Portland General Electric Company
121 SW Salmon Street • Portland, Oregon 97204

February 27, 2015

Ms. Dana Hall
Deputy Director
Low Impact Hydropower Institute
PO Box 194
Harrington Park, NJ 07640

Subject: PGE's response to DRA's comments on LiHi recertification application

Dear Ms. Hall:

Portland General Electric Company (PGE) and the Confederated Tribes of the Warm Springs Reservation of Oregon (CTWS) appreciate the opportunity to respond to comments made by the Deschutes River Alliance (DRA) regarding our application for recertification of the Pelton Round Project (the Project) as low impact hydroelectric power.

PGE and CTWS have a long history of operating the Project in a safe, reliable, responsible, and collaborative manner. We believe that as users of a public resource, it is our responsibility to not only comply with our license obligations but to also work closely with stakeholders to understand, and whenever possible, address concerns raised regarding operation of these facilities.

Selective water withdrawal
One requirement of the June 21, 2005 relicensing of the Project was to design, construct, and operate the selective water withdrawal (SWW) tower. The SWW serves multiple purposes with the goal of creating conditions on the Deschutes River that more closely mimic those that would be expected if the three-dam project was not there, while still allowing generation of renewable, carbon- and other emissions-free hydroelectric power to serve Oregonians.

Specifically, the SWW was designed to allow downstream passage of anadromous fish for the first time since salmon and steelhead runs in the upper Deschutes basin were cut off by the construction of the Round Butte Dam in the 1960s. At the same time, the SWW is configured to allow project operators to manage water temperatures so that the temperatures of the Deschutes River water discharged below the Project approximate the temperature conditions if the dams were not in place.

Long term commitment
The SWW is an extraordinary tool, without precedent, but it must be viewed within the long-term context of broader efforts to restore the health of multiple interrelated ecosystems in the region.

Fish passage by itself would not be enough to create conditions favorable to recovery of healthy salmon and steelhead runs, so PGE and CTWS have joined with local governments, environmental and fish advocates, landowners and irrigators, and federal and state agencies to promote habitat restoration and fish reintroduction efforts throughout the Deschutes Basin. PGE and CTWS are working diligently to understand how changes relating to operation of the SWW, since it's completion in 2009, fit into this broader picture. We remain committed to a collaborative approach that engages the full range of stakeholders with an interest in this effort.

Significant progress, but no simple solutions

Management of water temperatures and water quality requires patience as we strive to untangle multiple factors and influences. This is especially challenging in a context where the "normal" conditions river users were accustomed to for the 40 years between construction of the dams and construction of the SWW were artificial, distorted by the abnormally unseasonable temperatures of water released from the original project intake in the cool depths of Lake Billy Chinook.

We are making important progress as the SWW has allowed passage of thousands of salmon and steelhead downstream (with upstream migration beginning as well). PGE, CTWS, and dozens of organizations and volunteers have completed numerous habitat restoration projects throughout the basin. These projects have measurably improved rearing and spawning conditions for salmon and steelhead.

License requirements

As we work on these long term efforts, we must also comply with strict guidelines and requirements for daily and seasonal operation.

The license for the Project requires that PGE provide annual and monthly water quality reports to the Oregon Department of Environmental Quality (ODEQ) and the CTWS Water Control Board (WCB). Additionally, PGE and CTWS meet with ODEQ and CTWS-WCB regularly to discuss project operations and water quality monitoring results. We also work closely with fish agencies - Oregon Department of Fish and Wildlife, CTWS Branch of Natural Resources, National Marine Fisheries Service, the United States Fish and Wildlife Service, and the Pelton Round Butte Fish Committee – and non-profit organizations, like Trout Unlimited, on fish passage and monitoring efforts.

We maintain the collaborative approach we have taken ever since 22 stakeholder organizations came together to develop and sign the 2004 agreement that created a path for project relicensing, including construction and operation of the SWW. Discussions and collaborative planning regarding water quality and fish-related issues occur during regular Fish Committee meetings, with engagement from a broad cross section of interested stakeholders, as well as in other pertinent forums, including the annual Pelton Round Butte Fisheries Workshop.

PGE and CTWS are fully committed to working openly and collaboratively with these many stakeholders as we continue to learn and refine our efforts to integrate the operation of the SWW into the natural functions of the river.

Conclusion

As stated in our application for recertification, there have been no material changes to the information provided in the 2006 application for the Pelton Round Butte Project and there have been no notices of

violation received from ODEQ or CTWS-WCB. PGE and CTWS continue to make progress on the goals in the Project's relicensing agreement and to comply with the Project's license requirements.

We understand and appreciate the concerns raised by the DRA, but respectfully note that any specific questions or ongoing challenges we face in operating the Project in the most environmentally-conscious manner possible should be considered in context. The work we are doing will not only continue to reduce the environmental impact of this clean, renewable generating resource, it will also help other projects anticipate and respond to similar challenges as they work to achieve the low-impact standards LIHI was created to support and promote.

PGE's and CTWS's responses to the specific comments made by DRA are attached. We appreciate the opportunity to provide the Institute with clarifications to our recertification application. If you have any additional questions please do not hesitate to contact me at 503-464-7361 or Scot.Lawrence@pgn.com.

Sincerely,

Scot Lawrence
Portland General Electric
Environmental Compliance & Licensing
121 SW Salmon St – 3WTCBR05
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DRA's Comment - Page 1

These changes have affected aquatic invertebrate species by altering life cycles and emergency patterns of some species and reducing populations of others, including the near complete elimination of *Antocha* crane flies, a previously common aquatic insect, from the lower river. Studies funded by Portland General Electric (PGE) have also documented increases in roundworm, flatworm and snail populations in the river below the Project, conditions typically associated with a decline in other important invertebrates such as mayflies, stoneflies and caddisflies (R2 Resource Consultants 2014).

Licensees' Response

DRA's assertion is based on incomplete, preliminary data that does not support an inference that the Project has altered life cycles and emergence patterns or reduced the populations of various species. Article 416 of the License requires a macroinvertebrate and periphyton monitoring study to be conducted on the lower Deschutes River following the implementation of the selective water withdrawal (SWW). During relicensing (1999-2001), R2 Resource Consultants completed the first phase of this study to establish baseline data (pre-SWW). The post-SWW study began in 2013. The post-SWW study runs from October 2013 to May 2015. The report that DRA cites is R2's interim summary, which presents preliminary results of data collected during the first year of the post-SWW study (October 2013 and April/May 2014). R2's summary report does not include any statistical analysis or interpretation of the data collected thus far; this will occur once April/May 2015 data is collected and Year 2 data is processed.

In response to the increase in round worms (oligochates), R2 concludes in its Year 1 Data Summary Report "At this point, it is unclear whether the baseline samples accurately estimated the abundance of soft-bodied oligochates, so extreme care should be exercised in attempting to draw conclusions from this preliminary data" Page 41. R2 has further clarified to PGE that differences in baseline and post-SWW round worm numbers are likely due to ineffective soft-bodied organism sample-preservation methods used in the baseline study.

Flat worm and snail numbers show seasonal variability in the baseline data and in the 2013/2014 data. The second year of post-SWW (2014/2015) sampling will help R2 better understand this variability. No substantive analysis has been completed on these data.

As for macroinvertebrate populations, R2's data shows that some taxa appear to have decreased while others have increased from pre- to post-SWW sampling. For instance, while *Antocha* craneflies declined, *Baetis* mayflies increased. Other changes are more complex - some mayflies and caddisflies appeared to increase in fall but decrease in spring. Again, the post-SWW sample results include only one year of sampling. A second year of fall sampling has been completed and spring sampling is pending. A final analysis will consider the totality of observed changes and specific cases that help inform the mechanisms of change.

DRA's Comment - Page 1

Finally, two previously unreported species of stalk-forming diatoms (*Gomphoneis herculeana* and *Cymbella mexicana janschii*), which are detrimental to the habitat and food resources of aquatic invertebrates, have been found growing in large colonies throughout the lower river.

Licensees' Response

This assertion is not correct, as studies prior to the SWW installation show that these species were already present. In 1997, as part of Pelton Round Butte's (PRB) relicensing, E&S Environmental Chemistry, Inc. conducted a water quality study on the lower Deschutes River that involved periphyton sampling. In the final report, E&S listed *Gomphoneis herculeana* as one of the species that comprised 5% or more biovolume or cell density in at least one periphyton sample collected in May, July, and September on the lower Deschutes River (Raymond, Eilers, Bernert &Vache, 1998).

In 2000, the Deschutes River was included in the U.S. EPA's Environmental Monitoring and Assessment Program Western Pilot (EMAP West). The rivers in this survey were analyzed for chemistry, macroinvertebrates, aquatic vertebrates, periphyton, and physical habitat. Eight sites were sampled on the Deschutes River, two upstream of the Project and six downstream of the Project in the lower Deschutes. *Gomphoneis herculeana* was identified at the two upstream sites (sampled between 2000 and 2001) and at all six lower river sites (sampled between 2000 and 2003). *Cymbella mexicana* was identified at two of the lower river sites (sampled between 2001 and 2002) (U.S. EPA, Western Ecology Division, n.d.).

In 2008, the U.S. EPA completed another water quality survey as part of National Rivers and Streams Assessment. Although this study included only one site on the Deschutes River, 120 river miles upstream of the Pelton Round Butte Project, *Gomphoneis herculeana* was identified at the site (U.S. EPA, NRSA, n.d.).

For information on algal growth, please see licensees' response DRA's Comment – Page 8. Other Water Quality Indicators Signaling Water Quality Degradation A on page 7 of this document.

DRA's Comment - Page 2. Section 401.D.1

Data collected by the Applicants and reported in the 2014 water quality report (Campbell 2014) document that the conditions cited above have not been met. Specifically:

1.) Campbell 2014, on page 6 reports: *Individual readings of IGDO from both grab and diel samples dropped below 8.00 mg/L during sample dates in August and September. However, the daily median for IGDO remained above the ODEQ criteria of 8.00 mg/L for all sample dates.*

The above statement confirms that individual readings of IGDO dropped below 8.00 mg/l, but because the "daily median" IGDO remained above 8.00 mg/l, Applicants assert that they are in compliance. However, the DOMP clearly states that IGDO levels should exceed 8.0 mg/l "at all times" or the 11.0 mg/l water column criterion would apply, and does not refer to a "daily median" value of IGDO as being acceptable.

Licensees' Response

The Project is in compliance with the intergravel dissolved oxygen (IGDO) provision of the Dissolved Oxygen Management Plan (DOMP). This provision is based on Oregon's water quality criterion for dissolved oxygen (OAR 340-041-0016(1)), which states:

> *For water bodies identified as active spawning areas in the places and times indicated on the following Tables and Figures…the following criteria apply during the applicable spawning through fry emergence periods set forth in the tables and figures and, where resident trout spawning occurs, during the time trout spawning through fry emergence occurs:*
>
> *(a) The dissolved oxygen may not be less than 11.0 mg/l. However, if the minimum intergravel dissolved oxygen, measured as a spatial median, is 8.0 mg/l or greater, then the DO criterion is 9.0 mg/l;*
>
> *. . .*
>
> *(c) The spatial median intergravel dissolved oxygen concentration must not fall below 8.0 mg/l.*

PGE conducted three years (2010 - 2012) of post-SWW monitoring of IGDO, as directed by the Water Quality Management and Monitoring Plan (WQMMP). Following consultation with ODEQ and the Confederated Tribes of the Warm Springs Reservation of Oregon – Water Control Board (CTWS-WCB), it was determined that an additional year (2013) of monitoring was needed to further define the IGDO/DO relationship. This 4-year study involved sampling seven standpipes at the selected spawning area, and one of the standpipes had short duration (24 - 48 hours) diel monitoring. According to the study's methodology, IGDO results were calculated as spatial medians according to ODEQ's definition OAR 340-041-0002(59).

In August and September 2013, individual IGDO readings below 8.0 mg/L were measured; however, the other IGDO measurements were sufficiently above 8.0 mg/L, resulting in a calculated spatial median value above 8.0 mg/L. It is important to note that the August and September 2013 IGDO sampling events occurred during the non-spawning season (June 16 – October 14) for this segment of the lower Deschutes River, when IGDO concentrations would be expected to be at their lowest values during the year, and when the IGDO water quality criterion does not apply. During the spawning and fry emergence period (October 15 – June 15) IGDO spatial median values reported for all sample years (2010-2013) were above 8.0 mg/L.

DRA's Comment - Page 2. Section 401.D.1

1.) Campbell 2014, pages 6 & 7, reports: *In 2013 the project operators, according to an interim agreement with ODEQ and the CTWSRO WCB, initially operated to meet the 9.0 mg/L criterion throughout the year. During July and August discharge oxygen levels began to drop and various controlled spill scenarios were initiated to maintain concentrations above compliance. However, dissolved oxygen concentrations continued to drop and, following consultation with ODEQ and the CTWSRO WCB, project operators on August 28 changed operations to instead meet the*

current ambient DO standard (8.0 mg/L) for that section of the lower river during the non-spawning season (June 16 – October 14), and the 9.0 mg/L criteria for the remainder of the year.

These results violate the DOMP. Lowering the required water column DO standard from 9.0 mg/l (as defined in the DOMP) to 8.0 mg/l was arbitrary, and there was no supporting rationale for lowering the standard, other than the inability of the operations to meet 9.0 mg/l. Nowhere in the DOMP does it indicate a water column criterion of 8.0 mg/l is acceptable. Moreover, data presented by Campbell 2014, figure 8, page 13, shows that both IGDO and water column dissolved oxygen in September 2013 dropped below 8.0 mg/l.

Licensees' Response

DRA misreads the DOMP. The DOMP is a management plan that establishes dissolved oxygen target concentrations that determine when the Project must institute controlled spills at the Reregulating Dam to increase river dissolved oxygen concentrations. In accordance with the DOMP, the Project instituted controlled spills at the Reregulating Dam to achieve the target concentration of 9.0 mg/L. However, as dissolved oxygen concentrations continued to drop during the late summer of 2013, ODEQ and CTWS-WCB authorized a target concentration of 8.0 mg/L that could be met as a 30-day mean minimum, which the Project followed. The revised target concentration was consistent with 401 Certification Condition D.6., which provides:

With the approval of ODEQ, the Joint Applicants may. . . implement a modified DOMP and WQMP. ODEQ may approve. . . modification if ODEQ determines that it will not impair the achievement of any LA [total maximum daily load (TMDL) load allocation] for the Project for dissolved oxygen and will not contribute to violation of dissolved oxygen criteria in waters affected by the Project.

There is no dissolved oxygen LA (load allocation) for the Project, and the target concentration was consistent with the applicable water quality criterion during the non-spawning period (OAR 340-041-0016(2)):

For water bodies identified by the Department as providing cold-water aquatic life, the dissolved oxygen may not be less than 8.0 mg/L as an absolute minimum. … At the discretion of the Department, when the Department determines that adequate information exists, the dissolved oxygen may not fall below 8.0 mg/L as a 30-d mean minimum, 6.5 mg/l as a seven-day minimum mean, and may not fall below 6.0 mg/L as an absolute minimum. (OAR 340-041-0016(2))

In 2013, hourly ambient dissolved oxygen readings in the Reregulating Dam discharge did result in values below 8.0 mg/L during 24 hour periods in late summer months. However, the 30-day mean minimum remained above 8.0 mg/L, the 7-day minimum mean remained above 6.5 mg/L, and the absolute minimum remained above 6.0 mg/L from August 28 to October 14. August 28 is when ODEQ approved the change to the 30-day mean minimum.

DRA's Comment - Page 3. Section 401.E.1

Based on data submitted under the PHMP by the Applicants…pH values have exceeded ODEQ and CTWS pH standards (maximum pH value 8.5) in the lower Deschutes River at all sites monitored every year since surface withdrawal began. In addition, the Reregulation [sic] Dam Tailrace is the only site where continuous pH data has been collected, and the time of day when pH grab samples were taken from other lower river sites is not reported. In the absence of continuous data or a practice of consistently collecting grab samples during peak diel periods for pH, it is probable that pH values even higher than those reported by the Applicants regularly occur in the river.

Licensees' Response

DRA misreads the PHMP. The PHMP is an iterative management plan that specifies how the Project is to be operated to control pH. Although post- and pre-SWW pH values in the lower Deschutes River have at times exceeded pH criteria between May and October (the frequency, duration and magnitude varies each year), ODEQ and CTWS-WCB are aware of these exceedances. PGE notifies ODEQ and CTWS-WCB when it happens and provides the agencies with monthly water quality reports.

Moreover, pre-SWW pH values in the lower Deschutes River, downstream of the Project at RM 25, also exceeded pH criteria during summer and early fall months (Campbell, 2008, 2009, 2010). Also, studies on the lower river (Raymond et al., 2000) monitored water quality, including pH, both longitudinally with grab samples and short-duration continuous monitoring and measured pH values above 8.5. DRA's attribution of these exceedances to the SWW is not supported by the data.

DRA's Comment - Page 3. Section 401.E.1

Section 4.4 assumes that the Project discharge pH values will be lower than inflow values. However, data submitted by the Applicants (FERC no. 2030 Project Water Quality Monitoring Reports for 2011, 2012, & 2013), show that pH values discharged from the Project are in fact higher than the weighted average inflow pH values for nearly all dates sampled from May through September (see attached data tables below from PGE Water Quality Monitoring Reports).

The simple fact is….SWW regimes for managing water temperature and DO do not "suffice for management of pH as well"….

Licensees' Response

The Project has been and continues to be operated in accordance with the PHMP. Because Project operations to control pH also affect temperature, DO, and fish passage (see PHMP Section 4.6, p. 9), the Project is working with ODEQ and CTWS-WCB to control pH in a manner that is also consistent with achieving appropriate temperature and DO values and surface withdrawal volumes necessary to facilitate smolt movement in Lake Billy Chinook.

DRA's Comment - Page 5. Section 401.E.1

Based on results presented in Joint Applicants water quality monitoring reports it is clear that pH at the Reregulating Dam has consistently exceeded the weighted average pH values of the inflows, yet no effective approach to reduce pH to inflow levels has been developed.

Licensees' Response

The Project is operating the SWW within a specified range and in accordance with the PHMP to achieve appropriate pH, temperature, and DO values while also maintaining surface water withdrawal volumes necessary to facilitate smolt movement. There is no requirement in the PHMP to maintain pH at the Reregulating Dam at levels below inflow pH values, and there is no evidence that any pH values higher than inflow values have harmed fish or other aquatic life.

DRA's Comment - Page 7. Section 401.F.1

Based on these results, the Applicants were required to seek guidance from ODEQ and CTWS WCB to conduct recreational surveys, and to implement a control strategy for nuisance phytoplankton growth. However, no such survey or control strategy has been described or reported, and as such is a violation of the NPGMP.

Licensees' Response

The Project is in compliance with the Nuisance Phytoplankton Growth Management Plan (NPGMP). The NPGMP states that the Project will consult with ODEQ and CTWS-WCB regarding "the need to conduct a recreational user survey to assess whether or not beneficial uses have been impaired" (PRB WQMMP, Section 5.3, pg. 15). The Project has been in regular consultation with ODEQ and CTWS-WCB about a survey. Last year the Project began developing a robust study to measure nutrient concentrations, algae, and water chemistry on Lake Billy Chinook, Lake Simtustus, the tributaries of the reservoirs, the 100 river miles below the Project, and the tributaries of the lower Deschutes. Both ODEQ and CTWSRO-WCB have reviewed and provided comments on our sampling schedule. This is a two year study with sampling starting in February 2015. The results will provide data about this system that currently do not exist.

Also, according to the WQMMP, the feasibility of implementing a control strategy will be assessed if "any required recreational survey indicates that impairment has occurred" (Section 5.3, p. 15). At this time, a recreational survey has not been required and, as a result, a control strategy has not been assessed.

However, in 2015 PGE's Parks Department is conducting an extensive recreational survey on Lake Billy Chinook that will assess all aspects of recreational use. This study is being developed in conjunction with a professor at Oregon State University and should provide insight into whether beneficial use on the reservoirs has been impaired by phytoplankton.

DRA's Comment – Page 8. Other Water Quality Indicators Signaling Water Quality Degradation A

One possible cause for a decline in insect numbers is the proliferation of stalked diatom species noted in the lower river over the past several years…

These diatoms densely colonize streambed rocks and crowd out nymphal invertebrates. The rapid proliferation of these diatom species, which were rarely found on the lower river prior to the implementation of SWW, suggests that SWW is increasing nutrient loads and promoting nuisance algae growth in the river below the Project. Further studies should be done to evaluate changes in nutrient levels being released into the lower Deschutes as a result of SWW, and evaluate the effects of these changes in nutrients on the river and the algal communities downstream.

Licensees' Response

In its post-SWW sampling, R2 Resource Consultants noted that periphyton biovolumes were heavily influenced by sampling depth and proximity to shoreline. During sampling trips, they observed thicker algal growth in very shallow shoreline areas with very low stream velocities. These conditions, located along the edges of the river, produce the preferred environment for these stalked forms of diatoms (Kociolek and Spaulding, 2003), as opposed to the higher velocities out in the riffle areas sampled during this study.

For additional information on R2's study, please see licensees' response to DRA's Comment - Page 1 on page 1 of this document.

For information on nutrients and algae, please see licensees' response to DRA's Comment - Page 7. Section 401.F.1 on page 6 of this document.

DRA's Comment - Page 8. Other Water Quality Indicators Signaling Water Quality Degradation B

The interim report for this study (R2 Resource Consultants 2014) found that biological shifts are taking place in the river downstream from the Pelton-Round Butte Project subsequent to implementation of SWW. The report notes that one species of aquatic insect (*Antocha* crane flies), once prolific, has disappeared from the lower Deschutes River.

R2 Resource Consultants' Response

Antocha craneflies were widely distributed in 1999-2001 samples but absent in most 2013-2014 samples. *Antocha* were found at virtually all sample sites during springs of 2000 and 2001, generally increasing in abundance with distance downstream from the Project. *Antocha* were also documented at almost all sites during fall in 1999 and 2000, albeit in much lower numbers than spring.

While widely distributed, this species was not particularly abundant in comparison with other species in any sample date or year. During baseline study years, *Antocha* comprised an overall average of just 1.1% of all organisms sampled. Percent relative abundance of these craneflies peaked at about 3-4% in the lowermost sample sites during spring of 2000 and 2001. Relative abundance was somewhat higher at sample sites upstream from the reservoir during 2000-2001, reaching 5-6%. *Antocha* have also

disappeared from the Crooked River and Deschutes River reference sites upstream from Lake Billy Chinook. Only the Metolius site shows *Antocha* numbers similar to pre-SWW levels.

Additional information on *Antocha* numbers in the upper Deschutes Basin is available from two BLM reports by Mark Vinson of Utah State University (Vinson, 2005; Vinson and Dinger, 2007). Samples were collected in these studies from sites at or near the reference sites sampled during the PGE study in the Crooked River in 2004 (Vinson, 2005), and on the Deschutes (above the Project) in 2005-2006 (Vinson and Dinger, 2007). Both BLM surveys found *Antocha* numbers to be low or absent in the samples at the reference sites. Counts of only 1-7 individuals/m^2 were noted. In comparison, baseline study counts in 1999-2001 were 7 to 71 individuals/m^2 at the upper Deschutes site, and 30-160 individuals/ m^2 at the Crooked River site.

So while *Antocha* numbers have declined downstream from the Project since 2001, similar declines occurred upstream from the Project. BLM study results suggest that the upstream decline might have occurred before implementation of the SWW. The causes of these changes remain unclear. While we cannot yet preclude the possibility that the SWW could have been a factor downstream, the upstream results suggest that the declines have resulted from other environmental factors common to all sample areas.

These results also highlight the utility in the experimental design of the study reference sites upstream from the reservoir. While habitat conditions in these sites are not representative of those occurring in an unimpounded Deschutes River downstream from the Project site, they are informative regarding the normal fluctuations in macroinvertebrate communities unaffected by the Project.

DRA's Comment - Page 8. Other Water Quality Indicators Signaling Water Quality Degradation B

Sampling by the R2 study is heavily weighted to the "upper" portion of the lower river (Site 10, just below Warm Springs River, and above), with just two sites located below site 10, at Sandy Beach and Mack's Canyon.

R2 Resource Consultants' Response

The current study is repeating the baseline study using the same methods and locations. The study employs a "Before-After, Control-Impact" (BACI) experimental design, examining differences over time above and below the Project and along a longitudinal gradient downstream from the Project.

Based on the longitudinal pattern of macroinvertebrates in the baseline study, we would expect that any post-SWW changes would be most heavily manifested within the current extent of sampling. The Serial Discontinuity Concept (SDC) (Ward and Stanford, 1983) predicts that in response to the interruption of the river continuum, the stream system also has a tendency to reset itself toward natural or unregulated conditions as the distance downstream from the dam or river regulation increases (Stanford and Ward, 2001). That is not to say that areas further downstream may not be affected but rather the current extent of sampling should be adequate to identify substantive changes that might have occurred.

DRA's Comment - Pages 8 - 9. Water Quality Conclusions

There is also strong evidence that operation of the SWW program has degraded water quality and fish habitat below the Project, without to date promoting fish returns above it.

. . .

Oregon water quality standards are being violated in the 100 miles of the Deschutes River below the Project. Water being discharged by the Project is not supporting the designated beneficial uses which LIHI's standards are designed to protect, including the spawning and rearing of listed species of resident and anadromous fish.

Licensees' Response

We do not believe these statements to be true. Adult Chinook, sockeye, and steelhead began returning to the Pelton Trap from upper basin releases in 2011. These returning adults were reared upstream of Round Butte Dam and entered the SWW as smolts; they were then transported to the lower Deschutes to continue their migration to the ocean. In 2011 and 2012 between 50% and 100% of returning adults were taken to Round Butte Hatchery to provide broodstock for future fry introductions upstream of Round Butte Dam as required by fish agency co-managers, Oregon Department of Fish &Wildlife (ODFW) and Confederated Tribes of the Warm Springs Reservation Oregon - Branch Natural Resources (CTWS-BNR). The remaining returning adults were passed upstream to spawn naturally. Starting in 2013, all returning adult Chinook, sockeye, and steelhead from upper basin releases were passed upstream. Radio-tagging studies have documented salmon and steelhead in all three tributaries upstream of the Project. We have confirmed spawning by all three species in the upper Deschutes basin. These data are summarized in annual reports filed with FERC.

Furthermore, there is no evidence that fish populations in the Deschutes River downstream of the Project have declined since SWW implementation. ODFW, CTWS-BNR, and PGE study the fish populations downstream of the Project. Relevant results are summarized very briefly below.

The Licensees have monitored biological and geomorphological parameters in the lower Deschutes River downstream of the Project since 2008. There has been no statistically significant trend in relative distribution of use by redband and steelhead between upstream and downstream sites, and no evidence of declines in abundance in the post-SWW years (Spateholts, 2014). Also, fall Chinook spawning has shown no statistically significant shifts in spawning distribution in the study reaches, and redd (spawning nest) numbers indicate increases in abundance in recent years. CTWS-BNR and ODFW conduct redd surveys of fall Chinook in the Deschutes River. Their fall Chinook escapement estimate in 2012 (whole-river escapement including jacks and adults) was 24,462, which was 56% above the 2000-2012 average of 15,719 (Baker and Jim, 2013). CTWS-BNR also measures juvenile fall Chinook growth rates in the Deschutes River and has continued to see positive growth.

The Licensees conducted a redband trout embryo survival study in 2013 (Year 4, post-SWW). Naturally occurring redband trout redds were sampled at the six spawning study sites and in suitable spawning gravel at the experimental gravel augmentation sites. Several environmental parameters, including intergravel dissolved oxygen (IGDO), gravel permeability, and substrate composition were measured

within the redds after fry had emerged. Survival indices were calculated based on literature studies of redd composition and measured embryo survival. In general, redds at upstream and downstream sites all had conditions which would support highly successful redband trout emergence survival (Spateholts, 2013).

Bull trout, which is on the Endangered Species List, are rearing and growing well in the Deschutes River. Bull trout less than 10 inches that enter the SWW are PIT tagged and transported downstream of the Project. As of 2013, 23 of these bull trout returned to the Pelton trap after an average of 1.7 years in the Deschutes River. During this period, bull trout grew at a similar rate to bull trout rearing in Lake Billy Chinook (Quesada, Bennett & Hill, 2014).

DRA's Comment - Page 9. IV Comments Oregon Department of Environmental Quality (ODEQ) Letter of Support

ODEQ has placed the Deschutes River on Oregon's Clean Water Act Section 303(d) list for not meeting water quality standards for several parameters including flow modification, dissolved oxygen, pH, and temperature. Additionally, two reservoirs within the Project are listed for not meeting water quality standards for pH and chlorophyll-*a*. . . .

In response to LIHI Recertification Question #3… ODEQ answers affirmatively that such a determination was made to support issuance of the Section 401 certification, and referenced in ODEQ's 2006 comments supporting the original LIHI certification.

ODEQ's statement is non-responsive to the specific question. ODEQ's original determination was made prior to the construction of the SWW structure. ODEQ's failure to evaluate the Project's impacts upon ongoing water quality standard violations arising from new Project facilities and operations precludes ODEQ from affirmatively answering Question #3.

Licensees' Response

All the water quality characteristics for which the river and reservoirs are currently listed—dissolved oxygen, pH, and temperature in the river, and chlorophyll a and pH in the reservoirs—were also listed on Oregon's 1998 subsection 303(d) list, which was the approved 303(d) list in 2002 when ODEQ certified that the Project complied with applicable water quality standards. There is no evidence that any potential adverse effects of the Project on the river have increased since 2002, and ODEQ in September 2014 again reiterated that the Project does not cause or contribute to exceedances of these standards in the river.

Reference Section

Page 1:

Raymond, R.B., Eilers, J.M., Bernert, J.A., & Vachè, K.B. (1998). Lower Deschutes River Studies Water Quality and Biota: 1997 Final Report. E&S Environmental Chemistry, Inc.

R2 Resource Consultants, Inc. (2014). Year 1 Data Summary Report: Lower Deschutes River Macroinvertebrate & Periphyton Study. Review Draft. Prepared for Portland General Electric.

U.S. EPA. Western Ecology Division. EMAP West Data. Retrieved from http://www.epa.gov/wed/pages/models/EMAP_West_Data.htm

U.S. EPA. National Rivers and Streams Assessment. Data, 2008-2009 NRSA. Retrieved from http://water.epa.gov/type/rsl/monitoring/riverssurvey/

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