



PUGET SOUND ENERGY
The Energy To Do Great Things

EFFECTIVENESS MONITORING PLAN

SETTLEMENT AGREEMENT ARTICLE 514

Appendix K to the SA 501 Terrestrial Resource Management Plan

BAKER RIVER PROJECT

FERC No. 2150-033



Puget Sound Energy

Bellevue, Washington

September 30, 2009

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1.0 Executive Summary

This Effectiveness Monitoring Plan (EMP) has been prepared to comply with Settlement Agreement Article 514 (SA 514), “Use of Habitat Evaluation Procedures,” of the *Order on Offer of Settlement, Issuing New License and Dismissing Amendment Application as Moot* for the Baker River Hydroelectric Project (FERC Project No. 2150). As directed by SA 514, it establishes standards and guidelines for monitoring the effectiveness of SA 502, “Forest Habitat;” SA 503, “Elk Habitat;” SA 504, “Wetland Habitat;” SA 506, “Osprey Nest Structures;” SA 507, “Loon Floating Nest Platforms;” and SA 513, “Bald Eagle Management Plans.” This EMP was prepared collaboratively by the Baker River Project Terrestrial Resource Implementation Group (TRIG), which is composed of representatives of the signatories to the settlement agreement and other interested parties.

2.0 Introduction

This EMP has been prepared for the Baker River Hydroelectric Project, FERC Project No. 2150, pursuant to the *Order on Offer of Settlement, Issuing New License and Dismissing Amendment Application as Moot* dated October 17, 2008 (the “license”). Specifically, Settlement Agreement Article 514 (SA 514), “Use of Habitat Evaluation Procedures,” sets forth the applicable guidance for this plan.

SA 514 directs Puget Sound Energy to develop a plan for monitoring the effectiveness of SA 502, “Forest Habitat;” SA 503, “Elk Habitat;” SA 504, “Wetland Habitat;” SA 506, “Osprey Nest Structures;” SA 507, “Loon Floating Nest Platforms;” and SA 513, “Bald Eagle Management Plans.” Working in consultation with the TRIG, Puget Sound Energy was to develop a plan for assessing habitat quantity and quality using the U. S. Fish and Wildlife Service (USFWS) Habitat Evaluation Procedures (HEP) methodology (USFWS 1980a, 1980b, 1981), “or another appropriate methodology selected in consultation with the TRIG.” This EMP describes the use of HEP for articles and actions that can be assessed with that methodology and provides alternate methodologies that Puget Sound Energy and the TRIG have selected for monitoring the effectiveness of SA 506, SA 507, and SA 513, and the process by which they will determine the monitoring programs for SA 502, SA 503, and SA 504 once lands have been identified and acquired to implement these last three articles.

The HEP methodology was developed by the USFWS to quantify species-specific changes in wildlife habitat quantity and quality brought about by development (habitat loss or degradation) and active management (habitat creation or enhancement). It was developed to address quantification of habitat impacts associated with actions such as reservoir creation or other habitat changes associated with mitigation involving the manipulation of vegetation over tens to thousands of acres.

HEP methodology was not used to quantify the wildlife habitat impacts of the existing Baker River Project during relicense, but it may be appropriate for the quantification of habitat benefits that will be realized by SA 502, SA 503, and SA 504. All three of these

articles require the acquisition and management of lands to provide habitat for one or more targeted wildlife species. The specific applications of HEP, or an alternate methodology, to SA 502, SA 503, and SA 504 will depend on the land parcels selected by the TRIG, and the habitat objectives for those parcels determined by the TRIG at the time of acquisition. For forest habitat (SA 502), the TRIG may find it more appropriate to monitor overall forest habitat condition (forest structure and plant species composition) than to use HEP to monitor habitat for individual wildlife species, or they may chose a HEP model that matches desired targets for habitat conditions, like the ruffed grouse (*Bonasa umbellus*) HSI model. For SA 503, which focuses entirely on a single aspect of elk habitat (forage), the TRIG may or may not decide to run a HEP analysis. The TRIG may find it more desirable to monitor forage production (grass and forb biomass) than to develop a multi-parameter elk habitat model that would be needed to support a HEP analysis. If a HEP analysis is done, the TRIG may choose to create a new elk model or modify an existing model. Wetland habitat (SA 504) could be monitored using HEP to quantify habitat conditions for specific wildlife species, such as the pond breeding amphibian HSI model based on the native red-legged frog, or an alternate methodology that focuses on all aspects of wetland structure and function. These are all decisions that may be made at the time of habitat acquisition, when the habitat objectives for the lands are determined as required by the respective articles.

Other methodologies for monitoring osprey nest structures (SA 506), loon floating nest platforms (SA 507), and bald eagle nests (SA 513) may be more effective than HEP for measuring effectiveness. HEP could be adapted to the monitoring of bald eagle communal winter night roosts, but the simple monitoring of forest structures and bald eagle use of the roosts would be more effective. All three of these articles already include provisions for monitoring that are more appropriate for measuring effectiveness than HEP. After careful review of the monitoring provisions of SA 506, SA 507, and SA 513, the TRIG has concluded that the effectiveness monitoring provisions contained in those articles are sufficient and should be accepted as the appropriate alternative to HEP and better suited for the purposes of SA 514. These are described in greater detail in section 6.5, “Procedures, Standards, and Criteria.”

This EMP describes the steps Puget Sound Energy will take to meet the requirements of SA 514. It establishes goals and objectives for monitoring the effectiveness of the six specified terrestrial articles, and criteria and procedures that will be used to develop monitoring programs for each of the articles. This plan was prepared collaboratively by the Baker River Project Terrestrial Resources Implementation Group (TRIG), which includes representatives from Puget Sound Energy and other signatories to the settlement agreement.

This plan includes:

- Review of the pertinent settlement agreement article to ensure the EMP meets all stated requirements.
- Statements of the purpose, goals, and objectives of the EMP.
- General provisions to describe the process by which the EMP has been developed and can be modified in the future.

- EMP implementation requirements describing the article-specific monitoring that will take place.
- Reporting procedures that describe the content and format for effectiveness monitoring reports, as required by the license.

3.0 Basis for the Plan

The EMP has been prepared in response to SA 514, which is provided in its entirety below.

3.1 Settlement Agreement Article 514

Settlement Agreement Article 514, “Use of Habitat Evaluation Procedures,” states:

Within one year of license issuance, the licensee shall, in consultation with the TRIG, develop and prepare in accordance with Article 501 a monitoring plan to determine the effectiveness of the implementation of Articles 502, 503, 504, 506, 507 and 513. The plan shall require licensee to monitor the effectiveness of the implementation of Articles 502, 503, 504, 506, 507 and 513 through periodic assessments of habitat quantity and quality, using the U. S. Fish and Wildlife Service, Department of Interior, Ecological Service Manuals ESM 101, 102, 103 (Division of Ecological Services, Washington D.C. 1980), Habitat Evaluation Procedures (“HEP”), or another appropriate methodology selected in consultation with the TRIG. Monitoring is intended to assist resource managers in determining the current conditions of the lands acquired and assess management activities over the term of the license. Licensee shall consider the monitoring results in implementing Articles 502, 503, 504, 506, 507 and 513, in consultation with the TRIG.

Within five years of license issuance, licensee shall develop, in consultation with the TRIG, the schedule for specific monitoring actions, the timing of each monitoring period, monitoring criteria, the scope of monitoring given available funding, and the format for monitoring reports in accordance with the consultation requirements of Article 501.

Funding for all aspects of monitoring is not to exceed \$200,000 (if license is 30 years or shorter) or \$300,000 (if license is 40 years or longer) (2006\$). The licensee shall make the funding available in \$100,000 increments according to the following schedule: the first \$100,000 available during the first 10 years of the license term, the second \$100,000 available between years 20 and 30 of the license term (and the third \$100,000 available after year 30 if the license is issued for a term of 40 years or longer). If funds are available forty years following license issuance, and licensee, in consultation with the TRIG, determines further use of the HEP is not feasible for any of the intended purposes of this article, any remaining funds required by this article may be made available to the TERF established pursuant to Article 602.

4.0 Goals and Objectives

The goal of the EMP is to determine the effectiveness of SA 502, SA 503, SA 504, SA 506, SA 507, and SA 513 at providing deciduous forest bird habitat, elk foraging habitat, wetland habitat, osprey nest structures, loon floating nest platforms, bald eagle nests, and bald eagle communal winter night roosts. The objectives of SA 514 are to provide Puget Sound Energy and the TRIG with sufficient information to determine the conditions of

lands and habitats being managed under these six articles, and assess management activities over the term of the license.

5.0 Regulatory Reference and Definitions

Effectiveness monitoring will be in compliance with all applicable local, state, and federal laws and regulations. No local or state law or regulations specifically addresses the types of activities typically associated with habitat-based effectiveness monitoring, and no regulatory conflicts are expected to occur. The USFS may require permits for habitat monitoring on National Forest System lands, and those will be acquired if needed. If it become necessary over the term of the license to capture and handle individual animals as part of effectiveness monitoring, appropriate permits will be obtained from the USFS, U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS) and/or Washington Department of Fish and Wildlife (WDFW).

6.0 Plan Implementation

6.1 Plan Area

The EMP will apply to:

- Deciduous forest habitat acquired and managed according to SA 502.
- Elk foraging habitat acquired and managed according to SA 503.
- Wetland habitat acquired and managed according to SA 504.
- Natural and artificial osprey nest structures along the shoreline of Lake Shannon according to SA 506.
- Loon floating nest platforms on Lake Shannon and Baker Lake, according to SA 507.
- Bald eagle nests and communal winter night roosts for which Puget Sound Energy has prepared management plans according to SA 513.

6.2 Funding

Funding for effectiveness monitoring will be provided as described in Terrestrial Resource Management Plan (TRMP) section 6.0, “Funding.” The use of funds will be reported annually as described in TRMP section 5.0, “Monitoring and Reporting.” If effectiveness monitoring funds specified in SA 514 are still available in 2048, and if Puget Sound Energy, in consultation with the TRIG, determines further use of the HEP is not feasible for any of the intended purposes of SA 514, any remaining funds required by this article may be made available to the Terrestrial Enhancement and Research Fund (TERF) established pursuant to SA 602.

6.3 Development and Modification of the Effectiveness Monitoring Plan

The EMP was developed by consensus of the TRIG for approval by the FERC. The TRIG may propose modifications of the EMP to the FERC according to the procedures described in TRMP section 3.2.1, “Process for TRMP Implementation and Modification.”

6.4 Implementation Schedule

By October 1, 2013, Puget Sound Energy will develop, in consultation with the TRIG, a schedule for monitoring actions, the timing of each monitoring period, monitoring criteria, the scope of monitoring given available funding, and the format for monitoring reports in accordance with the consultation requirements of SA 501, except as modified by the following provisions:

- Effectiveness monitoring of deciduous forest habitat, elk foraging habitat and wetland habitat will occur according to site-specific monitoring programs developed for those lands as they are acquired. Monitoring of these acquired lands will occur in three intervals: a) between 2008 and 2017, b) between 2028 and 2037, and c) after 2037.
- Use and productivity of osprey nest structures will be monitored annually over the term of the license, as required by SA 506. At two-year intervals over the term of the license, artificial osprey nest structures will also be examined and repaired, as needed.
- Loon nest platforms will be monitored annually for the first 15 years after installation to observe nesting activity and evaluate the effectiveness of access restrictions. If the floating nest platform program is continued after 2021, annual monitoring will continue as well.
- Monitoring of bald eagle nests and communal winter night roosts will occur according to schedules specified within management plans prepared in compliance with SA 513.

6.5 Procedures, Standards, and Criteria

6.5.1 Forest Habitat

Monitoring of deciduous forest habitat will be determined on a site-specific basis and described in habitat management measures developed by Puget Sound Energy and the TRIG according to the Forest Habitat Plan prepared for SA 502, and by reference SA 501. Forest management measures will contain habitat objectives for each deciduous forest parcel, and monitoring will be conducted to determine whether the habitat objectives are met. Habitat objectives may include the quantity (acres) and/or quality (plant species composition, structural condition, and presence of specific habitat elements) of habitat to be provided on a given parcel. Habitat objectives may be general in nature, or they may be specific to the needs of particular wildlife species. Monitoring will be conducted to measure the habitat quantity and quality parameters specified in the objectives. Monitoring will be conducted prior to and during implementation of the management measures to detect any changes in habitat quantity and quality resulting from management. Monitoring may be conducted to report general habitat conditions for all deciduous forest species, or it may be directed to the needs of a particular set of neotropical migratory bird species that are in decline in the Puget Sound region, using the USFWS Habitat Evaluation Procedures (HEP) (USFWS 1980a, 1980b, 1981) or an alternate methodology selected by Puget Sound Energy and the TRIG.

6.5.2 Elk Foraging Habitat

Monitoring of elk foraging habitat will be determined on a site-specific basis and described in habitat management measures developed by Puget Sound Energy and the TRIG according to the Elk Foraging Habitat Plan prepared for SA 503, and by reference SA 501. Elk habitat management measures will contain forage objectives for each elk habitat parcel, and monitoring will be conducted to determine whether the forage objectives are met. Objectives may include the quantity (acres) and/or quality (forage species composition and density) of elk foraging habitat to be provided on a given parcel. Monitoring will be conducted to measure the forage parameters specified in the objectives. Monitoring will be conducted prior to and during implementation of the management measures to detect any changes in elk foraging habitat resulting from management. The TRIG may use or modify an existing elk HEP model or an alternate methodology selected by Puget Sound Energy and the TRIG to measure or monitor elk foraging habitat on lands acquired and managed according to SA 503.

6.5.3 Wetland Habitat

Monitoring of wetland habitat will be determined on a site-specific basis and described in habitat management measures developed by Puget Sound Energy and the TRIG according to the Wetland Habitat Plan prepared for SA 504, and by reference SA 501. Wetland management measures will contain habitat objectives for each wetland parcel, and monitoring will be conducted to determine whether the habitat objectives are met. Habitat objectives may include the quantity (acres) and/or quality (hydrology, plant species composition, structural condition, and presence of specific habitat elements) of habitat to be provided on a given parcel. Habitat objectives may be general in nature, or they may be specific to the needs of particular wildlife species. Monitoring will be conducted to measure the parameters of habitat quantity and quality specified in the objectives. Monitoring will be conducted prior to and during implementation of the management measures to detect any changes in habitat quantity and quality resulting from management. Monitoring may be conducted to report general habitat conditions for all wetland species, or it may be directed to the needs of a particular set of species, with native amphibians and other native species as priorities, using HEP (USFWS 1980a, 1980b, 1981) or an alternate methodology selected by Puget Sound Energy and the TRIG.

6.5.4 Osprey Nest Structures

Osprey nests will be monitored as specified in the Osprey Nest Structure Management Plan prepared for SA 506, and by reference SA 501. Ten artificial nest structures at Lake Shannon will be inspected at two-year intervals during the term of the license and maintained in a condition suitable for use by nesting osprey. Annual monitoring of osprey nesting and productivity between April 1 and August 31 at both Lake Shannon and Baker Lake will provide information on the effectiveness of the osprey nest structures at meeting the goal of seven nesting pairs.

During each report review period, Puget Sound Energy, in consultation with the TRIG, will determine whether additional artificial nest sites or modifications to the placement and design of new structures are needed to achieve the goal of seven breeding pairs on

Lake Shannon. This evaluation will include consideration of results of site evaluation, site monitoring, and best available science.

HEP (USFWS 1980a, 1980b, 1981) is not currently designed to monitor individual bird nests or nesting success, so it will not be applied to the monitoring of osprey nest structures.

6.5.5 Loon Floating Nest Platforms

Loon nests will be monitored as specified in the Loon Floating Nest Platform Plan prepared for SA 507, and by reference SA 501. All platforms will be monitored twice per month between April 1 and July 31 for the first 15 years after initial installation to determine nesting activity and the effectiveness of public access restrictions. At least one visit each year will occur between April 15 and April 31, with another between May 15 and May 31. If monitoring results indicate that success might be improved by modifications to the platforms, Puget Sound Energy may implement such modifications subject to TRIG approval. Puget Sound Energy, in consultation with the TRIG, will also monitor loon nest platforms throughout the season for any issues or concerns with the design, stability, or function of the platforms and anchoring systems.

In the sixteenth year after platform installation, Puget Sound Energy will submit a draft Loon Platform Effectiveness Report summarizing the results of the 15 years of monitoring to assess loon breeding success on the platforms to the TRIG. The report will make recommendations as to the continuation of the floating nest platform program based on the presence or absence of nesting activity, according to the following general criteria:

- Observed loon nest-building activity or use of nests (suggesting nesting success).
- Lack of breeding attempts on one or more of the platforms by the end of the 15-year period (suggesting lack of success).

The TRIG will then decide on the continuation or cessation of the floating nest platform program. HEP (USFWS 1980a, 1980b, 1981) is not currently designed to monitor individual bird nests or nesting success, so it will not be applied to the monitoring of loon floating nest platforms.

6.5.6 Bald Eagle Management Plans

Bald eagle nests and communal winter night roosts will be monitored as specified in the Bald Eagle Plan prepared for SA 512 and 513, and by reference SA 501. Monitoring provisions will be contained within each nest and communal roost management plan developed according to the Bald Eagle Plan. Monitoring procedures may include:

- Periodic observation of known nest sites on existing or acquired Project lands.
- Periodic observation of known winter night roost sites on existing or acquired Project lands.

HEP (USFWS 1980a, 1980b, 1981) is not currently designed to monitor individual bird nests or communal roosts, so it will not be applied to the monitoring of bald eagle management plans.

6.6 Rationale

Monitoring will be done to inform Puget Sound Energy and the TRIG on the effectiveness of specified terrestrial resource plans and facilitate meaningful oversight of plan implementation. Detailed monitoring measures will be developed on a site-specific and plan-specific basis to optimize effectiveness. General guidelines for monitoring are provided in this EMP, and detailed measures are left to be determined concurrent with site-specific habitat or nest management measures. The USFWS HEP methodology (USFWS 1980a, 1980b, 1981) will be employed where it meets monitoring needs identified by PSE and the rest of the TRIG. Other methodologies will be used where HEP is not applicable, or where another methodology will provide better measurement of the effectiveness of plan implementation.

7.0 Reporting

Reports on effectiveness monitoring will be provided as specified in each of the settlement articles covered by this EMP. The format and contents of effectiveness monitoring reports for forest habitat, elk foraging habitat and wetland habitat will be determined when site-specific habitat management measures are developed for those lands. Schedules for reporting will also be developed at that time.

Reports on the effectiveness of osprey nest structures will be prepared annually as described in section 6.5.4. Reports on the effectiveness of loon floating nest platforms will be provided annually for at least 15 years and contain the information specified in section 6.5.5. Loon floating nest platform reports will continue on an annual basis after 15 years if the platform program is continued.

The format and content of reports on the effectiveness of bald eagle nest site and communal winter night roost plans are specified in the plans, as are the schedules for preparing and submitting the reports.

8.0 References

- U.S. Fish and Wildlife Service (USFWS). 1980a. Ecological Services Manual 101: Habitat as a Basis for Environmental Assessment. Division of Ecological Services, Washington, D. C. Release No. 4-80. Unnumbered.
- 1980b. Ecological Services Manual 102: Habitat Evaluation Procedures. Division of Ecological Services, Washington, D. C. Release No. 2-80. Unnumbered.
1981. Ecological Services Manual 103: Standards for the Development of Habitat Suitability Index Models. Division of Ecological Services, Washington, D. C. Release No. 1-81. Unnumbered.

9.0 Review Comments and Responses

Puget Sound Energy prepared a final draft and distributed it via certified US Mail to the TRIG for a 30-day review period on August 14, 2009. Comments on the final draft were due September 14, 2009.

9.1 Distribution List

Table 1. Effectiveness Monitoring Plan reviewers.

Name	Organization	Address
Brock Applegate	WA Dept of Fish & Wildlife	Post Office Box 1100 La Conner, WA 98257
Cathy Baker	The Nature Conservancy	1917 First Avenue Seattle, WA 98101
Len Barson	The Nature Conservancy	1917 First Avenue Seattle, WA 98101
Mignonne Bivin	National Park Service	7280 Ranger Station Road Marblemount, WA 98267
Bob Carey	The Nature Conservancy	410 N. 4th Street Mount Vernon, WA 98273
Chris Danilson	Sauk-Suiattle Indian Tribe	5318 Chief Brown Lane Darrington, WA 98273
Don Gay	USDA Forest Service	810 State Route 20 Sedro-Woolley, WA 98284
Patrick Goldsworthy	North Cascades Conservation Council	P.O. Box 95980 Seattle, WA 98145
Joann Gustafson	WA Dept of Natural Resources	919 North Township Sedro-Woolley, WA 98284
Mark Hunter	WA Dept of Fish & Wildlife	600 Capitol Way North Mail Stop 43143 Olympia, WA 98501
Lou Ellyn Jones	US Fish & Wildlife Service	510 Desmond Dr. SE, Suite 102 Lacey, WA 98503
Robert Kuntz	National Park Service	810 State Route 20 Sedro-Woolley, WA 98284
Chris Madsen	Northwest Indian Fisheries Commission	6730 Martin Way East Olympia, WA 98512
Laura Martin	USDA Forest Service	42404 SE North Bend Way North Bend, WA 98405
Greta Movassaghi	USDA Forest Service	810 State Route 20 Sedro-Woolley, WA 98284
Bob Nelson	Rocky Mountain Elk Foundation	45 Overmeyer Road Raymond, WA 98577
James Roberts	Sauk-Suiattle Indian Tribe	5318 Chief Brown Lane Darrington, WA 98241

Name	Organization	Address
Regina Rochefort	National Park Service	810 State Route 20 Sedro-Woolley, WA 98284
William Rogers	Skagit County Noxious Weed Control Board	302 South First Street Mount Vernon, WA 98233
Scott Schuyler	Upper Skagit Indian Tribe	25944 Community Plaza Sedro-Woolley, WA 98284
Jon-Paul Shannahan	Upper Skagit Indian Tribe	25944 Community Plaza Sedro-Woolley, WA 98284
Laurel Shiner	Whatcom County Noxious Weed Control Board	901 W. Smith Road Bellingham, WA 98226
Stan Walsh	Swinomish Indian Tribe	P.O. Box 368 La Conner, WA 98233
Brenda Werden	WA Dept of Natural Resources	919 North Township Sedro-Woolley, WA 98284
Todd Wilbur	Swinomish Indian Tribe	P.O. Box 368 La Conner, WA 98233

9.2 Transmittal Letter

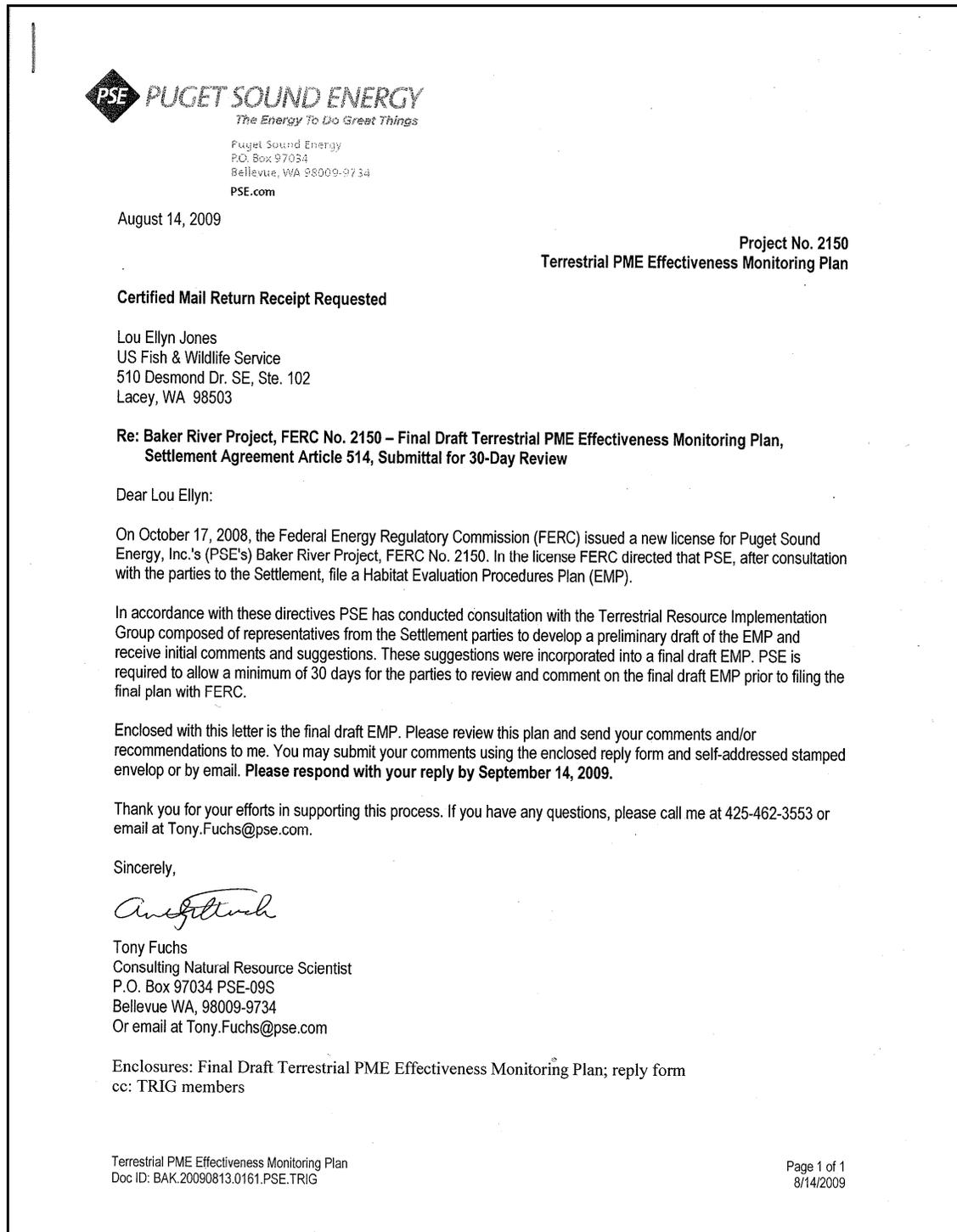


Figure 1. Sample transmittal letter from PSE.

9.3 Reviewer Comments and PSE Responses

Table 2. Comments following formal review of the Effectiveness Monitoring Plan, August 14 – September 14, 2009.

Comment	Puget Sound Energy Response
WDNR – JoAnn Gustafson, received August 27, 2009	
I have no comments (checked on comment form)	Comment noted. No revisions to plan.
NCCC – Patrick Goldsworthy, received August 27, 2009	
I have no comments (checked on comment form)	Comment noted. No revisions to plan.
NPS – Mignonne Bivin, received September 4, 2009	
I have no comments (checked on comment form)	Comment noted. No revisions to plan.
NPS – Robert Kuntz, received September 11, 2009	
I have no comments (checked on comment form)	Comment noted. No revisions to plan.
USDA-FS – Greta Movassaghi, received September 14, 2009 (via e-mail)	
I have no comments (checked on comment form)	Comment noted. No revisions to plan.
RMEF – Bob Nelson, received September 21, 2009	
I have no comments (checked on comment form).	Comment noted. No revisions to plan.