Appendix A
Revised Mitigation Measures

The proposed project includes measures that would limit construction and operation impacts to elements of the natural and human environment. These measures are presented for each element of the environment identified as a potential concern by Bonneville and EFSEC based on preliminary environmental review and public and regulatory agency input. Updates to the mitigation table below are in response to comments on the Draft EIS or to incorporate new information included in the Settlement Agreements.

Mitigation Measure	Power Plant	Pipelines	Bonneville T-Line
EARTH			
Seismicity			
Facilities would be designed to meet regional seismic design criteria as presented in the Uniform Building Code (UBC).	X	X	
Any slopes requiring soil reinforcement to resist seismic loading would be reinforced with geo-grid for fills and soil nailing for cuts.	X		
The plant would be designed to reasonably withstand ground acceleration levels that are unlikely to occur over the life of the project. Specifically, project facilities would be designed for magnitude 7 earthquake with a peak ground acceleration of 0.22g. This design standard primarily affects the foundation and structural steel specifications for buildings, the HRSG structure, combustion gas turbine-generator foundations, steam turbine-generator foundations and supports, cooling tower basins and structures, HRSG stacks, and large tank foundations and design.	X		
Visual inspection would be conducted following perceptible seismic activity. Inspectors would look for signs of incipient mass movements in those areas identified as potentially susceptible to such failures.	X	X	
Structures would be designed to reasonably withstand ground motions associated with the Maximum Credible Earthquake.			X
Structures would be sited to avoid unstable slopes or difficult soil conditions wherever possible.			X

Mitigation Measure	Power Plant	Pipelines	Bonneville T-Line
Stormwater and Erosion			
A stormwater detention pond would be sized to contain the 100-year rainfall event of 1.8 inches in a 24-hour period. Power plant water would be collected and diverted through oil-water separator to an unlined pond for evaporation and percolation into the shallow groundwater. External stormwater would be collected and diverted to unlined pond for evaporation and percolation to groundwater.	X	X	
Silt fences/hay bales, diversion ditches, and hydro seeding would be sized to handle the 10-year, 24-hour storm. Seeding mixes would be selected to survive in the arid environment of the project site.	X	X	X
Clearing, excavation and grading would be limited to areas absolutely necessary for construction. Areas outside the construction limits would be identified and clearly marked and avoided.	X	X	X
To the extent possible, excavation and grading would be timed to coincide with the dry seasons to reduce the potential for water erosion. Water would be applied to control dust and minimize wind erosion.	X	X	
Excavated materials would be reused. Excess materials would be placed where they would not easily erode, and would not be placed at slopes steeper than 4 horizontal: 1 vertical unless compacted to the requirements of structural fills. Disturbed areas would be revegetated by seeding.	X	X	X
Soil stockpiles would be covered with tarps or emulsion and surrounded by silt fences and hay bales, where necessary, to prevent excessive erosion by wind or rain.	X	X	X
Surface runoff would be directed around and away from cut-and-fill slopes and conveyed in pipes or temporary channels.	X	X	
At road crossings or where water erosion potential is high, the trenches would be compacted to 95% of maximum dry density by compacting until the backfill is flush with original or finish grade.	X	X	
During ongoing operations, routine maintenance and inspection activities would include project site inspections and compliance with the stormwater pollution prevention plan, landscaping plan, and erosion control plan (until permanent erosion control features are established).	X	X	
Erosion hazard areas would be avoided wherever possible.	X		X
Disturbed sites would be reseeded with a seed mixture suited to the site at an optimal time for success.			X

Mitigation Measure	Power Plant	Pipelines	Bonneville T-Line
Discharge of solid materials including building materials into waters of the United States would be avoided unless authorized by a Clean Water Act Section 404 permit. Measures would be implemented to reduce off-site tracking of soil and the generation of dust. Vegetative buffers would be left along stream courses to minimize erosion and bank instability.			X
If required, a stormwater pollution prevention plan (SWPPP) would be prepared, as required under the National Pollutant Discharge Elimination System (NPDES) General Permit.			X
Disruption of low-growing vegetation would be minimized to reduce potential for wind and water erosion.			X
An erosion and sediment control plan (ESCP) that incorporates best management practices (BMPs) would be developed and implemented for this project.			X
The Wallula Power Project would include regular surveillance of the makeup water supply pipeline to identify and repair dune shift erosion and accretion. GTN, as the owner and operator of the natural gas pipeline, would provide regular surveillance of the natural gas pipeline.		X	
Vegetative buffers would be left along stream courses to reduce erosion and bank instability.			X
Construction-related activities within Juniper Canyon will be minimized.			X
Grading/Geotechnical			
To the extent feasible, slopes would be graded to no steeper than 2 horizontal: 1 vertical	X	X	X
The top 12 inches of topsoil in the areas of agricultural and native habitat would be removed and preserved for final grade reuse.	X	X	
Trench materials would be replaced and compacted to a minimum of 85% of the maximum dry density.	X	X	
Embankments, bedding for buried pipe, and backfill surrounding structures would be compacted to at least 90% of the maximum dry density. General backfill placed in remote and/or unsurfaced areas would be compacted to at least 85% of the maximum dry density.	X	X	
Based on detailed geotechnical surveys, specific foundations would be designed and constructed to reduce the potential for soil subsidence, soil liquefaction, soil frost heaving, and soil expansion.	X		

Mitigation Measure	Power Plant	Pipelines	Bonneville T-Line
Debris and material not suitable for backfill would be removed and disposed of at an acceptable location on the site. Graded areas would be smooth, compacted, free from irregular surface changes, and sloped to drain. Backfilling would be done in layers of uniform, specified thickness material. Soil in each layer would be properly moistened to facilitate compaction to achieve the specified density. Representative field density and moisture-content tests would be made during compaction. Structural fill supporting foundations, roads, equipment access areas, etc. would be compacted to at least 90% of the maximum dry density in accordance with ASTM D698.	X		
The placement of fill consisting of moisture-sensitive soils would be limited to dry weather periods. If storm events occur during construction periods, fill placement would be suspended until the soil can be properly moisture conditioned. A qualified engineer or engineering technician would monitor the fill and backfill placement during construction and would conduct the appropriate field tests to verify proper compaction of the fill and backfill.	X		
Foundations would be designed to accommodate undesirable soil conditions where necessary.			X
Periodic inspection and maintenance of all structures would be performed to identify and correct progressive adverse geologic processes before they pose a risk of failure or significant environmental impact.			X
Roads and Culverts			
Based on soil conditions, roads would be constructed using crushed rock as subgrade and base course.			X
Culverts required for drainage through access roads would be properly spaced and sized to reduce bank erosion, sheet flooding, and impediments to fish passage (if any).			X
All culvert installations would be coordinated with appropriate federal, state, and local agencies.			X
Cross drains, water bars, rolling dips, ditch armoring, and drain inlets and outlets would be designed and constructed to reduce erosion and sheet flooding.			X
Existing culverts and stream crossings that pose a risk to riparian, wetland, or aquatic habitat would be improved to accommodate at least a 100-year flood and associated bedload and debris.			X
Road construction would be restricted to the minimum needed and nonessential existing roads and temporary construction access roads would be ripped, restored, and reseeded.			X
Non-essential existing roads and temporary construction access roads would be ripped to break compaction, and restored and stabilized with native vegetation seeding and drainage measures.			X

Mitigation Measure	Power Plant	Pipelines	Bonneville T-Line
Hazardous Materials			
Extensive engineering and operational analyses would be completed for systems using hazardous chemicals. Risk management plans would be developed for those systems.	X		
AIR			
Emissions Control			
The project has been designed using Best Available Control Technologies (BACT) for the control of criteria pollutants and air toxics. BACT technologies proposed include dry low-NOx combustors, selective catalytic reduction (SCR) for additional NOx control, and oxidation catalysis for CO and VOC control.	X		
The plant would incorporate ultra-low drift elimination devices in the cooling towers, which would maintain drift at a level of 0.0005% of the amount of circulating water flow.	X		
Combustion technology on the combustion gas turbines would limit particulate emissions to 12 lb/hr.	X		
A continuous emissions monitoring (CEM) system would provide real-time information to the facility operators to ensure that the facility operates within the permitted limits.	X		
PM10 offsets are proposed in the form of emission reduction credits through the retirement of agricultural lands at the project site and in Walla Walla and Benton Counties.	X		
Natural gas is proposed to fuel gas combustion turbines, HRSG duct burners and the auxiliary boiler, thereby eliminating the higher emissions that would be associated with fuel oil combustion.	X		

Mitigation Measure	Power Plant	Pipelines	Bonneville T-Line
Greenhouse Gas Mitigation			
Wallula Generation would pay $1,000,000 directly to the Last Mile Electric Cooperative (LMEC), a nonprofit organization committed to the development of renewable energy resources for publicly owned power entities. All funds paid to LMEC resulting from this settlement would be expended at the sole discretion of LMEC as long as the funds are used to develop renewable energy resources or for other greenhouse gas mitigation and/or reduction efforts.	X		
Wallula Generation would directly pay $2,550,000 to the Washington State University Cooperative Extension Energy Program (WSU Energy Program), a nonprofit organization dedicated to greenhouse gas mitigation and/or reduction projects and/or renewable energy resource development. Funds would be dispersed through a Request for Projects (RFP) process.	X		
Windblown Dust Control			
Windblown dust would be controlled through regular use of water or application of other appropriate dust suppressants.	X	X	X
Crushed rock aprons would be used at all construction entrances to reduce migration of construction dirt to adjacent public streets.	X	X	X
Rough-surface asphalt would be used to coat the temporary construction access road and power plant access roads early in the construction process.	X		
Topsoil storage piles would be covered with tarps or emulsions.	X	X	
Vacuum sweeping and/or water flushing of paved road surface would be used to remove buildup of loose material on public streets affected by construction activities.	X	X	X
All trucks hauling soil, sand, and other loose materials would be covered, or all trucks required to maintain at least 2 feet of freeboard.	X	X	X
Traffic speeds on unpaved roads would be limited to 25 mph.	X	X	X
Erosion control measures would be implemented to prevent silt runoff to roadways.	X	X	X
Vegetation in disturbed areas would be replanted or reseeded as quickly as possible.	X	X	X
Temporary roads constructed in cropland would be removed and affected soils would be restored as necessary.			X

Mitigation Measure	Power Plant	Pipelines	Bonneville T-Line
WATER			
Water Use			
Water rights would be partially retired through the purchase of existing land and water rights that would not be consumed during power plant operations. This would result in a net increase to instream flows in the Columbia River of 573.66 acre-feet per year. This is equivalent to 12.0% of the Wallula Power Project's maximum expected annual water usage.	X		
The cooling tower water chemistry is designed to accommodate 20 cycles of water circulation, thereby reducing the volume of cooling tower blowdown and plant makeup water requirements.	X		
The mechanical draft cooling tower design includes high efficiency drift eliminators that would reduce drift water losses to 0.0005% of circulating water flow, thus reducing the power plant makeup water requirements.	X		
Upon the close of project operations, all water rights other than the onsite industrial water right (Ground Water Permit No. G3-29640P) obtained by Wallula Generation and/or the project would be transferred within 90 days to the State of Washington's water trust, as described in RCW 90.42. Should RCW 90.42 be amended prior to the close of project operations, all water rights would be used to increase in-stream flows with the legal mechanisms available at that time.	X		
Wallula Generation would directly pay $300,000 to the Walla Walla Watershed Alliance (WWWA), a nonprofit organization dedicated to both the sound management of water resources in the Walla Walla River Basin, and to the balancing of agricultural and environmental interests.	X	X	
Wastewater			
Design of a zero liquid discharge system, including the use of a brine concentrator and evaporation ponds, would eliminate the potential for water contamination from wastewater discharges.	X		
The evaporation ponds would be lined with a 2-foot-thick clay liner, on top of which would be a high-density polyethylene (HDPE) liner, which, in turn would be covered with a clay liner. A leakage detection system consisting of a network of collection pipes and sumps would be installed under the evaporation ponds to detect and collect any leakage that might occur through the pond liners. This leakage system would be monitored by plant personnel to ensure the integrity of the pond liners.	X		

Mitigation Measure	Power Plant	Pipelines	Bonneville T-Line
The only wastewater that would be discharged to the ground would be domestic sanitary wastewater. It would be discharged to a septic system and drainfield designed and operated in accordance with local regulations and industry standards.	X		
Shallow groundwater quality would be monitored routinely in monitoring wells installed for this project.	X		
Erosion Control/Stormwater			
A stormwater pollution prevention plan (SWPPP) would be developed to prescribe technology-based measures for construction stormwater management.	X		
Stormwater control measures would be designed in accordance with the Washington Department of Ecology's guidance document, Stormwater Management Manual for Western Washington. These measures would be implemented as appropriate to reduce the potential for runoff during project construction.	X		
Stormwater control measures would be designed in accordance with Ecology's guidance document, Stormwater Management Manual for Western Washington (Ecology 2001). These measures would be implemented as appropriate to reduce the potential for runoff during project construction. These stormwater control measures could include the following. ▪ Temporary and permanent structural devices would be used to divert, store, or limit runoff from disturbed areas. This could include but not be limited to the installation of silt fences, sediment traps (catch basins), straw-bale dikes, and culvert inlet/outlet protection (rock or riprap), as appropriate. ▪ Properly spaced cross drains, water bars, or other appropriate measures would be used on access roads to intercept surface runoff and divert it before erosive runoff volumes and concentrations occur. ▪ Existing vegetation would be preserved where practical, especially near drainage areas. Where appropriate, disturbed areas would be temporarily seeded or mulched to reduce erosion and runoff during construction. ▪ Soil stabilization might include temporary or permanent seeding, mulching, geotextiles, or aggregate surfacing. ▪ Stabilization measures would begin as soon as practical where construction activities have temporarily or permanently ceased.	X		
The stormwater runoff from within the bermed area surrounding the power plant would be directed to oil/water separators and then to an unlined detention pond for evaporation and infiltration. Stormwater from plant site areas outside the bermed power plant facility would be directed to an unlined pond for evaporation and infiltration.	X		
The stormwater management procedure and operational system would reduce the potential for contamination of stormwater in the project site area during construction and operation.	X		
The erosion control procedure and operational system would reduce the potential for turbidity in runoff in the project site area.	X		

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Gates would be installed on roads to restrict access to authorized personnel only.			X
Erosion and sedimentation associated with transmission line construction would be minimized. Existing roads would be used where possible, minimizing the need for new road construction. Where feasible, Bonneville would avoid constructing structures on potentially unstable slopes.			X
Existing roads would be used for access wherever feasible, reducing the need for new road construction.			X
Where feasible, structure construction on potentially unstable slopes would be avoided.			X
Streams and Wetlands Protection			
Existing vegetation would be preserved where practical, especially next to intermittent and perennial creeks and streams.			X
To the extent practicable, construction in wetland areas along transmission line would be avoided.			X
Construction in wetland areas would be avoided to the extent practicable.			X
Intermittent stream crossings would be designed to avoid adverse impacts to stream hydraulics and deterioration of streambed or bank characteristics.			X
Hazardous Materials			
BMPs such as good housekeeping measures, inspections, containment, and spill prevention practices would be used to limit contact between potential pollutants and stormwater or groundwater. ▪ Storage areas for hazardous materials would be provided with secondary containment to ensure that spills in these areas do not reach surface waters. ▪ All construction vehicles would be monitored for oil and fuel leaks and would receive regular maintenance. ▪ Refueling or mixing hazardous materials would be avoided where accidental spills could enter surface or groundwater. ▪ Soil contaminated during construction would be removed and disposed at an approved disposal site. ▪ Sanitary wastes would be collected and portable units would be maintained on a regular basis. Wastes would be collected by a licensed contractor and disposed off-site in accordance with applicable regulations. ▪ Hazardous wastes generated during construction would be disposed of according to local or state regulations, or the manufacturer's recommendation. ▪ Fertilizers would be applied as recommended by the manufacturer and stored in a covered area or in watertight containers. ▪ All construction waste material would be collected and disposed at an approved disposal site.	X		

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Impervious containment equivalent to 110% of tank volume would be constructed around and beneath all tanks containing hazardous substances.	X		
The sump vault beneath the ammonia storage area would contain 110% of the volume of a tanker truck used for delivery of aqueous ammonia for the NOx control system.	X		
A spill prevention and contingency plan would be prepared prior to the start of construction, and implemented to minimize the potential for hazardous materials to enter surface or groundwater.	X	X	X
Construction crews would avoid refueling and/or mixing hazardous materials where accidental spills could enter surface or groundwater.			X
A spill prevention and contingency plan would be prepared prior to the start of construction to minimize the potential for spills of hazardous materials to migrate to streams, other water bodies, or groundwater. BMPs would be developed and implemented to prevent fuel spills and herbicide runoff from reaching streams.			X
WETLANDS AND VEGETATION			
Wetlands Protection			
Wallula Generation would prepare a wetland management plan or plans to follow prior to, during, and after construction to protect wetlands on the project site. Protection includes, but is not limited to providing at least 100-foot buffers between all wetlands and any construction or operational activity, instituting a weed management program, and ensuring that the water levels in the wetlands are maintained or wetland impacts are otherwise mitigated. Wallula Generation has entered into an agreement with WDFW for the mitigation of the loss of one irrigation pond and protection of the remaining wetlands.	X		
There would be no direct clearing, grading, or filling of wetland areas located along the western edge of the project site and the Jaussaud property. Wetland E on the adjacent property to the north would not be directly affected by construction activities. A 50-foot to 100-foot buffer would be observed around these wetlands, to exclude construction equipment access.	X		X
Wetland F on the Jaussaud property would be protected by a 100-foot buffer.	X		X

Mitigation Measure	Power Plant	Pipelines	Bonneville T-Line
Mitigation for the loss of wildlife habitat value provided by these wetlands would be provided by enhancement of riparian habitats along the Walla Walla River via the applicant's participation with the Washington Department of Ecology in the purchase and placement into trust of water rights. Under the purchase agreement, approximately 145 acres of land would be planted with native trees.	X		
Structures and new roads would be located to avoid wetlands and buffers. If wetland filling is required for road or culvert construction, wetlands would be delineated and flagged and appropriate permits would be obtained prior to construction.			X
Before final design and prior to construction of the transmission line, site-specific wetland delineations and vegetation surveys would be conducted at proposed structure locations and along all proposed access roads. Areas that contain sensitive, threatened, or endangered vegetation species would be avoided through adjustments to structure and road locations.			X
To monitor and protect wetland hydrology, Wallula Generation would install a staff gage in the deepest portion of the wetland complex and regularly monitor water level changes in the wetland. Wallula Generation would use its best efforts to secure authorization to use the South Columbia Irrigation District water right or an adjacent domestic water well for the purposes of maintaining a minimum seasonal water level in the Habitat Reserve Area. If dewatering of the wetlands were to occur, Wallula Generation would investigate alternative mitigation options.	X		
Wallula Generation agrees to provide at closing $50,000.00 to the United States Fish and Wildlife Service, for wetland and riparian enhancement activities on the Walla Walla River within the McNary National Wildlife Refuge. Wallula Generation's contribution would result in creation of 686 feet of high-flow stream channel, creation of 13 acres of seasonal wetlands associated with the high-flow channel, and enhancement of 16 acres of riparian corridor and bottomland habitat.	X		
Vegetation Management/Restoration/Protection Measures			
An erosion control plan, clearing and grading plan, and revegetation and landscaping plan would be developed for the project site and all other areas to be affected by construction, and submitted to EFSEC at least 90 days prior to construction. The plan would provide detailed specifications for erosion control methods, revegetation preparation, and seeding and planting species mixes, and describe long-term vegetation maintenance objectives. These plans would provide for the protection of a Habitat Reserve Area along the western edge of the project site. Delineated wetlands and wetland buffers and adjacent upland habitats within the Habitat Reserve Area would be protected from ground disturbance during construction and operation of the project. Limited ground disturbance would be allowed only as necessary to accomplish weed management objectives within the Habitat Reserve Area.	X	X	

Mitigation Measure	Power Plant	Pipelines	Bonneville T-Line
An environmental awareness plan would be prepared and submitted for EFSEC review and approval at least 90 days prior to construction. The plan would summarize the resources to be protected, the reasons for protection, the temporary and permanent protection measures to be employed, and performance standards for the protection measures.	X	X	
A qualified environmental monitor familiar with all plans noted above would inspect the work site prior to and during construction to ensure that avoidance areas are properly marked and observed.	X	X	X
The plans would be provided to all construction workers and operational personnel, and the environmental monitor and construction manager would hold briefing sessions to familiarize personnel with the plans.	X	X	X
Native plant species would be used, when possible, in revegetation and landscaping activities. Noninvasive species of nonnative plants may be used in situations where no native species is well suited for the project site or objective. Revegetation would be performed as soon as possible after completion of construction to prevent soil erosion and establishment of weeds. Temporary erosion control methods, both physical and biological, may be used to protect soils until the proper planting season, typically late fall and winter.	X	X	
When working within or adjacent to any drainage ditch, watercourse, ravine, etc., the contractor would have an emergency spill containment kit to contain and remove spilled fuels, hydraulic fluids, etc. Likewise, equipment refueling, or storage of these materials or any other toxic or deleterious materials would not occur within 100 feet of surface water. The washing of construction equipment, use of herbicides or disposal of general or other waste materials would not occur within or adjacent to within 100 feet of any drainage ditch, watercourse, ravine, etc. Storage and disposal of any hazardous or nonhazardous materials would adhere to applicable laws and regulations.	X	X	X
Avoidance areas would be established for all sensitive plant and wildlife occurrences in or near the construction impact zone. Metal or other strong stakes connected by rope or other visible fencing would identify the avoidance areas with flagging to increase visibility, as appropriate. Avoidance areas would be marked prior to construction in an area and would be maintained during construction. Markers would be removed when construction in the area is completed and all construction equipment has been removed.	X	X	X
Shrub-steppe habitat that is temporarily lost as a result of construction would be revegetated with native (and appropriate nonnative) shrub-steppe and/or dryland grass species at the conclusion of construction. Shrub-steppe habitat that is permanently lost as a result of construction and operation of the power plant would be replaced by an equivalent area of shrub-steppe habitat through revegetation and/or enhancement of habitat at another site in the area determined through consultation with WDFW and/or USFWS.	X	X	

Mitigation Measure	Power Plant	Pipelines	Bonneville T-Line
The applicant would mitigate the impacts of pipeline construction by reseeding the pipeline corridors and restoring the disturbed lands to dryland native grasses consistent with the revegetation success criteria identified in the monitoring and performance standards. Agricultural lands that are cleared for installation of the pipelines would be replanted into agricultural crops at the discretion of the landowner(s).	X	X	
An initial project site restoration plan as outlined would be developed to address the restoration of the project site at the end of the life of the project.	X		
Wallula Generation would monitor revegetation success and file written reports with EFSEC (and provide copies to WDFW) documenting the monitoring activity, results, and implementation of remedial actions. On sites revegetated with native grasses, establishment would be monitored annually for the first three growing seasons following seeding. On the project site, shrub-steppe habitats planted with shrub and forb stock would be monitored annually for three additional growing seasons. Annual monitoring of weeds, erosion potential, and project effects at the project site and the Benton County property would continue through the life of the project. Once grasses were successfully established on the pipeline lateral rights-of-way, long-term maintenance of those lands could revert to the landowner(s).	X	X	
Noxious Weeds			
Aggressive vegetation management programs would be implemented to limit colonization by nonnative species and eradicate noxious weeds where feasible. Weed control techniques would be implemented in accordance with Walla Walla and Umatilla County Weed Board policies and the Bonneville Transmission System Vegetation Management Program ROD (July 2000; DOE/EIS-0285).	X	X	X
All straw (bales or loose) or hydro-mulch would be certified as weed free.	X	X	X
Noxious weed infestations would be avoided in wetlands by washing all construction vehicles and conducting a weed inventory 1 year after construction to verify that weeds have not been introduced.			X
Preconstruction noxious weed surveys would be conducted during the summer of 2002 to determine the current extent of noxious weeds along the proposed right-of-way for the transmission line. The survey would document the presence and extent of species listed as a concern within Walla Walla County in Washington and Umatilla County in Oregon. A postconstruction survey 1 year after the completion of construction would occur to determine any change in the presence of noxious weeds. This information would be used to determine a course of action to prevent the spread of noxious weeds along the right-of-way.			X

Mitigation Measure	Power Plant	Pipelines	Bonneville T-Line
Wallula Generation would provide, at closing, $25,000.00 to be apportioned between two researchers, one at Washington State University and one at the University of Idaho. The funds would be used to assist with the development of biological control agents, which would ultimately benefit weed control efforts on the site and on surrounding ownerships.	X		
AGRICULTURE AND LIVESTOCK			
Irrigated crop circles disturbed during makeup water supply pipeline and natural gas pipeline construction would be returned to service after pipeline construction. Pipelines would be buried 5 feet below grade to allow tilling to occur without damage to the pipelines.		X	
The top 12 inches of topsoil in the areas of agricultural and native habitat would be removed and preserved for final grade reuse.		X	
Temporary access roads through nonirrigated farmlands would be obliterated through successive farming cycles.			X
Access roads and structure footings would be located to avoid irrigated farmlands.			X
Disturbed areas would be monitored for noxious weeds and managed to prevent introduction and spread.		X	X
Lost agricultural cropland would be compensated by an easement agreement with the landowner.			X
WILDLIFE			
Measures described previously to mitigate impacts to vegetation and wetlands also apply to wildlife mitigation.	X	X	X
Construction Timing and Construction Avoidance Areas			
Prior to construction, site-specific wildlife surveys would be conducted at proposed structure locations and along all access roads. Sensitive, threatened, or endangered wildlife species and critical habitat would be avoided through adjustments to structure locations and access road alignments.	X	X	X
Prior to construction, it would be verified that no new bald eagle nests have been constructed in the project area. If any were found, construction would not occur within 2,600 feet of the nest during the nesting period (January 1 through August 15), if possible given potential conflicting mitigation with McNary Wildlife Refuge construction window.	X	X	X

Mitigation Measure	Power Plant	Pipelines	Bonneville T-Line
Active western burrowing owl nest sites would be protected from disturbance closer than 75 meters (250 feet) during the breeding season (March 15 to August 15), if possible given potential conflicting mitigation with McNary Wildlife Refuge construction window.	X	X	X
Prolonged activities (0.5 hour to several days), such as human access, should be avoided, and noisy, prolonged activities would not occur within 1 kilometer (0.62 mile) of occupied ferruginous hawk nests during the breeding season (March 1 to August 15). Construction or other developments near occupied nests would be scheduled around this time period, if necessary or if possible given potential conflicting mitigation with McNary Wildlife Refuge construction window.	X	X	X
To the extent possible, riparian corridors would be spanned, leaving riparian vegetation in the right-of-way for use as wildlife travel corridors. New road building within or adjacent to wetlands would be avoided, structure footings would not be placed within or adjacent to wetlands, and soil disturbance would be minimized within or adjacent to wetlands and stream banks.			X
If possible, the transmission line in the Wallula Habitat Unit of McNary Wildlife Refuge would be constructed between April 1 and September 30. If construction within the Wallula Habitat Unit does occur during the winter, Bonneville would limit access within the refuge to short periods, and muffle sound from heavy equipment. Some activities such as surveying, staking, and site preparation could potentially be performed in winter.			X
Road construction through the Wanaket Wildlife Area would be coordinated with the Area Manager.			X
Revegetation/Habitat Restoration			
Shrub-steppe habitat that is temporarily lost as a result of construction would be revegetated with native (and appropriate nonnative) shrub-steppe and/or dryland grass species at the conclusion of construction. Wallula Generation would replant approximately 74 acres in dryland cultivated native grass habitat with a component of native shrubs and forbs prior to commencing operation of the Project. Wallula Generation would develop a landscaping and revegetation plan in consultation with EFSEC and WDFW in order to be prepared to replant the project site in an expeditious manner. Shrub-steppe habitat that is permanently lost as a result of construction and operation of the power plant would be replaced by an equivalent area of shrub-steppe habitat through revegetation and/or enhancement of habitat at other sites in the area. Bonneville is considering mitigation for cumulative impacts to shrub-steppe habitat resulting from construction of various transmission line projects; they are considering up to 0.5 acre of mitigation per each transmission tower.	X	X	X

Mitigation Measure	Power Plant	Pipelines	Bonneville T-Line
Mitigation for the loss of wildlife habitat value provided by wetlands would be provided by enhancement of riparian habitats along the Walla Walla River via the applicant's participation with the Washington Department of Ecology in the purchase and placement into trust of water rights. Under the purchase agreement, approximately 145 acres of land would be planted with native trees.	X		
Project site-specific surveys would be conducted immediately prior to construction to determine the presence of several special-status bird species such as merlins during migration, western burrowing owls, sage thrashers, Oregon vesper sparrows, sage sparrows, bald eagles, ferruginous hawks, longbilled curlew, grasshopper sparrow, loggerhead shrikes, and Swainson's hawks, and two special-status mammal species—black-tailed jackrabbits and Ord's kangaroo rats. If these species are present, specific mitigation plans would be developed and offsite mitigation would be implemented for loss of habitat required by these species.	X	X	X
Wallula Generation would develop a Waterfowl Monitoring Plan with WDFW prior to commencement of commercial operations. Phase 1 of the Plan would focus on monitoring activities during the first 6 months of commercial operations including characterization of brine concentrator reject water and waterfowl use of the ponds. The plan would be designed to determine if the brine concentrator reject water in the lined evaporation ponds has a detrimental effect to wintering waterfowl. The plan would include proposed mitigation measures if such detrimental effects were confirmed.	X		
Wallula Generation would place a perpetual conservation easement upon a 640-acre property in Benton County (Section 35, T7N, R30E) in favor of the Washington Department of Ecology, a land trust that has adopted the Standards and Practices of the Land Trust Alliance, or other equivalent entity sufficient to satisfy the requirements for the permanent protection of wildlife habitat and for the permanence of air emission PM10 offsets, required under the Prevention of Significant Deterioration (PSD) permit to be issued by EFSEC as part of the SCA. In addition, Wallula Generation would take the necessary steps to perfect the conservation easement. Wallula Generation would seed, reseed, or plant the Benton County property, as needed, to establish dryland cultivated native grass habitat with a component of native shrubs and forbs. Wallula Generation would also install a guzzler on the property to provide water to wildlife, and would enroll the property in WDFW's Public Access Program to provide controlled public access for viewing and hunting of wildlife. Wallula Generation would take actions necessary to control livestock grazing on the Benton County property, authorizing only specific, onsite wildlife habitat improvement projects for livestock grazing.	X		
Prevention of Bird Strikes			
Strobe lighting meeting the recommendations of the U.S. Fish and Wildlife Service Division of Migratory Bird Management and Federal Aviation Administration (FAA) Circulars 70/460-1G and 70/460-1H would be installed on the four HRSG exhaust stacks. White strobe lights would be used with the minimum number of lights, intensity, and number of flashes per minute (longest duration between flashes) allowable by the FAA. Security lighting would be down shielded.	X		

Mitigation Measure	Power Plant	Pipelines	Bonneville T-Line
Flat configuration towers would be used where the transmission line crosses the Wallula Habitat Management Unit to suspend conductors at the same height as the existing transmission line to lessen risk of bird strikes.			X
The three spans that cross the Wallula Habitat Management Unit, the span across Spring Gulch, the span across Juniper Canyon, and the spans across the Wanaket Wildlife Area would have bird diverters or yellow spherical markers placed on the ground wire (the uppermost wire) to avert bird collisions.			X
FISHERIES			
Wetlands and Riparian Areas			
Riparian habitats along the Walla Walla River would be enhanced via purchase and transfer of water rights and the planting of 145 acres with native trees.	X	X	
Transmission line structures and access roads would be sited to avoid riparian areas, sediment and erosion control methods would be used during construction, and clearing of riparian vegetation would be minimized.			X
To the extent possible, new road building within or adjacent to wetlands would be avoided.			X
Water Quality Protection			
When working within or adjacent to any drainage ditch, watercourse, ravine, etc., the construction contractor would have an emergency spill containment kit to contain and remove any accidentally spilled fuels, hydraulic fluids, etc.	X	X	
Equipment refueling and storage of fuels and hydraulic fluids or any other toxic or deleterious materials would not occur within 100 feet of surface water.	X	X	
The washing of construction equipment, use of herbicides or disposal of other waste materials would not occur within 100 feet of any drainage ditch, watercourse, ravine, etc.	X	X	
Several measures would be taken to avoid or minimize potential impacts to fish habitat from access road construction and road use: implementing construction BMPs to protect water quality; minimizing construction activities on steep or unstable slopes; eliminating the construction and use of fords during construction; using temporary or permanent culverts where required; and moving or avoiding existing access roads or crossings with known erosion problems. In addition, existing roads would be improved to remedy potential erosion problems prior to construction.			X

Mitigation Measure	Power Plant	Pipelines	Bonneville T-Line
Access roads would be designed to minimize the potential for erosion. Construction of steep, straight road sections, which could result in channelization and concentration of runoff, would be avoided.			X
Standards and guidelines established in the record of decision (ROD) for vegetation management would be followed.			X
A spill prevention and contingency plan would be developed prior to the start of construction, and implemented to minimize the potential for spills of hazardous materials and potential impacts on streams and other water bodies. The plan would include provisions for storage of hazardous materials and refueling of construction equipment outside of riparian zones, a spill containment and recovery plan, and notification and activation protocols.			X
Measures for Specific Areas			
The Walla Walla River (Location 1) is by far the best aquatic habitat for fish and is occupied by threatened, endangered, and sensitive species. Most impact would be avoided through keeping construction activities out of the water and timing activities to avoid important fish life history stages. Impacts are expected to be low because disturbance of the riparian areas would be minimized through BMPs and mitigation measures.			X
North of existing towers 56-3 and 56-4 on the Lower Monumental–McNary Transmission line (between Locations 7 and 8), a new access road would cross a small, unnamed intermittent drainage. The crossing requires a 60-inch culvert and approximately 50 tons of fill material. Potential impacts would be minimized by constructing during the dry season and implementing BMPs and mitigation measures.			X
ENERGY AND NATURAL RESOURCES			
The number of transmission structure locations would be optimized to reduce the amount of steel required for construction.			X
Construction vehicles would be regularly serviced to optimize fuel consumption.	X	X	X
Crushed rock for roads would be used only where existing soil conditions require that the road base materials and/or filter fabric be constructed for stability.	X	X	X
Wallula Generation would develop and implement a plan to reuse construction and construction waste materials to the greatest extent feasible	X	X	

Mitigation Measure	Power Plant	Pipelines	Bonneville T-Line
Wallula Generation would directly pay $1,650,000 to the Bonneville Environmental Foundation (BEF), a nonprofit environmental organization whose focus is to encourage and fund projects that develop renewable energy resources, and/or to acquire, maintain, preserve, restore and/or sustain fish and wildlife habitat within the Pacific Northwest. In addition to these direct cash payments to BEF, Wallula Generation would transfer certain real property valued at $6,000,000 to a 501(c)(3) tax-exempt supporting organization for the benefit of BEF.	X		
NOISE			
Construction Equipment/Activities			
Measures to reduce potential construction noise impacts during nonexempt days or hours would be implemented, such as the use of temporary noise-reducing panels between the project construction site and the affected area, and the implementation of a noise education and compliance process.	X	X	X
A steam blow exhaust silencer would be used to reduce the noise level approximately 20 dBA during steam cleaning of the piping systems.	X		
Pile driving necessary for the project construction would be limited to daytime hours, and the affected community would be notified in advance of any pile driving or blasting activities.	X	X	X
All noise producing equipment and vehicles using internal combustion engines would be equipped with mufflers and air inlet silencers, where appropriate; be in good operating condition; and meet or exceed original factory specifications. Mobile or fixed "package" equipment (e.g., arc welders and air compressors) would be equipped with shrouds and noise control features that are readily available for that type of equipment.	X	X	X
The use of noise-producing signals, including horns, whistles, alarms, and bells, would be used for safety warning purposes only. No project-related public address loudspeaker, two-way radio, or music system would be audible at any adjacent noise sensitive receptor.	X	X	X
The on-site construction supervisor would have the responsibility and authority to receive and resolve noise complaints.	X	X	X

Mitigation Measure	Power Plant	Pipelines	Bonneville T-Line
Facility Operation			
Generating station noise mitigation measures would be implemented in the detailed design phase of the project to achieve nighttime and daytime noise levels at all residential receivers in compliance with the Washington State noise limits. These measures would include, but would not be limited to, purchase of a steam turbine-generator and combustion gas turbine-generator standard noise mitigation package, enclosures around the gas reducing stations, enclosures around the steam turbine-generators, and additional noise mitigation measures such as sound walls and/or enclosures. The Wallula Power Project would meet the requirements of the Walla Walla County Noise Ordinance.	X		
Transmission line corona noise generation would be designed to meet or exceed Bonneville standards.			X
LAND AND SHORELINE USE			
Bonneville would reduce the visibility and contrast of disturbed areas through strategic vegetative clearing and placement and alignment of access roads, particularly in significant recreational areas such as the Walla Walla River crossing.			X
Line and structure locations would be adjusted to avoid agricultural uses or subdivision lots where possible.			X
If required, relocation services and benefits would be provided pursuant to Public Law 91-646 and other related regulations to affected owner occupants, tenants, and businesses. Eligible parties would be provided with information concerning the relocation process and given assistance in filing claims for relocation benefits.			X
Landowners would be compensated at fair market value for any farmland removed from production.			X
Farmers would be compensated for crop damage, and given assistance to control weeds and restore compacted soils.			X
The placement of new structures and equipment and the logistics and timing of construction at the Smiths Harbor Switchyard would be coordinated with landowners.			X
No permanent road construction would take place in cultivated or fallow fields if this is desired by the landowners.			X
Roadbeds would be repaired, and disturbed ground would be repaired and reseeded as necessary.			X
Fences, gates, cattle guards, and rock would be added to access roads to keep them in good repair and contain cattle.			X

Mitigation Measure	Power Plant	Pipelines	Bonneville T-Line
Easement agreements would cover short-term damage and any long-term impacts to affected agricultural lands resulting from the water or natural gas pipeline.		X	
VISUAL RESOURCES/ LIGHT AND GLARE			
Light and Glare			
The project would be developed and operated consistent with industrial light and glare provisions of the Walla Walla County Zoning Code Regulations – Title 17.	X		
Where economically feasible, all new equipment and fencing would be constructed of materials that restrict glare.	X		
The power plant structures and equipment would be finished with flat light brown (sandalwood) paint	X		
To the extent possible, power plant lighting would be shielded from public view, directing light downwards. Where practical, outdoor lighting would be restricted to low-intensity lamps, such as sodium or mercury vapor lamps except for the HRSG stacks' lighting.	X		
Nonreflective conductors and nonluminous insulators would be used to reduce impacts to recreational use.			X
Roads			
To the extent possible, access roads would not be placed in highly sensitive areas.	X	X	X
Temporary construction roads would be returned to their original contours following construction to reestablish preproject surface flow patterns.			X
Existing road systems would be used to access new transmission line structure locations as much as possible.			X
Degraded road surfaces would be repaired and unused roads decommissioned.	X	X	X
The visibility and contrast of disturbed areas would be reduced through strategic vegetative clearing and placement and alignment of access roads, particularly in significant recreational areas.			X

Mitigation Measure	Power Plant	Pipelines	Bonneville T-Line
Vegetation/Landscaping			
Visual impacts would be reduced with vegetative screening on the perimeter of the project site. When fully mature, the tree screening the site would largely shield all near-field views, and shield all but the upper third of the four HRSG stacks from the far-field views from the north, west, and south.	X		
Cut and fill slopes would be revegetated on access roads and near structure locations.	X	X	X
Existing vegetation would be preserved along highways where possible to screen the transmission line and structures.			X
Noxious weed infestations would be reduced in wetlands by washing all construction vehicles and conducting a weed inventory 1 year after construction to verify that weeds have not been introduced.	X		X
Other Measures			
Where possible, new transmission line towers would be sited near existing towers using a similar structure type to lessen visual clutter.			X
Water would be applied to disturbed areas to reduce dust.	X	X	X
Construction on steep slopes, steep road grades, and geologically unstable areas would be minimized.		X	X
POPULATION, HOUSING, AND ECONOMICS			
Private landowners would be compensated for the market value of the easement area and any severed property, together with market value for any timber off the right-of-way and future rights to remove danger trees.			X
A stipulation agreement with Walla Walla County would commit the applicant to prepay taxes for mitigation of impacts to Walla Walla County to cover costs incurred due to the Wallula Power Project prior to receipt of property tax revenues.	X		
Wallula Generation would provide $150,000 to the Blue Mountain Action Council (BMAC), a nonprofit organization that works with low-income people to help them achieve self-sufficiency. Funds provided to BMAC would be for the sole purpose of weatherizing homes for low-income persons in the Walla Walla County area.	X		

Mitigation Measure	Power Plant	Pipelines	Bonneville T-Line
PUBLIC SERVICES AND UTILITIES			
Fire Protection			
The existing on-site 1,200 gpm well would be outfitted with a fire protection connection for use during the construction period.	X		
A comprehensive communication plan would be developed that coordinates Fire District 5 responses to emergencies at the project site with the applicant and the power plant operator. The communication would become part of the fire suppression and prevention plan during construction and the fire prevention plan during operation.	X		
At least 90 days prior to construction, meetings would occur between the applicant, the power plant construction contractor, and Fire District 5 to coordinate all final construction response plans and communications.	X		
At least 90 days prior to operation, meetings would occur between the applicant, the power plant operations and maintenance contractor, and Fire District 5 to coordinate all final operational response plans and communications.	X		
Fire District 5 staff recommended that the applicant have an on-site response capability for confined-space entry situations and other emergencies. The applicant has committed to providing this on-site capability.	X		
Site Security			
Project site security during construction and operation would include chain-link fences, adequate lighting, access control, security services, and communication planning.	X		
Bonneville intends to provide on-site security for the transmission line during construction.			X
Waste Disposal			
Construction sanitary waste would be managed through a contract with a local portable toilet vendor.	X	X	
Operational sanitary waste would be treated in an on-site septic system.	X		
Solid waste would be handled through a service contract with a local waste management firm.	X	X	

Mitigation Measure	Power Plant	Pipelines	Bonneville T-Line
The power plant is expected to qualify as a small quantity generator of hazardous wastes. These wastes would be accumulated in a satellite accumulation area designed for appropriate security, waste containment, segregation, and safety. The hazardous wastes would be disposed through a service contractor in accordance with applicable federal, state, and local regulations.	X		
Emergency Management			
Prior to construction the applicant would meet with the Hanford site safety officer to discuss comprehensive communication plans and evacuation procedures in the event of a Hanford emergency. Similar meetings would be held with the safety officer at the Umatilla Chemical Depot.	X		
Other Measures			
Modern hardware and construction practices would be used to minimize potential effects of television interference and radio interference.			X
Bonneville has an active program to identify, investigate, and mitigate legitimate radio and television interference complaints.			X
CULTURAL RESOURCES			
Construction staging areas, access roads and structure locations were not defined at the time of the field survey and will require a field reconnaissance survey prior to construction. In addition, any areas of modifications to the proposed project that have not been assessed as part of former investigations should be inventoried for cultural resources prior to any subsurface disturbance associated with the proposed project. If cultural resources were identified that may be significant, these would be evaluated for their eligibility for listing in the National Register of Historic Places.	X	X	X
Prior to construction, BPA would conduct site-specific cultural resource surveys at the proposed structure locations and along all access roads. Any identified cultural or historical sites would be avoided through relocation of structures or realignments of proposed access roads.			X

Mitigation Measure	Power Plant	Pipelines	Bonneville T-Line
To eliminate impacts to cultural resources, known archaeological sites would be avoided during the project's construction. Below is a summary of specific avoidance measures for each site. ▪ **Newport No. 1.** Measures to avoid impact to the site identified during the Lithic Analysts survey of the northernmost portion of the Area of Potential Effects (APE) would include staking and flagging the site boundary prior to construction activities. Should construction activities occur within or adjacent to the site's boundaries an archaeological monitor would be present to observe for cultural materials. ▪ **Wallula Site No. 1.** Impact to prehistoric Wallula Site No. 1 would be avoided by locating the proposed transmission line on the west side of the existing 500 kV transmission line. Wallula Site No. 1 is located approximately 300 feet east of the existing transmission line and therefore would be completely avoided by limiting construction and operating activities to the west of the existing 500 kV line. ▪ **Wallula Site No. 2.** Construction activities would not directly impact Wallula Site No. 2 due to its location on the side of a relatively steep hill where helicopters would be employed rather than ground-based vehicles to assist in the installation of structures. To ensure avoidance to prehistoric Wallula Site No. 2, the site boundary (as determined by visual components) would be staked and flagged prior to the start of construction activities. ▪ **Wallula Site No. 3.** Measures to avoid impact to Wallula Site No. 3, which is located 200 feet north of the existing transmission line, would include staking and flagging the site boundary (as determined by visual examination) prior to nearby construction activities. An archaeological monitor would also be present for construction activities.			X
A lithic scatter located near the proposed makeup water supply pipeline would be avoided. The archaeological site boundary would be staked before construction and monitored during construction. If it becomes necessary to ascertain more information about the archaeological site, it would be tested by subsurface excavation in a phase II survey.		X	
Areas related to the project area in which a lithic scatter has been discovered would be exempted from any project disturbance.	X	X	
Bonneville has consulted with the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) and other Native American Tribes within the region, including the Yakama Indian Nation, the Nez Perce Tribe, the Confederated Tribes of the Colville Indian Reservation, the Warm Springs Tribe, and the Wanapum Band of Indians. Bonneville has requested information from the tribes on the history and cultural significance of the proposed project areas. A ground survey for cultural and historical artifacts has been conducted in conjunction with the CTUIR along the transmission line corridor, as well as an inventory of known cultural and historical sites in the vicinity.			X

Mitigation Measure	Power Plant	Pipelines	Bonneville T-Line
All known or identified cultural or historical sites along the proposed corridor would be avoided when setting structure foundations, staging areas, or access road locations. Should any previously unknown artifacts be identified during construction, all activities in the immediate area would stop until the resource can be evaluated by an archaeologist meeting the Secretary of the Interior's Qualifications Standards for Archaeology (48 Federal Register 44738-39). Representatives of the CTUIR would be contacted and the area would be surveyed and avoided if possible during further site construction. If human remains/burials were encountered, construction would cease immediately in the area of the burial and the area would be secured and placed off limits for anyone but authorized personnel. The Indian Tribal monitor would notify the Cultural Resource Protection Program (CRPP) of the CTUIR immediately and the CTUIR Policies and Procedures Manual for the Handling of Ancestral Human Remains and Funerary Objects would be implemented. If an isolated historic resource were located, it would be recorded on a CTUIR isolated find form and submitted to the Washington State Office of Archaeology and Historic Preservation (OAHP). If an archeological site were located, an OAHP site form would be compiled and submitted to the OAHP. All archaeological, historical, and cultural sites within the area that would be disturbed by the project that are potentially significant to the CTUIR and cannot be avoided would be evaluated for their significance. If a historic resource is identified that is potentially significant to the CTUIR and cannot be avoided, mitigation measures would be developed with the concurrence of both the State Historic Preservation Officer (SHPO) and CTUIR.			X
Wallula Generation would be responsible for the cost of all testing that may be required, as well as reinterment, curation, and storage in accordance with applicable law of any artifact of cultural significance, or human remains, which are excavated or permanently disturbed at the project site.	X	X	
A tribal cultural resource monitor from the CTUIR would be present during construction-related ground disturbance in agreed upon areas.	X	X	X
Prior to any activities in a new area not previously surveyed, a traditional cultural use field visit would be conducted with the participation of the CTUIR to identify traditional uses by members of the CTUIR.	X	X	X
Depending on the type and significance of any new cultural resource discovery, procedures may include testing the site with shovel test probes (STPs) to determine the site boundaries and any possible subsurface components. If results of the shovel test probes determine the presence of an extensive subsurface component, the structure location may be moved. Alternatively, a full data recovery program for the site could be developed and implemented in consultation with the CTUIR and Washington and/or Oregon State Historic Preservation Office archaeologists.			X
The applicant intends to work with CTUIR in developing a list of candidate cultural resource mitigation projects in the Walla Walla basin to identify a mitigation project relative to the Wallula Power Project. Once finalized and approved by both the applicant and CTUIR, a stipulation agreement would be executed and submitted to EFSEC.	X	X	X

Mitigation Measure	Power Plant	Pipelines	Bonneville T-Line
Wallula Generation would make a payment to CTUIR in the amount of $1,750,000.00 cash comprised of payments for environmental enhancement activities ($1,250,000.00, referred to as the "Enhancement Gift") and payments for educational scholarships, or other uses as decided by the CTUIR Board of Trustees ($500,000.00, referred to as the "Educational Gift"). Wallula Generation would provide an additional payment of $50,000.00 cash (the "Initial Gift") to CTUIR upon execution of its agreements with CTUIR to be used (i) for planning activities with respect to Walla Walla River Basin environmental enhancement projects or (ii) for seed capital to secure water rights options within the Walla Walla River Basin.	X		
Within 60 days of closing, Wallula Generation would cause a deed restriction (or other equivalent instrument) to be placed on approximately 40 acres of real property ("Restricted Property") to be acquired by Wallula Generation or an affiliated limited liability company from the Boise Cascade Corporation that has been identified by CTUIR as having potentially significant cultural resources. The purpose of the deed restriction is to prevent development of the Restricted Property in perpetuity.	X		
TRAFFIC AND TRANSPORTATION			
Construction			
The Wallula Power Project would access SR 12 from Dodd Road for both construction and operation. The access point from the power plant to Dodd Road would meet WSDOT setback requirements from the intersection of Dodd Road and SR 12. WSDOT would work with Wallula Generation to review the traffic volume projections and the construction schedule for the WSDOT SR12 improvement project to support consideration of a temporary traffic signal installation at Dodd Road/SR 12 during construction of the Wallula Power Project. Any such necessary traffic control, including a possible temporary signal, would be designed, installed, and removed at the sole expense of Wallula Generation.	X		
During construction, manual traffic control would be used to direct truck movements and protect existing traffic from construction traffic if needed.	X		X
The construction contract would include a transportation management plan to enhance safety for construction workers, pedestrians and motorists. This would help avoid congestion during construction. Part of this plan would be a requirement to avoid public road access during the morning and mid-afternoon peak hours as much as possible. Blockage or closures of roads would be avoided or minimized where possible, and coordinated with periods of low traffic volumes (off-peak hours).	X		X
Property owners would be notified in advance when their access may be blocked or restricted during construction.			X
Damages to road surfaces would be repaired as soon as possible following construction.	X		X

Mitigation Measure	Power Plant	Pipelines	Bonneville T-Line
Construction activities would be coordinated with property owners to diminish interference with use of property.			X
Operation and Maintenance			
Access roads and spur roads would be used to perform routine, periodic maintenance and emergency repairs on transmission line structures, switchyards, conductors, and other equipment.			X
Access roads would be maintained (including road grading, clearing of vegetation, and maintaining ditches and culverts). Minimal clearing of vegetation is anticipated for maintenance of this right-of-way.			X
Maintenance crews would be responsible for preventing the spread of noxious weeds within the right-of-way using methods compatible with practices identified in the Transmission System Vegetation Management ROD (July 2000) (DOE/EIS-0285).			X
Other Measures			
If the Washington State Department of Transportation (WSDOT) proceeds in the future with converting at-grade county road intersections to interchanges with ramps and overcrossings, all at-grade U.S. Highway 12 access points would be closed and all local circulation would take place on a county road network connecting the interchanges and providing access to local properties. In this eventuality, the applicant has agreed to grant an easement to WSDOT for a county-maintained road across the project site, as a segment in a longer north-south aligned arterial located east of U.S. Highway 12. The easement is being built as a portion of the county north-south arterial to county collector or arterial standards. Further, the applicant is planning a new road extension between the project site and Dodd Road to create a new road designed to county collector or arterial standards.	X		
The applicant has agreed to provide up to $35,000 in funds to partially sponsor a long-range area transportation plan for the Attalia Industrial Urban Growth Area along with the WSDOT, Port of Walla Walla, and the Walla Walla County Public Works Department (lead agency). When the funding agreement and work scope are fully documented, they would be submitted to EFSEC.	X		
Gates would be installed on access roads to reduce unauthorized use.	X	X	X
If required by the FAA, yellow marker balls would be placed on the ground wire at the Walla Walla River crossing to assist in aviation safety.			X

Mitigation Measure	Power Plant	Pipelines	Bonneville T-Line
HEALTH AND SAFETY			
Protection from Fire and Explosion			
A dedicated water storage supply would be provided for fire protection purposes. This would consist of a minimum of 240,000 gallons in the service water storage tank, sized in accordance with National Fire Protection Association (NFPA) 850 to provide 2 hours of protection from the on-site, worst case, single fire.	X		
An electric jockey pump and electric motor driven main fire pump would be installed to increase the water pressure in the power plant fire mains to the level required to serve all water fire fighting systems.	X		
A diesel, engine-driven fire pump would be installed to pressurize the fire loop if the power supply to the main fire pump fails.	X		
A dedicated underground firewater loop piping system with fire hydrants would be provided with the fixed suppression systems supplied from the firewater loop.	X		
Fixed fire-suppression systems would be installed at determined fire risk areas such as transformers, turbine lubrication oil equipment, steam turbine cooling towers, and the aqueous ammonia storage tanks.	X		
Sprinkler systems would be installed in the auxiliary boiler, warehouse, water treating and administration buildings as required by NFPA.	X		
Hand-held fire extinguishers of the appropriate size and rating would be located throughout the facility in accordance with NFPA 850.	X		

Mitigation Measure	Power Plant	Pipelines	Bonneville T-Line
The combustion gas turbine-generator units would be equipped with ▪ Gas detectors that alarm when combustible gas in the combustion gas turbine unit enclosures reaches approximately 25% of the lower explosive limit. ▪ Automatic shutdown controllers for the natural gas supply trip valves if the combustion gas turbine concentration reaches 60% of the lower explosive limit. ▪ Vent fans in the combustion gas turbine enclosures to ventilate any collected gas. ▪ Thermal fire detectors and smoke detectors located throughout the combustion gas turbine enclosures. Actuating one sensor would provide a high temperature alarm on the combustion gas turbine control panel. Actuating a second sensor would trip the combustion gas turbine, turn off ventilation, close the ventilation openings, and automatically release gaseous carbon dioxide to quench the fire.	X		
The steam turbine-generator units would be supplied with ▪ A bearing pre-action water spray system, which provides fire spray water to the steam turbine-generator bearings in case of a fire. ▪ Fire detectors and an automatic water-deluge water spray system for the steam turbine-generator lube oil areas.	X		
Each major transformer would be supplied with ▪ A deluge spray system in the case of a fire. ▪ Concrete foundations with crushed rock and curbs to contain a transformer mineral oil fire. ▪ Block walls installed as fire breaks between transformers.	X		
The auxiliary boiler building would house the emergency diesel fire pump, the emergency diesel generator, and the gas-fired auxiliary boiler. This equipment would be supplied with fire detectors and automatically operated deluge water spray systems.	X		
The cooling towers would be supplied with a dry pipe water spray system in case of a fire.	X		

Mitigation Measure	Power Plant	Pipelines	Bonneville T-Line
Ammonia Storage			
The ammonia storage tanks would be equipped with ▪ Fire detectors, ammonia leakage detectors and an automatically initiated water deluge system to cool the ammonia storage tanks. ▪ A surrounding enclosed walled area to contain the entire storage capacity. ▪ A 3-foot opening under the ammonia tanker truck unloading area emptying into a wet sump sized to hold the entire contents of a tanker truck in case of a leak.	X		
Aqueous ammonia (24.5%) would be stored and used, rather than anhydrous ammonia. This would be a significant mitigating factor in reducing the potential off-site impact from an accidental release.	X		
Ammonia tanks would be built to the proper codes, as required by the seismic zone 2B.	X		
Engineered controls, such as containment dikes and sumps, would be used to minimize the emissions of potentially spilled ammonia. A containment dike would be installed around the storage tanks to contain a release from a tank. The loading area would be designed to contain and drain spilled ammonia through a 3-foot opening into a wet sump that can hold the entire truckload volume.	X		
Oil, Diesel, and Other Materials			
The distillate fuel oil, gasoline, and diesel oil would be stored in diked aboveground carbon steel storage tanks.	X		
The steam turbine generators would contain hydraulic oil and generator seal oil in piping and tanks.	X		
All tanks would be designed to meet the applicable standards of the American Society of Mechanical Engineers and the American National Standards Institute.	X		
The 5,600-gallon aboveground diesel storage tanks would require a spill prevention control and containment plan under the requirements of the Clean Water Act (40 CFR 112), which would regulate discharge of oil into navigable water or adjoining shorelines.	X		
The safety controls and handling processes committed to in the project description would minimize the potential for off-site impacts from chlorine and/or hydrogen gas release.	X		

Mitigation Measure	Power Plant	Pipelines	Bonneville T-Line
Gas Pipeline Safety			
On-site natural gas pipelines would be inspected and maintained in accordance with the facility operation and maintenance plan to meet or exceed all regulatory requirements. Wallula Generation would install a leak detection system downstream of the GTN meters by installing a series of methane detection monitors in areas where natural gas could accumulate and not disperse consistently with the combustible gas standards.	X	X	
Natural gas line appurtenances would be protected on the project site through containment within buildings or within immediate fenced in areas. Bollards would be erected, as required, to ensure that on-site vehicles cannot reach critical areas. Access to critical areas would be limited to authorized personnel. The natural gas pipeline would be buried in all other uncontrolled areas.	X	X	
The natural gas pipeline would be inspected as required by GTN who is the designer, constructor, operator, and owner of the natural gas pipeline. Upon evidence of a natural gas leak, the personnel conducting the inspection would use a combustible gas indicator to determine ambient gas concentrations in the soil and air, and immediately notify their supervisor of the leak. Once informed, the power plant emergency action plan would then be implemented. The inspectors would be qualified in accordance with U.S. Department of Transportation requirements specified in 49 CFR Part 192. The following are typical events to be investigated and reported: ▪ Any evidence of a leak (dead or dying vegetation, odor). ▪ Flooding or unusual erosion of roads, banks, easements, or right-of-way. ▪ Subsidence or cracking of land and paved surfaces. ▪ Construction, land leveling, or excavation work by others on or adjacent to the natural gas pipeline. ▪ Subdivision planning, surveying, or construction activity in the vicinity of the natural gas pipeline. ▪ Missing or mutilated natural gas pipeline markers, or inadequately marked natural gas pipelines. ▪ Evidence of gunshot damage or corrosion on exposed piping and components. ▪ Evidence of vandalism. ▪ Inoperative or damaged cathodic protection facilities.		X	

Mitigation Measure	Power Plant	Pipelines	Bonneville T-Line
Maintenance or repair work on either the existing Chevron Products pipeline or the proposed natural gas pipeline would be coordinated and jointly inspected by both Chevron Products and GTN to ensure no damage to either pipeline would occur.		X	
Measures to lessen natural gas pipeline construction risks would include: ▪ A qualified and experienced pipeline construction contractor would perform construction. ▪ Prior to construction, the existing natural gas pipeline would be located and staked. ▪ Construction method and safety procedures would be established to avoid striking or damaging the Chevron Products pipeline. ▪ Heavy equipment would not normally be operating over the Chevron Products pipeline during construction of the new natural gas pipeline. ▪ Heavy equipment or trucks would cross the existing natural gas pipeline at existing road crossings or at right angles to the natural gas pipeline with the ground bridged with mats or additional soil cover. ▪ The trench for the new natural gas pipeline would be covered or cordoned off after work hours to prevent livestock or anything else from falling into the trench.		X	
Transmission Line Safety			
Lines would be designed and constructed in accordance with the National Electrical Safety Code (NESC) to minimize shock hazard. NESC specifies the minimum allowable distances between the transmission lines and the ground or other objects.			X
The proposed project would meet the electric field standard of 9 kilovolts per meter (kV/m) maximum on the right-of-way and 5 kV/m at the edge of the right-of-way.			X
The fire control regulations established by the landowners would be followed, including carrying the requisite fire suppression equipment in mobile vehicles.			X
Safe clearance between the tops of trees and the proposed transmission lines would be established and maintained to prevent fires and other hazards.			X

Mitigation Measure	Power Plant	Pipelines	Bonneville T-Line
The storage of flammable materials on the right-of-way would be prohibited. Operation and maintenance of the proposed transmission line would follow prescribed policies that minimize the potential for fire.			X
Ground wires and counterpoise wires would be installed on the new transmission system, providing lightning strike protection.			X
Disposal of Hazardous Materials			
Strict procedures for disposal of common construction materials (e.g., concrete, paint, and wood preservatives) and petroleum products (e.g., fuels, lubricants, and hydraulic fluids) or any other hazardous materials used during construction would be followed.	X	X	X
If a hazardous material, toxic substance, or petroleum product is discovered, and may pose an immediate threat to human health or the environment, then the Contractor shall notify the COTR immediately. Other conditions such as large dump sites, drums of unknown substances, suspicious odors, stained soil, etc., shall also be reported immediately to the COTR. The COTR will coordinate with the appropriate personnel within Bonneville. The Contractor shall not disturb such conditions until the COTR has given the notice to proceed.			X
Operating Procedures			
Qualified personnel, using written procedures, would operate the power plant. The procedures would provide clear instructions for safely conducting activities involved in the startup, normal operations, temporary operations, normal shutdowns, emergency shutdowns, and subsequent startups. The procedures for emergency shutdowns would include the conditions under which emergency shutdowns are required and the assignment of shutdown responsibilities to qualified operators to ensure that shutdowns are performed in a safe and timely manner. The procedures also would cover the consequences of operational deviations and the steps required to correct or avoid the deviations.	X		
Before they are allowed to operate the facility, operating employees would be presented with a facility plan including the health and safety program as outlined in the Application for Site Certification and would receive training regarding the operating procedures and other requirements of safe power plant operations. In addition, operating employees would receive periodic refresher training, which would include testing of their understanding of the procedures. Individual training and testing records would be maintained.	X		
Protective equipment would be provided for personnel use during chemical unloading. In addition, personnel working with chemicals would be trained in proper handling techniques and in emergency response procedures for chemical spills or accidental releases.	X		

Mitigation Measure	Power Plant	Pipelines	Bonneville T-Line
Health and Safety Plans/Programs			
Potential hazards associated with the compressed gases and flammable liquids used for welding, painting, and other activities would be reduced by compliance with a construction health and safety program. The program would include the following elements: ▪ an injury and illness prevention plan, ▪ a written safety program, ▪ a personnel protective devices program, ▪ on-site fire suppression and prevention plans, ▪ off-site fire suppression support, and ▪ an emergency plan. The general construction contractor would administer the program to ensure compliance with laws, ordinances, regulations, and standards pertaining to worker safety.	X		
Several programs would be developed to address hazardous materials storage, emergency response procedures, employee training, hazard recognition, fire safety, first aid/emergency medical procedures, hazardous materials release containment/control procedures, hazard communications, personnel protective equipment, and release reporting requirements. The applicant has also committed to developing and implementing emergency plans addressing project evacuation, fire or explosion, natural gas release on-site, natural gas release off-site, ammonia release on-site, other chemical releases on-site, diesel oil/gasoline release on-site, floods, weather abnormalities, emergency freeze protection, earthquake, volcanic eruption, personnel injury, facility blackout, and external facility threats (e.g., bomb threats).	X		
Spillage prevention and control measures for diesel fuel oil, gasoline, lubricating oil, boiler and water treatment chemicals, and resins would be documented in a spill prevention, control, and countermeasures plan developed prior to commencement of operations. This will show storage, detention, and response procedures for all chemicals on site.	X		
Prior to construction, the applicant would meet with the Hanford site safety officer to discuss comprehensive communication plans and evacuation procedures in the event of a Hanford emergency. Similar meetings would be held with the safety officer at the Umatilla Chemical Depot.	X		

Wildlife Survey Areas, Survey Dates, and Survey Data Forms

Transect Area and Subarea Number & Description	2001 Survey Dates		
	April	May	June
Area 1, Plant Site :	4-08	5-02**, 5-06, 5-07, 5-22**, 5-23**	6-13, 6-14
Area 2, Jaussaud property	4-08	5-06	6-12 *
Area 3, Natural gas pipeline route, western portion			
Area 3, Subarea 1 (southwest segment)	4-10		
Area 3, Subarea 2 (central segment)	4-10	5-07	6-13*
Area 3, Subarea 2, south (well-field segment)		5-07	6-13*
Area 3, Subarea 3 (northwestern segment)	4-11		
Area 4, Electrical transmission line, western portion			
Area 4, Subarea 1 (western segment)	4-08		
Area 4, Subarea 2 (eastern segment)	4-08	5-07	6-13*
Area 5, Electrical transmission line, eastern portion			
Area 5, Subarea 1 (northernmost segment)	4-10	5-07	6-13*
Area 5, Subarea 2 (north of Worden Road)	4-10		
Area 5, Subarea 3 (south of Worden Road)	4-11		
Area 5, Subarea 4 (south segment)	4-11	5-08	6-13*
Area 5, Subarea 5 (interconnect segment)	4-11	5-08	6-13*
Area 6, Natural gas pipeline route, eastern portion			
Area 6, Subarea 1 (easternmost segment, tap site)	4-09	5-07	6-13*
Area 6, Subarea 2 (Simplot grazed lands-east)	4-09, 4-10	5-07	6-13
Area 6, Subarea 3 (Simplot grazed lands-west)	4-09	5-07	
Area 6, Subarea 4 (Worden Farms east)	4-09	5-08	
Area 6, Subarea 5 (Worden Farms central)	4-09		
Area 6, Subarea 6 (Worden Farms west)	4-09	5-08	
Area 6, Subarea 7 (intersect with transmission line ROW)	4-10		

* These sites walked through during botanical surveys

** Incidental sightings and surveys

Source: Smayda Environmental Associates, Inc. July 12, 2001

Updated Information on Geology and Seismicity in the Project Vicinity

Soils at the Switchyard and along the Interconnect, Transmission Line, and Access Road Rights-of-Way

Map Symbol	Soil Series	Texture	Slope (%)	Drainage	Erosion Hazards		Erosion Factor "K"[a]	Wind Erosion Group[b]	Permeability (inch/hr)	Agricultural Land Use Category
					Wind	Water				
Qd	Quincy-duneland complex	50% fine sand, 30% duneland, 20% minor extent	NA	NA	NA	NA	0.17-0.28	1	6 to 20	NA
QmB2	Quincy	Loamy fine sand over coarse sand, eroded	0 to 8	Very deep, excessively drained	NA	NA	0.28- 0.32	2	6 to 20	NA
QuB2	Quincy	Loamy fine sand, eroded	0 to 8	Very deep, excessively drained	NA	NA	0.28- 0.32	2	6 to 20	NA
QuC2	Quincy	Loamy fine sand, eroded	8 to 15	Very deep, excessively drained	NA	NA	0.28- 0.32	2	6 to 20	NA
AfC2	Adkins	Loamy fine sand, eroded	15 to 30	Very deep, well drained	NA	NA	0.28- 0.32	2	0.06 to 6	NA
Ac	Active duneland	Active duneland	NA	NA	NA	NA	0.17-0.28	1	6 to 20	NA
Hp2	Hezel-Quincy complex	50% Hezel, 40% Quincy, eroded	NA	NA	NA	NA	0.24-0.43	2	Hezel 6 to 20, Quincy 0.08-0.12	NA
QfD2	Quincy series	Fine sand, eroded	0 to 30	Very deep, excessively drained	NA	NA	0.17-0.28	1	6 to 20	NA
HoC2	Hezel series	Loamy fine sand, eroded	0 to 15	Very deep, somewhat excessively drained	NA	NA	0.24-0.43	2	0.2 to 6	NA

Map Symbol	Soil Series	Texture	Slope (%)	Drainage	Erosion Hazards		Erosion Factor "K"[a]	Wind Erosion Group[b]	Permeability (inch/hr)	Agricultural Land Use Category
					Wind	Water				
SmD2	Sagemoor series	Very fine sandy loam, eroded	8 to 15	Very deep, well drained	NA	NA	0.55	3	0.2 to 2	NA
SmB	Sagemoor series	Very fine sandy loam	3 to 8	Very deep, well drained	NA	NA	0.55-0.64	3	0.2 to 2	NA
SmC	Sagemoor series	Very fine sandy loam	8 to 15	Very deep, well drained	NA	NA	0.55-0.64	3	0.2 to 2	NA
BcG	Basalt Rockland	Very steep rockland, 60% rock outcrop, 30% Lickskillet	NA	NA	NA	NA	0.17-0.2	8	Rock 0 to 0.01, Lickskillet 0.06 to 0.14	NA
BdF	Basalt Rockland - Walla Walla complex	50% Rock outcrop, 35% Walla Walla soils	30 to 60	NA	NA	NA	0.2-0.49	5	Rock 0 to 0.01, Walla Walla 0.09 to 0.2	NA
BcF	Basalt Rockland - Lickskillet series	60% Rock outcrop, 30% Lickskillet soils	30 to 60	NA	NA	NA	Rock NA 0.17-0.20	8	Rock 0 to 0.01 Lickskillet 0 to 2	NA
SyD	Starbuck Rocky series	70% Starbuck soils, 20% rock outcrop	0 to 30	NA	NA	NA	0.32-0.55	5	Starbuck 0 to 20, Rock 0 to 0.01	NA
FaC	Farrell series	Very fine sandy loam	3 to 15	Very deep, well drained	NA	NA	0.49-0.55	3	0.6 to 2.0	NA
BcD	Basalt Rockland	Undulating to hilly	NA	NA	NA	NA	0.2-0.28	7	Rock 0 to 0.01, Lickskillet 0.06 to 0.14	NA
RtB	Ritzville series	Very fine sandy loam	0 to 8	Very deep, well drained	NA	NA	0.49-0.55	3	0.6 to 2	NA
RiD2	Ritzville series	Silt loam, eroded	8 to 30	Very deep, well drained	NA	NA	0.55	4L	0.6 to 2	NA
RiD	Ritzville series	Silt loam	8 to 30	Very deep, well drained	NA	NA	0.49-0.55	5	0.6 to 2	NA

Map Symbol	Soil Series	Texture	Slope (%)	Drainage	Erosion Hazards		Erosion Factor "K"[a]	Wind Erosion Group[b]	Permeability (inch/hr)	Agricultural Land Use Category
					Wind	Water				
RiB	Ritzville series	Silt loam	0 to 8	Very deep, well drained	NA	NA	0.49-0.55	5	0.6 to 2	NA
RiF	Ritzville series	Silt loam	45 to 60	Very deep, well drained	NA	NA	0.49-0.55	5	0.6 to 2	NA
RtD	Ritzville series	Very fine sandy loam	8 to 30	Very deep, well drained	NA	NA	0.49-0.55	5	0.6 to 2	NA
RiE	Ritzville series	Silt loam	30 to 45	Very deep, well drained	NA	NA	0.49-0.55	5	0.6 to 2	NA
RtF2	Ritzville series	Very fine sandy loam, eroded	30 to 60	Very deep, well drained	NA	NA	0.49-0.55	5	0.6 to 2	NA
RiG	Ritzville series	Wind-blown silt loam	60 to 65	Very deep, well drained	NA	NA	0.49-0.55	5	0.6 to 2	NA
79C	Ritzville series	Very fine sandy loam	7 to 12	Deep, well drained	Moderate	Moderate	0.43-0.49	3	Moderate, 10 to 13	Small grain-fallow
79B	Ritzville series	Very fine sandy loam	2 to 7	Deep, well drained	Moderate	Moderate	0.43-0.49	3	Moderate, 10 to 13	Small grain-fallow
79D	Ritzville series	Very fine sandy loam	12 to 25	Deep, well drained	Moderate	High	0.43-0.49	3	Moderate, 10 to 13	Small grain-fallow
79E	Ritzville series	Very fine sandy loam	25 to 50	Deep, well drained	Moderate	High	0.43-0.49	3	Moderate, 10 to 13	Small grain-fallow
50F	Lickskillet series	Rock outcrop complex	40 to 70	Shallow, well drained	High	Slight	0.15-0.17	NA	Moderate, 1 to 3	Rangeland and wildlife habitat
85F	Xeric Torriorthents series	Rock outcrop – Xeric Torriorthents complex	10 to 20	Moderately deep to deep, somewhat excessively drained to well drained	High	High	NA	NA	Variable	Rangeland and wildlife habitat
75E	Quincy series	Loamy fine sand	5 to 25	Deep, excessively drained	High	Slight	0.17	2	Rapid, 3 to 6	Irrigated cropland rangeland and wildlife habitat

Map Symbol	Soil Series	Texture	Slope (%)	Drainage	Erosion Hazards		Erosion Factor "K"[a]	Wind Erosion Group[b]	Permeability (inch/hr)	Agricultural Land Use Category
					Wind	Water				
23	Dune land	Eolian sand	0 to 3	Deep, excessively drained	High	Slight	NA	NA	Rapid to very rapid	Wildlife habitat and limited livestock grazing
15B	Burke series	Silt loam	1 to 7	Moderately deep, well drained	Moderate	Moderate	0.43-0.49	4L	Moderate to 26 inches, then very slow to 4 to 8	Small grained-fallow, few areas used for irrigated crops and rangeland
74B	Quincy series	Fine sand	0 to 5	Deep, excessively drained	High	Slight	0.17	1	Rapid, 2.5 to 5	Irrigated cropland pasture and rangeland
123B	Winchester Quincy series complex	Loamy fine sand	0 to 5	Deep, excessively drained	High	Slight	0.1-0.15	1	Rapid, 2.5-3.5 1.5-3	Irrigated cropland pasture and rangeland, and wildlife habitat
93B	Starbuck series	Very fine sandy loam	2 to 20	Shallow, well drained	Moderate	Moderate	0.28-0.43	3	Moderate, 1.5-3.5	Rangeland and wildlife habitat
78B	Quincy series	Rock outcrop	1 to 20	Deep, excessively drained	Moderate	Moderate	0.17	1	Rapid, 3-6	Non-irrigated crops, irrigated crops, rangeland
122B	Winchester series	Sand	0 to 5	Deep, excessively drained	Very high	Slight	0.1-0.15	1	Rapid, 2.5-3.5	Irrigated crops, pasture and rangeland, and wildlife habitat
119A	Wanser series	Loamy fine sand	0 to 3	Deep, poorly drained	High	Slight	0.24-0.32	2	Rapid, 3-6	Irrigated crops, pasture and rangeland
3A	Adkins series	Fine sandy loam, wet	0 to 3	Deep well drained soil wet - canal seepage	Moderate	Slight	0.32-0.37	3	Moderately rapid, 8-10	Irrigated crops, pasture, wildlife habitat

Map Symbol	Soil Series	Texture	Slope (%)	Drainage	Erosion Hazards		Erosion Factor "K"[a]	Wind Erosion Group[b]	Permeability (inch/hr)	Agricultural Land Use Category
					Wind	Water				
94A	Starbuck series	Rock outcrop complex	0 to 5	Shallow, well drained	Moderate	Moderate	0.28-0.43	3	Moderate, 1.5-3.5	Pasture, rangeland and wildlife habitat
1B	Adkins series	Fine sandy loam	0 to 5	Deep, well drained	Moderate	Slight	0.32-0.37	3	Moderate, 8-11	Irrigated crops, nonirrigated crops, pasture, rangeland and wildlife habitat
70	Pits, Gravels	Excavated, waterworn gravel, commonly mixed with sand	NA	Commonly occurs with other units such as the Quincy and Adkins soils	NA	NA	NA	NA	NA	NA – little support offered for vegetation
14B	Burbank series	Loamy fine sand	0 to 5	Deep, excessively drained	High	Slight	0.1-0.24	2	Rapid to 30, and very rapid below 1.5-3.5	Irrigated crops, rangeland, pasture and wildlife habitat
2C	Adkins series	Fine sandy loam, gravelly substratum	0 to 5	Deep, well drained	Moderate	Moderate	0.15-0.32	3	Moderately rapid, 6-9	Irrigated crops, pasture, rangeland and wildlife habitat

Sources: Soil Survey of Umatilla County Area, Oregon (USDA 1984), Soil Survey of Walla Walla County, Washington (USDA 1964)

[a] K values range from 0.05 to 0.69. Higher values indicate more erosion susceptibility.

[b] See table on next page for Wind Erosion Groups. Group 1 is the most susceptible to wind erosion with higher numbered groups increasingly less susceptible.

NA = Not Available

Wind Erosion Groups

Group	Soil Description
1	Sand, fine sand, and very fine sand. These soils are extremely erodible and it is difficult to establish vegetation on them.
2	Loamy sand, loamy fine sand, and loamy very fine sand. These soils are very highly erodible.
3	Sandy loam, coarse sandy loam, fine sandy loam, and very fine sandy loam. These soils are highly erodible.
4L	Calcareous loamy soils that are less than 35%clay and more than 5% finely divided calcium carbonates. These soils are erodible.
4	Clay, silty clay, clay loam, and silty clay loam that are more than 35% clay. These soils are moderately erodible.
5	Loamy soils that are less than 20% clay and less than 5% finely divided calcium carbonate and sandy lay loam and sandy clay that are less than 5 % finely divided calcium carbonate. These soils are slightly erodible.
6	Loamy soils that are 20 to 35% clay and less than 5% finely divided calcium carbonate, except silty clay loam. These soils are very slightly erodible.
7	Silty clay loam that is less than 35% clay and less than 5 % finely divided calcium carbonate. These soils are very slightly erodible.
8	Stony or gravelly soils and other soils not subject to wind erosion.
Source: USDA (1964, 1984)	

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

4601 N. Monroe Street • Spokane, Washington 99205-1295 • (509) 456-2926

March 21, 2002

Wallula Generation, L.L.C.
100 Bayview Circle, Suite 500
Newport Beach, California 92660

Dear Sir or Madam:

Re: Applications for Change/Transfer under Ground Water Certificate No.'s G3-28146C, G3-28683C, G3-24791C, G3-21039C, G3-21038C, G3-21036C, G3-21037C
WRIA 32 – Walla Walla County

Enclosed please find revised copies of the Department of Ecology's Reports of Examination for your transmittal to the Energy Facility Site Evaluation Council (EFSEC). These reports constitute our determinations and findings regarding the above referenced applications for change.

Under the development schedule contained in the Reports, construction work for your project shall be completed by October 1, 2004. This construction schedule is recommended within the reports.

Under a separate cover, we will transmit these decisions to EFSEC for their consideration in your licensing process. This action completes the requirements under the agreement between the Department of Ecology and Walulla Generation LLC instrumented August 17th and 20th, 2001.

If you have any questions concerning these reports, please contact Bill Neve at (509) 527-4546.

Sincerely,

George B. Schlender
Section Manager
Water Resources Program

GBS:kay
w:ROE/Neve/2002/Wallula Gen-Boise ROE revised cvr 3-20-2002.doc

Enclosures

IN RE APPLICATION NO. 2001-01 EXHIBIT _____ (SAN-3)
WALLULA POWER PROJECT SCOTT A. NOLL

REPORT OF EXAMINATION

For State of Washington Energy Facility Site Evaluation Council (EFSEC)
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
February 18, 1976	G3-24791	G3-24791P	G3-24791C

NAME
WALLULA GENERATION, L.L.C.

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
100 Bayview Circle, Suite 500	Newport Beach	California	92660

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Wells (10)

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
	310	300

QUANTITY, TYPE OF USE, PERIOD OF USE

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION-WITHDRAWAL

#1 - 80 feet north and 80 feet east;
#2 - 525 feet north and 80 feet east;
#3 - 650 feet north and 80 feet east;
#4 - 700 feet north and 250 feet east;
#5 - 80 feet north and 280 feet east;

1-5 ALL from the SW corner of Sec. 11

#6 - 1200 feet north and 1400 feet east;
#7 - 30 feet north and 300 feet east;
#8 - 1300 feet south and 1300 feet east;
#9 - 2500 feet south and 500 feet east;
#10 - 2350 feet south and 1820 feet east;

#6-10 ALL from the center of Sec. 14

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
	11 & 14	7	31 E	32	Walla Walla

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

That portion of Tracts 37 though 44, inclusively, and tracts 53 through 60, inclusively, all of the plat known as the Pasco Plats, Page 8, records of Walla Walla County, all lying in Section 34, Township 8 North, Range 31 East, Willamette Meridian, County of Walla Walla, State of Washington; and that portion of Tracts 65, 80, 81, 96,97, 112, and 113 of the plat known as Attalia Five Acre Tracts, according to the official plat thereof, lying Easterly of the Easterly right of way boundary line of the Washington State Department of Transportation's highway designated as Primary State Highway #3, Pasco to Attalia, as shown on that certain map of definite location now of record and on file in the office of the Director of Highways at Olympia Washington; and more particularly being described as that portion of the Southwest quarter of Section 34, Township 8 North, Range 31 East, Willamette Meridian, County of Walla Walla, State of Washington; and that portion of the East half of the East half of the southeast quarter of Section 33, Township 8 North, Range 31 East, Willamette Meridian, County of Walla Walla, State of Washington, described as follows:

Commencing at a found 2-inch brass cap monument marking the southwest corner of said Section 34; thence North 88°47'18" East, coincident with the South boundary line of the Southwest quarter of said Section 34, a distance of 165.12 feet to the northeast right of way boundary line of the Washington State Department of Transportation's highway designated as Primary State Highway #3, Pasco to Attalia, as shown on that certain map of a definite location now of record and on file in the office of the Director of Highways at Olympia, Washington, and to the Point of Beginning; thence northwesterly on the following two courses coincidental with the northeasterly right of way boundary line of said State Highway #3:

1. northwesterly on a non-tangent 11,385.00-foot radius curve concave to the northeast through a central angle of 9°16'13" to the right, the long chord of said curve being North 18°05'12" West a distance of 1,840.02 feet;
2. North 13°27'06" West a distance of 899.97 feet to the north boundary line of the Northeast quarter of said Section 33;

Thence North 89°32'11" East, coincident with the north boundary line of the Northeast quarter of said Section 33, a distance of 586.12 feet to the Northwest corner of the Southwest quarter of said Section 34; thence North 88°43'39" East, coincident with the north boundary line of the Southwest quarter of said Section 34, a distance of 2708.74 feet to the northwest right of way boundary line of the Union Pacific Railroad; thence South 01°48'07" West, coincident with the northwest right of way boundary line of said Railroad, a distance of 2636.48 feet to the South boundary line of the Southwest quarter of said Section 34, said point bears South 88°47'18" West, coincident with the south boundary line of the Southwest quarter of said Section 34, a distance of 47.07 feet from a found 2-inch U.S. Bureau of Reclamation brass cap marking the Southeast corner of the Southwest quarter of said Section 34; thence South 88°47'18" West, coincident with the south boundary line of the Southwest quarter of said Section 34, a distance of 2431.87 feet to the Point of Beginning.;

Containing 175.529 Acres, more or less.

DESCRIPTION OF PROPOSED WORKS

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
Started	October 1, 2004	October 1, 2005

REPORT

BACKGROUND

Purpose

Wallula Generation, L.L.C. ("WallulaGen") is proposing to construct and operate a natural gas combined cycle electrical generating facility of approximately 1,300 MW at Wallula, Washington. As part of the development of this project, WallulaGen is seeking to transfer water rights from other uses for the purpose of operating the proposed power plant. The proposed changes include changing the points of withdrawal (consolidated of the existing wells), changing the place of use, and changing the purpose of use to the following water rights: Ground Water Certificate No.'s G3-21037C, G3-21038C, G3-20139C, G3-21936C, G3-24791C, G3-28146C and G3-28683C. The purpose of this report is to review the proposed changes to these, and to provide a tentative determination as to the extent of water available for such transfer.

Expedited Processing

In August of 2001, WallulaGen entered into a contract with Ecology to pay $344,200.00 for the purchase of water rights on the lower Walla Walla River. This purchase completed a contract Ecology had entered into earlier with a private landowner to purchase water rights appurtenant to 659 acres located along the lower reach of the Walla Walla River. The water rights purchased are in the process of being placed in the Trust Water Right Program for the purpose of instream flow. The WallulaGen portion of this purchase will result in instream flow augmentation to the Walla Walla River in the amount of approximately 2.8 cubic feet per second from April 1 to July 1.

As part of this contract with WallulaGen; Ecology agreed to provide a tentative determination as to the extent of water available for the proposed transfer, and to write a report outlining those findings. It is the intent of WallulaGen to submit said report to Energy Facility Siting Evaluation Committee ("EFSEC") as part of their effort to license the proposed power plant. (Under Washington State law, EFSEC is responsible for siting and licensing the construction and operation of major energy facilities in Washington State, including this project). Due to the fact WallulaGen's purchase is considered by Ecology to be a significant environmental benefit, Ecology agreed to complete this report on an expedited basis - no later than December 31, 2001, if possible.

INVESTIGATION

Project Description

The proposed project site is located primarily within the SW¼ of Sec. 34, T. 8 N., R. 31 E.W.M. This site is 3.5 miles north of Wallula, Washington, due west of the I.B.P. Inc. processing plant, and on the east side of SR 12. The 183 acre site is zoned Heavy Industrial and is presently in agricultural use. WallulaGen has indicated their desire to change the place of use, purpose of use, add points of withdrawal (consolidation), and season of use to the following water rights to allow for their use in the operation of the proposed power plant: Ground Water Certificate No.'s G3-21037C, G3-21038C, G3-20139C, G3-21936C, G3-24791C, G3-28146C and G3-28683C.

Existing Water Rights/Claims

There are two water rights appurtenant the proposed WallulaGen project site: Ground Water Permit No. G3-29640P and Surface Water Right No. 10703.

Ground Water Permit No. G3-29640P

Priority date:	February 16, 1994
Qi (instantaneous):	1,200 gallons per minute
Qa (annual):	1,800 acre-feet per year
Purpose:	Industrial use
Season:	Continuous
Source:	A well (basalt aquifer)
Point of withdrawal:	SE¼SW¼ of Sec. 34, T. 8 N., R. 31 E.W.M.
Place of use:	Within SE¼ of Sec. 33 and W½of Sec. 34, T. 8 N., R. 31 E.W.M.

This permit issued to the Port of Walla Walla on February 12, 1996. No beneficial use of water has been made under this permit to date, although the subject well has been completed. This permit is in good standing, and WallulaGen has indicated their intent to use water from this well to the full extent possible. In their EFSEC application, they indicate that this permit will be the initial source of water for the plant, with water needs over and above those allocated coming from other sources - primarily the shallow aquifer wells authorized through the water rights proposed for change herein.

There is a change application pending with Ecology for this Permit, filed by the Port of Walla Walla in December of 1996. This application requests authority to add an additional well to the one authorized, to serve as an emergency back-up source to the primary well.

Surface Water Right No. 10703

Priority date:	October 27, 1958
Qi (instantaneous):	80 cubic feet per second
Qa (annual):	23,121 acre-feet per year
Purpose:	Irrigation of 3,303 acres
Season:	March 15 to October 31
Source:	Columbia River
Point of withdrawal:	NE¼SE¼ of Sec. 20, T. 8 N., R. 31 E.W.M.

This water right was issued to the U.S. Bureau of Reclamation, and is administered by the South Columbia Basin Irrigation District. This right has been used on the subject property in the past for irrigation of orchard and grain crops. The applicant has expressed the intent to continue to use at least a portion of their allocation of Surface Water Right No. 10703 for irrigation purposes. Any use of water under Certificate No. 10703 will be independent from the use of water proposed herein for industrial purposes.

Evaluation of Certificate No.'s G3-21037C, G3-21038C, G3-20139C, G3-21936C, G3-24791C, G3-28146C and G3-28683C

In Okanogan Wilderness League v. Town of Twisp, 133 Wn.2d 769, 947 P.2d 732 (1997), the Supreme Court held that applications for change of water rights may be granted only to the extent the water has been historically put to beneficial use, as beneficial use determines the measure of a water right. The Court also held that (1) the existence and quantification of a water right must first be determined, and (2) that it then must be determined whether or not any perfected water right has been lost for nonuse due to statutory relinquishment or common law abandonment before the Department can approve a change or transfer. While Ecology is not considering a formal application for change in development of this report, the evaluation of these rights will be consistent with this court decision.

Below is a summary of the water rights proposed for change/transfer:

Certificate No.	Well No.	Priority Date	Qi (gpm)	Qa (afy)	Acres	Season of Use
G3-28146C [1,2]	1-5	2/27/86	5,000	2,790	600	3/1 - 11/30
G3-28683C [1,2]	1-5	11/2/89	2,500	883	190	3/1 - 11/30
G3-21038C	6	4/19/73	560	279	60	1/1 - 12/31
G3-24791C [3]	7	2/18/76	650	623	124	1/1 - 12/31
G3-21037C	8	4/19/73	800	372	80	1/1 - 12/31
G3-21039C	9	4/19/73	1300	744	160	1/1 - 12/31
G3-21936C	10	10/12/73	530	293	63	1/1 - 12/31

[1]Subject to the minimum flows set forth in the Columbia River Instream Protection Program (WAC 173-563-040 and WAC 173-563-050)
[2]Family Farm Development Certificate
[3]Of these totals, 340 gpm and 158 ac/ft for irrigation of 34 acres are supplemental to existing water rights (G3-21037C)

1. Historical Beneficial Use

Beneficial use encompasses two (2) principal elements of a water right: First it refers to the purposes for which water may be used; and second, beneficial use determines the measure of a water right. The measure of a water right refers to the quantities of water actually used, without waste, within the authorized place of use for the purpose(s) authorized. The measure is defined in terms of both annual quantity and instantaneous quantity. Prior to recommending any change to the subject water rights, it is necessary to determine the extent of beneficial use of water under these rights.

a. Purpose

The use authorized under Ground Water Certificate No.'s G3-21037C, G3-21038C, G3-20139C, G3-21936C, G3-24791C, G3-28146C and G3-28683C, irrigation, is explicitly identified in statute as being a beneficial use (RCW 90.54.020(1)).

b. Measure

In order to determine the amount of water available for the requested change, a determination must be made as to the quantities of water beneficially used to irrigate crops on the subject property. Alan Kottwitz, Irrigation Manager for Boise Cascade Fiber Farms, provided meter data for each of the past seven (7 years for all of the wells. These data are summarized below (Note: Water under Certificate No.'s G3-28146C and G3-28683C is withdrawn from five (5) integrated wells; likewise, water withdrawn from the two (2) wells authorized for use under Certificate No.'s G3-21039C and G3-21936C are also integrated. The use of water under these rights is summarized in cumulative form.)

Water	Well No.	Water	Metered	Metered	Metered	Metered	Metered	Metered	Metered

Right No.'s		Right (Ac/ft/yr)	Use - 1995	Use - 1996	Use - 1997	Use - 1998	Use - 1999	Use - 2000	Use - 2001
G3-28146; G3-28683	1 - 5	3,673	3,038	N/A	2,489	3,073	3,302	3,156	3,163
G3-21038	6	279	142	N/A	170	204	225	87	237
G3-24791	7	465 [1]	176	N/A	241	313	316	116	290
G3-21037	8	372	89	N/A	111	121	136	56	160
G3-21039; G3-21936	9 - 10	1073	575	N/A	803	1065	1070	968	1105

[1]Quantity represents primary right only

Note shaded areas represent the maximum year of metered use for each well respectively during the six (6) years of measurement provided.

It is noted that the instantaneous and annual quantities withdrawn in 2001 under Certificate No.'s G3-21039 and G3-21936C exceed those quantities authorized. The acres irrigated under these rights also exceed what is authorized; however, these additional acres are within the place of use of Certificate No. G3-21037C. When taken together, the quantities of water withdrawn and number of acres irrigated do not exceed those authorized through a combination of the three certificates. In essence, Well No.'s 9 and 10 were added as points of withdrawal to Certificate No. G3-21037C without authorization. All three (3) wells withdraw water from the same aquifer, and no real expansion of the rights in total quantities or acres occurred through this "defacto" change. This being the case, consideration can and will be given to the full quantities withdrawn under the various rights. The total gross quantity of water available for change is (3,302+237+316+160+1105) 5120 acre-feet.

One of the proposed changes to the subject rights is in purpose of use, from irrigation to industrial. A component of the irrigation use, return flows to the Columbia River in the form of deep percolation and surface runoff, would be eliminated if such a change were approved. In order to minimize any potential impairment to the Columbia River by virtue of this change, the estimated return flows should be subtracted from the total amount withdrawn.

Irrigation of hybrid poplars through the subject water rights occurs by means of drip irrigation system. Boise Cascade utilizes 9 neutron probes installed to a depth of 5 feet. The probes were reported to have been read weekly from mid-March to mid-October, with irrigation being managed according to the soil moisture readings. A well-managed drip system can run at a 90% application efficiency, with the 10% loss occurring through a variety of factors including evaporation, deep percolation, and surface runoff. A review of pertinent material in the Washington State Irrigation Guide, and discussions with Brian Leib, WSU Extension Irrigation Specialist, confirm that half of the efficiency loss, or 5%, is a reasonable estimate for deep percolation return flows for the irrigation system described.

A 5% return flow component would equate to 256 acre-ft. The resulting net annual quantity of water available for consideration for transfer is 4,864 acre-feet. The maximum projected annual water use at the WallulaGen plant is expected to be 6,591 acre-feet per year.

Boise Cascade reported cumulative instantaneous withdrawal rates totaling 9,735 gallons per minute from the subject wells. Due to a portion of Certificate No. G3-24791C being supplemental, a total of 9,671 gallons per minute is available for transfer. The total currently authorized is 11,000 gallons per minute. This compares with the projected maximum instantaneous water demand for the project of 7,901 gallons per minute reported in the WallulaGen EFSEC application.

c. Waste

As described above, Boise Cascade has employed a drip irrigation system in utilizing water under the subject rights. Assuming that the drip system was operated in a well-managed manner, this would be a relatively efficient irrigation application method, which would minimize any waste. Operational losses are part of any irrigation system; the losses estimated herein are within what would be necessary and expected.

Hybrid poplars are known to have transpiration rates that are among the highest of temperate deciduous trees. Generally, research suggests that hybrid poplars will "use" as much water as is made available to them; that is, if potential evapotranspiration of a certain quantity exists at a site and that quantity of water is made available to the tree, it will "use" that quantity. While there is no published crop irrigation requirement for hybrid poplars, a review of pertinent literature indicates that single, mature hybrid poplars trees are capable of consuming 7 acre-feet or more of water per year. Ideally the producer would attempt to match applied water to that used by the poplar stand for optimal production. The technology to assess the water use characteristics of a stand is generally not available, and is made more difficult by the fact that the water use will change considerably from early in the stand rotation to later years.

The annual application of water for the hybrid poplars grown on the subject lands, based on information supplied by Boise Cascade, averages 4.35 acre-feet per acre per year. It could be expected that poplars in the Wallula area, with its typically high summer temperatures and windy conditions, would exhibit a relatively high

evapotranspiration rate. Given the climate and soil type of the area in which this tree farm has been established, the annual quantity applied would appear to reasonable for optimizing production without waste.

2. Relinquishment/Abandonment

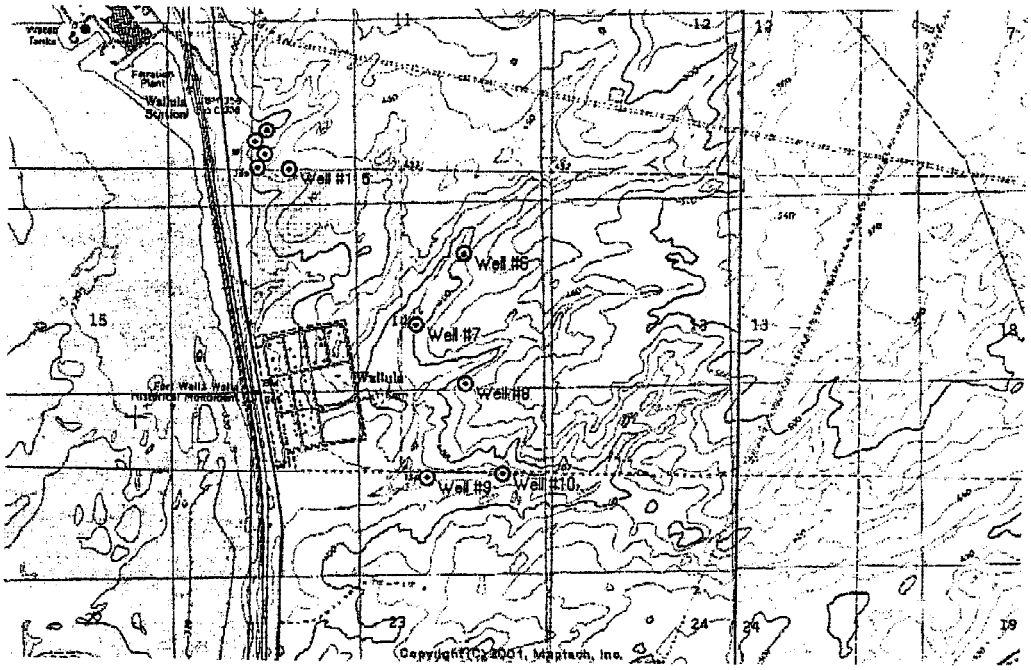
That difference between that amount of water available for the changes requested herein (4,864 acre-feet, 9,671 gallons per minute) and the amount of water authorized in total by the subject water rights (5,826 acre-feet, 11,000 gallons per minute), being 962 acre-feet and 1,329 gallons per minute, would be subject to relinquishment should the changes proposed herein be approved.

Assessment of the Proposed Changes

a. Points of Withdrawal

While no additional wells are proposed through changes to the subject water rights, officials from WallulaGen have indicated a desire to consolidate the existing points of withdrawal under the subject water rights. This would enable WallulaGen to utilize more fully and efficiently the existing higher capacity wells, while maintaining the lower capacity wells as backup or reserve supply for use as needed.

All the subject wells have been completed in the upper alluvial aquifer (see table below). Wells in this area generally range in depth from 50 to 150 feet. The specific capacity of the wells range from 30 to 100 gallons per minute per foot of drawdown. There are two (2) wells located approximately 1.25 miles south of the subject wells. These wells were drilled in 1984, and test pumped and developed at variable withdrawal rates which ranged from 1,000 to 2,000 gallons per minute. These tests indicated that the specific capacity of the wells was related to the types of material in the immediate vicinity of the wells as these materials dictated the size of the screen and therefore the ability of the wells to produce water.



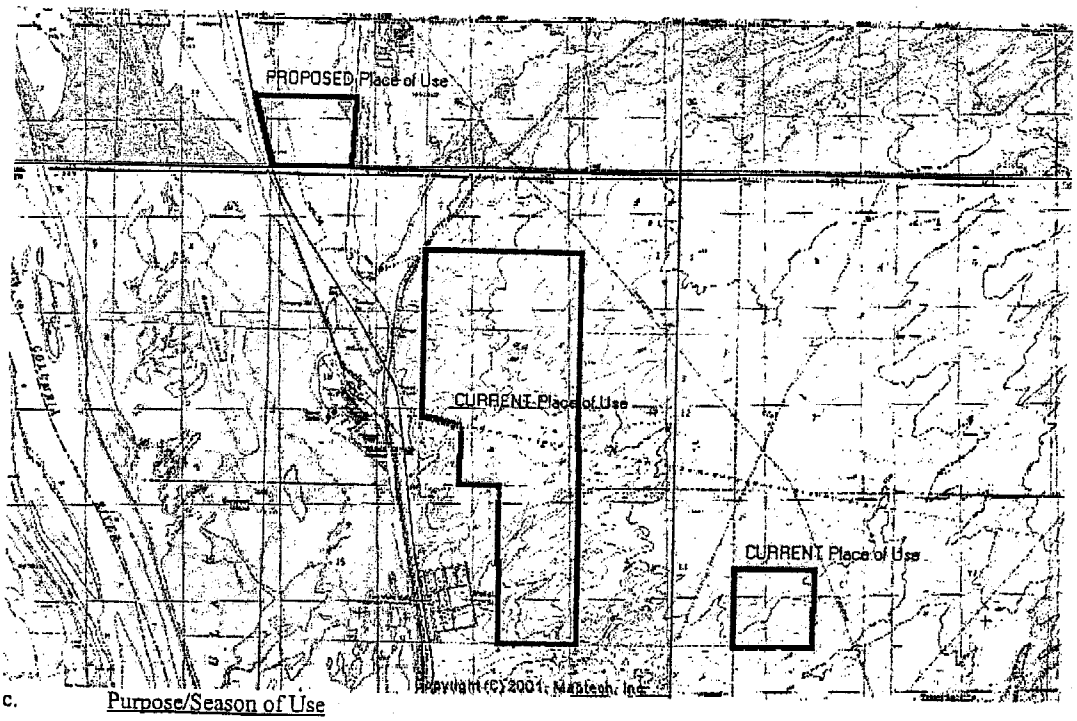
Well No.	Completed Depth (in feet)	Pumping Level * (in feet)	Surface Elevation * (in feet asl)
1	100	95	400
2	99	92	395
3	91	74	380
4	104	75	380
5	135	115	430
6	145	110	428
7	127	Unknown	405
8	150	125	418
9	118	85	387
10	106	70	385

*Estimates supplied by Boise Cascade Fiber Farm

Boise Cascade's "operational use rate" (well yield) for the existing ten wells has been reported as 9,735 gpm during the irrigation season (EFSEC Application - Table 3.3.5.4.1-2). Pumping at up to this rate, they produce approximately 5,000 acre-feet during the irrigation season. The highest demand water month for the WallulaGen power plant, once it is operational, will be July with an estimated average total withdrawal rate for these ten wells of 4,104 gpm (EFSEC Application - Table 3.3.5.4.1-4). Consolidating the existing points of withdrawal under the subject water rights to utilize more fully and efficiently the existing higher capacity wells will not lead to impairment of any of the nearby, existing water rights. Well interference problems caused by the combined withdrawals of any combination of these existing wells under the power plant operations scenario will be less than the well interference problems that arise under the current pumping scenario.

b. Place of Use

The proposed place of use for these rights is located on an industrial site owned by the Port of Walla Walla. This site is approximately two (2) miles north of the existing place of use. Through this change the poplar plantation currently irrigated through authority of these rights would no longer be irrigated.



c. Purpose/Season of Use

Certificate No.'s G3-28146C and G3-28683C authorize the withdrawal and use of water from March 1 to November 1, while Certificate No.'s G3-21038C, G3-24791C, G3-21037C, G3-21039C and G3-21936C all authorized withdrawal from January 1 to December 31. Use of water under each of these rights has historically occurred during the period of March to November, thereby establishing the season of use for these rights. WallulaGen had requested that the season/purpose of use be expanded from seasonal irrigation to continuous industrial supply.

By increasing the period of use to include December, January and February, a determination as to the potential impacts to existing water rights must be made. Consultants hired by WallulaGen to evaluate these impacts constructed a MODFLOW computer model for the gravel aquifer in the project area. Output from the simulation of the proposed future use (year-round) of the Boise Cascade Corporation fiber farm wells was compared to output from the simulation of the current conditions to identify power plant operation effects. Their results indicate that the annual fluctuation of water levels in the gravel aquifer due to relatively stable year-round pumping (for power plant operations) versus the highly seasonal pumping (for irrigation) will be reduced under the proposed future use. Water levels in December through May are predicted to be lower under future conditions while water levels in June through November are predicted to be higher. The magnitude of the changes are quite small (< +/- 2 feet) except very close to the Boise Cascade Well field (Wells 1 to 5) which will experience slightly larger changes. Existing gravel aquifer wells should not be impaired by the change in the pattern of pumping at the Boise Cascade fiber farm wells because future water level fluctuations should be less than current fluctuations. Also, maximum water use by existing water users typically occurs during the summer months when water levels under future conditions should be higher than historical levels.

If should be noted that both Ground Water Certificate No.'s G3-28146C and G3-28683C were issued subject to the Columbia River Instream Protection Program (CRIPP - WAC 173-563) which specifies minimum flows in the

Columbia River which must be met prior to withdrawal of water under these permits. Curtailment of pumping under this regulation can be expected at least once every 20 years, and occurred most recently during the 2001 irrigation season. These provisions would remain with the certificates through approval of any change in season of use.

d. Family Farm Development Permits

Ground Water Certificate No.'s G3-28146C and G3-28683C were issued as Family Farm Development Permits. These types of permits are defined through RCW 90.66.050(2) as follows:

"Such permits may be issued to persons without any limit on the number of acres to be irrigated during a specified period of time permitted for the development of such land into family farms and the transfer of the controlling interest of such irrigate lands to persons qualifying for family farm permits. The initial period of time allowed for development and transfer of such lands to family farm status shall not exceed an additional ten years upon a showing to the department that an additional period of time is needed for the orderly development and transfer of controlling interests to persons who can qualify for family farm permits."

These two (2) permits were issued in 1986 and 1990, respectively, and are currently into the 2nd 10 year extension period allowed to develop and transfer to entities which qualify for Family Farm Permits. WallulaGen is an entity which would qualify for Family Farm Permit status, and has stated their intent to request conversion of these permits to Family Farm status once their purchase option is executed.

Recent legislative changes to Chapter 90.66 allow for changes in purpose of use to Family Farm Permits under certain circumstances. The purpose of use of these Family Farm Permits may change from irrigation to industrial use, if 1). The water right is for the use of water at a location that is, at the time the transfer is approved, within the boundaries of an urban growth area designated under chapter 36.70A RCW {RCW 90.66.065(2) (c)}, and 2). The place of use for the right to be transferred remains within the water resource inventory area containing the place of use for the water right before the transfer {RCW 90.66.065(5)}.

The subject rights meet both of these criteria. The proposed place of use is within the Attalia Industrial Urban Growth Area, an industrial growth area established under the 2001 Walla Walla County Comprehensive Plan. Both the proposed and existing places of use for these rights are within the WRIA 32, Walla Walla River Basin.

Provided that the above-described transaction is completed and controlling interest of these rights accrue to WallulaGen, these rights should be able to be transferred to Family Farms Permits, and subsequently the change in purpose of use for irrigation to industrial supply could be approved.

FINDINGS

Validity/Extent of Water Rights:
The extent and validity of Ground Water Certificate No.'s G3-21037C, G3-21038C, G3-20139C, G3-21936C, G3-24791C, G3-28146C and G3-28683C, has been tentatively determined to equal 9671 gallons per minute, 4,864 acre-feet per year. The difference between these quantities and that authorized through the subject water rights, 962 acre-feet and 1,329 gallons per minute, are subject to relinquishment.

No Impairment to Existing Rights:
There would be no impairment to existing rights through implementation of the proposed changes, provided that the CRIPP low flow provisions conditioned to Ground Water Certificate No.'s G3-28146C and G3-28683C are carried over and adhered to.

No Detriment to the Public Welfare:
Provided that the transition from Family Farm Development Permits to Family Farm Permits to industrial use is pursued and completed as proposed, the proposed changes will not prove detrimental to the public interest/welfare.

No Enhancement of the Original Certificate:
The quantities of water determined to be available for the proposed changes are those quantities determined to have been put to historical beneficial use. The season of use for these rights will expand, but the potential for impairment to existing rights or instream flows should actually be reduced by expanding the season of use into the winter months. Approving the proposed changes for the 4,864 acre-feet considered herein will not result in an enhancement of the original certificate.

Same Source of Water:
The source of groundwater for the subject water rights will not change as a result of the proposed changes.

CONCLUSIONS AND RECOMMENDATIONS

The above discussion concludes that the proposed changes in place of use, purpose of use, and points of withdrawal to Ground Water Certificate No.'s G3-21037C, G3-21038C, G3-20139C, G3-21936C, G3-24791C, G3-28146C and

G3-28683C will not impair existing rights, will not be detrimental to the public welfare, and will not enhance the original certificates. The proposed changes to Ground Water Certificate No. G3-24791C should be approved, in the amount of 310 gallons per minute, 300 acre-feet per year, continuously, for industrial supply, subject to the following provisions:

"Upon completion of the project, a superceding certificate shall issue only for those quantities of water beneficially used for the purpose authorized."

"The combined withdrawal under Ground Water Certificate No.'s G3-21936C, G3-21037C, G3-21038C, G3-20139C, G3-24791C, G3-28146C and G3-28683C shall not exceed 9,671 gallons per minute, 4,864 acre-feet per year, for continuous industrial supply."

"The amount of water granted is a maximum limit that shall not be exceeded and the water user shall be entitled only to that amount of water within the specified limit that is beneficially used and required.

The water source and/or water transmission facilities are not wholly located upon the land owned by the applicant. Issuance of a permit by this Department for appropriation of the waters in question does not convey a right of access to, or other right to use, land which the applicant does not legally possess. Obtainment of such right is a private matter between applicant and owner of that land.

"This authorization to make use of public waters of the State is subject to existing rights, including any existing rights held by the United States for the benefit of Indians under treaty or otherwise."

"All water wells constructed within the State shall meet the minimum standards for construction and maintenance as provided under RCW 18.104 (Washington Water Well Construction Act of 1971) and Chapter 173-160 WAC (Minimum Standards for Construction and Maintenance of Water Wells)."

An approved measuring device shall be installed and maintained for each of the sources identified herein in accordance with the rule "Requirements for Measuring and Reporting Water Use", Chapter 173-173 WAC. Water use data shall be recorded weekly and shall be submitted annually to Ecology by January 31st of each calendar year.

The rule above describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition Ecology for modifications to some of the requirements. Installation, operation and maintenance requirements are enclosed as a document entitled "Water Measurement Device Installation and Operation Requirements.

At a minimum, the following information shall be included with each submittal of water use data: owner, contact name if different, mailing address, daytime phone number, WRIA, Permit or Certificate #, source name, annual quantity used including units, maximum rate of diversion including units, and period of use. In the future, Ecology may require additional parameters to be reported or more frequent reporting.

Ecology prefers web based data entry, but does accept hard copies. Ecology will provide forms and electronic data entry information by December 31, 2002.

Department of Ecology personnel, upon presentation of proper credentials, shall have access at reasonable times, to the records of water use that are kept to meet the above conditions, and to inspect at reasonable times any measuring device used to meet the above conditions.

DATED this 21st day of March, 2002 in Spokane, Washington.

George B. Schlender
Section Manager, Water Resources Program
Department of Ecology – Eastern Regional Office

GBS:BN:kay
y:WR/Final ROE/Neve/2002/Cert. No. G3-24791C Wallula – Boise 3-7-2002.doc

REPORT OF EXAMINATION

For State of Washington Energy Facility Site Evaluation Council (EFSEC)

TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
February 27, 1986	G3-28146	G3-28146P	G3-28146C

NAME: WALLULA GENERATION, L.L.C.

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
100 Bayview Circle, Suite 500	Newport Beach	California	92660

PUBLIC WATERS TO BE APPROPRIATED

SOURCE: Wells (10)

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
	5,000	2,651

QUANTITY, TYPE OF USE, PERIOD OF USE

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL

#1 - 80 feet north and 80 feet east;
#2 - 525 feet north and 80 feet east;
#3 - 650 feet north and 80 feet east;
#4 - 700 feet north and 250 feet east;
#5 - 80 feet north and 280 feet east;

1-5 ALL from the SW corner of Sec. 11

#6 - 1200 feet north and 1400 feet east;
#7 - 30 feet north and 300 feet east;
#8 - 1300 feet south and 1300 feet east;
#9 - 2500 feet south and 500 feet east;
#10 - 2350 feet south and 1820 feet east;

#6-10 ALL from the center of Sec. 14

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
	11 & 14	7	31 E	32	Walla Walla

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

That portion of Tracts 37 though 44, inclusively, and tracts 53 through 60, inclusively, all of the plat known as the Pasco Plats, Page 8, records of Walla Walla County, all lying in Section 34, Township 8 North, Range 31 East, Willamette Meridian, County of Walla Walla, State of Washington; and that portion of Tracts 65, 80, 81, 96,97, 112, and 113 of the plat known as Attalia Five Acre Tracts, according to the official plat thereof, lying Easterly of the Easterly right of way boundary line of the Washington State Department of Transportation's highway designated as Primary State Highway #3, Pasco to Attalia, as shown on that certain map of definite location now of record and on file in the office of the Director of Highways at Olympia Washington; and more particularly being described as that portion of the Southwest quarter of Section 34, Township 8 North, Range 31 East, Willamette Meridian, County of Walla Walla, State of Washington; and that portion of the East half of the East half of the southeast quarter of Section 33, Township 8 North, Range 31 East, Willamette Meridian, County of Walla Walla, State of Washington, described as follows:

Commencing at a found 2-inch brass cap monument marking the southwest corner of said Section 34; thence North 88°47'18" East, coincident with the South boundary line of the Southwest quarter of said Section 34, a distance of 165.12 feet to the northeast right of way boundary line of the Washington State Department of Transportation's highway designated as Primary State Highway #3, Pasco to Attalia, as shown on that certain map of a definite location now of record and on file in the office of the Director of Highways at Olympia, Washington, and to the Point of Beginning; thence northwesterly on the following two courses coincidental with the northeasterly right of way boundary line of said State Highway #3:

1. northwesterly on a non-tangent 11,385.00-foot radius curve concave to the northeast through a central angle of 9°16'13" to the right, the long chord of said curve being North 18°05'12" West a distance of 1,840.02 feet;
2. North 13°27'06" West a distance of 899.97 feet to the north boundary line of the Northeast quarter of said Section 33;

Thence North 89°32'11" East, coincident with the north boundary line of the Northeast quarter of said Section 33, a distance of 586.12 feet to the Northwest corner of the Southwest quarter of said Section 34; thence North 88°43'39" East, coincident with the north boundary line of the Southwest quarter of said Section 34, a distance of 2708.74 feet to the northwest right of way boundary line of the Union Pacific Railroad; thence South 01°48'07" West, coincident with the northwest right of way boundary line of said Railroad, a distance of 2636.48 feet to the South boundary line of the Southwest quarter of said Section 34, said point bears South 88°47'18" West, coincident with the south boundary line of the Southwest quarter of said Section 34, a distance of 47.07 feet from a found 2-inch U.S. Bureau of Reclamation brass cap marking the Southeast corner of the Southwest quarter of said Section 34; thence South 88°47'18" West, coincident with the south boundary line of the Southwest quarter of said Section 34, a distance of 2431.87 feet to the Point of Beginning.;

Containing 175.529 Acres, more or less.

DESCRIPTION OF PROPOSED WORKS

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
Started	October 1, 2004	October 1, 2005

REPORT

BACKGROUND

Purpose

Wallula Generation, L.L.C. ("WallulaGen") is proposing to construct and operate a natural gas combined cycle electrical generating facility of approximately 1,300 MW at Wallula, Washington. As part of the development of this project, WallulaGen is seeking to transfer water rights from other uses for the purpose of operating the proposed power plant. The proposed changes include changing the points of withdrawal (consolidation of the existing wells), changing the place of use, and changing the purpose of use to the following water rights: Ground Water Certificate No.'s G3-21037C, G3-21038C, G3-20139C, G3-21936C, G3-24791C, G3-28146C and G3-28683C. The purpose of this report is to review the proposed changes to these, and to provide a tentative determination as to the extent of water available for such transfer.

Expedited Processing

In August of 2001, WallulaGen entered into a contract with Ecology to pay $344,200.00 for the purchase of water rights on the lower Walla Walla River. This purchase completed a contract Ecology had entered into earlier with a private landowner to purchase water rights appurtenant to 659 acres located along the lower reach of the Walla Walla River. The water rights purchased are in the process of being placed in the Trust Water Right Program for the purpose of instream flow. The WallulaGen portion of this purchase will result in instream flow augmentation to the Walla Walla River in the amount of approximately 2.8 cubic feet per second from April 1 to July 1.

As part of this contract with WallulaGen, Ecology agreed to provide a tentative determination as to the extent of water available for the proposed transfer, and to write a report outlining those findings. It is the intent of WallulaGen to submit said report to Energy Facility Siting Evaluation Committee ("EFSEC") as part of their effort to license the proposed power plant. (Under Washington State law, EFSEC is responsible for siting and licensing the construction and operation of major energy facilities in Washington State, including this project). Due to the fact WallulaGen's purchase is considered by Ecology to be a significant environmental benefit, Ecology agreed to complete this report on an expedited basis - no later than December 31, 2001, if possible.

INVESTIGATION

Project Description

The proposed project site is located primarily within the SW¼ of Sec. 34, T. 8 N., R. 31 E.W.M. This site is 3.5 miles north of Wallula, Washington, due west of the I.B.P. Inc. processing plant, and on the east side of SR 12. The 183 acre site is zoned Heavy Industrial and is presently in agricultural use. WallulaGen has indicated their desire to change the place of use, purpose of use, add points of withdrawal (consolidation), and season of use to the following water rights to allow for their use in the operation of the proposed power plant: Ground Water Certificate No.'s G3-21037C, G3-21038C, G3-20139C, G3-21936C, G3-24791C, G3-28146C and G3-28683C.

Existing Water Rights/Claims

There are two water rights appurtenant the proposed WallulaGen project site: Ground Water Permit No. G3-29640P and Surface Water Right No. 10703.

Ground Water Permit No. G3-29640P

Priority date:	February 16, 1994
Qi (instantaneous):	1,200 gallons per minute
Qa (annual):	1,800 acre-feet per year
Purpose:	Industrial use
Season:	Continuous
Source:	A well (basalt aquifer)
Point of withdrawal:	SE¼SW¼ of Sec. 34, T. 8 N., R. 31 E.W.M.
Place of use:	Within SE¼ of Sec. 33 and W½of Sec. 34, T. 8 N., R. 31 E.W.M.

This permit issued to the Port of Walla Walla on February 12, 1996. No beneficial use of water has been made under this permit to date, although the subject well has been completed. This permit is in good standing, and WallulaGen has indicated their intent to use water from this well to the full extent possible. In their EFSEC application, they indicate that this permit will be the initial source of water for the plant, with water needs over and above those allocated coming from other sources - primarily the shallow aquifer wells authorized through the water rights proposed for change herein.

There is a change application pending with Ecology for this Permit, filed by the Port of Walla Walla in December of 1996. This application requests authority to add an additional well to the one authorized, to serve as an emergency back-up source to the primary well.

Surface Water Right No. 10703

Priority date:	October 27, 1958
Qi (instantaneous):	80 cubic feet per second
Qa (annual):	23,121 acre-feet per year
Purpose:	Irrigation of 3,303 acres
Season:	March 15 to October 31
Source:	Columbia River
Point of withdrawal:	NE¼SE¼ of Sec. 20, T. 8 N., R. 31 E.W.M.

This water right was issued to the U.S. Bureau of Reclamation, and is administered by the South Columbia Basin Irrigation District. This right has been used on the subject property in the past for irrigation of orchard and grain crops. The applicant has expressed the intent to continue to use at least a portion of their allocation of Surface Water Right No. 10703 for irrigation purposes. Any use of water under Certificate No. 10703 will be independent from the use of water proposed herein for industrial purposes.

Evaluation of Certificate No.'s G3-21037C, G3-21038C, G3-20139C, G3-21936C, G3-24791C, G3-28146C and G3-28683C

In Okanogan Wilderness League v. Town of Twisp, 133 Wn.2d 769, 947 P.2d 732 (1997), the Supreme Court held that applications for change of water rights may be granted only to the extent the water has been historically put to beneficial use, as beneficial use determines the measure of a water right. The Court also held that (1) the existence and quantification of a water right must first be determined, and (2) that it then must be determined whether or not any perfected water right has been lost for nonuse due to statutory relinquishment or common law abandonment before the Department can approve a change or transfer. While Ecology is not considering a formal application for change in development of this report, the evaluation of these rights will be consistent with this court decision.

Below is a summary of the water rights proposed for change/transfer:

Certificate No.	Well No.	Priority Date	Qi (gpm)	Qa (afy)	Acres	Season of Use
G3-28146C [1,2]	1-5	2/27/86	5,000	2,790	600	3/1 - 11/30
G3-28683C [1,2]	1-5	11/2/89	2,500	883	190	3/1 - 11/30
G3-21038C	6	4/19/73	560	279	60	1/1 - 12/31
G3-24791C [3]	7	2/18/76	650	623	124	1/1 - 12/31
G3-21037C	8	4/19/73	800	372	80	1/1 - 12/31
G3-21039C	9	4/19/73	1300	744	160	1/1 - 12/31
G3-21936C	10	10/12/73	530	293	63	1/1 - 12/31

[1]Subject to the minimum flows set forth in the Columbia River Instream Protection Program (WAC 173-563-040 and WAC 173-563-050)
[2]Family Farm Development Certificate
[3]Of these totals, 340 gpm and 158 ac/ft for irrigation of 34 acres are supplemental to existing water rights (G3-21037C)

1. **Historical Beneficial Use**

Beneficial use encompasses two (2) principal elements of a water right: First it refers to the purposes for which water may be used; and second, beneficial use determines the measure of a water right. The measure of a water right refers to the quantities of water actually used, without waste, within the authorized place of use for the purpose(s) authorized. The measure is defined in terms of both annual quantity and instantaneous quantity. Prior to recommending any change to the subject water rights, it is necessary to determine the extent of beneficial use of water under these rights.

a. Purpose

The use authorized under Ground Water Certificate No.'s G3-21037C, G3-21038C, G3-20139C, G3-21936C, G3-24791C, G3-28146C and G3-28683C, irrigation, is explicitly identified in statute as being a beneficial use (RCW 90.54.020(1)).

b. Measure

In order to determine the amount of water available for the requested change, a determination must be made as to the quantities of water beneficially used to irrigate crops on the subject property. Alan Kottwitz, Irrigation Manager for Boise Cascade Fiber Farms, provided meter data for each of the past seven (7) years for all of the wells. These data are summarized below (Note: Water under Certificate No.'s G3-28146C and G3-28683C is withdrawn from five (5) integrated wells; likewise, water withdrawn from the two (2) wells authorized for use under Certificate No.'s G3-21039C and G3-21936C are also integrated. The use of water under these rights is summarized in cumulative form.)

Right No.'s		Right (Ac/ft/yr)	Use - 1995	Use - 1996	Use - 1997	Use - 1998	Use - 1999	Use - 2000	Use - 2001
G3-28146; G3-28683	1 - 5	3,673	3,038	N/A	2,489	3,073	3,302	3,156	3,163
G3-21038	6	279	142	N/A	170	204	225	87	237
G3-24791	7	465 [1]	176	N/A	241	313	316	116	290
G3-21037	8	372	89	N/A	111	121	136	56	160
G3-21039; G3-21936	9 - 10	1073	575	N/A	803	1065	1070	968	1105

[1]Quantity represents primary right only

Note shaded areas represent the maximum year of metered use for each well respectively during the six (6) years of measurement provided.

It is noted that the instantaneous and annual quantities withdrawn in 2001 under Certificate No.'s G3-21039 and G3-21936C exceed those quantities authorized. The acres irrigated under these rights also exceed what is authorized; however, these additional acres are within the place of use of Certificate No. G3-21037C. When taken together, the quantities of water withdrawn and number of acres irrigated do not exceed those authorized through a combination of the three certificates. In essence, Well No.'s 9 and 10 were added as points of withdrawal to Certificate No. G3-21037C without authorization. All three (3) wells withdraw water from the same aquifer, and no real expansion of the rights in total quantities or acres occurred through this "defacto" change. This being the case, consideration can and will be given to the full quantities withdrawn under the various rights. The total gross quantity of water available for change is (3,302+237+316+160+1,105) 5120 acre-feet.

One of the proposed changes to the subject rights is in purpose of use, from irrigation to industrial. A component of the irrigation use, return flows to the Columbia River in the form of deep percolation and surface runoff, would be eliminated if such a change were approved. In order to minimize any potential impairment to the Columbia River by virtue of this change, the estimated return flows should be subtracted from the total amount withdrawn.

Irrigation of hybrid poplars through the subject water rights occurs by means of drip irrigation system. Boise Cascade utilizes 9 neutron probes installed to a depth of 5 feet. The probes were reported to have been read weekly from mid-March to mid-October, with irrigation being managed according to the soil moisture readings. A well-managed drip system can run at a 90% application efficiency, with the 10% loss occurring through a variety of factors including evaporation, deep percolation, and surface runoff. A review of pertinent material in the Washington State Irrigation Guide, and discussions with Brian Leib, WSU Extension Irrigation Specialist, confirm that half of the efficiency loss, or 5%, is a reasonable estimate for deep percolation return flows for the irrigation system described.

A 5% return flow component would equate to 256 acre-ft. The resulting net annual quantity of water available for consideration for transfer is 4,864 acre-feet. The maximum projected annual water use at the WallulaGen plant is expected to be 6,591 acre-feet per year.

Boise Cascade reported cumulative instantaneous withdrawal rates totaling 9,735 gallons per minute from the subject wells. Due to a portion of Certificate No. G3-24791C being supplemental, a total of 9,671 gallons per minute is available for transfer. The total currently authorized is 11,000 gallons per minute. This compares with the projected maximum instantaneous water demand for the project of 7,901 gallons per minute reported in the WallulaGen EFSEC application.

c. Waste

As described above, Boise Cascade has employed a drip irrigation system in utilizing water under the subject rights. Assuming that the drip system was operated in a well-managed manner, this would be a relatively efficient irrigation application method, which would minimize any waste. Operational losses are part of any irrigation system; the losses estimated herein are within what would be necessary and expected.

Hybrid poplars are known to have transpiration rates that are among the highest of temperate deciduous trees. Generally, research suggests that hybrid poplars will "use" as much water as is made available to them; that is, if potential evapotranspiration of a certain quantity exists at a site and that quantity of water is made available to the tree, it will "use" that quantity. While there is no published crop irrigation requirement for hybrid poplars, a review of pertinent literature indicates that single, mature hybrid poplars trees are capable of consuming 7 acre-feet or more of water per year. Ideally the producer would attempt to match applied water to that used by the poplar stand for optimal production. The technology to assess the water use characteristics of a stand is generally not available, and is made more difficult by the fact that the water use will change considerably from early in the stand rotation to later years.

The annual application of water for the hybrid poplars grown on the subject lands, based on information supplied by Boise Cascade, averages 4.35 acre-feet per acre per year. It could be expected that poplars in the Wallula area, with its typically high summer temperatures and windy conditions, would exhibit a relatively high evapotranspiration rate. Given the climate and soil type of the area in which this tree farm has been established, the annual quantity applied would appear to reasonable for optimizing production without waste.

2. Relinquishment/Abandonment

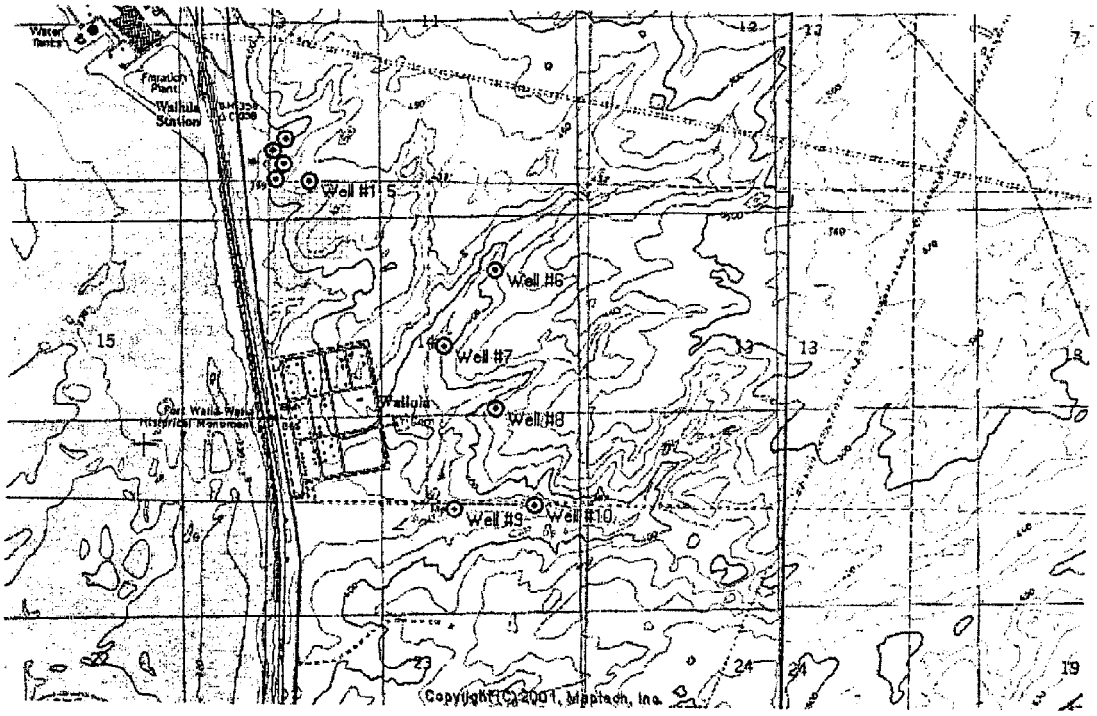
That difference between that amount of water available for the changes requested herein (4,864 acre-feet, 9,671 gallons per minute) and the amount of water authorized in total by the subject water rights (5,826 acre-feet, 11,000 gallons per minute), being 962 acre-feet and 1,329 gallons per minute, would be subject to relinquishment should the changes proposed herein be approved.

Assessment of the Proposed Changes

a. Points of Withdrawal

While no additional wells are proposed through changes to the subject water rights, officials from WallulaGen have indicated a desire to consolidate the existing points of withdrawal under the subject water rights. This would enable WallulaGen to utilize more fully and efficiently the existing higher capacity wells, while maintaining the lower capacity wells as backup or reserve supply for use as needed.

All the subject wells have been completed in the upper alluvial aquifer (see table below). Wells in this area generally range in depth from 50 to 150 feet. The specific capacity of the wells range from 30 to 100 gallons per minute per foot of drawdown. There are two (2) wells located approximately 1.25 miles south of the subject wells. These wells were drilled in 1984, and test pumped and developed at variable withdrawal rates which ranged from 1,000 to 2,000 gallons per minute. These tests indicated that the specific capacity of the wells was related to the types of material in the immediate vicinity of the wells as these materials dictated the size of the screen and therefore the ability of the wells to produce water.



Well No.	Completed Depth (in feet)	Pumping Level * (in feet)	Surface Elevation * (in feet asl)
1	100	95	400
2	99	92	395
3	91	74	380
4	104	75	380
5	135	115	430
6	145	110	428
7	127	Unknown	405
8	150	125	418
9	118	85	387
10	106	70	385

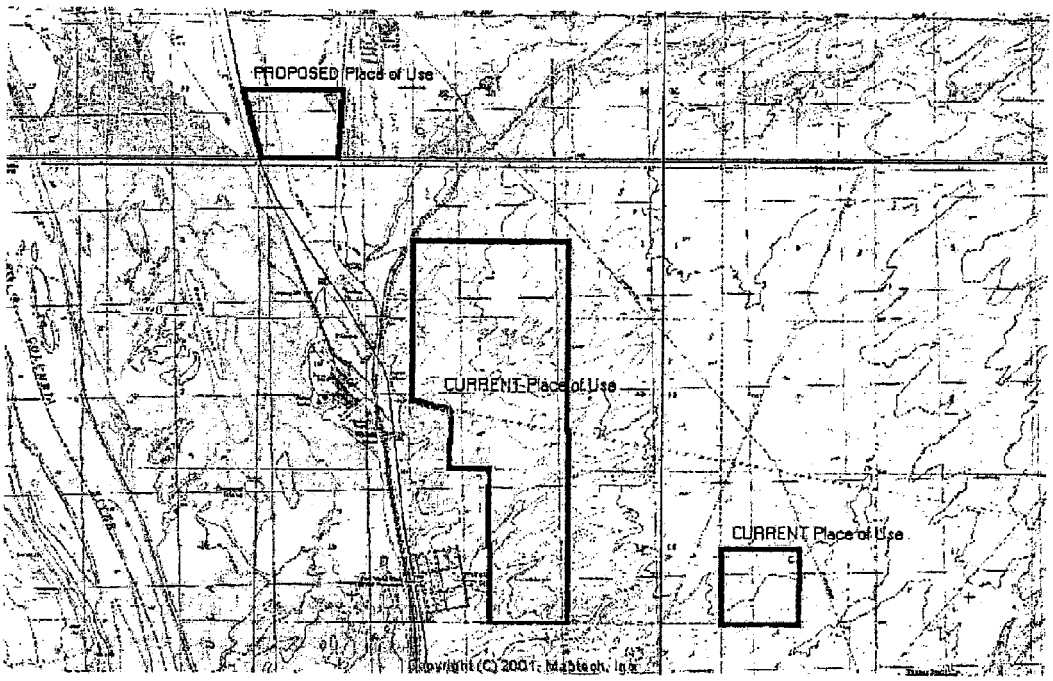
* Estimates supplied by Boise Cascade Fiber Farm

Boise Cascade's "operational use rate" (well yield) for the existing ten wells has been reported as 9,735 gpm during the irrigation season (EFSEC Application - Table 3.3.5.4.1-2). Pumping at up to this rate, they produce approximately 5,000 acre-feet during the irrigation season. The highest demand water month for the WallulaGen

of 4,104 gpm (EFSEC Application - Table 3.3.5.4.1-4). Consolidating the existing points of withdrawal under the subject water rights to utilize more fully and efficiently the existing higher capacity wells will not lead to impairment of any of the nearby, existing water rights. Well interference problems caused by the combined withdrawals of any combination of these existing wells under the power plant operations scenario will be less than the well interference problems that arise under the current pumping scenario.

b. Place of Use

The proposed place of use for these rights is located on an industrial site owned by the Port of Walla Walla. This site is approximately two (2) miles north of the existing place of use. Through this change the poplar plantation currently irrigated through authority of these rights would no longer be irrigated.



c. Purpose/Season of Use

Certificate No.'s G3-28146C and G3-28683C authorize the withdrawal and use of water from March 1 to November 1, while Certificate No.'s G3-21038C, G3-24791C, G3-21037C, G3-21039C and G3-21936C all authorized withdrawal from January 1 to December 31. Use of water under each of these rights has historically occurred during the period of March to November, thereby establishing the season of use for these rights. WallulaGen had requested that the season/purpose of use be expanded from seasonal irrigation to continuous industrial supply.

By increasing the period of use to include December, January and February, a determination as to the potential impacts to existing water rights must be made. Consultants hired by WallulaGen to evaluate these impacts constructed a MODFLOW computer model for the gravel aquifer in the project area. Output from the simulation of the proposed future use (year-round) of the Boise Cascade Corporation fiber farm wells was compared to output from the simulation of the current conditions to identify power plant operation effects. Their results indicate that the annual fluctuation of water levels in the gravel aquifer due to relatively stable year-round pumping (for power plant operations) versus the highly seasonal pumping (for irrigation) will be reduced under the proposed future use. Water levels in December through May are predicted to be lower under future conditions while water levels in June through November are predicted to be higher. The magnitude of the changes are quite small (< +/- 2 feet) except very close to the Boise Cascade Well field (Wells 1 to 5) which will experience slightly larger changes. Existing gravel aquifer wells should not be impaired by the change in the pattern of pumping at the Boise Cascade fiber farm wells because future water level fluctuations should be less than current fluctuations. Also, maximum water use by existing water users typically occurs during the summer months when water levels under future conditions should be higher than historical levels.

If should be noted that both Ground Water Certificate No.'s G3-28146C and G3-28683C were issued subject to the Columbia River Instream Protection Program (CRIPP - WAC 173-563) which specifies minimum flows in the Columbia River which must be met prior to withdrawal of water under these permits. Curtailment of pumping under this regulation can be expected at least once every 20 years, and occurred most recently during the 2001 irrigation season. These provisions would remain with the certificates through approval of any change in season of use.

d. Family Farm Development Permits

Ground Water Certificate No.'s G3-28146C and G3-28683C were issued as Family Farm Development Permits. These types of permits are defined through RCW 90.66.050(2) as follows:

"Such permits may be issued to persons without any limit on the number of acres to be irrigated during a specified period of time permitted for the development of such land into family farms and the transfer of the controlling interest of such irrigate lands to persons qualifying for family farm permits. The initial period of time allowed for development and transfer of such lands to family farm status shall not exceed an additional ten years upon a showing to the department that an additional period of time is needed for the orderly development and transfer of controlling interests to persons who can qualify for family farm permits."

These two permits were issued in 1986 and 1990, respectively, and are currently into the 2nd 10 year extension period allowed to develop and transfer to entities which qualify for Family Farm Permits. WallulaGen is an entity which would qualify for Family Farm Permit status, and has stated their intent to request conversion of these permits to Family Farm status once their purchase option is executed.

Recent legislative changes to Chapter 90.66 allow for changes in purpose of use to Family Farm Permits under certain circumstances. The purpose of use of these Family Farm Permits may change from irrigation to industrial use, if 1). The water right is for the use of water at a location that is, at the time the transfer is approved, within the boundaries of an urban growth area designated under chapter 36.70A RCW {RCW 90.66.065(2) (c)}, and 2). The place of use for the right to be transferred remains within the water resource inventory area containing the place of use for the water right before the transfer {RCW 90.66.065(5)}.

The subject rights meet both of these criteria. The proposed place of use is within the Attalia Industrial Urban Growth Area, an industrial growth area established under the 2001 Walla Walla County Comprehensive Plan. Both the proposed and existing places of use for these rights are within the WRIA 32, Walla Walla River Basin.

Provided that the above-described transaction is completed and controlling interest of these rights accrue to WallulaGen, these rights should be able to be transferred to Family Farms Permits, and subsequently the change in purpose of use for irrigation to industrial supply could be approved.

FINDINGS

Validity/Extent of Water Rights:
The extent and validity of Ground Water Certificate No.'s G3-21037C, G3-21038C, G3-20139C, G3-21936C, G3-24791C, G3-28146C and G3-28683C, has been tentatively determined to equal 9,671 gallons per minute, 4,864 acre-feet per year. The difference between these quantities and that authorized through the subject water rights, 962 acre-feet and 1,329 gallons per minute, are subject to relinquishment.

No Impairment to Existing Rights:
There would be no impairment to existing rights through implementation of the proposed changes, provided that the CRIPP low flow provisions conditioned to Ground Water Certificate No.'s G3-28146C and G3-28683C are carried over and adhered to.

No Detriment to the Public Welfare:
Provided that the transition from Family Farm Development Permits to Family Farm Permits to industrial use is pursued and completed as proposed, the proposed changes will not prove detrimental to the public interest/welfare.

No Enhancement of the Original Certificate:
The quantities of water determined to be available for the proposed changes are those quantities determined to have been put to historical beneficial use. The season of use for these rights will expand, but the potential for impairment to existing rights or instream flows should actually be reduced by expanding the season of use into the winter months. Approving the proposed changes for the 4,864 acre-feet considered herein will not result in an enhancement of the original certificate.

Same Source of Water:
The source of groundwater for the subject water rights will not change as a result of the proposed changes.

CONCLUSIONS AND RECOMMENDATIONS

The above discussion concludes that the proposed changes in place of use, purpose of use, and points of withdrawal to Ground Water Certificate No.'s G3-21037C, G3-21038C, G3-20139C, G3-21936C, G3-24791C, G3-28146C and G3-28683C will not impair existing rights, will not be detrimental to the public welfare, and will not enhance the original certificates. The proposed changes to Ground Water Certificate No. G3-28146C should be approved, in the amount of 5,000 gallons per minute, 2,651 acre-feet per year, continuously, for industrial supply, subject to the following provisions:

"Upon completion of the project, a superceding certificate shall issue only for those quantities of water beneficially used for the purpose authorized."

"If at any time in the future the authorized purpose of use for any portion of this right is changed back to irrigation, that portion shall be subject to the appropriate designation through the Family Farm Water Act, Chapter 90.66 RCW."

"The combined withdrawal under Ground Water Certificate No.'s G3-21936C, G3-21037C, G3-21038C, G3-20139C, G3-24791C, G3-28146C and G3-28683C shall not exceed 9,671 gallons per minute, 4,864 acre-feet per year, for continuous industrial supply."

"The amount of water granted is a maximum limit that shall not be exceeded and the water user shall be entitled only to that amount of water within the specified limit that is beneficially used and required"

The water source and/or water transmission facilities are not wholly located upon the land owned by the applicant. Issuance of a permit by this Department for appropriation of the waters in question does not convey a right of access to, or other right to use, land which the applicant does not legally possess. Obtainment of such right is a private matter between applicant and owner of that land.

"This authorization to make use of public waters of the State is subject to existing rights, including any existing rights held by the United States for the benefit of Indians under treaty or otherwise."

"All water wells constructed within the State shall meet the minimum standards for construction and maintenance as provided under RCW 18.104 (Washington Water Well Construction Act of 1971) and Chapter 173-160 WAC (Minimum Standards for Construction and Maintenance of Water Wells)."

An approved measuring device shall be installed and maintained for each of the sources identified herein in accordance with the rule "Requirements for Measuring and Reporting Water Use", Chapter 173-173 WAC. Water use data shall be recorded weekly and shall be submitted annually to Ecology by January 31st of each calendar year.

The rule above describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition Ecology for modifications to some of the requirements. Installation, operation and maintenance requirements are enclosed as a document entitled "Water Measurement Device Installation and Operation Requirements.

At a minimum, the following information shall be included with each submittal of water use data: owner, contact name if different, mailing address, daytime phone number, WRIA, Permit or Certificate #, source name, annual quantity used including units, maximum rate of diversion including units, and period of use. In the future, Ecology may require additional parameters to be reported or more frequent reporting.

Ecology prefers web based data entry, but does accept hard copies. Ecology will provide forms and electronic data entry information by December 31, 2002.

Department of Ecology personnel, upon presentation of proper credentials, shall have access at reasonable times, to the records of water use that are kept to meet the above conditions, and to inspect at reasonable times any measuring device used to meet the above conditions.

"This authorization for certificate is subject to the following minimum flow provisions as specified in WAC 173-563-040 and WAC 173-563-050 and the following table. It is subject to regulation by the Department of Ecology for protection of instream resources whenever the March 1 forecast of April-September runoff at The Dalles is 60 MAF or less, and when gauged flows are predicted by the BPA 30-Day Power Operation Plan to violate the following minimum, flow provision at:

Primary Control Station McNary
River Mile
Minimum Average Weekly Flow
Columbia River Projects
(1,000 cubic feet/second)

	CHIEF JOSEPH*	WELLS & ROCKY REACH*	ROCK ISLAND & WANAPUM*	PRIEST RAPIDS	MCNARY	JOHN DAY	THE DALLES
Jan	30	30	30	70	60	60	60
Feb	30	30	30	70	60	60	60
Mar	30	30	30	70	60	60	60
Apr 1-15	50	50	60	70	100	100	100
16-25	60	60	60	70	150	150	160
26-30	90	100	110	110	200	200	200
May	100	115	130	130	220	220	220
June 1-15	80	110	110	110	200	200	200
16-30	60	80	80	80	120	120	120
Jul 1-15	60	80	80	80	120	120	120
16-31	90	100	110	110	140	140	140
Aug	85	90	95	95	120	120	120
Sep	40	40	40	40	60	85	90
Oct 1-15	30	35	40	40	60	85	90
16-31	30	35	40	70	60	85	90
Nov	30	30	30	70	60	60	60
Dec	30	30	30	70	60	60	60

*For the reach from Grand Coulee through Wanapum, minimum average weekly flows shall be as shown above, or as necessary to maintain minimum flows (subject to low runoff adjustment) at Priest Rapids, whichever, is higher. As provided in WAC 173-563-505(1), the minimum average weekly flows set forth in this subsection are subject to a reduction of up to 25 percent during low flow years, except that in no case shall the outflow from Priest Rapids Dam be less than 36,000 cubic feet per second.

Use of water under this authorization shall be contingent upon the water right holder's utilization of up-to-date water conservation practices and maintenance of efficient water delivery systems consistent with established regulation requirements and facility capabilities.

Use of water under this authorization can be expected to be curtailed at least once in every 20 years."

DATED this 21st day of March, 2002 in Spokane, Washington.

George B. Schlender
Section Manager, Water Resources Program
Department of Ecology – Eastern Regional Office

BN:kay
y:wr/Final ROE/Neve/2002/Cert. No. G3-28146C Wallula – Boise 3-7-2002.doc

REPORT OF EXAMINATION

For State of Washington Energy Facility Site Evaluation Council (EFSEC)

TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
April 19, 1973	G3-21037	G3-21037P	G3-21037C

NAME: WALLULA GENERATION, L.L.C.

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
100 Bayview Circle, Suite 500	Newport Beach	California	92660

PUBLIC WATERS TO BE APPROPRIATED

SOURCE: Wells (10)

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
	800	217

QUANTITY, TYPE OF USE, PERIOD OF USE

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL

#1 - 80 feet north and 80 feet east;
#2 - 525 feet north and 80 feet east;
#3 - 650 feet north and 80 feet east;
#4 - 700 feet north and 250 feet east;
#5 - 80 feet north and 280 feet east;

1-5 ALL from the SW corner of Sec. 11

#6 - 1200 feet north and 1400 feet east;
#7 - 30 feet north and 300 feet east;
#8 - 1300 feet south and 1300 feet east;
#9 - 2500 feet south and 500 feet east;
#10 - 2350 feet south and 1820 feet east;

#6-10 ALL from the center of Sec. 14

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
	11 & 14	7	31 E	32	Walla Walla

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

That portion of Tracts 37 though 44, inclusively, and tracts 53 through 60, inclusively, all of the plat known as the Pasco Plats, Page 8, records of Walla Walla County, all lying in Section 34, Township 8 North, Range 31 East, Willamette Meridian, County of Walla Walla, State of Washington; and that portion of Tracts 65, 80, 81, 96,97, 112, and 113 of the plat known as Attalia Five Acre Tracts, according to the official plat thereof, lying Easterly of the Easterly right of way boundary line of the Washington State Department of Transportation's highway designated as Primary State Highway #3, Pasco to Attalia, as shown on that certain map of definite location now of record and on file in the office of the Director of Highways at Olympia Washington; and more particularly being described as that portion of the Southwest quarter of Section 34, Township 8 North, Range 31 East, Willamette Meridian, County of Walla Walla, State of Washington; and that portion of the East half of the East half of the southeast quarter of Section 33, Township 8 North, Range 31 East, Willamette Meridian, County of Walla Walla, State of Washington, described as follows:

Commencing at a found 2-inch brass cap monument marking the southwest corner of said Section 34; thence North 88°47'18" East, coincident with the South boundary line of the Southwest quarter of said Section 34, a distance of 165.12 feet to the northeast right of way boundary line of the Washington State Department of Transportation's highway designated as Primary State Highway #3, Pasco to Attalia, as shown on that certain map of a definite location now of record and on file in the office of the Director of Highways at Olympia, Washington, and to the Point of Beginning; thence northwesterly on the following two courses coincidental with the northeasterly right of way boundary line of said State Highway #3:

1. northwesterly on a non-tangent 11,385.00-foot radius curve concave to the northeast through a central angle of 9°16'13" to the right, the long chord of said curve being North 18°05'12" West a distance of 1,840.02 feet;
2. North 13°27'06" West a distance of 899.97 feet to the north boundary line of the Northeast quarter of said Section 33;

Thence North 89°32'11" East, coincident with the north boundary line of the Northeast quarter of said Section 33, a distance of 586.12 feet to the Northwest corner of the Southwest quarter of said Section 34; thence North 88°43'39" East, coincident with the north boundary line of the Southwest quarter of said Section 34, a distance of 2708.74 feet to the northwest right of way boundary line of the Union Pacific Railroad; thence South 01°48'07" West, coincident with the northwest right of way boundary line of said Railroad, a distance of 2636.48 feet to the South boundary line of the Southwest quarter of said Section 34, said point bears South 88°47'18" West, coincident with the south boundary line of the Southwest quarter of said Section 34, a distance of 47.07 feet from a found 2-inch U.S. Bureau of Reclamation brass cap marking the Southeast corner of the Southwest quarter of said Section 34; thence South 88°47'18" West, coincident with the south boundary line of the Southwest quarter of said Section 34, a distance of 2431.87 feet to the Point of Beginning.;

Containing 175.529 Acres, more or less.

DESCRIPTION OF PROPOSED WORKS

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
Started	October 1, 2004	October 1, 2005

REPORT

BACKGROUND

Purpose

Wallula Generation, L.L.C. ("WallulaGen") is proposing to construct and operate a natural gas combined cycle electrical generating facility of approximately 1300 MW at Wallula, Washington. As part of the development of this project, WallulaGen is seeking to transfer water rights from other uses for the purpose of operating the proposed power plant. The proposed changes include changing the points of withdrawal (consolidation of the existing wells), changing the place of use, and changing the purpose of use to the following water rights: Ground Water Certificate No.'s G3-21037C, G3-21038C, G3-20139C, G3-21936C, G3-24791C, G3-28146C and G3-28683C. The purpose of this report is to review the proposed changes to these, and to provide a tentative determination as to the extent of water available for such transfer.

Expedited Processing

In August of 2001, WallulaGen entered into a contract with Ecology to pay $344,200 for the purchase of water rights on the lower Walla Walla River. This purchase completed a contract Ecology had entered into earlier with a private landowner to purchase water rights appurtenant to 659 acres located along the lower reach of the Walla Walla River. The water rights purchased are in the process of being placed in the Trust Water Right Program for the purpose of instream flow. The WallulaGen portion of this purchase will result in instream flow augmentation to the Walla Walla River in the amount of approximately 2.8 cubic feet per second from April 1 to July 1.

As part of this contract with WallulaGen, Ecology agreed to provide a tentative determination as to the extent of water available for the proposed transfer, and to write a report outlining those findings. It is the intent of WallulaGen to submit said report to Energy Facility Siting Evaluation Committee ("EFSEC") as part of their effort to license the proposed power plant. (Under Washington State law, EFSEC is responsible for siting and licensing the construction and operation of major energy facilities in Washington State, including this project). Due to the fact WallulaGen's purchase is considered by Ecology to be a significant environmental benefit, Ecology agreed to complete this report on an expedited basis - no later than December 31, 2001, if possible.

INVESTIGATION

Project Description

The proposed project site is located primarily within the SW¼ of Sec. 34, T. 8 N., R. 31 E.W.M. This site is 3.5 miles north of Wallula, Washington, due west of the I.B.P. Inc. processing plant, and on the east side of SR 12. The 183 acre site is zoned Heavy Industrial and is presently in agricultural use. WallulaGen has indicated their desire to change the place of use, purpose of use, add points of withdrawal (consolidation), and season of use to the following water rights to allow for their use in the operation of the proposed power plant: Ground Water Certificate No.'s G3-21037C, G3-21038C, G3-20139C, G3-21936C, G3-24791C, G3-28146C and G3-28683C.

Existing Water Rights/Claims

There are two (2) water rights appurtenant the proposed WallulaGen project site: Ground Water Permit No. G3-29640P and Surface Water Right No. 10703.

Ground Water Permit No. G3-29640P

Priority date:	February 16, 1994
Qi (instantaneous):	1,200 gallons per minute
Qa (annual):	1,800 acre-feet per year
Purpose:	Industrial use
Season:	Continuous
Source:	A well (basalt aquifer)
Point of withdrawal:	SE¼SW¼ of Sec. 34, T. 8 N., R. 31 E.W.M.
Place of use:	Within SE¼ of Sec. 33 and W½of Sec. 34, T. 8 N., R. 31 E.W.M.

This permit issued to the Port of Walla Walla on February 12, 1996. No beneficial use of water has been made under this permit to date, although the subject well has been completed. This permit is in good standing, and WallulaGen has indicated their intent to use water from this well to the full extent possible. In their EFSEC application, they indicate that this permit will be the initial source of water for the plant, with water needs over and above those allocated coming from other sources - primarily the shallow aquifer wells authorized through the water rights proposed for change herein.

There is a change application pending with Ecology for this Permit, filed by the Port of Walla Walla in December of 1996. This application requests authority to add an additional well to the one authorized, to serve as an emergency back-up source to the primary well.

Surface Water Right No. 10703

Priority date:	October 27, 1958
Qi (instantaneous):	80 cubic feet per second
Qa (annual):	23,121 acre-feet per year
Purpose:	Irrigation of 3,303 acres
Season:	March 15 to October 31
Source:	Columbia River
Point of withdrawal:	NE¼SE¼ of Sec. 20, T. 8 N., R. 31 E.W.M.

This water right was issued to the U.S. Bureau of Reclamation, and is administered by the South Columbia Basin Irrigation District. This right has been used on the subject property in the past for irrigation of orchard and grain crops. The applicant has expressed the intent to continue to use at least a portion of their allocation of Surface Water Right No. 10703 for irrigation purposes. Any use of water under Certificate No. 10703 will be independent from the use of water proposed herein for industrial purposes.

Evaluation of Certificate No.'s G3-21037C, G3-21038C, G3-20139C, G3-21936C, G3-24791C, G3-28146C and G3-28683C

In Okanogan Wilderness League v. Town of Twisp, 133 Wn.2d 769, 947 P.2d 732 (1997), the Supreme Court held that applications for change of water rights may be granted only to the extent the water has been historically put to beneficial use, as beneficial use determines the measure of a water right. The Court also held that (1) the existence and quantification of a water right must first be determined, and (2) that it then must be determined whether or not any perfected water right has been lost for nonuse due to statutory relinquishment or common law abandonment before the Department can approve a change or transfer. While Ecology is not considering a formal application for change in development of this report, the evaluation of these rights will be consistent with this court decision.

Below is a summary of the water rights proposed for change/transfer:

Certificate No.	Well No.	Priority Date	Qi (gpm)	Qa (afy)	Acres	Season of Use
G3-28146C [1,2]	1-5	2/27/86	5,000	2,790	600	3/1 - 11/30
G3-28683C [1,2]	1-5	11/2/89	2,500	883	190	3/1 - 11/30
G3-21038C	6	4/19/73	560	279	60	1/1 - 12/31
G3-24791C [3]	7	2/18/76	650	623	124	1/1 - 12/31
G3-21037C	8	4/19/73	800	372	80	1/1 - 12/31
G3-21039C	9	4/19/73	1300	744	160	1/1 - 12/31
G3-21936C	10	10/12/73	530	293	63	1/1 - 12/31

[1]Subject to the minimum flows set forth in the Columbia River Instream Protection Program (WAC 173-563-040 and WAC 173-563-050)

[2]Family Farm Development Certificate

[3]Of these totals, 340 gpm and 158 ac/ft for irrigation of 34 acres are supplemental to existing water rights (G3-21037C)

1. Historical Beneficial Use

Beneficial use encompasses two principal elements of a water right: First it refers to the purposes for which water may be used; and second, beneficial use determines the measure of a water right. The measure of a water right refers to the quantities of water actually used, without waste, within the authorized place of use for the purpose(s) authorized. The measure is defined in terms of both annual quantity and instantaneous quantity. Prior to recommending any change to the subject water rights, it is necessary to determine the extent of beneficial use of water under these rights.

a. Purpose

The use authorized under Ground Water Certificate No.'s G3-21037C, G3-21038C, G3-20139C, G3-21936C, G3-24791C, G3-28146C and G3-28683C, Irrigation is explicitly identified in statute as being a beneficial use (RCW 90.54.020(1)).

b. Measure

In order to determine the amount of water available for the requested change, a determination must be made as to the quantities of water beneficially used to irrigate crops on the subject property. Alan Kottwitz, Irrigation Manager for Boise Cascade Fiber Farms, provided meter data for each of the past seven years for all of the wells. These data are summarized below (Note: Water under Certificate No.'s G3-28146C and G3-28683C is withdrawn from five (5) integrated wells; likewise, water withdrawn from the two (2) wells authorized for use under

Certificate No.'s G3-21039C and G3-21936C are also integrated. The use of water under these rights is summarized in cumulative form.)

Water Right Nos.	Well No.	Water Right (Ac/ft/yr)	Metered Use - 1995	Metered Use - 1996	Metered Use - 1997	Metered Use - 1998	Metered Use - 1999	Metered Use - 2000	Metered Use - 2001
G3-28146; G3-28683	1 - 5	3,673	3,038	N/A	2,489	3,073	3,302	3,156	3,163
G3-21038	6	279	142	N/A	170	204	225	87	237
G3-24791	7	465 [1]	176	N/A	241	313	316	116	290
G3-21037	8	372	89	N/A	111	121	136	56	160
G3-21039; G3-21936	9 - 10	1073	575	N/A	803	1065	1070	968	1105

[1]Quantity represents primary right only

Note: shaded areas represent the maximum year of metered use for each well respectively during the xix (6) years of measurement provided.

It is noted that the instantaneous and annual quantities withdrawn in 2001 under Certificate No.'s G3-21039 and G3-21936C exceed those quantities authorized. The acres irrigated under these rights also exceed what is authorized; however, these additional acres are within the place of use of Certificate No. G3-21037C. When taken together, the quantities of water withdrawn and number of acres irrigated do not exceed those authorized through a combination of the three (3) certificates. In essence, Well No.'s 9 and 10 were added as points of withdrawal to Certificate No. G3-21037C without authorization. All three wells withdraw water from the same aquifer, and no real expansion of the rights in total quantities or acres occurred through this "defector" change. This being the case, consideration can and will be given to the full quantities withdrawn under the various rights. The total gross quantity of water available for change is (3,302+237+316+160+1105) 5120 acre-feet.

One of the proposed changes to the subject rights is in purpose of use, from irrigation to industrial. A component of the irrigation use, return flows to the Columbia River in the form of deep percolation and surface runoff, would be eliminated if such a change were approved. In order to minimize any potential impairment to the Columbia River by virtue of this change, the estimated return flows should be subtracted from the total amount withdrawn.

Irrigation of hybrid poplars through the subject water rights occurs by means of drip irrigation system. Boise Cascade utilizes 9 neutron probes installed to a depth of 5 feet. The probes were reported to have been read weekly from mid-March to mid-October, with irrigation being managed according to the soil moisture readings. A well-managed drip system can run at a 90% application efficiency, with the 10% loss occurring through a variety of factors including evaporation, deep percolation, and surface runoff. A review of pertinent material in the Washington State Irrigation Guide, and discussions with Brian Leib, WSU Extension Irrigation Specialist, confirm that half of the efficiency loss, or 5%, is a reasonable estimate for deep percolation return flows for the irrigation system described.

A 5% return flow component would equate to 256 acre-ft. The resulting net annual quantity of water available for consideration for transfer is 4,864 acre-feet. The maximum projected annual water use at the WallulaGen plant is expected to be 6,591 acre-feet per year.

Boise Cascade reported cumulative instantaneous withdrawal rates totaling 9,735 gallons per minute from the subject wells. Due to a portion of Certificate No. G3-24791C being supplemental, a total of 9,671 gallons per minute is available for transfer. The total currently authorized is 11,000 gallons per minute. This compares with the projected maximum instantaneous water demand for the project of 7,901 gallons per minute reported in the WallulaGen EFSEC application

c. Waste

As described above, Boise Cascade has employed a drip irrigation system in utilizing water under the subject rights. Assuming that the drip system was operated in a well-managed manner, this would be a relatively efficient irrigation application method, which would minimize any waste. Operational losses are part of any irrigation system; the losses estimated herein are within what would be necessary and expected.

Hybrid poplars are known to have transpiration rates that are among the highest of temperate deciduous trees. Generally, research suggests that hybrid poplars will "use" as much water as is made available to them; that is, if potential evapotranspiration of a certain quantity exists at a site and that quantity of water is made available to the tree, it will "use" that quantity. While there is no published crop irrigation requirement for hybrid poplars, a review of pertinent literature indicates that single, mature hybrid poplars trees are capable of consuming 7 acre-feet or more of water per year. Ideally the producer would attempt to match applied water to that used by the poplar stand for optimal production. The technology to assess the water use characteristics of a stand is generally not available, and is made more difficult by the fact that the water use will change considerably from early in the stand rotation to later years.

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The annual application of water for the hybrid poplars grown on the subject lands, based on information supplied by Boise Cascade, averages 4.35 acre-feet per acre per year. It could be expected that poplars in the Wallula area, with its typically high summer temperatures and windy conditions, would exhibit a relatively high evapotranspiration rate. Given the climate and soil type of the area in which this tree farm has been established, the annual quantity applied would appear to be reasonable for optimizing production without waste.

2. Relinquishment/Abandonment

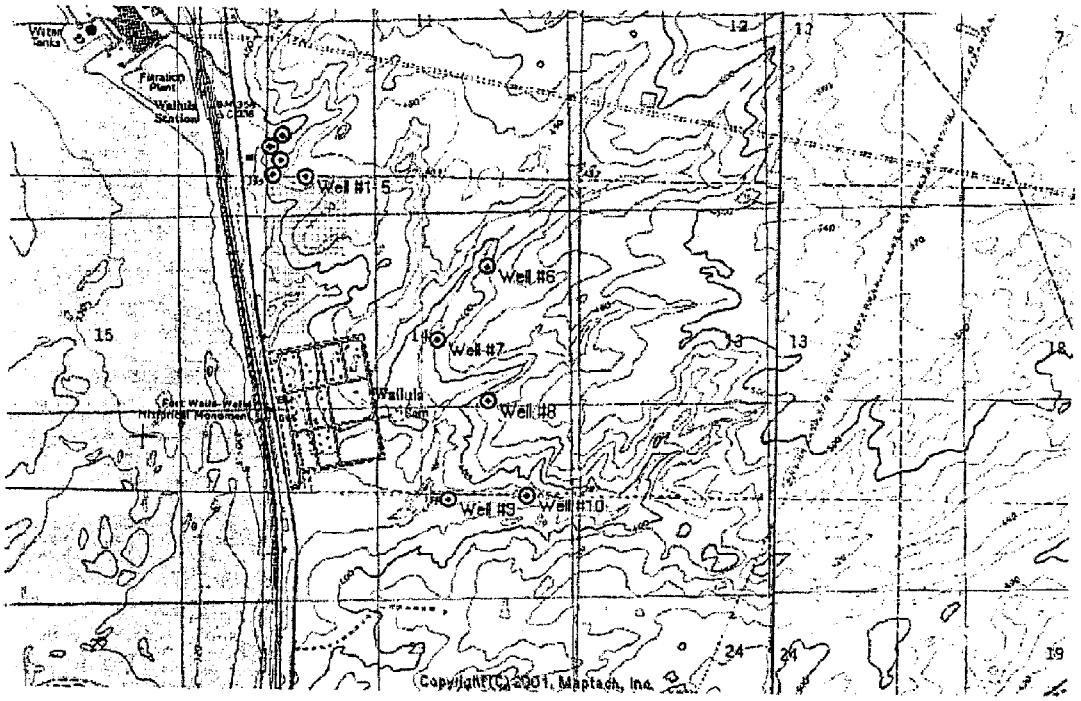
That difference between that amount of water available for the changes requested herein (4,864 acre-feet, 9,671 gallons per minute) and the amount of water authorized in total by the subject water rights (5,826 acre-feet, 11,000 gallons per minute), being 962 acre-feet and 1,329 gallons per minute, would be subject to relinquishment should the changes proposed herein be approved.

Assessment of the Proposed Changes

a. Points of Withdrawal

While no additional wells are proposed through changes to the subject water rights, officials from WallulaGen have indicated a desire to consolidate the existing points of withdrawal under the subject water rights. This would enable WallulaGen to utilize more fully and efficiently the existing higher capacity wells, while maintaining the lower capacity wells as backup or reserve supply for use as needed.

All the subject wells have been completed in the upper alluvial aquifer (see table below). Wells in this area generally range in depth from 50 to 150 feet. The specific capacity of the wells range from 30 to 100 gallons per minute per foot of drawdown. There are two (2) wells located approximately 1.25 miles south of the subject wells. These wells were drilled in 1984. Test pumped and developed at variable withdrawal rates which ranged from 1000 to 2,000 gallons per minute. These tests indicated that the specific capacity of the wells was related to the types of material in the immediate vicinity of the wells as these materials dictated the size of the screen and therefore the ability of the wells to produce water.



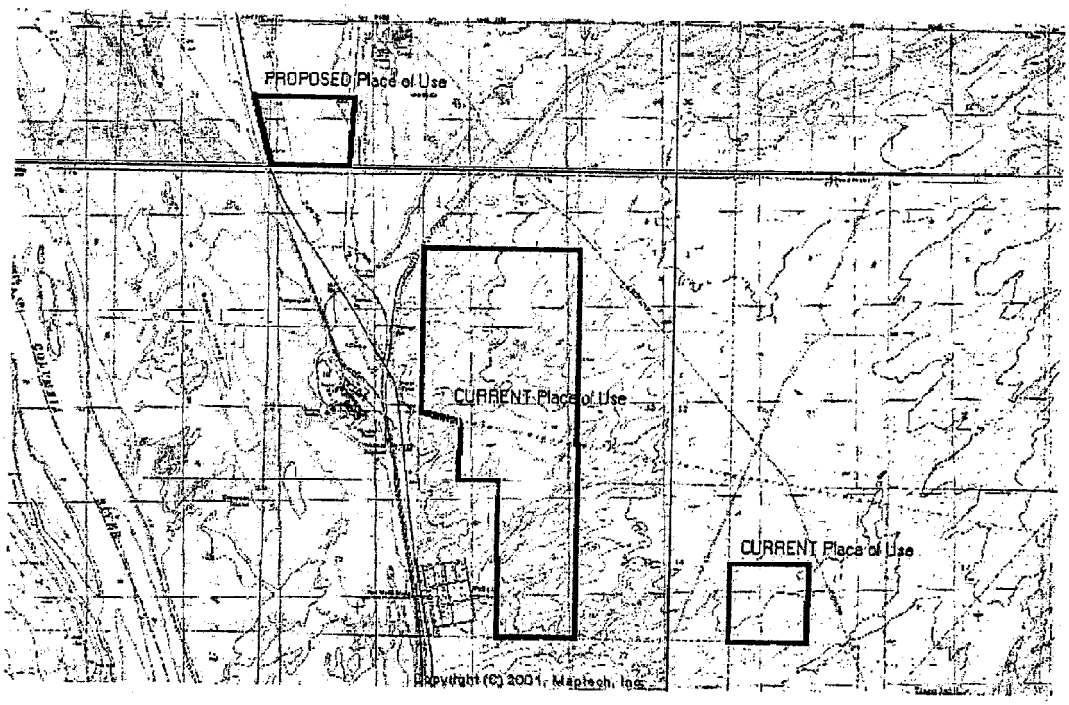
Well No.	Completed Depth (in feet)	Pumping Level * (in feet)	Surface Elevation* (in feet asl)
1	100	95	400
2	99	92	395
3	91	74	380
4	104	75	380
5	135	115	430
6	145	110	428
7	127	Unknown	405
8	150	125	418
9	118	85	387
10	106	70	385

* Estimates supplied by Boise Cascade Fiber Farm

Boise Cascade's "operational use rate" (well yield) for the existing ten wells has been reported as 9,735 gpm during the irrigation season (EFSEC Application - Table 3.3.5.4.1-2). Pumping at up to this rate, they produce approximately 5,000 acre-feet during the irrigation season. The highest demand water month for the WallulaGen power plant, once it is operational, will be July with an estimated annual average withdrawal rate for these ten wells of 4,104 gpm (EFSEC Application - Table 3.3.5.4.1-4). Consolidating the existing points of withdrawal under the subject water rights to utilize more fully and efficiently the existing higher capacity wells will not lead to impairment of any of the nearby, existing water rights. Well interference problems caused by the combined withdrawals of any combination of these existing wells under the power plant operations scenario will be less than the well interference problems that arise under the current pumping scenario.

b. Place of Use

The proposed place of use for these rights is located on an industrial site owned by the Port of Walla Walla. This site is approximately two (2) miles north of the existing place of use. Through this change the poplar plantation currently irrigated through authority of these rights would no longer be irrigated.



c. Purpose/Season of Use

Certificate No.'s G3-28146C and G3-28683C authorize the withdrawal and use of water from March 1 to November 1, while Certificate No.'s G3-21038C, G3-24791C, G3-21037C, G3-21039C and G3-21936C all authorized withdrawal from January 1 to December 31. Use of water under each of these rights has historically occurred during the period of March to November, thereby establishing the season of use for these rights. WallulaGen had requested that the season/purpose of use be expanded from seasonal irrigation to continuous industrial supply.

By increasing the period of use to include December, January and February, a determination as to the potential impacts to existing water rights must be made. Consultants hired by WallulaGen to evaluate these impacts constructed a MODFLOW computer model for the gravel aquifer in the project area. Output from the simulation of the proposed future use (year-round) of the Boise Cascade Corporation fiber farm wells was compared to output from the simulation of the current conditions to identify power plant operation effects. Their results indicate that the annual fluctuation of water levels in the gravel aquifer due to relatively stable year-round pumping (for power plant operations) versus the highly seasonal pumping (for irrigation) will be reduced under the proposed future use. Water levels in December through May are predicted to be lower under future conditions while water levels in June through November are predicted to be higher. The magnitude of the changes are quite small (< +/- 2 feet) except very close to the Boise Cascade Wellfield (Wells 1 to 5) which will experience slightly larger changes. Existing gravel aquifer wells should not be impaired by the change in the pattern of pumping at the Boise Cascade fiber farm wells because future water level fluctuations should be less than current fluctuations. Also, maximum water use by existing water users typically occurs during the summer months when water levels under future conditions should be higher than historical levels.

If should be noted that both Ground Water Certificate No.'s G3-28146C and G3-28683C were issued subject to the Columbia River Instream Protection Program (CRIPP - WAC 173-563) which specifies minimum flows in the Columbia River which must be met prior to withdrawal of water under these permits. Curtailment of pumping under this regulation can be expected at least once every 20 years, and occurred most recently during the 2001 irrigation season. These provisions would remain with the certificates through approval of any change in season of use.

d. Family Farm Development Permits

Ground Water Certificate No.'s G3-28146C and G3-28683C were issued as Family Farm Development Permits. These types of permits are defined through RCW 90.66.050(2) as follows:

"Such permits may be issued to persons without any limit on the number of acres to be irrigated during a specified period of time permitted for the development of such land into family farms and the transfer of the controlling interest of such irrigate lands to persons qualifying for family farm permits. The initial period of time allowed for development and transfer of such lands to family farm status shall not exceed an additional ten years upon a showing to the department that an additional period of time is needed for the orderly development and transfer of controlling interests to persons who can qualify for family farm permits."

These two permits were issued in 1986 and 1990, respectively, and are currently into the 2nd 10 year extension period allowed to develop and transfer to entities which qualify for Family Farm Permits. WallulaGen is an entity which would qualify for Family Farm Permit status, and has stated their intent to request conversion of these permits to Family Farm status once their purchase option is executed.

Recent legislative changes to Chapter 90.66 allow for changes in purpose of use to Family Farm Permits under certain circumstances. The purpose of use of these Family Farm Permits may change from irrigation to industrial use, if 1). The water right is for the use of water at a location that is, at the time the transfer is approved, within the boundaries of an urban growth area designated under chapter 36.70A RCW {RCW 90.66.065(2)(c)}, and 2). The place of use for the right to be transferred remains within the water resource inventory area containing the place of use for the water right before the transfer {RCW 90.66.065(5)}.

The subject rights meet both of these criteria. The proposed place of use is within the Attalia Industrial Urban Growth Area, an industrial growth area established under the 2001 Walla Walla County Comprehensive Plan. Both the proposed and existing places of use for these rights are within the WRIA 32, Walla Walla River Basin.

Provided that the above-described transaction is completed and controlling interest of these rights accrue to WallulaGen, these rights should be able to be transferred to Family Farms Permits, and subsequently the change in purpose of use for irrigation to industrial supply could be approved.

FINDINGS

Validity/Extent of Water Rights:
The extent and validity of Ground Water Certificate No.'s G3-21037C, G3-21038C, G3-20139C, G3-21936C, G3-24791C, G3-28146C and G3-28683C, has been tentatively determined to equal 9,671 gallons per minute, 4,864 acre-feet per year. The difference between these quantities and that authorized through the subject water rights, 962 acre-feet and 1,329 gallons per minute, are subject to relinquishment.

No Impairment to Existing Rights:
There would be no impairment to existing rights through implementation of the proposed changes, provided that the CRIPP low flow provisions conditioned to Ground Water Certificate No.'s G3-28146C and G3-28683C are carried over and adhered to.

No Detriment to the Public Welfare:
Provided that the transition from Family Farm Development Permits to Family Farm Permits to industrial use is pursued and completed as proposed, the proposed changes will not prove detrimental to the public interest/welfare.

No Enhancement of the Original Certificate:
The quantities of water determined to be available for the proposed changes are those quantities determined to have been put to historical beneficial use. The season of use for these rights will expand, but the potential for impairment to existing rights or instream flows should actually be reduced by expanding the season of use into the winter months. Approving the proposed changes for the 4,864 acre-feet considered herein will not result in an enhancement of the original certificate.

Same Source of Water:
The source of groundwater for the subject water rights will not change as a result of the proposed changes.

CONCLUSIONS AND RECOMMENDATIONS

The above discussion concludes that the proposed changes in place of use, purpose of use, and points of withdrawal to Ground Water Certificate No.'s G3-21037C, G3-21038C, G3-20139C, G3-21936C, G3-24791C, G3-28146C and G3-28683C will not impair existing rights, will not be detrimental to the public welfare, and will not enhance the original certificates. The proposed changes to Ground Water Certificate No. G3-21037C should be approved, in the amount of 800 gallons per minute, 217 acre-feet per year, continuously, for industrial supply, subject to the following provisions:

"Upon completion of the project, a superceding certificate shall issue only for those quantities of water beneficially used for the purpose authorized."

"The combined withdrawal under Ground Water Certificate No.'s G3-21936C, G3-21037C, G3-21038C, G3-20139C, G3-24791C, G3-28146C and G3-28683C shall not exceed 9,671 gallons per minute, 4,864 acre-feet per year, for continuous industrial supply."

"The amount of water granted is a maximum limit that shall not be exceeded and the water user shall be entitled only to that amount of water within the specified limit that is beneficially used and required for the actual crop grown on the number of acres and the place of use specified."

The water source and/or water transmission facilities are not wholly located upon the land owned by the applicant. Issuance of a permit by this Department for appropriation of the waters in question does not convey a right of access to, or other right to use, land which the applicant does not legally possess. Obtainment of such right is a private matter between applicant and owner of that land.

"This authorization to make use of public waters of the State is subject to existing rights, including any existing rights held by the United States for the benefit of Indians under treaty or otherwise."

"All water wells constructed within the State shall meet the minimum standards for construction and maintenance as provided under RCW 18.104 (Washington Water Well Construction Act of 1971) and Chapter 173-160 WAC (Minimum Standards for Construction and Maintenance of Water Wells)."

An approved measuring device shall be installed and maintained for each of the sources identified herein in accordance with the rule "Requirements for Measuring and Reporting Water Use", Chapter 173-173 WAC. Water use data shall be recorded weekly and shall be submitted annually to Ecology by January 31st of each calendar year.

The rule above describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition Ecology for modifications to some of the requirements. Installation, operation and maintenance requirements are enclosed as a document entitled "Water Measurement Device Installation and Operation Requirements.

At a minimum, the following information shall be included with each submittal of water use data: owner, contact name if different, mailing address, daytime phone number, WRIA, Permit or Certificate #, source name, annual quantity used including units, maximum rate of diversion including units, and period of use. In the future, Ecology may require additional parameters to be reported or more frequent reporting.

DATED this 21st day of March, 2002 in Spokane, Washington.

George B. Schlender
Section Manager, Water Resources Program
Department of Ecology – Eastern Regional Office

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REPORT OF EXAMINATION

For State of Washington Energy Facility Site Evaluation Council (EFSEC)
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
October 12, 1973	G3-21036	G3-21036P	G3-21036C

NAME
WALLULA GENERATION, L.L.C.

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
100 Bayview Circle, Suite 500	Newport Beach	California	92660

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Wells (10)

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
	530	278

QUANTITY, TYPE OF USE, PERIOD OF USE

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL

#1 - 80 feet north and 80 feet east;
#2 - 525 feet north and 80 feet east;
#3 - 650 feet north and 80 feet east;
#4 - 700 feet north and 250 feet east;
#5 - 80 feet north and 280 feet east;

1-5 ALL from the SW corner of Sec. 11

#6 - 1200 feet north and 1400 feet east;
#7 - 30 feet north and 300 feet east;
#8 - 1300 feet south and 1300 feet east;
#9 - 2500 feet south and 500 feet east;
#10 - 2350 feet south and 1820 feet east;

#6-10 ALL from the center of Sec. 14

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE (E. OR W.) W.M.	W.R.I.A.	COUNTY
	11 & 14	7	31 E	32	Walla Walla

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

That portion of Tracts 37 though 44, inclusively, and tracts 53 through 60, inclusively, all of the plat known as the Pasco Plats, Page 8, records of Walla Walla County, all lying in Section 34, Township 8 North, Range 31 East, Willamette Meridian, County of Walla Walla, State of Washington; and that portion of Tracts 65, 80, 81, 96,97, 112, and 113 of the plat known as Attalia Five Acre Tracts, according to the official plat thereof, lying Easterly of the Easterly right of way boundary line of the Washington State Department of Transportation's highway designated as Primary State Highway #3, Pasco to Attalia, as shown on that certain map of definite location now of record and on file in the office of the Director of Highways at Olympia Washington; and more particularly being described as that portion of the Southwest quarter of Section 34, Township 8 North, Range 31 East, Willamette Meridian, County of Walla Walla, State of Washington; and that portion of the East half of the East half of the southeast quarter of Section 33, Township 8 North, Range 31 East, Willamette Meridian, County of Walla Walla, State of Washington, described as follows:

Commencing at a found 2-inch brass cap monument marking the southwest corner of said Section 34; thence North 88°47'18" East, coincident with the South boundary line of the Southwest quarter of said Section 34, a distance of 165.12 feet to the northeast right of way boundary line of the Washington State Department of Transportation's highway designated as Primary State Highway #3, Pasco to Attalia, as shown on that certain map of a definite location now of record and on file in the office of the Director of Highways at Olympia, Washington, and to the Point of Beginning; thence northwesterly on the following two courses coincidental with the northeasterly right of way boundary line of said State Highway #3:

1. Northwesterly on a non-tangent 11,385.00-foot radius curve concave to the northeast through a central angle of 9°16'13" to the right, the long chord of said curve being North 18°05'12" West a distance of 1,840.02 feet;
2. North 13°27'06" West a distance of 899.97 feet to the north boundary line of the Northeast quarter of said Section 33;

Thence North 89°32'11" East, coincident with the north boundary line of the Northeast quarter of said Section 33, a distance of 586.12 feet to the Northwest corner of the Southwest quarter of said Section 34; thence North 88°43'39" East, coincident with the north boundary line of the Southwest quarter of said Section 34, a distance of 2708.74 feet to the northwest right of way boundary line of the Union Pacific Railroad; thence South 01°48'07" West, coincident with the northwest right of way boundary line of said Railroad, a distance of 2636.48 feet to the South boundary line of the Southwest quarter of said Section 34, said point bears South 88°47'18" West, coincident with the south boundary line of the Southwest quarter of said Section 34, a distance of 47.07 feet from a found 2-inch U.S. Bureau of Reclamation brass cap marking the Southeast corner of the Southwest quarter of said Section 34; thence South 88°47'18" West, coincident with the south boundary line of the Southwest quarter of said Section 34, a distance of 2431.87 feet to the Point of Beginning.;

Containing 175.520 Acres, more or less

DESCRIPTION OF PROPOSED WORKS

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
Started	October 1, 2004	October 1, 2005

REPORT

BACKGROUND

Purpose

Wallula Generation, L.L.C. ("WallulaGen") is proposing to construct and operate a natural gas combined cycle electrical generating facility of approximately 1,300 MW at Wallula, Washington. As part of the development of this project, WallulaGen is seeking to transfer water rights from other uses for the purpose of operating the proposed power plant. The proposed changes include changing the points of withdrawal (consolidation of the existing wells), changing the place of use, and changing the purpose of use to the following water rights: Ground Water Certificate No.'s G3-21037C, G3-21038C, G3-20139C, G3-21936C, G3-24791C, G3-28146C and G3-28683C. The purpose of this report is to review the proposed changes to these, and to provide a tentative determination as to the extent of water available for such transfer.

Expedited Processing

In August of 2001, WallulaGen entered into a contract with Ecology to pay $344,200 for the purchase of water rights on the lower Walla Walla River. This purchase completed a contract Ecology had entered into earlier with a private landowner to purchase water rights appurtenant to 659 acres located along the lower reach of the Walla Walla River. The water rights purchased are in the process of being placed in the Trust Water Right Program for the purpose of instream flow. The WallulaGen portion of this purchase will result in instream flow augmentation to the Walla Walla River in the amount of approximately 2.8 cubic feet per second from April 1 to July 1.

As part of this contract with WallulaGen, Ecology agreed to provide a tentative determination as to the extent of water available for the proposed transfer, and to write a report outlining those findings. It is the intent of WallulaGen to submit said report to Energy Facility Site Evaluation Committee ("EFSEC") as part of their effort to license the proposed power plant. (Under Washington State law, EFSEC is responsible for siting and licensing the construction and operation of major energy facilities in Washington State, including this project). Due to the fact WallulaGen's purchase is considered by Ecology to be a significant environmental benefit, Ecology agreed to complete this report on an expedited basis - no later than December 31, 2001, if possible.

INVESTIGATION

Project Description

The proposed project site is located primarily within the SW¼ of Sec. 34, T. 8 N., R. 31 E.W.M. This site is 3.5 miles north of Wallula, Washington, due west of the I.B.P. Inc. processing plant, and on the east side of SR 12. The 183 acre site is zoned Heavy Industrial and is presently in agricultural use. WallulaGen has indicated their desire to change the place of use, purpose of use, add points of withdrawal (consolidation), and season of use to the following water rights to allow for their use in the operation of the proposed power plant: Ground Water Certificate No.'s G3-21037C, G3-21038C, G3-20139C, G3-21936C, G3-24791C, G3-28146C and G3-28683C.

Existing Water Rights/Claims

There are two (2) water rights appurtenant to the proposed WallulaGen project site: Ground Water Permit No. G3-29640P and Surface Water Right No. 10703.

Ground Water Permit No. G3-29640P

Priority date:	February 16, 1994
Qi (instantaneous):	1,200 gallons per minute
Qa (annual):	1,800 acre-feet per year
Purpose:	Industrial use
Season:	Continuous
Source:	A well (basalt aquifer)
Point of withdrawal:	SE¼SW¼ of Sec. 34, T. 8 N., R. 31 E.W.M.
Place of use:	Within SE¼ of Sec. 33 and W½of Sec. 34, T. 8 N., R. 31 E.W.M.

This permit issued to the Port of Walla Walla on February 12, 1996. No beneficial use of water has been made under this permit to date, although the subject well has been completed. This permit is in good standing, and WallulaGen has indicated their intent to use water from this well to the full extent possible. In their EFSEC application, they indicate that this permit will be the initial source of water for the plant, with water needs over and above those allocated coming from other sources - primarily the shallow aquifer wells authorized through the water rights proposed for change herein.

There is a change application pending with Ecology for this Permit, filed by the Port of Walla Walla in December of 1996. This application requests authority to add an additional well to the one authorized, to serve as an emergency back-up source to the primary well.

Surface Water Right No. 10703

Priority date:	October 27, 1958
i (instantaneous):	80 cubic feet per second
Qa (annual):	23,121 acre-feet per year
Purpose:	Irrigation of 3,303 acres
Season:	March 15 to October 31
Source:	Columbia River
Point of withdrawal:	NE¼SE¼ of Sec. 20, T. 8 N., R. 31 E.W.M.

This water right was issued to the U.S. Bureau of Reclamation, and is administered by the South Columbia Basin Irrigation District. This right has been used on the subject property in the past for irrigation of orchard and grain crops. The applicant has expressed the intent to continue to use at least a portion of their allocation of Surface Water Right No. 10703 for irrigation purposes. Any use of water under Certificate No. 10703 will be independent from the use of water proposed herein for industrial purposes.

Evaluation of Certificate No.'s G3-21037C, G3-21038C, G3-20139C, G3-21936C, G3-24791C, G3-28146C and G3-28683C.

In Okanogan Wilderness League v. Town of Twisp, 133 Wn.2d 769, 947 P.2d 732 (1997), the Supreme Court held that applications for change of water rights may be granted only to the extent the water has been historically put to beneficial use, as beneficial use determines the measure of a water right. The Court also held that (1) the existence and quantification of a water right must first be determined, and (2) that it then must be determined whether or not any perfected water right has been lost for nonuse due to statutory relinquishment or common law abandonment before the Department can approve a change or transfer. While Ecology is not considering a formal application for change in development of this report, the evaluation of these rights will be consistent with this court decision.

ow is a summary of the water rights proposed for change/transfer:

Certificate No.	Well No.	Priority Date	Qi (gpm)	Qa (afy)	Acres	Season of Use
G3-28146C [1,2]	1-5	2/27/86	5,000	2,790	600	3/1 - 11/30
G3-28683C [1,2]	1-5	11/2/89	2,500	883	190	3/1 - 11/30
G3-21038C	6	4/19/73	560	279	60	1/1 - 12/31
G3-24791C [3]	7	2/18/76	650	623	124	1/1 - 12/31
G3-21037C	8	4/19/73	800	372	80	1/1 - 12/31
G3-21039C	9	4/19/73	1300	744	160	1/1 - 12/31
G3-21936C	10	10/12/73	530	293	63	1/1 - 12/31

[1] Subject to the minimum flows set forth in the Columbia River Instream Protection Program (WAC 173-563-040 and WAC 173-563-050)

[2] Family Farm Development Certificate

[3] Of these totals, 340 gpm and 158 ac/ft for irrigation of 34 acres are supplemental to existing water rights (G3-21037C)

1. **Historical Beneficial Use**

Beneficial use encompasses two (2) principal elements of a water right: First it refers to the purposes for which water may be used; and second, beneficial use determines the measure of a water right. The measure of a water right refers to the quantities of water actually used, without waste, within the authorized place of use for the purpose(s) authorized. The measure is defined in terms of both annual quantity and instantaneous quantity. Prior to recommending any change to the subject water rights, it is necessary to determine the extent of beneficial use of water under these rights.

Purpose

The use authorized under Ground Water Certificate No.'s G3-21037C, G3-21038C, G3-20139C, G3-21936C, G3-24791C, G3-28146C and G3-28683C, irrigation, is explicitly identified in statute as being a beneficial use (RCW 90.54.020(1)).

b. Measure

In order to determine the amount of water available for the requested change, a determination must be made as to the quantities of water beneficially used to irrigate crops on the subject property. Alan Kottwitz, Irrigation Manager for Boise Cascade Fiber Farms, provided meter data for each of the past seven years for all of the wells. These data are summarized below. (Note: Water under Certificate No.'s G3-28146C and G3-28683C is withdrawn from five (5) integrated wells; likewise, water withdrawn from the two (2) wells authorized for use under Certificate No.'s G3-21039C and G3-21936C are also integrated. The use of water under these rights is summarized in cumulative form.)

Water Right No.'s	Well No.	Water Right (Ac/ft/yr)	Metered Use - 1995	Metered Use - 1996	Metered Use - 1997	Metered Use - 1998	Metered Use - 1999	Metered Use - 2000	Metered Use - 2001
G3-28146; G3-28683	1 - 5	3,673	3,038	N/A	2,489	3,073	3,102	3,156	3,163
G3-21038	6	279	142	N/A	170	204	225	87	257
G3-24791	7	465 [1]	176	N/A	241	313	316	116	290

G3-21037 G3- 21039; G3-21936	8 9 - 10	372 1073	89 575	N/A N/A	111 803	121 1065	136 1070	56 968	60 1105

[1] Quantity represents primary right only

Note shaded areas represent the maximum year of metered use for each well respectively during the six (6) years of measurement provided.

It is noted that the instantaneous and annual quantities withdrawn in 2001 under Certificate No.'s G3-21039 and G3-21936C exceed those quantities authorized. The acres irrigated under these rights also exceed what is authorized; however, these additional acres are within the place of use of Certificate No. G3-21037C. When taken together, the quantities of water withdrawn and number of acres irrigated do not exceed those authorized through a combination of the three (3) certificates. In essence, Well No.'s 9 and 10 were added as points of withdrawal to Certificate No. G3-21037C without authorization. All three (3) wells withdraw water from the same aquifer, and no real expansion of the rights in total quantities or acres occurred through this "defacto" change. This being the case, consideration can and will be given to the full quantities withdrawn under the various rights. The total gross quantity of water available for change is (3,302+237+316+160+1,105) 5,120 acre-feet.

One of the proposed changes to the subject rights is in purpose of use, from irrigation to industrial. A component of the irrigation use, return flows to the Columbia River in the form of deep percolation and surface runoff, would be eliminated if such a change were approved. In order to minimize any potential impairment to the Columbia River by virtue of this change, estimated return flows should be subtracted from the total amount withdrawn.

Irrigation of hybrid poplars through the subject water rights occurs by means of drip irrigation system. Boise Cascade utilizes nine (9) neutron probes installed to a depth of five (5) feet. The probes were reported to have been read weekly from mid-March to mid-October, with irrigation being managed according to the soil moisture readings. A well-managed drip system can run at a 90% application efficiency, with the 10% loss occurring through a variety of factors including evaporation, deep percolation, and surface runoff. A review of pertinent material in the Washington State Irrigation Guide, and discussions with Brian Leib, WSU Extension Irrigation Specialist, confirm that half of the efficiency loss, or 5%, is a reasonable estimate for deep percolation return flows for the irrigation system described.

A 5% return flow component would equate to 256 acre-ft. The resulting net annual quantity of water available for consideration for transfer is 4,864 acre-feet. The maximum projected annual water use at the WallulaGen plant is expected to be 6,591 acre-feet per year.

Boise Cascade reported cumulative instantaneous withdrawal rates totaling 9,735 gallons per minute from the subject wells. Due to a portion of Certificate No. G3-24791C being supplemental, a total of 9,671 gallons per minute is available for transfer. The total currently authorized is 11,000 gallons per minute. This compares with the projected maximum instantaneous water demand for the project of 7,901 gallons per minute reported in the WallulaGen EFSEC application.

c. Waste

As described above, Boise Cascade has employed a drip irrigation system in utilizing water under the subject rights. Assuming that the drip system was operated in a well-managed manner, this would be a relatively efficient irrigation application method, which would minimize any waste. Operational losses are part of any irrigation system; the losses estimated herein are within what would be necessary and expected.

Hybrid poplars are known to have transpiration rates that are among the highest of temperate deciduous trees. Generally, research suggests that hybrid poplars will "use" as much water as is made available to them; that is, if potential evapotranspiration of a certain quantity exists at a site and that quantity of water is made available to the tree, it will "use" that quantity. While there is no published crop irrigation requirement for hybrid poplars, a review of pertinent literature indicates that single, mature hybrid poplars trees are capable of consuming seven (7) acre-feet or more of water per year. Ideally the producer would attempt to match applied water to that used by the poplar stand for optimal production. The technology to assess the water use characteristics of a stand is generally not available, and is made more difficult by the fact that the water use will change considerably from early in the stand rotation to later years.

The annual application of water for the hybrid poplars grown on the subject lands, based on information supplied by Boise Cascade, averages 4.35 acre-feet per acre per year. It could be expected that poplars in the Wallula area, with its typically high summer temperatures and windy conditions, would exhibit a relatively high evapotranspiration rate. Given the climate and soil type of the area in which this tree farm has been established, the annual quantity applied would appear to reasonable for optimizing production without waste.

2. **Relinquishment/Abandonment**

That difference between that amount of water available for the changes requested herein (4,864 acre-feet, 9,671 gallons per minute) and the amount of water authorized in total by the subject water rights (5,826 acre-feet, 11,000 gallons per minute), being 962 acre-feet and 1,329 gallons per minute, would be subject to relinquishment should the changes proposed herein be approved.

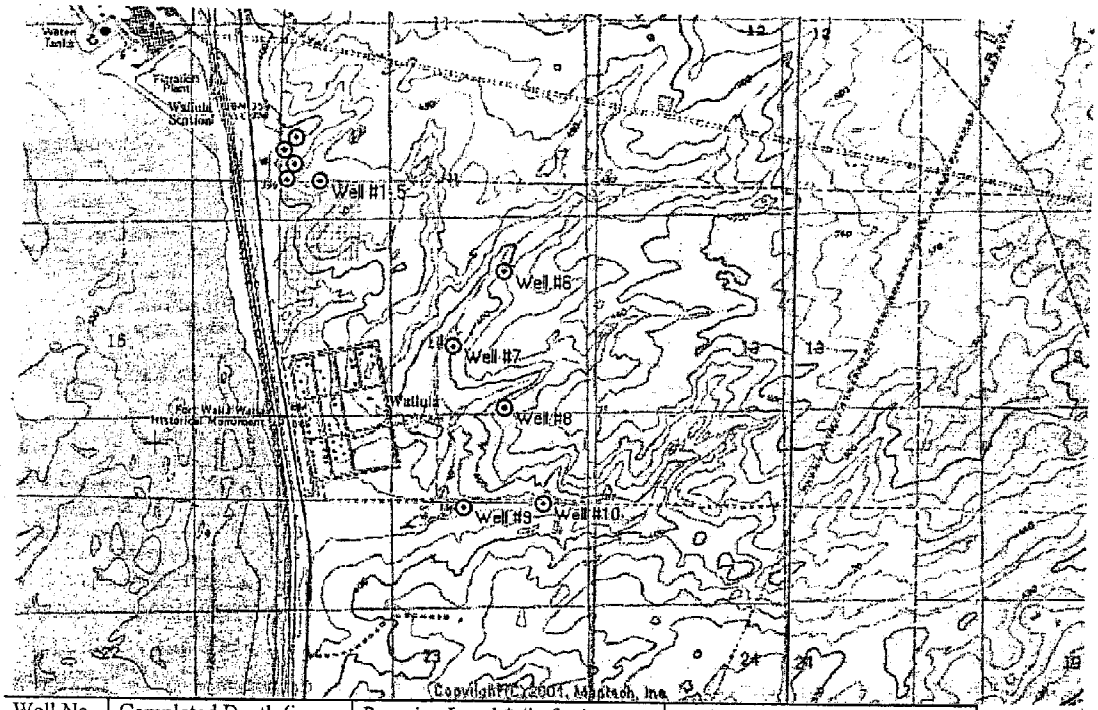
Assessment of the Proposed Changes

1. Points of Withdrawal

REPORT OF EXAMINATION

While no additional wells are proposed through changes to the subject water rights, officials from WallulaGen have indicated a desire to consolidate the existing points of withdrawal under the subject water rights. This would enable WallulaGen to utilize more fully and efficiently the existing higher capacity wells, while maintaining the lower capacity wells as backup or reserve supply for use as needed.

All the subject wells have been completed in the upper alluvial aquifer (see table below). Wells in this area generally range in depth from 50 to 150 feet. The specific capacity of the wells range from 30 to 100 gallons per minute per foot of drawdown. There are two wells (2) located approximately 1.25 miles south of the subject wells. These wells were drilled in 1984, and test pumped and developed at variable withdrawal rates which ranged from 1,000 to 2,000 gallons per minute. These tests indicated that the specific capacity of the wells was related to the types of material in the immediate vicinity of the wells as these materials dictated the size of the screen and therefore the ability of the wells to produce water.



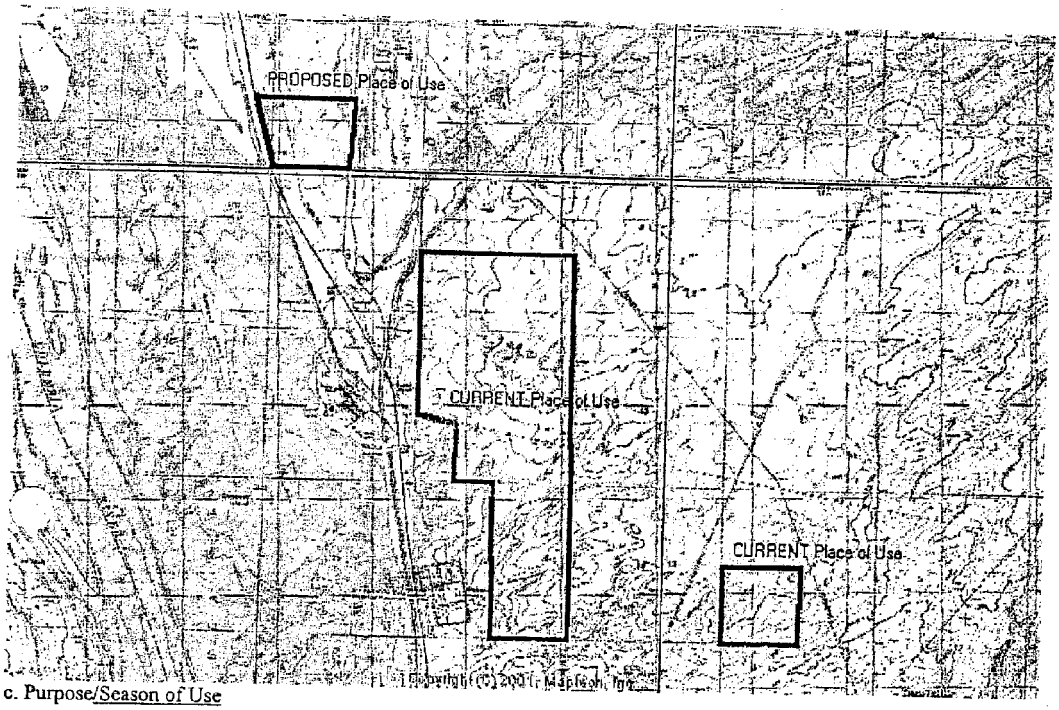
Well No.	Completed Depth (in feet)	Pumping Level * (in feet)	Surface Elevation* (in feet asl)
1	100	95	400
2	99	92	395
3	91	74	380
4	104	75	380
5	135	115	430
6	145	110	428
7	127	Unknown	405
8	150	125	418
9	118	85	387
10	106	70	385

*Estimates supplied by Boise Cascade Fiber Farm

Boise Cascade's "operational use rate" (well yield) for the existing ten wells has been reported as 9,735 gpm during the irrigation season (EFSEC Application - Table 3.3.5.4.1-2). Pumping at up to this rate, they produce approximately 5,000 acre-feet during the irrigation season. The highest demand water month for the WallulaGen power plant, once it is operational, will be July with an estimated average total withdrawal rate for these ten wells of 4,104 gpm (EFSEC Application - Table 3.3.5.4.1-4). Consolidating the existing points of withdrawal under the subject water rights to utilize more fully and efficiently the existing higher capacity wells will not lead to impairment of any of the nearby, existing water rights. Well interference problems caused by the combined withdrawals of any combination of these existing wells under the power plant operations scenario will be less than the well interference problems that arise under the current pumping scenario.

b. Place of Use

The proposed place of use for these rights is located on an industrial site owned by the Port of Walla Walla. This site is approximately two (2) miles north of the existing place of use. Through this change the poplar plantation currently irrigated through authority of these rights would no longer be irrigated.



c. Purpose/Season of Use

Certificate No.'s G3-28146C and G3-28683C authorize the withdrawal and use of water from March 1 to November 1, while Certificate No.'s G3-21038C, G3-24791C, G3-21037C, G3-21039C and G3-21936C all authorized withdrawal from January 1 to December 31. Use of water under each of these rights has historically occurred during the period of March to November, thereby establishing the season of use for these rights. WallulaGen had requested that the season/purpose of use be expanded from seasonal irrigation to continuous industrial supply.

By increasing the period of use to include December, January and February, a determination as to the potential impacts to existing water rights must be made. Consultants hired by WallulaGen to evaluate these impacts constructed a MODFLOW computer model for the gravel aquifer in the project area. Output from the simulation of the proposed future use (year-round) of the Boise Cascade Corporation fiber farm wells was compared to output from the simulation of the current conditions to identify power plant operation effects. Their results indicate that the annual fluctuation of water levels in the gravel aquifer due to relatively stable year-round pumping (for power plant operations) versus the highly seasonal pumping (for irrigation) will be reduced under the proposed future use. Water levels in December through May are predicted to be lower under future conditions while water levels in June through November are predicted to be higher. The magnitude of the changes are quite small (< +/- 2 feet) except very close to the Boise Cascade Wellfield (Wells 1 to 5) which will experience slightly larger changes. Existing gravel aquifer wells should not be impaired by the change in the pattern of pumping at the Boise Cascade fiber farm wells because future water level fluctuations should be less than current fluctuations. Also, maximum water use by existing water users typically occurs during the summer months when water levels under future conditions should be higher than historical levels.

It should be noted that both Ground Water Certificate No.'s G3-28146C and G3-28683C were issued subject to the Columbia River Instream Protection Program (CRIPP - WAC 173-563) which specifies minimum flows in the Columbia River which must be met prior to withdrawal of water under these permits. Curtailment of pumping under this regulation can be expected at least once every 20 years, and occurred most recently during the 2001 irrigation season. These provisions would remain with the certificates through approval of any change in season of use.

Family Farm Development Permits

Ground Water Certificate No.'s G3-28146C and G3-28683C were issued as Family Farm Development Permits. These types of permits are defined through RCW 90.66.050(2) as follows:

"Such permits may be issued to persons without any limit on the number of acres to be irrigated during a specified period of time permitted for the development of such land into family farms and the transfer of the controlling interest of such irrigate lands to persons qualifying for family farm permits. The initial period of time allowed for development and transfer of such lands to family farm status shall not exceed an additional ten years upon a showing to the department that an additional period of time is needed for the orderly development and transfer of controlling interests to persons who can qualify for family farm permits."

These two (2) permits were issued in 1986 and 1990, respectively, and are currently into the 2nd 10 year extension period allowed to develop and transfer to entities which qualify for Family Farm Permits. WallulaGen is an entity which would qualify for Family Farm Permit status, and has stated their intent to request conversion of these permits to Family Farm status once their purchase option is executed.

Recent legislative changes to Chapter 90.66 allow for changes in purpose of use to Family Farm Permits under certain circumstances. The purpose of use of these Family Farm Permits may change from irrigation to industrial use, if 1). The water right is for the use of water at a location that is, at the time the transfer is approved, within the boundaries of an urban growth area designated under chapter 36.70A RCW {RCW 90.66.065(2)(c)}, and 2). The place of use for the right to be transferred remains within the water resource inventory area containing the place of use for the water right before the transfer {RCW 90.66.065(5)}.

The subject rights meet both of these criteria. The proposed place of use is within the Attalia Industrial Urban Growth Area, an industrial growth area established under the 2001 Walla Walla County Comprehensive Plan. Both the proposed and existing places of use for these rights are within the WRIA 32, Walla Walla River Basin.

Provided that the above-described transaction is completed and controlling interest of these rights accrue to WallulaGen, these rights should be able to be transferred to Family Farms Permits, and subsequently the change in purpose of use for irrigation to industrial supply could be approved.

FINDINGS

Validity/Extent of Water Rights:

The extent and validity of Ground Water Certificate No.'s G3-21037C, G3-21038C, G3-20139C, G3-21936C, G3-24791C, G3-28146C and G3-28683C, has been tentatively determined to equal 9,671 gallons per minute, 4,864 acre-feet per year. The difference between these quantities and that authorized through the subject water rights, 962 acre-feet and 1,329 gallons per minute, are subject to relinquishment.

No Impairment to Existing Rights:

There would be no impairment to existing rights through implementation of the proposed changes, provided that the CRIPP flow provisions conditioned to Ground Water Certificate No.'s G3-28146C and G3-28683C are carried over and adhered to.

No Detriment to the Public Welfare:

Provided that the transition from Family Farm Development Permits to Family Farm Permits to industrial use is pursued and completed as proposed, the proposed changes will not prove detrimental to the public interest/welfare.

No Enhancement of the Original Certificate:

The quantities of water determined to be available for the proposed changes are those quantities determined to have been put to historical beneficial use. The season of use for these rights will expand, but the potential for impairment to existing rights or instream flows should actually be reduced by expanding the season of use into the winter months. Approving the proposed changes for the 4,864 acre-feet considered herein will not result in an enhancement of the original certificate.

Same Source of Water:

The source of groundwater for the subject water rights will not change as a result of the proposed changes.

CONCLUSIONS AND RECOMMENDATIONS

The above discussion concludes that the proposed changes in place of use, purpose of use, and points of withdrawal to Ground Water Certificate No.'s G3-21037C, G3-21038C, G3-20139C, G3-21936C, G3-24791C, G3-28146C and G3-28683C will not impair existing rights, will not be detrimental to the public welfare, and will not enhance the original certificates. The proposed changes to Ground Water Certificate No. G3-21036C should be approved, in the amount of 530 gallons per minute, acre-feet per year, continuously, for industrial supply, subject to the following provisions:

"Upon completion of the project, a superceding certificate shall issue only for those quantities of water beneficially used for the purpose authorized."

"The combined withdrawal under Ground Water Certificate No.'s G3-21936C, G3-21037C, G3-21038C, G3-20139C, G3-24791C, G3-28146C and G3-28683C shall not exceed 9,671 gallons per minute, 4,864 acre-feet per year, for continuous industrial supply."

"An approved measuring device shall be installed and maintained in accordance with RCW 90.03.360 and/or WAC 508-64-020 through WAC 508-64-040." (Installation, operation and maintenance requirements attached hereto)."

"The amount of water granted is a maximum limit that shall not be exceeded and the water user shall be entitled only to that amount of water within the specified limit that is beneficially used and required for the actual crop grown on the number of acres and the place of use specified."

The water source and/or water transmission facilities are not wholly located upon the land owned by the applicant. Issuance of a permit by this Department for appropriation of the waters in question does not convey a right of access to, or other right to use, land which the applicant does not legally possess. Obtainment of such right is a private matter between applicant and owner of that land.

REPORT OF EXAMINATION

"This authorization to make use of public waters of the State is subject to existing rights, including any existing rights held by the United States for the benefit of Indians under treaty or otherwise."

"All water wells constructed within the State shall meet the minimum standards for construction and maintenance as provided under RCW 18.104 (Washington Water Well Construction Act of 1971) and Chapter 173-160 WAC (Minimum Standards for Construction and Maintenance of Water Wells)."

An approved measuring device shall be installed and maintained for each of the sources identified herein in accordance with the rule "Requirements for Measuring and Reporting Water Use", Chapter 173-173 WAC. Water use data shall be recorded weekly and shall be submitted annually to Ecology by January 31st of each calendar year.
The rule above describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition Ecology for modifications to some of the requirements. Installation, operation and maintenance requirements are enclosed as a document entitled "Water Measurement Device Installation and Operation Requirements.

At a minimum, the following information shall be included with each submittal of water use data: owner, contact name if different, mailing address, daytime phone number, WRIA, Permit or Certificate #, source name, annual quantity used including units, maximum rate of diversion including units, and period of use. In the future, Ecology may require additional parameters to be reported or more frequent reporting.

DATED this 21st day of March, 2002 in Spokane, Washington.

George B. Schlender
Section Manager, Water Resources Program
Department of Ecology – Eastern Regional Office

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REPORT OF EXAMINATION

REPORT OF EXAMINATION

For State of Washington Energy Facility Site Evaluation Council (EFSEC)
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
November 2, 1989	G3-28683	G3-28683P	G3-28683C

NAME
WALLULA GENERATION, L.L.C.

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
100 Bayview Circle, Suite 500	Newport Beach	California	92660

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Wells (10)

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
	1,200	486

QUANTITY, TYPE OF USE, PERIOD OF USE

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION–WITHDRAWAL

#1 - 80 feet north and 80 feet east;
#2 - 525 feet north and 80 feet east;
#3 - 650 feet north and 80 feet east;
#4 - 700 feet north and 250 feet east;
#5 - 80 feet north and 280 feet east;

1-5 ALL from the SW corner of Sec. 11

#6 - 1200 feet north and 1400 feet east;
#7 - 30 feet north and 300 feet east;
#8 - 1300 feet south and 1300 feet east;
#9 - 2500 feet south and 500 feet east;
#10 - 2350 feet south and 1820 feet east;

#6-10 ALL from the center of Sec. 14

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
	11 & 14	7	31 E	32	Walla Walla

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

That portion of Tracts 37 though 44, inclusively, and tracts 53 through 60, inclusively, all of the plat known as the Pasco Plats, Page 8, records of Walla Walla County, all lying in Section 34, Township 8 North, Range 31 East, Willamette Meridian, County of Walla Walla, State of Washington; and that portion of Tracts 65, 80, 81, 96,97, 112, and 113 of the plat known as Attalia Five Acre Tracts, according to the official plat thereof, lying Easterly of the Easterly right of way boundary line of the Washington State Department of Transportation's highway designated as Primary State Highway #3, Pasco to Attalia, as shown on that certain map of definite location now of record and on file in the office of the Director of Highways at Olympia Washington; and more particularly being described as that portion of the Southwest quarter of Section 34, Township 8 North, Range 31 East, Willamette Meridian, County of Walla Walla, State of Washington; and that portion of the East half of the East half of the southeast quarter of Section 33, Township 8 North, Range 31 East, Willamette Meridian, County of Walla Walla, State of Washington, described as follows:

Commencing at a found 2-inch brass cap monument marking the southwest corner of said Section 34; thence North 88°47'18" East, coincident with the South boundary line of the Southwest quarter of said Section 34, a distance of 165.12 feet to the northeast right of way boundary line of the Washington State Department of Transportation's highway designated as Primary State Highway #3, Pasco to Attalia, as shown on that certain map of a definite location now of record and on file in the office of the Director of Highways at Olympia, Washington, and to the Point of Beginning; thence northwesterly on the following two courses coincidental with the northeasterly right of way boundary line of said State Highway #3:

1. northwesterly on a non-tangent 11,385.00-foot radius curve concave to the northeast through a central angle of 9°16'13" to the right, the long chord of said curve being North 18°05'12" West a distance of 1,840.02 feet;
2. North 13°27'06" West a distance of 899.97 feet to the north boundary line of the Northeast quarter of said Section 33;

Thence North 89°32'11" East, coincident with the north boundary line of the Northeast quarter of said Section 33, a distance of 586.12 feet to the Northwest corner of the Southwest quarter of said Section 34; thence North 88°43'39" East, coincident with the north boundary line of the Southwest quarter of said Section 34, a distance of 2708.74 feet to the northwest right of way boundary line of the Union Pacific Railroad; thence South 01°48'07" West, coincident with the northwest right of way boundary line of said Railroad, a distance of 2636.48 feet to the South boundary line of the Southwest quarter of said Section 34, said point bears South 88°47'18" West, coincident with the south boundary line of the Southwest quarter of said Section 34, a distance of 47.07 feet from a found 2-inch U.S. Bureau of Reclamation brass cap marking the Southeast corner of the Southwest quarter of said Section 34; thence South 88°47'18" West, coincident with the south boundary line of the Southwest quarter of said Section 34, a distance of 2431.87 feet to the Point of Beginning.;

Containing 175.529 Acres, more or less.

DESCRIPTION OF PROPOSED WORKS

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
Started	October 1, 2004	October 1, 2005

REPORT

BACKGROUND

Purpose

Wallula Generation, L.L.C. ("WallulaGen") is proposing to construct and operate a natural gas combined cycle electrical generating facility of approximately 1,300 MW at Wallula, Washington. As part of the development of this project, WallulaGen is seeking to transfer water rights from other uses for the purpose of operating the proposed power plant. The proposed changes include changing the points of withdrawal (consolidation of the existing wells), changing the place of use, and changing the purpose of use to the following water rights: Ground Water Certificate No.'s G3-21037C, G3-21038C, G3-20139C, G3-21936C, G3-24791C, G3-28146C and G3-28683C. The purpose of this report is to review the proposed changes to these, and to provide a tentative determination as to the extent of water available for such transfer.

Expedited Processing

In August of 2001, WallulaGen entered into a contract with Ecology to pay $344,200.00 for the purchase of water rights on the lower Walla Walla River. This purchase completed a contract Ecology had entered into earlier with a private landowner to purchase water rights appurtenant to 659 acres located along the lower reach of the Walla Walla River. The water rights purchased are in the process of being placed in the Trust Water Right Program for the purpose of instream flow. The WallulaGen portion of this purchase will result in instream flow augmentation to the Walla Walla River in the amount of approximately 2.8 cubic feet per second from April 1 to July 1.

As part of this contract with WallulaGen, Ecology agreed to provide a tentative determination as to the extent of water available for the proposed transfer, and to write a report outlining those findings. It is the intent of WallulaGen to submit said report to Energy Facility Siting Evaluation Committee ("EFSEC") as part of their effort to license the proposed power plant. (Under Washington State law, EFSEC is responsible for siting and licensing the construction and operation of major energy facilities in Washington State, including this project). Due to the fact WallulaGen's purchase is considered by Ecology to be a significant environmental benefit, Ecology agreed to complete this report on an expedited basis - no later than December 31, 2001, if possible.

INVESTIGATION

Project Description

The proposed project site is located primarily within the SW¼ of Sec. 34, T. 8 N., R. 31 E.W.M. This site is 3.5 miles north of Wallula, Washington, due west of the I.B.P. Inc. processing plant, and on the east side of SR 12. The 183 acre site is zoned Heavy Industrial and is presently in agricultural use. WallulaGen has indicated their desire to change the place of use, purpose of use, add points of withdrawal (consolidation), and season of use to the following water rights to allow for their use in the operation of the proposed power plant: Ground Water Certificate No.'s G3-21037C, G3-21038C, G3-20139C, G3-21936C, G3-24791C, G3-28146C and G3-28683C.

Existing Water Rights/Claims

There are two water rights appurtenant the proposed WallulaGen project site: Ground Water Permit No. G3-29640P and Surface Water Right No. 10703.

Ground Water Permit No. G3-29640P

Priority date:	February 16, 1994
Qi (instantaneous):	1,200 gallons per minute
Qa (annual):	1,800 acre-feet per year
Purpose:	Industrial use
Season:	Continuous
Source:	A well (basalt aquifer)
Point of withdrawal:	SE¼SW¼ of Sec. 34, T. 8 N., R. 31 E.W.M.
Place of use:	Within SE¼ of Sec. 33 and W½of Sec. 34, T. 8 N., R. 31 E.W.M.

This permit issued to the Port of Walla Walla on February 12, 1996. No beneficial use of water has been made under this permit to date, although the subject well has been completed. This permit is in good standing, and WallulaGen has indicated their intent to use water from this well to the full extent possible. In their EFSEC application, they indicate that this permit will be the initial source of water for the plant, with water needs over and above those allocated coming from other sources - primarily the shallow aquifer wells authorized through the water rights proposed for change herein.

There is a change application pending with Ecology for this Permit, filed by the Port of Walla Walla in December of 1996. This application requests authority to add an additional well to the one authorized, to serve as an emergency back-up source to the primary well.

Surface Water Right No. 10703

Priority date:	October 27, 1958
Qi (instantaneous):	80 cubic feet per second
Qa (annual):	23,121 acre-feet per year
Purpose:	Irrigation of 3,303 acres
Season:	March 15 to October 31
Source:	Columbia River
Point of withdrawal:	NE¼SE¼ of Sec. 20, T. 8 N., R. 31 E.W.M.

This water right was issued to the U.S. Bureau of Reclamation, and is administered by the South Columbia Basin Irrigation District. This right has been used on the subject property in the past for irrigation of orchard and grain crops. The applicant has expressed the intent to continue to use at least a portion of their allocation of Surface Water Right No. 10703 for irrigation purposes. Any use of water under Certificate No. 10703 will be independent from the use of water proposed herein for industrial purposes.

Evaluation of Certificate No.'s G3-21037C, G3-21038C, G3-20139C, G3-21936C, G3-24791C, G3-28146C and G3-28683C

In Okanogan Wilderness League v. Town of Twisp, 133 Wn.2d 769, 947 P.2d 732 (1997), the Supreme Court held that applications for change of water rights may be granted only to the extent the water has been historically put to beneficial use, as beneficial use determines the measure of a water right. The Court also held that (1) the existence and quantification of a water right must first be determined, and (2) that it then must be determined whether or not any perfected water right has been lost for nonuse due to statutory relinquishment or common law abandonment before the Department can approve a change or transfer. While Ecology is not considering a formal application for change in development of this report, the evaluation of these rights will be consistent with this court decision.

Below is a summary of the water rights proposed for change/transfer:

Certificate No.	Well No.	Priority Date	Qi (gpm)	Qa (afy)	Acres	Season of Use
G3-28146C [1,2]	1-5	2/27/86	5,000	2,790	600	3/1 - 11/30
G3-28683C [1,2]	1-5	11/2/89	2,500	883	190	3/1 - 11/30
G3-21038C	6	4/19/73	560	279	60	1/1 - 12/31
G3-24791C [3]	7	2/18/76	650	623	124	1/1 - 12/31
G3-21037C	8	4/19/73	800	372	80	1/1 - 12/31
G3-21039C	9	4/19/73	1300	744	160	1/1 - 12/31
G3-21936C	10	10/12/73	530	293	63	1/1 - 12/31

[1]Subject to the minimum flows set forth in the Columbia River Instream Protection Program (WAC 173-563-040 and WAC 173-563-050)
[2]Family Farm Development Certificate
[3]Of these totals, 340 gpm and 158 ac/ft for irrigation of 34 acres are supplemental to existing water rights (G3-21037C)

1. **Historical Beneficial Use**

Beneficial use encompasses two (2) principal elements of a water right: First it refers to the purposes for which water may be used; and second, beneficial use determines the measure of a water right. The measure of a water right refers to the quantities of water actually used, without waste, within the authorized place of use for the purpose(s) authorized. The measure is defined in terms of both annual quantity and instantaneous quantity. Prior to recommending any change to the subject water rights, it is necessary to determine the extent of beneficial use of water under these rights.

a. Purpose

The use authorized under Ground Water Certificate No.'s G3-21037C, G3-21038C, G3-20139C, G3-21936C, G3-24791C, G3-28146C and G3-28683C, irrigation, is explicitly identified in statute as being a beneficial use (RCW 90.54.020(1)).

b. Measure

In order to determine the amount of water available for the requested change, a determination must be made as to the quantities of water beneficially used to irrigate crops on the subject property. Alan Kottwitz, Irrigation Manager for Boise Cascade Fiber Farms, provided meter data for each of the past seven (7) years for all of the wells. These data are summarized below (Note: Water under Certificate No.'s G3-28146C and G3-28683C is withdrawn from five (5) integrated wells; likewise, water withdrawn from the two (2) wells authorized for use under Certificate No.'s G3-21039C and G3-21936C are also integrated. The use of water under these rights is summarized in cumulative form.)

Water Right No.'s	Well No.	Water Right (Ac/ft/yr)	Metered Use - 1995	Metered Use - 1996	Metered Use - 1997	Metered Use - 1998	Metered Use - 1999	Metered Use - 2000	Metered Use - 2001
G3-28146; G3-28683	1 - 5	3,673	3,038	N/A	2,489	3,073	3,302	3,156	3,163
G3-21038	6	279	142	N/A	170	204	225	87	237
G3-24791	7	465 [1]	176	N/A	241	313	316	116	290
G3-21037	8	372	89	N/A	111	121	136	56	160
G3-21039; G3-21936	9 - 10	1073	575	N/A	803	1065	1070	968	1105

[1]Quantity represents primary right only

Note shaded areas represent the maximum year of metered use for each well respectively during the six (6) years of measurement provided.

It is noted that the instantaneous and annual quantities withdrawn in 2001 under Certificate No.'s G3-21039 and G3-21936C exceed those quantities authorized. The acres irrigated under these rights also exceed what is authorized; however, these additional acres are within the place of use of Certificate No. G3-21037C. When taken together, the quantities of water withdrawn and number of acres irrigated do not exceed those authorized through a combination of the three certificates. In essence, Well No.'s 9 and 10 were added as points of withdrawal to Certificate No. G3-21037C without authorization. All three (3) wells withdraw water from the same aquifer, and no real expansion of the rights in total quantities or acres occurred through this "defacto" change. This being the case, consideration can and will be given to the full quantities withdrawn under the various rights. The total gross quantity of water available for change is (3,302+237+316+160+1,105) 5120 acre-feet.

One of the proposed changes to the subject rights is in purpose of use, from irrigation to industrial. A component of the irrigation use, return flows to the Columbia River in the form of deep percolation and surface runoff, would be eliminated if such a change were approved. In order to minimize any potential impairment to the Columbia River by virtue of this change, the estimated return flows should be subtracted from the total amount withdrawn.

Irrigation of hybrid poplars through the subject water rights occurs by means of drip irrigation system. Boise Cascade utilizes 9 neutron probes installed to a depth of 5 feet. The probes were reported to have been read weekly from mid-March to mid-October, with irrigation being managed according to the soil moisture readings. A well-managed drip system can run at a 90% application efficiency, with the 10% loss occurring through a variety of factors including evaporation, deep percolation, and surface runoff. A review of pertinent material in the Washington State Irrigation Guide, and discussions with Brian Leib, WSU Extension Irrigation Specialist, confirm that half of the efficiency loss, or 5%, is a reasonable estimate for deep percolation return flows for the irrigation system described.

A 5% return flow component would equate to 256 acre-ft. The resulting net annual quantity of water available for consideration for transfer is 4,864 acre-feet. The maximum projected annual water use at the WallulaGen plant is expected to be 6,591 acre-feet per year.

Boise Cascade reported cumulative instantaneous withdrawal rates totaling 9,735 gallons per minute from the subject wells. Due to a portion of Certificate No. G3-24791C being supplemental, a total of 9,671 gallons per minute is available for transfer. The total currently authorized is 11,000 gallons per minute. This compares with the projected maximum instantaneous water demand for the project of 7,901 gallons per minute reported in the WallulaGen EFSEC application.

c. Waste

As described above, Boise Cascade has employed a drip irrigation system in utilizing water under the subject rights. Assuming that the drip system was operated in a well-managed manner, this would be a relatively efficient irrigation application method, which would minimize any waste. Operational losses are part of any irrigation system; the losses estimated herein are within what would be necessary and expected.

Hybrid poplars are known to have transpiration rates that are among the highest of temperate deciduous trees. Generally, research suggests that hybrid poplars will "use" as much water as is made available to them; that is, if potential evapotranspiration of a certain quantity exists at a site and that quantity of water is made available to the tree, it will "use" that quantity. While there is no published crop irrigation requirement for hybrid poplars, a review of pertinent literature indicates that single, mature hybrid poplars trees are capable of consuming 7 acre-feet or more of water per year. Ideally the producer would attempt to match applied water to that used by the poplar stand for optimal production. The technology to assess the water use characteristics of a stand is generally not available, and is made more difficult by the fact that the water use will change considerably from early in the stand rotation to later years.

The annual application of water for the hybrid poplars grown on the subject lands, based on information supplied by Boise Cascade, averages 4.35 acre-feet per acre per year. It could be expected that poplars in the Wallula area, with its typically high summer temperatures and windy conditions, would exhibit a relatively high

evapotranspiration rate. Given the climate and soil type of the area in which this tree farm has been established, the annual quantity applied would appear to reasonable for optimizing production without waste.

2. Relinquishment/Abandonment

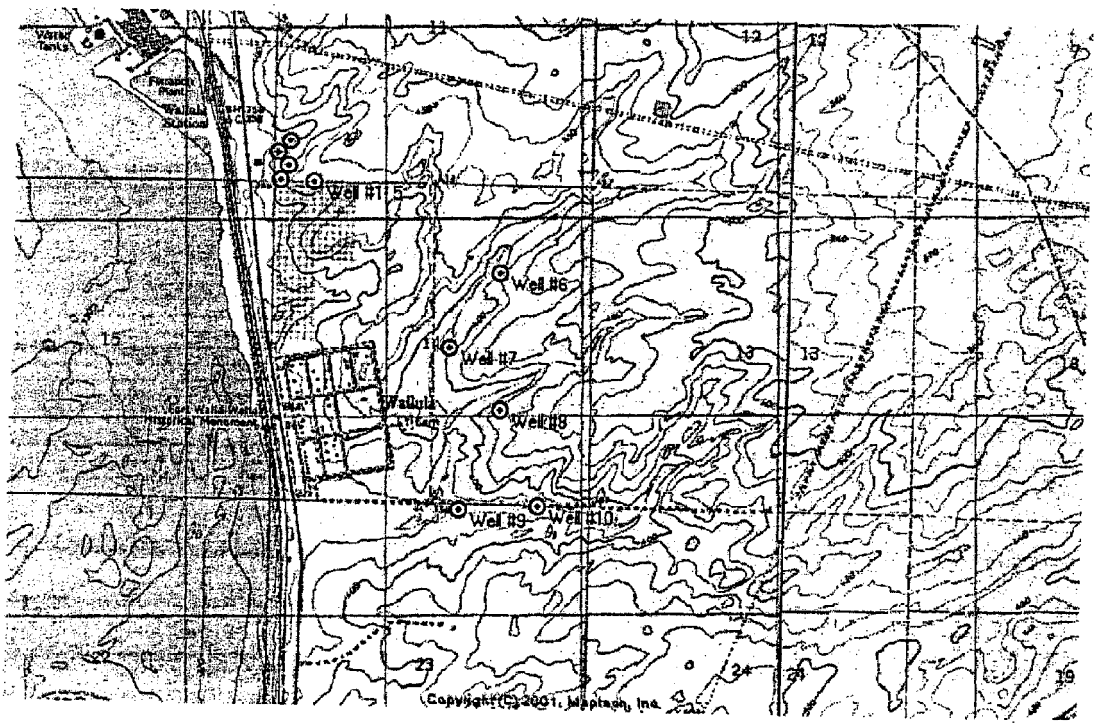
That difference between that amount of water available for the changes requested herein (4,864 acre-feet, 9,671 gallons per minute) and the amount of water authorized in total by the subject water rights (5,826 acre-feet, 11,000 gallons per minute), being 962 acre-feet and 1,329 gallons per minute, would be subject to relinquishment should the changes proposed herein be approved.

Assessment of the Proposed Changes

a. Points of Withdrawal

While no additional wells are proposed through changes to the subject water rights, officials from WallulaGen have indicated a desire to consolidate the existing points of withdrawal under the subject water rights. This would enable WallulaGen to utilize more fully and efficiently the existing higher capacity wells, while maintaining the lower capacity wells as backup or reserve supply for use as needed.

All the subject wells have been completed in the upper alluvial aquifer (see table below). Wells in this area generally range in depth from 50 to 150 feet. The specific capacity of the wells range from 30 to 100 gallons per minute per foot of drawdown. There are two (2) wells located approximately 1.25 miles south of the subject wells. These wells were drilled in 1984, and test pumped and developed at variable withdrawal rates which ranged from 1,000 to 2,000 gallons per minute. These tests indicated that the specific capacity of the wells was related to the types of material in the immediate vicinity of the wells as these materials dictated the size of the screen and therefore the ability of the wells to produce water.



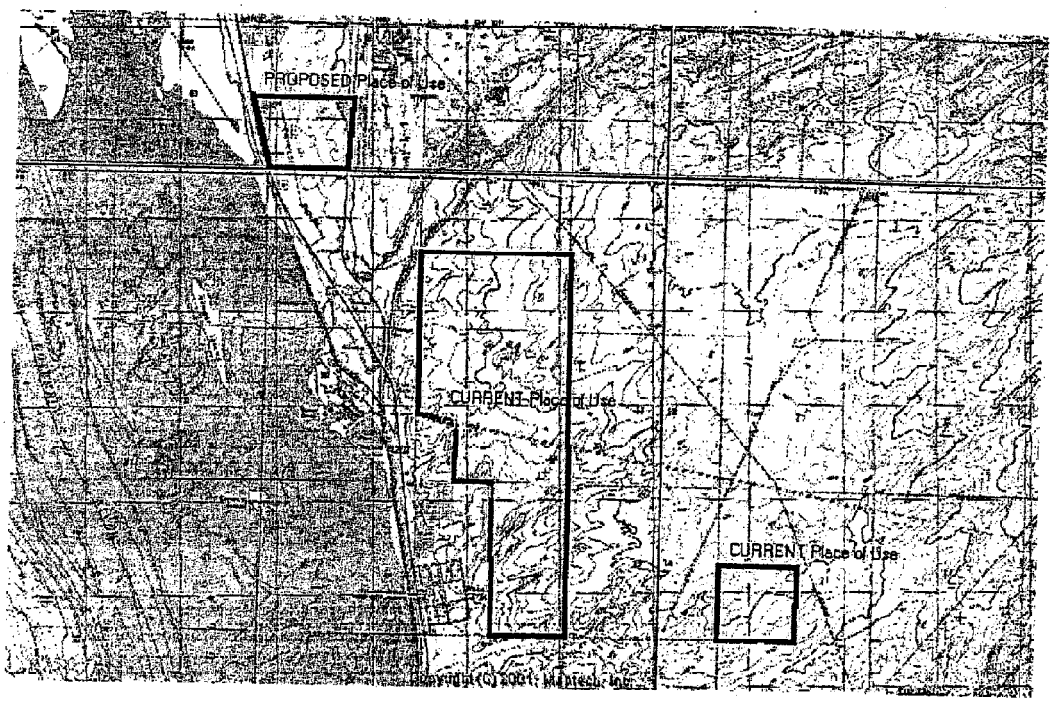
Well No.	Completed Depth (in feet)	Pumping Level * (in feet)	Surface Elevation * (in feet asl)
1	100	95	400
2	99	92	395
3	91	74	380
4	104	75	380
5	135	115	430
6	145	110	428
7	127	Unknown	405
8	150	125	418
9	118	85	387
10	106	70	385

*Estimates supplied by Boise Cascade Fiber Farm

Boise Cascade's "operational use rate" (well yield) for the existing ten wells has been reported as 9,735 gpm during the irrigation season (EFSEC Application - Table 3.3.5.4.1-2). Pumping at up to this rate, they produce approximately 5,000 acre-feet during the irrigation season. The highest demand water month for the WallulaGen power plant, once it is operational, will be July with an estimated average total withdrawal rate for these ten wells of 4,104 gpm (EFSEC Application - Table 3.3.5.4.1-4). Consolidating the existing points of withdrawal under the subject water rights to utilize more fully and efficiently the existing higher capacity wells will not lead to impairment of any of the nearby, existing water rights. Well interference problems caused by the combined withdrawals of any combination of these existing wells under the power plant operations scenario will be less than the well interference problems that arise under the current pumping scenario.

b. Place of Use

The proposed place of use for these rights is located on an industrial site owned by the Port of Walla Walla. This site is approximately two (2) miles north of the existing place of use. Through this change the poplar plantation currently irrigated through authority of these rights would no longer be irrigated.



c. Purpose/Season of Use

Certificate No.'s G3-28146C and G3-28683C authorize the withdrawal and use of water from March 1 to November 1, while Certificate No.'s G3-21038C, G3-24791C, G3-21037C, G3-21039C and G3-21936C all authorized withdrawal from January 1 to December 31. Use of water under each of these rights has historically occurred during the period of March to November, thereby establishing the season of use for these rights. WallulaGen had requested that the season/purpose of use be expanded from seasonal irrigation to continuous industrial supply.

By increasing the period of use to include December, January and February, a determination as to the potential impacts to existing water rights must be made. Consultants hired by WallulaGen to evaluate these impacts constructed a MODFLOW computer model for the gravel aquifer in the project area. Output from the simulation of the proposed future use (year-round) of the Boise Cascade Corporation fiber farm wells was compared to output from the simulation of the current conditions to identify power plant operation effects. Their results indicate that the annual fluctuation of water levels in the gravel aquifer due to relatively stable year-round pumping (for power plant operations) versus the highly seasonal pumping (for irrigation) will be reduced under the proposed future use. Water levels in December through May are predicted to be lower under future conditions while water levels in June through November are predicted to be higher. The magnitude of the changes are quite small (< +/- 2 feet) except very close to the Boise Cascade Well field (Wells 1 to 5) which will experience slightly larger changes. Existing gravel aquifer wells should not be impaired by the change in the pattern of pumping at the Boise Cascade fiber farm wells because future water level fluctuations should be less than current fluctuations. Also, maximum water use by existing water users typically occurs during the summer months when water levels under future conditions should be higher than historical levels.

If should be noted that both Ground Water Certificate No.'s G3-28146C and G3-28683C were issued subject to the Columbia River Instream Protection Program (CRIPP - WAC 173-563) which specifies minimum flows in the Columbia River which must be met prior to withdrawal of water under these permits. Curtailment of pumping under this regulation can be expected at least once every 20 years, and occurred most recently during the 2001 irrigation season. These provisions would remain with the certificates through approval of any change in season of use.

d. Family Farm Development Permits

Ground Water Certificate No.'s G3-28146C and G3-28683C were issued as Family Farm Development Permits. These types of permits are defined through RCW 90.66.050(2) as follows:

"Such permits may be issued to persons without any limit on the number of acres to be irrigated during a specified period of time permitted for the development of such land into family farms and the transfer of the controlling interest of such irrigate lands to persons qualifying for family farm permits. The initial period of time allowed for development and transfer of such lands to family farm status shall not exceed an additional ten years upon a showing to the department that an additional period of time is needed for the orderly development and transfer of controlling interests to persons who can qualify for family farm permits."

These two permits were issued in 1986 and 1990, respectively, and are currently into the 2nd 10 year extension period allowed to develop and transfer to entities which qualify for Family Farm Permits. WallulaGen is an entity which would qualify for Family Farm Permit status, and has stated their intent to request conversion of these permits to Family Farm status once their purchase option is executed.

Recent legislative changes to Chapter 90.66 allow for changes in purpose of use to Family Farm Permits under certain circumstances. The purpose of use of these Family Farm Permits may change from irrigation to industrial use, if 1). The water right is for the use of water at a location that is, at the time the transfer is approved, within the boundaries of an urban growth area designated under chapter 36.70A RCW {RCW 90.66.065(2)(c)}, and 2). The place of use for the right to be transferred remains within the water resource inventory area containing the place of use for the water right before the transfer {RCW 90.66.065(5)}.

The subject rights meet both of these criteria. The proposed place of use is within the Attalia Industrial Urban Growth Area, an industrial growth area established under the 2001 Walla Walla County Comprehensive Plan. Both the proposed and existing places of use for these rights are within the WRIA 32, Walla Walla River Basin.

Provided that the above-described transaction is completed and controlling interest of these rights accrue to WallulaGen, these rights should be able to be transferred to Family Farms Permits, and subsequently the change in purpose of use for irrigation to industrial supply could be approved.

FINDINGS

Validity/Extent of Water Rights:
The extent and validity of Ground Water Certificate No.'s G3-21037C, G3-21038C, G3-20139C, G3-21936C, G3-24791C, G3-28146C and G3-28683C, has been tentatively determined to equal 9,671 gallons per minute, 4,864 acre-feet per year. The difference between these quantities and that authorized through the subject water rights, 962 acre-feet and 1,329 gallons per minute, are subject to relinquishment.

No Impairment to Existing Rights:
There would be no impairment to existing rights through implementation of the proposed changes, provided that the CRIPP low flow provisions conditioned to Ground Water Certificate No.'s G3-28146C and G3-28683C are carried over and adhered to.

No Detriment to the Public Welfare:
Provided that the transition from Family Farm Development Permits to Family Farm Permits to industrial use is pursued and completed as proposed, the proposed changes will not prove detrimental to the public interest/welfare.

No Enhancement of the Original Certificate:
The quantities of water determined to be available for the proposed changes are those quantities determined to have been put to historical beneficial use. The season of use for these rights will expand, but the potential for impairment to existing rights or instream flows should actually be reduced by expanding the season of use into the winter months. Approving the proposed changes for the 4,864 acre-feet considered herein will not result in an enhancement of the original certificate.

Same Source of Water:
The source of groundwater for the subject water rights will not change as a result of the proposed changes.

CONCLUSIONS AND RECOMMENDATIONS

The above discussion concludes that the proposed changes in place of use, purpose of use, and points of withdrawal to Ground Water Certificate No.'s G3-21037C, G3-21038C, G3-20139C, G3-21936C, G3-24791C, G3-28146C and G3-28683C will not impair existing rights, will not be detrimental to the public welfare, and will not enhance the original certificates. The proposed changes to Ground Water Certificate No. G3-28683C should be approved, in the amount of 1,200 gallons per minute, 486 acre-feet per year, continuously, for industrial supply, subject to the following provisions:

"Upon completion of the project, a superceding certificate shall issue only for those quantities of water beneficially used for the purpose authorized."

"If at any time in the future the authorized purpose of use for any portion of this right is changed back to irrigation, that portion shall be subject to the appropriate designation through the Family Farm Water Act, Chapter 90.66 RCW."

"The combined withdrawal under Ground Water Certificate No.'s G3-21936C, G3-21037C, G3-21038C, G3-20139C, G3-24791C, G3-28146C and G3-28683C shall not exceed 9,671 gallons per minute, 4,864 acre-feet per year, for continuous industrial supply."

"The amount of water granted is a maximum limit that shall not be exceeded and the water user shall be entitled only to that amount of water within the specified limit that is beneficially used and required.

The water source and/or water transmission facilities are not wholly located upon the land owned by the applicant. Issuance of a permit by this Department for appropriation of the waters in question does not convey a right of access to, or other right to use, land which the applicant does not legally possess. Obtainment of such right is a private matter between applicant and owner of that land.

"This authorization to make use of public waters of the State is subject to existing rights, including any existing rights held by the United States for the benefit of Indians under treaty or otherwise."

"All water wells constructed within the State shall meet the minimum standards for construction and maintenance as provided under RCW 18.104 (Washington Water Well Construction Act of 1971) and Chapter 173-160 WAC (Minimum Standards for Construction and Maintenance of Water Wells)."

An approved measuring device shall be installed and maintained for each of the sources identified herein in accordance with the rule "Requirements for Measuring and Reporting Water Use", Chapter 173-173 WAC. Water use data shall be recorded weekly and shall be submitted annually to Ecology by January 31st of each calendar year.

The rule above describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition Ecology for modifications to some of the requirements. Installation, operation and maintenance requirements are enclosed as a document entitled "Water Measurement Device Installation and Operation Requirements.

At a minimum, the following information shall be included with each submittal of water use data: owner, contact name if different, mailing address, daytime phone number, WRIA, Permit or Certificate #, source name, annual quantity used including units, maximum rate of diversion including units, and period of use. In the future, Ecology may require additional parameters to be reported or more frequent reporting.

Ecology prefers web based data entry, but does accept hard copies. Ecology will provide forms and electronic data entry information by December 31, 2002.

Department of Ecology personnel, upon presentation of proper credentials, shall have access at reasonable times, to the records of water use that are kept to meet the above conditions, and to inspect at reasonable times any measuring device used to meet the above conditions.

"This authorization for permit is subject to the following minimum flow provisions as specified in WAC 173-563-040 and WAC 173-563-050 and the following table. It is subject to regulation by the Department of Ecology for protection of instream resources whenever the March 1 forecast of April-September runoff at The Dalles is 60 MAF or less, and when gauged flows are predicted by the BPA 30-Day Power Operation Plan to violate the following minimum, flow provision at:

Primary Control Station - McNary River Mile	Minimum Average Weekly Flow Columbia River Projects

(1,000 cubic feet/second)

	CHIEF JOSEPH*	WELLS & ROCKY REACH*	ROCK ISLAND & WANAPUM*	PRIEST RAPIDS	MCNARY	JOHN DAY	THE DALLES
Jan	30	30	30	70	60	60	60
Feb	30	30	30	70	60	60	60
Mar	30	30	30	70	60	60	60
Apr 1-15	50	50	60	70	100	100	100
16-25	60	60	60	70	150	150	160
26-30	90	100	110	110	200	200	200
May	100	115	130	130	220	220	220
June 1-15	80	110	110	110	200	200	200
16-30	60	80	80	80	120	120	120
Jul 1-15	60	80	80	80	120	120	120
16-31	90	100	110	110	140	140	140
Aug	85	90	95	95	120	120	120
Sep	40	40	40	40	60	85	90
Oct 1-15	30	35	40	40	60	85	90
16-31	30	35	40	70	60	85	90
Nov	30	30	30	70	60	60	60
Dec	30	30	30	70	60	60	60

*For the reach from Grand Coulee through Wanapum, minimum average weekly flows shall be as shown above, or as necessary to maintain minimum flows (subject to low runoff adjustment) at Priest Rapids, whichever, is higher. As provided in WAC 173-563-505(1), the minimum average weekly flows set forth in this subsection are subject to a reduction of up to 25 percent during low flow years, except that in no case shall the outflow from Priest Rapids Dam be less than 36,000 cubic feet per second."

Use of water under this authorization shall be contingent upon the water right holder's utilization of up-to-date water conservation practices and maintenance of efficient water delivery systems consistent with established regulation requirements and facility capabilities.

Use of water under this authorization can be expected to be curtailed at least once in every 20 years."

DATED this 21st day of March, 2002 in Spokane, Washington.

George B. Schlender
Section Manager, Water Resources Program
Department of Ecology – Eastern Regional Office

BN:kay
y:WR/Final ROE/Neve/2002/Cert. No. G3-28683C Wallula – Boise 3-7-2002.doc

WALLULA-SMITHS HARBOR SEGMENT OF THE WALLULA-MCNARY TRANSMISSION LINE PROJECT BIOLOGICAL ASSESSMENT

Prepared for:

BONNEVILLE POWER ADMINISTRATION
Portland, Oregon

Prepared by:

ENTRIX, INC.
Olympia, WA

Project No. 326801

July 26, 2002

WALLULA-SMITHS HARBOR SEGMENT OF THE WALLULA-MCNARY TRANSMISSION LINE PROJECT BIOLOGICAL ASSESSMENT

Prepared for:

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July 26, 2002

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Wallula Generation, LLC is proposing to build and operate a 1,300-megawatt (MW) natural gas-fired combustion turbine power plant and associated facilities in Walla Walla County, Washington. The Wallula Power Project would be designed to provide low cost electric energy to meet the growing needs of the Pacific Northwest and other interconnected electric transmission areas where electrical energy is needed.

The overall project, which is shown in Figure 1.1, can be divided into four general components, summarized in the following bullets. **This biological assessment (BA) is provided for the 5.1-mile Wallula-Smiths Harbor transmission line segment and the Smiths Harbor Switchyard (First two bullets listed below).**

- **A 5.1-mile 500-kilovolt (kV) transmission line (Wallula-Smiths Harbor transmission line segment) to interconnect the proposed Wallula Power Plant to the existing electrical grid system.**

- **A new electric switchyard (Smiths Harbor Switchyard) where the interconnection of the new power to the existing power grid would take place.**

- The power generation plant and it's associated facilities (Wallula Substation).

- A 28-mile 500-kV transmission line connecting the new switchyard and the existing McNary Substation (Smiths Harbor-McNary segment).

The proposed power plant, facilities and associated utility line will be located approximately 8 miles south of the city of Pasco, in southeastern Washington. These utility lines include a 4.6-mile makeup water supply pipeline from the existing Boise Cascade Corporation fiber farm water wells, a 5.9-mile natural gas pipeline interconnection, and permanent county access roads. A biological assessment has been previously completed for this portion of the Wallula Power Project (Appendix D).

To distribute the electricity generated by the Wallula Power Project to the locations requested by the proponent, the Bonneville Power Administration (BPA) has determined that 5.1-miles of new 500-kV transmission line and the construction of a new switchyard at Smiths Harbor switchyard would be required. **The 5.1-mile segment (Wallula-Smiths Harbor segment) and the Smiths Harbor Substation are the primary focus of this biological assessment (BA).**

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The 28-mile segment of transmission line would not be needed at this time for the Wallula Power Project, but may be needed in the near future if other proposed projects are approved.

The Wallula-Smiths Harbor transmission line and the Smiths Harbor Switchyard are both interrelated and interdependent on the completion of the Wallula Power Plant. If the proposed Wallula Power Plant does not go forward and is not built, there will be no need for the transmission line or the switchyard. Conversely, without the completion of the transmission line and switchyard, the power plant will have no ability to transfer its electrical generation and would therefor be not viable.

2.1 PROJECT LOCATION AND ACTION AREAS

The Wallula-Smiths Harbor 500-kV transmission line for the Wallula Power Project originates at the generation plant, which is located in the northwestern portion of Walla Walla County, Washington. The generation plant is approximately 8 miles south of the City of Pasco, 2 miles north of the unincorporated community of Wallula, and 7 miles southeast of the unincorporated community of Burbank. The project site is within the southern half of Section 34, Township 8 North, Range 8 East, and is bordered on the west by Highway 12 with the Union Pacific Railroad bordering the project site to the east. Lake Wallula (the McNary Pool reach of the Columbia River) is located approximately 800 feet to the west. The transmission line is approximately 5.1 miles in length and terminates at the proposed Smiths Harbor switchyard that is located in the northwest corner of the northeast quarter of Section 24, Township 7 North, Range 31 East. Figure 2.1 shows a detail of the Wallula-Smiths Harbor segment along its newly proposed route.

All areas within a two-mile radius of the project are to be considered "action areas" under the Endangered Species Act (ESA), as defined by the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS). The action areas for the Wallula-Smiths Harbor transmission line segment and the Smiths Harbor Switchyard incorporate areas of industrial development, agricultural croplands, undeveloped grass and shrub-steppe habitat, as well as portions of the Columbia River. This action area also incorporates part of a 1,243-acre cottonwood farm to be purchased from Boise Cascade Corporation, by Wallula Generation, LLC.

2.2 PROJECT DESCRIPTION

The Wallula-Smiths Harbor segment is required to connect the Wallula Power Project to the existing Federal Columbia River Transmission System grid. Currently there are no existing high voltage transmission lines along this portion of the route. Much of this segment of transmission line would be on land, with the rights either owned or optioned by Wallula Generation, LLC.

2.2.1 RIGHT OF WAY AND ACCESS ROADS

BPA would acquire any additional easements for right-of-way needed for the transmission lines or access roads from the landowners. The easements would give BPA the rights to construct, operate and maintain the line and access roads in perpetuity. A right-of-way 150 feet in width would be purchased for the 5.1-mile Wallula-Smiths Harbor segment of the transmission line.

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General right-of-way access in the Wallula-Smiths Harbor segment is primarily along county and agricultural roads. Access for the transmission line would be from new roads constructed within the right-of-way purchased by BPA. New roads would be 16 feet wide and located within the right-of-way paralleling the transmission line. The road would be constructed from near the NE corner of section 23 T7N R31E to the approximate middle of the east border of section 2 T7N R31E (approximately three miles). From the approximate middle of the east border of section 2 T7N R31E, the road will continue in as straight a route as practical to the Wallula Power Generation Plant.

Access to the new Smiths Harbor Switchyard will require major reconstruction and rocking of one road approximately three miles long. The section line road to the east of the existing Boise Cascade tree farm (along the boundary between sections 1 and 2, 11 and 12, 13 and 14, T7N R31E) would be widened to a 20-foot wide single-lane road with a gravel top course for access to the switchyard. The zone of disturbance for road construction would be approximately 25 feet wide.

Currently, road access to the transmission line right-of-way exists along much of this segment and minimal improvements would be required. Access to the Wallula-Smiths Harbor segment is provided by Attalia Road, a graded gravel road that runs from Highway 12 to approximately the middle of the north-south run of this segment. Furthermore, access on the northern portion of the segment is provided by three graded dirt roads which converge together and then connect to Highway 12.

2.2.2 TRANSMISSION LINE AND TOWERS

The approximately 5.1-mile Wallula-Smiths Harbor segment would be constructed along a new right-of-way that does not parallel any existing BPA transmission lines. Construction of this transmission line would take advantage of existing county and other public roads for access, to the maximum extent practicable, as well as private agricultural access roads with appropriate landowner easement. The route of this transmission line primarily traverses shrub-steppe environments.

The 500-kV transmission line would be supported by approximately 25 steel lattice structures averaging 145 feet in height. Most of these structures would be the “delta” design, which are designed to elevate the wires a safe distance above the ground on relatively straight stretches between towers. The standard span distance between these structures would be approximately 1,150 feet. At locations where the run of the transmission line undergoes sharp angled turns and at each end of the run “dead end” structures will be needed. These dead end structures elevate the conductors above the ground and equalize tension of the conductors between two segments of transmission line when the line makes a turn. Approximately six dead end structures would be needed.

2.2.3 SMITHS HARBOR SWITCHYARD

The Smiths Harbor Switchyard would be a new facility in the transmission system. The switchyard would be constructed within shrub-steppe habitat. A switchyard serves the same functions as a substation except that it does not regulate voltage fluctuations. The following equipment would be required at the Smiths Harbor Switchyard:

- Switchyard fence – A chain-link fence with barbed wire on top provides security and safety. Space to maneuver construction and maintenance vehicles is provided between the fence and the electrical equipment.

- Switchyard rock surfacing – A 3-inch layer of rock selected for its insulating properties is placed on the ground within the switchyard to protect operation and maintenance personnel from electrical danger during switchyard electrical failures.

- Bus tubing, bus pedestals – Power moves within a switchyard and between breakers and other equipment on rigid aluminum pipes called bus tubing. Bus tubing is elevated by supports called bus pedestals.

2.2.4 OPERATION AND MAINTENANCE ACTIVITIES

BPA would perform routine and periodic maintenance and emergency repairs on structures, switchyards, conductors and other equipment. These activities could include replacing insulators or repairing damaged conductors and other ancillary equipment. Within switchyards, BPA may need to replace equipment periodically. BPA would utilize the access roads described in the previous sections to perform repairs and routine maintenance.

BPA would also maintain the access roads and the right-of ways. Maintenance on roads would include road grading, clearing of vegetation, and repairing ditches and culverts as necessary. Very little clearing of vegetation is anticipated for maintenance of the right-of-way. However, any vegetation would be trimmed if necessary to maintain regulatory height restrictions near the transmission lines.

2.2.5 BOISE CASCADE COTTONWOOD FARM

The Wallula Power Project would include the purchase of the Boise Cascade Corporation cottonwood plantation land to the south/southeast of the proposed generation site. Water currently used to irrigate 1,243-acres of the cottonwood plantation would be diverted for use at the power plant. As a result, the use of this land for irrigated agriculture would cease. The land where the cottonwood plantation is currently located would be managed as a conservation area and converted to cultivated dryland grasses or dryland grasses and shrubs.

3.1 SPECIES INFORMATION

Information on federally threatened, endangered, and candidate species has been obtained from the U.S. Fish and Wildlife Service (USFWS 2000 and 2001), Washington Department of Fish and Wildlife (2000 and 2001), and the National Marine Fisheries Service (NMFS 2000). Furthermore, the USFWS responded to a request for an updated listing of species on August 29, 2001 (Appendix A). Table 1 summarizes the state and federal species of concern potentially located in the action area for this BA.

Additional information has been requested from USFWS and will be included in an addendum if necessary. The action area for the current project is within the area covered by the endangered and threatened species listings previously attained. Habitat types and availability are consistent with the previous action area, with the exception of a large cottonwood farm in the current site. Given the proximity and similarities between the sites, no issues are foreseen arising from this assumption. New information regarding ESA-listed of proposed species occurrences in or near the action areas is anticipated.

3.1.1 SNAKE RIVER SOCKEYE SALMON HABITAT USE AND CRITICAL HABITAT AVAILABILITY IN ACTION AREA

Snake River sockeye salmon (*Oncorhynchus nerka*) were formally listed as an endangered species under the ESA on November 20, 1991 (56 FR 58619). During their migration to and from their spawning habitat, this evolutionarily significant unit (ESU) of Snake River sockeye will migrate thorough the action area of this project. Even though the boundary limit for this ESU of sockeye salmon lies entirely within the state of Idaho, the mainstem Columbia River from the mouth to the confluence of the Snake River has been designated critical habitat for Snake River sockeye salmon (58 FR 68543).

The Snake River sockeye salmon are considered to be “lake-type” sockeye salmon. This means the adults will spawn in lakes or near lakes. After emergence, the juveniles will migrate to lakes and spend one to three years there before their migration to marine waters. After a one to four year period in the ocean, sockeye salmon will migrate back to their spawning sites (Gustafson et al. 1997). Sockeye salmon have similar environmental requirements as other Pacific salmonids, e.g. substantial cover, high water quality and water temperatures general less then 15^{o} C.

During the migration from Redfish Lake in Idaho to the ocean, the juvenile Snake River sockeye salmon will migrate past the action area between the months of April to May. Returning adults migrate back to Redfish Lake from July through September (Waples and

Table 1. Summary Listing of Species of Concern for the Project Vicinity and Associated Areas.

Common Name	Scientific Name	Federal Status	State Status	Sited During Surveys
Plants				
Beaked cryptantha	*Cryptantha rostellata*		S	x
Bristly sedge	*Carex comosa*		S	
Gray cryptantha	*Cryptantha leucophaea*	SOC	S	
Plumed clover	*Trifolium plumosum var. plumosum*		S	
Prairie lupine	*Lupinus cusickii*	SOC	R	x
Pulsifer's monkey flower	*Mimulus pulsiferae*		S	
Sabin's lupine	*Lupinus sabinii*		E	
Snake Canyon desert parsley	*Lomatium serpentinum*		S	
Ute ladies' tresses	*Spiranthes diluvialis*	T		
Washington mokey-flower	*Mimulus washingtonesis*		R	
Priority Habitats				
Shrub-Steppe			P	
Birds				
Aleutian Canada goose	*Branta canadensis leucopareia*		T	
American white pelican	*Pelecanus erythrorhynchos*		E	x
Bald eagle	*Haliaeetus leucocephalus*	T	T	x
Black-crowned night heron	*Nycticorax nycticorax*		M	
Caspian tern	*Sterna caspia*		M	x
Common loon	*Gavia immer*		S	
Ferruginous hawk	*Buteo regalis*	SOC	T	x
Forster's tern	*Sterna forsteri*		M	
Golden eagle	*Aquila chrysaetos*		C	x
Lewis' woodpecker	*Melanerpes lewis*		C	
Loggerhead shrike	*Lanius ludovicianus*	SOC	C	x
Long-billed curlew	*Numenius americanus*		M	x
Merlin	*Falco columbarius*		C	
Northern goshawk	*Accipiter gentilis*	SOC	C	
Olive-sided flycatcher	*Contopus borealis*	SOC		
Oregon vesper sparrow	*Pooecetes gramineus affinis*	SOC	C	
Peregrine falcon	*Falco peregrinus*	SOC	E	
Sage grouse	*Centrocercus urophasianus*	SOC	T	
Sage sparrow	*Amphispiza belli*		C	
Sage thrasher	*Oreoscoptes montanus*		C	
Sandhill crane	*Grus canadensis*		E	
Snowy plover	*Charadrius alexandrinus*	T	E	
Streaked horned lark	*Eremophila alpestris strigata*	SOC	C	
Swainson's hawk	*Buteo swainsonii*		M	x
Vaux's swift	*Chaetura vauxi*		C	
Western burrowing owl	*Athene cunicularia hypugea*	SOC	C	x
Willow flycatcher	*Empidonax traillii*	SOC		

Table 1. Continued. Summary Listing of Species of Concern for the Project Vicinity and Associated Areas.

Common Name	Scientific Name	Federal Status	State Status	Sited During Surveys
Mammals				
Black-tailed jackrabbit	*Lepus californicus*		C	x
Fringed myotis	*Myotis thysanodes*	SOC		
Ord's kangaroo rat	*Dipodomys ordii*		M	x
Pale Townsend's big-eared bat	*Plecotus townsendii pallescens (=Coryhorhinus townsendii)*	SOC	C	
Small-footed myotis	*Myotis ciliolabrum*	SOC		
Washington ground squirrel	*Spermophilus washingtonii*	C	C	
White-tailed jackrabbit	*Lepus townsendii*		C	x
Yuma myotis	*Myotis yumanensis*	SOC		
Reptiles				
Northern sagebrush lizard	*Sceloporus graciosus graciosus*	SOC		
Amphibians				
Columbia spotted frog	*Rana luteiventris*	SOC	C	
Oregon spotted frog	*Rana pretiosa*	SOC	E	
Western toad	*Bufo boreas*	SOC	C	
Fish				
Bull trout – Columbia River Distinct Population Segment (DPS)	*Salvelinus confluentus*	T	C	
Chinook Salmon – Middle Columbia River Spring/Summer and Fall Run ESUs	*Oncorhynchus tshawytscha*	T	C	
Chinook Salmon – Upper Columbia River Spring Run ESU	*Oncorhynchus tshawytscha*	E	C	
Steelhead – Middle Columbia River ESU	*Oncorhynchus mykiss*	T	C	
Steelhead – Snake River ESU	*Oncorhynchus mykiss*	T	C	
Steelhead – Upper Columbia River ESU	*Oncorhynchus mykiss*	E	C	
Margined Sculpin	*Cottus marginatus*	SOC	S	
Leopard Dace	*Rhinoichthys falcatus*	SOC	C	
White Sturgeon	*Acipenser transmontanus*	SOC	C	
River Lamprey	*Lampetra ayresi*	SOC	C	
Pacific Lamprey	*Entosphenus tridentatus*	SOC		
Sockeye Salmon – Snake River ESU		E	C	
Westslope Cutthroat Trout	*Oncorhynchus clarki lewisi*	SOC		
Interior Redband Trout	*Oncorhynchus mykiss gairdneri*	SOC	C	

Federal and State Status Codes
C = Candidate
E = Endangere
S = Sensitive
SOC = Species of Concern
T = Threatened

Johnson 1991). No substantive rearing of Snake River sockeye salmon occurs on the Columbia River in the vicinity of this action area. Furthermore, the Snake River sockeye salmon are only in the action area for short periods during their migrations.

3.1.2 Chinook Salmon Habitat use and Critical Habitat Availability in Action Area

Three different federally listed ESU's of chinook salmon (*Oncorhynchus tshawytscha*) are known to pass through the Wallula Power project action area. Both the spring/summer and the fall populations of Snake River chinook salmon have been federally listed as threatened species under the ESA on April 22. 1992 (54 FR 23458). Furthermore, NMFS listed the Upper Columbia River spring chinook salmon as endangered on March 24, 1999 (64 FR 14308). The boundary limits for these ESU's of chinook salmon lie entirely outside of Lake Wallula. However, due to the potential presence of migrating salmon throughout the year, the mainstem Columbia River has been designated critical habitat for chinook salmon (58 FR 68543 – revised in 64 FR 57399, 65 FR 7764).

Both the Columbia River and Snake River chinook salmon are considered to be ocean-type chinook salmon, meaning that they outmigrate as sub-yearlings during the summer and fall after emergence, spending little time in their natal streams and rivers (Mathews and Waples 1991; Waples et al. 1991; Myers et al. 1998). After 4 to 5 years in the ocean, these chinook salmon began the migrations back to their spawning grounds. Chinook salmon also require substantial cover, high water quality and cool water temperatures.

Listed chinook salmon can be present in the action area on a limited basis during the migrations to and from spawning sites. Returning adult Snake River chinook salmon migrate though the Columbia River from May to October (includes both spring/summer and fall Chinook salmon populations). Returning Upper Columbia River chinook salmon adults migrate from March through May (Mathews and Waples 1991, Waples et al. 1991).

3.1.3 Steelhead Trout Habitat use and Critical Habitat Availability in Action Area

Three stocks of steelhead trout (*Oncorhynchus mykiss*) that utilize areas within the action area as critical habitat have been listed as threatened or endangered. These include Upper Columbia River steelhead trout, which are listed as endangered (62 FR 43937); Middle Columbia River steelhead trout, listed as threatened (62 FR 14517); and Snake River steelhead trout, also listed as threatened (62 FR 43937). The boundary limits for the ESU's of Upper Columbia River and Snake River steelhead trout lie entirely outside of Lake Wallula. Due to the potential presence of migrating steelhead throughout the year, the mainstem Columbia River has been designated critical habitat for these ESU's. In contrast, Lake Wallula is within the boundaries of the Middle Columbia River steelhead trout and these fish may be found in residence of this action area.

Steelhead trout generally remain in fresh water habitats for one to three years before migrating to salt water. The returning adults may spend between 1 to 2 years in salt water before returning upriver. In contrast to most other salmonids, steelhead trout may reside in the fresh water up to a year before spawning (Busby et al. 1996).

After several years in fresh water, most juveniles within these ESU's will migrate to marine environments from April through June. Adult steelhead trout from these ESU's migrate back to their natal streams from March through May and June through October.

Steelhead trout have similar environmental requirements as other Pacific salmonids, including substantial cover, high water quality and cool water temperatures. Steelhead trout have been shown to be especially sensitive to water temperatures, water temperatures exceeding 17^{o}C have been found to impact juvenile steelhead trout populations (Frissell et al. 1992).

3.1.4 Bull Trout Habitat use and Critical Habitat Availability in Action Area

The population of Columbia River bull trout (*Salvelinus confluentus*) was federally listed as threatened by the USFWS on June 10, 1998 (63 FR 31647). This listing includes all waters of the watershed from the mouth of the Columbia River to the Canadian border. The fragmented nature of the population within this watershed is the primary basis for the broad listing of these trout (WDFW 1998).

Newly hatched bull trout emerge from their gravel beds in the spring. After emergence, bull trout are known to exhibit four distinct life history patterns based on differences in migration preference. Resident bull trout spend their entire lives within the same stretch of headwater streams. These fish are slow to mature (seven to eight years) and rarely reach sizes greater than 14 inches in length. The remaining life history alternatives include: fluvial fish that migrate within the river system; adfluvial fish that migrate between river and lake habitats; and anadromous or ocean going fish. These migrating fish typically spend two years within or near their natal waters before they migrate to their feeding grounds (Goetz 1989, WDFW 1998).

Bull trout display a high degree of environmental sensitivity during all life stages and have more specific habitat requirements than other salmonids (Rieman and McIntyre 1993). The health of bull trout populations and their distributions within a river basin appear to be directly linked to the amount of cover, channel stability, substrate composition, temperature, and migratory corridors within the basin (Rieman and McIntyre 1993). Bull trout require pristine waters and clean gravel and water temperatures between 2-10^{o} C. Water temperatures greater than 15^{o} C are believed to impose a thermal barrier for bull trout (63 FR 31647, Goetz 1989).

There are no documented populations of bull trout in the Columbia River between the Snake and Walla Walla rivers (USACOE 2000). Bull trout have been documented in the cooler upper reaches of the Walla Walla River and the tributaries of the Snake River. However, the lower reaches of the Walla Walla and the Snake rivers have been

documented as exceeding water quality parameters for temperature, which would likely limit bull trout migrations in these waterways (DOE 2000). No bull trout are expected within the action area for this project. Bull trout are not found near the mouth of the Walla Walla River (USACOE 2000), and are not expected to occur in the Lake Wallula reach of the Columbia River.

3.1.5 Bald Eagle Habitat use and Critical Habitat Availability in Action Area

In Washington State, the bald eagle (*Haliaeetus leucocephalus*) has been listed as threatened under the ESA since 1978 (43 FR 6230). However, due to a ten fold increase in population size since 1963 the U.S Fish and Wildlife Service proposed to remove bald eagles from the list of threatened and endangered species in 1999 (64 FR 36453). The decision for delisting the bald eagle is yet to be determined, therefore all protections afforded the bald eagles and their critical habitat remain intact.

Bald eagles are found along the shores of fresh and saltwater environments. Breeding territories are located in predominantly coniferous uneven-aged stands with old-growth components. Nesting locations are generally in mature old-growth trees with nearby available prey. These nests may be used in successive years. The availability of suitable nesting location is often a limiting factor in the establishment of bald eagle territories (USFWS 1986). In Washington, courtship and nest-building activities occur between the months of January and February. Eggs are laid and cared for beginning in March to early June. Chicks are hatched from mid-April to early May. Eaglets usually fledge in mid-July but may remain in the nesting location for another month (Rodrick and Milner 1991).

Wintering locations for bald eagles are dependent on suitable roosting locations and available prey. Bald eagles will use communal night roosts. Suitable roosts are usually snags or trees that are older and taller than other trees in the area. As many as 50 individuals may share a single roost (Adams et al. 2000). Food sources during the winter months for bald eagles have been shown to consist primarily of waterfowl, which is 80 to 90 percent of their diet. Fish, carrion, small mammals and other birds make up the reminder of the bald eagles food sources (Fielder and Starkey 1980, Fielder 1982).

Nesting bald eagles have not been documented within the Wallula Power Project area (USACOE 2000). This area is believed to provide only wintering habitat for bald eagles. This assumption is supported by the two wildlife surveys conducted for the Wallula Power Project, one from November 2000 through March 2001 (Smayda 2001b) and the other in May 2002 (Entrix 2002).

During the 2000/2001 winter surveys (Smayda 2001b), 71 bald eagles were sited over 14 days. Of these bald eagles, 42 were juveniles and 29 were adult birds. The majority of these bald eagles were seen within the boundaries of the McNary National Wildlife Refuge perched in the Poplar trees along the Walla Walla and Columbia River. Many were also observed perching on fence posts, on the ground, or hunting in the lagoons at

the J.R. Simplot Company cattle feedlot located to the east of the proposed project area (Smayda 2001b). These winter sightings correspond to areas of highest available prey.

During the May 2002 wildlife surveys, no bald eagles or nesting sites were observed (Entrix 2002). Given the fact that bald eagle chicks hatch within this time period, nest and nesting activity would be apparent if it were present in the area. The lack of sighting supports the assumption that this proposed project area is not currently suitable nesting habitat for bald eagles.

3.1.6 Ute ladies' tresses Habitat use and Critical Habitat Availability in Action Area

Ute ladies' tresses (*Spiranthes diluvialis*) were listed as threatened under the ESA in 1992 by the U.S. Fish and Wildlife Service (57 FR 2048). This perennial orchid was discovered in Washington State in 1997 in a wetland meadow near Wannacut Lake in Okanogan County. Fewer than 20 individual plants were found in this location (Ohlson 2000).

Generally Ute ladies' tresses occur at elevations below the coniferous forest vegetation zone within steppe, shrub-steppe or pinyon-juniper woodland zones (USFWS 1998). It is typically found between elevations of 4,000 to 6,000 feet but has been found as high as 6,800 feet. The Washington population is at approximately 1,800 feet in elevation.

The Washington State population of Ute ladies' tresses is located over 200 miles north of the Wallula Power Project site. Suitable habitat does not occur within the action area for this power project and the botanical field survey revealed no occurrences of Ute ladies' tresses (Entrix 2002).

4.1 INTRODUCTION

4.1.1 POTENTIAL EFFECTS ANALYSIS

In this chapter, the construction, operation and maintenance for the proposed construction of the Wallula-Smiths Harbor transmission line and the Smiths Harbor Switchyard are examined to determine if federally listed threatened or endangered species within the action area could potentially be affected. A summary table is provided (Table 2.). Potential impacts resulting from the construction activities associated with the proposed project are evaluated in terms of listed species and associated habitat disturbance and/or loss. The magnitude of these impacts is based upon the type, amount and duration of project effects. Impacts are characterized as direct or indirect. Direct impacts result from an immediate action of the project, such as the removal of bald eagle nesting trees for a new roadway. In contrast, indirect effects are caused by or result from the proposed action, such as the avoidance of a site by bald eagle prey species due to construction noise. Short-term impacts (construction) and long-term impacts (after project is in place) are considered. Impact assessment will focus primarily on access road and facility construction. Tower location is not known at this time, so the potential effects of this project element will be addressed in an addendum to this BA.

In addition to the potential environmental impacts arising from direct or indirect impacts, future and/or cumulative impacts from interrelated and interdependent actions in this action area are also discussed. Cumulative effects analysis considers the impacts of other projects within the action area that are unrelated to the project actions specifically addressed by the BA but that may likely occur in the future. Interrelated effects are defined as those "activities that are part of the larger action and depend on the larger action for their justification," while interdependent effects are defined as actions "which have no independent utility apart from the proposed action being considered.

4.1.2 FIELD REVIEWS

Two field reviews of the project site were conducted for the Wallula Power Project. One field survey from November 2000 through March 2001 (Smayda 2001b). The other survey in May 2002 (Entrix 2002). The purpose of the wildlife and botanical surveys were to determine the status of listed species in the area and to evaluate the potential impacts of the proposed project. Findings from the November 2000 through March 2001 field survey are discussed in the McNary Transmission Line Project Environmental Impact Statement (BPA and WSEFSEC 2002). Wildlife and botanical surveys conducted in May 2002 are provided in Appendix B and Appendix C, respectively.

Table 2. Direct, Indirect, Short-term, Long-term, and Cumulative Impacts Summary for Threatened and Endangered Species Within the Action Area.

Species	Status	Direct Short-term Impacts	Indirect Short-term Impacts	Direct Long-term Impacts	Indirect Long-term Impacts	Cumulative Interrelated & Interdependent Impacts
Sockeye Salmon-Snake River ESU (*Oncorhynchus nerka*)	F-Threatened S-Candidate	Boundary limit for this ESU lies outside of action area. Generally, fish only inhabit area during migrations. Project action is isolated and has no surface connectivity to aquatic habitats via ephemeral or perennial streams. Impacts from project are improbable. **No effect.**	Boundary limit for this ESU lies outside of action area. Generally, fish only inhabit area during migrations. Project action is isolated and has no surface connectivity to aquatic habitats via ephemeral or perennial streams. Impacts from project are improbable. **No effect.**	Boundary limit for this ESU lies outside of action area. Generally, fish only inhabit area during migrations. Project action is isolated and has no surface connectivity to aquatic habitats via ephemeral or perennial streams. Impacts from project are improbable. **No effect.**	Boundary limit for this ESU lies outside of action area. Generally, fish only inhabit area during migrations. Project action is isolated and has no surface connectivity to aquatic habitats via ephemeral or perennial streams. Impacts from project are improbable. **No effect.**	Project action is interrelated and interdependent to the proposed power plant construction. Future construction of a 28-mile segment transmission line may occur if current projects are completed. Impacts from those project where discussed in a previous BA and conclude – may affect. No other development is envisioned associated with the proposed project action, therefore, no cumulative impacts are likely. **No effect.**
Chinook Salmon-Spring/Summer and Fall ESU (*Oncorhynchus tshawytscha*)	F-Threatened S-Candidate	Boundary limit for these ESU's lies outside of action area. Generally, fish only inhabit area during migrations. Project action is isolated and has no surface connectivity to aquatic habitats via ephemeral or perennial streams. Impacts from project are improbable. **No effect.**	Boundary limit for these ESU's lies outside of action area. Generally, fish only inhabit area during migrations. Project action is isolated and has no surface connectivity to aquatic habitats via ephemeral or perennial streams. Impacts from project are improbable. **No effect.**	Boundary limit for these ESU's lies outside of action area. Generally, fish only inhabit area during migrations. Project action is isolated and has no surface connectivity to aquatic habitats via ephemeral or perennial streams. Impacts from project are improbable. **No effect.**	Boundary limit for these ESU's lies outside of action area. Generally, fish only inhabit area during migrations. Project action is isolated and has no surface connectivity to aquatic habitats via ephemeral or perennial streams. Impacts from project are improbable. **No effect.**	Project action is interrelated and interdependent to the proposed power plant construction. Future construction of a 28-mile segment transmission line may occur if current projects are completed. Impacts from those project where discussed in a previous BA and conclude – may affect. No other development is envisioned associated with the proposed project action, therefore, no cumulative impacts are likely. **No effect.**

Table 2. Direct, Indirect, Short-term, Long-term, and Cumulative Impacts Summary for Threatened and Endangered Species Within the Action Area.

Species	Status	Direct Short-term Impacts	Indirect Short-term Impacts	Direct Long-term Impacts	Indirect Long-term Impacts	Cumulative Interrelated & Interdependent Impacts
Chinook Salmon-Upper Columbia River ESU (*Oncorhynchus tshawytscha*)	F-Endangered S-Candidate	Boundary limit for this ESU lies outside of action area. Generally, fish only inhabit area during migrations. Project action is isolated and has no surface connectivity to aquatic habitats via ephemeral or perennial streams. Impacts from project are improbable. **No effect.**	Boundary limit for this ESU lies outside of action area. Generally, fish only inhabit area during migrations. Project action is isolated and has no surface connectivity to aquatic habitats via ephemeral or perennial streams. Impacts from project are improbable. **No effect.**	Boundary limit for this ESU lies outside of action area. Generally, fish only inhabit area during migrations. Project action is isolated and has no surface connectivity to aquatic habitats via ephemeral or perennial streams. Impacts from project are improbable. **No effect.**	Boundary limit for this ESU lies outside of action area. Generally, fish only inhabit area during migrations. Project action is isolated and has no surface connectivity to aquatic habitats via ephemeral or perennial streams. Impacts from project are improbable. **No effect.**	Project action is interrelated and interdependent to the proposed power plant construction. Future construction of a 28-mile segment transmission line may occur if current projects are completed. Impacts from those project where discussed in a previous BA and conclude "not expected to affect". No other development is envisioned associated with the proposed project action, therefore, no cumulative impacts are likely. **No effect.**
Steelhead Trout-Middle Columbia River and Snake River ESU (*Oncorhynchus mykiss*)	F-Threatened S-Candidate	Boundary limit lies outside of action area for Snake River ESU Generally, these fish only inhabit area during migrations. Middle Columbia River ESU may be found in residence. Project action is isolated and has no surface connectivity to aquatic habitats via ephemeral or perennial streams. Impacts from project are improbable. **No effect.**	Boundary limit lies outside of action area for Snake River ESU Generally, these fish only inhabit area during migrations. Middle Columbia River ESU may be found in residence. Project action is isolated and has no surface connectivity to aquatic habitats via ephemeral or perennial streams. Impacts from project are improbable. **No effect.**	Boundary limit lies outside of action area for Snake River ESU Generally, these fish only inhabit area during migrations. Middle Columbia River ESU may be found in residence. Project action is isolated and has no surface connectivity to aquatic habitats via ephemeral or perennial streams. Impacts from project are improbable. **No effect.**	Boundary limit lies outside of action area for Snake River ESU Generally, these fish only inhabit area during migrations. Middle Columbia River ESU may be found in residence. Project action is isolated and has no surface connectivity to aquatic habitats via ephemeral or perennial streams. Impacts from project are improbable. **No effect.**	Project action is interrelated and interdependent to the proposed power plant construction. Future construction of a 28-mile segment transmission line may occur if current projects are completed. Impacts from those project where discussed in a previous BA and conclude "not expected to affect". No other development is envisioned associated with the proposed project action, therefore, no cumulative impacts are likely. **No effect.**

Table 2. Direct, Indirect, Short-term, Long-term, and Cumulative Impacts Summary for Threatened and Endangered Species Within the Action Area.

Species	Status	Direct Short-term Impacts	Indirect Short-term Impacts	Direct Long-term Impacts	Indirect Long-term Impacts	Cumulative Interrelated & Interdependent Impacts
Steelhead Trout-Upper Columbia River ESU (*Oncorhynchus mykiss*)	F-Endangered S-Candidate	Boundary limit lies outside of action area for Upper Columbia ESU. Generally, fish only inhabit area during migrations. Project action is isolated and has no surface connectivity to aquatic habitats via ephemeral or perennial streams. Impacts from project are improbable. **No effect.**	Boundary limit lies outside of action area for Upper Columbia ESU. Generally, fish only inhabit area during migrations. Project action is isolated and has no surface connectivity to aquatic habitats via ephemeral or perennial streams. Impacts from project are improbable. **No effect.**	Boundary limit lies outside of action area for Upper Columbia ESU. Generally, fish only inhabit area during migrations. Project action is isolated and has no surface connectivity to aquatic habitats via ephemeral or perennial streams. Impacts from project are improbable. **No effect.**	Boundary limit lies outside of action area for Upper Columbia ESU. Generally, fish only inhabit area during migrations. Project action is isolated and has no surface connectivity to aquatic habitats via ephemeral or perennial streams. Impacts from project are improbable. **No effect.**	Project action is interrelated and interdependent to the proposed power plant construction. Future construction of a 28-mile segment transmission line may occur if current projects are completed. Impacts from those project where discussed in a previous BA and conclude "not expected to affect". No other development is envisioned associated with the proposed project action, therefore, no cumulative impacts are likely. **No effect.**
Bull Trout *(Salvelinus confluentis)*	F-Threatened S-Candidate	No suitable habitat exists within action area and access is restricted. No direct short-term impacts possible. **No effect**	No suitable habitat exists within action area and access is restricted. No indirect short-term impacts possible. **No effect**	No suitable habitat exists within action area and access is restricted. No direct long-term impacts possible. **No effect**	No suitable habitat exists within action area and access is restricted. No indirect long-term impacts possible. **No effect**	Project action is interrelated and interdependent to the proposed power plant construction. Future construction of a 28-mile segment transmission line may occur if current projects are completed. Impacts from those project where discussed in a previous BA and conclude "not expected to affect". No other development is envisioned associated with the proposed project action, therefore, no cumulative impacts are likely. **No effect.**

Table 2. Direct, Indirect, Short-term, Long-term, and Cumulative Impacts Summary for Threatened and Endangered Species Within the Action Area.						
Species	**Status**	**Direct Short-term Impacts**	**Indirect Short-term Impacts**	**Direct Long-term Impacts**	**Indirect Long-term Impacts**	**Cumulative Interrelated & Interdependent Impacts**
Bald Eagle *(Haliaeetus leucocephalus)*	F-Threatened S-Threatened	No suitable nesting habitat in action area. Likely fly over area and may hunt within project area; increased human activity during construction may discourage use. **Actions may affect but are not likely to affect.**	Construction disturbance could alter eagle prey behavior temporarily and potentially disrupt feeding opportunity. **Actions may affect but are not likely to affect.**	Possible collisions with transmission line may occur, however direct impacts are excepted to be low. **Actions may affect but are not likely to affect.**	Loss of habitat from access road construction may occur for small mammal and bird prey of the eagle. As eagles are predominately fish eaters, this effect is not likely to be adverse. **Actions may affect but are not likely to affect.**	Project action is interrelated and interdependent to the proposed power plant construction. Future construction of a 28-mile segment transmission line may occur if current projects are completed. Impacts from those project where discussed in a previous BA and conclude "not expected to affect". No other development is envisioned associated with the proposed project action, therefore, no cumulative impacts are likely. **No effect.**
Ute ladies' tresses plant (*Spiranthes diluvialis)*	F-Threatened S-Threatened	Not identified as occurring in project or action areas; based upon habitat preferences its occurrence is unlikely in this area. Therefore, construction activities are not likely to affect this species. **Actions may affect but are not likely to affect.**	Not identified as occurring in project or action areas; based upon habitat preferences its occurrence is unlikely in this area. Therefore, construction activities are not likely to affect this species. **Actions may affect but are not likely to affect.**	Not identified as occurring in project or action areas; based upon habitat preferences its occurrence is unlikely in this area. Therefore, the habitat destruction that would be occupied by access roads would not likely affect this species. **Actions may affect but are not likely to affect.**	Not identified as occurring in project or action areas; based upon habitat preferences its occurrence is unlikely in this area. Therefore, the habitat destruction that would be occupied by access roads would not likely affect this species. **Actions may affect but are not likely to affect.**	Project action is interrelated and interdependent to the proposed power plant construction. Future construction of a 28-mile segment transmission line may occur if current projects are completed. Impacts from those project where discussed in a previous BA and conclude, "will not affect". No other development is envisioned associated with the proposed project action, therefore, no cumulative impacts are likely. **No effect.**

4.2 DIRECT IMPACTS

4.2.1 FISH AND AQUATIC HABITATS

Critical habitat within the action area for federally listed salmonids is limited to the migration corridors for Snake River sockeye salmon, chinook salmon, Upper Columbia River and Snake River steelhead trout, and bull trout. Only Middle Columbia River steelhead trout have ESU boundary limits within the action area.

The proposed construction of the Wallula-Smiths Harbor transmission line does include portions of the Walla Walla and Columbia Rivers within its two-mile action area. However, there is no direct surface connectivity i.e. irrigation canals, waterways, ephemeral creeks, etc. between the site and these rivers (Smayda 2001a). The nearest potential construction to a body of water with critical habitat designation will be the termination of the transmission line at the Wallula Substation. At this point impacts from the power project will be approximately 800 feet from the Lake Wallula stretch of the Columbia River. The net effect of this proposed action will be to maintain existing conditions (Table 3). Because of the spatial isolation for the majority of the construction and lack of conveyance to the rivers the proposed actions are not likely to have any direct adverse affects the listed threatened or endangered fish or their critical habitat.

4.2.2 BALD EAGLES

Construction for this project could cause short-term temporary behavioral avoidance of the area due to increased activity, but should not involve overly excessive noises such as blasting. The bald eagle can be expected to frequent the project area on rare occasion, particularly as a fly-over migrant to feeding grounds on the Columbia and Walla Walla Rivers during the winter months. However, bald eagles wintering along the Columbia River in the project vicinity frequent perches near U.S. Highway 12, which suggests an apparent habituation to traffic noise. The threshold for noise disturbance has not been established for the eagle, although some habituation can occur, it cannot be assured.

The construction of the switchyard and transmission line will result in an increase of human presence in the project vicinity. Studies suggest that bald eagles can become tolerant of human presence and activity, and particularly the interaction with vehicles (Stalmaster and Kaiser 1998, Skagen 1980). The additional traffic and human presence from the project construction is not expected to adversely affect wintering bald eagles. Short-term direct impacts to bald eagles nests are limited because no nest locations have been observed, curtailing the possibility of abandonment from disturbance.

Collision with transmission lines is not a major source of mortality for raptors (Olendorff and Lehman 1986). Direct impacts to bald eagles are expected to be low.

The Wallula-Smiths Harbor transmission line route occurs in open shrub-steppe environments, which eliminates the necessity of tree removal. The location for the

Table 3 Pathways and Indicators Used to Evaluate Effects on Salmonids, and the Net Effects of the Actions on Relevant Pathways and Indicators.

Pathway	Indicators	Effects of Action		
		Improve[1]	Maintain[2]	Degrade[3]
Construction	Noise		X	
Disturbances	Entrainment		X	
	Stranding		X	
	Water quality (turbidity, etc.)		X	
Long-Term	Turbidity		X	
Water Quality	Chemical contamination/nutrients		X	
	Temperature		X	
	Dissolved oxygen		X	
Stormwater	Stormwater quality/quantity		X	
Sediment	Sedimentation sources/rates		X	
	Sediment quality		X	
Habitat	Fish access/refugia		X	
Conditions	Depth		X	
	Substrate		X	
	Slope		X	
	Shoreline		X	
	Riparian conditions		X	
	Flow and hydrology/current patterns/salt-freshwater mixing patterns		X	
	Overwater structures		X	
	Disturbance		X	
Biota	Prey-epibenthic and pelagic zooplankton		X	
	Infauna		X	
	Prey-forage fish		X	
	Aquatic vegetation		X	
	Nonindigenous species		X	
	Ecological diversity		X	

1 Action will contribute to long-term improvement, over existing conditions of the indicator

2 Action will maintain existing conditions.

3 Action will contribute to long-term degradation, over existing conditions of the indicator

switchyard may necessitate the removal of a few trees. However, these trees do not provide observation points for congregations of waterfowl or other prey sources and are not considered suitable perch habitat. Similarly, the removal of the cottonwood trees of the Boise Cascade tree farm is not expected to impact perch habitat.

Ultimately, no critical habitat will be affected for the bald eagle and no direct take will occur. The significance of behavioral avoidance by eagles in the long-term (if it occurs), would be minor because multiple routes to and from principal feeding grounds of the eagle will be maintained.

4.2.3 UTE LADIES TRESSES

No suitable habitat for Ute ladies tresses occurs within the project site. However, wetland habitats do occur in the action area along irrigation ponds to the north of the transmission line near the terminus. The majority of these wetland habitats are dominated by a dense growth of non-native weeds and native plant species. Furthermore, no plant species normally associated with potential habitat for Ute ladies tresses were identified during field surveys.

Ute ladies tresses were not identified as occurring in the project or action areas during field surveys. Based upon habitat preferences, its occurrence is unlikely in this area. Habitat losses that would occur from road and switchyard construction would not be likely to adversely affect this species. Therefore, the proposed actions are not likely to have any direct adverse affects to this plant species or to its critical habitat.

4.3 INDIRECT IMPACTS

4.3.1 FISH AND AQUATIC HABITATS

Because of the spatial isolation for the majority of the construction and lack of conveyance to the rivers, the proposed actions are not likely to have any indirect adverse affects the listed threatened or endangered fish or their critical habitat. Furthermore, the daily operations and maintenance activity at the switchyard are not expected to have any indirect impacts to these fish or their habitats.

4.3.2 BALD EAGLES

Temporary construction disturbance could cause some indirect short-term impacts via avoidance of the project areas by bald eagle prey. This affect is expected to be minimal since bald eagles do little hunting within these areas.

Long-term indirect impacts to the bald eagles are expected to be minimal. Habitat loss to small prey (e.g. rodents) from road and switchyard construction is negligible. Furthermore, as bald eagles are predominately fish eaters, this effect is not likely to be adverse.

4.2.3 UTE LADIES TRESSES

Ute ladies tresses' were not identified as occurring in the project or action areas during field surveys. Furthermore, no potential habitat for Ute ladies' tresses, are present in the action area The proposed actions are not likely to have any indirect adverse affects Ute ladies' tresses or to its critical habitat.

4.4 CUMULATIVE IMPACTS

4.4.1 CUMULATIVE EFFECTS OVERVIEW

Cumulative effects include the effects of future state, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological assessment. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Endangered Species Act.

The largest contributors to any possible cumulative impacts within this action area arise from proposed elements to complete the BPA's proposed Wallula Power Project. These elements are interrelated and interdependent to the completion of the Wallula-Smiths Harbor transmission line segment. These include the construction of the Wallula Power Generation Plant and upgrading the 28-mile Smiths Harbor-McNary 500-kV transmission line. The project elements for the Wallula Power Generation Plant are discussed in detail in the Biological Assessment completed by Smayda Environmental Associates, Inc. (Appendix D) and are the basis for much of the cumulative impact assessments. Furthermore, the 28-mile Smiths Harbor-McNary 500-kV transmission line is discussed in the Wallula Power Project and Wallula-McNary Transmission Line Project, Draft Environmental Impact Statement (BPA and WSEFSEC 2002) and is the basis for relevant cumulative impact assessment evaluations.

The following subsections provide a brief summary of the project elements that are interrelated and interdependent with the subject Biological Assessment.

Proposed Project – Wallula Power Plant and Associated Facilities (Laterals)

The construction of the Wallula Power Generation Plant consists of the plant facilities and the natural gas and makeup water supply lines (project laterals). The proposed power plant is to occupy approximately 64 acres of a 175-acre parcel located at the initiation of the Wallula-Smiths Harbor transmission line segment. The generation plant is approximately 8 miles south of the City of Pasco, 2 miles north of the unincorporated community of Wallula, and 7 miles southeast of the unincorporated community of Burbank. The project site is within the southern half of Section 34, Township 8 North, Range 8 East. Lake Wallula (the McNary Pool reach of the Columbia River) is located approximately 800 feet to the west. Plant structures include the stream turbine building, four heat recovery steam boilers and exhaust stacks, two sets of cooling towers, storage tanks, switchyard, one stormwater detention pond, and two evaporation ponds. The tallest structures in the power plant will be the exhaust stacks at 175 feet in height.

The makeup water supply line will extent south from the power plant site to the southeast corner of Section 3, T7N, R31E, and would continue south along the section line onto the Boise Cascade Wallula Mill tree farm. Within the tree farm, the pipeline will link to five wells in the southwest corner of Section 11, T7N, R31E and five wells in the eastern half of Section 14, T7N, R31E. This pipeline will be approximately 4.6 miles in length and will be buried for its entire length.

The Natural Gas pipeline consists of a 5.9 mile, 20 inch diameter pipeline buried along its entire route. This pipeline will follow the same route and share the same underground corridor as the makeup water supply pipeline up to their intersection with Wordon Road. From this point the natural gas pipeline will extent east-southeast to the tap point with the existing Pacific Transmission-Northwest (GTN) natural gas pipeline, about one mile north of the Walla Walla River (Appendix D, Figure 3).

Proposed Project - Smiths Harbor-McNary 500-kV Transmission Line

The Smiths Harbor-McNary 500-kV transmission line would interconnect the new Smiths Harbor Switchyard to the existing McNary Substation. This transmission line would parallel the existing 500-kV Bonneville transmission line. As currently proposed, the new transmission line would be constructed at a distance of approximately 200 feet on the west and north side of the existing transmission line. Approximately 140 tower structures would be required for this segment of transmission line.

Proposed Project – Lower Monumental-McNary Re-conductor

This project would involve a segment of the Lower Monumental-McNary 500 kilovolt (kV) line between towers 37/5 and 38/4, where the line crosses the Wallula Habitat Unit of the McNary Wildlife Refuge. The BPA contractor will remove the old conductor and replace it with a new twin conductor bundle like that already installed on other sections of this line. Stringing equipment will be set up at both ends of this segment to remove conductor. The work will require access to each structure to change hardware. No new towers are planned. This work is planned for mid-September and should be completed by October 4, 2002. Neither the new nor the replaced conductor is expected to touch or disturb the ground. Implosive devices will be used to fuse the ends of the new conductor to existing conductor, which will cause limited short term noise disturbance.

4.4.2 FISH AND AQUATIC HABITATS

This project action is interrelated and interdependent to the proposed power plant construction. In addition, future construction of a 28-mile segment transmission line may occur if additional proposed generation projects in the region are completed. Impacts from the power plant project are described in the BA developed for that project (Appendix D). That BA concluded, “construction and operation of the proposed power plant and its laterals is not expected to affect listed fish species” (Smayda 2001a). Even though the project elements discussed in this BA are spatially isolated from waterways, the footprint for the proposed power plant is closer to the Columbia River and sedimentation from construction practices must be considered. In contrast, the isolation

and lack of direct surface connectivity would safeguard aquatic habitats from construction of the natural gas and makeup water pipelines as well as the possible construction of the 28-mile Smiths Harbor-McNary 500-kV transmission line. No other development is envisioned associated with the proposed project action, therefore, no cumulative impacts are likely.

4.4.3 BALD EAGLE

The construction and operation of the Wallula Power Plant will result in the removal of the irrigated crop circle and agricultural ponds on the project site. Smayda (2001a) notes that the loss of this waterfowl habitat at the project site is not expected to affect wintering bald eagles. No water bodies supporting waterfowl are located along the natural gas and water pipeline corridors. The proposed construction of these elements is therefore not expected to affect bald eagles.

The irrigated ponds of the Wanaket Wildlife Area and the Wallula Habitat Unit of the McNary Wildlife Refuge are found along the proposed Smiths Harbor-McNary 500-kV transmission line. These two areas do support waterfowl, however no bald eagle nests were sighted in either area during two separate visits in 2001 and 2002. Use of these areas by bald eagles is predominantly migrant birds wintering along the Columbia and Walla Walla Rivers. A majority of this 28-mile segment of transmission line segment would be well away from any water body and use by bald eagles would be very limited. The proposed construction of these elements is therefore not expected to adversely affect bald eagles.

The noise caused by implosive devices with the re-conductor project will occur in the early fall when bald eagles are not likely to be present in the area.

As previously discussed, collision with transmission lines is not a major source of mortality for raptors (Olendorff and Lehman 1986). The addition of new transmission line towers for the Smiths Harbor-McNary 500-kV transmission line adjacent to the current transmission line route should not significantly increase collision rates nor should current flight paths be altered. Smayda (2001a) indicates that even though the cooling towers for the proposed power generation plant are 175 feet tall, the project structures are not expected to impede the ability of bald eagles to fly through the project vicinity.

This project action is dependent on the completion of the Wallula Power Generation Plant and is interrelated to and interdependent on the proposed power plant construction. Additionally, construction of the 28-mile Smiths Harbor-McNary segment transmission line may occur in the future if these projects are completed. No other development is envisioned associated with the proposed project action. The project has no interrelated or interdependent elements to our knowledge that would cumulatively affect the eagles' ability to forage along or access the river corridors.

4.4.4 UTE LADIES TRESSES

None of the surveys completed for any portion of the Wallula Power Project has documented the presence of the Ute ladies tresses within this action area. No wetland habitats, and no potential habitat for Ute ladies' tresses, are present in the action area. The additional loss of potential habitat for this orchid species from the power plant and its laterals or the Smiths Harbor-McNary transmission line is not expected to impact this plant.

- Construct during dry season to avoid potential impacts to water quality and listed and candidate aquatic species that may utilize habitats downstream of the project area.

- Incorporate appropriate sedimentation control measures where applicable.

- Stop work during construction if bald eagles are observed in the action area. Resume work if the bald eagle(s) leave the area or, if they remain in the action area, a biologist or environmental monitor determines the work would not interfere with the bald eagle(s).

- Have a trained biologist/botanist reexamine project footprint prior to construction to prevent avoidable losses.

- Allow or enhance recovery of shrub-steppe habitat in project area where practicable.

- Ensure compliance with the spill prevention plan, and monitor stormwater per best management practices (e.g., erect silt-fences, etc.).

6.1 DEFINITIONS

NMFS and USFWS guidelines for the preparation of biological assessments state that a conclusion of "may affect, but is not likely to adversely affect" is appropriate when, "the effects on the species or critical habitat are expected to be beneficial, discountable, or insignificant". Insignificant effects, in the NMFS/USFWS definition, "…relate to the size of the impacts and should never reach the size where take occurs…[One would not expect to]…be able to meaningful measure, detect, or evaluate insignificant effects." Furthermore, these guidelines state that a conclusion of "no effect" is the "appropriate conclusion when it is determined that the proposed action will not affect listed species or critical habitat".

6.2 FISH AND AQUATIC HABITATS

Construction and operation of the proposed Wallula-Smiths Harbor 500-kV transmission line and Smiths Harbor Switchyard are not expected to impact any threatened or endangered salmonids. Construction of the project facilities is isolated from aquatic critical habitats. Furthermore, no surface water connections exist between project sites and the Columbia and Walla Walla Rivers. Therefore, a conclusion of **no effect for Snake River sockeye salmon, spring/summer and fall Snake River and Upper Columbia River chinook salmon, Snake River and Upper/Middle Columbia River steelhead trout, and Columbia River Basin bull trout is proposed for this project.**

6.3 BALD EAGLES

Wintering bald eagles that utilize the river shorelines in the project vicinity are not anticipated to undergo any significant impacts from the project construction and operations. Suitable nesting sites have not been documented within the project action area. Sightings of bald eagles documented during the 2000-2001 surveys were located at distances of 600 feet or greater from the project sites. Temporary construction and long-term traffic disturbance could cause avoidance of the area by the bald eagle during heavy use periods. However, multiple routes to and from principal feeding grounds of the eagle will be maintained. This BA concludes that the proposed **actions may affect, but are not likely to adversely affect bald eagles. Furthermore, the proposed action will result in no adverse modification or destruction of designated critical habitat for this species.**

6.4 UTE LADIES TRESSES

Construction and operation of the proposed power project is not expected to affect the threatened species Ute ladies' tresses. Suitable habitat for this species is not found within the project vicinity. Botanical surveys of the project's action area revealed no occurrences of this orchid species. However, due to the fact that surveys were not conducted during Ute ladies' tresses blooming season, a conclusive determination of its presence can not be made. Therefore, this BA concludes that the proposed **actions may affect, but are not likely to adversely affect, Ute ladies' tresses.** Furthermore, the proposed action will result in **no adverse modification or destruction of designated critical habitat for this species.**

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APPENDIX A

LETTER FROM SUSAN B. MARTIN, FIELD SUPERVISOR, USFWS UPPER COLUMBIA FISH AND WILDLIFE OFFICE, SPOKANE WA 99206, RE: UPDATED SPECIES LIST FOR THE WALLULA POWER PROJECT

Appendix A
USFWS Letter Dated August 29, 2001

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Upper Columbia Fish and Wildlife Office
11103 E. Montgomery Drive
Spokane, WA 99206

August 29, 2001

Kathleen W. Smayda
Smayda Environmental Associates, Inc.
139 NE 61st Street
Seattle, Washington 98115

Subject: Updated Species List for the Wallula Power Project, Walla Walla County, Washington (File #870.2300)

Reference Number: 1-9-01-SP-0687: Cross Reference: 1-9-01-SP-85

Dear Ms. Smayda:

Per your August 22, 2001, request, the U.S. Fish and Wildlife Service (Service) is writing to update the November 7, 2000, species list FWS 1-9-01-SP-85 for the subject project. There have been changes to this list. Our records indicate that the following listed species may occur in the vicinity of the project and could potentially be affected by it:

LISTED

Threatened
Bald eagle *(Haliaeetus leucocephalus)*
Bull trout *(Salvelinus confluentus)*
Ute ladies'-tresses *(Spiranthes diluvialis)*

This letter officially updates the previous list, and provides you with a new reference number, 1-9-01-SP-0687. You should refer to this species list number in all subsequent correspondence. This update fulfills the requirements of the Service under section 7(c) of the Endangered Species Act of 1973 (Act), as amended.

Information regarding Federal agency obligations under the Act, biological assessments, and candidate species has been provided to you in previous correspondence from this office. If you have questions, please contact Carrie Cordova in this office at (509) 893-8022. Thank you for your efforts to protect our nation's species and their habitats.

Sincerely,

Suzanne Audet

For Supervisor

c: Rick Donaldson, UCFWS, Spokane
WNHP, Olympia
WDFW, Region 1

APPENDIX B

WALLUA-MCNARY TRANSMISSION LINE: BIOLOGICAL SURVEYS, SUMMARY REPORT FOR WILDLIFE. CONDUCTED MAY 7-11 2002.

APPENDIX B

WALLULA-MCNARY TRANSMISSION LINE

1. BIOLOGICAL SURVEYS -- SUMMARY REPORT

[by Bob Honig, 14 May 2002]

1.1. OVERVIEW

ENTRIX conducted biological surveys on the proposed Wallula-McNary transmission line route and access roads on 7-11 May 2002. The goals were to assess the presence of listed (endangered and threatened) plants and animals, and to record land use types along the portions of the project that previously had not been surveyed.

The focuses were:

- the previously surveyed alignment (200-foot corridor).
- a new 5.1-mile alignment (200-foot corridor) from the start of the route to the proposed switching station;
- a new option (200-foot corridor) from the Power City wetlands to the end of the route at the McNary Substation; and
- all proposed access roads (20-foot corridor), other than public access roads, that are not within the previously surveyed 200-foot corridor.

The biological survey crew ranged from 3-5 people (Dave Durofchalk, Bob Honig, Marlene Heller, Erin Cunningham, Megan Herkelrath). Because of the length to be surveyed (approximately 33 miles of transmission line alignment plus access roads) in a very short time (5 days), we divided our crew at times in order to increase our coverage and be able to finish essentially all the target areas in the available time; only 2 people surveyed some areas. Depending on vegetation cover and number of people at a given time, our visual coverage was not 100% of the 200-foot corridor ground surface. In general, we only made one pass over a given length of corridor --we simply did not have time to do more.

In addition, we drove all driveable proposed access roads.

We skipped some agricultural lands (those with bare, recently tilled soil) because they would as initial inspections by vehicle and walking one field (approximately 0.5 miles long) indicated these would be totally barren. Thus we feel confident they do not support any of the listed species however, see comments on Streaked Horned lark, below).

There are just a few short areas that we did not get to -- I will mark what was and was not surveyed on the large maps provided by BPA when I am provided with extra copies.

I have not yet received Marlene's field notes, so any details in those will not be included in the following summary report.

1.2. LAND USE

GPS reading were taken for land use changes along all access roads that did not parallel the proposed transmission line alignment, as well as for the new 5.1-mile transmission line alignment at the beginning of the route and the new option at McNary. For access roads paralleling or roughly paralleling the proposed transmission line alignment (either immediately adjacent to or near that alignment), no GPS readings were taken for land use if the land use was the same as that along the previously surveyed 200-foot transmission line corridor (this was essential in order to cover the project facilities in the time available) -- land uses were in fact identical to the parallel line in essentially all locations; the data for these access road can be retrieved from the previous ENTRIX surveys.

1.3. VEGETATION

Target plant species were Gray Cryptantha, Beaked Cryptantha, and Prairie Lupine. The references that we obtained from the Whitman College library in Walla Walla were absolutely essential to our performing the survey work for these species; without them, the plant surveys would have been impossible.

Dave Durofchalk will be preparing the summary report on vegetation.

1.4. WILDLIFE

Target species were based on those listed in Section 3.6.1.1 of the DEIS for the Wallula Power Project and Wallula-McNary Transmission Line Project (February 2002). We did not have available the ER that ENTRIX produced for the transmission line, so I do not know if there is a more focused list available.

A list of all wildlife species observed on or near the proposed transmission line alignment and access roads can be found in Table 1 at the end of this section.

1.4.1. Birds

Observations follow. Note that the survey was during the spring migration, and some breeding birds may not yet have arrived on the breeding grounds yet.

a) Aleutian Canada Goose

A Canada Goose was observed in one of the potholes (no GPS taken). It is not known if this was the Aleutian subspecies, however it did not appear especially large.

b) American White Pelican

American White Pelicans were observed flying over the project area, including just east of the culvert site. None were observed on the ground or in potholes; however it is possible they may occasionally use the potholes.

c) Caspian Tern

A single Caspian Tern was seen flying to the west over the proposed alignment at Madame Dorion Park just before sunset on 11 May -- it was not interested in the habitat on the corridor at that location.

d) Ferruginous Hawk and Golden Eagle

A Ferruginous Hawk was observed diving on a juvenile Golden Eagle along Access Road AR-41-1 (GPS Waypoint 116).

e) Grasshopper Sparrow

None observed; however a single sparrow (possibly short-tailed like the Grasshopper Sparrow) was observed diving into the grass in a field just east of the eastern end of AR-57-1 about 0.5 miles east of Highway 207. Grasshopper Sparrow cannot be ruled out. (I know exactly where this is -- a green grassy field with a stream running through it along the proposed transmission line corridor, with lots of cows grazing, just east of the steep rock face east of the highway -- but I don't have Marlene's notes yet, so at the moment I can't tell you which GPS Waypoint.)

f) Loggerhead Shrike

Three sightings: 1 just west of Tower 1-50-1; .1 on Tower 1-48-2; 1 along AR-41-1.

g) Long-billed Curlew

Heard while we were on the proposed corridor -- the bird was quite a distance away. (Marlene's notes will have the GPS Waypoint #).

h) Streaked Horned Lark

Numerous Horned Larks wee observed in the agricultural fields between Hatch Grade Road and Juniper Canyon. I was able to get good, close looks at 4 of them -- none had streaked underparts. I believe that this is the distinguishing characteristic of the listed subspecies, but I have not seen a description of that subspecies. This should be checked before making any conclusions about the Horned Larks, which were quite common in the agricultural fields that wee bare soil, evidently having been recently tilled.

i) Swainson's Hawk

Two sightings, if I recall accurately: 1 soaring near AR-61-3; for the other I will need to see Marlene's notes.

j) Bald Eagle
Common Loon

Forster's Tern
Lewis' Woodpecker
Merlin
Northern Goshawk
Olive-sided Flycatcher
Oregon Vesper Sparrow
Prairie Falcon
Sage Grouse
Sage Sparrow
Sage Thrasher
Snowy Plover
Tricolored Blackbird
Vaux's Swift
Western Burrowing Owl
Willow Flycatcher
Yellow-billed Cuckoo
Yellow-breasted Chat

None of these species were observed during the 7-11 May 2002 surveys.

1.4.2. Mammals

Many of the listed mammals are nocturnal, and nocturnal surveys were not part of our scope. They all are somewhat secretive. In addition, we did not have the expertise to accurately identify burrows, tracks, or scat. Therefore, I cannot make conclusive statements about any of the listed mammals. Further analysis of habitat requirements may shed some light on the likelihood of occurrence. Observations follow.

a) Black-tailed Jackrabbit

A number of observations -- GPS or nearby landmark info was taken for all. We observed this species in most fairly dense sagebrush-steppe; I would expect it to be present in most if not all such habitat.

b) Ord's Kangaroo Rat

One individual seen on the switchyard site (GPS, photographs); this individual was apparently sick as it was out in the daytime and allowed approach to within a few inches. Tracks were also observed at another location, along the proposed transmission line corridor (need Marlene's notes to get exact location).

c) White-tailed Jackrabbit

None observed, however at least 1 of the jackrabbits observed was not seen well enough to be identifiable to species.

d) Fringed Myotis
Long-eared Myotis
Pale Townsend's Big-eared Bat
Pallid bat
Small-footed Myotis
Yuma Myotis
Washington Ground Squirrel

None observed -- see introductory Mammals section notes.

1.4.3. Reptiles

No listed species observed. However, due to their secretive nature and the fast pace of our survey, I would be hesitant to make definitive conclusions on their presence or absence.

a) Northern Sagebrush Lizard
Striped Whipsnake

None observed -- see introductory Reptiles section notes.

1.4.4. Amphibians

Detailed aquatic habitat observations were not possible within our time frame. Definitive conclusions not possible. Review of habitat information may allow some conclusions to be made.

a) Northern Leopard Frog

One possible Northern Leopard Frog was heard giving an alarm call as it dove into the water of a pothole as I walked by (not GPS). The call was indistinguishable from that of the Southern Leopard Frog in Texas (the Northern Leopard Frog does not occur in Texas) -- however I do not know if the Northern Leopard Frog can reliably be identified by that call in the project area.

b) Columbia Spotted Frog
Oregon Spotted Frog
Western Toad
Woodhouse Toad

None observed -- see introductory Amphibians section notes.

Table 1:
Wildlife species observed on or near the proposed transmission line alignment and access roads, 7-11 May 2002.

Mammals

Ord's Kangaroo Rat	Eastern Cottontail	Mule Deer
Badger	Yellow-bellied Marmot	
Black-tailed Jackrabbit	Coyote	

Reptiles

Gopher Snake	Western Rattlesnake	unidentified lizards

Amphibians

Northern Leopard Frog ??

Birds

Pied-billed Grebe	Ring-necked Pheasant	Barn Swallow
American White Pelican	California Quail	Bewick's Wren
Double-crested Cormorant	Sora	House Wren
Great Blue Heron	American Coot	Marsh Wren
Canada Goose	Killdeer	Townsend's Solitaire
Wood Duck	Black-necked Stilt	American Robin
Gadwall	Long-billed Curlew	European Starling
Mallard	Ring-billed Gull	Yellow Warbler
Cinnamon Teal	California Gull	Lark Sparrow
Northern Shoveler	Caspian Tern (overflight)	Savannah Sparrow
Redhead	Rock Dove	Song Sparrow
Common Goldeneye	Mourning Dove	Lincoln's Sparrow
Osprey (overflight)	Great Horned Owl	White-crowned Sparrow
Northern Harrier	Downy Woodpecker	Lazuli Bunting
Sharp-shinned Hawk	Northern Flicker	Red-winged Blackbird
Swainson's Hawk	Western Kingbird	Western Meadowlark
Red-tailed Hawk	Loggerhead Shrike	Yellow-headed Blackbird
Ferruginous Hawk	Black-billed Magpie	Brewer's Blackbird
Golden Eagle	American Crow	Brown-headed Cowbird
American Kestrel	Common Raven	House Finch
Peregrine Falcon	Horned Lark	American Goldfinch
Gray Partridge	Bank Swallow	House Sparrow
Chukar	Cliff Swallow	

APPENDIX C

WALLUA-MCNARY TRANSMISSION LINE: BIOLOGICAL SURVEYS, SUMMARY REPORT FOR VEGETATION. CONDUCTED MAY 7-11 2002.

Appendix C

Wallula-McNary Transmission Line

Phase II Biological Survey - - Summary Report on Vegetation

by David Durofchalk, May 16, 2002

Overview

ENTRIX conducted reconnaissance level biological surveys on the proposed Wallula-McNary transmission line route and access roads on May 7 through May 11, 2002. The goal of the surveys were to assess the presence of listed sensitive (endangered and threatened) plants and animals, and to record land use types along portions of the project that had not been previously surveyed or due to timing required additional inspection.

The ENTRIX biological survey crew included Bob Honig, David Durofchalk, Marlene Heller, Erin Cunningham, and Megan Herkelrath. The survey focus included:

- The previously surveyed approximately 28-mile transmission line alignment (200-foot corridor);
- The new 5.1-mile alignment (200-foot corridor) from the start of the route at the proposed plant site to the proposed Smiths Harbor switchyard;
- New alignment Option #2 (200-foot corridor) west of the original proposed alignment from Power City to the McNary Substation (not indicated on maps); and
- All proposed access roads (20-foot corridor), other than the public access roads, that are not within the previously surveyed 200-foot corridor (indicated on BPA's GIS mapping of May 6, 2002 as yellow, purple, green, or red dashed lines).

A pedestrian field survey was conducted on approximately 33 miles of transmission line corridor. Due to the length to be surveyed in a relatively short period of time, the crew was sometimes divided to enable completion of primary target areas in the available time frame. Bob Honig was responsible for the wildlife surveys and David Durofchalk was responsible for the vegetation surveys. All five of the survey crew personnel provided visual coverage of the survey corridor, alerting Bob or Dave of specific observations/occurances. For the most part, the survey crew spread out equally along the width of the 200-foot survey corridor to provide the best visual coverage. Generally, only one pass was made over a given length of corridor. In addition to the pedestrian survey, a windshield survey was conducted on all proposed access roads that were driveable.

Survey work proceeded generally from west to east on May 7 through May 9, beginning at the McNary Substation in Power City and continuing to the Juniper Canyon. Survey work continued on May 10 at the proposed plant site to provide complete coverage of the new 5.1-mile alignment and access roads, continuing along the alignment in a southwest direction on May 11 toward Juniper Canyon. We skipped some agricultural lands and orchards where we felt confident that they did not support any of the listed species.

There were also a few short areas that we did not get to (see Bob's comments) including the area at the foot of Juniper Canyon where the transmission line would span the canyon and ground surface impacts would not be expected.

Field work was completed on Saturday, May 11, 2002 by Bob Honig, Marlene Heller and Megan Herkelrath. David Durofchalk and Erin Cunningham had to leave the field on Friday, May 10.

Land Use

For land use, GPS readings were taken for land use changes along all access roads that did not parallel the proposed transmission line alignment, as well as for the new 5.1-mile transmission line alignment at the beginning of the route and the Option #2 alignment at McNary. For access roads paralleling or roughly paralleling the proposed transmission line alignment, no GPS readings were taken for land use if the land use was the same as that along the previously surveyed 200-foot transmission line corridor. Land uses were identical to the parallel line in essentially all locations. The data for these access road where no GPS readings were recorded can be retrieved from the previous ENTRIX surveys where indicated on the photo alignment mapping.

Wildlife

For the wildlife survey, target species were based on those listed in Section 3.6.1.1 of the DEIS for the Wallula Power Project and Wallula-McNary Transmission Line Project (February 2002). Bob Honig has prepared the summary report on Wildlife (see Bob's comments).

Vegetation

For the botanical survey for the special-status species, target plant species were Grey Cryptantha (*Cryptantha leucophaea*), Beaked Cryptantha (*Cryptantha rostellata*), and Prairie Lupine (*Lupinus cusickii*). These target species were based on habitat requirements and historic record of special-status plant species in the project area as indicated in Section 3.4.1.3 of the DEIS for the Wallula Power Project and Wallula-McNary Tranmission Line Project (February 2002). Blooming periods for these species did not coincide with previous surveys.

Special-Status Plant Species

Grey Cryptantha (*Cryptantha leucophaea*) has been documented in the project area within the last 20 years, according to data provided by the Washington Department of Natural Resources Natural Heritage Program. Grey Cryptantha grows in loose, sandy soils and flowers in May and June. Based upon habitat requirements, Beaked Cryptantha (*Cryptantha rostellata*) and Prairie Lupine (*Lupinus cusickii*) may also occur in the project area. Beaked Cryptantha occurs in dry open places, sometimes with sagebrush, and flowers late April to mid-May. Prairie Lupine occurs in rocky, open slopes and areas that contain deposits of volcanic ash, and flowers May to June.

A list of all vegetative species observed during the May 2002 botanical survey is provided in the table at the end of this summary. A list of botanical references utilized for field identification of plants, including special-status species, is also included at the end of this summary.

On May 9 we identified what appeared to be a small colony of approximately 15 or more individuals of Beaked Cryptantha (*Cryptantha rostellata*) on the south face of rocky outcrop and grassland along the 200-foot-wide transmission line corridor east of where access road LM-JD-AR 57-2 joins the alignment (GPS coordinates N45.91795, W119.10702). Photographs detailing the plants were obtained.

On May 11 we identified what appeared to be Prairie Lupine (*Lupinus cusickii*). At least 9 individual plants were encountered in a 30-foot radius in a westerly-exposed sandy area of the transmission corridor, on the east side of the access road on the north side of the Walla Walla River, just east of Smiths Harbor (GPS coordinates N46.06270, W118.88606). Photographs detailing the plants were obtained.

These two plants were the only special-status plant species observed during the survey. No other special-status plants were identified in the course of the 5-day field reconnaissance survey. However, while the potential that the two special-status species exist on the project site, subtle differences at the specific and sub-specific level for both *Cryptantha rostellata* and *Lupinus cusickii* precluded a definitive positive identification. It is strongly suggested that a botanist with specific expertise in the definitive identification of these two species conduct a detailed site review at the identified location sites during the short flowering period of mid-May to June. Given the relatively small confined area where the special-status species were found, it is entirely possible to avoid disturbance to the plants by slight relocation of access road or transmission line towers, if necessary.

Master List of Plant Species Identified during Wallula Phase II Investigation

American three-square	*Scirpus americanus*	
Arrow-leaved balsamroot	*Balsamorhiza sagittata*	
Aster	*Aster* spp.	
Beaked cryptantha*	*Cryptantha rostellata*	*State Sensitive
Big sagebrush	*Artemisia tridentata*	
Bitterbrush	*Purshia tridentata*	
Bitterbrush	*Purshia tridentata*	
Bluebunch wheatgrass	*Agropyron spicatum*	
Bluegrass	*Poa* spp.	
Buckwheat	*Eriogonum* spp.	
Canada thistle	*Cirsium arvense*	
Cat's ear	*Hyochaeris radicata*	
Cattail	*Typha latifolia*	
Cheatgrass	*Bromus tectorum*	
Cheatgrass	*Bromus tectorum*	
Cleavers	*Galium aparine*	
Common burdock	*Arcticum minus*	
Common larkspur	*Delphinium nuttellianum*	
Common mullein	*Verbascum thapsus*	
Common teasel	*Dipsacus fullonum*	
Cottonwood	*Populus deltoides*	
Cultivated peppermint	*Mentha* spp.	
Dagger-pod	*Phoenicaulis cheiranthoides*	
Dandelion	*Taraxacum officinale*	
Desert parsley	*Lomatium grayi*	
Evening primrose	*Oenothera pallida*	
Fescue	*Festuca* spp.	
Fescue	*Festuca* spp.	
Fiddleneck	*Amsinckia* spp.	
Field pennycress	*Saxifraga occidentalis*	
Golden pea	*Thermopsis montana*	
Goldenrod	*Salidago* spp.	
Green rabbitbrush	*Chrysothamnus viscidiflorum*	
Grey rabbitbrush	*Chrysothamnus nauseosus*	
Hardstem bulrush	*Scirpus acutus*	
Hood's phlox	*Phlox hoodii*	
Hybrid poplar	*Populus* spp.	
Knapweed	*Centaurea* spp.	
Kochia	*Kochia scoparium*	
Lamb's quarters	*Chenopodium album*	
Locoweed	*Astragalus* spp.	
Milkweed	*Asclepias* spp.	
Mustard	*Brassica* spp.	

Orange globe mallow	*Sphaeralcea munroana*
Pacific willow	*Salix lasiandra*
Pineappleweed	*Matricaria discoidea*
Plantain	*Plantago lanceolata*
Prairie lupine	*Lupinus lepidus*
Prickly pear cactus	*Opuntia polycantha*
Purple loosestrife	*Lythrum salicaria*
Reed canarygrass	*Phalaris arundinacea*
Russian olive	*Eleagnus angustifolia*
Rye grass	*Secale cereale*
Sand dock	*Rumex venosus*
Sedge	*Carex* spp.
Shepherd's purse	*Capsella bursa-pastoris*
Smartweed	*Polygonum* spp.
Snowball	*Abronia elliptica*
Spikerush	*Eleocharis* spp.
Stinging nettle	*Urtica dioica*
Stork's bill	*Erodium cicutarium*
Tall white top	*Lepidium latifolium*
Thyme-leaved buckwheat	*Eriogonum thymoides*
Tumblemustard	*Sisymbrium altissimum*
Tumbleweed	*Salsola iberica*
Western yarrow	*Achillea lanulosa*
Wild onion	*Allium acuminatum*
Yarrow	*Achillea millefolium*
Yellow salsify	*Tragopogon dubius*
Yellow starthistle	*Centaurea solstitialis*

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APPENDIX D

WALLULA POWER PROJECT, BIOLOGICAL ASSESSMENT FOR TERRESTRIAL AND AQUATIC PLANTS AND ANIMALS. SMAYDA ENVIRONMENTAL ASSOCIATES, INCORPORATED, SEATTLE, WASHINGTON. SEPTEMBER 10 2001

Wallula Power Project

Biological Assessment for Terrestrial and Aquatic Plants and Animals

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September 26, 2001

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Wallula Power Project

Biological Assessment for Terrestrial and Aquatic Plants and Animals

September 26, 2001

1. Introduction

Wallula Generation LLC, proposes to develop of a 1,300 megawatt, natural gas-fueled combustion turbine power plant in Wallula, Walla Walla County, Washington. The Wallula Power Project is designed to provide low cost electric energy to meet the growing needs of the Northwest and other interconnected electric transmission areas where electric energy is needed.

The project site is located in the northwestern portion of Walla Walla County, approximately eight miles south of the city of Pasco, two miles north of the unincorporated community of Burbank. The property is within the southeastern quarter of Section 33 and southwestern quarter of Section 34, both located in Township 8 North, Range 31 East. The project site is bordered on the west by U.S. Highway 12 and on the east by the Union Pacific Railroad. Lake Wallula (the McNary Pool reach of the Columbia River) is located approximately 800 feet to the west. Project laterals include makeup water supply and natural gas pipelines that will extend southeast from the power plant site, 4.6 and 5.9 miles, respectively.

Figure 1 Wallula Power Project Vicinity Map shows the location of the proposed project and its laterals.

2. Description of Proposed Development

Project Site

Project facilities will occupy approximately 100 acres of the 175-acre parcel which is currently zoned industrial and designated 'IH, Heavy Industrial' in the existing land use plan for western Walla Walla County. The project site is currently developed for irrigated agriculture and has most recently been used for production of alfalfa. Adjacent land uses include the highway right-of-way, the Iowa Beef Processors, Incorporated slaughterhouse, the J.R. Simplot Company cattle feedlots, the Ponderosa Fibers of Washington de-inking plant, and the Boise Cascade Wallula Mill pulp and paper products mill. Irrigated annual crops and orchards are farmed immediately north of the project site.

insert figure 1; Wallula Power Project Vicinity Map

Figure 2 Vegetation Map of Project Site shows the habitats present on the project site and adjacent parcels of land to the north and south. **Table 1 Project Site Cover Type Descriptions** defines the cover type codes used on the vegetation map. The 175-acre project site is dominated by an agricultural crop circle (approximately 125 acres) currently cultivated with alfalfa. Abandoned orchards are present in three of the four corners of the project site (approximately 30 acres). Irrigated farming began on the project site in about 1978 (Chen-Northern 1993).

Table 1. Project Site Cover Type Descriptions

Map Code	Cover Type Description
AGa	Agriculture, irrigated annual cropland
AGo	Agriculture, irrigated orchards
AGd	Agriculture, developed lands
AGf	Agriculture, fallow lands
C	Canal or irrigation ditch
DSS	Disturbed shrub-steppe
IND	Industrial lands
OWi	Open water, irrigation created
PEMi	Palustrine emergent wetland, irrigation created
PFOi	Palustrine forested wetland, irrigation created
PSSi	Palustrine scrub/shrub wetland, irrigation created
R	Unpaved farm road
RR	Railroad

The primary irrigation supply pond is located in the northeast corner of the project site. The pond has a surface area of about three acres when full during the March to October irrigation season. A narrow band of vegetation (about one acre total area) consisting of Great Plains cottonwood (*Populus deltoides var. occidentalis*), honey locust (*Gleditsia* sp.), sandbar willow (*Salix exigua*), Russian olive (*Eleagnus angustifolia*), common cattail (*Typha latifolia*), and hardstem bulrush (*Scirpus acutus*) surrounds the pond.

Irrigation ponds and drainage ways are also located along the western edge of the project site. None of the irrigation structures are lined, and water-dependent vegetation has become established in these areas, through planting and natural colonization from nearby areas. Dominant species include Russian olive, Pacific willow (*Salix lasiandra*), Great Plains cottonwood, common cattail, hardstem bulrush, and purple loosetrife (*Lythrum salicaria*). Disturbed shrub-steppe habitat is present between the irrigation ponds on the western edge of the project site. Dominant grasses and forbs include cheatgrass (*Bromus tectorum*), Russian thistle (*Salsola iberica*), yellow starthistle (*Centaurea solstitialis*), perennial pepperweed (*Lepidium latifolium*), kochia (*Kochia scoparia*), and Canada thistle (*Cirsium arvense*). Shrub species include big sagebrush (*Artemisia tridentata*), and both gray and green rabbitbrush *(Chrysothamnus nauseosus* and *C. viscidiflorus*). The western portion of the project site, exclusive of agricultural lands, totals approximately 16 acres.

insert figure 2; Vegetation Map

Construction of the power plant and associated facilities is scheduled to occur over a 24-month period. Clearing and grading of the project site will result in removal of vegetation from the majority of the site, including the trees surrounding the main irrigation pond northeast corner. A total of 100 acres will be used for placement of project facilities.

When complete, the Wallula Power Project will include the following structures: the steam turbine building housing four combustion gas turbine generators, four heat recovery steam boilers and exhaust stacks, two sets of cooling towers, storage tanks, switchyard, two stormwater detention ponds and two evaporation ponds. The tallest structures are the heat recovery steam boiler exhaust stacks, at 175 feet each. These stacks will be freestanding above the height of the adjacent steam turbine building. The steam turbine building and heat recovery steam boilers will be 98 feet tall. The cooling towers will be arranged in two rows of nine cells, approximately 600 feet long by 61 feet tall.

The small wetlands surrounding the irrigation ponds on the west side of the project site will be protected by wetland buffers, and no vegetation will be cleared within either the wetlands or their buffers. Over time, these wetlands are expected to become drier sites as a result of cessation of irrigation on the site. All other portions of the project site not occupied by project facilities will be reseeded to shrub-steppe habitat, emphasizing native plant species, upon completion of construction. Juniper trees (*Juniperus occidentalis*) may be planted as a wind and visual screen along the western edge of the project site adjacent to U.S. Highway 12.

Access Road

Access to the project site during construction will be achieved through a temporary access road on the project site and the adjacent Jaussaud property to the south. The access road will intersect U.S. Highway 12 at a temporary construction T intersection. Permanent access to the power plant will be constructed from Dodd Road, located to the north of the project site. After construction is completed, the temporary U.S. Highway 12 intersection will revert to a gated access as a second means of emergency access until such time as a permanent north-south parallel County roadway is developed. Once the County access road is completed, the temporary access road will be revegetated.

The temporary construction access road will pass through disturbed shrub-steppe habitat characterized by cheatgrass, knapweed (*Centaurea spp*.), Russian thistle, and perennial pepperweed. The permanent access road to the site will be located in an area currently farmed with alfalfa. This access road will be paved with asphalt.

Project Laterals

Figure 3 Vegetation Map of Project Laterals shows the proposed routing of the makeup water supply and natural gas pipelines.

insert figure 3; Vegetation Map of Laterals

Makeup Water Supply Pipeline

The proposed industrial makeup water pipeline will extend south from the southeast corner of the project site, then diagonally to the southeast corner of Section 3, T7N, R31E, and would continue south along the section line onto the Boise Cascade Wallula Mill tree farm. The pipeline will continue within the tree farm to link five existing wells in the southwest corner of Section 11, T7N, R31E and five existing wells in the eastern half of Section 14, T7N, R31E. The overall length of the industrial makeup water pipeline is approximately 4.6 miles from the project site to the southernmost Boise Cascade well. The pipeline will be buried for its entire length.

Habitat along the makeup water supply pipeline route is comprised of disturbed shrub-steppe and hybrid poplar stands. A high proportion of weedy non-native species intermixed with native shrubs characterizes the disturbed shrub-steppe habitat along the route. The dominant shrub species are big sagebrush, green rabbitbrush, and gray rabbitbrush. Cheatgrass is the dominant understory grass species, with occasional plants of bluebunch wheatgrass (*Agropyron spicatum)* and Idaho fescue (*Festuca idahoensis*). Russian thistle, Canada thistle, knapweed, and yellow starthistle are common.

The Boise Cascade tree farm stands are plantations of hybrid poplar grown on a seven-year harvest rotation. The dense stands are intensively maintained and few other plant species are present. Weedy plants that grow along the access roads adjacent to the stands include cheatgrass, Russian thistle, and perennial pepperweed.

Construction of the natural gas pipeline will be accomplished over an approximately three-month period. The pipeline trench will be excavated at multiple points in order to reduce the duration of construction and return the land to agricultural use as soon as possible. The pipeline will be buried 4 to 5 feet deep, using excavated material to backfill around the pipe. The disturbed areas will be seeded with native and appropriate non-native grasses and forbs to stabilize the soil. Assuming an average excavation and disturbance width of 75 feet, installation of the pipeline and tap site at the eastern terminus will temporarily disturb approximately 60 acres of habitat, about half of which is disturbed shrub-steppe, one quarter hybrid poplar stands, and one quarter existing utility corridor.

Natural Gas Pipeline

Natural gas for the power plant will be transported to the site via a 5.9-mile, 20-inch diameter pipeline. The proposed natural gas pipeline will extend from the southeast corner of the project site, south along the eastern boundary of the Jaussaud property, southeast to the southeast corner of Section 3 of T7N, R31E, and then south along the section line to the intersection with Worden Road. The natural gas pipeline and makeup water supply pipeline will be located in a common, underground utility corridor along this segment of the route. From this point, the natural gas pipeline will extend east-southeast adjacent to the farm road to the tap point with the existing Pacific Transmission-Northwest (GTN) natural gas pipeline, about one-mile north of the Walla Walla River.

The majority of the land affected by construction of the proposed natural gas pipeline is irrigated cropland. Vegetation within the crop circles reflects the annual crop that is seeded (primarily alfalfa, potatoes, and corn) or the weedy species present on fallow sites. Shrub-steppe habitat along the proposed natural gas pipeline route is restricted to the corners between crop circles and a few parcels of grazed land. This habitat is characterized by a high proportion of weedy non-native species intermixed with native shrubs. The dominant shrub species are big sagebrush, green rabbitbrush, and gray rabbitbrush. Cheatgrass is the dominant understory species. Russian thistle, Canada thistle, knapweed, and yellow starthistle are common.

Construction of the make-up water supply pipeline will occur over an approximately three-month period. Multiple sites will be excavated simultaneously in order to achieve this short construction duration. The pipeline will be buried 4 to 5 feet deep, and any roads that are cut during excavation will be repaired and returned to pre-construction condition. Excavated soil will be used to backfill the trench and the site will be revegetated with native and appropriate non-native grasses and forbs upon completion of construction. Assuming an average excavation and disturbance corridor width of 75 feet, the installation of the pipeline will temporarily affect about 4.5 acres of disturbed shrub-steppe habitat and 22 acres of hybrid poplar stands.

Electrical Transmission

Electrical transmission for the project will be designed, constructed, and owned by Bonneville Power Administration (BPA), and will be addressed in an environmental report prepared by BPA.

3. Listed and Proposed Species in the Project Vicinity

Information on federally threatened and endangered species and candidates for federal listing was obtained from the U.S. Fish and Wildlife Service (USFWS 2000b and 2001), Washington Department of Fish and Wildlife (2000 and 2001), and National Marine Fisheries Service (NMFS 2000). The USFWS responded to a request for updated listing of species on August 29, 2001. A copy of this letter is included as Appendix A.

The USFWS indicated that the following federally listed threatened species may occur in the project area (USFWS 2000b):

- Bald eagle (*Haliaeetus leucocephalus*)
- Bull trout (*Salvelinus confluentus*)
- Ute ladies' tresses (*Spiranthes diluvialis*)

These three species and other federally listed and proposed species that could potentially occur in the project area are described briefly below.

Brief Description of the Proposed/Listed Species Potentially Occurring in the Project Vicinity

Fish Species

Investigations of the project site and corridors for the natural gas pipeline, makeup water pipeline, and access road have confirmed that there is no direct connectivity of surface waters and runoff from the plant site and laterals to the waters of the Columbia River or the Walla Walla River (refer to Section 4 below). However, to ensure a comprehensive biological assessment of potential impacts on species listed under the Endangered Species Act of 1973 (ESA), the fish species known or suspected to occur in the Lake Wallula reach of the Columbia River and the lower reach of the Walla Walla River are briefly discussed. Appendix B provides more detailed information (biology, behavior, habitat preferences, etc.) about listed anadromous Pacific salmonids (*Oncorhynchus* sp.) that migrate through the Lake Wallula reach of the Columbia River.

Snake River Sockeye Salmon (Oncorhynchus nerka)

The National Marine Fisheries Service formally listed Snake River sockeye salmon as an endangered species under the ESA on November 20, 1991 (56 FR 58619). The limit of the evolutionarily significant unit (ESU) boundary for Snake River sockeye salmon is entirely within the State of Idaho. However, due to the potential presence of migrating sockeye at various times throughout the year, the mainstem Columbia River from the mouth up to the confluence with the Snake River has been designated as critical habitat for Snake River sockeye (58 FR 68543).

Snake River sockeye may travel through Lake Wallula during migration periods. Juvenile Snake River sockeye migrate from Redfish Lake in Idaho from April to May and adults migrate back to the lake from July through September (Waples and Johnson 1991). Snake River sockeye are considered lake-type sockeye, meaning they spawn in or near lakes. These fish tend to rear for 1 to 3 years prior to migrating to marine waters. Sockeye spend between 1 and 4 years in the ocean before returning to their natal streams to spawn (Gustafson et al. 1997). Like other Pacific salmon, sockeye require substantial cover, relatively high water quality, and low water temperatures (generally less than 15°C).

No rearing of Snake River sockeye salmon would be expected in the Columbia River in the vicinity of the project area. Therefore, presence of this species in Lake Wallula would be expected only for short periods during juvenile and adult migration.

Chinook Salmon (Oncorhynchus tshawytscha)

Both fall chinook and spring/summer chinook salmon populations of the Snake River were listed by NMFS as threatened species under the ESA on April 22, 1992 (57 FR 23458). In addition, NMFS listed Upper Columbia River spring chinook salmon as an endangered species on March 24, 1999 (64 FR 14308). The limits of the evolutionarily significant unit (ESU) boundaries for these populations are entirely outside of Lake Wallula. However, due to the potential presence of migrating chinook at various

times throughout the year, the mainstem Columbia River, including Lake Wallula, is designated critical habitat for all three chinook salmon ESUs (58 FR 68543 - revised in 64 FR 57399, 65 FR 7764).

Listed chinook salmon are present in the Columbia River adjacent to the project area during migration periods. Adult chinook salmon from the Snake River migrate through the Columbia River from May to October (includes both spring/summer and fall chinook populations). Upper Columbia River adult chinook salmon migrate from March through May (Mathews and Waples 1991, Waples, et al. 1991). The Majority of the Columbia River and Snake River chinook are thought to be "ocean-type" chinook, meaning that they outmigrate as subyearlings during the summer and fall after emergence (Mathew and Waples 1991, Waples et al. 1991, Myers et al. 1998).

Juvenile ocean-type chinook such as these tend to migrate quickly to the estuary, therefore, residence in Lake Wallula would be limited. Adults would also be expected to move rather quickly through Lake Wallula. There would be no expected rearing of listed chinook salmon in the vicinity of the project area.

Steelhead Trout (Oncorhynchus mykiss)

NMFS has listed three steelhead evolutionarily significant units (ESUs): Upper Columbia River ESU – endangered (62 FR 43937), Middle Columbia River ESU – threatened (64 FR 14517), and the Snake River Basin ESU – threatened (62 FR 43937). Critical habitat for all of these species has been designated to include the Columbia River reach near the proposed project site (65 FR 7764). However, the area is only considered a migration corridor for Upper Columbia River and Snake River Basin steelhead. Lake Wallula is within the boundary of the Middle Columbia River steelhead ESU.

The Middle Columbia River ESU supports both winter and summer runs of steelhead. In fact, only remaining inland winter-run steelhead population in the United States is thought to exist within this ESU. The Yakima and Klickitat rivers are the major producers of steelhead in the ESU; however, the Walla Walla River supports a summer-run population (West Coast Steelhead BRT 1999).

Adult steelhead from these ESUs generally migrate to their natal streams from September through late June with peak spawning occurring from May through July. Juvenile steelhead in the ESU rear in freshwater for one to two years before migrating to the ocean. Primary migration windows for steelhead through Lake Wallula are mid-April through mid-June for juveniles, and mid- March through mid-May and mid-June through mid-October for adults (USACOE 2000b).

Steelhead have the same basic habitat requirements as other Pacific salmon, including adequate cover, clean substrate, and generally cool water temperatures. Steelhead appear to be especially sensitive to water temperatures. Temperatures exceeding 17°C have been found to have a negative effect on juvenile steelhead populations (Frissell et al. 1992).

Bull Trout (Salvelinus confluentus)

The USFWS listed the Columbia River bull trout population segment as threatened on June 10, 1998 (63 FR 31647). This listing includes all bull trout in the Columbia River watershed from the mouth to the Canadian border. The primary constraint on bull trout production noted by USFWS was the fragmented nature of bull trout habitat throughout the basin (WDFW 1998).

Bull trout have four distinct life history patterns: the resident or non-migratory type, fluvial fish that migrate within the river system, adfluvial fish that migrate between river and lake habitats, and anadromous (Goetz 1989).

Bull trout display a high degree of sensitivity at all life stages to environmental disturbance and have more specific habitat requirements than other salmonids (Rieman and McIntyre 1993). The health of bull trout populations appears to be directly associated with the amount of cover, channel stability, substrate composition, temperature, and migratory corridors provided by a river basin (Rieman and McIntyre 1993). Bull trout require pristine waters with clean gravel and optimal water temperatures from 2-10°C. Water temperatures greater than 15°C are thought to produce a thermal barrier for most bull trout (63 FR 31647, Goetz 1989).

There are no documented populations of bull trout in the Columbia River between the Snake and Walla Walla rivers (USACOE 2000a). Bull trout are known to occur in the upper reaches of the Walla Walla River and tributaries of the Snake River. However, lower reaches of both rivers have been documented as exceeding water quality parameters for temperature, which would likely limit bull trout migration in these streams (DOE 2000). Bull trout are not found near the mouth of the Walla Walla River (USACOE 2000a), and are not expected to occur in the Lake Wallula reach of the Columbia River.

Terrestrial Species

Bald Eagle (Haliaeetus leucocephalus)

The bald eagle is listed as threatened under the ESA. The Federal Government has protected bald eagles since 1967 (32 FR 4001). In the state of Washington, bald eagles have been managed as a threatened species since 1978 (43 FR 6230). Since 1963, the species has increased by more than tenfold, which prompted the U.S. Fish and Wildlife Service to propose the removal of bald eagles from the list of threatened and endangered species in 1999 (64 FR 36453). To date, no decision has been made regarding this proposal; therefore, all protections afforded to the species from their threatened status remain intact.

The Wallula Power Project area is thought to provide only wintering habitat for bald eagles. Several unsuccessful nesting attempts have been documented in the project vicinity; however, there are no documented active nests (USACOE 2000a).

Bald eagle surveys were conducted in the proposed project area from November 2000 through March 2001. During this period, a total of 71 bald eagles were sighted during the fourteen survey dates. Of these, 42 of the bald eagles were juveniles and 29 were adults (SEA 2001). This age distribution is consistent with other studies of bald eagles in the area (Fitzner et al. 1980). However, other studies conducted in the middle Columbia River area have found that adults generally outnumber juveniles (Wood 1980, Fielder and Starkey 1987). Larger numbers of juveniles has generally been associated with an abundant prey base, increasing the chances of success for the less experienced hunters (Fitzner et al. 1980).

On three occasions, bald eagles were observed flying over the proposed project site; however, none were observed perching or hunting in this area. In addition, on one occasion bald eagles were observed flying over the location of the proposed natural gas and industrial makeup water supply line. No observations of eagles perching or hunting over the project laterals were recorded (SEA 2001).

The majority of the bald eagles sighted during the surveys were observed perching in mature cottonwood trees along the Columbia River and Walla Walla Rivers within the boundaries of management units of the McNary National Wildlife Refuge. Individuals were also observed perching on fence posts, the ground, and actively hunting at the water treatment lagoons of the Simplot Feedlot located to the east of the proposed project area. These locations coincide with the highest abundance of waterfowl, a primary food source for wintering bald eagles in this area (Fielder 1982). In fact, some studies have found that during the late winter, waterfowl can comprise between 80 to 90 percent of the bald eagle's diet. The remainder of the food sources include fish, carrion, small mammals, and other birds (Fielder and Starkey 1980, Fielder 1982). The peak abundance of bald eagles in the project vicinity occurred during the months of February and March, which is consistent with other bald eagle studies conducted in the area (Fielder and Starkey 1987, Wood 1980, Fitzner et al. 1980).

Another factor to consider regarding the ecology of wintering bald eagles is the use of communal night roosts. These roosts are used perennially and are typically located near areas with plentiful food sources. The roosts usually contain special habitat features, such as snags or trees that are older and larger than other trees in the area (Adams et al. 2000). Anywhere from a few individuals up to 50 or more may utilize a single roost (Wood 1980, Adams et al. 2000). The surveys conducted at the project included late afternoon and early morning observations. Small congregations of bald eagles (up to five) were noted within the McNary National Wildlife Refuge (SEA 2001); no evidence of early or late day flight patterns to or from specific stands of trees were noted. Neither the project site, nor the laterals, contain adequate tree stands to serve as bald eagle night roosts.

***Ute ladies' tresses* (*Spiranthes diluvialis*)**

On January 17, 1992, the U.S. Fish and Wildlife Service listed Ute ladies' tresses, *Spiranthes diluvialis*, as threatened under the Endangered Species Act (57 FR 2048, January 17, 1992). This perennial orchid has been documented in eight states: Colorado, Idaho, Montana, Nebraska, Nevada, Utah, Washington and Wyoming (USFWS 1998a). The Nevada population has not been relocated since it was initially reported in 1936 (Moseley 1998). In 1997, a small population of Ute ladies' tresses was documented in a wetland meadow adjacent to Wannacut Lake in Okanogan County, Washington. The Washington population is located over 200 miles north of the Wallula Power Project site. This population consists of fewer than 20 individual plants (Ohlson 2000).

The general habitat of *Spiranthes diluvialis* is considered to be broad, low-elevation intermontane valley and plains. It typically occurs at elevations below the coniferous forest vegetation zone in steppe, shrub-steppe, or pinyon-juniper woodland zones. Some populations have been found at the transition zone between coniferous forest and nonforested or woodland vegetation (USFWS 1998a). Specifically, Ute ladies' tresses is a species of wetland habitats. It is often found in habitats that are inundated early in the growing season, such as wet meadows, riparian zones, dry stream channels, river banks, river meadows and floodplains. These sites characteristically retain late season subsurface moisture and exhibit limited overstory cover.

The habitat of the Washington population of Ute ladies' tresses can be described as wetland meadow. It is a periodically flooded alkaline flat adjacent to ponderosa pine and Douglas fir woodland and sagebrush steppe (USFWS 1998a). This population is located at approximately 1,800 feet elevation, lower than other reported populations which are reported from 4,000 to 6,000 feet elevation and range as high as 6,800 feet (USFWS 1998a). Plant species associated with Ute ladies' tresses in Washington include *Eleocharis rostellata, Carex viridula, C. lanuginosa, C. parryana, Panicum occidentale, P. capillare, and Juncus torreyi* (USFWS 1998a*).* In Idaho, *Agrostis stolonifera, Salix exigua, Equisetum variegatum, Eleocharis rostellata,* and *Eleagnus commutata* are commonly associated with *Spiranthes diluvialis* (Moseley 1998).

USFWS (1998) reports that exotic species, including reed canarygrass (*Phalaris arundinacea*), Russian olive (*Eleagnus angustifolia*), Canada thistle (*Cirsium arvense*), whitetop (*Cardaria* spp., and purple loosetrife (*Lythrum salicaria*), can adversely affect habitat for Ute ladies' tresses.

Potential habitat for *Spiranthes diluvialis* is defined in general terms in USFWS (1998). Potential habitats are generally from 1,500 to 7,000 feet elevation in areas where soils is moist to the surface or in the subsurface layer throughout the growing season. The presence of assoicated species is an indicator of potential habitat, as is the presence of other orchid species including *Spiranthes romanzoffiana, Habenaria* spp., and *Epipactis gigantea.*

Habitats disqualified from consideration as potential habitat for Ute ladies' tresses (USFWS 1998a) include (in part): areas composed primarily of upland vegetation; sites characterized by aquatic vegetation in standing water; sites with abrupt transition from stream margin to upland areas; riparian areas or stream banks vegetated by dense rhizomatous species such as reed canarygrass or common reed (*Phragmites australis*); agricultural lands; and riparian areas managed such that the vegetation is composed of upland native or weedy species.

4. Potential Effects of the Proposed Project on Listed Species or Designated Critical Habitat

Fish Species

A review of USGS topographic maps and aerial photographs (U.S. Army Corps Of Engineers and Farm Service Agency) was conducted for the project site and laterals to determine the presence and location of naturally occurring and man-made surface water bodies, including streams, ponds, and lakes. Water bodies present in the project vicinity include small, man-made surface water impoundments (irrigation and water treatment ponds), irrigation canals and drains, Lake Wallula- a reservoir impoundment of the McNary Dam project on the Columbia River, and the Walla Walla River.

Initial field surveys were performed on August 22, 2000 and September 13, 2000 to ascertain the origin and characteristics of small impoundments, canals and drains in the project vicinity. It was determined that the surface-water bodies in the immediate locations of the project site and pipeline laterals are appurtenances of agricultural and industrial activities, and did not exist prior to these activities. Field visits also confirmed that these water bodies have no direct surface connectivity to the Columbia and Walla Walla Rivers. A follow-up site visit on January 3, 2001 further confirmed that irrigation ponds A, B, C, and D on the project site do not have direct surface connectivity to the Columbia River/Lake Wallula.

Consultations with personnel of the Natural Resources Conservation Service (NRCS 2001) and the Army Corps of Engineers (USACOE 2001c) support the conclusion that naturally occurring surface-water bodies are nonexistent in the immediate area of the project site and pipeline laterals. These agency representatives provided additional confirmation that there is no direct surface connectivity of man-made impoundments and irrigation canal and drains in the project vicinity with the Columbia and Walla Walla rivers.

The project site contains four small irrigation ponds that were surveyed for fish presence on six separate occasions. No salmonid species were ever found in these ponds and water quality measurements found that summer temperatures in the ponds exceed 20°C, which is well above optimal temperatures for the listed fish species (Wallula Generation 2001).

As there is no connectivity between any of the proposed project locations and the surface waters of either the Columbia River or the Walla Walla River; construction and operation of the proposed power plant and its laterals is not expected to affect listed fish species.

Terrestrial Species

Bald Eagle

The project site supports limited food resources for bald eagles. Ducks were observed in small numbers on the agricultural ponds on the west side of the project site. The primary irrigation pond, located in the northeast corner of the site, is typically dry between late October and late March. Canada geese were frequently observed in the alfalfa fields at the project site and the adjacent property to the north. Bald eagles were not observed feeding on or hunting for waterfowl on the project site.

Construction and operation of the Wallula Power Project will result in removal of the irrigated crop circle and agricultural ponds on the project site. Approximately 100 acres of the 175-acre site will be converted to power plant structures and related facilities. Remaining lands will be maintained as shrub-steppe habitat. The site will no longer support wintering geese or ducks. Given the low number of waterfowl at the project site relative to other nearby congregations of waterfowl along the Columbia River, as noted during the bald eagle observations, the loss of waterfowl habitat at the project site is not expected to affect wintering bald eagles.

Suitable perch and roost trees are also limited in number on the project site. The largest trees on the site are Lombardy poplars, honey mesquites, and Great Plains cottonwoods of about 20-25 years of age. No stands of mature cottonwoods or other tall trees are present. Bald eagles were not observed perching in any trees on the project site during the survey and due to the limited number of trees, the site would provide poor quality night roosting habitat. In addition, there are numerous perch trees available nearby along the Columbia River. Therefore, the clearing of vegetation on the project site is not expected to affect bald eagles.

Congregations of waterfowl and suitable perch trees are also absent from the locations of the proposed natural gas and industrial makeup water pipelines. Canada geese, gulls, and several species of songbirds are frequently observed at the Boise Cascade compost facility southeast of the project site. However, no bald eagles were observed at this site during the survey. No water bodies supporting waterfowl are present along the laterals. Perch and roost trees are limited to the hybrid poplars of the Boise Cascade Wallula Tree Farm. These trees may reach 75 feet in height before harvest, but are removed and regrown on a 7-year rotation. The poplar stands do not provide observation points for congregations of waterfowl. Due to the absence of food sources and suitable perch trees, the proposed construction and operation of the natural gas and makeup water pipelines is not expected to affect bald eagles.

Construction activity at the project site, including the access road, is scheduled to occur over a 24-month period. Prolonged, noisy activities will occur on the project site approximately 1,000 feet (and possibly as close as 500 feet) to the observation station Refuge South. These activities will be ongoing during the period when bald eagles arrive and utilize the Columbia River corridor but will not involve blasting or other excessively noisy activities. Bald eagles wintering along the Columbia River in the project vicinity apparently are habituated to the noise of traffic on U.S. Highway 12, given the high use of perches near the highway at Station 18, Refuge South, Refuge North and Casey Pond.

Studies have found that bald eagles in areas with high levels of human use become tolerant of human activities, especially interactions with vehicles as opposed to humans in open view (Stalmaster and Kaiser 1998, Skagen 1980). The additional noise and traffic caused by project construction over the two-year construction period is not expected to adversely affect wintering bald eagles.

Construction and operation of the power project will result in slight increases in human presence in the area. Studies have found that bald eagles tend to avoid areas within 500-1600 feet of visible humans. However, eagles return to these areas from between 0.5 hours and 4 hours after the human interaction (McGarigal et al. 1991, Skagen 1980). Bald eagles frequently perched in the cottonwood trees at the Refuge South station (26 of 71 sightings; SEA 2001). The stand of cottonwood trees is located about 1500 feet from the southwestern edge of the project site, and about 2000 feet from the location of the proposed power plant and operations facilities. The Refuge North station was used less frequently by bald eagles, with only eight sightings recorded (SEA 2001). This station is located (at its closest point) approximately 600 feet from the western boundary of the project site and about 1000 feet from the power plant. There was no documented hunting or perching within on the project site itself. The increased human presence during construction and operation will be located more than 600 feet away from a documented bald eagle use areas, and about 1500 feet from a documented site of frequently used bald eagle perch trees. Because of the generally high level of human activity and presence in the general vicinity, including highway and train traffic, farm workers, and visitors/hunters at the Refuge and on Lake Wallula, the increase of human presence caused by the construction and operation of the power project is not expected to affect bald eagles.

Construction activities at the natural gas pipeline and makeup water pipeline laterals will occur over an approximately 3-month period. These laterals are located well away from documented bald eagle use areas. Construction at these sites is not expected to affect bald eagles.

Avian collisions with towers and other tall structures have been documented in the literature (Weir 1976, Avery et al. 1980, California Energy Commission 1995, USFWS 1998b). Illuminated latticework towers, particularly those over 200 feet in height and supported by guy wires, are particularly likely to experience collisions (Weir 1976, Evans and Manville 2000). The class of birds affected in the greatest numbers is neotropical migratory birds, which migrate primarily at night (Manville 2000).

The Wallula Power Project facilities include four heat recovery steam boiler exhaust stacks, each 20 feet in diameter and 175 feet tall. These towers will be freestanding, extending above the heat recovery steam boiler structures by approximately 77 feet. Preliminary information from the Federal Aviation Administration indicates that aviation safety lighting will not be required for these structures. If required, the lighting would meet the recommendations in the U.S. Fish and Wildlife Service September 14, 2000 Draft Guidance on the Siting, Construction, Operation and Decommissioning of Communications Towers (USFWS 2000a). Other project facilities do not exceed 100 feet in height and will be illuminated as necessary with down-shielded security lights. The project structures are not expected to impede the ability of bald eagles to fly through the project vicinity.

***Ute ladies' tresses* (*Spiranthes diluvialis*)**

No habitat suitable for *Spiranthes diluvialis* occurs on the project site or adjacent properties proposed for placement of the access roads. Wetland habitats are present on the Wallula Power Project site adjacent to irrigation ponds on the west side and northeast corner of the property. The west side wetlands are dominated by Russian olive, reed canarygrass, whitetop, poison hemlock (*Sium suave*), cattail (*Typha latifolia*), and other weedy species. No suitable habitat is present based on the dense growth of weedy non-native species at these wetlands. The irrigation pond in the northeast corner is steep-sided, transitioning over ten to twenty feet from aquatic to upland habitat. A narrow fringe of willow, Russian olive, Great Plains cottonwood (*Populus deltoides* var. *occidentalis*), and honey locust (*Gleditsia* sp.) are located on the berm surrounding the pond. Emergent vegetation within the pond includes cattail and hardstem bulrush.

No wetland habitats, and no potential habitat for Ute ladies' tresses, are present along the proposed project laterals.

Field surveys of project habitats in August 2000 and spring 2001 (Wallula Generation 2001) confirm the absence of suitable habitat for Ute ladies' tresses. The majority of wetland habitats are dominated by dense growth of non-native weeds and native weedy species. Vegetation and wetland field investigations also indicate a relative lack of associated species that could indicate potential habitat. No other orchid species were found on the project site. Two species associated with *Spiranthes diluvialis* in Okanogan County were reported as occasional on the project site: *Panicum capillare* and *Juncus torreyi*. None of the dominant plant species at the project site are species associated with Ute ladies' tresses.

The Wallula Power Project will not affect Ute ladies' tresses or its habitat.

5. Summary

Construction and operation of the proposed Wallula Power Project are not expected to affect listed or candidate fish species since no surface water bodies capable of supporting bull trout or Pacific salmon are present on the project site or the sites of project laterals. Irrigation ponds on the project site do not have surface water connection to the Columbia River.

Wintering bald eagles that utilize the Columbia River and Walla Walla River shorelines in the project vicinity are not expected to be affected by project construction or operation. Bald eagle use areas documented in the winter 2000-2001 surveys are located at distances of 600 feet or greater from the project site. Bald eagle nests or night roosts have not been documented in the project vicinity. Critical habitat for bald eagles has not been designated in the project vicinity.

Construction and operation of the proposed power project is not expected to affect the threatened orchid species *Spiranthes diluvialis*. Habitat suitable for this species is not present at the project site or along the proposed laterals. The nearest documented sighting of this species is over 200 miles distant.

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Appendix A: USFWS Letter Dated August 29, 2001

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Upper Columbia Fish and Wildlife Office
11103 E. Montgomery Drive
Spokane, WA 99206

August 29, 2001

Kathleen W. Smayda
Smayda Environmental Associates, Inc.
139 NE 61st Street
Seattle, Washington 98115

Subject: Updated Species List for the Wallula Power Project, Walla Walla County, Washington (File #870.2300)

Reference Number: 1-9-01-SP-0687: Cross Reference: 1-9-01-SP-85

Dear Ms. Smayda:

Per your August 22, 2001, request, the U.S. Fish and Wildlife Service (Service) is writing to update the November 7, 2000, species list FWS 1-9-01-SP-85 for the subject project. There have been changes to this list. Our records indicate that the following listed species may occur in the vicinity of the project and could potentially be affected by it:

LISTED

Threatened
Bald eagle *(Haliaeetus leucocephalus)*
Bull trout *(Salvelinus confluentus)*
Ute ladies'-tresses *(Spiranthes diluvialis)*

This letter officially updates the previous list, and provides you with a new reference number, 1-9-01-SP-0687. You should refer to this species list number in all subsequent correspondence. This update fulfills the requirements of the Service under section 7(c) of the Endangered Species Act of 1973 (Act), as amended.

Information regarding Federal agency obligations under the Act, biological assessments, and candidate species has been provided to you in previous correspondence from this office. If you have questions, please contact Carrie Cordova in this office at (509) 893-8022. Thank you for your efforts to protect our nation's species and their habitats.

Sincerely,

Suzanne Audet

For Supervisor

c: Rick Donaldson, UCFWS, Spokane
WNHP, Olympia
WDFW, Region 1

Appendix B: Run-Timing and Spatial Distribution Of Listed Anadromous Pacific Salmonids (*Oncorhynchus sp.)* In Lake Wallula

Run Timing

Run timing of anadromous salmonids is a function of genetic phenotype, but varies with stream-flow hydrograph, water temperature, and probably other factors. Over time, average distributions for individual runs or groups of runs may be established from sampling at hydroelectric dams. Sampling data of anadromous salmonid populations that pass across the McNary Hydroelectric Dam, operated by the U.S. Army Corps of Engineers, provided the informational basis for a salmonid run timing analysis. An analysis was performed to estimate the run timing of anadromous salmonid populations passing through Lake Wallula in the vicinity of the project. This analysis is based on data of the Fish Passage Center. A series of figures (**Figures 1** through **7**) illustrate the run timing of these populations using McNary Dam fish counts as a relative measure of run timing in Lake Wallula. The raw data used for the analysis and generation of the figures are not included in the appendix, but are readily available on the Fish Passage Center website (http://www.fpc.org/Index.htm).

As can be seen in **Figure 1**, juvenile sub-yearling chinook salmon outmigrate from late June through early August, with the bulk of the fish passing McNary Dam in July. By the end of the curve, most of these fish are probably from the middle Columbia River stocks, having been delayed in outmigration by their location and the lower flows. Snake River fall chinook juveniles probably make up a lesser percentage of the fish at this time, as water temperatures in the Snake River extirpate them by July (Waples et al. 1991). Increases in both desirable food supply (cladoceran zooplankton) and water temperature in late summer tend to metabolically offset each other to some degree. Yearling chinook, having over-wintered in the system, migrate across McNary Dam earlier, in the April through June period **(Figure 2)**, well before the warmer water of late summer and early autumn. Before the completion of the Columbia River dams, there were significant runs of spring, summer, and fall chinook that passed through the subject area. Most of the adult chinook now pass during the September and October period and are therefore considered fall chinook. These fish are both of wild and hatchery origin and include the large-body-sized chinook bound for spawning in the Hanford Reach, in the free-flowing area above Lake Wallula and below Priest Rapids Dam. **Figure 3** shows the passage of adult spring chinook during the mid-April to early June period, as well as minor percentages of fish passing through the subject area in midsummer.

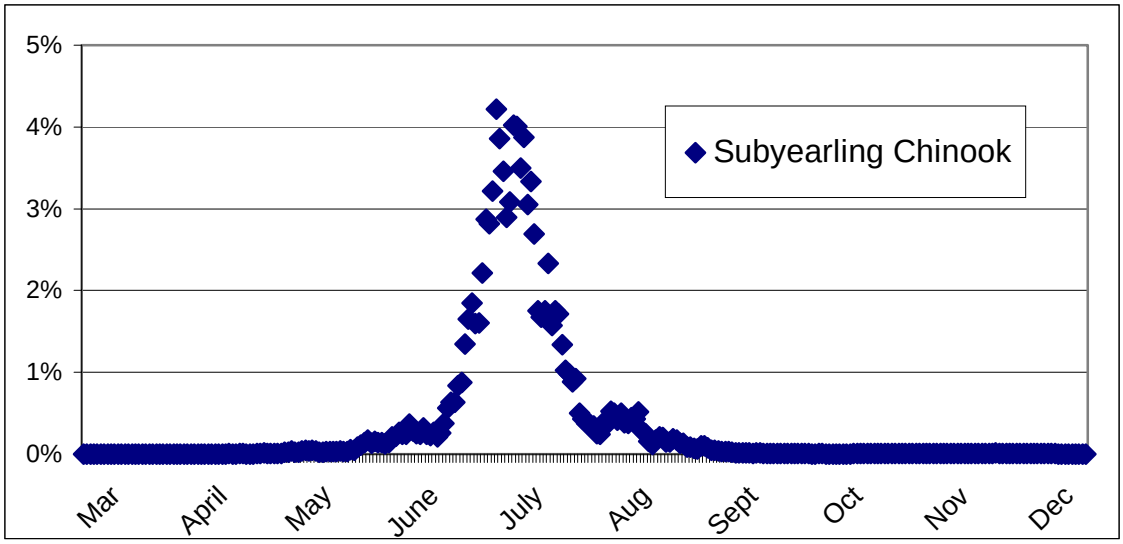

Figure 1. Run Timing Of Juvenile, Subyearling Chinook Salmon At McNary Dam, 1989–1999, In Percent/Day Passage (Fish Passage Center Data).

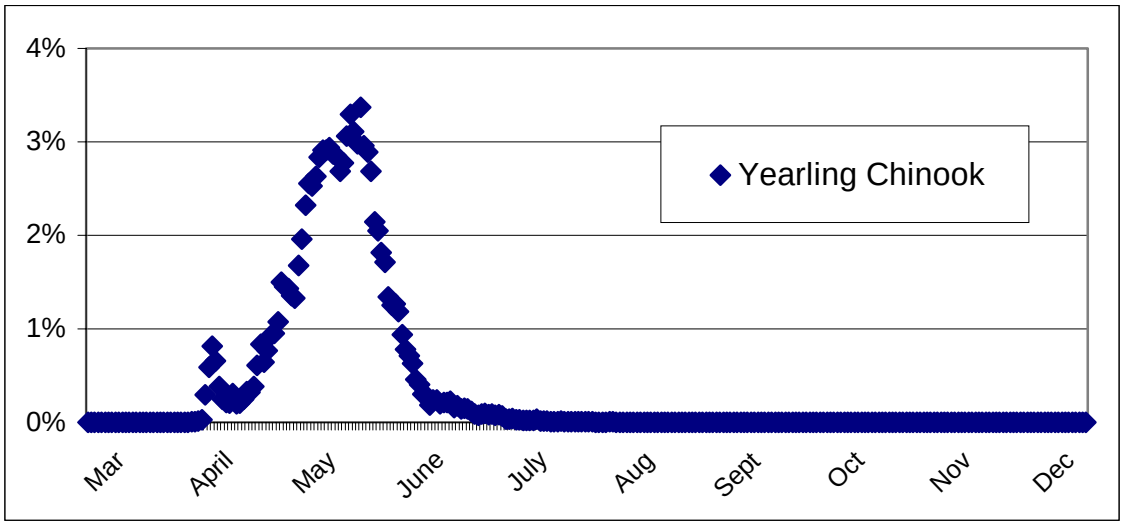

Figure 2. Run Timing Of Juvenile, Yearling Chinook Salmon At McNary Dam, 1989–1999 In Percent/Day Passage (Fish Passage Center Data).

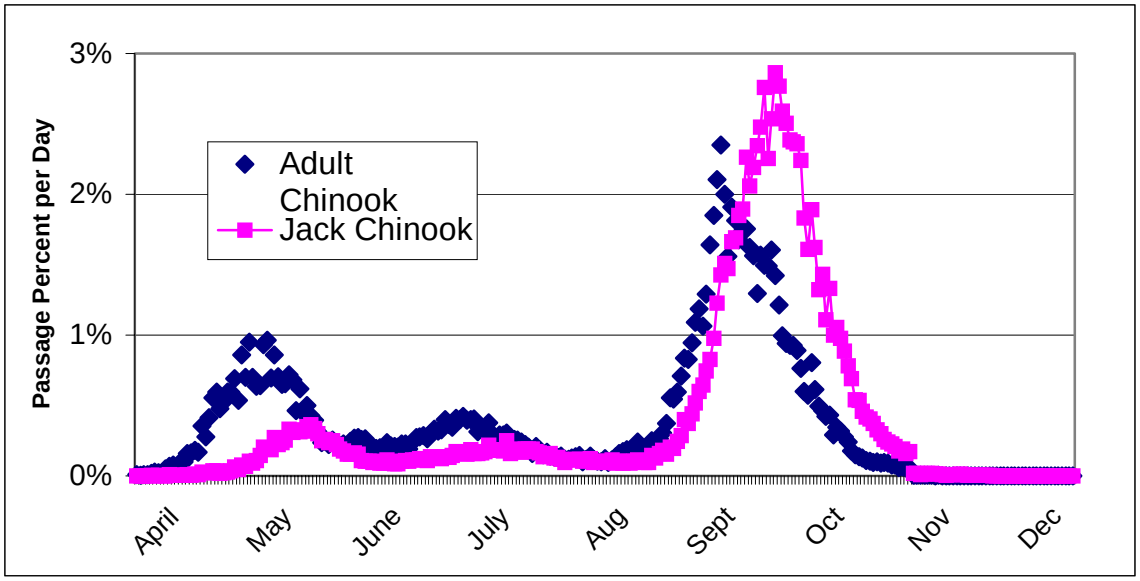

Figure 3. Run Timing Of Adult And Jack Chinook Salmon At McNary Dam, 1989–1999, In Percent/Day Passage (Fish Passage Center Data).

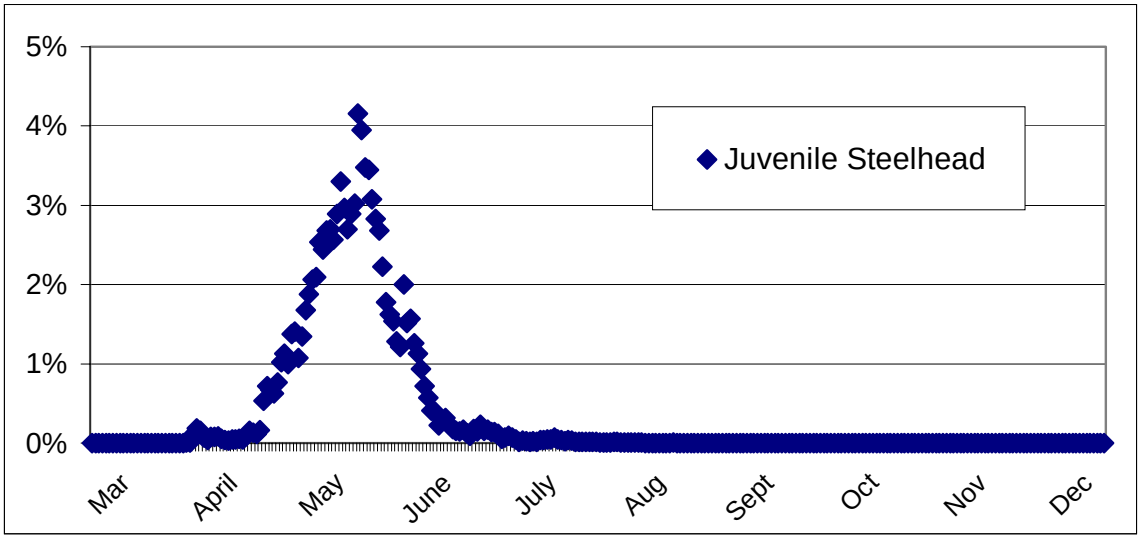

Figure 4. Run Timing Of Juvenile, Subyearling Chinook Salmon At McNary Dam, 1989–1999 In Percent/Day Passage (Fish Passage Center Data).

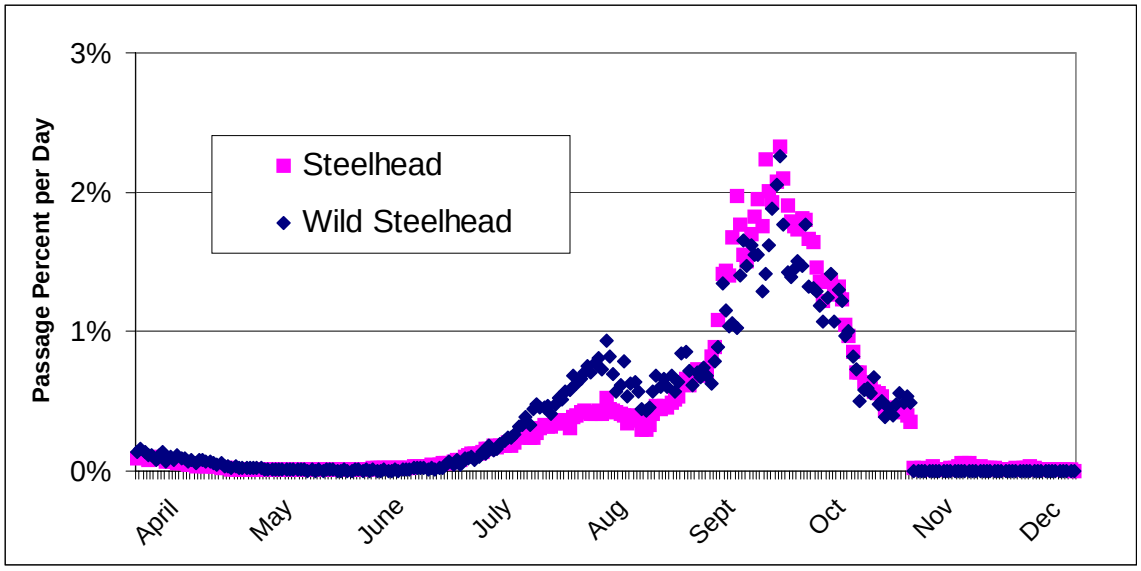

Figure 5. Run Timing Of Adult Steelhead And Wild Steelhead At McNary Dam, 1989-1999, In Percent/Day Passage (Fish Passage Center Data).

Juvenile steelhead pass McNary Dam in spring, with a symmetrical run timing centered around early May **(Figure 4)**. These are the largest of the salmonid smolts in the system, and as flows are generally high, they move quickly through the system (Chapman et al. 1994b). In contrast, adult steelhead run timing at McNary Dam is focused more in the midsummer to fall period **(Figure 5)**. There is a major peak around October 1st and significant percentages passing between July and November. Wild steelhead adults have similar temporal distribution with a minor divergence in August.

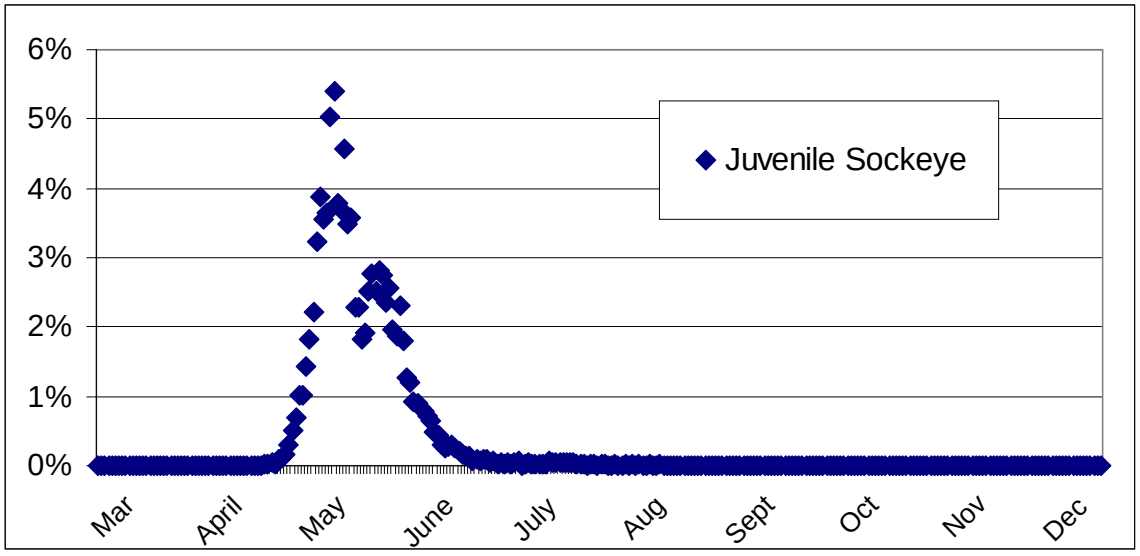

Figure 6. Run Timing Of Juvenile Sockeye Salmon At McNary Dam, 1989–1999, In Percent/Day Passage (Fish Passage Center Data).

Sockeye salmon juveniles tend to move into the McNary area quickly in May, but the distribution is skewed out more to the trailing tail **(Figure 6)**. Although juvenile sockeye and kokanee prefer large-bodied crustacean zooplankton as primary prey, there is often a seasonal decline of their

prey in late spring in natal lakes (Rensel 1993) and similarly they are not abundant in main-stem reservoirs at this time (Haskell et al. in press), Normandeau 2000, Parametrix et al. 2000). Because of lower water temperatures at that time, required food ration is less than later in the year.

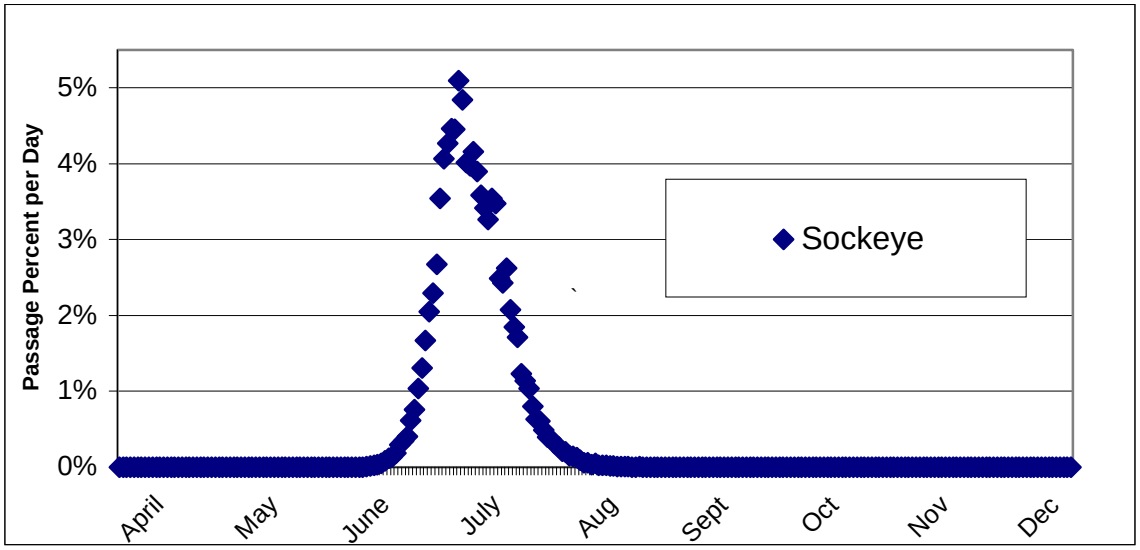

Figure 7. Run Timing Of Adult Sockeye Salmon At McNary Dam, 1989–1999, In Percent/Day Passage (Fish Passage Center Data).

Sockeye salmon adults have a relatively narrow and normal-shaped passage-timing curve, with a peak on July 2nd **(Figure 7)**. These fish are of Snake River, Okanogan River, or Lake Wenatchee stocks, although the former are depleted to an extent that the curve probably reflects mostly the latter.

Spatial Distribution

Some limited studies have been conducted in Lake Wallula and nearby reservoirs that give insight into the spatial distribution of salmon, steelhead and resident fish. This section concentrates on the former two groups, in light of their current ESA status.

Chinook Salmon

In general, the distribution of juvenile fish outmigrating to the Pacific Ocean is divided between the two life-history types of chinook salmon presently populating the mid-Columbia River and tributaries: Spring chinook ("stream type" or yearlings) and summer–fall chinook ("ocean type" or underyearlings). Both Columbia River and Snake River mainstems and some tributaries have populations manifesting these differing life-history types. The type categorization refers to where they spend much of their first rearing year, the stream type in the river or other freshwater areas, and the ocean type in the Pacific Ocean after outmigration downriver. There is large variation from stock to stock and with differing climate and other environmental conditions. Meyers et al. (1998) provides a more extensive description of these life-history types. Discrimination of ocean and stream types in the Columbia River is somewhat subjective. Outmigrants passing Priest Rapids Dam (RM 397.1) prior to and after June 13th are categorized respectively as 'river type' and 'ocean type' (Beak Consultants 1996).

The stream-type chinook are generally larger and tend to use mid-channel habitats when outmigrating (Ledgerwood et al. 1994, and Burley & Poe 1994), although there are exceptions. They outmigrate during a period of cooler water and higher flows, and it can be assumed that these fish probably occupy more of the pelagic zone than their smaller, later-outmigrating relatives, the ocean-types.

In contrast, ocean-type juvenile chinook use shallow littoral areas shortly after emergence in April and May (Becker 1970, and Chapman et al. 1994b). Differences in timing between lower mid-Columbia River and upper mid-Columbia River chinook stocks may affect spatial distribution (Becker 1970). Differentiation between stream- and ocean-types may be related to predator avoidance and suitability of current velocity to body size, but may also relate to increased food availability nearshore for the smaller fish. Haskell et al. (in press) found higher density of crustacean zooplankton nearshore than offshore in Lake Wallula over a 3-year survey period. Water temperatures nearshore in the spring and summer are also warmer in most of the mid-Columbia reservoirs, which is advantageous for growth earlier in the year. In the Snake River, high water temperatures in the summer apparently prevent juvenile fall chinook salmon from rearing in the mainstem after July. These fish may be extirpated into Lake Wallula for more rearing and outmigration to the sea. In contrast, some fall chinook salmon of the upper Columbia River may rear in the river well into August, reaching lengths of 110–130 mm before migrating to the ocean (Allen & Meekin 1973).

There are also unpublished data suggesting that stream-type juvenile chinook are fairly evenly distributed across channel profiles, based on recent unpublished work of the USGS in Lake Wallula and John Day Reservoirs (D. Rondorf, USGS, personal communication, 20 Oct 2000). Nearer to dam structures, however, one study during May 1980 in the forebay of Priest Rapids Dam found most chinook and sockeye salmon near the edges of the reservoir while steelhead trout were located directly in front of the dam (Stober et al. 1980). Certainly other results are known from other rivers outside the basin (e.g., Healy & Jordan 1982), but there are significant differences in the physical habitat of these studies.

Behavior may also vary on a diel basis; many salmonids actively migrate more at night than during the day. There is some evidence from studies of smaller rivers that salmonids may move inshore at night, but this is not the case for studies of the Columbia River. With regard to depth distribution, many if not all stocks of salmon tend to migrate at shallow, near-surface depths in the Columbia River, at depths less than 20.0 ft (Beak Consultants 1996). Studies show that depth distribution of salmonids varies in the water column from the bottom to 20 feet. In some years, almost all of the salmonids occupied depths less than 6.5 ft; yet in other years, they were found at a depth of 6.5–13.0 ft (Weitkamp 1974, Seattle Marine Laboratory 1973).

However, in other locales, some salmonids may establish territorial feeding stations along the bottom as they increase in size above 50 mm; and this is the case for salmon in the Lewis River of Washington State (Campbell & Eddy 1988). To the best of our knowledge, there is no evidence of aforementioned feeding behavior in Lake Wallula. Rondorf, Gray & Farley (1987) found that ocean-type chinook tend to move offshore into areas with current velocity less than 4 feet per second (fps) in June, when reaching about 80-mm in length. For comparison, the highest velocities in tailrace sections of the Columbia are generally on the order of 10 feet per second (fps) or greater.

Adult chinook, moving up the mid-Columbia River, experience some migratory delays due to fallback at dams, which are related to elevated water temperature. Snake River adult fall chinook salmon enter the Columbia River in July and August and reach the mouth of the Snake River

from the mid-August through October (Waples et al. 1991). It is possible, but not documented, that arrivals during August or early September in abnormally warm-water years will hold in the relatively cooler waters of Lake Wallula, as they do in the reservoirs of several hydroelectric projects in the lower Snake River. Utter et al. (1982) presented data documenting substantial differences in water temperature between the upper Columbia and Snake Rivers. Over a 2-year period during the 1960s, the mean monthly summer water temperatures in the mid-Snake River (at Weiser, Idaho) were 6 to 8°C higher than those at Rock Island Dam (RM 453.4) in the upper Columbia River.

In summary, juvenile chinook salmon of ocean- and river- types use different but overlapping areas of Lake Wallula for rearing and migration. Smaller ocean-type chinook tend to use the shoreline areas. Larger stream-type yearlings apparently utilize the entire reservoir including pelagic waters Both types tend to be surface-oriented, and are normally not found in deep, offshore bottom areas. The upstream migration of adult chinook salmon in the Columbia River may be negatively effected during late-spring, summer and early fall seasons when water temperatures are elevated; and Snake River fall chinook may temporarily hold in Lake Wallula until Snake River water temperatures decline later in September.

Sockeye Salmon

Sockeye salmon have the most diverse salmonid life-history patterns (see review by Chapman et al. 1995, Gustafson et al. 1997), but here comments are restricted to those life-history stages of the Snake River run that may pass through Lake Wallula as juveniles or adults. Stober et al. (1980) found juvenile sockeye migrating along the littoral margins of the Columbia River in the Priest Rapids pool. This may or may not be descriptive of other lacustrine sections of the reservoirs. Hartman et al. (1967) suggest that sockeye migrate near the surface of some rivers, but may also like to maintain visual contact with the bottom. These observations led Chapman et al. (1995) to conclude that although somewhat surface-oriented, sockeye tend to migrate at deeper depths than juvenile chinook. The available literature is somewhat scant about this subject, but it suggests that sockeye migrate in the top half of the water column in "clear" rivers (i.e., low-turbidity, high water-transparency areas). Sockeye outmigrants tend to travel in large schools. Surprisingly, Muir and Emmett (1988) found that few outmigrating sockeye near Bonneville Dam consumed zooplankton prey but instead focused mainly on amphipods (*Corophium* spp). These amphipods are tube-dwelling, but are believed to be available to salmon as prey in the water column when displaced by water currents. Water currents vary on short- and long-term cycles in mid-Columbia River reservoirs, with the most variation on a short-term diel basis related to daily peaking of power demand.

Adult sockeye migrating upriver tend to move along in shallow water utilizing eddies and slower water than in the thalweg of the stream channel (Burgner 1991). In the mid-Columbia, adult sockeye move quickly upstream, except into tributaries when water temperatures exceed about 21°C such as often occurs in August in the Brewster Bar area of Lake Pateros. Chapman et al. (1995) presents strong evidence that upstream migration of sockeye adults actually occurs quicker than in pre-impoundment eras, which could be caused by reduced flows in June in the post-impoundment river. Site-specific information was not available on migration of adult sockeye in Lake Wallula, although the endangered Snake River sockeye pass through this area. However, adult sockeye likely utilize both littoral and pelagic spaces in migrating upstream in the middle reaches of Lake Wallula because current velocity is reduced compared with the riverine areas of the lake and the Hanford Reach. Adult sockeye are well known to travel in large schools (population size allowing) throughout their returning coastal and riverine life stage.

Steelhead Trout

Steelhead trout smolts migrate downstream during spring (April and May), when water temperatures are low and stream flows are relatively high. The relationship between flow and outmigration speed and behavior is controversial and complex because the physiological status of steelhead smolts, which is controlled by many factors including water temperature, also interacts to confound a direct flow/speed relationship. Much of the data related to steelhead outmigration involves observed travel times at the dams, not the spatial and depth distribution in the reservoirs that is the focus here. What little data that may be pertinent to this subject is derived from studies of Columbia basin dam forebays and lower pool areas. Stober et al. (1980) found that steelhead in Priest Rapid's forebay were found mostly in the mid-channel, which they related to the large body size and strength of these fish. However, large size is not an advantage when passing through hydroelectric turbines; hence the studies were focused on bypass and entrainment mechanisms for steelhead smolt.

The upstream migration of adult steelhead extends over a long period from early summer through early winter, and hence a wide variety of physical conditions affect their migration. Specific published information was not ascertained in regards to their distribution in Lake Wallula or nearby reservoirs. But, extensive sports fishing for adult steelhead occurs in the Wallula Reservoir, particularly in the area around the mouth of the Snake River, and this activity is an indicator that steelhead may be present in this area during the late summer, fall, and early winter months. Again, the literature tends to focus on passage at dams and the timing as well as gas-saturation effects. Steelhead trout tend to home to their natal streams with high success but experience an inter-dam loss of about 4% (Chapman et al. 1994b).

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SITE PHOTOGRAPHS

[insert two pages of color photos]