in elevation, the Umatilla River flows out of the Blue Mountains through narrow well-defined canyons. After leaving the mountains, the North and South Forks join to form the mainstem, a 90-mile reach of river, which flows through a series of broad valleys that drain rolling lands (ACOE 1999; ODEQ 2001). The mainstem Umatilla River has eight main tributaries: North and South Forks of the Umatilla River and Meacham Creek in the upper basin; Wildhorse Creek, Tutuilla, McKay and Birch Creeks in the mid basin; and Butter Creek in the lower basin. The average monthly discharge of the Umatilla River (measured at River Mile 2.1 varies from 23 cubic feet per second (cfs) in July to 1,095 cfs in April (low flow at the mouth occurs in July rather than September due to upstream withdrawls for irrigation).

There are numerous smaller streams that flow into the Umatilla River. These streams include Isquulktpe, Buckaroo, Coonskin, Moonshine, Cottonwood and Mission Creeks. Patawa Creek flows into Tutuilla Creek.

Water Quality

The upper Umatilla subbasin has historically been valued as a source of cool, clean, abundant water and habitat for resident and migratory fish. For the last 150 years, increased demands on the watershed have degraded water quality. The CTUIR developed water quality standards in conjunction with EPA in 1999 in order to regulate water quality conditions. A Total Maximum Daily Load (TMDL) that addresses stream temperature and turbidity for which there is ample data to indicate water quality standards are not being met was completed by the CTUIR in 2005 (CTUIR 2005). The TMDL established reduction goals for stream temperature and sediment and led to the completion of a Water Quality Management Plan (WQMP) in 2008 (CTUIR 2008).

Stream Temperature

Water temperature is a concern throughout most of the Umatilla River drainage from May until early November (period of low flow). ODEQ (2001) listed 287 miles of the Umatilla subbasin as impaired for elevated water temperatures including the entire mainstem Umatilla River. The highest water temperatures have been recorded in late July and early August when ambient air temperatures are high. During this period, the Umatilla River warms rapidly from the headwaters to the mouth, reaching sub-lethal (64°F to 74°F) and incipient lethal temperatures (74°F to 89°F)

for salmonids its entire length. Most of the tributaries where temperature data were collected also reached sub-lethal and incipient lethal ranges for salmonids (ODEQ 2001).

Sediment and Turbidity

The Umatilla River produces large amounts of sediment, much of which originates from weathered basalt and unconsolidated loess deposits. The primary sources include both bank and upland erosion of tributaries and tributary watersheds both of which may be accelerated by land uses (ODEQ 2001). The dominant erosion processes in the subbasin are surface erosion by sheetwash, rills and gullies, and bank erosion. Peak sedimentation usually occurs during rainstorms or snowmelts associated with freeze and thaw periods. The CTUIR has identified segments of two streams, Umatilla River and Mission Creek, on the UIR that do not meet water quality standards for turbidity.

Fish Populations

Currently more than 31 species of fish including 17 native species inhabit the Umatilla subbasin (Northwest Power and Conservation Council 2005). Anadromous salmonids that currently occur in the subbasin include summer steelhead (O*ncorhynchus mykiss*), coho (*Oncorhynchus kisutch*), and spring and fall chinook (*Oncorhynchus tshawytscha*). Coho and chinook have been reintroduced from Columbia River hatchery stock while steelhead are currently supplemented by hatchery reared fish using wild, endemic broodstock to prevent domestication. Resident salmonid species inhabiting the Umatilla subbasin include mountain whitefish (*Prosopium williamson*), redband trout (O*ncorhynchus mykiss*), and bull trout (*Salvelinus confluentus*).

Spring chinook, fall chinook and coho were absent from the subbasin for approximately 75 years. Irrigation and agricultural development in the 1900's are the primary causes of the decline of steelhead and directly related to the extirpation of spring chinook (ODEQ 2001).

Stream Function and Aquatic Habitat

The proposed project area is in the Patawa Creek Watershed. Patawa Creek is a tributary to Tutuilla Creek. Two major channel courses are located within the Coyote Business Park. The mainstem of Patawa Creek flows 6600 feet through the middle of Coyote Business Park just south of I-84 in a westerly direction. It drains a total area of approximately 10.5 square miles from an elevation of 3500 feet down to 1330 feet at Coyote Busines s Park.

Included in this drainage area is a small, unnamed tributary that flows southwesterly and drains 2.7 square miles just north of I-84, crossing under the interstate to join with Patawa Creek in the northcentral portion of the proposed project site. Although both these channels intermittently convey water, they are well defined in the landscape with developed banks and bedload. The overall Patawa Creek drainage is defined by deep loess soils that overlay alluvium and cemented alluvium. The drainage is in a parallel pattern oriented in a northwest direction and characterized by long, parallel, single-thread channels with relatively few tributaries.

The existing condition of the two stream channels in the project area is poor in terms of stream function and aquatic habitat. Both streams have been straightened into single-thread channels with very little complexity. Complexity is typically considered desirable because situations are created in the channel and floodplain that reduce erosive energy and promote positive bank and floodplain building processes. Sediment that may flow off the upland is detained and stored by variable terrain and riparian vegetation in a complex floodplain. Sediment that is transported within a sinuous, complex channel is deposited in specific and appropriate areas such as point bars rather than center bars. During high flow events, a complex floodplain filled with vegetation that has stabilizing root masses is able to withstand overbank flow and not be torn apart. These conditions would promote a narrow and deep low flow channel that is less susceptible to temperature increases and provides positive conditions for aquatic species.

The stream channel through the proposed project area is relatively low gradient (<2%) with low sinuosity (<1.2) and moderate to high entrenchment (<1.8). This means that the existing channel is straight and downcut into the floodplain; channel-forming flows remain within the terrace banks and only extreme flows (>25-year recurrence) will access any energy relief. This also means that during high flows (flows greater than bankfull) shear stress will continue to increase as flows increase and bed and bank erosion will occur. Shear stress will be highest at the bottom of the channel, which will cause downward erosion until a resistant layer is encountered. Dominant substrate materials in the channel bed and floodplain consist of small gravels, sands and fines. The channel configuration shows signs of both lateral and vertical instability, with excessive bank erosion observed.

Native Vegetation/Invasive Weeds

The proposed site for the Tutuilla Solar Electric Production Facility has been farmed for decades under a predominately winter wheat/fallow rotation. The CTUIR Tribal Farming Enterprise (TFE) currently has winter wheat planted on the proposed site for harvest in 2021. Johnson and Makinson (1988) mapped the soil on the site as Hermiston Silt Loam. There is no native vegetation on the site. Based on the soil survey, the Natural Resources Conservation Service (2021) would classify the area as Loamy Bottom Ecological Site (R010XY005OR) An Ecological Site is a distinctive type of land with specific characteristics that differ from other kinds of land in its ability to produce a distinctive kind and amount of vegetation. The potential natural plant community would likely be dominated by basin wildrye (Le*ymus cinereus*). Associated forbs include common yarrow (*Achillea millefolium*), lupine (*Lupinus spp.*), and hawksbeard (*Crepis spp.*).

Invasive weeds occur in patches of varying sizes and densities on the UIR. Invasive weeds are known to be more abundant in certain areas than in others. Areas within or adjacent to human development, including roadsides, railroads, pipelines, transmission line rights-of-way, residential areas, and the margins of agricultural fields, are often highly infested with invasive weeds. Invasive weeds typically found in these areas include bull thistle (*Cirsium vulgare*), cheatgrass (*Bromus tectorum*), common teasel (*Dipsacus fullonum*), puncturevine (*Tribulus terrestris*), Russian thistle (*Salsola kali*), diffuse knapweed (*Centaurea diffusa*), Scotch thistle (*Onopordum acanthium*), St. Johnswort (*Hypericum perforatum*), and yellow starthistle (*Centaurea solstitialis*). A full list of invasive weeds known to occur on the UIR is provided in Table 3.

Table 3. Invasive Weeds Known to Occur on the UIR

Common name	Scientific name	Umatilla County Invasive Weed List Designation	Oregon Invasive Weed List Designation	CTUIR Invasive Weed List Designation
Bachelor's button	*Centaurea cyanus*	-	-	Priority 1-small isolated infestations, Priority 2-large established infestations
Black locust	*Robinia pseudoacacia*	-	-	Priority 3
Bulbous bluegrass	*Poa bulbosa*	-	-	Priority 3
Bull thistle	*Cirsium vulgare*	–	B-listed	Priority 2
Bur chervil	*Anthriscus caucalis*	-	-	Priority 1-small isolated infestations, Priority 3-large established infestations
Canada thistle	*Cirsium arvense*	B-listed	B-listed	Priority 1- small isolated infestations, Priority 3-large established infestations
Catchweed	*Asperugo procumbens*	-	-	Priority 3
Cereal rye	*Secale cereale*	B-listed	-	Priority 3
Cheatgrass	*Bromus tectorum*	-	-	Priority 3
Common bugloss	*Anchusa officinalis*	A-listed	B-listed, T-designated	Priority 1
Common crupina	*Crupina vulgaris*	A-listed	B-listed	Priority 1
Common mullein	*Verbascum thapsus*	-	-	Priority 3
Common teasel	*Dipsacus fullonum*	-	-	Priority 3
Dalmatian toadflax	*Linaria dalmatica*	B-listed	B-listed, T-designated	Priority 1
Diffuse knapweed	*Centaurea diffusa*	B-listed	B-listed	Priority 1- mall isolated infestations, Priority 3-large established infestations
Field bindweed	*Convolvulus arvensis*	-	B-listed, T-designated	Priority 3
Garlic mustard	*Alliaria petiolata*	-	B-listed, T-designated	Priority 1
Himalayan blackberry	*Rubus armeniacus*	A-listed	B-listed, T-designated	Priority 1- small isolated infestations, Priority 3-large established infestations
Houndstongue	*Cynoglossum officinale*	-	B-listed	Priority 3
Jointed goatgrass	*Aegilops cylindrica*	B-listed	B-listed	Priority 3
Kochia	*Bassia scoparia*	B-listed	B-listed	Priority 3

Table 4. Invasive Weeds Known to Occur on the UIR Continued

Common name	Scientific name	Umatilla County Invasive Weed List Designation	Oregon Invasive Weed List Designation	CTUIR Invasive Weed List Designation
Medusahead	*Taeniatherum caput-medusae*	B-listed	B-listed	Priority 3
Multiflora rose	*Rosa multiflora*	-	-	Priority 1- small isolated infestations, Priority 3 -large established infestations
Musk thistle	*Carduus nutans*	B-listed	B-listed	
Myrtle spurge	*Euphorbia myrsinites*	A-listed	B-listed	Priority 1
Perennial pepperweed	*Lepidium latifolium*	-	B-listed, T-designated	
Poison hemlock	*Conium maculatum*	B-listed	B-listed	Priority 3
Puncturevine	*Tribulus terrestris*	B-listed	B-listed	
Purple loosestrife	*Lythrum salicaria*	A-listed	B-listed	Priority 1
Rattail fescue	*Vulpia myuros*	-	-	Priority 3
Reed canarygrass	*Phalaris arundinaceae*	-	B-listed, T-designated	Priority 3
Rush skeletonweed	*Chondrilla juncea*	A-listed	B-listed, T-designated	Priority 1
Russian knapweed	*Acroptilon repens*	B-listed	B-listed	Priority 1- small isolated infestations, Priority 3 -large established infestations
Russian olive	*Elaeagnus angustifolia*	-	-	Priority 1- small isolated infestations, Priority 2-large established infestations
Russian thistle	*Salsola kali*	-	-	Priority 3
Scotch thistle	*Onopordum acanthium*	B-listed	B-listed	Priority 2
Smooth brome	*Bromus inermis*	-	-	Priority 3
Spikeweed	*Centromadia pungens*	A-listed	B=Listed	Priority 1
Spotted knapweed	*Centaurea stoebe*	A-listed	B-listed, T-designated	Priority 1

Table 5. Invasive Weeds Known to Occur on the UIR Continued

Common name	Scientific name	Umatilla County Invasive Weed List Designation	Oregon Invasive Weed List Designation	CTUIR Invasive Weed List Designation
Spreading hedge-parsley	*Torilis arvensis*	-	-	Priority 2
St. Johnswort	*Hypericum perforatum*	B-listed	B-listed	Priority 3
Sulfur cinquefoil	*Potentilla recta*	-	B-Listed	Priority 1- small isolated infestations, Priority 3 -large established infestations
Swainson pea	*Sphaerophysa salsula*	-	B-Listed	Priority 2
Sweetbriar rose	*Rosa eglanteria*	-	-	Priority 3
Tall oatgrass	*Arrhenatherum elatius*	-	-	Priority 3
Tansy ragwort	*Senecio jacobaea*	A-listed	B-Listed	Priority 1
Tree of heaven	*Ailanthus altissima*	-	B-Listed	Priority 1
Ventenata	*Ventenata dubia*	-	-	Priority 3
Viper's bugloss	*Echium vulgare*	A-listed	-	Priority 2
Whitetop (hoary cress)	*Cardaria draba*	B-listed	-	Priority 1
Yellow flag iris	*Iris pseudacorus*	A-listed	B-listed	Priority 1
Yellow starthistle	*Centaurea solstitialis*	B-listed	B-listed	Priority 1- small isolated infestations, Priority 2 -large established infestations

NOTES:
A-listed: A weed of known economic importance that occurs in the state/county in small enough infestations to make eradication or containment `possible; or is not known to occur, but its presence in neighboring states/county make future occurrence in seem imminent.
B-listed: A weed of economic importance which is regionally abundant, but which may have limited distribution in some counties.
T-designated: A designated group of weed species that are selected and will be the focus for prevention and control. Action against these weeds will receive priority.
Priority 1 Species. An invasive weed with small infestations in the IWMP management area that are quick to spread, and/or are difficult to control. Eradication will be the primary management strategy. Priority 1 species are the highest priority for treatment; eradication will likely require repeated treatments.
Priority 2 Species. An invasive weed that is limited in abundance, but widespread in the IWMP management area. Reduction will be the primary management strategy for Priority 2 species. Annual treatment may be needed to prevent more severe infestations.
Priority 3 Species. An invasive weed that is already widespread in the IWMP management area, and will thus be costly to control, or is considered less invasive than Priority 1 or Priority 2 species. Treatment of Priority 3 species will be focused along roads and other vectors for containment and to prevent the population from spreading.

Visual Environment

Introduction

The visual environment can be described according to view character and quality. The character of a view is described by the topography, land uses, vegetation, and buildings depicted in the view. The assessment of the visual character is descriptive and not quantitative. Visual quality refers to the aesthetics of the view. Determining the quality of a view can be subjective because it is based in part on the viewer's values and notions about what constitutes a quality setting. In an effort to establish an objective framework, assessment of the quality of a view applies the evaluative criteria (i.e., vividness, intactness, and unity) and qualitative rankings (low, medium, and high). Vividness is the visual power or memorability of landscape components as they combine in striking and distinctive visual patterns. Intactness is the visual integrity of the natural and man-made landscape and its freedom from encroaching elements. Unity is the visual coherence and compositional harmony of the landscape considered as a whole.

Views of high quality have topographic relief, a variety of vegetation, rich colors, impressive scenery, and unique natural and/or built features. Views of medium quality have interesting but minor landforms, some variety in vegetation, and/or moderate scenery. Views of low quality have uninteresting features, little variety in vegetation, uninteresting scenery, and/or common elements. All three criteria (i.e., vividness, intactness, and unity) must be high to indicate high quality. The visual quality of the area can be characterized as medium quality with interesting but minor landforms (bottomlands and terraces), some variety in vegetation (riparian vegetation in bottomlands and agricultural fields on terraces).

Land Use of Proposed Site

The approximately 14.0-acre site for the proposed Tutuilla Solar Electric Generation Facility Center sits on a terrace above Patawa Creek. A terrace consists of a flat or gently sloping geomorphic surface, called a "tread", that is typically bounded the sides by steeper ascending or descending slopes called "risers" or "scarps." The predominate land use for the area is agricultural.

Land Use of Adjacent Properties and Surrounding Area

Within a one-mile radius of the subject property the surrounding land uses include agricultural production, commercial businesses, rural residential properties, government facilities and Interstate 84. The predominate land use is agricultural production. There are over 130 residential dwellings within a one-mile radius of the subject property of which many are located on 5-10 acre lots, The Shenandoah Estates Subdivision south of the proposed site consists of approximately 60 homes.

Land uses north of Interstate 84 include agricultural production; Wildhorse Resort and Casino (including Wildhorse Casino, Hotel, RV Park, Golf Course, and Tamastslikt Cultural Institute); Arrowhead Travel Plaza (which includes a parking area that can serve approximately one hundred (100) semi-trucks); Cayuse Holdings Facility, Umatilla National Forest Supervisor's Office and

Davita Blue Mountain Kidney Center. The CTUIR owns Wildhorse Resort and Casino, Arrowhead Travel Plaza, and Cayuse Holdings and constructed and leases the buildings in which the Umatilla National Forest Supervisor's Office and DaVita Kidney Center are located.

There are currently three government owned facilities south of Interstate 84 and north of the proposed site for the Tutuilla Solar Electric Generation Facility, The Oregon Department of Transportation (ODOT) owns and operates a seven-acre gravel shed facility next to Interstate 84. The CTUIR owns and operates a waste transfer station, also known as the Tribal Environmental Recovery Facility (TERF). Regular operations at TERF involve truck and vehicular traffic. The Bonneville Power Administration (BPA) holds an easement 100 feet wide for one 230 kilovolt (kV) regional transmission line. Usage of the area immediately underneath the line is constrained by terms of the easement.

Threatened, Endangered, or Sensitive Fish and Wildlife

Introduction

The following species list was compiled from information available on the U.S. Fish and Wildlife Service (USFWS) Oregon Field Office web site (http://www.fws.gov/oregonfwo/Species) and from information available on the web site of the National Oceanic and Atmospheric Administration (NOAA) Fisheries West Coast Region (http://www.westcoast.fisheries.noaa.gov/).

Thirteen (13) species of fish and wildlife that are listed as either threatened (T), endangered (E), candidate (C), or a species of concern (SC) by NOAA Fisheries and USFWS are associated with habitats known to occur within the UIR (Table 4). NOAA-Fisheries defines an Evolutionary Significant Unit (ESU) as an anadromous fish population or group of populations that is substantially reproductively isolated from other conspecific populations and that represents an important component of the evolutionary legacy of the species. In 2005, NOAA Fisheries designated critical habitat for the Middle Columbia River ESU of summer steelhead but specifically excluded Indian trust lands from the critical habitat designation.

Description of Species/Habitat Designated as Threatened/Endangered or a Candidate for Listing as well as Species of Cultural Significance to the CTUIR

Fish

Steelhead/Redband Trout

Middle Columbia River evolutionarily significant unit (ESU) steelhead populations were listed as a threatened species by the federal ESA on March 25, 1999. Although total steelhead abundance in the area had been increasing, the majority of natural stocks had been decreasing at the time of the study. Riparian vegetation and in-stream habitat of streams within this ESU have been heavily impacted by overgrazing, timber harvest, road building, and channelization, as well as past gold dredging and sedimentation due to poor land management. These factors led to the conclusion by

NOAA Fisheries that the Middle Columbia River steelhead is at risk of becoming endangered in the foreseeable future.

Table 6. Federally Listed Fish and Wildlife Species Associated with Habitats on the UIR

Species Name	Common Name	Federal Status	Critical Habitat
Fish			
Oncorhynchus mykiss	Mid-Columbia ESU Summer Steelhead	T	Designated Indian Trust Lands Excluded
Essential Fish Habitat Middle Columbia River Chinook Salmon	N/A	N/A	Designated
Lampetra tridentate	Pacific Lamprey	SC[1]	N/A
Salvelinus confluentus	Bull Trout	T	Designated
Amphibians			
Rana luteiventris	Columbia Spotted Frog	SC	N/A
Birds			
Accipiter gentilis	Northern Goshawk	SC	N/A
Coccyzus americanus	Yellow-billed Cuckoo	T	N/A
Contopus borealis	Olive-sided Flycatcher	SC	N/A
Otis flammeolus	Flammulated Owl	SC	N/A
Oreortyx pitus	Mountain Quail	SC	N/A
Mammals			
Brachylagus idahoensis	Pygmy Rabbit	SC	N/A
Lynx canadensis	Lynx	T	Designated
Myotis thysanodes	Fringed Myotis	SC	N/A
Urocitellus washingtoni	Washington Ground Squirrel	C	N/A

[1] State of Oregon Sensitive Critical Designation

In the last 35 years, adult steelhead returns have fluctuated in the Umatilla subbasin in a similar pattern to steelhead in the John Day and other systems in the region. Endemic steelhead are artificially supplemented using wild endemic broodstock to prevent domestication. Adult hatchery fish are passed above Three-Mile Dam for harvest opportunities and to supplement natural production by spawning naturally.

Spawning occurs in the mainstem of the Umatilla River primarily from Minthorn Springs (RM 65) upstream and in the headwater tributaries. Major spawning tributaries include Birch Creek, Meacham Creek, and Isqúulktpe Creek.

Of the total 770 miles of stream in the Umatilla subbasin, 233 miles are estimated to be suitable rearing habitat for juvenile steelhead based on water temperatures and persistent flows (Contor et al 1996). During the late fall, winter, and early spring, juvenile steelhead are observed throughout the subbasin including reaches that are often intermittent during the summer. Juvenile steelhead have been observed in the lower reaches of Patawa Creek. During spring and early summer, juvenile steelhead move into the higher quality habitat areas associated with headwater streams, spring areas, and the upper reaches of the Umatilla River. Steelhead rearing streams include, but are not limited to, Meacham Creek, Isqúulktpe Creek, Buckaroo Creek, Boston Canyon Creek, Mission Creek, Coonskin Creek, and others.

Pacific Lamprey

Pacific lamprey (*Lampetra tridentata*) belong to a primitive group of fishes that are eel-like in form but lack the jaws and paired fins of true fishes. Pacific lampreys have a round sucker-like mouth, no scales and gill openings. Adult Pacific lampreys are characterized by the presence of three large anterior teeth and many smaller posterior teeth on the oral disc.

Historically, Pacific lamprey were abundant in the Umatilla subbasin (Close et al. 1995). The CTUIR harvested lamprey at the current site of Three-Mile Dam and in the North and South Forks of the Umatilla River (Lane and Lane 1979).

After spending one to three years in the ocean, Pacific lampreys cease feeding and migrate to freshwater between February and June. They are thought to overwinter and remain in freshwater for approximately one year before spawning Most upstream migration takes place at night.

Pacific lampreys spawn in habitat similar to salmon in gravel bottomed streams at the upstream end of riffles. Spawning occurs Between March and June. The degree of homing is unknown, but adult lamprey cue in on ammocoetes which release pheromones that are thought to aid adult migration and spawning location. Ammocoetes burrow in substrate where they live and grow three to seven years feeding primarily on diatoms and algae. Ammocoetes move downstream as they age and during high flow events.

Metamorphosis to the juvenile phase occurs over sever months beginning in the summer completing by winter. As development occurs, the juveniles leave the substrate and move downstream. They emigrate to the ocean between late fall and spring where they mature into adults.

The CTUIR are currently implementing efforts to establish Pacific lamprey in the Umatilla subbasin.

Bull Trout

The USFWS considers the bull trout population in the Umatilla subbasin a part of the Columbia River Distinct Population Segment, which represents an evolutionary significant unit. Historically fluvial bull trout would have had access to the Columbia River and its tributaries and been connected to populations in adjacent basins forming a larger metapopulation (Buchanan et al. 1997). Populations were listed as a threatened species by the federal ESA on June 10, 1998. Construction of Three-Mile Dam and McKay Dam has impacted the fluvial bull trout population and prevented access to and from the Columbia River.

Because of poor water quality in much of the Umatilla subbasin, bull trout are isolated in the headwaters of the Umatilla River and Meacham Creek (ODFW 2005). Currently, bull trout are found in the mainstem Umatilla River upstream of Thorn Hollow at elevations above 1,600 feet. Spawning and rearing occur in the North and South Forks of the Umatilla River and in the North Fork of Meacham Creek. Year-round use also occurs in Isqúulktpe Creek, Ryan Creek, Coyote Creek, Shimmiehorn Creek and Meacham Creek although no spawning has been identified in these areas.

Essential Fish Habitat, Chinook Salmon

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires federal agencies to consult with NOAA on activities that may adversely affect Essential Fish Habitat (EFH).

The objective of the EFH assessment is to describe potential adverse effects to designated EFH for federally-managed fisheries species within the proposed action area. It also describes conservation measures to avoid, minimize, or otherwise offset potential adverse effects to designated EFH resulting from the proposed action.

EFH for Pacific salmon, which includes chinook, means "those waters and substrate necessary for salmon production needed to support a long-term sustainable salmon fishery and salmon contributions to a healthy ecosystem. EFH includes all those streams, lakes, ponds, wetlands, and other currently viable water bodies and most of the habitat historically accessible to salmon in Washington, Oregon, Idaho, and California. *Waters* include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish. *Substrate* includes sediment, hard bottom, structures underlying the waters, and associated biological communities. *Necessary* means the habitat required to support a

sustainable fishery and the managed species' contribution to a healthy ecosystem" (EFH Assessment Template).

Birds

Yellow-Billed Cuckoo

The federally threatened yellow-billed cuckoo is a medium sized brown bird about 12 inches long and weighing about two ounces. The bird's physical features are a long patterned black and white tail and an elongated down-curved bill which is yellow on the bottom. Historically, the yellow-billed cuckoo bred throughout much of North America. The yellow-billed cuckoo's range and population numbers have declined substantially across the western United States in the last 50 years.

Yellow-billed cuckoos are migratory arriving in Oregon in mid-May and leaving for wintering grounds in September. Yellow-billed cuckoos breed in dense willow and cottonwood stands in river floodplains. If present on the UIR, their distribution would most likely be limited to such stands along the mainstem Umatilla River.

Mammals

Canada Lynx

The current population status and distribution of the Canada Lynx in the Umatilla subbasin is unknown. Surveys failed to detect the lynx within and adjacent to the subbasin in 1999 and the species may have been extirpated from the area (Stinson 2001). The secretive nature of the lynx makes it difficult to conclusively establish its presence or absence. Preferred habitat for the lynx consists of high elevation (> 4,500 feet) stands of cold and cool forest types with a mosaic of structural stages for foraging and denning. Primary habitat consists of subalpine fir *Abies lasiocarpa*, Engelmann spruce *Picea engelmannii* and lodgepole pine *Pinus contorta* (Ruediger et al. 2000). Lynx habitat occurs at higher elevations in the forested areas of the subbasin off the UIR.

Washington Ground Squirrel

Due to increasing threats to its habitat, the Washington ground squirrel candidate species listing under ESA was recently changed from priority 5 (species with high magnitude, non-imminent threats) to priority 2 (high magnitude, imminent threats). The primary threat to the squirrel's habitat is conversion to agricultural land, a change that cannot be remedied in the future. The Washington ground squirrel is also considered an agricultural pest and, in the past, has been the subject of control programs. Other factors that leave the squirrels highly vulnerable to extinction, especially on the periphery of the appropriate habitat range, are parasitism, predation, and weather.

One of the smallest members of the subgenus *Spermophilus*, the Washington ground squirrel is 7 to 10 inches long with a tail 1 to 2.8 inches long. It is gray with white spots and has a short tail with a blackish tip. Adults emerge after 8 to 9 months of hibernation in late January and early

February and begin breeding. One litter is produced every year, with births occurring in February or early March. The young are weaned in late March and begin appearing above ground. By late April they are half grown, and by late May they are nearly full-grown and indistinguishable from adults. Washington ground squirrels are strictly diurnal. To avoid the heat of midday in late spring, they are most active in the morning. Adults will enter hibernation usually late May to early June, while juveniles remain active until late June or early July.

Dry, open sagebrush or grassland habitat is preferable to Washington ground squirrel populations. Sandy soils are important for burrowing. The diet of the Washington ground squirrel consists of succulent vegetation, flowers, roots, bulbs, seeds, seed pods, and insects. Also consumed are cabbage, green peas, corn, oats, wheat, rye, barley, and alfalfa.

Historic Properties/Traditional Uses

Lands within the UIR contain the entire spectrum of sensitive cultural resources significant to the CTUIR. The highest concern is the ancestral remains. Additionally, archaeological resources on the landscape may include but not limited to:

- Encampments
- Lithic Scatters
- Lithic Tool Quarrying Sites
- Rock Cairns
- Petroglyphs
- Isolated Artifacts
- Village/Habitation Sites
- Historic Structures
- Historic refuse scatter
- Irrigation Canals

Additionally, there are sites which may or may not have an archeological component but are nonetheless cultural resources. These include but are not limited to:

- Sacred Sites/Traditional Cultural Properties
- Historic Properties of Religious and Cultural Significance
- Legendary Sites
- Vision Quest Sites
- Traditional Gathering Sites
- Native Plants
- Hunting Areas
- Fishing Sites

From the CTUIR point of view, natural resources upon which Tribal members depend are cultural resources, whether they are within the UIR, in ceded lands, or at usual and accustomed fishing/hunting/gathering areas

4.0 Environmental Consequences

Introduction

This Section discloses the environmental consequences of implementing the two alternatives described in Section 2.0. This section evaluates and compares direct and indirect effects as well as cumulative effects on the existing conditions and affected environment described in Section 3.0. For each major component (Water Quality/Instream Fisheries Habitat, Development of Renewable Energy Source/ Economic Return to Landowners, Native Vegetation/Invasive Weeds, Visual Environment, Threatened and Endangered Fish and Wildlife, Historic Properties/Traditional Uses) key effects and conclusions are presented.

Water Quality/Instream Fisheries Habitat

Under Alternative A, there would be no change to existing water quality and instream fisheries habitat. Implementation of Alternative B would result in minimal and temporary impacts to surface water resources and instream fisheries habitat adjacent to the project area.

Short-term water quality impacts may result if high-intensity rainstorms occur during construction when soil is exposed and more susceptible to being eroded and added to the sediment load. During the construction period, approximately 14.5 acres of topsoil would be more susceptible to erosion and contribute to an increase in sediments through the water runoff from the project area. The proposed project area is approximately 0.3 mile from Patawa Creek. In 2003, the CTUIR Tribal Farm Enterprise established a 400-foot long, 30-foot wide buffer strip planted to non-native grasses south of Patawa Creek nearest the proposed project site. This buffer protects the creek from direct runoff from agricultural fields. Therefore, impacts from this action to the water quality of Patawa Creek are expected to be negligible.

Development of Renewable Electric Energy Source/Economic Return to the Landowners

There would be long-term, beneficial impacts to air quality and climate from the construction and operation of the Tutuilla Solar Electric Generation Facility because the power generated by the solar facility would displace power that could be generated by fossil fuel sources, thereby decreasing air pollution. Table 5 provides estimates of emissions associated with generating one megawatt-hour (MWh) of electricity in fossil fuel–fired power plants (BLM and DOE 2010). Solar facility emissions are assumed to be negligible.

Economic return to the CTUIR varies by alternative. Implementation of Alternative A would result in the CTUIR Tribal Farming Enterprise continuing to raise and harvest agricultural crops from the proposed site. The income generated would vary by year and depend on the crop rotation, cost of production, and market price for the commodity. Under Alternative B, the CTUIR would receive a minimum of $205,000 over the initial lease term.

Table 7. Estimated Emissions from Fossil Fuel-Fired Electric Power Plants

Combustion Emissions Kilograms (Kg) per Year per Megawatt Hour (MWhr)			
Sulfur Dioxide (SO_2)	Nitrogen Oxides (NO_x)	Mercury (Hg)	Carbon Dioxide (CO_2)
0.69	1.0	80×10^{-6}	716

Natural Vegetation/Invasive Weeds

Under Alternative A, the TFE would continue to raise and harvest agricultural crops from the proposed site. The TFE would continue to control invasive weeds in order to maximize crop production and economic return.

Under Alternative B, the CTUIR and Tutuilla Solar LLC will develop and begin implementation of permanent vegetation and invasive weeds control plans. These plans should incorporate establishment of native vegetation suitable to the site and consistent with operation of the solar electric generation facility.

Visual Environment

Criteria used to evaluate effects on the landscape and existing views include: (1) Character Consistency and (2) Obstruction of Views. Significant visual impact/adverse effect would result if the proposed project would introduce new visual elements that would strongly contrast or be incompatible with the character of the existing landscape or key view. A significant visual impact/adverse effect would also result if the proposed project would obstruct key views. The importance of a view is based on its character and quality, its viewers, and the duration of the view.

Effects or impacts are further characterized by their potential levels of significance, as follows:

Low—Project would result in a minor adverse change related to visual resources or the visual environment, with low viewer response to that change.

Moderate—Project would result in a moderate degree of adverse change related to visual resources or the visual environment, with a moderate level of response to that change.

High—Project would result in a high level of adverse change related to visual resources or the visual environment, to such a degree that architectural design and landscape treatment may or may not mitigate the impacts/effects. The viewer response level would be high.

Under Alternative A, here would be no change to the visual environment. Under Alternative B there would be a moderate impact to visual resources or the visual environment. The proposed Tutuilla Solar Electric Generation Facility would introduce new visual elements that would strongly contrast with the character of the existing landscape.

Threatened, Endangered, and Candidate Fish and Wildlife

As described in Chapter III, federally listed threatened, endangered, and candidate species known to occur presently, or historically, on the UIR include the Middle Columbia River ESU of summer steelhead, Pacific lamprey, bull trout, yellow-billed cuckoo, and Washington ground squirrel. None of the alternatives will have an impact on any of these threatened, endangered, and candidate fish and wildlife species (Table 6). The methods outlined in the NOAA document "Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale" were used to determine possible impacts of the project on the Patawa Creek Watershed and on listed or candidate species.

Fish

Middle Columbia River ESU Steelhead. Incorporation of mitigation criteria for construction and operation of the Tutuilla Solar Electric Generation Facility on Tract T2103-C should prevent any increase in runoff flow velocities or sedimentation. Water quality in Patawa Creek should not be measurably degraded or improved. Therefore, the proposed project will have **no effect** on Middle Columbia River ESU steelhead (James and Scheeler 2020).

Pacific Lamprey/ Incorporation of mitigation criteria for construction and operation of the Tutuilla Solar Electric Generation Facility on Tract T2103-C should prevent any increase in runoff flow velocities or sedimentation. Water quality in Patawa Creek should not be measurably degraded or improved. Therefore, the proposed project will have **no effect** on Pacific lamprey.

Bull Trout. Bull trout are only found in the mainstem Umatilla River upstream of Thorn Hollow at elevations above 1,600 feet. In any event, incorporation of mitigation criteria for construction and operation of the Tutuilla Solar Electric Generation Facility on Tract T2103-C should prevent any increase in runoff flow velocities or sedimentation. Water quality in Patawa Creek should not be measurably degraded or improved. Therefore, the proposed project will have **no effect** on bull trout.

Essential Fish Habitat, Chinook Salmon. The incorporation of mitigation criteria in the one or more mining leases for the extraction of basalt aggregate from Allotments UM-5 and 878 should prevent any increase in runoff flow velocities or sedimentation. Water quality in Patawa Creek should not be measurably degraded or improved. Therefore, the proposed project will have no **effect** on EFH for chinook salmon.

Birds.

Yellow-billed Cuckoo. No yellow-billed cuckoos have been observed at the proposed project site, nor are there potential nesting or foraging trees (cottonwood and willows) on the site. Yellow-billed cuckoos, especially in the west, seem to prefer large areas (25 acres) of undisturbed riparian vegetation, which is not available on Tribal Tract T2103-C. Therefore, the proposed Tutuilla Solar Electric Generation Facility will have **no effect** on the yellow-billed cuckoo.

Mammals

Canada Lynx. Tribal Tract T2103-C does not support stands of cold and cool forest types that are the preferred habitat for Canada lynx. Therefore, the proposed Tutuilla Solar Electric Generation Facility will have **no effect** on Canada lynx.

Washington Ground Squirrel. Vegetation on Tribal Tract 2103-C is not appropriate habitat for the Washington ground squirrel. There are no known populations of Washington ground squirrel in the adjacent area. The proposed Tutuilla Solar Electric Generation Facility will have **no effect** on the Washington ground squirrel.

Table 8. Summary of Determination of Effects from Construction and Operation of Tutuilla Solar Electric Generation Facility on ESA Listed Species

Species	Federal ESA Status	Occurrence at Proposed Project Site	Project Effects	Criteria Used for Determination
Middle Columbia River ESU steelhead *Oncorhynchus mykiss*	Threatened	None known	No effect	Water Quality in Patawa Creek not likely to be measurably degraded or improved.
Pacific Lamprey *Lampetra tridentata*	Species of Concern	None at site	No effect	Water Quality in Patawa Creek not likely to be measurably degraded or improved.
Bull Trout *Salvelinus confluentus*	Threatened	None at site	No effect	No populations in the proposed project area.
Essential Fish Habitat (EFH) Middle Columbia Chinook Salmon			No effect	Water Quality in Patawa Creek not likely to be measurably degraded or improved.
Yellow-billed cuckoo *Coccyzus americanus*	Candidate	None known	No effect	No populations in the proposed project area. No appropriate nesting/feeding habitat.
Canada Lynx *Lynx canadensis*	Threatened	None Known	No effect	No animals in the proposed project area. No suitable habitat.
Washington Ground Squirrel *Spermophilus washingtoni*	Candidate	None known	No effect	No populations in the proposed project area. No suitable habitat.

Historic Properties/Traditional Uses

In August and September 2020, the CTUIR Cultural Resources Protection Program CRPP) surveyed an approximately 23-acre area using north/south transects at a 20-meter interval. Ground visibility was excellent. CRPP also excavated shovel test probes (STPs) in a 30-meter grid throughout the entire parcel. STPs were cylindrical, approximately 40 cm in diameter, excavated in approximate 10 cm levels, and with a target depth of 100 cm. No archaeological resources were observed (Tiede 2020).

The project area is within the view from two historic properties of religious and cultural significance to the CTUIR: one outside of and one inside of Coyote Business Park. The viewshed analysis determined the solar array will only be visible from the unnamed historic property in Coyote Business Park. Mature trees along South Patawa Creek currently block the view from the historic property outside of Coyote Business Park. However, the trees are on private property and if the landowner removes the trees, the viewshed from the historic property would be impacted. As Coyote Business Park has minimal development and flat topography, the proposed project will have an adverse effect on the viewshed of the unnamed historic property in Coyote Business Park by compromising the integrity of setting, feeling, and association.

To minimize impacts to the unnamed historic property, the CRPP recommends that DECD keep the view as natural as possible by planting vegetation at a setback around the solar array to help minimize the view but not impact the effectiveness of the solar panels, and the use of natural paint colors and non-reflective materials where possible. DECD will need to consult with the CRPP regarding the colors of paint and the materials and the vegetation to be planted. Due to the nature of the project, selected colors and materials will only be possible for a small portion of the solar array and associated equipment. Therefore, the CRPP recommends off-site mitigation to fully resolve the adverse effects of the undertaking. Recommended activities that would benefit the tribal community would be used to purchase items needed at the Mission Long House, where First Foods are prepared for religious, cultural, and social gatherings.

The Tribal Historic Preservation Officer concurred with the CRPP recommendations for a finding of no adverse effect to historic properties provided DECD and Tutuilla Solar LLC agree to the conditions outlined in the preceding paragraph (Miller 2020). In addition, a cultural resource monitor is required to be on-site during any excavation work. In the event cultural resources are discovered during operations, work will immediately cease and the CRPP, BIA, and Tribal Historic Preservation Officer contacted.

Cumulative Impacts

“Cumulative impact” is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes can result from individually minor but collectively significant actions taking place over a period of time (Title 40 Code of Federal Regulations Part 1508.7).

Alternative B could change the rural character of the area by extending the rural-urban interface southwest from the commercially developed area north of Interstate 84, resulting in a more urban atmosphere for rural residents living south of the interstate. This change is consistent with the Mission Community Plan, the Land Development Code (Industrial Development Zone) and the FEIS for the Coyote Business Park South.

Alternative B should incrementally enhance the CTUIR's ability to diversify its economy and to address adverse impacts of climate change and hydropower on treaty reserved rights. Construction and operation of the Tutuilla Solar Electric Generation Facility represents the first tenant for the Coyote Business Park perhaps enticing additional tenants in the future.

Irreversible or Irretrievable Commitment of Resources

The irreversible commitment of resources is the use of non-renewable resources such as fossil fuels, cultural resources and land conversion to other uses. The proposed action would irreversibly commit 14.5 acres of agricultural land to construction and operation of a government facility.

The irretrievable commitment of resources is the lost production of renewable resources such as, timber forage, or wildlife habitat. For this project, the irretrievable commitment of resources would be the loss of crop production on the 14.5 acres of agricultural land.

5.0 Mitigation

On January 15, 2021, DECD, CRPP, and THPO entered into Inter-Department Agreement (IDA) to satisfy conditions required for the Finding of No Adverse Effect to archaeological resources and historic properties of religious and cultural significance. (CTUIR 2021). Under terms of the IDA, DECD shall complete the following actions:

1. Pay Ataw Consulting, LLC $2,500 upon execution of the lease with Tutuilla Solar LLC to be used for purchase of items for the Mission Longhouse.

2. Complete within 24 months of the effective date of the IDA the initial phase of an overall landscaping and vegetation plan consistent with the current activities and planned future development for the Coyote Business Park.

3. Complete within 24 months of the effective date. of the IDA the initial phase of an overall invasive weed control plan consistent with the current activities and planned future development for the Coyote Business Park.

4. Develop and implement within 28 months of the start of construction of the Tutuilla Solar Electric Generation Facility a landscaping plan for Tutuilla Church Road bordering Lot 15 that will screen the view of the facility with trees or shrubs designed in a manner that will not adversely impact the project.

5. Develop and implement within 28 months of the start of construction of the Tutuilla Solar Electric Generation Facility a landscaping plan for the entrance area of Tokti Road and along South Market Road that will screen the view of the facility with trees or shrubs designed in a manner that will not adversely impact the project.

6.0 Consultation

ESA Section 7 consultation was not required because proposed activities will not affect federally listed species. Consultation with the THPO was completed to satisfy NHPA compliance.

7.0 List of Preparers and Contributors

Holly Anderson
CTUIR Tribal Planning Office, Associate Planner

Daniel Hale
Sunhurst Energy LLC

Jerry L. Lauer
Elkhorn Resource Solutions LLC

Carey L. Miller
CTUIR, Tribal Historic Preservation Officer

Carl Scheeler
CTUIR Department of Natural Resources. Wildlife Program Manager

Gordy Schumacher
CTUIR Department of Natural Resources, Range, Agriculture and Forestry Program Manager

Bill Tovey
CTUIR Department of Economic and Community Development Director

Bruce Zimmerman
CTUIR Department of Economic and Community Development Tax Code Administrator

Literature Cited

ACOE. 1999. Upper Umatilla River Flood Study. U.S. Army Corps of Engineers Portland District, Portland, OR.

Buchanan, D., M. Hanson, and R. Hooton. 1997. Status of Oregon's Bull Trout: Distribution, Life History, Limiting Factors, Management Considerations, and Status. USDOE Bonneville Power Administration Technical Report DOE/BP-34342-5. Portland, OR

Bureau of Land Management and Department of Energy (BLM and DOE). 2010. Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States. DES 10-59. DOE/EIS-0403. Available at: http://solareis.anl.gov/. Accessed November 29 2020.

Close, D.A., M. Fitzpatrick, H. Li, B. Parker, D. Hatch, and G. James. 1995. Status Report of the Pacific Lamprey (Lampetra tridentate) in the Columbia River Basin. USDOE Bonneville Power Administration Technical Report DOE/BP-39067-1, Portland, OR.

Contor, C., E. Hoverson, P. Kissner, and J. Volkman. 1996. Umatilla Basin Natural Production, Monitoring, and Evaluation Annual Progress Report 1994-1995. USDOE Bonneville Power Administration Technical Report DOE/BP-75349-2. Portland, OR.

CTUIR. 2005. Confederated Tribes of the Umatilla Indian Reservation Total Maximum Daily Load for Temperature and Turbidity. Confederated Tribes of the Umatilla Indian Reservation, Department of Natural Resources. Pendleton (Mission), OR.

CTUIR. 2006. Coyote Business Park Final Environmental Impact Statement. USDI Bureau of Indian Affairs. Pendleton, OR.

CTUIR. 2008. Water Quality Management Plan. Confederated Tribes of the Umatilla Indian Reservation, Department of Natural Resources. Pendleton (Mission), OR.

CTUIR. 2010. Comprehensive Plan. Confederated Tribes of the Umatilla Indian Reservation. Tribal Planning Office. Pendleton (Mission), OR.

CTUIR 2021. Inter-Department Agreement (IDA) to Satisfy Conditions required for the Finding of No Adverse Effect pursuant the National Historic Preservation Act (NHPA) and Compliance with National Environmental Policy Act (NEPA). Departments of Natural Resources and Economic and Community Development. Pendleton (Mission), OR.

Gonthier, J.B. and D.D. Harris. 1977. Water Resources of the Umatilla Indian Reservation. USDI U.S. Geological Survey Water Resources Investigations Report 77-3. Portland, OR.

James, G. and C. Scheeler. 2020. Review of Biological Information for the Tutuilla Solar Electric Generation Facility Business Lease. Confederated Tribes of the Umatilla Indian Reservation, Department of Natural Resources. Pendleton (Mission), OR.

Johnson, D.R. and A.J. Makinson. 1988. Soil Survey of Umatilla County, Oregon. USDA Soil Conservation Service. Portland, OR.

Johnson, C.G. and R.R. Clausnitzer. 1992. Plant Associations of the Blue and Ochoco Mountains. USDA Forest Service Pacific Northwest Region Technical Publication R6-ERW-TF-036-92. Portland, OR.

Lane, R.B. and B. Lane 1979. Traditional Fisheries of the Walla Walla, Cayuse, and Umatilla. Unpublished Report Confederated Tribes of the Umatilla Indian Reservation. Pendleton, OR.

Miller, C. 2020. Results of Cultural Resource Investigation. Confederated Tribes of the Umatilla Indian Reservation. Tribal Historic Preservation Office. Pendleton (Mission), OR.

NOAA Fisheries. 1996. Making Endangered Species Act Determinations of Effect for Individual and Group Actions at the Watershed Scale. Environmental and Technical Services, Habitat Conservation Branch.

Northwest Power and Conservation Council. 2005. Umatilla River/Willow Creek Subbasin Plan. In Columbia River Basin Fish and Wildlife Program. Portland, OR.

Natural Resources Conservation Service, 2021. Ecological Site R010XY005OR Loamy Bottom. Available: http://edit.jornada.nmsu.edu/catalog/esd/010X/R010XY005OR. Accessed [January 30, 2021].

ODEQ. 2001. Umatilla River Basin Total Daily Maximum Load (TMDL) and Water Quality Management Plan (WQMP). Oregon Department of Environmental Quality. Portland, OR.

ODFW. 2005. 2005 Oregon Native Fish Status Report. Oregon Department of Fish and Wildlife. Portland, OR.

Ruediger, B., J. Claar, S. Gniadek, B. Holt, L. Lewis, S. Mighton, B. Naney, G. Patton, T. Rinaldi, J. Trick, A. Vandehet, F. Wahl, N. Warren. D. Wenger and A. Williamson. 2000. Canada Lynx Conservation Assessment and Strategy. USDA Forest Service, USDI Fish and Wildlife Service, Bureau of Land Management, and National Park Service, Missoula, MT.

Stinson, D. 2001. Lynx Recovery Plan. Washington Department of Fish and Wildlife. Olympia, WA.

Tiede, K. 2020 Archaeological Survey, Testing and Viewshed Analysis for the Proposed Solar Array in Lot 15 of Coyote Business Park South, Umatilla Indian Reservation, Umatilla County, Oregon. Prepared for the Department of Economic and Community Development. Cultural Resources Protection Program, Confederated Tribes of the Umatilla Indian Reservation. Mission, Oregon.