Vegetation Management Plan: Teanaway Solar Reserve Kittitas County, Washington

Prepared for

Teanaway Solar Reserve, LLC

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1.0 Introduction

Teanaway Solar Reserve, LLC (TSR) proposes to construct an array of solar collection panels on 477 acres of privately held land near Cle Elum, Washington. (See Appendix A, Figure 1.) The proposed solar panel project site would be constructed on land leased from American Forest Holdings, LLC, which is managed and operated by American Forest Land Company, LLC of Ellensburg, Washington. The total leased parcel covers 982 acres (proposed project area). This Vegetation Management Plan (Plan) was developed in order to avoid or alleviate impacts to vegetation resources that are expected to result from the project and to provide TSR with guidance during and after construction for the management of vegetation resources within the proposed project area.

The proposed project site currently contains important habitat for wildlife, particularly elk, and supports a high diversity of native plant species. For this reason, this management plan uses many conservation and mitigation measures defined for the wind power industry by the Washington Department of Fish and Wildlife (WDFW) (2009).

This Plan also provides mitigation goals for offsetting the expected reduction in carbon-sequencing conifers with project implementation. Tree seedlings will be planted in nearby conservation easement lands and/or riparian corridors along degraded areas of the Teanaway River to mitigate for the permanent loss of tree cover under panels and facilities.

1.1 Site Location

The proposed project site is located approximately 4 miles northeast of Cle Elum, Washington, in Township 20N, Range 16E, within Sections 22, 23, and 27 (see Appendix A, Figure 2). The site is located on the eastern slopes of the Cascade Mountains on Cle Elum Ridge, which runs generally from east to west at elevations ranging from approximately 2,200 to 2,600 feet. The Teanaway River is approximately 1 mile to the northeast of Cle Elum Ridge. The site is accessed from Highway 970 by way of County roads such as Red Bridge Road (see SEPA Checklist Attachment J, Figure 3), private roads such as Loping Lane, and public roads that are privately maintained such as Wiehl Road.

The proposed project area consists of 982 acres. Based on site surveys, the project will utilize approximately 477 acres within the proposed project area. The remaining acres are currently undeveloped open space.

The Teanaway River is approximately 1 mile to the northeast of Cle Elum Ridge. The Teanaway River is the largest naturally flowing tributary in the Upper Yakima Basin. It supports populations of spring chinook salmon, steelhead, and bull trout. Several reaches of the Teanaway River and its tributaries do not meet Washington State's numeric water quality standards for stream temperature and several segments of the Teanaway River have been placed on Washington State's 303(d) list of impaired water bodies.

In general, the proposed project area is open ponderosa pine (*Pinus ponderosa*) forest with a mixed bunchgrass-forb understory. A few areas support wetlands and aspen groves. Habitat across the proposed project areas is rated as Category II by the WDFW. (Class I and Class II habitats are considered the highest priorities for current statewide conservation action in Washington. Class I habitats have a greater number of associated Species of

Greatest Conservation Need [SGCN] than the Class II habitats and Class II habitats have a greater number of associated SGCN than the Class III habitats. Class IV habitats are generally low-value habitats, and this is the only class that generally requires no mitigation for impacts.) The proposed project area supports elk herds, at least seasonally, and is considered habitat for elk and deer.

1.2 Purpose and Intent

The purpose of the proposed project is to generate up to 75 direct current megawatt (MWdc) of photovoltaic (PV) solar energy for distribution to utilities and communities seeking to optimize their renewable and sustainable energy sources. The project was conceived in response to the growing need for sustainable energy sources and the State of Washington's Renewable Electricity Standard, Revised Code of Washington (RCW) Title 19, mandate that by the year 2020, the state's largest electric utilities meet 15 percent of their retail electric load with renewable electricity (for example, wind and solar energy). The standard first takes effect in 2012 with a requirement of 3 percent through 2015, then 9 percent from 2016 through 2019 and 15 percent thereafter.

Oregon and California have adopted similar standards. Depending on the commercial terms available for the power sales, the utilities that may buy the power from the project could change over time.

TSR proposes to develop the site with key components described below to maximize its solar energy potential, based on its commitment to providing renewable energy and becoming the leading (in terms of energy production and environmentally sensitive development and management of its solar production site) sustainable energy production location in North America. The following factors will be analyzed to determine optimal location within the site defined below:

- Significant solar radiation (insolation)
- Site accessibility
- Avoidance of environmentally sensitive areas
- Limited visibility from offsite locations

All utility-scale solar energy facilities require relatively large areas for solar radiation collection when used to generate electricity at a commercial scale, and the large arrays of solar collectors may interfere with natural sunlight, rainfall, and drainage, which could have a variety of effects on plants and animals. Proper siting decisions and conservation mitigation measures described in this Plan were developed to help avoid land disturbance and land use impacts and to mitigate for unavoidable impacts to vegetation.

1.2.1 Key Project Components

The proposed project will consist of the following key components:

- Solar modules
- Field inverters
- Field transformers
- Electrical conductors

- Electrical substation and switchyard
- Operations and maintenance (O&M) building supervisory control and data acquisition (SCADA) system
- Overhead interconnection transmission line
- Access and maintenance roads

Key components are described in more detail in the project description section of the Expanded SEPA Checklist.

1.3 Goals and Objectives

To meet the purpose and intent of this Plan, goals, and objectives were developed to guide vegetation management activities related to project construction and solar production O&M. These goals and objectives for vegetation management are described below:

1.3.1 Vegetation Maintenance

- Maintain, preserve, and restore the diversity of herbaceous native plant species within the proposed project site.
 - Objective: Woody vegetation removal and ongoing management will be necessary to prevent interference with solar collectors. Measures will be implemented to protect herbaceous plant cover on site, including under collectors, to the fullest extent possible in order to retain high carbon sequencing potential for the site, to avoid extreme changes in hydrological infiltration-runoff ratio, to protect wildlife forage, and to maintain vegetation diversity to the greatest extent possible.
 - Objective: Restoration of impacted areas, of weed control areas, and for future decommissioning of the site will be based on native species currently on site.
- Develop and maintain native plant communities that are resistant to non-native plant invasion.
 - Objective: Develop and implement construction BMPs that will prevent weed invasion into project area and limit construction impacts to the smallest footprint possible.

1.3.2 Revegetation

- Maintain carbon sequestration potential after woody vegetation removal.
 - Objective: Develop or enhance woody vegetation on nearby parcels to offset the negative impacts to woody vegetation from the construction of solar panels and other facilities.
- Preserve and maintain the land's aesthetic values to the fullest extent possible while developing electrical production.
 - Objective: Provide screening around the perimeter of the project area and make trees available for neighboring landowners to plant on their land to provide additional screening as they see fit. These plantings will further enhance potential carbon sequestering.

1.3.3 Agency Coordination

Through the formation of a Technical Advisory Committee (TAC), present the WDFW and the Washington Department of Natural Resources (WDNR) with a plan to provide conservation measures that will compensate for the loss of native vegetation that will be permanently affected by project construction and O&M without negatively impacting forest health, fire risk, and elk habitat by overstocking trees in areas that are already high-value forests. This would mean replacing and/or upgrading deteriorated native vegetation nearby.

- **Objective**: Present the WDFW with a plan to ensure that vegetation removal and associated revegetation mitigation activities are consistent with, or complementary to, objectives for weed prevention, fish and wildlife habitat, erosion control, ground cover, riparian reserves, and fire/fuels management. Promote the idea of a TAC with Kittitas County, WDNR, WDFW and other stakeholders to help guide the deliberation process for tree planting locations and stocking rates that would best serve elk habitat values, forest health values, and fire prevention measures. Investigate opportunities to use tree plantings along segments of the Teanaway River that are currently listed by the U.S. Environmental Protection Agency (EPA) as impaired water bodies (303(d)) because of high temperatures to improve shading and channel morphology over time.

1.3.4 Weed Control

Comply with recommendations of the Washington State and Kittitas County Weed Control Boards for Region 6 Class A, B, and C weeds, which require land owners within weed-control districts to protect and preserve the land and resources from the degrading impact of noxious weeds.

 Objective: Reduce cover of noxious weeds. Restore cover by native plant species in areas of temporary disturbance. Maintain a clean, healthy environment with diverse native plant assemblages that resemble current conditions.

1.4 Summary of Plan Implementation Actions

The intent of the Plan is to provide Teanaway Solar Reserve, WDFW, WDNR, and Kittitas County with the information needed to evaluate vegetation management activities associated with proposed project construction and operations and maintenance activities. The Plan will ultimately provide Teanaway Solar Reserve with information needed to implement vegetation management activities for the project over the long term.

This Plan is neither a fiscal nor a funds obligation document. Any endeavor involving reimbursement or contributions of funds between Teanaway Solar Reserve and other stakeholders relative to the Plan will be handled in accordance with applicable laws, regulations, and procedures including those for government procurement and printing. This Plan does not provide such authority.

The Plan consists of three separate but inter-related elements of implementation; each deals with a specific aspect of vegetation management:

- 1. **Vegetation Maintenance -** describes measures for the routine removal and disposal of vegetation that interferes with safe and effective project construction and long-term operations, while protecting herbaceous vegetation on the site.
- 2. **Noxious Weed Prevention and Control -** prescribes methods for the prevention and control of noxious weeds in the project boundary.
- 3. **Revegetation -** outlines the measures to replace woody vegetation that will be removed from the project site by planting woody vegetation on other appropriate locations. It also discusses the procedure for revegetating abandoned road segments. Revegetation includes replanting all areas disturbed during construction. It also describes activities for decommissioning the project site.

2.0 Planning and Coordination

Implementation of the Plan is the primary responsibility of TSR. However, since much of the project is located in the leased land and habitat concerns for elk are important, other stakeholders have important roles in its implementation through the consultation process. The proposed solar panel project site is on land leased from American Forest Holdings, LLC, which is managed and operated by American Forest Land Company, LLC (AFL) of Ellensburg, Washington. Conservation easements for sections for impacted uplands nearby and for impaired segments of the Teanaway River will be investigated in coordination with Kittitas County, WDFW and WDNR. Assessment of the suitability of all potential mitigation replanting sites for elk would include consultation with WDFW.

2.1 Permits and Authorizations

Table 1 outlines the permits and authorizations required to construct the proposed project. Several of these permits involve vegetation avoidance or management.

TABLE 1
Required Permits and Authorizations

Act/Law	Permit/Authorization	Permit Trigger	Agency/Contact
Federal Permits			
Section 404 Clean Water Act Compliance	Section 404—Nationwide Permit	May be required if road improvements impact wetlands along Loping Lane	U.S. Army Corps of Engineers
State Permits			
Historic Preservation Act Compliance	Section 106 Review	Applicants receiving a section 404 permit from the U.S. Army Corps must undergo a Section 106 review	Washington Authority Delegated to State Department of Archaeology and Historic Preservation (DAHP)
State Environmental Policy Act	Chapter 197-11 Washington Administrative Code	Conditional use permit per Kittitas County	Authority Delegated to Kittitas County
Clean Water Act—Section 401 Compliance	Water Quality Certification	Applicants receiving a section 404 permit from the U.S. Army Corps are required to obtain a section 401 water quality certification	Washington Department of Ecology
National Pollutant Discharge Elimination System (NPDES)	General Construction Permit	Required for land disturbances greater than 1 acre	Washington Department of Ecology
Forest Practices Act (76.09 RCW)	Forest Practices Permit	Harvesting trees from onsite	Washington Department of Natural Resources (WDNR)
County Permits			
Land Use Review	Conditional Use Permit	Development occurring within Kittitas County	Kittitas County
Land Use Review	Development Agreement	Development occurring within Kittitas County	Kittitas County
Land Use Review	Cultural Resources	Development occurring within Kittitas County	Kittitas County
Land Use Review	Stormwater	Development occurring within Kittitas County	Kittitas County
Land Use Review	Critical Areas Ordinance	Development occurring within Kittitas County	Kittitas County
Land Use Review	Construction Permit	Development occurring within Kittitas County	Kittitas County

2.2 Summary of Construction Activities and Components

Site preparation will consist of clearing the existing vegetation only in those areas where construction, grading, and road improvements will occur. Site preparation will be limited to maintenance roads, the O&M facility, the substation, and the solar facility. Once the site is prepared, the installation of foundations, trackers, modules, inverter pads and enclosures, and substation foundation can begin.

2.3 Site Clearing and Grading

The project area will require clearing to address the potential for damage to the project from blown down trees, decreased power efficiency of the solar modules because of shading, the risk of fire from fuel buildup within the project area, and the need to create a 100-foot firebreak along the project's perimeters as described below. To clear the site for installing the project facilities, trees will be harvested within the project area on an as-needed basis for facilitating the each construction phase of the project (Table 2-1). Trees will generally be harvested to a stump level of 6 to 12 inches above ground level. TSR will obtain a permit from the WDNR and contract with a professional forester to harvest these trees in accordance with the Forest Practices Act (FPA). Because the bottoms of the solar modules will be approximately 3 feet above grade, any vegetation taller than 3 feet or expected to exceed 3 feet in height will be removed. Shrubs, grass, and groundcover will, to the maximum extent practicable, remain between rows and under the solar modules.

Trees within the 100-foot firebreak will be limbed up to 12 feet, as negotiated with Kittitas County Fire District 7. This minimizes the need to remove the entire tree, thus potentially decreasing the visual impact to nearby landowners. Also, existing trees with a dbh of 3 inches or greater will be replanted at a 3:1 ratio. Although there is no legal requirement for this action, TSR is committed to undertaking efforts that will further the potential long-term sustainability of the land. These two measures will provide greater carbon sequestration, wildlife habitat, and soil stabilization opportunities than are currently available on the site.

Construction equipment such as tractors, backhoes, loaders, dozers, and graders will be needed to clear brush and vegetation from the site as needed, and to grade roads and foundation locations. If the slope of the land is excessive, terracing, or retaining walls may be required.

3.0 Existing Conditions

Five vegetation categories or habitat types were mapped for the project area based on classification descriptions using Chappel *et al.* (2001) and field studies performed by CH2M HILL in the summer of 2009. These five habitat types are illustrated in Appendix A, Figure 3:

- Ponderosa Pine Forest and Woodlands
- Open Water Lakes, Rivers, and Streams
- Herbaceous Wetlands
- Riparian
- Upland Aspen Forest

These vegetation categories are described in more detail below. Two of the vegetation categories described below are Washington Priority Habitats: Upland Aspen Forest and Herbaceous Wetlands. Because these habitats comprise only a small portion of the site, direct impacts to these habitats from construction and operation of the project will be avoided.

Native plant diversity is high across the project area, 66 of the 81 (81 percent) plant species found during rare plant inventories were native species.

3.1 Ponderosa Pine Forest and Woodlands

Ponderosa Pine Forest and Woodlands vegetation is the dominant vegetation category found on the proposed project site. The project site has been actively managed as commercial timberlands for the past 100 years. The proposed project area was last logged in 2001-2002, leaving relatively few trees per acre and open stands of predominantly ponderosa pine (*Pinus ponderosa*). Crown cover of larger ponderosa pine, commercial grade, (greater than 8 inches diameter at breast height [dbh]) currently is approximately 10 to 15 percent across the proposed project site. Ponderosa pine stands growing on site are dominated by an overstory of 50-year-old ponderosa pine trees with a subcomponent of Douglas-fir (*Pseudotsuga menziesii*) trees. Saplings of both species are present in the understory.

The understory is dominated by a mixture of native bunchgrass species, including Idaho fescue (*Festuca idahoensis*), bluebunch wheatgrass (*Pseudoroegneria spicata*), squirreltail (*Elymus elymoides*), and western wheatgrass (*Pascopyrum smithii*). Common native forbs in the understory are arrowleaf balsamroot (*Balsamorhiza sagittata*), yarrow (*Achillea millefolium*), silky lupine (*Lupinus* spp.), sticky purple geranium (*Geranium viscossimum*), and Oregon checkermallow (*Sidalcea oregana* var. *procera*).

The variety of Oregon checkermallow found on site is the more common of two varieties of this species. A second variety of this checkermallow (*Sidalcea oregana var. calva*) was federally listed under the Endangered Species Act as Endangered on December 22, 1999 (64 FR 71680). Rare plant surveys completed for the proposed project site in 2009 determined that the Oregon checkermallow variety found on site is not the endangered variety (CH2M HILL 2010).

Non-native species, such as bulbous bluegrass (*Poa bulbosa*), ventenata (*Ventenata dubia*), and rush skeletonweed (*Chondrilla juncea*) are abundant in many areas. Rush skeletonweed is a Class B noxious weed in Washington.

3.2 Open Water—Lakes, Rivers, and Streams

Several ephemeral streams and one artificially ponded area occur within the proposed project area. Streambeds were vegetated to varying extents and all dry at the time of the field visits (June and July 2009). Typical herbaceous grass and forb species within most dry channels include Brewer's navarretia (*Navarretia brewerii*), poverty oatgrass (*Danthonia spicata*), and small tarweed (*Madia exigua*). Other channels were dominated by dense shrub and herb species including Woods' rose (*Rosa woodsii*), snowberry (*Symphoricarpos albus*), cinquefoil (*Potentilla* spp.), and Oregon checkermallow (*Sidalcea oregana var. procera*).

3.3 Herbaceous Wetlands

Herbaceous wetland habitats within the survey area consist of depressional wetlands dominated by herbaceous vegetation. Exposed soils were cracked, which is evident of altering drying and wetting periods. Water arrives as either snowmelt or rain. These wetlands support hydrophytic herbaceous vegetation and meet the criteria for hydric soils and wetland hydrology. Common plant species within these wetlands were creeping spikerush (*Eleochaeris palustris*), Parry's rush (*Juncus parryi*), marsh cudweed (*Gnaphalium palustre*), and several sedge (*Carex* spp.) species. The non-native, annual grass ventenata (*Ventenata dubia*) had invaded most of the depressional wetlands and dominated them as they dried. Herbaceous wetlands are located within the proposed project area boundary but will not be impacted by project activities (see Appendix A, Figure 2).

3.4 Riparian

Riparian habitat is found adjacent to some of the ephemeral stream channels in the survey area. Riparian habitat is located in the transitional area between the stream channel and ponderosa pine forest. It typically consists of a dense shrub layer composed of a mixture of oceanspray (*Holodiscus discolor*), mountain spiraea (*Spiraea betulifolia*), Woods' rose (*Rosa woodsii*), and ponderosa pine. Oregon checkermallow (*Sidalceae oregana* var. *procera*) was often found in the understory of these areas.

3.5 Upland Aspen Forest

A small grove of aspen (*Populus tremuloides*) forest occurs along one drainage and around an artificially impounded pond in the southwestern portion of the survey area. Associated species include ponderosa pine, snowberry, and wild rose. This aspen grove is within the proposed project area boundary, but will not be impacted by project activities as it is located outside of the proposed project site boundary (see Appendix A, Figure 2).

4.0 Vegetation Maintenance

This section provides a set of procedures and associated BMPs to guide the routine removal and disposal of vegetation during construction and during O&M. Ongoing O&M vegetation removal will be limited to woody vegetation that could potentially interfere with safe and effective project operations. Vegetation maintenance goals for the Plan are:

- Maintain, preserve, and restore the diversity of herbaceous native plant species within the proposed project site.
- Develop and maintain native plant communities that are resistant to non-native plant invasion.

The objectives of these goals are described in described in Section 1.4. Two general categories of vegetation impact (described in Section 2.2 Construction Activities and Components and Section 2.3 O&M Activities) will occur. Construction activities are likely to be of short duration, but they will be permanent in areas where roads or structures will be constructed. Some construction activities will have more short-term impacts, such as areas used for staging or slash collection. O&M activities will continue to occur over the life of the project and are long-term impacts.

4.1 Maintain Herbaceous Plant Diversity.

Goal 1 of this plan to is to maintain, preserve, and restore the diversity of herbaceous native plant species within the proposed project site during construction and O&M activities. Construction BMPs are provided in Section 7.1 to avoid impacts to plants that will not be directly and permanently removed by construction activities. These include erosion control and temporary fencing protection. In addition, site preparation will consist of clearing the existing vegetation only in those areas where construction, grading, and road improvements will occur. Temporary staging and material storage areas will be located within areas that will be required for later construction to minimize site disturbance. Site preparation will be limited to maintenance roads, the O&M facility, the substation, and the solar facility. Once the site is prepared, the installation of foundations, trackers, modules, inverter pads and enclosures, and substation foundation will use built roads. Avoiding incidental impacts to vegetation that will not be permanently impacted helps promote plant communities that are more resistant to non-native plant invasion.

As described in Section 2.3 above, woody vegetation management will be necessary to prevent interference with solar collectors. The bottoms of the solar modules will be approximately 3 feet above the ground; any vegetation taller than 3 feet or expected to exceed 3 feet in height will be removed. Approximately 10 to 15 percent of the crown cover currently on the proposed project site is commercial-size timber (larger than 8-inch dbh). Shrubs, grass, and groundcover will, to the maximum extent practicable, remain between rows and under the solar modules.

Trees within the 100-foot firebreak will be limbed up to 12 feet, as negotiated with Kittitas County Fire District 7.

Goal 2 will be discussed primarily under Section 5.0 Weed Control. However, maintaining healthy, diverse herbaceous plant communities for carbon sequestering has the added bonus of making the project site more resistant to non-native plant invasion.

The objective of this goal is to develop and implement construction BMPs that will prevent weed invasion into the project area and ensure construction impacts are limited to the smallest footprint possible.

5.0 Weed Control

Routine weed control will be required to ensure vegetation growth does not interfere with the operation of any equipment. The frequency of visits will be determined by the growth rate and density of the vegetation left on the site once construction is complete. TSR will comply with the Development Agreement, included as Attachment E of the Conditional Use Permit. TSR is also contractually bound to reclaim the site to address any damage caused by the demolition and removal of any alterations or improvements to the site, including the project.

While attempting to reach weed control goals and objectives, TSR will take a long-term, integrated approach. It will strive to reduce herbicide use over the long term while making measurable progress toward vegetation management goals over the short term. Reliance solely upon broadleaf herbicides without additional tools would be expensive, increase

health concerns, and ultimately lead to losses in native broadleaf diversity. An aggressive, creative, and fully integrated management approach to weed control will be promoted.

Table 2 lists the known non-native species currently found within the project area boundaries and the status of each as a noxious weed. This is not an exhaustive weed list and other species may be introduced onto the site during construction. Appendix B lists all current noxious weeds for Washington. Eradication of Class B weeds with reseeding of native species will be implemented to contain infestations. Control of all other non-native species from spreading and eradicating if possible is recommended in order to ease site restoration after the project facilities are removed in the future.

TABLE 2
Non-native Species Currently Known to Occur within the Proposed Project Area

Common Name	Scientific Name	Status in Washington ^a	Recommended Action
Common corncockle	Agrostemma githago		Control
European water plantain	Alisma plantago-aquatica		Control
Centaury	Centaurium erythraea		Control
Rush skeletonweed	Chondrilla juncea	Class B	Eradicate and reseed
Ox-eye daisy	Chrysanthemum leucanthemum	Class B	Eradicate and reseed
Bull thistle	Cirsium vulgare	Class C	Control
Field bindweed/ morning glory	Convoluus arvensis	Class C	Control
Rough hawksbeard	Crepis setosa		Control
Scotch broom	Cytisus scoparius	Class B	Eradicate and reseed
Common timothy	Phleum pratense		Control
Bulbous bluegrass	Poa bulbosa		Control
Self-heal	Prunella vulgaris		Control
Tall buttercup	Ranunculus acris		Control
Sheep sorrel	Rumex acetosella		Control
Yellow salsify	Tragopogon dubius		Control
Ventenata	Ventenata dubia		Control

Notes:

Class B Weeds: Non-native species presently limited to portions of the state. Species are designated for control in regions where they are not yet widespread. Preventing new infestations in these areas is a high priority. Class C Weeds: Noxious weeds which are already widespread in Washington or are of special interest to the state's agricultural industry. The Class C status allows counties to enforce control if locally desired.

^a Class A Weeds: Non-native species whose distribution in Washington is still limited. Preventing new infestations and eradicating existing infestations are the highest priority. Eradication of all Class A plants is required by law.

6.0 Revegetation

Existing trees with a diameter at breath height (dbh) of 3 inches or greater will be replanted at a 3:1 ratio. Although there is no legal requirement for this mitigation, TSR is committed to undertaking efforts that will further the long-term sustainability of the land. These two measures may provide greater carbon sequestration, wildlife habitat, and soil stabilization opportunities than are currently available onsite. On the other hand, if trees are stocked too heavily, elk forage habitat values decrease, fire dangers increase, and forest health issues increase. In order to address locations where these trees can be planted, TSR will coordinate with the TAC (Kittitas County, WDNR, and WDFW).

The Forest Practices Act (FPA) requires 150 or more well-distributed, vigorous, undamaged seedlings per acre of commercial tree species (the site is dominated by Ponderosa Pine) 3 years post harvest. As a general rule, a stand is replanted within 1 or 2 years after harvest. Beyond this, the FPA does not have a specific stocking standard related to forest health or fire issues. Further standards will be developed by the TAC.

6.1 Agency Coordination

TSR is forming a TAC to address mitigation for tree replacement (TAC commitment letters are provided in Appendix C). TSR will plan and coordinate meetings between these stakeholders to discuss and formulate a planting plan and to determine acceptable final goals for a monitoring plan. At a minimum, the planting plan would include the following elements:

- Determine suitable parcels for planting, both upland areas and areas along the Teanaway River, including riparian and upland buffers will be considered.
- Define areas for ponderosa pine planting so that plantings would not result in overstocking areas just to meet total numbers. Suitable stocking rates for ponderosa pine forest in this area are 150 trees per acre.

The TAC includes at a minimum TSR, Kittitas County, WDNR, and WDFW.

6.2 Monitoring

Once plantings are in place, the success of plantings will be monitored annually for 3 years by TSR by installing monitoring plots. Plots will be monitored for seedling survival for the duration of 3 years. If the viable seedlings meet or exceed 150 stems 3 years post planting, the site is considered fully stocked and WDNR will close the FPA permit. An annual monitoring report will be sent to Kittitas County, WDNR, and WDFW, at a minimum

6.3 Revegetation Guidance

6.3.1 Temporary Disturbance Seeding

Areas temporarily disturbed by construction activities, including the areas under solar arrays, will be revegetated with native species. Annual revegetation monitoring will be undertaken to ensure that all seeded revegetation sites meet a minimum cover standard of 70 percent cover composed of predominantly native species within 3 years. A general seeding mixture consisting of 12 pounds per acre of pure live seed (PLS) from a certified

weed-free source will be planted on disturbed sites at a ratio of 4 pounds of bluebunch wheatgrass (*Pseudoroegneria spicata*), 2 pounds of Idaho fescue (*Festuca idahoensis*), 2 pounds of prairie junegrass (*Koeleria macrantha*), 2 pounds needle-and-thread grass (*Hesperostipa comata*), 1 pound of arrowleaf balsamroot (*Balsamorhiza sagittata*), and 1 pound of silky lupine (*Lupinus sericeus*).

6.3.2 Road Decommissioning during Construction

Several small roads segments located near wetlands will be abandoned during construction of the project to avoid impacts to the wetland resource.

6.3.3 Decommissioning

Per the Development Agreement (Attachment E of the Conditional Use Permit) TSR will return the site in good condition and, at the landowner's request, to remove any or all of the project's components. For more details on project decommissioning, see Attachment E of the Conditional Use Permit. TSR will also reclaim the site to address any damage caused by the demolition and removal of any alterations or improvements to the site, including the project. Decommissioning could include removing all facilities and roads. It is likely to include reseeding and replanting areas disturbed by construction activities at the project site with a diverse mix of native plants. If some of the species currently on site, particularly the forb species, are not readily available commercially, this agreement could require seed collection to fulfill the intent of the decommissioning language.

7.0 Best Management Practices (BMPs) and Mitigation Measures

7.1 Construction BMPs and Mitigation Measures

BMPs will be implemented during construction to avoid and reduce temporary and permanent impacts to the extent practicable. In the event that a state or federally listed threatened or endangered plant or wildlife species is observed during project development, work will be halted immediately and a qualified biologist notified.

BMPs will be implemented wherever surface disturbances occur. These measures include, but are not limited to, the following:

- Trees will generally be harvested to a stump level of 6 to 12 inches above ground level. TSR will obtain a permit from the WDNR and contract with a professional forester to harvest these trees in accordance with the Forest Practices Act.
- It is TSR's intent not to burn woody debris, slash, or logging refuse. Any woody debris chipped on site will be put to a beneficial use (e.g. chipped material will be sent to a compost facility, used for paper or ground cover). If burning is necessary, TSR will secure the necessary permits from the regulatory agencies and no more than approximately 130 consumable tons of material will be burned.
- Slash production from logging will use a chipper, such as the Hydro-ax, to de-limb and
 process slash and small trees. This will be done in confined staging areas on or next to
 proposed or current roadways. The resulting chips could be used as composting chips,

ground cover, or erosion control material, or taken to a mulch center for recycling. Kittitas County has a new compost center north in Ellensburg, which is approximately 25 miles from the project site. No slash or brush piles permanently left on the project site to inadvertently impact herbaceous vegetation cover.

- All trees, shrubbery, and other vegetation not designated for removal will be protected from damage caused by the project construction.
- Areas of temporarily disturbed by construction activities will be seeded with the specified seed mix.
- Install filter bags, sediment fences, sediment filter fabric traps, and graveled construction accesses as necessary for erosion control, where possible.
- Cover stockpiles with impervious materials when unattended or during rainfall.
- Locate construction staging areas for storage, maintenance, and fueling of construction equipment minimum of 150 feet from creeks or wetlands. Show staging areas on the construction plans.
- Petroleum products and other harmful material will be prevented from entering wetland or waterways at all times.
- Upon completion of construction, seed or plant all areas of temporary disturbance due to construction activities with native plants.
- Erect construction fencing along buffered boundaries of all wetland and riparian areas and aspen groves within the proposed project site prior to construction to avoid inadvertent impacts to these habitats.
- Monitor areas used for staging after construction to determine if impacts to these areas
 are temporary. If weeds invade or native plants on these sites appear to be dead or
 unhealthy the year following construction, weeds will be controlled and these areas will
 be overseeded with the same seeding mixture described for other disturbed areas.
- Where seeding is necessary, seeding mixture consisting of 12 pounds of PLS from a certified weed-free source will planted on this prepared surface at a ratio of 4 pounds of bluebunch wheatgrass (*Pseudoroegneria spicata*), 2 pounds of Idaho fescue (*Festuca idahoensis*), 2 pounds of prairie junegrass (*Koeleria macrantha*), 2 pounds needle-and-thread grass (*Hesperostipa comata*), 1 pound of arrowleaf balsamroot (*Balsamorhiza sagittata*), and 1 pound of silky lupine (*Lupinus sericeus*).

7.2 Operations and Maintenance BMPs and Mitigation Measures

7.2.1 Noxious Weed Control

The following BMPs for noxious weed control will be presented to the Kittitas County Noxious Weed Control Board (NWCB).

- Weed monitoring and any necessary control efforts will be completed annually.
- Ground application of herbicides will be with a dripless wand applicator carried over the site either on foot in a backpack sprayer or in a tank on a rubber-tired all-terrain

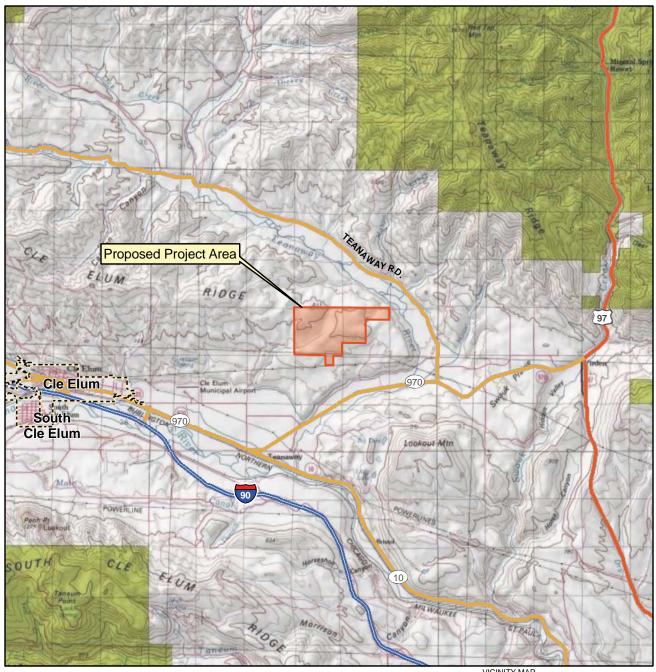
- vehicle (ATV). Herbicide(s) used will be limited to types that do not move through the soil and whose affect is immediate but short-lived. Herbicide(s) used will be approved for use near or in wetlands to avoid unintentional affects to aquatic species.
- Herbicide mixes will be colored with dye to aid in post-application monitoring.
- The first pass of each application will be made parallel to the buffer zones in such a way that chemicals cannot drift into the buffers.
- Wetland buffers will be maintained and are described in detail in Attachment B, Wetland Delineation Report.

8.0 References

- CH2M HILL. 20101. Sensitive Species Surveys for the Teanaway Solar Reserve Kittitas County, Washington. February.
- Chappell, C.B., R.C. Crawford, C. Barrett, J. Kagan, D.H. Johnson, M. O'Mealy, G.A. Green, H.L. Ferguson, W.D. Edge, E.L. Greda, and T.A. O'Neill. 2001. "Wildlife Habitats: Descriptions, Status, Trends, and System Dynamics." Wildlife-Habitat Relationships in Oregon and Washington. D.H. Johnson and T.A. O'Neil, managing directors. Oregon State University Press, Corvallis. Pages 22-114.

Washington Department of Fish and Wildlife (WDFW). 2009. Washington Department of Fish and Wildlife Wind Power Guidelines.

APPENDIX A Figures





Proposed Project Area

City Boundary

Interstate

Highway

Major Road

Note:

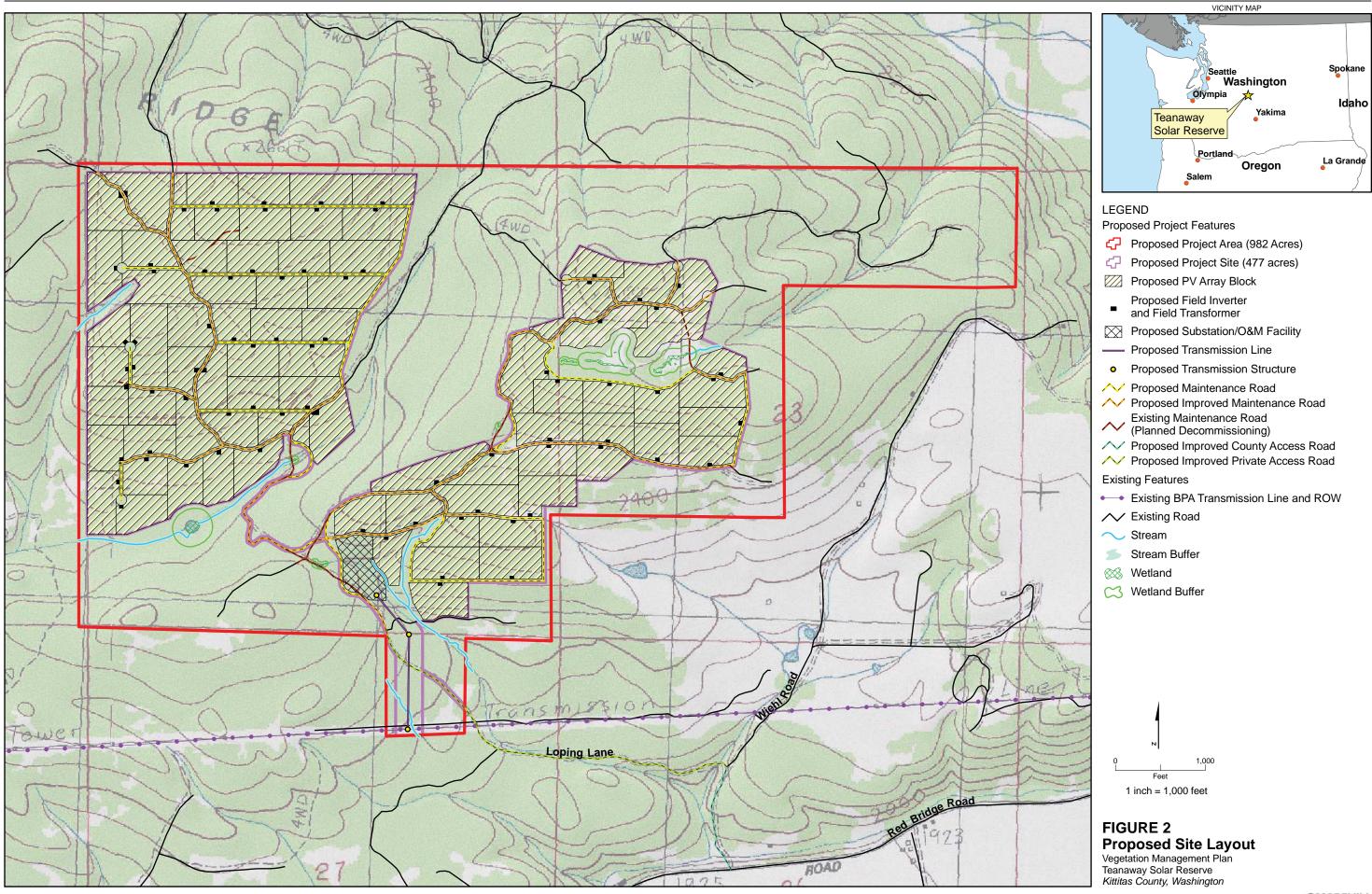
1. USGS 100K Quadrangle: Wenatchee.

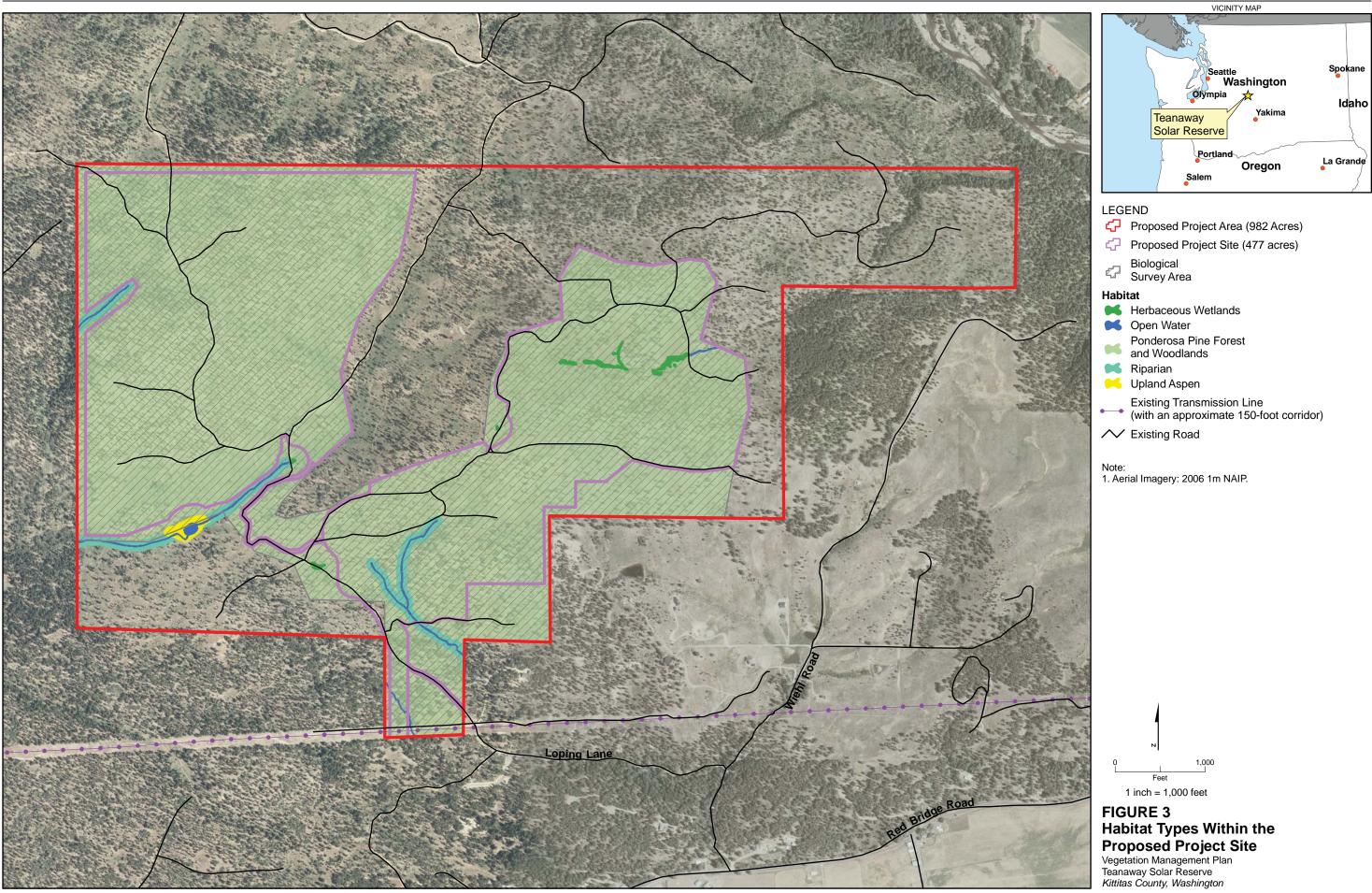


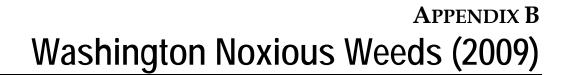


FIGURE 1 Vicinity Map Vegetation Management Plan

Vegetation Management Plan Teanaway Solar Reserve Kittitas County, Washington







Noxious Weeds are non-native plants introduced to Washington State that can be highly destructive, competitive, and difficult to control. These plants invade our croplands, rangeland, forests, parks, rivers, lakes, wetlands, and estuaries causing both ecological and economical damage that affects us all. Noxious weeds can:

- Lower crop yields
- Reduce forage quality
- Destroy plant and animal habitat
- Displace native plants
- Reduce recreational opportunities (e.g., fishing, hunting, swimming and hiking)
- Clog waterways
- Decrease land values
- Increase erosion and wildfire risk
- And some are toxic to humans and livestock

To help protect the State's resources and economy, the Washington State Noxious Weed Control Board adopts a State Noxious Weed List each year (WAC 16-750). This list classifies weeds into three major classes – A, B, and C – based on the stage of invasion of each species and the seriousness of the threat they pose to Washington State. This classification system is designed to:

- Prevent small infestations from expanding by eradicating them when they are first detected
- Restrict already established weed populations to regions of the state where they occur and prevent their movement to un-infested areas
- Allow flexibility of weed control at the local level for weeds that are already widespread.

To learn more about noxious weeds and noxious weed control in Washington State, please contact:

WA State Noxious Weed Control Board

P.O. Box 42560 Olympia, WA 98504-2560 (360)-725-5764

Email: noxiousweeds@agr.wa.gov

Website: http://www.nwcb.wa.gov

Or

WA State Department of Agriculture

21 North First Avenue #103 Yakima, WA 98902 (509) 225-2604

Or

Your local County
Noxious Weed Control Board

Please help protect Washington's economy and environment from noxious weeds!

2009

Washington State Noxious Weed List



Shiny geranium, Geranium lucidum, a new Class A noxious weed

Figure from *Deutschlands Flora in Abbildungen* at http://www.biolib by
Johann Georg Sturm in 1796.
Image taken from Wikimedia Commons

Class A Weeds: Non-native species whose distribution in Washington is still limited. Preventing new infestations and eradicating existing infestations are the highest priority. Eradication of all Class A plants is required by law.

Class B Weeds: Non-native species presently limited to portions of the State. Species are designated for control in regions where they are not yet widespread. Preventing new infestations in these areas is a high priority. In regions where a Class B species is already abundant, control is decided at the local level, with containment as the primary goal. Please contact your County Noxious Weed Control Coordinator to learn which species are designated in your area.

Class C Weeds: Noxious weeds which are already widespread in WA or are of special interest to the state's agricultural industry. The Class C status allows counties to enforce control if locally desired. Other counties may choose to provide education or technical consultation.

<u>Class A Weeds</u> Eradication is required

buffalobur	Solanum rostratum
common crupina	Crupina vulgaris
cordgrass, common	Spartina anglica
cordgrass, dense flower	Spartina densiflora
cordgrass, salt meadow	Spartina patens
■ cordgrass, smooth	Spartina alterniflora
dyers woad	Isatis tinctoria
eggleaf spurge	Euphorbia oblongata
• false brome	Brachypodium sylvaticum
floating primrose-willow	Ludwigia peploides
flowering rush	Butomus umbellatus
garlic mustard	Alliaria petiolata
giant hogweed	Heracleum mantegazzianum
goatsrue	Galega officinalis
hawkweed, European	Hieracium sabaudum
hawkweed, yellow devil	Hieracium floribundum
hydrilla	Hydrilla verticillata
johnsongrass	Sorghum halepense
knapweed, bighead	Centaurea macrocephala
knapweed, Vochin	Centaurea nigrescens
kudzu	Pueraria montana var. lobata
·	·

meadow clary	Salvia pratensis
purple starthistle	Centaurea calcitrapa
reed sweetgrass	Glyceria maxima
ricefield bulrush	Schoenoplectus mucronatus
sage, clary	Salvia sclarea
sage, Mediterranean	Salvia aethiopis
shiny geranium	Geranium lucidum
silverleaf nightshade	Solanum elaeagnifolium
Spanish broom	Spartium junceum
spurge flax	Thymelaea passerina
Syrian bean-caper	Zygophyllum fabago
Texas blueweed	Helianthus ciliaris
thistle, Italian	Carduus pycnocephalus
thistle, milk	Silybum marianum
thistle, slenderflower	Carduus tenuiflorus
variable-leaf milfoil	Myriophyllum heterophyllum
velvetleaf	Abutilon theophrasti
wild four o'clock	Mirabilis nyctaginea

Class B Weeds

<u> </u>	D WCCas
Austrian fieldcress	Rorippa austriaca
blackgrass	Alopecurus myosuroides
blueweed	Echium vulgare
Brazilian elodea	Egeria densa
bugloss, annual	Anchusa arvensis
bugloss, common	Anchusa officinalis
butterfly bush	Buddleja davidii
camelthorn	Alhagi maurorum
common catsear	Hypochaeris radicata
common fennel	Foeniculum vulgare
common reed	Phragmites australis
(nonnative genotypes)	
Dalmatian toadflax	<i>Linaria dalmatica</i> ssp.
	dalmatica
Eurasian watermilfoil	Myriophyllum spicatum
fanwort	Cabomba caroliniana
gorse	Ulex europaeus
grass-leaved arrowhead	Sagittaria graminea
hawkweed oxtongue	Picris hieracioides
hawkweed, mouseear	Hieracium pilosella
hawkweed, orange	Hieracium aurantiacum
hawkweed, polar	Hieracium atratum
hawkweed, queen-devil	Hieracium glomeratum
hawkweed, smooth	Hieracium laevigatum
hawkweed, yellow	Hieracium caespitosum
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herb-Robert	Geranium robertianum		
hoary alyssum	Berteroa incana		
houndstongue	Cynoglossum officinale		
indigobush	Amorpha fruticosa		
knapweed, black	Centaurea nigra		
knapweed, brown	Centaurea jacea		
knapweed, diffuse	Centaurea diffusa		
knapweed, meadow	Centaurea jacea x nigra		
knapweed, Russian	Acroptilon repens		
knapweed, spotted	Centaurea stoebe		
knotweed, Bohemian	Polygonum bohemicum		
knotweed, giant	Polygonum sachalinense		
knotweed, Himalayan	Polygonum polystachyum		
knotweed, Japanese	Polygonum cuspidatum		
kochia	Kochia scoparia		
lawnweed	Soliva sessilis		
lepyrodiclis	Lepyrodiclis holosteoides		
longspine sandbur	Cenchrus longispinus		
loosestrife, garden	Lysimachia vulgaris		
loosestrife, purple	Lythrum salicaria		
loosestrife, wand	Lythrum virgatum		
oxeye daisy	Leucanthemum vulgare		
parrotfeather	Myriophyllum aquaticum		
perennial pepperweed	Lepidium latifolium		
perennial sowthistle	Sonchus arvensis ssp.		
	arvensis		
policeman's helmet	Impatiens glandulifera		
poison-hemlock	Conium maculatum		
puncturevine	Tribulus terrestris		
rush skeletonweed	Chondrilla juncea		
saltcedar	Tamarix ramosissima		
Scotch broom	Cytisus scoparius		
spurge laurel	Daphne laureola		
spurge, leafy	Euphorbia esula		
spurge, myrtle	Euphorbia myrsinites		
sulfur cinquefoil	Potentilla recta		
swainsonpea	Sphaerophysa salsula		
tansy ragwort	Senecio jacobaea		
thistle, musk	Carduus nutans		
thistle, plumeless	Carduus acanthoides		
thistle, Scotch	Onopordum acanthium		
water primrose	Ludwigia hexapetala		
white bryony	Bryonia alba		
wild carrot	Daucus carota		
wild chervil	Anthriscus sylvestris		

yellow floating heart	Nymphoides peltata	
yellow nutsedge	Cyperus esculentus	
yellow starthistle	Centaurea solstitialis	

Class C Weeds

<u>Olass</u>	<u>C weeds</u>		
absinth wormwood	Artemisia absinthium		
babysbreath	Gypsophila paniculata		
black henbane	Hyoscyamus niger		
cereal rye	Secale cereale		
common groundsel	Senecio vulgaris		
common St. Johnswort	Hypericum perforatum		
common tansy	Tanacetum vulgare		
curly-leaf pondweed	Potamogeton crispus		
English ivy - four	Hedera helix 'Baltica',		
cultivars only	'Pittsburgh', and 'Star'; H.		
	hibernica 'Hibernica'		
• evergreen blackberry	Rubus laciniatus		
field bindweed	Convolvulus arvensis		
fragrant water lily	Nymphaea odorata		
hairy whitetop	Cardaria pubescens		
hairy willow-herb	Epilobium hirsutum		
hawkweed, common	Hieracium lachenalii		
hawkweeds, nonnative	<i>Hieracium</i> spp.		
and invasive species			
not listed elsewhere			
Himalayan blackberry	Rubus armeniacus		
hoary cress	Cardaria draba		
jointed goatgrass	Aegilops cylindrica		
old man's beard	Clematis vitalba		
reed canarygrass	Phalaris arundinacea		
scentless mayweed	Matricaria perforata		
smoothseed alfalfa	Cuscuta approximata		
dodder			
spikeweed	Hemizonia pungens		
spiny cocklebur	Xanthium spinosum		
thistle, bull	Cirsium vulgare		
thistle, Canada	Cirsium arvense		
white cockle	Silene latifolia ssp. alba		
yellow archangel	Lamiastrum galeobdolon		
yellow flag iris	Iris pseudacorus		
yellow toadflax	Linaria vulgaris		

- New additions to the 2009 Noxious Weed List
- Change in Noxious Weed Class

APPENDIX C TAC Commitment Letters

Seidell, Nichole/PDX

From: MAUNEY, MARTY (DNR) [MARTIN.MAUNEY@dnr.wa.gov]

Sent: Wednesday, February 10, 2010 6:48 PM

To: Seidell, Nichole/PDX
Cc: MAUNEY, MARTY (DNR)

Subject: RE: Teanaway Solar Reserve- Vegetation Mitigation TAC

Nichole:

Thanks for the chance to talk with you and Travis Nelson this afternoon. I am looking forward to working with you on the TAC. I will be the DNR's representative on the TAC. Please let Kittitas County know this, as well as my contact information, in case they should need to get a hold of me.

Sincerely:

Marty Mauney

Forest Practices Forester Southeast Region Washington State Department of Natural Resources (DNR) (509) 925-0909 (office) (509) 856-7054 (cell) marty.mauney@dnr.wa.gov

From: Nichole.Seidell@ch2m.com [mailto:Nichole.Seidell@ch2m.com]

Sent: Wednesday, February 10, 2010 4:21 PM **To:** Nelson, Travis W (DFW); MAUNEY, MARTY (DNR)

Subject: Teanaway Solar Reserve- Vegetation Mitigation TAC

Thank you both for taking the time to discuss the TAC for the Teanaway Solar Reserve.

I appreciate your willingness to serve as a member of the TAC. As I mentioned on the phone call today, we are submitting supplemental information to Kittitas County on February 22, 2010.

If you wouldn't mind responding to this email and confirming my understanding that you (or someone from your agency) is willing to serve on the TAC, that would be a huge help to us.

Again, thanks for your time and I look forward to working with you on this project!

Nichole Seidell CH2M HILL, Inc. 503.872.4803 (office) 503.329.2543 (cell) 503.736.2000 (fax) nseidell@ch2m.com From: Nelson, Travis W (DFW)
To: Seidell, Nichole/PDX

Subject: RE: Teanaway Solar Reserve - Vegetation Mitigation TAC

Date: Wednesday, February 10, 2010 6:55:19 PM

Nicole,

WDFW will participate in a Technical Advisory Committee (TAC) for the Teanaway Solar Reserve. WDFW involvement will be dependent upon staff availability and term of commitment.

Travis Nelson Washington Department of Fish and Wildlife Renewable Energy Section Manager 600 Capitol Way North Olympia, WA 98501-1091

phone: 360-902-2390 facsimile: 360-902-2946 Travis.Nelson@dfw.wa.gov

From: Nichole.Seidell@ch2m.com [mailto:Nichole.Seidell@ch2m.com]

Sent: Wednesday, February 10, 2010 4:21 PM

To: Nelson, Travis W (DFW); MAUNEY, MARTY (DNR)

Subject: Teanaway Solar Reserve- Vegetation Mitigation TAC

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Again, thanks for your time and I look forward to working with you on this project!

Nichole Seidell CH2M HILL, Inc. 503.872.4803 (office) 503.329.2543 (cell) 503.736.2000 (fax) nseidell@ch2m.com