Appendix E--Response to Comments

The public comment period for this permit extended from February 3, 2014 through 5pm on April 18, 2014. Following is a response to comments received. EFSEC consolidated and summarized comments where appropriate. Comments are organized by major topic. The following table associates the commenter(s) with the topic(s) and comment(s) provided:

Commenter	Topic	Comment
Energy Northwest (ENW)	2,3,5,6	2.1, 3.1, 5.1, 6.1, 17.5
Northwest Environmental Advocates (NWEA), Northwest Environmental Defense Center (NEDC), Columbia Riverkeeper	1,5,8,9,10, 11,12,13,14,15, 16,17	1.1, 5.2, 8.1, 9.1, 10.1-10.7, 11.1-11.15, 12.1, 12.2, 13.1, 14.1, 14.2, 15.1-15.3, 16.1,17.6
United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS)	17	17.2
United States Environmental Protection Agency (EPA)	17	17.1
United States Nuclear Regulatory Commission (NRC)	17	17.3
University Legal Assistance	1	1.1
Washington State Department of Fish and Wildlife (WDFW)	17	17.4
Washington State Department of Natural Resources (DNR)	4	4.1

A complete listing of individual commenters and comments is available at EFSEC's website here: http://www.efsec.wa.gov/Columbia%20Generating%20Station/NPDES%202014.shtml.

Contents

1 – Requests for extension of public comment period

Comment 1.1 – Two commenters requested extension of the original comment period.

Response 1.1 – EFSEC extended the comment period from March 14th to April 18, 2014.

Comment 1.2 – U.S. Environmental Protection Agency (EPA) requested 90 days to comment on the permit, as allowed under federal rule and the Memorandum of Agreement (MOA) between EFSEC and EPA.

Response 1.2 – EFSEC accepted comments from EPA on May 5, 2014.

2 – Editorial comments

Comment 2.1 – Factsheet pg.40 – the reference to the footnote to Table 11 should be "Table 10"

Response 2.1 – Correction made

3 – Whole effluent toxicity (WET) monitoring

Comment 3.1 – ENW completed WET effluent characterization monitoring in November 2013. EFSEC coordinated with the Washington State Department of Ecology (Ecology) WET Coordinator to evaluate these results. EFSEC received the evaluation report for the November tests during the public comment period (February 24, 2014). Results indicate the need for an acute WET limit in the permit.

Response 3.1 – EFSEC added an acute WET limit in S1.A of the permit and associated requirements to S12 of the permit. The permit now requires quarterly monitoring for the duration of the permit term. EFSEC will reevaluate the need for WET requirements with the next permit issuance.

4 – Sediment sampling

Comment 4.1 – DNR would like to see sediment sampling as a requirement within the NPDES permit. DNR is particularly concerned about the sediment around the point of discharge. DNR suggests required sediment sampling that includes sampling for the suite of conventional contaminants, as well as metals and organic compounds per WAC 173-204-563. In addition, radiological contaminants of concern, strontium-90, gamma emitting radionuclides (potassium-40, cobalt-60, cesium-137), europium, uranium and plutonium should all be sampled for per subsection (4) of WAC 173-204-563. If sediment sampling becomes a requirement of the NPDES permit, DNR encourages Energy Northwest to submit a sampling and analysis plan for review by DNR's Sediment Quality Unit.

Response 4.1 – EFSEC determined that the discharge has no reasonable potential to violate the sediment management standards (fact sheet III.G). Main factors informing this decision are the low concentrations of total suspended solids in the discharge, corresponding with a lack of sediment deposition in the vicinity of the discharge. The dominant source of sediment is windblown dust captured in the circulating cooling water system. Much of the sediment in the system settles on the floors of the cooling towers and is removed and disposed of per Resolution 299 (fact sheet, pg. 14) prior to discharge. S11 of the permit requires an outfall evaluation during the permit term. EFSEC will make this report available to DNR and use the information to reevaluate the need for sediment sampling at the next reissuance.

5 – Temperature

Comment 5.1 – Permit pg.8, Section S2.A, footnote 5 – ENW recommends that footnote 5 be revised to allow the use of the existing Circulating Water pumphouse (CWP) temperature instrument as an alternative sampling location during maintenance or outages of the new temperature instrument required to be installed at the River pumphouse.

Response 5.1 – EFSEC revised S2.A, footnote 5 to allow use of the existing temperature instrument at the CWP during maintenance or outages of the temperature instrument at the River pumphouse. After the River pumphouse instrument is operational, ENW must notify EFSEC on the monthly report when monitoring results include measurements from the CWP instrument.

Comment 5.2 – The draft permit impermissibly removes narrative temperature limits. Removing the narrative temperature limit violates the anti-backsliding provisions because it provides for a less stringent requirement and does not meet the limited exceptions under section 402(o)(2). The lack of any temperature effluent limit is less stringent than the previous narrative temperature limit. As justification for removing the technology-based effluent limit, EFSEC states that it "does not believe removal of this limit results in less stringent requirements." Fact Sheet at 40. Belief, however, is insufficient. EFSEC has a duty to demonstrate how the deletion of any effluent limit related to temperature is not less stringent than the narrative limit in the previous permit. Due to EFSEC's improper analysis of the water quality standards applicable to CGS's discharges and that the entire Columbia River is considered impaired for temperature, it is likely that the relaxation by removing the narrative technology-based water quality standard will result in CGS's discharges causing or contributing to a violation water quality standards for temperature.

Response 5.2 – The narrative temperature limit EFSEC removed is:

- The temperature of the circulating cooling water blowdown shall not exceed, at any time, the lowest temperature of the circulating cooling water, prior to the addition of makeup water, except that the temperature of the blowdown may be less than the temperature of the river.

As discussed in the fact sheet, the physical location of the discharge of circulating cooling water to the blowdown line and Outfall 001 is at the point of lowest temperature of the circulating cooling water system. That is, the point is located downstream of the cooling towers with no additional sources of heat located between the cooling towers and the discharge location. EFSEC notes that this provision was removed from the federal effluent guidelines during the 1982 rule revision. The preamble to this rule revision discusses the addition of upset and bypass provisions to the NPDES regulations in 1979 (44 FR 32854 32862-3). The proposed permit, and past permits, prohibit bypass of any portion of a treatment facility, which was clearly the intent of the narrative temperature limit. The removal of this narrative limit in no way relaxes or makes less stringent technology-based limitations on the discharge of heat from the facility. EFSEC's evaluation of water-quality based effluent limitations for temperature is detailed in the fact sheet, Section III.E, beginning on page 35.

6 – Evaporative ponds

Comment 6.1 – Permit pg.8, Section S2.A (4) – ENW observes the new evaporation pond flow monitoring requirement was written into the draft permit before the pond was fully designed or constructed. ENW recommends that footnote 1 be revised to authorize daily measurements or calculated estimates of flow when continuous monitoring is not possible.

Response 6.1 – EFSEC revised S2.A (4) to require monitoring of the totalized flow (volume) for all pond influent flows. The permit now requires the sum of all influent flow volumes for each month be reported on the monthly discharge monitoring report (DMR). EFSEC concurs that the evaporative pond cited in the permit was undergoing final design and construction after the draft permit language was written. The final design includes a series of cells within the overall "pond" and accepts discharges from a number of sources (as described in the fact sheet). EFSEC acknowledges that continuous monitoring will not be feasible for every discharge. Continuous monitoring is also not required to meet the monitoring objective, which is to confirm the pond is functioning according to the approved design and operations and maintenance manual.

7 – Spill control plan

Comment 7.1 – Permit pg.21, Section S9.B.1 – ENW recommends this condition be limited to "bulk" rather than "all" products and materials.

Response 7.1 – EFSEC adds the term "bulk" to S9.B.1 of the permit to clarify the intent of the requirement. The fact sheet at V.C *Spill Plan* also speaks to the intent of this requirement.

8 – Copper

Comment 8.1 – The draft permit impermissibly removes copper limits. The 2006 permit included numeric effluent limits for copper. *See* Fact Sheet at 40. In the proposed permit, EFSEC states that it "updated" effluent limits for copper based on the effluent mixing study. Fact Sheet at 1. This relaxation of the effluent limitation for copper violates the CWA's anti-backsliding provisions for two reasons. First, it is not merely a relaxation. Rather, the proposed permit removes any effluent limit on copper. Fact Sheet at 40. The lack of *any* effluent limitation is a far cry from a "less stringent effluent limitation" allowed by the anti-backsliding exceptions. Second, the exception to anti-backsliding cited by EFSEC is inappropriate where the implementation of the less stringent effluent limitation would result in a violation of water quality standards. EFSEC claims a relaxation of the copper effluent limitation is allowed under the exception at 40 C.F.R. § 122.44(l)(2)(i)(A). This regulation is based on the statutory language that creates an exception where "material and substantial alterations or additions to the permitted facility occurred after permit issuance which justify the application of a less stringent effluent limitation." 33 U.S.C. § 1342(o)(2)(A). Regardless of the condenser replacement at the facility, these exceptions do not apply. Both the regulatory and statutory exceptions are subject to the baseline limitation prohibiting a permit with a less stringent effluent limitation if its implementation would result in a violation of a water quality standard. 33 U.S.C. § 1342(o)(3). EFSEC's analysis of the water quality standards applicable to CGS's discharges is incorrect. Under a proper analysis of the applicable water quality standards, it is likely that copper contained in CGS's discharges following the condenser replacement may exceed the water quality criteria.

Response 8.1 – Energy Northwest's replacement of the main condenser was a "material and substantial alteration" to the facility. Monitoring results clearly indicate a significant decrease in copper concentrations in the effluent following condenser replacement. The proposed permit requires continued monitoring for copper. EFSEC does not agree that removal of the copper limit will result in violation of a water quality standard. EFSEC was conservative in its reasonable potential analysis, including pre and post condenser replacement values, and still found no reasonable potential for the discharge to cause or contribute to a violation of water quality

standards. Further information on EFSEC's analysis of the water quality standards is provided in responses at *11 – Water quality standards* below.

9 – Chromium and Zinc

Comment 9.1 – The draft permit impermissibly establishes less stringent effluent limits for chromium and zinc. EFSEC first asserts that it is adding technology-based limits by establishing numeric limits for chromium and zinc in the proposed permit. Fact Sheet at 1. The previous permit in 2006 limited the discharge of chromium and zinc to "no detectable amount." 2006 Permit, page 8. It did not, as EFSEC claims, fail to include limits. By imposing numeric chromium and zinc limits, EFSEC is authorizing ENW to increase the allowable pollutant concentration and load discharged. EFSEC then seems to recognize this, because in the fact sheet it goes on to justify the change under an exception to the anti-backsliding prohibition. Fact Sheet at 42. It cites to a supposed exception where the change would constitute a cause for permit modification or revocation and reissuance under 40 C.F.R. § 122.62. Yet that is not an exception to the anti- backsliding prohibition. The exceptions are listed at 40 C.F.R. § 122.44(l)(2). What EFSEC may be attempting to claim is exception where "technical mistakes or mistaken interpretations of law were made in issuing the permit under subsection (a)(1)(B) of this section." 33 U.S.C. § 1342(o)(2)(B)(ii); 40 C.F.R. § 122.44(l)(2)(i)(B)(2). But that provision only applies if the mistakes were related to a BPJ determination of BAT. Here, EFSEC's 2006 permit provision referenced EPA's applicable limits for chromium and zinc. 40 C.F.R. Part 423 (listing maximum daily and maximum average concentrations for chromium and zinc applicable to nuclear fuel generating units). Thus even that exception would not apply. By imposing less stringent effluent limits for chromium and zinc, EFSEC's proposed permit violates the prohibition against anti-backsliding.

Response 9.1 – EFSEC agrees that 40 CFR 122.(l)(2(i)(b)(2) applies when technical mistakes are related to BPJ determinations of BAT. Application of the BAT standards (200 µg/L chromium, 1,000 µg/L zinc) would result in violation of applicable water quality standards. As described in the fact sheet, EFSEC based the proposed permit limits on BPJ.

The 2006 permit included the following sentence in S1.Discharge Limitations:

- There shall be no detectable amount of priority pollutants (listed in 40 CFR Part 423, Appendix A) in the effluent from chemicals added for cooling system maintenance.

The 2006 fact sheet discusses chromium and zinc beginning on page 15. Referencing *Table 5: Categorical Limits and Maximum Measured Concentrations*, which includes the daily maximum and monthly average categorical limits for chromium and zinc, the fact sheet includes this statement:

- Therefore, the proposed permit incorporates the above effluent guideline limits as effluent limits in Special Condition S1.A of the permit.

The technical mistake and mistaken interpretation of law corrected in the proposed permit is the failure to include the *(except chromium and zinc)* statement from the effluent guidelines in the permit sentence above, and the failure to include appropriate limits for chromium and zinc, in the 2006 permit. Finally, EFSEC notes that the discharge limitation included in the 2006 permit ends with "…in the effluent from chemicals added for cooling system maintenance." ENW does not add chromium or zinc for cooling system maintenance. EPA banned the use of chromium as a

biocide in the early 1990's. The Permittee has monitored and reported detectable amounts of zinc and sometimes chromium throughout the permit term. EFSEC has not taken, and has no plans to take, enforcement actions based on this data. The permit has been implemented consistently as if it did not include limits for chromium and zinc. The mistakes were discovered during permit reissuance and the proposed permit corrects these mistakes.

10 – Monitoring and Reporting

Comment 10.1 – EFSEC's proposed permit merely parrots the federal regulation requiring monitoring that is representative of the monitored activity. It does not specify where the monitoring must occur, or what equipment or method is required.

Response 10.1 – Monitoring locations are specified in S2.A of the permit. Details on location and equipment are provided in operations and maintenance manuals required in S4 of the permit. Additional requirements for monitoring devices are specified in S2.C of the permit. Required test methods are specified in S2.B and Appendix A of the permit.

Comment 10.2 – The permit must require continuous monitoring from outfall 001, especially for priority pollutants.

Response 10.2 – The draft and final permits require continuous monitoring for flow, pH, and temperature. Sufficient methods do not exist for continous monitoring of many priority pollutants. The permit, in S2.A, specifies the minimum sampling frequency and sample type for each parameter where monitoring is required. Specified monitoring frequencies take into account the quantity and variability of the discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring.

Comment 10.3 – The permit should also require monitoring for organic contaminants in the discharge with a semipermeable membrane device (SPMD). SPMDs are commonly used to monitor for polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), chlorinated pesticides, polybrominated diphenyl ethers (PBDEs), dioxins, and furans.

Response 10.3 – See *Response 10.6* below

Comment 10.4 – The monitoring requirements for any water quality-based permit limits must be established using sufficiently sensitive methods to demonstrate compliance with those effluent limitations.

Response 10.4 – Recommended analytical protocol and required detection and quantitation levels are provided in Appendix A of the permit. From Appendix A, "EFSEC added this appendix to the permit in order to reduce the number of analytical "non-detects" in permit-required monitoring and to measure effluent concentrations near or below criteria values where possible at a reasonable cost."

Comment 10.5 – The proposed permit appears to have used the appropriate methodology, specifying Method 1631E (for Mercury), which is the most sensitive method currently available. Proposed Permit at 37.

Response 10.5 – Yes, Appendix A specifies detection and quantitation levels consistent with those achievable using Method 1631E.

Comment 10.6 – The fact sheet states that there is a technology-based limit for PCBs of "no discharge." The proposed permit specifies the use of Method 608 for PCBs. *See* Proposed

Permit at 41. Use of Method 608 is not sufficient to ensure that the discharge will meet the permit limits of "no discharge" of PCBs because this method is not the most sensitive methods available for detection of PCBs.

Response 10.6 – EFSEC must consider applicable federal rules when specifying permit requirements, including test procedures. 40 CFR 122.41(j) (4) requires, "Monitoring must be conducted according to test procedures approved under 40 CFR Part 136 unless another method is required under 40 CFR subchapters N or O." Method 608 is the most sensitive method approved under 40 CFR Part 136 for PCBs. The permit requires use of this method.

Comment 10.7 – The permit must include a wide variety of monitoring throughout the region of the receiving water that corresponds with the water quality standard criteria and use designations to demonstrate that the discharge does not cause or contribute to a violation of water quality standards. To adequately protect Washington's and Oregon's water quality and the wildlife that depends on it, EFSEC's proposed permit for the CGS should include simple monitoring and reporting requirements.

Response 10.7 – EFSEC requires monitoring, recording, and reporting (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and that the discharge complies with the permit's effluent limits. EFSEC typically does not include ambient monitoring. As demonstrated by supplemental information provided by the reviewer, a significant amount of ambient monitoring date is available. EFSEC does require ambient monitoring when the data is required to inform permit limit calculations. ENW completed an effluent mixing study in 2008 that included ambient monitoring data used in calculating permit limits. The discharge monitoring schedule is detailed in S2.A of the permit. Reporting and recording requirements are specified in S3 of the permit.

11 – Water quality standards

Comment 11.1 – EFSEC misconstrues the requirements of the CWA and implementing regulations that all NPDES permitted sources must not cause or contribute to water quality standards violations, in part because it apparently does not understand the legal definition of a water quality standard. In short, a permitting agency cannot ignore the narrative criteria and use only numeric criteria where numeric criteria do not exist or where the numeric criteria fall short of providing full support for designated uses. In contrast to the legal definition of a water quality standard and the EPA permitting regulations, and while it discusses the applicable narrative criteria, EFSEC states that it "uses numerical criteria . . . to derive the effluent limits in the discharge permit" (Fact Sheet), page 25. This limitation is plainly inconsistent with legal requirements. EFSEC must also ensure compliance with Washington and Oregon narrative criteria.

Response 11.1 – EFSEC did consider the narrative criteria described in Chapter 173-201A-260 WAC when it determined permit limits and conditions. EFSEC considered the narrative criteria when it evaluated the characteristics of the wastewater and implementation of all known, available, and reasonable methods of treatment and prevention (AKART) as described in the technology-based limits section of the fact sheet. When EFSEC determined that the facility is meeting AKART it considered the pollutants in the wastewater and the adequacy of treatment to prevent the violation of narrative criteria. In addition, EFSEC considered the toxicity of the wastewater discharge by requiring whole effluent toxicity (WET) testing. EFSEC's analysis of

the need for WET testing for discharges to Outfall 001 is described in the fact sheet. See *Response 11.1 – 11.15* for discussion of Oregon water quality standards.

Comment 11.2 – Little, if any, water quality monitoring appears to have taken place in the receiving water. Instead, EFSEC relies on a mixing zone study from June 2008 which evaluated 18 parameters in the immediate area of the discharge. Fact Sheet at 15-16. One problem with relying solely on ambient water quality monitoring, however, is that many toxic contaminants are not measurable at levels known to constitute a violation of water quality standards (e.g., numeric criteria) and because many toxic contaminants build up in depositional areas of sediment and/or tissue of aquatic or aquatic-dependent species downstream. EFSEC cannot rely solely on the states' current 303(d) lists. Both Washington's and Oregon's EPA-approved lists are mere starting points for assessing whether the CGS discharge is contributing to violations of water quality standards. EFSEC, however, must do much more to evaluate the status of the receiving water for the CGS discharge.

Response 11.2 – The mixing zone study referenced was specifically designed and implemented to collect ambient background water quality data for parameters relevant to the discharge, upstream and in the vicinity of the discharge. EFSEC considers this the best available data for use in the reasonable potential evaluation. The study identified measureable levels of ammonia, chromium, copper, zinc, and lead which EFSEC used in the reasonable potential analysis (see fact sheet Appendix D). See *Response 11.1 – 11.15* for further discussion of water quality standards.

Comment 11.3 – EFSEC has failed to identify and take into consideration relevant Washington and Oregon impairments. Washington has identified the following areas of the Columbia River as impaired by the stated pollutants or parameters:

- (Lake Wallula) for temperature, TDG
- (Lake Umatilla) for temperature, TDG, DDE, Chlordane, PCBs, dioxin
- (Lake Celilo) for temperature, TDG, dioxin
- Columbia River for DO, pH, temperature, dioxin, aldrin, chlordane, TDG, dieldrin, PCBs, DDE and bioassay in sediment

Oregon has identified the following segments of the Columbia River as impaired by the stated pollutants or parameters:

- 0-35.2 for arsenic, DDE, dioxin, PCBs, TDG
- 35.2 - 98 for arsenic, DDE, dioxin, PCBs, TDG
- 98 - 142 for arsenic, DDE, dioxin, PCBs, pH (fall/winter/spring), PAHs,
- 142 - 188.6 for dioxin, PCBs, pH, TDG,
- 188.6 - 213.7 for dioxin, TDG
- 213.7 - 287.1 for dioxin, TDG
- 287.1 - 303.9 for dioxin,
- 121.8-319.3 for pH (fall/winter/spring)
- 0 - 306.1 for temperature

Response 11.3 – EFSEC considered the listings identified by the reviewer and concluded that only temperature is relevant to the discharge, which is discussed in the fact sheet. EFSEC followed the procedures in Ecology's *Procedures to Implement the State's Temperature Standards through NPDES Permits* (October 2010) in evaluating temperature at the facility. The

remaining listings are either for parameters not found in the discharge or where the discharge does not have a reasonable potential to contribute to the impairment. For example, total dissolved gas (TDG) impairments are related to spill water from dams (for more on this parameter see: http://www.ecy.wa.gov/programs/wq/tmdl/ColumbiaRvr/ColumbiaTDG.html) See *Response 11.1 – 11.15* for further discussion of water quality standards.

Comment 11.4 – The Fact Sheet does not discuss how Tier I has been protected by the proposed permit terms (Fact Sheet at 26). Specifically, nothing in the Fact Sheet identifies what existing uses might require protection but that are not designated uses. Without an analysis of whether there are any existing uses that have not been designated and therefore not taken into account when numeric criteria were developed, the analysis cannot but fail to evaluate whether the discharge is or is not consistent with Tier I requirements.

Response 11.4 – EFSEC did not find existing uses in its analysis, or in the materials provided by the reviewer, to indicate an existing use not already protected within a more sensitive designated use for this segment of the Columbia River (at Chapter 173-201A-602 (2) WAC). The fact sheet at *III. Proposed Permit Limits, B. Surface water quality-based effluent limits, Facility Specific Requirements,* describes the Tier I analysis.

Comment 11.5 – Many of the numeric criteria established in Northwest states' water quality standards are intended to provide protection for salmonids. However, salmonids are not the most sensitive species in all instances. Therefore, EFSEC must evaluate whether there are designated and/or existing uses downstream of the CGS discharge that are already affected by pollutants including the CGS discharge. There are designated and existing uses that EFSEC has failed to evaluate.

See *Response 11.4 above.*

Comment 11.6 – Although not included in Washington Ecology's 303(d) list or the EFSEC evaluation, data and information exist to demonstrate that chemicals from the Hanford Site are having measurable effects on aquatic species in the CGS receiving water. For example, DOE (2011b) discusses results of sampling in 2006 and 2007 for mussels, sculpin, juvenile suckers, and for Asian clams in situ. Nothing in the EFSEC fact sheet for the proposed CGS permit indicates that these species have been evaluated for existing water quality impacts on them.

See *Response 11.1 – 11.15.*

Comment 11.7 – Federal regulations require that NPDES permits include conditions necessary to ensure compliance with the water quality requirements of all affected states. 40 C.F.R. § 122.44(d)(4). Despite the fact that the discharge from the CGS facility enters the Columbia River at river mile 351.75, which then becomes a bi-state water body at river mile 309, where Oregon water quality standards apply, EFSEC did not evaluate the discharge for compliance with Oregon's water quality standards. Therefore, EFSEC must still determine if the discharge has the reasonable potential to cause or contribute to excursions above Oregon's water quality standards, in addition to Washington's water quality standards. Not only is assuring compliance with Oregon's water quality standards required by law, it is appropriate policy under the circumstances of Washington's wholly outdated standards. Not all of Oregon's aquatic life criteria may be used without further analysis, however. On August 14, 2012, the National Marine Fisheries Service (NMFS) issued a biological opinion (BiOp) on Oregon's updated aquatic life criteria. The BiOp concluded that the criteria for cadmium, copper, ammonia, and aluminum

posed a jeopardy to species listed under the Endangered Species Act (ESA). Consequently, the use of those numeric criteria must be supplemented by use of the applicable narrative criteria to ensure against jeopardy and to ensure that the designated uses are fully supported consistent with the CWA.

See *Response 11.1 – 11.15.*

Comment 11.8 – Washington and Oregon have issued a fish consumption advisory due to elevated levels of mercury and PCBs found in fish tissue from Bonneville Dam, at river mile 145, for 150 miles upstream to McNary Dam, at river mile 292. Neither state has incorporated this fish consumption advisory in its current 303(d) lists. Contributions of mercury and PCBs upstream of river mile 292, from the CGS discharge, would constitute a contribution to the violations of water quality standards represented by these fish consumption advisories regardless of their not having been used by the states to update their 303(d) lists.

See *Response 11.1 – 11.15.*

Comment 11.9 – The fact sheet establishes that mercury is present in the discharge. Fact Sheet at 35. It concludes that there is no reasonable potential for mercury to exceed water quality criteria. *Id; see also id.*at 66. The problem is that this conclusion is based on Washington criteria alone, not the applicable and much more stringent Oregon human health criteria for mercury, and it is based, presumably, upon the belief that mercury is not already impairing the receiving water. As a contribution of mercury from the CGS represents the addition of a bioaccumulative pollutant, the permit must include an effluent limit that takes into consideration this fact and existing controls on point and nonpoint sources of mercury, if any exist.

Response 11.9 – EFSEC does not agree that Oregon mercury criteria are applicable to this discharge, which is at a significant distance upstream from the shared border. In addition, it is not clear which criteria the reviewer is referring to. EFSEC assumes the reviewer is referring to Oregon's criterion for methylmercury (MeHg) since Oregon's aquatic life criteria for mercury are not more stringent than current Washington state criteria. Although the Oregon criteria are not applicable, EFSEC evaluated the discharge for MeHg following Oregon Internal Management Directive; *Implementation of Methylmercury Criterion in NPDES Permits*, January, 2013. Page 2, *Determining Reasonable Potential* – discusses the process for evaluating the MeHg criterion for facilities where the intake water is taken directly from the same body of water as the facility discharges (as at CGS). From this document:

> For facilities where the only source of mercury in the discharge is from the intake water taken directly from the "same body of water" to which the facility discharges, and that there are no known sources or additional contributions of mercury at the facility, the permit writer may reasonably conclude that the discharge <u>does not</u> have reasonable potential to exceed the criterion. An example of this is a facility that uses a surface water as a source of cooling water and that discharges immediately downstream of the intake location. In these situations where there are no known sources or additional contributions of mercury at the facility, the permitting authority could reasonably conclude that there is no reasonable potential to cause or contribute to an exceedance. Furthermore, any slight increase in concentration after discharge (due to evaporation or other water loss) should not increase the bioaccumulation of MeHg in fish tissue unless the fish are known to regularly reside within the mixing zone of the outfall.

Following this procedure, EFSEC would conclude that there is no reasonable potential for the discharge to cause or contribute to an exceedance of the criterion. Again, this analysis was only

conducted to provide a fuller response to the comment since the criteria are not applicable to this discharge. See *Response 11.1 – 11.15* for further discussion of water quality standards.

Comment 11.10 – Because some of the toxic contaminants found in downstream sediments and tissue are bioaccumulative, the discharge of these pollutants from the CGS upstream is contributing to violations of narrative water quality standards downstream regardless of Oregon's 303(d) listing policies, which do not amend or otherwise change their water quality standards. EFSEC is obligated to consider the prohibitions on combinations of pollutants set out in the states' narrative criteria in establishing the effluent limits for the CGS.

See *Response 11.1 – 11.15.*

Comment 11.11 – In evaluating the discharge and the proposed permit, EFSEC makes no mention of the releases of radioactive and chemical materials from various aspects of the Hanford Site. When a permitting agency seeks to determine if a "discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above a narrative or numeric criteria within a State water quality standard," the permitting agency is required to, *inter alia*, "use procedures which account for existing controls on point and nonpoint sources of pollution[.]" 40 C.F.R. §122.44(d)(1)(ii). Not only has EFSEC not evaluated these releases but it has not accounted for existing controls, if any, on these point and nonpoint sources of toxic pollutants. *See* Washington Closure Hanford, Mission Completion Project Library. Not only does EFSEC need to use these data to assess the quality of the receiving water for pollutants which are present in the CGS discharge and to evaluate the cumulative impact of the pollutants to assure compliance with narrative criteria but it must assess the controls on these pollution sources, along with the irrigation return flows discharging to this portion of the river, in order to develop appropriate water quality-based effluent limits for the discharge.

See *Response 11.1 – 11.15.*

Comment 11.12 – For example, results from later work demonstrates that chromium and chromium VI are "prevalent throughout Reach" and "some metals [are] elevated in 300 Area Sub-area island soils and sediments." USDOE, Data from the Remedial Investigation of Hanford Site Releases to the Columbia River (Oct. 2010) at 8 (Preliminary Findings - new information) (attached as Exhibit 13). The 300 Area Sub-area includes the rivermile of the CGS discharge. *See id.* at 11 (Columbia River Remedial Investigation Area) (300 Area Sub-Area is approximately river miles 340 to 360). The elevated metals include lead and cadmium. While cadmium is not listed as being in the CGS discharge, lead is. These data must be taken into account in establishing the water quality-based effluent limits for the CGS discharge. In addition, cadmium at levels currently allowed by Oregon water quality standards for protection of aquatic life have been determined to cause jeopardy to salmonids. Therefore, in evaluating the combined effect of multiple pollutants to ensure compliance with the narrative criteria and designated use support, the effect of this pollutant cannot be assumed to be that which the states have already used and incorporated into their numeric criteria. The maximum chromium VI detected was in shallow sediments at river mile 357, a few miles downstream of the CGS discharge. *Id.* at 39 (Hexavalent Chromium in Shallow Sediment). The data collected by the US DOE for their human and ecological risk assessments include non-Hanford pollutants, particularly metals, making this a rich source of data. For example, Johnson Island – at rivermile 345-346 – is described as a "hot area," *id.* at 214 (Exposure Assessment), for both radionuclides and metals,

id. at 227. Again, EFSEC is obligated to use these data in evaluating the need for WQBELs for the CGS discharge and in establishing such limits.

Response 11.12 – EFSEC notes that ambient background water quality data for chromium and lead were used in evaluating the discharge (see fact sheet Appendix D). Cadmium was not found in the discharge. Page 42 of the fact sheet describes the effluent limits proposed for chromium, which are based on best professional judgment. One reason for this decision is because many of the effluent samples contained no detectable chromium. EFSEC used the procedures given by EPA (see fact sheet Appendix D) to calculate effluent limits for chromium where water quality standards are met at end-of-pipe. That is, the limits include no allowance for mixing. In addition, the permit limits total chromium as a conservative substitute for hexavalent chromium water quality criteria. See *Response 9.1* for more information on chromium. The reasonable potential analysis for lead is also described in the fact sheet at Appendix D. Finally, the data provided is sediment quality data. The concentration of total suspended sediments in the effluent is very low and no sediment deposition has been observed in the vicinity of the outfall. See *Response 4.1* for more information on the evaluation of potential sediment impacts. See *Response 11.1 – 11.15* for further discussion of water quality standards.

Comment 11.13 – In addition to EFSEC's failure to review data on contamination of water, sediment, and tissue to which the CGS may contribute under the terms of its existing permit and the proposed permit, EFSEC also failed to evaluate possible contributions to existing impairments of designated and existing uses. There are a range of aquatic and aquatic-dependent species, including freshwater mussels, in the immediate and near- field area of the discharge which must be considered as Washington's standards require full support of existing and designated uses. In addition, there are pollution impacts to species further downstream which come from pollution sources throughout the Columbia River basin providing another context in which the CGS discharge must be evaluated. Specifically, these include reproductive failure and reproductive abnormalities in bald eagles, mink, and otter from such pollutants as mercury, DDT and its metabolites.

See *Response 11.1 – 11.15.*

Comment 11.14 – EFSEC has failed to "account for existing controls on point and nonpoint sources of pollution," as required by 40 C.F.R. § 122.44(d)(1)(ii) because it has not identified all the pollutants being discharged or released by other sources to the receiving water nor has it evaluated the existing controls on those sources. Moreover, both the Washington and the Oregon narrative criteria for toxics require protection of designated uses from the combined effects of multiple pollutants. In both instances, there need not be proof that the combinations of pollutants are harmful but, rather, the criterion requires that an evaluation be made of the "potential" that multiple chemicals "may" harm uses and that appropriate prohibitions be based on that evaluation. Here, EFSEC has ignored altogether the potential for multiple pollutants from the CGS in conjunction with other point and nonpoint sources to result in harm to designated uses.

Response 11.4 – The proposed permit required whole effluent toxicity (WET) testing for the discharge specifically to address the combinations of pollutants that may harm uses. EFSEC has added additional acute WET testing since the draft (see *Response 3.1* above) based on test results received during the comment period. These additional requirements include an acute WET limit and the required response for any exceedance of that limit. See *Response 11.1 – 11.15* for further discussion of water quality standards.

Comment 11.15 – In order to evaluate the impact on mass loading that accumulates in tissue and sediment, EFSEC must consider the quality of downstream tissue and sediment and on designated uses, not limited to salmonids. Contamination in sediment does not disperse evenly but, rather, accumulated in depositional areas, downstream of CGS, for example.

See *Response 11.1 – 11.15.*

Response 11.1-15

The reviewer raises several concerns specific to Washington's water quality standards. EFSEC sought and received input from Ecology water quality standards staff during preparation of this document. EFSEC responded above where comments are specific to a parameter or other facility and/or discharge specific detail. The remaining concerns are addressed here.

Ecology is currently working towards adoption of new human health criteria in the water quality standards. Ecology's five year plan, available from: http://www.ecy.wa.gov/programs/wq/swqs/triennial_review.html, indicates that the state's criteria for the protection of aquatic life will also be updated, the process beginning in 2015. Until such standards are effective, EFSEC is obligated to implement the current Washington water quality standards.

While not applicable for the parameters in question, EFSEC also considered Oregon water quality standards in responding to comments. The discharge is located over 42 miles upstream of the Oregon border. Even without an allowance for mixing, sampling indicates the applicable parameters identified in the discharge are below Oregon criteria. Both Washington and Oregon standards authorize the use of mixing zones. Using methods given in EPA, 1991 with any significant amount of mixing (see *15 – Mixing Zones* below) considered, there is no reasonable potential for the discharge to cause or contribute to a violation of Oregon water quality standards. Methylmercury was addressed independently, in *Response 11.9* above.

While EFSEC appreciates the over four thousand pages (exhibits 1-36) of supplemental data provided by the reviewer, much of its content would be more appropriately used in developing a water cleanup plan, or informing standards development, than in evaluating the CGS discharge. The reviewer notes that the narrative criteria in the standards must be considered in evaluating the discharge. EFSEC has described in the fact sheet, and in greater detail above for specific parameters, how it considered the narrative criteria. The permit application did not identify chemicals without numeric criteria as being present in the effluent. Nor is there any indication that such chemicals are added by processes at the facility.

The procedures followed are consistent with well established procedures described in Ecology's *Permit Writer's Manual* (December 2011) and other Ecology guidance documents. It would be inappropriate for EFSEC to interpret the narrative criteria in ways suggested by the reviewer without a proper scientific and policy basis. The suggested process is infeasible on an individual permit basis. It is more appropriate in developing a total maximum daily load (TMDL) and/or informing an update to the water quality standards. EFSEC has shared the information provided with Ecology's Water Quality Program.

12 – Unauthorized pollutants

Comment 12.1 – The Fact Sheet indicates some odd and extra-legal thinking about required effluent limits. Specifically, it states that:

> The limits in this permit reflect information received in the application and from supporting reports (engineering, hydrogeology, etc.). EFSEC evaluated the permit application and determined the limits needed to comply with the rules adopted by the state of Washington. EFSEC does not develop effluent limits for all reported pollutants. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation (Fact Sheet at 19).

EFSEC appears to believe that if a pollutant is "not treatable at the concentrations reported" that no effluent limit need be considered. It has cited no law to support that proposition nor will it find any. This finding is directly contrary to the requirements of EPA regulations. EFSEC also has determined that it is not responsible for any pollutant that the applicant has not identified:

> EFSEC does not usually develop limits for pollutants not reported in the permit application but may be present in the discharge. The permit does not authorize discharge of the non-reported pollutants (Fact Sheet at 19).

While we agree with EFSEC's conclusion that the permit does not authorize discharge of any non-reported pollutants, EFSEC is obligated by Washington's rules to issue a permit that addresses all pollutants. The permit does not, however, state that discharge of any pollutant not named and limited in the permit is a violation of the permit. Instead, it is entirely silent. Therefore, while EFSEC is correct that the proposed permit does not authorize non-reported pollutants, this statement is misleading because neither does it prohibit them. The permit should be revised to clearly prohibit the discharge of unauthorized pollutants. In fact, that is the only way in which EFSEC can ensure that it has not authorized a discharge that may cause or contribute to violations of water quality standards in violation of the statute and implementing regulations.

Response 12.1 – EFSEC does not agree with the conclusions drawn from the quoted statement. This introductory statement in *III. Proposed Permit Limits*, discusses both technology and water quality-based considerations. The first paragraph ends with "…and do not have a reasonable potential to cause a water quality violation" which provides important context and was not discussed in the comment. EFSEC evaluates all pollutants identified in the permit application, discharge monitoring reports, and other credible information specific to the effluent. The evaluations are detailed in the appropriate sections of the fact sheet in *III*. In addition, the permit requires whole effluent toxicity (WET) testing. WET testing is a direct measurement of effluent toxicity. It is addressing pollutants that may be present in a discharge at levels below available method detection levels, and any effects from the combination of pollutants in the effluent. Further, S1.A of the permit limits "The 126 priority pollutants (40 CRF 423 Appendix A) contained in chemicals added for cooling tower maintenance, except chromium and zinc" to *no detectable amount*, and PCBs to *no discharge*. S2.A of the permit requires annual monitoring of the 126 priority pollutants to verify compliance.

Comment 12.2 – It is unclear that the fact sheet contains a complete list of all constituents in the discharge.

Response 12.2 – The fact sheet lists all the constituents identified in the permit application, discharge monitoring reports, and other materials used in preparation of the permit. EFSEC performed reasonable potential analysis on all parameters identified in the discharge to Outfall

001. See fact sheet, Appendix D – Technical Calculations. The Permittee's application and other materials are available from EFSEC's website: http://www.efsec.wa.gov/default.shtm.

13 – Non-routine and unanticipated discharges

Comment 13.1 – The permit also contains a provision that allows so-called "non-routine and unanticipated" discharges without public notice and comment or modification of the permit (Proposed Permit at 20-21). The Fact Sheet provides no legal authority for a permit condition that purports to authorize EFSEC to issue a permit modification through a letter or administrative order. EFSEC cannot modify an NPDES permit in advance through a condition that by- passes public and EPA review. States may establish permit requirements that are more stringent than federal requirements but not less stringent. 40 C.F.R. § 123.25(a). Federal regulations require that draft permits be developed, 40 C.F.R. § 124.6(d), a fact sheet be developed, 40 C.F.R. §§ 124.8 and 124.56, and a public notice be issued and public comment be offered, 40 C.F.R. § 124.10. A permit may be modified, pursuant to 40 C.F.R. § 122.62, where there are alterations or additions to the permitted facility or activity, such as a discharge not previously contemplated, or new information is available that was not available at the time of permit issuance. We are unable to find any provision in law, however, that allows a permitting agency to essentially modify a permit in advance, bypassing all of the procedures that are required by law.

Response 13.1 – S8. *Non-routine and unanticipated discharges* requires an information submittal and approval prior to discharge. S8.2 also explicitly requires compliance with "…effluent limits as established in Special Condition S1 of this permit, water quality standards, and any other limits imposed by EFSEC." This provision is only appropriate for discharges with similar characteristics to those addressed in the permit and treatable by existing treatment systems at the facility. The fact sheet provides potential examples of; pressure-test water, fire system water and leaks from drinking water sources. EFSEC will consider the information submitted and applicable federal and state requirements (including those regarding permit modifications) in determining whether or not to authorize the discharge. If a cause for modification under 40 CFR 122.62 is found in the case-by-case review, the discharge would not be approved outside of the appropriate modification process.

14 – AKART

Comment 14.1 – Meeting Washington's antidegradation policy requires use of AKART. The fact sheet only provides a one-sentence conclusion, without explanation or analysis that "EFSEC has determined that the treatment provided at Columbia Generating Station meets the requirements of AKART (see "Technology-based Limits" *Id.* at 28. The referenced section cites to federal limitations for steam electric power generation set out at 40 C.F.R. § 423.13. *Id.* at 20. There is no basis for EFSEC to believe that AKART is the equivalent of only that which the technology-based requirements of the Clean Water Act and EPA's implementing regulations require. Because AKART requires an analysis and because AKART is a part of Washington's water quality standards, the federally-required fact sheet must include the AKART analysis.

Response 14.1 – EFSEC does not "believe that AKART is the equivalent of only that which the technology-based requirements of the Clean Water Act and EPA's implementing regulations require." The reference cited is to Section III.A "Technology-based effluent limits" of the fact sheet. A discussion of technology-based limits for total residual halogen (and cooling water intake structures) is presented there. EFSEC notes that the proposed limits for total residual

halogen are not based solely on federal requirements, as discussed there (and below in response to comment 14.2). The reviewer may also refer to Section III.J for further discussion of the basis for technology-based limits in the permit. The only parameters where the limit is based solely on the federal limitations are PCBs and priority pollutants (except chromium and zinc) where the limits are "no discharge" and "no detectable amount" respectively. EFSEC believes that the requirements for AKART are described appropriately in the fact sheet.

Comment 14.2 – An additional AKART evaluation is required for the use of chlorine and/or bromine. EFSEC establishes that the technology-based limits limit chlorination to less than two hours per day, pursuant to 40 C.F.R. § 423.13(d)(1) without an exception. Fact Sheet at 20. It further states that:

> The 1995 permit fact sheet documents that in March 1975, Energy Northwest requested and received a waiver of the two hour limitation, stating that it was not appropriate for recirculating water cooling systems. EFSEC later approved the use of bromine as well as chlorine biocides at the facility. Bromine has the same limit and is tested by the same procedure as chlorine.

As a result of this waiver, the 2006 permit prohibited discharges during biofouling treatments and "nor until the concentration of total residual halogens is less than 0.1 mg/L for at least 15 minutes." *Id.* at 21. The applicant requested, and EFSEC proposes to agree, that this permit limit be modified "to address discharges via gravity flow from the over three mile long discharge pipe that may continue even after the circulating water is isolated from the discharge pipe." *Id.* The fact sheet states that "EFSEC believes" this limit is the same as the current limit but provides no explanation. The waiver of the technology-based limit places into question the role of AKART in authorizing a mixing zone for chlorine and/or bromine. According to the Washington Permit Writer's Manual, in the example of municipal discharges where technology-based limits do not address ammonia and chlorine, the authorization of a mixing zone based on the use of AKART "should be addressed on the design basis or on a water quality basis." *See* WA DOE Permit Writer's Manual at VI-8. There is here, however, no discussion of how AKART has been evaluated to allow authorization of a mixing zone in light of the waiver of technology-based limits.

Response 14.2 – EFSEC does not agree that the technology-based limits have been waived. The two hour limitation was found to be inappropriate for application at the facility. The potential need for modification of the BAT limitations for chlorine is explicitly discussed in the preamble to the 1982 rule update (47 FR 52302). In addition, the same rule update modified 40 CFR 125.30 (Subpart D – Criteria and Standards for Determining Fundamentally Different Factors Under Sections 301(b)(1)(A), 301(b)(2)(A and (E) of the Act). The Permittee appropriately sought modification of the requirements for "fundamentally different factors" present at the facility.

The permit at S1.A, footnote c, requires the blowdown isolation valves be closed – no discharge to the blowdown line – during biofouling treatments. The 2006 permit prohibited discharge of cooling water from Outfall 001 during biofouling treatments. The modification to the language acknowledges that cooling water may continue to discharge from Outfall 001, as it drains via gravity flow from the three mile long blowdown line. This discharge however is not water being treated for biofouling because the isolation valves must be closed until the concentration of total residual halogen is less than 0.1 mg/L for at least 15 minutes. This level is below water quality

criteria without mixing. EFSEC does not agree that additional AKART evaluation is required at this time for this discharge.

15 – Mixing Zones

Comment 15.1 – Mixing zones are prohibited for pollutants being discharged to water quality limited streams. The EFSEC Fact Sheet states with regard to mixing zones: "[t]he pollutant concentrations outside of the mixing zones must meet water quality *numeric* standards." Fact Sheet at 27 (emphasis added). EFSEC is incorrect in stating that limitations on mixing zones apply only to "numeric standards" when in fact pollutant concentrations outside the mixing zones must meet water quality standards, including both numeric and narrative criteria. The use of a mixing zone has the reasonable potential to cause stress to organisms as well as the build up of toxic contaminants which may cause stress over time. Moreover, EFSEC did not conduct the analysis required by the water quality standards rules, which establish a default that a discharge does not include a mixing zone unless the supporting information supports having one.

Response 15.1 – EFSEC did not state that limitations on mixing zones apply only to numeric standards. EFSEC considered all applicable water quality standards in authorization of the mixing zone. EFSEC's analysis regarding application of water quality standards (Chapter 173-201A-400 WAC) is described in the fact sheet section referenced by the reviewer.

Comment 15.2 – EFSEC errs in concluding that "[t]oxic pollutants . . . are near-field pollutants; their adverse effects diminish rapidly with mixing in the receiving water." Fact Sheet at 32. This is patently absurd. Most toxic pollutants are conservative. Many are Bioaccumulative meaning that their effects do not diminish because they have become diluted but, rather, they become more hazardous because they bioaccumulate and biomagnify in the tissue of aquatic life. Because mixing zones by definition increase the mass loading of a pollutant to a water body, they can only be used when the receiving water has assimilative capacity. The Columbia River, however, does not have assimilative capacity for many toxic constituents, as discussed *supra*, because the receiving water does not meet water quality standards for those pollutants or it is unknown that assimilative capacity exists. In such an instance, the maximum possible effluent limit for the pollutant, in the absence of a wasteload allocation established in a Total Maximum Daily Load, is the applicable criterion itself applied at the end of pipe, not the edge of a mixing zone.

Response 15.2 – The reviewer's comments are more applicable to the water quality standards themselves. EFSEC must implement the existing water quality standards in permits. Washington water quality standards at Chapter 173-201A-400 allow for application of a mixing zone for the parameters limited by the permit. Further discussion of application of the water quality standards is above in *11 – Water quality standards*.

Comment 15.3 – Discharges of pollutants for which a receiving water is impaired may not be given a mixing zone. Once EFSEC has evaluated all the applicable data on downstream water quality violations to which the CGS discharge may contribute, then it can determine for which pollutants it can justify a mixing zone. Until it has done so, the default is that there may be no mixing zone.

Response 15.3 – EFSEC has evaluated applicable data on water quality violations and determined that a mixing zone is allowable and appropriate for the pollutants identified in the discharge. See *Response 11*.3 above for discussion of the impairments cited by the reviewer.

Further discussion of application of the water quality standards is above in *11 – Water quality standards*.

16 – Dilution

Comment 16.1 – Dilution in lieu of treatment cannot be authorized by an NPDES permit. The fact sheet establishes that the CGS impermissibly dilutes its effluent prior to discharge in order to meet permit effluent limits (Fact Sheet at 10):

> At the completion of the cleaning process, if any permit condition is not met, circulating water is pumped to a storage location using temporary pumps and piping. During this pumping process, the concentration of constituents in the circulating water is reduced by the addition of makeup water from the river. When the circulating water meets all conditions for the discharge, blowdown to the river is initiated. After the condenser cleaning process is completed, the stored water will be treated (if necessary) to meet discharge requirements, then discharged.

This description quite clearly states that if a permit condition is not met, the effluent is pumped to a storage location during which time river water is added to dilute the concentration of the pollutants, at which point it is discharged. (It is unclear what the last sentence means.). EFSEC is prohibited from issuing a permit that allows for dilution in lieu of treatment.

Response 16.1 – This is an excerpt from a description of the main condenser cleaning process. In the sentence just prior to the one cited, it notes that blowdown is stopped during this process. That is, there is no discharge from upstream of the blowdown isolation valves. There is also no discharge in those cases when circulating cooling water must be pumped to a storage location because sampling indicates that some permit condition is not met. Because water is being removed from the circulating cooling water system during this pumping process, makeup water must be added to maintain adequate cooling flow. This has the effect of reducing the concentration of constituents in the remaining circulating water. However, the water found to be exceeding a permit condition is not diluted during this process. As described, it is pumped to an off-line storage location and treated, if necessary, prior to discharge. Refer to *Figure 2 Columbia Generating Station Flow Diagram* in the fact sheet for more information.

17 – Cooling water intake structure

EPA Comments (17.1)

EPA submitted comments in a May 5, 2014 letter under the timeline established in the memorandum of agreement (MOA) with EFSEC. In addition, EPA reserved the ability to object to the proposed permit. Pursuant to the MOA, EPA will review the proposed final permit to determine whether EPA's comments and concerns have been addressed and, if necessary, object to the final proposed permit.

(From EPA's comment letter) The EPA's comments on the draft permit reflect the lack of current data on impacts of the CWIS on Federally-protected species that may be present and the need to make a BTA determination. We expect these deficiencies can be addressed by incorporating permit conditions that address the general concerns below as conditions of the final proposed permit:

CWA Section 316(b) Requirements

Section 316(b) of the Clean Water Act requires that National Pollutant Discharge Elimination System (NPDES) permits for facilities with cooling water intake structures (CWIS) ensure that the location, design, construction, and capacity of the structures reflect the best technology available (BTA) for minimizing adverse environmental impact. The conditions of this section of the permit are required to ensure the CWIS is designed, operated and maintained in such manner as to demonstrate compliance with the CWA section 316(b) and any related implementing regulations.

Monitoring

The permit must incorporate monitoring requirements sufficient to quantify the level of impingement and entrainment, including the level of impingement and entrainment of any Federally-protected species that may be present in the vicinity of the intake. The conditions should specify the monitoring location, frequency, duration and methods to determine the extent of impacts caused to species of concern. EFSEC, in consultation with the permittee, NMFS and any experts in the field of study must establish a monitoring program, subject to EPA review, to be carried out through the duration of the permit term.

The facility should be required to measure average monthly and maximum daily intake flow of cooling water through the CWIS and report the values on the monthly discharge monitoring report.

Inspection

The permit must incorporate routine inspections of the CWIS. Inspection techniques may include visual or remote monitoring with photographic records to evaluate impingement of species of concern and to detect and remove debris from the screens. The permittee should establish the frequency and time of year inspection should occur to maximize the overall operation and effectiveness of the CWIS. At a minimum, CWIS inspection should be done on an annual basis during critical period for species of concern.

Reporting

The permit must incorporate requirements to report results of any monitoring for impingement or entrainment, including of Federally-protected species, on a monthly and/or annual basis. It should also include reporting of CWIS inspection findings. The permit's 24-hr reporting requirement should extend to event of unusual significance related to the CWIS.

Operation and Maintenance

The permit must incorporate requirements to operate and maintain the CWIS and associated equipment, to the maximum extent practicable, to minimize adverse environment impacts consistent with the operational and maintenance practices taken into account in the BTA determination. This includes regular inspections and cleaning of the screen to minimize the through-screen velocity. Inspection records should document inspection dates, findings and maintenance preformed.

Best Technology Available Study and Report

The permit must incorporate requirements for submittal of a document that will serve as the BTA analysis for the facility's CWIS. The study should include analysis of the cost and project related approval/permitting requirements to upgrade the screens to meet the NMFS -Northwest Region screen criteria, and the expected benefits that would result to Federally-protected species. The cost analysis should include an evaluation of alternative construction/installation methods to minimize project-related downtime. The permit should incorporate requirements for a BTA determination based on current information and technology for submittal 12 to 18 months after permit issuance. Additionally, the permit should incorporate a reopener clause to address findings of the revised BTA determination in a timely manner.

National Marine Fisheries Service (NMFS) Comments (17.2)

NMFS submitted comments in a February 28, 2014 letter, summarized here:

NMFS disagrees with EFSEC's determination in the associated Fact Sheet (the draft permit is silent regarding the cooling water intake structure) that the existing cooling water intake screens represent the best available technology to minimize adverse environmental effects. NMFS has extensive experience in fish exclusion and passage systems, has evaluated the CGS intake screen designs and supporting studies, and has determined that they are notably out-of-date and would likely harm some of the juvenile salmon that encounter them.

NMFS Comment on Fact Sheet Page 24-25, Conclusions – This section references ENW's arguments that hydrodynamic effects of the intake structures and fish behavior lead to very small risks to ESA-listed salmon and steelhead juveniles at the intakes, but fails to acknowledge NMFS' rebuttals to those arguments that were provided to EFSEC (letter of December 12, 2013 - attached). Failure to consider our responses indicates that EFSEC's approach to developing its best professional judgment is incomplete.

NMFS *Anadromous Salmonid Passage Facility Design* manual is a guidance document, applicable at NMFS' sole discretion under the particular factual situation. The fish screen criteria contained in the manual are based on field and laboratory studies, are designed to provide a high level of protection to juvenile salmonids, and have been widely accepted, including by Washington's Department of Fish and Wildlife. NMFS screen criteria are used as the basis for screen design for any new or existing water intake where NMFS has a current jurisdictional involvement, and the existing water intake screen design (or lack thereof) provides inadequate fish protection. NMFS generally does not pursue existing facilities for screen design revisions unless there is current evidence of Endangered Species Act (ESA) species take, or until a new Federal action requires ESA consultation with NMFS. The U.S. Nuclear Regulatory Commission's relicensing of the CGS is such a new Federal action. Effects associated with implementing the NPDES permit are effects of NRC's relicensing action upon which we [NMFS] are consulting.

NRC Comments (17.3)

The Nuclear Regulatory Commission (NRC) commented on 2/27/2014 that it is not aware of any new and significant information indicating that CGS is entraining either Upper Columbia spring Chinook juveniles or Upper Columbia River steelhead juveniles. Energy Northwest is currently operating CGS, including the cooling water intake structure, in compliance with all of the NRC's rules and regulations.

Washington State Department of Fish and Wildlife (WDFW) Comments (17.4)

WDFW provided comments in an April 18th letter summarized here:

> In summary, WDFW recognizes EFSEC considered expert opinions in the context of its authorities under the CWA and federal rule for "minimizing adverse environmental impact" and found that no adverse environmental impact has been demonstrated. In addition EFSEC considered the potential risks in the context of the BPJ analysis and its authorities under the CWA. Although WDFW recognizes our limited regulatory ability to influence screening improvements within the NPDES process, WDFW would prefer our fish guard WAC, RCW, and the draft *Fish Protection Screen Guidelines for Washington State* be considered in evaluation of the intake system.
>
> WDFW believes EFSEC based their best professional judgment determination - that the existing cooling water system intake location, design, construction, and capacity represent the best technology available for minimizing adverse environmental impact - on the available data. Unfortunately, that data appears to be outdated and unverified. While we recognize the necessity to move forward with permit issuance, WDFW suggests a collective effort from Energy Northwest and the relevant federal, state, and tribal agencies to collect and verify new data associated with the intake screen. We respectfully suggest that EFSEC and Ecology consider clearly acknowledging in the NPDES permit the need to update intake data at the site.

Energy Northwest Comments (17.5)

Energy Northwest (ENW) submitted extensive comments on the cooling water intake structures at CGS. The majority of these comments are contained in two technical papers, the context for which is summarized here (from the ENW comment letter):

- In response to NMFS comment letters and memoranda authored by Mr. Nordland, ENW enlisted the services of Dr. Charles Coutant, PhD to evaluate Columbia's intake structure design, comments submitted by NMFS, and relevant scientific studies and literature. Dr. Coutant's comments were summarized in a paper originally provided to NMFS at our November 2013 meeting, and recently revised for this comment submission. While the NMFS letters and memoranda identify concerns related to Endangered Species Act (ESA) listed species, we believe Dr. Coutant's research into these questions provide objective evidence that counter many of NMFS claims. ENW is submitting Dr. Coutant's paper, *Why Cylindrical Screens in Flowing Water Impinge and Entrain Few Fish and Its Importance for The Columbia Generating Station's Intake,* as part of our NPDES comment response. Further, ENW is submitting a specific summary and response to the NMFS December 12, 2013 memorandum. This response also includes a review of the technical studies and references NMFS used as their basis for the December 12, 2013 memorandum.

The ENW comment letter provides the following general comments (in response to the December 12, 2013 memorandum from NMFS):

- It appears from the attachment to the letter that NMFS staff does not fully understand the Columbia Generating System's (CGS) intake system of in-river cylindrical screens oriented in line with river flow despite our meeting on November 13, 2013. Many

aspects of what were analyzed and presented by Energy Northwest (ENW) were misinterpreted by NMFS due to this apparent incomplete understanding.

- The NMFS comments suggest that the agency believes the CGS intake system is a proposed, new system whereas it has been operating successfully in the same place and with the generally expanding salmon populations for nearly 30 years. The hypothesized, detrimental impacts to juvenile salmon have not occurred.
- Detailed biological studies of entrainment in cylindrical screens in flowing water conducted by Alden Hydraulic Laboratories for the Indian Point Energy Center (provided to NMFS by Energy Northwest) do not seem to have been fully appreciated and used by NMFS staff in evaluating the CGS screening facility.
- Although the initial NMFS correspondence re the CGS intake was related to ESA consultation over entrainment of listed species, NMFS' latest comments relate to protection of fry of Hanford fall Chinook, which is not ESA listed and is a thriving population.
- NMFS seems to have not fully considered results of the 1980 pre-operational and 1985 operational entrainment studies that were conducted (with NMFS study-plan review) to assess many of the issues raised hypothetically in the NMFS letter and attachment.
- The main objective of the NMFS letter with attachment seems to be to defend and enforce application of their current (July 2011) screening criteria (e.g., pore size, approach velocity, debris removal) with little attempt to understand what the CGS intake system actually is and how it has performed.
- The NMFS fish-screen experience appears from the references they cite to be primarily with screening of water diversions in irrigation canals using angled rotary drum screens or bar screens, which are unlike the CGS's in-river, cylindrical screens used for cooling-tower make-up water.

NWEA, NEDC, Columbia Riverkeeper Comments (17.6)

Given the specific adverse impacts of cooling water intake structures, a BPJ determination of BTA must focus on minimizing the adverse environmental impacts regarding impingement and entrainment of aquatic life. For ENW's cooling water intake structures in the Columbia River, EFSEC must focus on minimizing impingement or entrainment of fish.

EFSEC failed to conduct its own, or require Energy Northwest to complete, any studies to support its BPJ determination. Outdated studies are not a reasonable basis for assessing the adverse environmental impact of the cooling water intake structures. EFSEC simply states that "[n]o adverse environmental impact has been demonstrated." *See* Fact Sheet at 25. This statement blatantly ignores EPA's comments noting that there have been no current studies to determine whether there is an adverse environmental impact. It is illogical to claim that something does not exist simply because no one has looked for it. EFSEC must consider the likely adverse environmental impacts, as identified by NOAA, along with the other factors when determining BPJ. By failing to rely on or require recent studies of impingement and entrainment at the facility, EFSEC has completely failed to take a reasoned approach in its assessment of BPJ. EFSEC's failure to determine the existence and scope of adverse environmental impacts violates section 316(b) of the CWA.

EFSEC makes no attempt to identify the critical aquatic organisms in the area potentially affected by the cooling water intake structures. Without this baseline assessment of whether and

to what extent thirty years of operating these structures has adversely impacted the environment in the Columbia River, a permit writer is unable to comply with the statutory requirements in section 316(b).

EFSEC's determination fails to comport with the statutory and regulatory requirements for cooling water intake structures. The proposed permit itself does not address section 316(b) of the CWA or cooling water intake structures. In the fact sheet, EFSEC states that its BPJ is that the existing cooling water intake system represents the best technology available for minimizing adverse environmental impacts and achieving compliance with CWA § 316(b). *See* Fact Sheet at 25. This conclusion is flawed because it fails to provide any evidence to support the claimed lack of adverse environmental impact.

EFSEC should not ignore NMFS's 2011 Guidelines. NMFS, *Anadromous Salmonid Passage Facility Design* (July 2011) ("2011 Guidelines") EFSEC is not free to and should not discount NMFS's 2011 Guidelines.

EFSEC's proposed permit improperly and impermissibly authorizes Energy Northwest to retain the existing cooling water system intake structures at the facility without upgrades necessary to protect against fish impingement and entrainment. The current structures represent a 1970s design to minimize fish entrainment. Much has changed since the 1970s, including design improvements and the fact that many species in the Columbia River have been listed and critical habitat has been designated. EFSEC must require ENW to update these outdated structures.

EFSEC's best professional judgment determination fails to consider important factors. Where no federal standards are in place, EFSEC must use its best professional judgment (BPJ) to determine the BTA for minimizing the adverse environmental impact of the cooling water intake structures. EFSEC must revise its BPJ assessment to account for all factors required by CWA regulations in making this case-by-case selection of BTA.

EFSEC's consideration of costs to implement new cooling water intake structures is wholly inadequate because EFSEC provides no foundation for the proposed economic benefit.

EFSEC's determination improperly discounts the advice and ignores the requests of the expert federal agencies. NMFS and EPA have continually voiced concern about the design and adverse impacts of the existing cooling water intake structures. The NRC and EFSEC have failed to give the benefit of the doubt to the species and instead rely on the absence of scientific information to continue using the existing cooling water intake structures that likely harm the imperiled species in the Columbia River. EFSEC should give NMFS's and EPA's opinions the appropriate weight and deference.

EFSEC determined that the 2011 Guidelines may also require review of NRC safety requirements for *potential* conflicts. *See* Fact Sheet at 23. EFSEC then relies on the proposed EPA regulations for the exception allowing for site-specific BTA determinations if the requirements specified by regulation *actually* conflict with NRC safety requirements. Because EFSEC has conducted no review to make this determination, these side references to exceptions in proposed rules are wholly beyond the scope of this BPJ discussion.

The proposed permit also lacks any required monitoring to assure compliance with section 316(b). EFSEC must require monitoring of the adverse environmental impacts from the existing cooling water intake structures. It is clear from the permit application and fact sheet that there is a lack of information regarding the adverse environmental impacts of the cooling water intake

structures on aquatic life. In addition, none of the state or federal entities, tribes, or private entities fully understands where the fish are located in the Columbia River. Given this lack of information, it is essential that EFSEC include monitoring requirements to measure the impacts of the cooling water intake structures to ensure compliance with section 316(b) of the CWA.

In the very least, EFSEC should require include a permit provisions that requires ENW and EFSEC to reconsider this BPJ determination when EPA finalizes the forthcoming section 316(b) regulations for existing facilities. EFSEC has committed to reevaluating its BPJ determination when EPA's final rules are issued, and acknowledges that it may modify the proposed permit accordingly, Fact Sheet at 25, but this commitment should be in the permit itself. EFSEC should include a provision in the proposed permit that allows for EFSEC to modify the permit terms, based on the information currently available. EPA blew past its court ordered deadline for new regulations by April 17, 2014, and instead has requested the court to allow an extension for finalizing the section 316(b) rules by May 16, 2014. *See* Exhibit 21. EFSEC should not give ENW a free pass on improving its extremely outdated structures simply because EPA has ignored judicially ordered deadlines. Including a provision to revisit the BPJ determination would be consistent with EPA's requests.

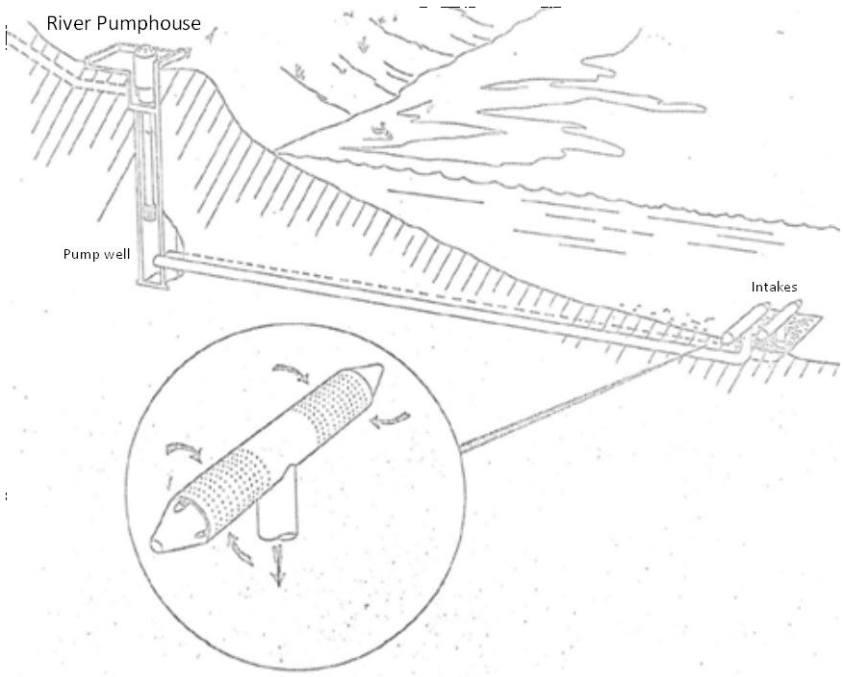
Response 17.1-6

EFSEC included new cooling water intake structure requirements in the final permit. These requirements were developed in response to the range of comments submitted. Response content was influenced by the final 316(b) rule, signed during preparation of these comments. Rather than respond to individual comments, this section provides additional background and the basis for each of the new requirements, thereby responding to the comments as a whole.

First, an overarching critic in the comments was a perceived lack of data used in EFSEC's analysis of Best Technology Available (BTA). To help remedy this, a fuller description of the existing intakes will be helpful. From the fact sheet:

> CGS withdraws water from the Columbia River through two 42-inch diameter inlets perforated with 3/8 inch diameter holes, each approximately 20 feet long and placed parallel to river flow approximately 350 feet offshore at low water. Water flows by gravity to the River Pumphouse.

Artist rendering – from ENW provided design documents:



In evaluating Best Technology Available (BTA), EFSEC considered the design of the CGS intakes as compared to designs considered by EPA in development documents for 316(b) rules. In its comment letter on the draft permit, EPA specifically referred EFSEC to, *Development Document for Best Technology Available for the Location, Design, and Construction, and Capacity of Cooling Water Intake Structures for Minimizing Adverse Environmental Impacts* (EPA, 1976). This document discusses various technologies including "fixed screens" which best fit the technology employed at CGS. It notes that fixed screen installations vary greatly, with effectiveness dependent on site specific design. It also notes:

> "Additions to the inside of the pipe, such as sleeves, may be made to produce equal velocities through the perforations. Very low approach velocities can be achieved with a reasonable total length of perforated pipe, divided into several individual pipes if necessary. In this manner large quantities of water may be handled at what may be substantially less cost and greater fish protection effectiveness than presently used in conventional screens."

EFSEC considered this when evaluating original design documents for the CGS intakes. Extensive studies were conducted to select the final design including study documented in, *Hanford Nuclear Project No. 2 Air and Hydraulic Model Studies of the Perforated Pipe Inlet and Protective Dolphin LHL-599*, (February 1974). This study involved testing of scale models and data analysis to optimize design prior to selection of the final technology. It directly addresses the site specific analysis cited two years later in the 1976 EPA development document, including establishing very low approach velocities through design. Debris deflection and sweeping are also discussed in detail.

Another document considered by EFSEC in its evaluation was, *Technical Development Document for the Proposed Section 316(b) Phase II Existing Facilities Rule* (EPA 821-R-11-

001). This document discusses a similar technology to that used at CGS in 6.13 *Coarse Mesh Cylindrical Wedgewire*. The screens at CGS have circular perforations, rather than the longitudinally adjacent wires of wedgewire systems. However, they are very similar in concept and design. This is particularly true given the two layers of screen at CGS which provide the low, uniform through-screen velocity typical of wedgewire screens. From the document:

> The intake velocity quickly dissipates away from the screen due to the cylindrical shape, thus creating a relatively small flow field in the water body. This small flow field, together with optimal screen orientation, results in a small system profile and minimizes the potential for contact between the screen and any susceptible organisms that may come under the intake's hydraulic influence. In addition, the ambient current crossflow (i.e., to maximize the sweeping velocity provided by the waterbody) carries most free-floating organisms and debris past the screen, removing organisms that are temporarily in contact with or pinned against the screen. As such, screen orientation is also an important component of this technology's overall performance. The low through-slot velocity in combination with the screen orientation and cross current flow carries organisms away from the screen allowing them to avoid or escape the intake current.

The 1974 EFSEC study provides a detailed discussion of how the design was optimized to provide low, equalized intake velocities and maximize the benefits of the relatively high sweeping velocities in the Columbia River.

The 2011 EPA development document mentions in 6.13.1 how sensitive the design is to site-specific factors. It also discusses the performance of this technology (pg. 6-40):

> Cylindrical wedgewire screens have not been used extensively as an impingement control technology at a large number of facilities with large intake flows, but data describing their performance at several installations, as well as laboratory evaluations, suggest a strong potential to reduce impingement impacts when certain design and construction criteria are satisfied. Data from limited studies have shown reductions in impingement of near 100 percent.

The 2011 EPA development document goes on to describe how wedgewire screens were deemed to be pre-approved technology for impingement in the 2004 Phase II rule. They were not included in the 2011 proposed rule specifically because they would already meet the proposed intake velocity criteria. The CGS intakes also meet the proposed maximum intake velocity.

The extensive design documents, along with over 30 years of operation and two separate studies showing no impingement or entrainment, support the conclusions in the EPA development documents that technologies similar to those used at CGS represent best technology available. ENW provided further technical support in the form of expert analysis of the CGS intakes.

EFSEC also considered the NMFS expert analysis which disputed most of the ENW expert analysis. NMFS provided comment that the CGS screens are "…notably out-of-date and would likely harm some of the juvenile salmon that encounter them." NMFS cites their guidance manual, *Anadromous Salmonid Passage Facility Design* (July 2011), as required best technology available. In an August 6, 2013 comment letter, NMFS cited design deficiencies when comparing existing CGS screens to the guidance manual. NMFS recommended the following:

- Design and installation of a waterjet back spray cleaning system
- Replacement of screen mesh with 3/32-inch stainless steel perforated plate

- Balance of screen approach velocities by installing an internal baffle with porosity varied to distribute flow evenly over the entire screen surface
- Install the screens at a lower elevation, if feasible

The NMFS 2011 guidance is predominately focused on dam and irrigation water diversions, not power plant intakes. While the design standards are transferable to the CGS intakes, they would require site-specific considerations to implement. This is precisely the type of site-specific analysis that the CGS intakes have already gone through, as demonstrated in the 1974 study.

The 3/32-inch screen mesh is the primary design upgrade recommended by NMFS. This is a significant decrease in perforation, which would necessitate either a significant increase in through-screen velocity or increase in screen surface area to maintain adequate cooling flow. It also necessitates the back spray cleaning system due to a probable decrease in the efficiency of cleaning by the river's sweeping velocity.

The CGS intakes already have the internal baffle to distribute flow evenly over the entire screen surface, as shown in the 1974 design study. This baffle would likely need to be redesigned with replacement of the external screen with 3/32-inch perforations.

The primary benefit of the 3/32-inch screen mesh is a reduction in entrainment potential, specifically of species of concern in the Pacific Northwest. Entrainment is the other major factor (other than impingement) addressed in the newly signed EPA 316(b) rule. Closed-cycle recirculating cooling systems are cited as the best available technology for minimizing overall withdrawals and therefore minimizing entrainment of organisms. ENW operates a closed-cycle recirculating cooling system consistent with the definition in the final rule.

While the CGS system meets EPA impingement and entrainment criteria, questions remain if this provides adequate protection of species of concern in the vicinity of the CGS intakes, including threatened and endangered species. Preoperational studies in 1978-1980 and follow-up studies in 1985 found no impingement or entrainment of any species. These studies demonstrate that the CGS cooling water intake system functions according to design. Further, this design is supported as best technology available by EPA's rule development documents. It is further supported by the final rule.

The final permit includes requirements to assure the facility continues to operate and maintain the cooling water system according to design. In addition, EFSEC added monitoring and reporting requirements to either confirm earlier findings, or expose the need for further protections to minimize the adverse environmental impacts of the cooling water intakes.

Following is explanatory text for each of the permit conditions added to the final permit in response to comments:

S12. Cooling water intake structure

> *The Permittee must ensure that the cooling water intake structure (CWIS) is designed, operated, and maintained to minimize adverse environmental impact as follows.*

EFSEC added this overarching condition to provide context for the sub-requirements specific to the CGS cooling water intake structure that follow.

S12.A. Operations and maintenance (O&M) manual

The Permittee must, at all times, properly operate and maintain the CWIS including any technology used to minimize impingement and entrainment.

EFSEC added this condition in response to comments from EPA. O&M Manuals are a standard condition in many NPDES permits. ENW's permit already requires an O&M Manual for the circulating water system. However, it lacks specificity about the intake structures. The added condition specifies that the Manual must be approved by EFSEC, including substantial changes or updates. ENW must keep a copy of the approved Manual at the facility and follow the procedures in it.

Required components of the O&M Manual include a 24-hour reporting requirement for significant impingement or entrainment observed. The approved Manual will define 'significant impingement or entrainment'.

S12.A.3 – The permit requires an impingement evaluation procedure be included in the Manual. EPA's 316(b) final rule is signed but not posted in the federal register at the time of this writing. It specifies a required frequency for visual or remote monitoring of at least weekly if feasible, in 40 CFR 125.96(e).

The final rule includes a provision for alternative methods of monitoring if the requirement is not feasible. The rule specifically cites offshore intakes as an example of where weekly visual monitoring may be infeasible. ENW may propose alternative procedures for evaluating impingement if weekly monitoring is infeasible.

ENW periodically deploys a boat for monitoring not required under this permit. They reported that the intakes are often informally observed during this monitoring. EFSEC expects this visual monitoring for impingement to be incorporated into the O&M Manual if feasible.

S12.A.4– The permit also requires ongoing entrainment evaluation. ENW may choose not to include these procedures until after the entrainment characterization study required in S12.B is implemented. While entrainment may be observed in any portion of the cooling water system downstream of the outer surface of the intake structures, it is most likely to be observed at the River Pumphouse in the pump well where the intake piping enters from the river. The River Pumphouse is an unmanned facility over three miles from the plant. The study is likely to require installation of new equipment at the Pumphouse that could be used for ongoing entrainment evaluation.

ENW is encouraged to incorporate ongoing entrainment evaluation into the O&M Manual as soon as possible. However, EFSEC has concluded that it may be unreasonable to require during the study. The 24-hour reporting requirement, which includes reporting any significant entrainment, is required in the first submittal.

S12.B. Entrainment Characterization Study

The Permittee must prepare and conduct an entrainment characterization study consistent with the content requirements in 40 CFR 122.21(r) (9).

This condition was added in response to numerous comments calling for the collection of new data to verify that the facility is functioning as reported in earlier studies reporting no impingement or entrainment observed. Impingement is much less likely given the design of the intakes at CGS. Based on comments, NMFS, EPA, and others tend to agree that the low intake velocities and high sweeping velocities at the intakes make impingement unlikely. However,

some reviewers raised concerns about debris fouling, which may cause higher velocities in un-fouled areas of the screens. EFSEC concludes that the requirements under S12.A.3 are responsive to the comments on the need for further verification of impingement minimization.

NMFS and others primary concerns are related to entrainment potential, given the 3/8-inch perforations in the screen's outer surfaces. While this diameter is compliant with the EPA 316(b) final rule, it is not consistent with NMFS guidance which requires 3/32-inch perforations. EPA comments specifically called for "…monitoring requirements sufficient to quantify the level of impingement and entrainment…" EFSEC included S12.A.3 impingement monitoring requirements and an entrainment study here in S12.B specifically in response to EPA and NMFS comments.

The final EPA 316(b) rule details an *Entrainment Characterization Study* in 40 CFR 122.21(r)(9). EFSEC notes that this is <u>not</u> a requirement that is or would be explicitly required at CGS, because the rule specifies it is applicable to facilities withdrawing greater than 125 million gallons per day (mgd) of actual intake flow. CGS's maximum intake flow is far below 125 mgd. However, the rule requirements provide a reasonable framework for study. From the rule:

> (9) *Entrainment Characterization Study.* The owner or operator of an existing facility that withdraws greater than 125 mgd AIF, where the withdrawal of cooling water is measured at a location within the cooling water intake structure that the Director deems appropriate, must develop for submission to the Director an *Entrainment Characterization Study* that includes a minimum of two years of entrainment data collection. The Entrainment Characterization Study must include the following components:
>
> (i) *Entrainment Data Collection Method*. The study should identify and document the data collection period and frequency. The study should identify and document organisms collected to the lowest taxon possible of all life stages of fish and shellfish that are in the vicinity of the cooling water intake structure(s) and are susceptible to entrainment, including any organisms identified by the Director, and any species protected under Federal, State, or Tribal law, including threatened or endangered species with a habitat range that includes waters in the vicinity of the cooling water intake structure. Biological data collection must be representative of the entrainment at the intakes subject to this provision. The owner or operator of the facility must identify and document how the location of the cooling water intake structure in the waterbody and the water column are accounted for by the data collection locations;
>
> (ii) *Biological Entrainment Characterization*. Characterization of all life stages of fish, shellfish, and any species protected under Federal, State, or Tribal law (including threatened or endangered species), including a description of their abundance and their temporal and spatial characteristics in the vicinity of the cooling water intake structure(s), based on sufficient data to characterize annual, seasonal, and diel variations in entrainment, including but not limited to variations related to climate and weather differences, spawning, feeding, and water column migration. This characterization may include historical data that are representative of the current operation of the facility and of biological conditions at the site. Identification of all life stages of fish and shellfish must include identification of any surrogate species used, and identification of data representing both motile and non-motile life-stages of organisms;
>
> (iii) *Analysis and Supporting Documentation*. Documentation of the current entrainment of all life stages of fish, shellfish, and any species protected under Federal, State, or Tribal law (including threatened or endangered species). The documentation may include historical data that are representative of the current operation of the facility and of biological conditions at the site. Entrainment data to support the facility's calculations must be collected during periods of representative operational flows for the cooling water intake structure, and the flows associated with the data collection must be documented. The method used to determine latent mortality along with data for specific organism mortality or survival that is applied to other life-stages or species must be identified. The owner or operator of the facility must identify and document all assumptions and calculations used to determine the total entrainment for that facility together with all methods and quality assurance/quality control procedures for data collection and data analysis. The proposed data collection and data analysis methods must be appropriate for a quantitative survey.

The permit requires ENW to submit the study design to EFSEC for review and approval. EFSEC will seek appropriate input during review of the study design. WDFW and NMFS experts have provided valuable input on the current design of the CGS intake structure. EFSEC will circulate the study design to WDFW and NMFS for review and comment prior to approving the final study design. EFSEC will also consider any peer review of the study design, consistent with the EPA final rule. Approval may require an iterative submittal and review process. EFSEC strongly encourages ENW and NMFS to communicate and coordinate early in development of the study design to fully address any concerns specific to federally-listed threatened and endangered species.

S12.B.3 Engineering analysis – EFSEC added this condition, which may or may not be triggered, in response to comments from EPA. EPA's May 5th comment letter specifically asked for a "Best Technology Available Study and Report" including analysis of the costs and benefits of replacing the current CGS screens with screens consistent with NMFS guidance. EPA requested this study within 12 to 18 months of permit issuance.

Currently available information would value the benefit of replacing the screens very low. No impingement or entrainment has been observed. EFSEC considered this in drafting the requirement to conduct the engineering analysis only if significant entrainment or impingement of federally-listed threatened and endangered species is indicated. This way, the potential benefits of replacing the screens may be properly considered along with the costs. EFSEC fully anticipates NMFS involvement in any determination of the significance of entrainment or impingement that may trigger this requirement.

In S12.B.3.a, EFSEC chose the words "…consistent with approvable design criteria" specifically to indicate the need to consider regulatory approvals in the engineering analysis. EFSEC anticipates approval would be required from WDFW under RCW 77.57.070. WDFW staff have indicated that NMFS guidance would be considered in review and approval of screen replacement. NRC approval would also be required as the cooling water system is a critical safety system at the facility. EPA anticipated NRC requirements in the final rule under 40 CFR 125.94(f) *Nuclear facilities*, allowing for site-specific BTA determinations to avoid conflict with safety requirements.

S12.B.4 Suspension of Entrainment Characterization Study – ENW may suspend the entrainment characterization study if, at any time, they elect to proceed with the engineering analysis and replace the intake structure with approvable design criteria. The purpose of the study is to either confirm earlier studies indicating no impingement or entrainment, or inform the need for additional technologies to minimized adverse environmental impacts. If ENW elects to replace the intake structure according to approvable design criteria, the study is no longer required.

S12.C. Closed-cycle recirculating system

> *The Permittee must continue to operate a closed-cycle recirculating system as defined at 40 CFR 125.92(c).*

EFSEC added this condition in response to comments for more data collection. The content is informed by the EPA 316(b) final rule.

S12.D. Endangered Species Act

> *Nothing in this permit authorizes take for the purposes of a facility's compliance with the Endangered Species Act.*

EFSEC added this condition in response to comments from EPA and NMFS. The content is informed by the EPA 316(b) final rule.

In summary, EFSEC has added conditions to the final permit to ensure compliance with CWA 316(b) and federal rule. The conditions are also responsive to concerns for threatened and endangered species known to be in the vicinity of the outfall. EFSEC will use the information gathered during this permit term to re-evaluate BTA and may modify the permit based on new information.