Comments on the Draft Environmental Impact Statement for Pebble Project, Bristol Bay, AK (DEIS 20190018) and Public Notice of Application for Permit (Reference Number POA-2017-00271)

Submitted by

The National Wildlife Federation

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Attachment A: Bonnie Gestring, May 2019, Pebble Mine: Unprecedented Waste Water Capture & Treatment Requirements, (Gestring 2019).

Attachment B: Bonnie Gestring, May 2019, *U.S. Operating Copper Mines: Failure To Capture & Treat Wastewater*, Earthworks. (Gestring 2019).

Attachment C: June 13, 2019 Comments of the American Fisheries Society on the Pebble Mine Draft Environmental Impact Statement.

Attachment D: Brennan, S. R., D. E. Schindler, T. J. Cline, T. E. Walsworth, G. Buck, and D. P. Fernandez. 2019. *Shifting habitat mosaics and fish production across river basins*. Science 364:783-786.

Attachment E: Margaret A. Palmer, Hodula K.L, Koch B.J., *Ecological Restoration of Streams and Rivers: Shifting Strategies and Shifting Goals*, Annu. Rev. Ecol. Evol. Syst. 2014. 45:247–69 at 262 (2014); doi: 10.1146/annurev-ecolsys-120213-091935.

The National Wildlife Federation appreciates the opportunity to comment on the Draft Environmental Impact Statement for the Pebble Project, Bristol Bay, AK, dated February 2019 (DEIS) and the Public Notice of Application for Permit (Reference Number POA-2017-00271).

The National Wildlife Federation is the nation's largest conservation education and advocacy organization with more than six million members and supporters, and affiliate conservation organizations in 52 states and territories. The National Wildlife Federation has a long history of working to improve federal decision making to protect the nation's wetlands, rivers, and estuaries and the fish and wildlife that depend on those vital resources.

General Comments

The National Wildlife Federation urges the Corps of Engineers (Corps) to deny the requested Clean Water Act permit for the extraordinarily destructive Pebble Project and withdraw the project's deeply flawed Draft Environmental Impact Statement. These actions are necessary to protect the people and wildlife of Alaska's pristine Bristol Bay watershed.

The Pebble Project will cause a staggering amount of harm to the ecological integrity of the pristine Bristol Bay watershed. PLPs preferred alternative will destroy 9,317 acres from the project footprint alone.[1] Water treatment facilities and enormous tailing pits will poison the environment—and must **never** leak, fail, or not work as "promised" for **all eternity** to avoid catastrophic water quality and ecosystem-wide impacts. More than 4,500 acres of pristine wetlands and 81 miles of untouched streams will be destroyed and damaged. More than 20 acres of Endangered Species Act-designated critical habitat will be damaged. Additional extensive stream and wetland habitat will be permanently fragmented and natural stream flows will be lost or substantially altered, causing additional significant harm to fish and wildlife.

This horrifying level of destruction will come at the direct expense of the people, fish, and wildlife of the Bristol Bay watershed and beyond. Fueled by the hydrologic and chemical connectivity between surface and subsurface waters, the Bristol Bay watershed is home to more than 190 species of birds, 40 species of mammals, and 29 species of fish.[2] Bristol Bay's world-famous salmon runs are particularly at risk—along with the economy of the entire region and the health, and the well-being of Tribes that have relied on this rich resource for thousands of years.

Bristol Bay salmon are the centerpiece of the region's economy, generating $1.5 billion in annual economic output and more than half of all private-sector jobs in the region.[3] Bristol Bay salmon are the cornerstone of the region's culture and communities. Native Alaskans have lived in Bristol Bay for thousands of years, relying on the region's healthy waters and abundant salmon to sustain their way of life. Generations of families have fished commercially in the region and many small businesses capitalize on the flourishing salmon populations.

Despite the immense importance of Bristol Bay's pristine ecosystem, the DEIS does not come close to providing a level of analysis that satisfies the important requirements of the National Environmental

[1] DEIS, Appendix K at K2-1 to K2-2.
[2] *Id*. at ES-5.
[3] Bristol Bay Watershed Assessment at ES-8.

Policy Act. The DEIS is scientifically unsound, lacks basic information, and provides only the most vague and generalized discussion of impacts. Notably, the DEIS completely ignores the extensively documented and detailed Pebble Project Proposed Determination prepared by the Environmental Protection Agency, which unquestionably demonstrates that the Pebble Project is prohibited by the Clean Water Act.

The DEIS process is equally flawed. Both the DEIS and permit application lack critical and fundamental information. So-called supporting assessments and plans continue to trickle in with no opportunity for public comment—and these of course could not have been considered in the DEIS. Members of the public and Tribes repeatedly asked for significantly more time to provide comments, but only a very limited amount of additional time was provided. The Corps' failure to require a complete permit application and adequate baseline data and information are clear examples of the inappropriately hasty review of this major project.

Notably, however, even the dramatically flawed DEIS demonstrates that the Pebble Project is prohibited by the Clean Water Act. The Project will cause and contribute to significant degradation of the nation's waters, as the Environmental Protection Agency has made clear. The Project will result in the illegal discharge of highly toxic contaminants. The Project will adversely affect Endangered Species Act-designated critical habitat. The Project will cause entirely avoidable harm. The Project's extensive harm cannot be mitigated—and indeed, no compensatory mitigation has been proposed.

In short, the Pebble Project must be rejected.

The National Wildlife Federation urges the Corps to deny the requested Clean Water Act permit for the extraordinarily destructive Pebble Project and withdraw the Project's deeply flawed DEIS. Should any future assessment be conducted (which we oppose), it must begin with a fundamentally new, legally-compliant, environmental impact statement that is released as a draft for public comment.

Detailed Comments

A. The Pebble Project Will Industrialize the Pristine Bristol Bay Watershed Causing Devastating Impacts to Fish, Wildlife, Water Quality, the Economy, and Tribal Resources

The Pebble Project will industrialize the pristine Bristol Bay watershed, causing devastating harm to fish, wildlife, water quality, the economy, and vital Tribal resources.

The high quality and diverse aquatic habitats in the Bristol Bay watershed make it a vital haven for fish and wildlife.[4] Fueled by the hydrologic and chemical connectivity between surface and subsurface waters, the Bristol Bay watershed is home to more than 190 species of birds, 40 species of mammals, and 29 species of fish.[5] All five species of North American Pacific salmon spawn and rear in the rivers,

[4] *See* Environmental Protection Agency, *An Assessment of Potential Mining Impacts on Salmon Ecosystems of Bristol Bay Alaska,* EPA 910-R-14-001ES at ES-8 and ES-25 (January 2014) ("Bristol Bay Watershed Assessment").
[5] *Id*. at ES-5.

streams and lakes that feed Bristol Bay,[6] with more than 58.5 million salmon returning in 2017,[7] and 62.3 million sockeye salmon returning in 2018.[8] The 2018 sockeye salmon run "is the largest on record dating back to 1893" and 2018 was the fourth consecutive year that inshore sockeye salmon runs exceeded 50 million fish."[9]

Bristol Bay's immense ecological wealth drives the region's economy:

> "This ecological wealth supports a number of sustainable economies that are of vital importance to the region, including commercial, subsistence, and sport fishing; subsistence and sport hunting; and non-consumptive recreation. In 2009 alone, these activities generated approximately $480 million in direct economic expenditures and provided employment for over 14,000 full- and part-time workers (EPA 2014: Chapter 1, Appendix E)."[10]

Bristol Bay supports the most valuable wild-salmon fishery in the world and accounts for more than 30 percent of all Alaska salmon harvests. This fishery is the centerpiece of the region's economy, generating $1.5 billion in annual economic output and more than half of all private-sector jobs in the region.[11] The commercial harvest of 41.3 million sockeye salmon in 2018 was "the second largest harvest on record."[12]

Bristol Bay salmon are the cornerstone of the region's culture and communities. Native Alaskans have lived in Bristol Bay for thousands of years, relying on the region's healthy waters and abundant salmon to sustain their way of life. Generations of families have fished commercially in the region and many small businesses capitalize on the flourishing salmon populations. Anglers travel to the Bristol Bay region from all over the world to fish for the region's bountiful salmon, world-class rainbow trout, arctic char, and grayling.

The Pebble Mine would industrialize this pristine habitat through the construction of

- A mine pit over a mile in length, 1-mile-wide and 200 m deep;
- A massive tailings storage facility, treatment ponds, and associated dams and embankments blocking and inundating salmon streams;
- A private two-lane 83-mile-long road with more than 200 stream crossings and 8 large bridges;
- An ice-breaker barge system across Lake Iliamna with two lakeside terminals in important salmon habitat;

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[6] Environmental Protection Agency, Proposed Determination of the U.S. Environmental Protection Agency Region 10 Pursuant to Section 404(c) of the Clean Water Act, Pebble Deposit Area, Southwest Alaska at 3-12 (July 2014) ("Proposed Determination").

[7] Alaska Department of Fish and Game Division of Commercial Fisheries, News Release, *2017 Bristol Bay Salmon Season Summary*, September 14, 2017 (available at http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/865497019.pdf).

[8] Alaska Department of Fish and Game Division of Commercial Fisheries, News Release, *2018 Bristol Bay Salmon Season Summary*, September 14, 2017 (available at http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/989536277.pdf).

[9] *Id*.

[10] Proposed Determination at 3-1.

[11] Bristol Bay Watershed Assessment at ES-8.

[12] Alaska Department of Fish and Game Division of Commercial Fisheries, News Release, *2018 Bristol Bay Salmon Season Summary*, September 14, 2017 (available at http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/989536277.pdf).

- A private and large port facility on Cook Inlet near salmon streams and extending more than 4 miles into the inlet waters that provide habitat for sea otters, humpback whales, seals, and designated critical habitat for Cook Inlet beluga whales;
- A 270-megawatt power plant (with two additional 2mw plants at the port) approximately 15 miles upwind from Lake Clark National Park;
- A 188-mile-long natural gas pipeline over land and under Cook Inlet and Iliamna Lake;
- At closure, Pebble will leave behind 1.1 billion tons of tailings waste that will be backhauled into the pit and require critical monitoring and maintenance **in perpetuity**.

As discussed throughout these comments, this industrialization of the pristine Bristol Bay watershed will have devastating impacts on the watershed's exceptional habitat, fisheries, and water quality. These impacts could shatter the economic well-being of local communities, tribes, and fishermen in Alaska and beyond.

The immense importance of Bristol Bay and the devastating impacts of the Pebble Mine have led more than 65 percent of Alaskans, 80 percent of Bristol Bay residents and Native communities, and 85 percent of commercial fishermen to oppose construction and operation of the Pebble Mine.

B. The Pebble Project Is Explicitly Prohibited by the Clean Water Act

As discussed in Section D of these comments, the DEIS is fundamentally flawed and vastly understates the true extent of the destruction that will be caused by the Pebble Project. However, even the limited impacts that are identified in the DEIS demonstrate that the Pebble Mine is prohibited under Clean Water Act § 404 and its implementing guidelines. As a result, the Corps is required to deny the requested permit as a matter of law.

The Clean Water Act § 404(b)(1) Guidelines make clear that "dredged or fill material should not be discharged into the aquatic ecosystem **unless it can be demonstrated** that such a discharge will not have an unacceptable adverse impact either individually or in combination with known and/ or probable impacts of other activities affecting the ecosystem of concern."[13] The "degradation or destruction of special aquatic sites, such as filling operations in wetlands, is considered to be among the most severe environmental impacts covered by the[] Guidelines."[14] To prevent such unacceptable impacts, the 404(b)(1) Guidelines prohibit the Corps from issuing a § 404 permit under circumstances that are clearly present in the case of the Pebble Project.

Even the dramatically flawed DEIS demonstrates that the Pebble Project is **prohibited** by the 404(b)(1) Guidelines because, as discussed in detail below:[15]

(1) The proposed discharge "will cause or contribute to significant degradation of the waters of the United States." 40 C.F.R. § 230.10(c).

[13] 40 C.F.R. § 230.1(c) (emphasis added).
[14] 40 C.F.R. § 230.10(d).
[15] Notably, the Corps would be required to deny the requested permit if any one of these prohibitions were triggered. The Pebble Project triggers all of these prohibitions. However, the Corps would be required to deny the requested permit even if just one of these prohibitions was triggered.

(2) The proposed discharge will violate applicable toxic effluent standards or prohibition under Clean Water Act § 307 and cause or contribute to violations of state water quality standards. 40 C.F.R. § 230.10(b).

(3) The proposed discharge will result in a likelihood of the destruction or adverse modification of formally designated critical habitat. 40 C.F.R. § 230.10(b).

(4) The applicant has not clearly demonstrated that there is no "practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem." 40 C.F.R. § 230.10(a).

(5) The applicant has not taken "appropriate and practicable" steps to minimize potential adverse impacts on the aquatic ecosystem. 40 C.F.R. § 230.10(d).

1. The Project Will Cause or Contribute to Significant Degradation of Protected Waters

A permit must be denied for the Pebble Project because the proposed discharge "will cause or contribute to significant degradation of the waters of the United States."[16] Significant degradation is measured by significant adverse impacts on: (a) human health or welfare, including municipal water supplies, plankton, fish, shellfish, wildlife, and special aquatic sites; (b) life stages of aquatic life and other water-dependent wildlife; (c) aquatic ecosystem diversity, productivity, and stability, such as loss of fish and wildlife habitat or loss of the capacity of a wetland to assimilate nutrients, purify water or reduce wave energy; and (d) recreational, aesthetic, and economic values.[17]

The DEIS acknowledges that Pebble Mine and its attendant tailings ponds, water treatment facilities, power plants, housing, roads, pipelines, ports, and ice breaker barge system will cause extensive and highly significant adverse impacts to pristine wetlands, streams, and other waters. Among other impacts, the DEIS acknowledges that PLP's preferred alternative (Action Alternative 1) will:

- Destroy 4,519 acres of wetlands—3,560 acres will be permanently destroyed at the mine site, 510 acres will be "temporarily" filled during construction, and 449 acres will be dewatered during operations;
- Destroy 81.1 miles of pristine streams covering 50 acres;
- Destroy 55 acres of lakes and ponds and 11 acres of marine waters;
- Blanket an additional 1,896 acres of wetlands and other waters with copper contaminated fugitive dust;

[16] 40 C.F.R. § 230.10(c).
[17] 40 C.F.R. § 230.10(c).

- Fragment an extensive array of aquatic habitat, including 462 acres of wetlands/other waters[18] and at least 59 streams, with more than 207 crossings, 8 bridges, and other project features;[19]

- Significantly alter flows in streams with documented anadromous and resident fish occurrence.

The Environmental Protection Agency's 2014 Proposed Determination has already determined that this level of harm is "unacceptable" and, as a result, the project could appropriately be vetoed under Clean Water Act §404(c).[20] The Proposed Determination concludes that unacceptable adverse effects would occur if the discharge of dredged or fill material related to mining the Pebble deposit, either individually or cumulatively resulted "in any of the following" impacts:

1. Loss of streams: The loss of 5 or more linear miles of streams with documented anadromous fish occurrence; or loss of 19 or more linear miles of streams where anadromous fish are not currently documented, but that are tributaries of streams with documented anadromous fish occurrence; **or**

2. Loss of wetlands, lakes, and ponds: The loss of 1,100 or more acres of wetlands, lakes, and ponds contiguous with either streams with documented anadromous fish occurrence or tributaries of those streams; **or**

3. Streamflow alterations: Streamflow alterations greater than 20% of daily flow in 9 or more linear miles of streams with documented anadromous fish occurrence.[21]

The Pebble Project impacts acknowledged in the DEIS far exceed these criteria, and as such, each of the alternatives evaluated in the DEIS would result in unacceptable adverse impacts – and would cause or contribute to significant degradation. *See* Table 1 on the next page.

[18] DEIS at 4.22-33, Table 4.22-10.

[19] "The road and pipeline would cross 16 anadromous (including Kokhanok East Ferry Terminal Variant) and 36 resident fish streams." DEIS at 4.24-6. "The mine access road and spur roads would cross seven fish-bearing streams, not including road crossings where channels enter stockpile embankments or the open pit (Figure 4.24-1). In terms of magnitude and extent, two of the stream crossings involve anadromous streams, four cross non-resident salmonid streams, and one crosses a sculpin-bearing stream. The anadromous crossing in the NFK drainage is over a branch of Tributary 1.190. The duration of impacts to this stream would permanent, because it would be blocked to anadromous fish during project construction and operations. The second anadromous crossing is in the headwaters of the mainstem SFK, approximately 1,000 feet below the southern edge of the mine pit." DEIS at 4.24-22.

[20] Proposed Determination of the U.S. Environmental Protection Agency Region 10 Pursuant to Section 404(c) of the Clean Water Act Pebble Deposit Area, Southwest Alaska, July 2014 (available at https://www.epa.gov/bristolbay/2014-proposed-determination-pursuant-section-404c-clean-water-act-pebble-deposit-area).

[21] U.S. Environmental Protection Agency, Proposed Determination of the U.S. Environmental Protection Agency Region 10 Pursuant to Section 404(c) of the Clean Water Act Pebble Deposit Area, Southwest Alaska (July 2014) at ES-5 to ES-6.

Table 1. Comparison of EPA Determined Unacceptable Impacts to DEIS Recognized Impacts

Criteria	EPA Unacceptable Impact Proposed Determination	DEIS Recognized Impact Proposed Alternative
Impacts to Streams with Anadromous Fish or Their Tributaries	5 linear miles or 19 miles of tributaries	81.1 linear miles destroyed and at least 59 streams fragmented[22] • Rearing coho salmon documented throughout the NFK drainage • 8.75 linear miles of destroyed streams highlighted as anadromous • Fragmentation of 18 anadromous streams highlighted • 20 linear miles of destroyed resident fish streams highlighted
Loss of Wetlands, Lakes, Ponds Contiguous to Anadromous Fish Streams or Tributaries	1,100 acres	4,519 acres of wetlands destroyed[23] • 3,560 acres filled; 510 acres "temporarily" filled with no restoration plan provided; 449 acres dewatered 462 acres of wetlands/other waters fragmented 55 acres of lakes and ponds lost 1,896 acres of wetlands/other waters damaged by copper-contaminated fugitive dust 12,445+ additional cumulative wetland acres lost under 78-year mine scenario
Streamflow Alterations >20% Daily Flow, Anadromous Fish Occurrence	9 linear miles	Significant changes in stream flow acknowledged[24] • Permanent removal of stream flow from Tributary NFK 1.190, sections of NFK 1.120 and SFK 1.0 • Average monthly streamflow 97% less to 37% less than baseline streamflow, depending on month, in main stem SFK reach closest to the mine • Average monthly stream flow 20% less to 23% more than baseline streamflow, depending on month, in main stem NFK reach closest to the mine Note: DEIS does not assess daily flow change or flow change by mile. DEIS only assesses changes to average monthly flows which could mask significant daily changes.

[22] "Rearing coho salmon have been documented throughout the [NFK] drainage." DEIS at 4.24-3. Stream losses include at least: "20 miles of fish-bearing streams . . . in the NFK drainage, including approximately 8.2 miles of anadromous waters"; and "2.0 miles of fish habitat in the upper mainstem SFK and a tributary of SFK 1.190" including approximately "0.75 mile of low-density coho and sockeye salmon rearing habitat." DEIS at 4.24-3; 4.24-5; 4.24-31. "The road and pipeline would cross 16 anadromous (including Kokhanok East Ferry Terminal Variant) and 36 resident fish streams." DEIS at 4.24-6. "The mine access road and spur roads would cross seven fish-bearing streams, not including road crossings where channels enter stockpile embankments or the open pit (Figure 4.24-1). In terms of magnitude and extent, two of the stream crossings involve anadromous streams, four cross non-resident salmonid streams, and one crosses a sculpin-bearing stream." DEIS at 4.24-22.

[23] DEIS at 4.22-33, DEIS at 4.22-40, DEIS at Table 4.22-10.

[24] DEIS at 4.24-32, Executive Summary at 38.

While the Proposed Determination has not been finalized, it should be viewed as dispositive—and at a minimum, must be granted extensive deference—with respect to a finding that the Pebble Project will cause or contribute to significant degradation for at least the following reasons:

(1) **The Proposed Determination is equally applicable to the Pebble Project reviewed in the DEIS.** The Proposed Determination is **not** based on any particular mine location or size. The Proposed Determination instead lays out the standards for a finding of "unacceptable adverse effects" of constructing any type of large industrial mining facility in the Pebble Project area.

(2) **The Proposed Determination is based on an extensive, robust, and insurmountable administrative record.**

a. The Proposed Determination is based on a three volume, 1,400 page comprehensive scientific assessment of the implications of constructing a large industrial mining facility in the Pebble Project area, *An Assessment of Potential Mining Impacts on Salmon Ecosystems of Bristol Bay, Alaska.*[25] This scientific assessment underwent multiple rounds of public comment and peer review:

> "The first external review draft of this assessment (EPA 910-R-12-004) was released in May 2012 for a 60-day public comment period and external peer review by 12 independent expert reviewers. The revised, second external review draft was released in April 2013 (EPA 910-R-12-004B) for another 60-day public comment period and follow-on review by the same 12 peer reviewers. All public and peer review comments on the two drafts were considered in the development of this final assessment."[26]

As part of the review for this scientific assessment, EPA held several public meetings and collected and considered 300,000 public comments.[27]

b. The 200-plus page Proposed Determination further reviewed the implications of constructing a large industrial mining facility in the Pebble Project area and was itself subject to at least seven public hearings and extensive public comment. At least 675,000 public comments were received during the public comment period on the Proposed Determination.[28]

c. The Proposed Determination was formally reviewed again in 2017-2018 for the express purpose of determining whether it should be withdrawn. That review was also subjected to a formal public notice and comment period that generated more

[25] Environmental Protection Agency, An Assessment of Potential Mining Impacts on Salmon Ecosystems of Bristol Bay, Alaska, January 2014 (EPA 910-R-14-001ES) (available at https://www.epa.gov/bristolbay/bristol-bay-assessment-final-report-2014).
[26] *Id*., Volume 1 Preface.
[27] Environmental Protection Agency description of the scientific assessment (available at https://www.epa.gov/bristolbay/bristol-bay-assessment-final-report-2014).
[28] Information obtained from Regulations.gov at (https://www.regulations.gov/docket?D=EPA-R10-OW-2014-0505).

than one million comments from the public. Upon completion of that review, the EPA Administrator (who at that time was Scott Pruitt) determined that the Proposed Determination should be retained:

> "The United States Environmental Protection Agency (EPA) Administrator and Region 10 Regional Administrator are announcing the EPA's decision not to withdraw at this time the EPA Region 10 July 2014 Proposed Determination that was issued pursuant to Section 404(c) of the Clean Water Act and EPA's implementing regulations. Today's notice suspends the proceeding to withdraw the Proposed Determination and leaves that Determination in place pending further consideration by the Agency of information that is relevant to the protection of the world-class fisheries contained in the Bristol Bay watershed."[29]
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> During the public comment period, EPA received more than one million public comments regarding its proposal to withdraw. An overwhelming majority of these commenters expressed opposition to withdrawal of the Proposed Determination. EPA also held two public hearings in the Bristol Bay watershed on the proposal to withdraw; approximately 200 people participated in the hearings. Of the 119 participants who testified, an overwhelming majority also expressed opposition to withdrawal of the Proposed Determination. Similarly, the vast majority of tribal governments and ANCSA Corporation shareholders who consulted with EPA expressed opposition to the proposed withdrawal."[30]

(3) **EPA has the ultimate responsibility for ensuring wetlands protection under the Clean Water Act.** The Courts have made clear that while both the Corps and EPA are responsible for the issuance of Clean Water Act 404 permits, the "EPA is ultimately responsible for the protection of wetlands."[31] This responsibility provides added weight to the importance of EPA's extensive review of Pebble Mine and its determination of an unacceptable level of impacts in the Bristol Bay watershed.

(4) **The Proposed Determination's finding of "unacceptable adverse effects" demonstrates a level of harm that is at least equivalent to—and likely much greater than—the level of harm that would "cause or contribute to significant degradation."** The Clean Water Act § 404c implementing regulations[32] define an "unacceptable adverse effect" as an "impact on

[29] 83 Fed. Reg. 8668 (February 28, 2018).
[30] 83 Fed. Reg. 8668 (February 28, 2018).
[31] *National Wildlife Federation v. Hanson*, 859 F.2d 313, 315-16 (4th Cir. 1988).
[32] Clean Water Act § 404(c) authorizes the Administrator of EPA to "prohibit the specification (including the withdrawal of specification) of any defined area as a disposal site, and he is authorized to deny or restrict the use of any defined area for specification (including the withdrawal of specification) as a disposal site, whenever he determines, after notice and opportunity for public hearings, that the discharge of such materials into such area will have an unacceptable adverse effect on municipal water supplies, shellfish beds and fishery areas (including spawning and breeding areas), wildlife, or recreational areas. Before making such determination, the Administrator shall consult with the Secretary. The Administrator shall set forth in writing and make public his findings and his reasons for making any determination under this subsection."

> an aquatic or wetland ecosystem which is likely to result in **significant degradation** of municipal water supplies (including surface or ground water) or **significant** loss of or damage to fisheries, shellfishing, or wildlife habitat or recreation areas. In evaluating the unacceptability of such impacts, consideration should be given to the relevant portions of the section 404(b)(1) guidelines (40 CFR part 230)."[33] EPA has also described an unacceptable adverse effect as "a large impact" and "one that the aquatic and wetland ecosystem cannot afford."[34]
>
> As a result, a determination that a discharge will cause "unacceptable adverse effects" by definition requires an assessment of significant degradation or loss. In reality, determinations that a discharge will cause "unacceptable adverse effects" under § 404(c) has been limited to only the most egregiously damaging projects. EPA has used the 404(c) veto authority to stop **just 13 of the more than two million activities** estimated to have been authorized under Section 404 in the 46-year history of the Clean Water Act.[35]

To issue a Clean Water Act permit for the Pebble Project in the face of the findings and record that support the Proposed Determination, the Corps would have to provide extensive and detailed scientific information which demonstrates that the criteria in the Proposed Determination (and thus, the much larger level of impacts acknowledged in the DEIS) no longer accurately describe impacts that would cause or contribute to significant degradation. The DEIS also "must demonstrate that it has considered significant comments and criticisms by explaining why it disagrees with them; it may not dismiss them without adequate explanation."[36]

The DEIS does not come close to providing the level of analysis required to overcome the extensive administrative record and detailed conclusions in the Proposed Determination. In the undeniable absence of such information, any decision to issue a Clean Water Act permit for the Pebble Project would be arbitrary and capricious and not in accordance with the law.

Astonishingly, the DEIS completely ignores the findings in EPA's Proposed Determination and the extensive underlying science that led to those findings. Indeed, the DEIS does not include a single reference to the Clean Water Act 404(c) process or EPA's Proposed Determination. Neither PLP nor the Corps have made a supportable, scientifically-defensible argument that the Watershed Assessment and Proposed Determination findings are either not relevant or inaccurate. This is a direct violation of NEPA which requires that the DEIS respond to the opposing views of outside experts and resource agencies.

Even were the Corps to improperly ignore the conclusions of EPA's Proposed Determination, however, it remains exceedingly clear that the Pebble Project will cause or contribute to significant degradation of the waters of the United States. Indeed, it is clear that the Pebble Project will cause the significant adverse impacts outlined below that trigger a significant degradation finding based solely on the vastly

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[33] 40 C.F.R. § 231.2(e) (emphasis added).

[34] 44 Fed. Reg. 58076 at 58078 (Oct. 9, 1979).

[35] The vast majority of these 404(c) actions – 11 out of 13 – were issued under Republican Administrations.Seven of the vetoes were issued under the Administration of President Ronald Regan.

[36] *Alliance to Save the Mattoponi v. U.S. Army Corps of Engineers*, 606 F.Supp.2d 121,132 (D.D.C 2009) (citing *ARCO Oil & Gas Co. v. FERC,* 932 F.2d 1501, 1504 (D.C.Cir.1991)("conclusory statements cannot substitute for the reasoned explanation that is wanting in this decision")).

understated[37] DEIS numbers alone—i.e., the acres of wetlands and miles of streams damaged and destroyed by the Pebble Project:

> (1) Significantly adverse effects on human health or welfare, including but not limited to effects on municipal water supplies, plankton, fish, shellfish, wildlife, and special aquatic sites;
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> (2) Significantly adverse effects on life stages of aquatic life and other wildlife dependent on aquatic ecosystems, including the transfer, concentration, and spread of pollutants or their byproducts through biological, physical, and chemical processes;
>
> (3) Significantly adverse effects on aquatic ecosystem diversity, productivity, and stability; which may include, but are not limited to, loss of fish and wildlife habitat or loss of wetland functions; or
>
> (4) Significantly adverse effects on recreational, aesthetic, and economic values.[38]

The egregiousness of the degradation is overwhelmingly confirmed by even the most cursory assessment of the functional and ecological impacts from these losses. Such an assessment makes clear that the Project-caused destruction, fragmentation, and contamination of vital stream, wetland, lake, pond and other aquatic habitat in the project area would cause catastrophic harm to the ecological health of the Bristol Bay watershed and its world-class salmon fishery. As EPA concluded in its Proposed Determination, "it is apparent that impacts of [even the smallest mine reviewed by EPA] could *compromise the sustainability of fish populations within the SFK, NFK, and UTC watersheds, as well as downstream fishery areas*."[39]

The Project-induced extensive damage to salmon and other fisheries that rely on the Project area's vital streams and wetlands will have cascading impacts on the indigenous communities and wildlife of the Bristol Bay watershed. As noted by the American Fisheries Society:

> "The high salmon production brings huge levels of marine-derived nutrients to the watersheds in which salmon spawn, fueling sustainable populations of grizzly bears, moose, estuarine birds, and indigenous Yup'ik and Dena'ina peoples. The latter peoples represent two of the planet's last salmon-based subsistence cultures, which were once widespread along the entire North American Pacific Coast."[40]

The extensive direct losses of intact headwater habitats will result in highly significant harm to the habitat and ecological functions essential to fish and wildlife. For example:

(1) The extensive loss and damage to the Project area's pristine headwater streams and wetlands will eliminate important juvenile salmon habitat, result in the loss of critical salmonid food

[37] As discussed in Section D.3.a of these comments, the DEIS fails to assess the true extent of wetland and stream mile impacts.
[38] 40 C.F.R. § 230(c).
[39] Proposed Determination at 4-13. (emphasis added).
[40] American Fisheries Society Comments on the Pebble Mine Draft Environmental Impact Statement (June 13, 2009) at 2. The National Wildlife Federation urges the Corps to carefully consider the comments of the American Fisheries Society in making its permitting decision.

resources, degrade downstream rearing and spawning habitat, and lead to a loss of genetic diversity, which is key to the Bristol Bay salmon stocks.

(2) The extensive loss and damage to the Project area's pristine headwater streams and wetlands will affect nutrient and detrital inputs, groundwater inputs, and stream flows for both contiguous and downstream waters.

(3) The extensive dewatering of wetlands will result in significant changes to the structure and function of the wetland systems and could result in major shifts in plant species with cascading impacts on fish and wildlife. Critically, dewatering could lead to additional significant losses of wetlands by eliminating the hydrologic regime needed to support wetland habitat.

(4) The extensive stream flow changes—including complete elimination of flows in critical areas—will likely dewater and extensively alter the hydrology of additional extensive areas of riparian wetlands.

(5) The altered and eliminated stream flows, and altered wetland hydrology, would fragment wildlife habitat and pose a barrier to the movement of fish, amphibians, some water birds, and some small and medium size mammals.

(6) The extensive fragmentation of streams will create additional significant barriers to fish passage, additional significant changes to flow and habitat, and loss of the vital functions that are created by the natural connectivity of the existing pristine system.

(7) Flow changes and water treatment discharges will increase water temperatures leading to a host of additional problems, including likely altering the aquatic invertebrate assemblages that provide a major food source to juvenile salmon.

(8) The diversion of billions of gallons of water will cause irreparable harm to the high quality, but fragile, ecosystem that has evolved as a result of—and is dependent upon—clean, clear, flows of certain amounts at certain times.

(9) Water quality, and the species that rely on the region's pristine streams and wetlands, will be harmed by highly damaging contamination with toxic compounds and copper, as discussed in Section B.2.b of these comments.

As discussed at length in Section D.4 and Section B of these comments, neither the DEIS nor the permit application demonstrate—or even vaguely suggest—that the extreme damaged caused by the Pebble Project could be offset through mitigation. To the contrary, the DEIS states that mitigation is not possible in the watershed. Absent proof that mitigation can, and that proposed mitigation in fact will offset the harm resulting from the extensive loss of pristine streams and wetlands, including the harm to lost functions and values, the Corps lacks "sufficient information to make a reasonable judgment" that this project complies with the 404(b)(1) Guidelines.[41]

[41] *See Alliance to Save the Mattoponi v. U.S. Army Corps of Engineers*, 606 F.Supp.2d 121, 132 (D.D.C 2009) (Corps "must explain how the Mitigation Plan will adequately compensate for lost wetland functions and values" to determine that a project will not cause or contribute to significant degradation based on proposed mitigation);

Simply put, the Pebble Project would "cause or contribute to significant degradation of waters of the United States." As a result, the Corps is prohibited from issuing a Clean Water Act § 404 permit for the Pebble Project as a matter of law.[42]

2. The Project Will Violate Applicable Clean Water Act Section 307 Toxic Effluent Standards and Cause or Contribute to Violations of State Water Quality Standards

A permit must be denied for the Pebble Project because the DEIS fails to demonstrate that the proposed discharge will not violate Clean Water Act § 307 toxic effluent standards and will not cause or contribute to violations of Alaska's Water Quality Standards.[43] Indeed, PLP's reliance on untested, experimental active water treatment and complex water collection and waste disposal systems in the harsh and seismically active project area virtually guarantees violations of the applicable numeric and narrative standards.

Sixty-five compounds are regulated under Clean Water Act § 307.[44] The DEIS identified criteria for 17 of these compounds for comparison to water and sediment quality data for the Pebble Project. DEIS at K3.18-2. The DEIS acknowledges that **all** Water Treatment Plant Inflows and **all** Mine Site Ponds during **all** Operations and Closure Phases will exceed the most stringent water quality standards for **11 toxic compounds regulated under § 307:** Antimony, Arsenic, Beryllium, Cadmium, Coper, Lead, Mercury, Nickel, Selenium, Silver, and Zinc. DEIS, Appendix K, Tables K4.18-4, k4.18-5, K4.18-7, K4.18-8, K4.18-9, K4.18-10, K4.18-11.

As discussed in detail below, the DEIS fails to demonstrate that PLPs water collection and active treatment technologies will prevent violations of the numeric criteria for these § 307 toxic contaminants. Moreover, the actual concentrations of water pollutants released into the environment by the Pebble Mine are likely to be far higher than the concentrations projected and assessed, including due to acid leaching.

Alaska's related narrative Water Quality Standard prohibits "concentrations of toxic substances in water or in shoreline or bottom sediments, that, singly or in combination, cause, or reasonably can be expected to cause, adverse effects on aquatic life."[45] "Toxic substances" include selenium, mercury, copper, silver, and zinc. The DEIS fails to demonstrate that the Pebble Project will not violate this narrative criteria. Indeed, the DEIS provides no information whatsoever on impacts of the potential

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Environmental Defense Fund v. U.S. Army Corps of Engineers, 515 F. Supp. 2d 69, 77, 81, 83 (D.D.C. 2007) (inflated mitigation undermines Corps' finding of compliance with 40 C.F.R § 230.10(c), (d)).

[42] As a result, a Court would have to overturn a § 404 permit for this Project if one were issued by the Corps. *Sierra Club v. U.S. Army Corps of Eng'rs,* 772 F.2d 1043, 1051 (2d Cir.1985) (if "an agency approves a project that the record before a reviewing court reveals will have a significant adverse impact on marine wildlife, the agency determination must be reversed.").

[43] 40 C.F.R. § 230.10(b). States and tribes must adopt water quality criteria sufficient enough to protect the designated use for § 307(a) toxic pollutants. 40 C.F.R. § 131.11. States and tribes also must adopt numeric criteria for all § 307(a) toxic pollutants for which such criteria have been published under Clean Water Act § 304(a). Clean Water Act § 303(c)(2)(B); *see also* National Toxics Rule, 57 Fed. Reg. 60848 (December 22, 1992) (promulgating toxic pollutant numeric criteria for the 14 states that had not yet done so).

[44] 40 C.F.R. §401.15.

[45] Alaska Department of Environmental Conservation, Regulations, *18 AAC 70.020: Water Quality Standards*, April 6, 2018, 25-26.

combinations of toxic substances introduced to surface waters by the Pebble Mine, including the effects of pollutants in concentrations that individually fall below the respective numeric water quality standards but that in combination cause or reasonably can be expected to cause adverse effects on aquatic life.

The potential for Pebble Mine to discharge § 307 compounds that exceed effluent standards into surface water is significant—and as discussed, almost certain to occur. As soon as construction begins, the mine will begin generating contaminated contact water which will continue to be produced as precipitation, surface water, and groundwater come into contact with materials disturbed by mining. The potential for toxic discharges continues through the entire operation phase and into perpetuity upon mine closure. Critically, if treatment fails or if contaminants bypass the treatment system there is no way to stop the ongoing production of contaminated water—there is no valve that can turn off the flow while a solution is identified and implemented. Instead toxic and other dangerous releases could continue for decades or centuries, all with accumulating and compounding downstream impacts.

a. The DEIS Acknowledges Adverse Water Quality Impacts, Including from § 307 Compounds

The DEIS acknowledges that the mine will cause adverse impacts to water quality. It also recognizes that at least at some points in time, discharges are likely to exceed concentrations levels identified in the DEIS. Critically, it also recognizes that leaks or failures in the water management ponds or tailings facilities will cause releases of § 307 contaminants above effluent standards:

(1) **The DEIS generally acknowledges adverse water quality impacts:**

> "As described above, direct and indirect impacts to water quality are likely to occur as a result of permitted discharges of treated water to drainages downstream of the mine site. The duration of these discharges would range from long term, lasting from construction throughout the life of the mine; and in some cases, throughout post-closure."[46] DEIS at 4.18-13.

(2) **The DEIS generally acknowledges that discharges from the mine may exceed limits incorporated into the NPDES permit:**

> "[O]ver the life of the mine, it is possible that APDES permit conditions may be exceeded for various reasons (e.g., treatment process upset, record-keeping errors) as has happened at other Alaska mines. In these types of events, corrective action is typically applied in response to ADEC oversight to bring the WTP discharges into compliance."[47] DEIS at 4.18-5.

(3) **The DEIS acknowledges that a leak in the main Water Management Pond would result in significant violations of toxic effluent and water quality standards:**

[46] The DEIS does not specify whether any of those impacts would result from discharge of toxic contaminants.
[47] The DEIS is silent as to which permit conditions might be exceeded, the specific mechanisms that might lead to exceedances, and the likelihood of each potential failure. The DEIS also does not explain what "corrective actions" might be available to address each mechanism of failure.

"In the event of an unintended release of untreated contact water [from the main Water Management Pond], impacts could range from temporary, local water quality impacts to a large flood and extensive contamination that could threaten downstream environments. The fate and behavior of released contact water would depend on several factors, as described above for tailings releases, including location of release, chemistry of contact water, volume of release, speed/duration of release, downstream topography, summer versus winter, and mode of failure." DEIS at 4.27-114.

"Contact water would have elevated concentrations of metals and other constituents that could impact downstream water quality. Aqueous chemistry of contact water across the mine site would vary by storage facility. Modeling predicts that contact water in the main WMP would have concentrations of the following metals at levels exceeding the most stringent WQC: aluminum, arsenic, beryllium, cadmium, copper, lead, manganese, mercury, molybdenum, nickel, selenium (a metalloid), silver, and zinc (Knight Piésold 2018a; Table K4.18-3). In addition, levels of TDS, alkalinity, hardness, and sulfate would also fail to meet applicable WQC." DEIS at 4.27-114.

Notably, the DEIS also recognizes the unprecedented nature of the Water Management Pond and the wholesale lack of precedent for assessing its risk of failure:

"Water reservoir dams are generally built to last for decades to centuries. Water management ponds and other water storage facilities at mine sites are generally not built to last beyond the operational life of a mine, and are therefore generally constructed with earthen materials instead of cementitious materials.

Most mine water management ponds are generally much smaller than the proposed main WMP. There are no known precedents for such a large lined WMP; therefore, there are no reliable statistics on their failure rates." DEIS at 4.27-115

(4) **The DEIS acknowledges that an "unplanned release" from one of the tailing storage facilities would result in significant violations of toxic effluent and water quality standards:**

"An unplanned release of tailings from one of the TSF facilities could cause a flood of water and/or tailings slurry downstream of the facility. Solid tailings could be deposited on uplands, wetlands, or in stream drainages. Streamflow would transport some of the spilled tailings downstream, where further deposition could occur, potentially burying stream substrate and altering benthic habitats. Entrained tailings would create turbid water conditions downstream, which would impact downstream habitat until the tailings are completely recovered or naturally flushed from the drainage. Metals could leach from unrecovered tailings on a timescale of years to decades. Unrecovered tailings that are exposed to oxygen could generate acid on a timescale of years to decades." DEIS at 4.27-64.

* * *

"A release of tailings fluid from the TSFs could include untreated process water ranging in volume from excess seepage of pore water that could overwhelm the seepage control pond to a flood of supernatant fluid. In the event of overfilling of an embankment, supernatant could overtop the dam and spill downslope. . . .Elevated levels of metals and other

constituents in the tailings fluids would impact water quality downstream. Released fluids would be immediately diluted by stream water, but stream water could fail to meet applicable WQC for many miles downstream." DEIS at 4.27-66 to 4.27-67.

While these analyses are notably insufficient and fail to assess the true potential for failures of the tailings storage facilities, it is clear from the history of leaks and catastrophic failures at other mine sites that the risk of significant violations of toxic effluent standards and Alaska's Water Quality Standards are very real. Certainly, the DEIS has not demonstrated that such leaks will in fact not happen.

b. The DEIS Fails to Demonstrate That Toxic Effluent and Narrative Standards Will Be Met Even in the Absence of a Leak or Failure of a Water Management Pond or Tailings Facility

Critically, the DEIS fails to demonstrate that the toxic effluent and narrative standards will in fact be met even in the unlikely absence of a leak or failure of a water management pond or tailings facility. Instead, the DEIS relies on a "high-level review of current WTP design [that assessed] the effectiveness of the planned water treatment approach at meeting water treatment goals"[48] to conclude that the active treatment facilities are "currently expected"[49] to prevent violations of toxic effluent standards and state water quality standards during at least 20 years of operation (and far more likely 78 years of operation) and in **perpetuity** upon closure of the Mine. This is fundamentally insufficient to demonstrate that toxic effluent and narrative standards will not be violated into perpetuity.

Indeed, no such demonstration is possible given the: (i) many fundamental failings in the DEIS; (ii) experimental and complex water treatment systems, diversion channels, berms, collection ditches, sediment control ponds, and tailing ponds; (iii) harsh and seismically active conditions at the project site; (iv) potential for significant and potentially catastrophic leaks; and (iv) pervasive violations of toxic standards at virtually all other copper mines in the United States. For example:

(1) **The DEIS fails to demonstrate the accuracy or sufficiency of the water balance model which, as acknowledged in the DEIS, drives the entire water treatment plan.**[50] Instead, the DEIS acknowledges significant limitations in the water balance model:

> "The accuracy of water balance models is limited by many factors, including the stochastic nature of the inputs and the potential effects of climate change. In recognition of these limitations, an adaptive water management strategy is planned." DEIS, Appendix N at 57.

In addition to the many problems created by these limitations, the DEIS provides no data or information to suggest that the water balance model: (i) accurately captures and accounts for the rich surface-ground water connections, fractured geology, and seismic activity influences in the project area; (ii) utilizes appropriate and accurate inputs into the three model modules; or (iii) accounts for climate change-induced changes to rainfall, snow, and snowmelt patterns.

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[48] DEIS, Appendix K4.18-45.

[49] DEIS at 4.18-4.

[50] DEIS Appendix N at 53 (the "foundation of the water management program is the water balance"). The water balance model consists of three primary modules (watershed, groundwater, and mine plan) to quantify "the numerous water flows in the streams, in the ground, and in the various pipes, ponds, and mine structures associated with the mine development." DEIS at 2-32.

Significant concerns with the quality and sufficiency of the water balance model have been raised, including concerns with the inadequacy of the numerical groundwater model for describing the interconnected groundwater-surface water system; use of a hydrologic period of record that is too short to characterize natural variability; and inputs and outputs to the hydrologic system that are not balanced based on measured data.

The DEIS provides no evidence to demonstrate—and it is unrealistic to assume—that the water treatment plan that is based on this unexplained and flawed model will in fact capture and effectively treat all mine-influenced water.

(2) **The DEIS fails to demonstrate that the complex, experimental and highly uncertain water treatment technology will bring all mine discharges in compliance with water quality standards.** PLP relies on active treatment technologies to bring massive quantities of highly toxic mine discharges into compliance with water quality standards. These technologies are experimental, untested, complex, poorly documented, and only vaguely described.

Among many other significant challenges, these systems will have to treat an unprecedented volume of highly toxic wastewater—with the very real potential for significantly higher flows due in part to the impacts of climate change. The DEIS estimates that the 20-year mine plan will generate an average of 6.8 billion gallons of wastewater each year during operations, and 11.8 billion gallons per year after the mine closes (Closure Phase 1).[51] The 78-year mine plan would generate an estimated 27.8 billion gallons of wastewater per year after the mine closes.[52] A detailed analysis of hardrock mines in the United States prepared by Earthworks demonstrates that "**no other U.S. hardrock mining operations** . . . capture and treat such a large volume of contaminated mine water for discharge to surface water."[53]

The DEIS provides no evidence to suggest that the proposed water treatment collection and treatment systems will be able to handle and effectively treat these unprecedented amounts of wastewater in a manner that will fully protect the currently pristine North Fork Koktuli River, South Fork Koktuli River, and Upper Talarik Creek watersheds and the fish and wildlife that rely on those waters. Indeed, the DEIS does not even provide data or information to demonstrate that the vaguely described water treatment system is scalable to high flow volumes.

Another significant challenge is the water treatment system's use of a biological-based treatment system for selenium. This system has struggled even at low flow levels, and has never been successfully deployed in the harsh climatic conditions found at the Pebble Mine site.[54] The Pebble Mine site is also rife with other factors that could negatively influence the

[51] Bonnie Gestring, May 2019, Pebble Mine: Unprecedented Waste Water Capture & Treatment Requirements, (Gestring 2019). A copy of this review is provided at Attachment A to these comments.
[52] Id.
[53] Id. (emphasis in original).
[54] As EPA noted in its review of an earlier draft of the DEIS, the DEIS must "explain whether this WTP technique has been utilized at other mine sites, in particular for the proposed treatment rates. If it has been utilized elsewhere, please explain how the differences in temperature at the Pebble site would affect the biological activity associated with Se removal, as well as describe whether the effect of temperature on the efficiency of Se removal using this technique has been evaluated." EPA, Comments, *Pebble EIS Draft Water and Sediment Quality Sections EPA Comments* (December 21, 2018) at 16.

functioning of the system including water temperature, pH, and concentrations of nitrates and salts among other things.

There is also a high likelihood that the water treatment system will itself cause adverse environmental impacts—none of which have been considered. For example, the proposed biological treatment to address selenium contamination requires minimum water temperatures that are higher than the water temperature in the project area streams. As a result, the biological treatment facility will be discharging heated water with the potential for highly significant adverse impacts. To avoid such heated water discharges, the mine will require a new treatment system to cool the water down before discharging. Such a system would create additional environmental harm, including at a minimum, increasing the footprint impacts of the Pebble Project.

If—as is virtually certain—the water treatment process in fact does not work, there will be no replacement process in place, and highly contaminated toxic discharges will continue unabated into surface streams. Neither the permit application nor the DEIS propose (or even discuss) a backup treatment system. Of course, any backup system could itself fail to address the problems and would add greatly to the costs, and thus the lack of economic viability, of the project.

"NEPA requires an EIS to expose scientific uncertainty concerning safety and environmental risk of a proposed action."[55] Among other things, this requires the DEIS to "disclose and discuss crucial information concerning technological uncertainty and what major environmental impact would occur if the . . . technology failed."[56] The DEIS, however, does not do so.

Failures in the treatment system will result in the discharge of Clean Water Act § 307 toxic contaminants that exceed effluent standards into surface waters.

(3) **The DEIS fails to demonstrate that the water collection and treatment systems can function reliably every hour of every day into perpetuity.** The DEIS states that the mine will be operated 24 hours a day, 365 days a year, with treatment required in perpetuity upon mine closure. However, the DEIS provides no data or information to support a conclusion that the water collection and treatment systems will function effectively and at full capacity 24 hours a day, 365 days a year during the at least 20 year period of mine operation, through each closure phase, and into perpetuity. This failure is not surprising, as it is utterly unrealistic that this could be the case in the remote, harsh, and seismically active project area. Failures in the treatment will result in the discharge of Clean Water Act § 307 toxic contaminants that exceed effluent standards into surface waters.

(4) **The DEIS fails to demonstrate that the water collection system will collect 100% of the contaminated mine discharges and convey 100% of those discharges to the treatment facility.** The DEIS documents multiple collection systems throughout the hydrologically complex and seismically active mine site. Most of these collection systems are not lined, and the precise locations and specific underlying hydrologic conditions are not described. Nor does the DEIS

[55] *Southern Oregon Citizens Against Toxic Sprays, Inc. v. Clark*, 720 F.2d 1475, 1479 (9th Cir. 1983), *cert. denied*, 469 U.S. 1028 (1984).
[56] *Friends of the Earth v. Hall*, 693 F. Supp. 904, 926 (W.D. Wash. 1988).

address the reliability of these collection systems in light of the complex interactions with the Project area's highly fractured bedrock. The DEIS provides no information to suggest that these collection systems will not be affected by leaks, breaks, incorrect siting, excess rainfall, floods or other problems. Failures in the collection system will result in the discharge of Clean Water Act § 307 toxic contaminants that exceed effluent standards into surface waters.

(5) **The DEIS fails to demonstrate that dewatering and other actions during construction will not result in Clean Water Act § 307 contaminants reaching surface waters.** As noted above, the potential for toxic discharges from Pebble Mine begins as soon as construction starts, and the DEIS generally acknowledges that dewatering, pit overburden stockpile seepage, runoff from embankment rockfill, and other construction activities will affect surface and groundwater quality. *See, e.g.*, DEIS at 4.18-8 to 4.18-10. However, the DEIS provides no information to support a conclusion that these activities, which generate contaminated contact water, will not result in the discharge of Clean Water Act § 307 contaminants that exceed effluent standards into surface waters.

(6) **The DEIS fails to demonstrate that contaminants in the water treatment and tailings storage facilities will not reach surface waters without treatment.** As the DEIS recognizes, tailings storage facilities will contain high levels of toxic contaminants that will require management and treatment **forever**. The DEIS fails to provide a full and meaningful assessment of the true risk of leaks and failures (both major and minor). The DEIS fails to assess the risk of untreated discharges of Clean Water Act § 307 through seepage, including through groundwater seepage. Some of these facilities will not be fully lined, and the DEIS does not provide specific information regarding the underlying hydrologic conditions for these facilities. The DEIS does not address the potential for significant leakage through the drain that will run underneath the bulk tailings facility, nor what will happen if acid generating rock is inadvertently placed in the bulk tailings facility (or how PLP plans to ensure complete segregation of acid generating rock). The DEIS does not address the implications of the complex hydrological interactions with the Project area's highly fractured bedrock. The DEIS does not address what happens if the water levels get too high in any of these facilities post closure. The DEIS also does not demonstrate that § 307 contaminants will not be transferred to surface waters through wildlife pathways.

PLPs reliance on untested treatment technologies is particularly troubling given the well-established historic trend of U.S. copper mines failing to achieve projected water treatment results. A recent review of fifteen operating open-pit copper mines in the United States (representing 99% of U.S. copper production in 2015) found that virtually all—93%—failed to capture and control wastewater, resulting in significant water quality impacts.[57] Sources of contamination at these existing open-pit copper mines included leaching through groundwater, pipeline ruptures, tailings spills, precipitation-induced runoff, and releases during extreme storm events.[58] Many of the discharges from these mines resulted in water quality standard exceedances for selenium, mercury, and other pollutants of concern.[59]

Failure to effectively treat the high concentrations of toxic pollutants resulting from construction, operation, and closure of Pebble Mine will cause significant adverse impacts. For example, the highly

[57] Bonnie Gestring, May 2019, *U.S. Operating Copper Mines: Failure To Capture & Treat Wastewater*, Earthworks. (Gestring 2019). A copy of this review is provided at Attachment B to these comments.
[58] *Id*.
[59] *Id*.

bioaccumulative § 307-listed toxin selenium can cause lethal deformities in fish and other aquatic organisms, as fully recognized by EPA:

> "Bioaccumulation and transfer through aquatic food webs are the major biogeochemical pathways of selenium in aquatic ecosystems. Dissolved selenium oxyanions (selenate, selenite) and organic selenides are assimilated into the tissues of aquatic primary producers (trophic level 1 organisms), such as periphyton, phytoplankton, and vascular macrophytes; and subsequently biotransformed into organoselenium. These organisms, together with other particle-bound selenium sources, constitute the particulate selenium fraction in the water column. Selenium from this particulate fraction is then transferred to aquatic primary consumers such as zooplankton, insect larvae, larval fish, and bivalves (trophic level 2), and then to predators such as fish and birds (trophic level 3 and above).[60]
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> [E]xcessive amounts of selenium can also have toxic effects, with selenium being one of the most toxic of the biologically essential elements (Chapman et al. 2010). Egg-laying vertebrates have a lower tolerance than do mammals, and the transition from levels of selenium that are biologically essential to those that are toxic occurs across a relatively narrow range of exposure concentrations (Luckey and Venugopal 1977; U.S. EPA 1987, 1998; Haygarth 1994; Chapman et al. 2009, 2010). Selenium consumed in the diet of adult female fish is deposited in the eggs, when selenium replaces sulfur in vitellogenin, which is transported to the ovary and incorporated into the developing ovarian follicle (Janz et al. 2010), the primary yolk precursor."[61]
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> "A variety of lethal and sublethal deformities can occur in the developing fish exposed to selenium, affecting both hard and soft tissues (Lemly 1993b). Developmental malformations are among the most conspicuous and diagnostic symptoms of chronic selenium poisoning in fish. Terata are permanent biomarkers of toxicity, and have been used to identify impacts of selenium on fish populations (Maier and Knight1994; Lemly 1997b). Deformities in fish that affect feeding or respiration can be lethal shortly after hatching. Terata that are not directly lethal, but distort the spine and fins, can reduce swimming ability, and overall fitness."[62]

Even relatively low amounts of selenium discharged into the aquatic environment can tip the balance and lead to harmful toxic effects. As recognized by EPA:

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[60] Environmental Protection Agency, Report EPA 822-R-16-006, *Aquatic Life Ambient Water Quality Criterion for Selenium – Freshwater 2016*, June 2016 at 10-11 (available at https://www.epa.gov/sites/production/files/2016-07/documents/aquatic_life_awqc_for_selenium_-_freshwater_2016.pdf) (EPA Selenium Report). The EPA Selenium Report supports EPA's final "Recommended Aquatic Life Ambient Water Quality Criterion for Selenium in Freshwater." 81 Fed. Reg. 45,285 (July 13, 2016) (available at https://www.govinfo.gov/content/pkg/FR-2016-07-13/pdf/2016-16585.pdf).

[61] EPA Selenium Report at 12.

[62] EPA Selenium Report at 14.

> "Selenium has a narrow range encompassing what is beneficial for biota and what is detrimental. . . . Aquatic and terrestrial organisms require low levels of selenium in their diet to sustain metabolic processes, whereas excess concentrations of selenium that are only an order of magnitude greater than the required level have been shown to be toxic to fish, apparently due to generation of reactive oxidized species, resulting in oxidative stress (Palace et.al. 2004)."[63]

EPA also recognizes that "studies have found interactions between mercury and selenium to be additive (Heinz and Hoffman 1998) or synergistic (Huckabee and Griffith 1974; Birge et al. 1979)."[64] A 2014 study found that selenium and mercury have "a synergistic negative effect on all aspects of fish reproduction."[65]

The DEIS, however, does not assess the impacts of the potential combinations of toxic substances that would be discharged into surface waters by the Pebble Mine. The DEIS also does not assess the effects of pollutants in concentrations that individually fall below the respective numeric water quality standards, but that in combination cause or reasonably can be expected to cause adverse effects on aquatic life. As a result, the DEIS does not demonstrate that the mine will not violate Alaska's narrative water quality standard prohibiting "concentrations of toxic substances in water or in shoreline or bottom sediments, that, singly or in combination, cause, or reasonably can be expected to cause, adverse effects on aquatic life."[66]

Additional information on the significant water quality problems that would be created by the Pebble Project are provided in the comments on the DEIS submitted by the Trustees for Alaska.[67] The National Wildlife Federation urges the Corps to fully account for these and other technical comments outlining the adverse impacts in its permitting decision.

The Pebble Project will violate applicable toxic effluent standards under Clean Water Act § 307 and will cause or contribute to violations of state water quality standards.[68] As a result, the Corps is prohibited from issuing a Clean Water Act § 404 permit for the Pebble Project as a matter of law. 40 C.F.R. § 230.10(b).

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[63] EPA Selenium Report at 14-15.
[64] EPA Selenium Report at 15-16.
[65] S. Penglase, Hamre K., Ellingsen S., *Selenium and mercury have a synergistic negative effect on fish reproduction*, Aquat Toxicol., 149:16-24. April 2014, doi: 10.1016/j.aquatox.2014.01.020 (available at https://www.ncbi.nlm.nih.gov/pubmed/24555955).
[66] Alaska Department of Environmental Conservation, Regulations, *18 AAC 70.020: Water Quality Standards*, April 6, 2018 at 25-26.
[67] The Trustees for Alaska submitted comments on the DEIS on behalf of The Alaska Center, Alaska Community Action on Toxics, Alaska Wilderness League, Audubon Alaska, Cook Inletkeeper, Defenders of Wildlife, Earthworks, Fairbanks Climate Action Coalition, Friends of McNeil River, McNeil River Alliance, National Parks Conservation Association, Natural Resources Defense Council, Sierra Club, and Wild Salmon Center. These comments are dated July 1, 2019.
[68] At the absolute minimum, the DEIS egregiously fails to demonstrate that the Pebble Project will not cause these violations, which is enough to require the Corps to deny the requested § 404 permit.

3. The Project Will Adversely Impact Designated Critical Habitat

A permit must be denied for the Pebble Project because it will result in the destruction or adverse modification of formally designated critical habitat for the federally endangered Cook Inlet beluga whale.[69] A permit must also be denied because these impacts to critical habitat combined with other direct and indirect impacts from the Pebble Project could jeopardize the continued existence of the Cook Inlet beluga whale.[70]

The Endangered Species Act defines "Critical habitat" as:

> "the specific areas within the geographical area occupied by the species, at the time it is listed . . . on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection;" and (2) "specific areas outside the geographical area occupied by the species at the time it is listed . . . upon a determination by the Secretary that such areas are essential for the conservation of the species."[71]

An action results in adverse modification of critical habitat if it causes a "direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of a listed species."[72] Adverse modification includes "significantly impairing essential behavioral patterns, including breeding, feeding or sheltering."[73]

The National Marine Fisheries Service (NMFS) unequivocally recognizes development in the beluga's coastal habitat as a threat to the future survival and recovery of the species. Moreover, the Cook Inlet beluga whale Conservation Plan explicitly acknowledges that it **"is imperative that beluga habitat is protected" for the future survival and recovery of the species.**[74]

The Pebble Project's port facility is located within the formally designated critical habitat for the federally endangered Cook Inlet beluga whale.[75] This designated critical habitat consists of two areas covering approximately 3,013 square miles of marine habitat that is of vital importance to the beluga's recovery and survival.[76] Area 2 consists of 2,275 of those square miles.[77] It "contains anywhere from

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[69] 40 C.F.R. § 230.10(b).
[70] 40 C.F.R. § 230.10(b).
[71] 16 U.S.C. § 1532(5)(A). Features to be considered when making a critical habitat designation include: "(1) Space for individual and population growth, and for normal behavior; (2) Food, water, air, light, minerals, or other nutritional or physiological requirements; (3) Cover or shelter; (4) Sites for breeding, reproduction, rearing of offspring, germination, or seed dispersal; and generally; (5) Habitats that are protected from disturbance or are representative of the historical geographical and ecological distributions of a species." 50 C.F.R. §424.12(b).
[72] 50 C.F.R. § 402.02.
[73] 50 C.F.R. § 17.3.
[74] NMFS, Conservation Plan for the Cook Inlet Beluga Whale 1 (2008) (Conservation Plan) at 3, 54 (*available at*, https://www.fisheries.noaa.gov/resource/document/conservation-plan-cook-inlet-beluga-whale-delphinapterus-leucas). Notably, the "Pebble Mine with a marine terminal in Iniskin Bay" was specifically noted as a potentially threatening development project within the NMFS Conservation Plan for Cook Inlet beluga whales. *Id*. at 56.
[75] 76 Fed. Reg. 20,180 (Apr. 11, 2011).
[76] 76 Fed. Reg. 20,180 et seq.
[77] *Id.* at 20,205.

one to all of the identified physical or biological features essential to the whale's conservation"[78] and is used by belugas in the late-summer, fall and winter for feeding, likely because of the salmon runs.[79] Beluga whales are predominantly concentrated in nearshore areas, which means that impacts to these areas have higher consequences to the whales.[80]

The DEIS acknowledges that approximately 10.7 acres of formally designated critical habitat for the beluga whale will be permanently effected by the placement of fill for the port construction. An additionally 11.5 acres will be temporarily impacted for the installation of the 188 mile-long natural gas pipeline. DEIS at 4.25-7.

While the DEIS discussion of the destruction and adverse modification of beluga whale critical habitat is sometimes contradictory, it is clear that the impacts will be significant. According to the DEIS:

> "The magnitude and extent of project impacts on the physical or biological features of beluga whale critical habitat would be disturbance or resuspension of sediments in the water column, installation of structures, and discharges of fill into marine waters during construction. . . . Additional critical habitat Primary Constituent Elements . . . that may be impacted include disturbance to primary prey species, and in-water noise levels resulting in abandonment of critical habitat areas. . . . The magnitude of impacts to Cook Inlet beluga whale critical habitat from construction of project components would include seafloor disturbance and habitat alteration in the form of increased turbidity and physical partitioning from project activities."[81] DEIS at 4.25-7

Notably, the Pebble Project impacts to beluga whale critical habitat would be permanent:

> "The duration of time that Cook Inlet beluga whales may be exposed to habitat alteration would be permanent for the life of the project. The duration of these impacts would be permanent. In terms of likelihood, these impacts on critical habitat would be certain to occur if the project is permitted and built." DEIS at 4.25-9.

However, neither the DEIS nor the Biological Assessment ("BA") meaningfully assess the implications of the Pebble Project's impacts on critical habitat, including:

(1) **Noise Impacts:** Like other marine mammals, Beluga whales rely heavily on sound to navigate, communicate, and hunt.[82] This is especially important for the whales in the turbid waters of

[78] *Id*. at 20,183.
[79] *Id.* at 20,182–20,183.
[80] *Id*. at 54.
[81] The DEIS attempts to downplay these impacts by claiming that the impacts will only occur in "the area immediately surrounding the port," DEIS at 4.25-9, and that construction would occur "during summer months when beluga whales are generally absent, and mitigation measures would be implemented to prevent harassment of beluga whales, in-water noise levels during construction are not likely to cause abandonment of critical habitat areas." DEIS at 4.25-7. However, the DEIS contradicts this latter statement by acknowledging that the "area has less-concentrated spring and summer beluga whale use," which by definition is different than the whales being "generally absent. *Id*.
[82] 76 Fed. Reg.at 20,203.

Cook Inlet,[83] where the whales live largely near shore.[84] Excessive noise from anthropogenic sources, can cause harassment, and in-turn, avoidance or abandonment of essential habitat.[85] Noise above ambient levels can injure beluga whales' delicate hearing and extreme noise can cause death.[86] NMFS has established levels of in-water noise that define what constitutes harassment or injury to the species. Harassment of the Cook Inlet beluga whale occurs at 160 dB re: 1 µPa for impulsive sounds, such as pile-driving; injury occurs at impulsive noise levels above 180 dB re: 1 µPa.[87] For continuous noise, harassment and injury is deemed to occur at 120 dB re: 1 µPa.[88] Noise in the Cook Inlet beluga whales' designated critical habitat at or above these levels presents a serious threat to the continued survival and recovery of this endangered species.[89]

However, noise levels below these thresholds may also have impacts on the whales and those impacts may be chronic over time.[90] Noise over distance may also impact the beluga whales, and NMFS noted that belugas can be displaced at distances of up to 20 km from a sound source.[91]

Noise is identified as a high concern that can impact beluga acoustic perception, communication, echolocation, and behavior, including habitat displacement.[92] The port will generate noise during the construction and operation phases of the project that will likely adversely impact the endangered Cook Inlet beluga and adversely modify the critical habitat. The comments of Trustees et al. details studies showing that pile-driving and construction activities will likely occur at levels that would harass beluga whales and create harm, including displacing them from their habitat. These activities could occur over several months. The DEIS and the BA fail to properly consider these impacts.

(2) **Rearing and Foraging Impacts:** The Cook Inlet beluga whales are often located close to shore for nursing and foraging purposes, as well as to escape predators.[93] As a result, coastal development can have serious impacts on the whales and be disruptive to the whale's ability to use critical habitat for nursing and foraging. The DEIS and the BA fail to adequately consider potential loss of habitat and displacement due to noise and vessel activity on beluga calving, rearing and other interactions.

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[83] *Id*.
[84] *Id*.
[85] *Id*.; *see also* National Marine Fisheries Service. 2008. Conservation Plan for the Cook Inlet beluga whale (Delphinapterus leucas). National Marine Fisheries Service, Juneau, Alaska (the Conservation Plan) at 58–59 (noting that "Alaska Native beluga whale hunters with [Cook Inlet Marine Mammal Council] have said that the Cook Inlet beluga whales are very sensitive to boat noise, and will leave areas subjected to high use;" and "[B]eluga whales were observed to react to [noise producing] ice-breaking ships at distances more than 80 km, showing strong avoidance, apparent alarm calls, and displacement." (internal citation omitted)).
[86] 76 Fed. Reg. at 20,203.
[87] Conservation Plan, at 66–67.
[88] *Id*.
[89] 76 Fed. Reg. at 20,203.
[90] *See* NMFS Recovery Plan. at III-13
[91] 71 Fed. Reg. 27997, 28004 (May 15, 2006).
[92] Recovery Plan at III–3, III-10 to III-13.
[93] Conservation Plan, at 13 (internal citation omitted); NMFS 2010 RIR/FRFA.

(3) **Toxic Contamination Impacts:** Cook Inlet beluga whales may be adversely affected by toxic contamination from activities around the port such as ship loading and fuel spills, which could also adversely modify critical habitat and restrict use.[94] Pollution and spill risk can harm food sources for the beluga whale and the whale directly. The DEIS and BA fail to take a hard look at these impacts on the beluga whale.

(4) **Turbidity Impacts:** The recovery plan indicates that the increased turbidity from disposing of dredged materials can have a direct impact on the beluga's echolocation performance and a cumulative impact by amplifying negative effects from anthropogenic noise sources.[95] These activities could impact critical habitat. The DEIS and BA fail to consider these impacts.

(5) **Vessel Strike Impacts:** The DEIS dismisses the likelihood of vessel strikes in critical habitat by asserting that there have been no vessel strikes in the analysis area, DEIS at 4.23–28, and errs by stating that the port and associated vessel activity would not change marine mammal behavior because there is already existing infrastructure and vessel traffic in Cook Inlet. DEIS at 4.23–27. The increase in traffic (at least 23%) would be significant. The DEIS and BA fail to take a hard look at impacts including displacement from critical habitat due to increased vessel activity.

These extensive impacts to critical habitat combined with the direct and indirect impacts of the Pebble Project—including particularly, the Project-induced losses to salmon productivity—could also jeopardize the continued existence of the Cook Inlet beluga whale.

Historically, Cook Inlet supported an estimated 1,300 beluga whales. These numbers have dropped dramatically, however, and just 375 beluga whales were estimated to exist in Cook Inlet in 2008, with a future rate of declined estimated at 1.5 percent per year.[96] However, despite the removal of a number of obvious stressor, the rate of decline remains much greater. By 2015, the Cook Inlet beluga whale population had dropped to just 312 beluga whales.[97] It would not take much additional stress to push this species to extinction. As discussed in detail in Section E these comments, the Biological Assessment fails to comply with the requirements of the Endangered Species Act, and a Biological Opinion is required.

Additional detailed information on the significant impacts to designated critical habitat and listed species that would be caused by the Pebble Project is provided in the comments on the DEIS submitted by the Trustees for Alaska. The National Wildlife Federation urges the Corps to fully account for these and other technical comments outlining the adverse impacts in its permitting decision.

The Pebble Project will result in the destruction and adverse modification of formally designated critical habitat.[98] As a result, the Corps may not issue a 404 permit for the Pebble Project as a matter of law. A permit must also be denied because these impacts to critical habitat combined with other direct and

[94] *See* DEIS at 4.27-26 ("The magnitude of potential impacts from the proposed diesel scenario on the Cook Inlet beluga whale (*Delphinapterus leucas*) is high, because the stock and its critical habitat are only found in Cook Inlet.").
[95] NMFS Recovery Plan, at III-10.
[96] Conservation Plan at 1.
[97] Alaska Wildlife Action Plan 2015 at 142.
[98] 40 C.F.R. § 230.10(b).

indirect impacts from the Pebble Project could jeopardize the continued existence of the Cook Inlet beluga whale.[99]

4. PLP Has Not Clearly Demonstrated that There is No Practicable Alternative that Would have Less Impact on the Aquatic Ecosystem

A permit must be denied for the Pebble Project because PLP has not clearly demonstrated that there is no "practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem."[100]

The 404(b)(1) Guidelines prohibit the discharge of dredged or fill material into any regulated "waters of the United States," including wetlands if there is a less environmentally damaging practicable alternative to the proposed discharge (the "LEDPA"). Under the Guidelines:

"An alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes. If it is otherwise a practicable alternative, an area not presently owned by the applicant which could reasonably be obtained, utilized, expanded or managed in order to fulfill the basic purpose of the proposed activity may be considered.[101]

Practicable alternatives include "activities which do not involve a discharge of dredged or fill material," as well as "discharges of dredged or fill material at other locations" where such discharges would result in fewer impacts to the aquatic environment.[102] The profitability of an alternative does not dictate the LEDPA determination. To the contrary, an alternative that is neither the least costly, nor the most profitable may very well be the LEDPA.[103]

The 404(b)(1) Guidelines create a strong presumption that less environmentally damaging alternatives exist for non-water-dependent activities that involve a discharge into wetlands and other "special aquatic sites":[104]

> "Where the activity associated with a discharge which is proposed for a special aquatic site (as defined in subpart E) does not require access or proximity to or siting within the special aquatic site in question to fulfill its basic purpose (i.e., is not ''water dependent''), practicable alternatives that do not involve special aquatic sites are presumed to be available, unless clearly demonstrated otherwise."[105]

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[99] 40 C.F.R. § 230.10(b).
[100] 40 C.F.R. § 230.10(a).
[101] 40 C.F.R. § 230.10(a)(2).
[102] 40 C.F.R. § 230.10(a)(1).
[103] *Louisiana Wildlife Federation, Inc. v. York*. 761 F.2d 1044, 1048 (5th Cir. 1985) (noting that the Corps had properly chosen "alternatives that reduced both the applicants' profit and the economic efficiency of their proposed operations in order to preserve other environmental values.").
[104] Special aquatic sites include wetlands, mud flats, and riffle and pool complexes that are deemed to be so ecologically valuable that their degradation or destruction may represent an irreversible loss of valuable aquatic resources. 40 C.F.R. § 230.1(d).
[105] 40 C.F.R. § 230.10(a)(3).

This presumption places the burden of proving whether a proposal is the LEDPA squarely on the applicant.[106]

The Pebble Project is not water dependent because access or proximity to a special aquatic site is not needed to fulfill the activity's basic purpose, which according to the DEIS is "to develop and operate a copper, gold, and molybdenum mine in Alaska to meet current and future demand." DEIS at 3. As a result, PLP bears the burden of providing "detailed, clear, and convincing information **proving** that an alternative with less adverse impact is impracticable."[107]

PLP has clearly failed to meet this burden for at least the following reasons:

(1) **PLP has not demonstrated that less damaging practicable mine locations are not available.** To the contrary, PLP has looked at only a **single** mine alternative. The variants in the DEIS only address variations to the transportation corridor (*i.e.*, access via Road and Ferry or Road only). The assessment of this improperly limited range of alternatives is itself fundamentally flawed, as discussed throughout these comments.

The few alternative mine locations mentioned in the DEIS were improperly dismissed out of hand (Whistler, Pyramid, Outside Alaska, Massive Sulfide Deposits in Alaska, and Pebble East). *See* DEIS Appendix B. PLP must meaningfully examine an appropriate range of reasonable alternatives—including mining of copper porphyry deposits at other locations within the United States and outside of the United States—to identify the LEDPA.

(2) **PLP has not demonstrated that less damaging practicable mine site configurations are not available.** To the contrary, the DEIS examines only a single mine site configuration despite PLP having made numerous changes to its proposed project footprints over the years, including since submitting its permit application in December 2017. The DEIS examination of the single mine site configuration is itself fundamentally flawed, as discussed throughout these comments.

The few alternative mine site configurations that were mentioned in the DEIS were improperly dismissed out of hand (Single TSF with Two Cells, Single TSF with Single Cell, EPA Restricted Mind Size, Smaller Pit, Larger Mine). *See* DEIS Appendix B. Notably, the DEIS fails to provide even the most basic information on the wetlands and streams that would be affected by such alternative configurations. PLP must meaningfully evaluate the impacts of alternative mine site configurations—including by utilizing expanded maps of wetland and aquatic areas that reflect the far more extensive delineations completed by PLP beginning in 2004—to identify the LEDPA.

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[106] *Greater Yellowstone Coalition v. Flowers*, 359 F.3d 1257, 1269 (10th Cir. 2004) (internal quotations and citation omitted)(emphasis added); *Utahns for Better Transp. v. DOT,* 305 F. 3d 1152, 1186-87 (10th Cir. 2002). *See also Sierra Club v. Flowers,* 423 F. Supp. 2d 1273, 1352 (S.D. Fla. 2006), *vacated on other grounds, Antwerp,* 526 F.3d 1353, 1363-64, n.8, 1365-69 (dissenting) (would affirm CWA violation for failure to apply the presumption and independently verify alternatives analysis).

[107] *Greater Yellowstone Coalition v. Flowers*, 359 F.3d 1257, 1269 (10th Cir. 2004) (internal quotations and citation omitted)(emphasis added); *Utahns for Better Transp. v. DOT,* 305 F. 3d 1152, 1186-87 (10th Cir. 2002). *See also Sierra Club v. Flowers,* 423 F. Supp. 2d 1273, 1352 (S.D. Fla. 2006), *vacated on other grounds, Antwerp,* 526 F.3d 1353, 1363-64, n.8, 1365-69 (dissenting) (would affirm CWA violation for failure to apply the presumption and independently verify alternatives analysis).

(3) **PLP has not demonstrated that less damaging practicable mining options are not available.** The alternative mining options mentioned in the DEIS (underground mining, underground mining combined with surface mining) are improperly dismissed out of hand based on an unsupported conclusion these options are "not practicable using existing technology for the portion of the deposit that is proposed to be mined." DEIS Appendix B. Among many other problems, the improper dismissal of underground mining ignores the option of mining deeper portions of the Pebble deposit than have been considered in the DEIS. While underground mining has its own set of highly significant adverse impacts, it could decrease the overall mine footprint and reduce the production of waste rock and tailings. PLP must meaningfully assess alternate mining options to identify the LEDPA.

(4) **PLP has not provided the information needed to determine whether the preferred alternative, or any other alternatives, are prohibitively expensive or otherwise not economically viable.** As a result, it is not possible to assess whether or not a particular alternative could be deemed to be impracticable under the Clean Water Act. PLP has not provided an economic feasibility study or any other type of economic assessment for its preferred alternative or for any of the other alternatives referenced in Appendix B. PLP also has not provided an assessment of the likely extremely significant costs of the legally-mandated mitigation and reclamation plans. As a result, it is not possible to meaningfully comply with the legal requirement to consider costs in the practicability determination.

(5) **PLP has not demonstrated that additional practicable steps cannot be taken to further minimize the adverse impacts of PLPs preferred alternative, as discussed in detail in Section B.5 of these comments.** As a result, PLP has not demonstrated that its preferred alternative is the LEDPA.

Because PLP has not met its burden of proof regarding the LEDPA, the Corps may not issue a 404 permit for the Pebble Project. The Corps may not blindly and uncritically accept an applicant's study of alternatives and its assertions that no practicable alternative exists.[108] The Corps must independently verify PLP's proposal. The Corps' failure to do so and the fundamental flaws in the DEIS further demonstrate that the Corps lacks "sufficient information to make a reasonable judgment" regarding the LEDPA, and thus may not issue a 404 permit for the Pebble Project.[109]

PLP has not demonstrated that there is no "practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem."[110] As a result, the Corps may not issue a 404 permit for the Pebble Project as a matter of law.

5. PLP Has Not Taken Appropriate and Practicable Steps to Minimize Potential Adverse Impacts

A permit must be denied for the Pebble Project because PLP has not taken "appropriate and practicable" steps to minimize potential adverse impacts on the aquatic ecosystem.[111] The DEIS fails to

[108] *Friends of the Earth v. Hintz*, 800 F.2d 822, 835–36 (9th Cir. 1986); Sierra Club v. Van Antwerp, 709 F.Supp.2d 1254, 1263 (S.D. Fla. 2009), *aff'd*., *Sierra Club v. Van Antwerp,* 362 Fed.Appx. 100 (11th Cir. 2010).
[109] 40 C.F.R. § 230.12(a)(iii).
[110] 40 C.F.R. § 230.10(a).
[111] 40 C.F.R. § 230.10(d).

identify the full extent of impacts, fails to propose specific actions to minimize those impacts, fails to adopt specific actions to compensate for the vast array of aquatic resources that will be destroyed and damaged, and fails to account for even a single component of a legally-adequate compensatory mitigation plan.

The Clean Water Act 404(b)(1) Guidelines establish a sequence of steps that PLP must take to minimize the Pebble Project's potential adverse impacts. PLP must first demonstrate that it has done everything possible to avoid adverse impacts in the first instance. PLP must then demonstrate that it has taken specific steps to minimize adverse impacts that could not be avoided. Finally, PLP must demonstrate that it has developed—and will carry out—compensatory mitigation to replace the functions and values of aquatic habitat impacts that cannot be avoided or minimized.[112] This sequencing process is reiterated in the 2018 Alaska Mitigation Memorandum of Agreement, which explicitly does **not** change any legal requirements.[113]

The 404(b)(1) Guidelines highlight an extensive array of actions that should be considered and, where practicable and appropriate, adopted to minimize impacts to aquatic resources. These include: (a) careful selection of the discharge location and designing the discharge to avoid disruptions of periodic water inundation patterns; (b) treating or limiting the material to be discharged; (c) controlling the material after it has been discharged to prevent point and nonpoint sources of pollution and timing the discharge to minimize impacts; (d) utilizing technology to reduce impacts, including by ensuring that discharge technologies are carefully adapted to the Project and that access roads and channel spanning structures will pass both low and high flows, accommodate fluctuating water levels, and maintain circulation and faunal movement; and (e) minimizing impacts on plants and animals, including by avoiding changes in water current and circulation patterns, preventing influx of invasive species, avoiding sites with unique or important habitat values, and carrying out compensatory mitigation.[114]

As discussed at length in Section D.4 of these comments, the DEIS fundamentally fails to meaningfully discuss these, or any other, appropriate and practicable steps to minimize adverse impacts. The DEIS certainly does not demonstrate that such appropriate and practicable steps have been taken. Among many other notable problems:

(1) The DEIS does not—and cannot—properly assess the extent to which adverse impacts can be avoided through mitigation because it does not meaningfully evaluate the full range and extent of direct, indirect, and cumulative adverse environmental impacts that will result

[112] These sequencing requirements were reconfirmed in the 1990 Mitigation Memorandum of Agreement between EPA and the Corps: "The Corps . . . first makes a determination that potential impact[s] have been avoided to the maximum extent practicable; remaining unavoidable impacts will then be mitigated to the extent appropriate and practicable by requiring steps to minimize impacts; and, finally, compensate for aquatic resource values." 1990 Memorandum of Agreement between EPA and the Corps, *The Determination of Mitigation Under the Clean Water Act Section 404(b)(1) Guidelines,* at II.C.

[113] Memorandum of Agreement between the Department of the Army and the Environmental Protection Agency concerning Mitigation Sequence for Wetlands in Alaska under Section 404 of the Clean Water Act, June 15, 2018 at 10 (the "Clean Water Act provisions and regulations described in this document contain legally binding requirements. This document does not substitute for those provisions or regulations, does not create legally binding requirements, nor is it a regulation itself.")

[114] 40 C.F.R. §§ 230.70 to 230.77

from construction and operation of Pebble Mine and its attendant transportation and pipeline infrastructure.[115]

(2) The DEIS provides only the most general description of efforts taken to avoid adverse impacts in the first instance and fails to assess mine alternatives or alternative mine configurations that could cause less harm. As discussed in Section B.4 of these comments, the DEIS also fundamentally fails to demonstrate that the proposed alternative is the least environmentally damaging practicable alternative, as required by the Clean Water Act.

(3) In direct violation of NEPA, the DEIS provides only the most generic description of measures that might be used to help minimize adverse impacts that cannot be avoided. These descriptions are contained in a single Table entitled "Proposed Mitigation Incorporated into the Project," which provides only a few perfunctory sentences on these possible measures. DEIS at 5-6, Table 5-2. Table 5-2 is devoid of any detail, analytical data, or discussion of effectiveness.

(4) The DEIS discussion of compensatory mitigation measures is patently inadequate. It provides no details on potential measures and no information on potential effectiveness. Indeed, the only information that can be gleaned from the demonstrably inadequate discussion of compensatory mitigation is that there is **no chance at all** that the proposed mitigation will replace the lost functions and values of the vast array of aquatic resources that will be destroyed and damaged by the Pebble Project.

The Corps also may not issue a Clean Water Act 404 permit for the Pebble Project because it violates fundamental Clean Water Act mitigation requirements. Among many other failings, the exceptionally conceptual, out-of-kind, out-of-watershed, vague references to compensatory mitigation in the DEIS do not—and cannot be amended to—comply with Clean Water Act mandates regarding the amount, type, location, and specificity of compensatory mitigation actions, including the following:

(1) Mitigation must compensate for the aquatic resource functions that will be lost to the project, and "must be commensurate with the amount and type of impact" caused by the project.[116] Where practicable, mitigation is to compensate for "the suite of functions typically provided by the affected aquatic resource."[117]

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[115] A legally adequate NEPA mitigation analysis is essential for ensuring that the Corps can meet Clean Water Act 404 permitting responsibilities because, as the Corps and EPA have made clear, it is essential to understand the full extent of the impacts to be able to develop compensatory mitigation that is capable of compensating for aquatic resource functions lost to a project: "The Corps determines the compensatory mitigation requirements for Section 404 permits, based on what is practicable and capable of compensating for the aquatic resource functions that will be lost as a result of the permitted activity (see 33 CFR Part 332.3(a)(1) and 40 CFR Part 230.93(a)(1)). Compensatory mitigation requirements must be commensurate with the amount and type of impact that is associated with a particular Section 404 permit (see 33 CFR Part 332.3(a)(1) and 40 CFR Part 230.93(a)(1))." Memorandum of Agreement Between the Department of the Army and the Environmental Protection Agency Concerning Mitigation Sequence for Wetlands in Alaska under Section 404 of the Clean Water Act (June 15, 2018) at 4.

[116] 33 C.F.R. § 332.3(a).

[117] 33 C.F.R. § 332.3(c).

(2) The mitigation "project site must be ecologically suitable for providing the desired aquatic resource functions." In determining the ecological suitability of the compensatory mitigation site, the Corps "must consider, to the extent practicable": the hydrological conditions, soil characteristics, and other physical and chemical characteristics; watershed-scale features including aquatic habitat diversity and habitat connectivity; and the size and location of the compensatory mitigation site relative to hydrologic sources (including the availability of water rights) and other ecological features.[118]

(3) Mitigation should be in kind if possible and where out of kind mitigation is utilized, the record must explain why.[119]

(4) Off-site and/or out-of-kind mitigation is appropriate only if on-site/in-kind compensatory mitigation opportunities "are not practicable, are unlikely to compensate for the permitted impacts, or will be incompatible with the proposed project, **and an alternative, practicable off-site and/or out-of-kind mitigation opportunity is identified that has a greater likelihood of offsetting the permitted impacts** or is environmentally preferable to on-site or in-kind mitigation."[120]

(5) A "mitigation ratio greater than one-to-one" is required "where necessary to account for the method of compensatory mitigation (e.g., preservation), the likelihood of success, differences between the functions lost at the impact site and the functions expected to be produced by the compensatory mitigation project, temporal losses of aquatic resource functions, the difficulty of restoring or establishing the desired aquatic resource type and functions, and/or the distance between the affected aquatic resource and the compensation site. The rationale for the required replacement ratio must be documented in the administrative record for the permit action."[121]

(6) Preservation can only be used to provide compensatory mitigation when all the following criteria are met: "(i) The resources to be preserved provide important physical, chemical, or biological functions for the watershed; (ii) The resources to be preserved contribute significantly to the ecological sustainability of the watershed. In determining the contribution of those resources to the ecological sustainability of the watershed, the district engineer must use appropriate quantitative assessment tools, where available; (iii) Preservation is determined by the district engineer to be appropriate and practicable; (iv) The resources are under threat of destruction or adverse modifications; and (v) The preserved site will be permanently protected through an appropriate real estate or other legal instrument (e.g., easement, title transfer to state resource agency or land trust)."[122]

(7) "The aquatic habitats, riparian areas, buffers, and uplands that comprise the overall compensatory mitigation project must be provided long-term protection through real estate instruments or other available mechanisms, as appropriate."[123]

[118] 33 C.F.R. § 332.3(d).
[119] 33 C.F.R. § 332.3(e).
[120] 33 CFR § 332.3(6).
[121] 33 C.F.R. § 332.3(f).
[122] 33 C.F.R. § 332.3(h).
[123] 33 C.F.R. § 332.7(a).

(8) The compensatory mitigation requirements must be clearly stated and include special conditions that "must be enforceable." The special conditions must: "(i) Identify the party responsible for providing the compensatory mitigation; (ii) Incorporate, by reference, the final mitigation plan approved by the district engineer; (iii) State the objectives, performance standards, and monitoring required for the compensatory mitigation project, unless they are provided in the approved final mitigation plan; and (iv) Describe any required financial assurances or long-term management provisions for the compensatory mitigation project, unless they are specified in the approved final mitigation plan…."[124] The "special conditions must clearly indicate the party or parties responsible for the implementation, performance, and longterm management of the compensatory mitigation project."[125]

(9) To the maximum extent practicable, compensatory mitigation must be implemented "in advance of or concurrent with the activity" causing the impacts. "The district engineer shall require, to the extent appropriate and practicable, additional compensatory mitigation to offset temporal losses of aquatic functions that will result from the permitted activity."[126]

(10) "The district engineer shall require sufficient financial assurances to ensure a high level of confidence that the compensatory mitigation project will be successfully completed, in accordance with applicable performance standards."[127]

(11) "For compensatory mitigation projects on public lands, where federal facility management plans or integrated natural resources management plans are used to provide long-term protection, and changes in statute, regulation, or agency needs or mission results in an incompatible use on public lands originally set aside for compensatory mitigation, the public agency authorizing the incompatible use is responsible for providing alternative compensatory mitigation that is acceptable to the district engineer for any loss in functions resulting from the incompatible use."[128]

(12) "Compensatory mitigation projects shall be designed, to the maximum extent practicable, to be self-sustaining once performance standards have been achieved. This includes minimization of active engineering features (e.g., pumps) and appropriate siting to ensure that natural hydrology and landscape context will support long-term sustainability. Where active long-term management and maintenance are necessary to ensure long-term sustainability (e.g., prescribed burning, invasive species control, maintenance of water control structures, easement enforcement), the responsible party must provide for such management and maintenance. This includes the provision of long-term financing mechanisms where necessary." 33 C.F.R. § 332.7(b).

[124] 33 C.F.R. § 332.3(k).
[125] 33 C.F.R. § 332.3(l).
[126] 33 C.F.R. § 332.3(m).
[127] 33 C.F.R. § 332.3(n).
[128] 33 C.F.R. § 332.7(a).

In addition, neither the DEIS nor the permit application touch on even a single element that must be included in the final mitigation plan[129]:

(1) The mitigation plan must include a level of detail that is "commensurate with the scale and scope of the impacts."[130]

(2) The mitigation plan must describe "the resource type(s) and amount(s) that will be provided, the method of ecoregion, physiographic province, or other geographic area of interest."[131]

(3) The mitigation plan must describe "the factors considered during the site selection process. This should include consideration of watershed needs, onsite alternatives where applicable, and the practicability of accomplishing ecologically self-sustaining aquatic resource restoration, establishment, enhancement, and/or preservation at the compensatory mitigation project site."[132]

(4) The mitigation plan must describe "the legal arrangements and instrument, including site ownership, that will be used to ensure the long-term protection of the compensatory mitigation project site."[133]

(5) The mitigation plan must describe "the ecological characteristics of the proposed compensatory mitigation project site . . . . This may include descriptions of historic and existing plant communities, historic and existing hydrology, soil conditions, a map showing the locations of the impact and mitigation site(s) or the geographic coordinates for those site(s), and other site characteristics appropriate to the type of resource proposed as compensation. The baseline information should also include a delineation of waters of the United States on the proposed compensatory mitigation project site."[134]

(6) The mitigation plan must describe "describe the number of credits to be provided, including a brief explanation of the rationale for this determination," including "an explanation of how the compensatory mitigation project will provide the required compensation for unavoidable impacts to aquatic resources resulting from the permitted activity."[135]

(7) The mitigation plan must provide "[d]etailed written specifications and work descriptions for the compensatory mitigation project, including, but not limited to**,** the geographic boundaries of the project; construction methods, timing, and sequence; source(s) of water, including connections to existing waters and uplands; methods for establishing the

[129] While neither NEPA nor the 2008 Mitigation Rule require inclusion of a final mitigation plan in the DEIS or permit application, the Corps does encourage applicants to include at least a draft mitigation plan with the DEIS so that states, tribes, federal agencies, outside experts, and members of the public can comment meaningfully on the proposal and on whether or how the applicant will avoid, minimize and compensate for adverse impacts.
[130] 33 C.F.R. 332.4(c)
[131] 33 C.F.R. § 332.4(c)(2).
[132] 33 C.F.R. § 332.4(c)(3).
[133] 33 C.F.R. § 332.4(c)(4).
[134] 33 C.F.R. § 332.4(c)(5).
[135] 33 C.F.R. § 332.4(c)(6).

desired plant community; plans to control invasive plant species; the proposed grading plan, including elevations and slopes of the substrate; soil management; and erosion control measures."[136]

(8) The mitigation plan must include "[a] description and schedule of maintenance requirements to ensure the continued viability of the resource once initial construction is completed."[137]

(9) The mitigation plan must include "[e]cologically-based standards that will be used to determine whether the compensatory mitigation project is achieving its objectives."[138] Ecological performance standards for assessing whether the mitigation is achieving its objectives is a key element of a legally adequate mitigation plan:

> "Performance standards should relate to the objectives of the compensatory mitigation project, so that the project can be objectively evaluated to determine if it is developing into the desired resource type, providing the expected functions, and attaining any other applicable metrics (e.g., acres)."[139]
>
> "Performance standards must be based on attributes that are objective and verifiable. Ecological performance standards must be based on the best available science that can be measured or assessed in a practicable manner. Performance standards may be based on variables or measures of functional capacity described in functional assessment methodologies, measurements of hydrology or other aquatic resource characteristics, and/or comparisons to reference aquatic resources of similar type and landscape position. The use of reference aquatic resources to establish performance standards will help ensure that those performance standards are reasonably achievable, by reflecting the range of variability exhibited by the regional class of aquatic resources as a result of natural processes and anthropogenic disturbances. Performance standards based on measurements of hydrology should take into consideration the hydrologic variability exhibited by reference aquatic resources, especially wetlands. Where practicable, performance standards should take into account the expected stages of the aquatic resource development process, in order to allow early identification of potential problems and appropriate adaptive management."[140]

(10) The mitigation plan must describe the "parameters to be monitored in order to determine if the compensatory mitigation project is on track to meet performance standards and if adaptive management is needed. A schedule for monitoring and reporting on monitoring results to the district engineer must be included."[141] The mitigation plan must provide for a monitoring period that is sufficient to demonstrate that the compensatory mitigation project has met performance standards, but not less than five years. A longer monitoring

[136] 33 C.F.R. § 332.4(c)(7).
[137] 33 C.F.R. § 332.4(c)(8).
[138] 33 C.F.R. § 332.4(c)(9).
[139] 33 C.F.R. § 332.5(a).
[140] 33 C.F.R. § 332.5(b).
[141] 33 C.F.R. § 332.4(c)(10).

period must be required for aquatic resources with slow development rates (e.g., forested wetlands, bogs).[142]

(11) The mitigation plan must describe "how the compensatory mitigation project will be managed after performance standards have been achieved to ensure the long-term sustainability of the resource, including long-term financing mechanisms and the party responsible for long-term management."[143]

(12) The mitigation plan must include a "management strategy to address unforeseen changes in site conditions or other components of the compensatory mitigation project, including the party or parties responsible for implementing adaptive management measures. The adaptive management plan will guide decisions for revising compensatory mitigation plans and implementing measures to address both foreseeable and unforeseen circumstances that adversely affect compensatory mitigation success."[144]

(13) The mitigation plan must describe the "financial assurances that will be provided and how they are sufficient to ensure a high level of confidence that the compensatory mitigation project will be successfully completed, in accordance with its performance standards."[145]

(14) The mitigation plan must provide for a monitoring period that is sufficient to demonstrate that the compensatory mitigation project has met performance standards, but not less than five years. A longer monitoring period must be required for aquatic resources with slow development rates (e.g., forested wetlands, bogs).[146]

(15) The mitigation plan must include a clear description of compensatory mitigation requirements and include special conditions that "must be enforceable." The special conditions must: "(i) Identify the party responsible for providing the compensatory mitigation; (ii) Incorporate, by reference, the final mitigation plan approved by the district engineer; (iii) State the objectives, performance standards, and monitoring required for the compensatory mitigation project, unless they are provided in the approved final mitigation plan; and (iv) Describe any required financial assurances or long-term management provisions for the compensatory mitigation project, unless they are specified in the approved final mitigation plan. . . . "[147] The "special conditions must clearly indicate the party or parties responsible for the implementation, performance, and longterm management of the compensatory mitigation project."[148]

(16) The mitigation plan must include a "real estate instrument, management plan, or other mechanism providing long-term protection of the compensatory mitigation site must, to the extent appropriate and practicable, prohibit incompatible uses (e.g., clear cutting or

[142] 33 C.F.R. § 332.6.
[143] 33 C.F.R. § 332.4(c)(11).
[144] 33 C.F.R. § 332.4(c)(12).
[145] 33 C.F.R. § 332.4(c)(13).
[146] 33 C.F.R. § 332.6.
[147] 33 C.F.R. § 332.3(k).
[148] 33 C.F.R. § 332.3(l).

mineral extraction) that might otherwise jeopardize the objectives of the compensatory mitigation project."[149]

The only conclusions that can be drawn from the demonstrably inadequate discussion of mitigation, is that PLP has **not** taken practicable steps to minimize impacts, and has **no chance at all** of compensating for the functions and values of the vast array of aquatic resources that will be destroyed and damaged by the Pebble Project. As a result, the Corps is prohibited from issuing a Clean Water Act § 404 permit for the Pebble Project as a matter of law.[150]

C. The Pebble Project Is Prohibited by the Corps' Public Interest Review Regulations

The Pebble Project is prohibited under the Corps' public interest review regulations.[151] As a result, the Corps may not issue a 404 permit even if the Corps improperly concludes that the Pebble Project somehow does not violate the Clean Water Act 404(b)(1) Guidelines. The National Wildlife Federation reiterates that the 404(b)(1) Guidelines explicitly prohibit the issuance of a 404 permit for the Pebble Project, as detailed in Section B of these comments.

In evaluating whether a project is in the public interest, the Corps must examine the "probable impacts, including cumulative impacts, of the proposed activity and its intended use on the public interest" and weigh the benefits that reasonably may be expected to accrue from the project against its reasonably foreseeable detriments.[152]

The Corps' public interest review decision is to reflect the national concern for both protecting and utilizing important resources, including protecting wetlands—a value explicitly recognized by the Corps' own regulations, which state that "wetlands constitute a productive and valuable public resource, the unnecessary alteration or destruction of which should be discouraged as contrary to the public interest."[153] The Corps' public interest evaluation also must consider at least the following factors:

(1) Environmental factors such as conservation, wetlands, fish and wildlife values, water quality, floodplain management, water conservation, energy conservation, environmental benefits, and mitigation;

(2) Cultural and economic factors such as historic, cultural, aesthetics, scenic and recreational values, general environmental concerns, water supply, development, navigation, and economics;

(3) The relevant extent of the public and private need for the proposed work;

(4) The practicability of using reasonable alternative locations and methods to accomplish the objective of the proposed work, where there is a conflict as to the resource use; and

[149] 33 C.F.R. § 332.7(a).
[150] 40 C.F.R. § 230.10(d).
[151] 33 C.F.R. §§ 320.4 and 323.6.
[152] 33 C.F.R. § 320.4(a).
[153] 33 C.F.R. § 320.4(b).

(5) The extent and permanence of the beneficial and/or detrimental effects the proposed work is likely to have on the public and private uses to which the area is suited.[154]

As detailed throughout these comments—and as demonstrated by the overwhelming opposition to the Pebble Project by Tribes, Alaskans, conservation organizations, sportsmen, commercial and recreational fishermen, experts, and members of the public—the Pebble Project is **not** in the public interest.

The Pebble Project will cause unimaginable harm to the pristine Bristol Bay watershed, the fish and wildlife that rely on that vital resource, the economy of the entire region, and the cultural heritage and well-being of Native Alaskans. The harm from the Pebble Project will be permanent and far greater than acknowledged in the DEIS. Indeed, the harm from the Project has a disturbingly high likelihood of being utterly catastrophic.

The Pebble Project's overwhelming destruction will drive a stake into the heart of the immense ecological wealth of the Bristol Bay watershed—ecological wealth that drives the region's economy, supports the most valuable wild-salmon fishery in the world, and generates $1.5 billion in annual economic output and more than half of all private-sector jobs in the region.[155] Project-induced harm to Bristol Bay salmon also threatens the very cornerstone of the region's culture and communities. Native Alaskans have lived in Bristol Bay for thousands of years, relying on the region's healthy waters and abundant salmon to sustain their way of life. Generations of families have fished commercially in the region and many small businesses capitalize on the flourishing salmon populations.

The harm to the pristine Bristol Bay watershed and the resulting economic, cultural, and public health impacts dramatically outweigh any possible benefits that may arise from the Pebble Project. Indeed, at least one well-respected expert has demonstrated that the 20-year mine plan would not produce any economic benefits and is fundamentally no economically viable.[156] This letter is discussed in Section D.2.c of these comments.

The Pebble Project is not in the public interest, as defined by the Corps' regulations. As a result, the Corps may not issue a 404 permit even if the Corps improperly concludes that the Pebble Project somehow does not violate the 404(b)(1) Guidelines.

D. The Pebble Project DEIS Does Not Comply with the National Environmental Policy Act

The National Environmental Policy Act (NEPA) requires that an environmental impact statement identify the full scope of direct, indirect, and cumulative impacts of a proposed action and determine whether there are less environmentally damaging ways to achieve the project purpose. As discussed throughout these comments, the DEIS is inadequate as a matter of law because it fails to satisfy these fundamental requirements.

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[154] 33 C.F.R. § 320.4(a).

[155] Bristol Bay Watershed Assessment at ES-8.

[156] March 28, 2019 letter from Richard K. Borden, Owner Midgard Environmental Services LLC to Shane McCoy regarding "Pebble Mine Project Economics." Mr. Borden has over thirty years of experience in the mining and consulting industries, including 23 years with the global mining company Rio Tinto where he participated in and contributed to more than twenty financial and technical assessments of new major capital projects, divestments and potential acquisitions.

1. The Project Purpose Does Not Comply with NEPA

An appropriate statement of Purpose and Need is crucially important to the adequacy of the DEIS because the Purpose and Need statement "delimit[s] the universe of the action's reasonable alternatives."[157] This is because "[o]nly alternatives that accomplish the purposes of the proposed action are considered reasonable, and only reasonable alternatives require detailed study. . . ."[158]

As the Courts have long acknowledged:

> "One obvious way for an agency to slip past the strictures of NEPA is to contrive a purpose so slender as to define competing "reasonable alternatives" out of consideration (and even out of existence). . . . If the agency constricts the definition of the project's purpose and thereby excludes what truly are reasonable alternatives, the EIS cannot fulfill its role. Nor can the agency satisfy the Act. 42 U.S.C. § 4332(2)(E)."[159]

Accordingly, the Courts have made it clear that an agency may not define a project so narrowly that it "forecloses a reasonable consideration of alternatives"[160] or makes the final EIS "a foreordained formality."[161]

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[157] *Citizens Against Burlington v. Busey*, 938 F.2d 190, 195 (D.C. Cir. 1991). *See also Wyoming v. U.S. Dep't of Agric.*, 661 F.3d 1209, 1244 (10th Cir. 2011) ("how the agency defines the purpose of the proposed action sets the contours for its exploration of available alternatives."); *Sierra Club v. U.S. Dep't of Transp.*, 310 F.Supp.2d 1168, 1192 (D. Nev. 2004) (citing *City of Carmel-By-The-Sea v. U.S. Dep't of Transp.*, 123 F.3d 1142, 1155 (9th Cir. 1997)).

[158] *Webster v. U.S. Department of Agriculture*, 685 F.3d 411, 422 (4th Cir. 2012); *Methow Valley Citizens Council v. Regional Forester*, 833 F.2d 810, 815-16 (9th Cir. 1987).

[159] *Simmons v. United States Army Corps of Eng'rs*, 120 F.3d 664, 666 (7th Cir. 1997). *See also City of Bridgeton v. FAA*, 212 F.3d 448, 458 (8th Cir. 2000); *City of Carmel-by-the-Sea v. United States Dep't of Transp.*, 123 F.3d 1142, 1155 (9th Cir. 1997) ("an agency cannot define its objectives in unreasonably narrow terms"); *Citizens Against Burlington, Inc. v. Busey*, 938 F.2d 190, 195-96 (D.C. Cir. 1991), *cert. denied*, 502 U.S. 994 (1991) ("an agency may not define the objectives of its action in terms so unreasonably narrow that only one alternative from among the environmentally benign ones in the agency's power would accomplish the goals of the agency's action"); *City of New York v. United States Dep't of Transp.*, 715 F.2d 732, 743 (2d Cir. 1983), *cert. denied*, 456 U.S. 1005 (1984) ("an agency will not be permitted to narrow the objective of its action artificially and thereby circumvent the requirement that relevant alternatives be considered"); *Methow Valley Citizens Council v. Regional Forester*, 833 F.2d 810, 815-16 (9th Cir. 1987) (impact statements must consider all reasonable alternatives that accomplish project purpose, but need not consider alternatives not reasonably related to purpose).

[160] *Fuel Safe Washington v. Fed. Energy Regulatory Comm'n*, 389 F.3d 1313, 1324 (10th Cir. 2004) (quoting *Davis v. Mineta*, 302 F.3d 1104, 1119 (10th Cir. 2002); *Citizens' Comm. To Save Our Canyons v. U.S. Forest Serv.*, 297 F.3d 1012, 1030 (10th Cir. 2002); *Friends of Southeast's Future v. Morrison*, 153 F.3d 1059, 1066 (9th Cir. 1998) ("An agency may not define the objectives of its action in terms so unreasonably narrow that only one alternative from among the environmentally benign ones in the agency's power would accomplish the goals of the agency's action".); *Simmons v. United States Army Corps of Eng'rs*, 120 F.3d 664, 666 (7th Cir. 1997); *City of New York v. United States Dep't of Transp.*, 715 F.2d 732, 743 (2d Cir. 1983), *cert. denied*, 456 U.S. 1005 (1984) ((holding that "an agency may not narrow the objective of its action artificially and thereby circumvent the requirement that relevant alternatives be considered); *Citizens Against Burlington, Inc. v. Busey*, 938 F.2d 190, 196 (D.C. Cir. 1991), *cert. denied* 502 U.S. 994 (1991).

[161] *City of Bridgeton v. FAA*, 212 F.3d 448, 458 (8th Cir. 2000) (quoting *Citizens Against Burlington, Inc. v. Busey*, 938 F.2d 190, 196 (D.C. Cir. 1991), *cert. denied* 502 U.S. 994 (1991); citing *Simmons v. U.S. Army Corps of Eng'rs*, 120 F.3d 664, 666 (7th Cir. 1997)).

The project purpose used in the DEIS is "to develop and operate a copper, gold, and molybdenum mine in Alaska to meet current and future demand."[162] This statement of project purpose is too narrow for at least the following reasons:

(1) It improperly restricts the geographic location of the mine site to the state of Alaska. This directly contradicts the Corps' own conclusion that the "public's interest in commodities such as copper, gold, and molybdenum does not dictate a particular source of these commodities."[163] Notably, the Corps used this conclusion to properly reject PLP's proposed purpose as being too narrow because it limited the proposed development to the Pebble deposit.[164]

The Corps attempts to justify limiting the project to Alaska by arguing that "the public also has an interest in improving the economy of the state, in the creation of jobs in the state, and in the extraction of natural resources for the benefit of the state," as allegedly demonstrated by scoping comments. DEIS 1-4. However, this argument is entirely specious. It fundamentally ignores the overwhelming opposition to the Pebble Project within Alaska and the strong interest that clearly exists for protecting the Bristol Bay watershed and its rich salmon and other resources from the damage that will be caused by the Pebble Project.

It is also fundamentally inappropriate to use the alleged public interest to require siting of the project in Alaska before the DEIS has even been initiated because: (i) the Corps is to conduct a full assessment of the public interest as part of the permitting process; and (ii) any legitimate public interest review that complies with the Corps' regulations must conclude that the Pebble Project is **not** in the public interest, as detailed in Section C of these comments.

(2) It improperly restricts the project to deposits that include all three minerals—copper, gold, and molybdenum—and to production methods that can extract and process those minerals from a single location. The inclusion of molybdenum is particularly restrictive in this regard.

(3) It improperly restricts the project to one that can produce molybdenum despite PLP's primary focus on producing copper. Indeed, the DEIS contends that "the project need is reflected in the worldwide demand for copper."[165] The DEIS does not demonstrate a need for a new molybdenum mine to address demand in the United States or worldwide.[166] Moreover, as documented in the comments by Trustees for Alaska, PLP never sought mineral rights for molybdenum, but instead discovered molybdenum mineralization in the Pebble deposit after it had acquired its mining rights. PLPs focus on copper production is also evident from the Pebble Project's minimal molybdenum outputs. Molybdenum output will constitute **less than 2.4%** of

[162] DEIS at ES–3, 1–4.
[163] DEIS at 1-4.
[164] DEIS at 1–4. PLP's stated purpose is "to produce commodities, including copper, gold, and molybdenum, from the Pebble Deposit in a manner that is commercially viable using proven technologies that are suitable for the project's remote project location." DEIS at ES–3, 1–3.
[165] DEIS at 1–3.
[166] The DEIS states that in 2017, US imports for consumption of molybdenum (which is primarily used for metallurgical applications) increased by 68 percent from 2016. However US exports of molybdenum also increased by 37 percent from 2016. The DEIS further states that "apparent consumption increased by 26 percent in comparison to 2016." These numbers suggest that existing mines have the ability to satisfy increases in consumption needs by increasing production. DEIS at 1-3. Notably, the DEIS does not provide any information to suggest that current mines have been, or will be, unable to meet demand.

annual dry concentrate outputs (annual dry concentrate outputs of copper-gold will be 613,000 tons a year, while annual outputs of dry concentrate molybdenum will be just 15,000 tons a year).

For at least these reasons, it is inappropriate to limit the project purpose to mining a deposit in Alaska that includes copper, gold, **and** molybdenum. These inappropriate limitations have created a project purpose that "preclude[s] the existence of any alternative sites and thus make what is practicable appear impracticable"[167] in violation of NEPA.

The project purpose used in the DEIS must be fundamentally revised to eliminate inappropriate restrictions, and a new draft EIS must be prepared that properly considers a full range of reasonable alternatives that can achieve the overall project purpose.

2. The Alternatives Analysis Does Not Comply with NEPA

NEPA requires that each EIS "[r]igorously explore and objectively evaluate all reasonable alternatives."[168] This requires a "**thorough consideration of all appropriate methods of accomplishing the aim of the action**" and an "**intense consideration of other more ecologically sound courses of action**."[169] The rigorous and objective evaluation of all reasonable alternatives is the "heart of the environmental impact statement."[170] Importantly, "the discussion of alternatives must be undertaken in good faith; it is not to be employed to justify a decision already reached."[171]

While an EIS need not explore every conceivable alternative, it must rigorously explore all reasonable alternatives that are consistent with its basic policy objective and that are not remote or speculative. A viable but unexamined alternative renders an EIS inadequate.[172] An alternative may not be disregarded merely because it does not offer a complete solution to the problem.[173]

An EIS must also evaluate an appropriate range of alternatives.[174] The range of alternatives that must be considered is determined by the nature and scope of the proposed action. The greater the impacts and scope of the proposed action, the greater the range of alternatives that must be considered.[175] The range of alternatives considered is not sufficient if each alternative has the same end result.[176]

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[167] *Sylvester v. U.S. Army Corps of Engineers*, 882 F.2d. 407, 409 (9th Cir. 1989).
[168] 40 C.F.R. § 1502.14.
[169] *Environmental Defense Fund, Inc. v. U.S. Army Corps of Engineers*, 492 F.2d 1123, 1135 (5th Cir. 1974) (emphasis added).
[170] 40 C.F.R § 1502.14.
[171] *Citizens Against Toxic Sprays, Inc. v. Bergland*, 428 F.Supp. 908, 933 (D.Or. 1977).
[172] *E.g. Muckleshoot Indian Tribe v. U.S. Forest Service*, 177 F.3d 800, 810, 814 (9th Cir. 1999).
[173] *Natural Resources Defense Council, Inc. v. Morton*, 458 F.2d 827, 836 (D.C. Cir. 1972).
[174] *E.g. Resources Ltd., Inc. v. Robertson*, 35 F.3d 1300, 1307 (9th Cir. 1993).
[175] *Alaska Wilderness Recreation and Tourism v. Morrison*, 67 F.3d 723, 729 (9th Cir. 1995); *see Sierra Club v. Espy*, 38 F.3d 792, 803 (5th Cir. 1994) (the range of alternatives that must be considered in an environmental assessment decreases as the environmental impact of the proposed action becomes less and less substantial).
[176] *State of California v. Block*, 690 F.2d 753, 767 (9th Cir. 1982) (holding that an inadequate range of alternatives was considered where the end result of all eight alternatives evaluated was development of a substantial portion of wilderness).

If actions are "connected" they must also be examined in a single EIS.[177] Actions are connected if they: (i) Automatically trigger other actions which may require environmental impact statements; (ii) Cannot or will not proceed unless other actions are taken previously or simultaneously; [or] (iii) Are interdependent parts of a larger action and depend on the larger action for their justification."[178]

The DEIS does not comply with these fundamental NEPA requirements.

a. The DEIS Fails to Evaluate a Reasonable Range of Alternatives

The DEIS fails to evaluate a reasonable range of alternatives, as required by NEPA. Indeed, the DEIS examines only two alternatives—the no action alternative and PLP's preferred alternative. The two variations to PLP's preferred alternative presented in the DEIS are limited solely to variations in the transportation corridor—each variant utilizes the exact same mine configuration, tailings storage and water treatment facilities, and footprint as PLP's preferred alternative. Each variant results in the exact same level of mining as PLP's preferred alternative.

Federal courts have routinely found that NEPA "prevents federal agencies from effectively reducing the discussion of environmentally sound alternatives to a binary choice between granting and denying an application."[179] The DEIS provides just such an improper binary choice; one alternative would result in mining the Pebble Deposit with all of the attendant impacts, while the second alternative would reject the Pebble Project.

The significant scope and extensive impacts of the Pebble Project unquestionably require the DEIS to evaluate a far greater range of alternatives.[180] The range of alternatives that must be considered is determined by the nature and scope of the proposed action. The greater the impacts and scope of the proposed action, the greater the range of alternatives that must be considered.[181]

As documented throughout these comments, both the scope and the impacts of the Pebble Project are undeniably enormous. For example, PLPs preferred alternative will destroy 9,317 acres from the project footprint alone.[182] Water treatment facilities and enormous tailing pits will poison the environment—and must **never** leak, fail, or even not work as "promised" in the DEIS for **all eternity** to avoid catastrophic water quality and ecosystem-wide impacts. More than 4500 acres of pristine wetlands and 81 miles of untouched streams will be destroyed. More than 20 acres of Endangered Species Act-

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[177] *Thomas v. Peterson*, 753 F.2d 754, 758 (9th Cir. 1985).
[178] 40 C.F.R. § 1508.25 (emphasis added).
[179] *Save Our Cumberland Mountains v. Kempthorne*, 453 F. 3d 334, 345 (6th Cir. 2006), *citing Davis v. Mineta,* 302 F.3d 1104, 1122 (10th Cir.2002) ("[O]nly two alternatives were studied in detail: the no build alternative, and the preferred alternative. [The agency] acted arbitrarily and capriciously in approving an [environmental assessment] that does not provide an adequate discussion of [p]roject alternatives."); *Colo. Envtl. Coal. v. Dombeck,* 185 F.3d 1162, 1174 (10th Cir.1999) ("[T]he National Environmental Policy Act and Council on Environmental Quality Regulations require [an agency] to study in detail all `reasonable' alternatives [in an environmental impact statement].... [Courts] have interpreted this requirement to preclude agencies from defining the objectives of their actions in terms so unreasonably narrow they can be accomplished by only one alternative.").
[180] *E.g. Resources Ltd., Inc. v. Robertson*, 35 F.3d 1300, 1307 (9th Cir. 1993).
[181] *Alaska Wilderness Recreation and Tourism v. Morrison*, 67 F.3d 723, 729 (9th Cir. 1995); *see Sierra Club v. Espy*, 38 F.3d 792, 803 (5th Cir. 1994) (the range of alternatives that must be considered in an environmental assessment decreases as the environmental impact of the proposed action becomes less and less substantial).
[182] DEIS, Appendix K at K2-1 to K2-2.

designated critical habitat will be damaged. Additional extensive stream and wetland habitat will be fragmented resulting in even more highly significant ecological harm. Natural stream flows vital to healthy fish and wildlife populations will be lost or substantially altered. The damage will be devastating to the ecological integrity of the entire Bristol Bay watershed and the critically important fish and wildlife species that rely on this resource.

Clearly, the DEIS must meaningfully assess far more than two alternatives to comply with NEPA.

b. The DEIS Fails to Evaluate Many Reasonable Alternatives

The DEIS improperly rejects numerous reasonable alternative out of hand. The DEIS:

(1) Dismisses **six** alternative mine locations out of hand: Whistler, Pyramid, Outside Alaska, Massive Sulfide Deposits in Alaska, and Pebble East. *See* DEIS Appendix B.

(2) Dismisses **five** alternative mine site configurations out of hand: Single TSF with Two Cells, Single TSF with Single Cell, EPA Restricted Mind Size, Smaller Pit, Larger Mine. *See* DEIS Appendix B.

(3) Dismisses **two** alternative mining operation alternatives out of hand: underground mining, underground mining combined with surface mining. *See* DEIS Appendix B.

Several alternatives, variants or options are inappropriately dismissed/screened out on unsupported claims that they are not economically viable.[183] For example, the screening criteria removed the Pyramid project from review on the grounds that there were no "assurances that the resources exist in the necessary quantity and quality" and thus "no investment and no development and mine operation."[184] In utilizing commercially viability in determining whether alternatives are reasonable, the Corps must undertake an independent analysis.[185] The Corps has failed to meet this burden and cannot meet this burden unless and until PLP prepares an economic assessment. Moreover, while commercial viability is a factor, it is fundamentally inappropriate to utilize unsupported claims regarding lack of economic viability as the primary reason for excluding alternatives from review when there are no benchmarks or sideboards to determine what is or is not economically viable.

Several alternatives were inappropriately dismissed/screened out on unsupported claims that they are "not practicable using existing technology for the portion of the deposit that is proposed to be mined." DEIS Appendix B. For example, this screening criteria removed the underground mining alternative from consideration. Among many other problems, the improper dismissal of the underground mining alternative ignores the option of mining deeper portions of the Pebble deposit than have been considered in the DEIS. While underground mining has its own set of highly significant adverse impacts, it could decrease the overall mine footprint and reduce the production of waste rock and tailings.

Improper justifications were also used to dismiss other alternatives. For example, the "massive sulfide deposits in Alaska" alternative was dismissed out of hand because they "do not contain molybdenum." As noted above, however, an otherwise reasonable alternative may not be disregarded merely because

[183] DEIS App. B at B–2
[184] DEIS App. B at B–7.
[185] *Utahns for Better Transp. v. U.S. DOT*, 305 F.3d 1152, 1187 (10th Cir. 2002).

it does not offer a complete solution to the problem.[186] This rejection is also inappropriate because it is based on the improper inclusion of molybdenum mining in the project purpose, as discussed in Section D.1 of these comments.

It is also quite possible that the DEIS does not evaluate any reasonable alternatives because the Pebble Project 20-year mine is almost certainly not economically viable, as discussed below in Section D.2.c of these comments. Courts have approved EISs that exclude a full examination of an alternative on the grounds that it is not economically viable, and thus not a reasonable alternative.[187]

The fundamentally flawed alternatives analysis in the DEIS, among many other problems, prevents PLP from being able to demonstrate that no "practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem."[188] As discussed in Section B above, this failure prohibits the Corps from issuing a Clean Water Act § 404 permit for the Pebble Project.

The DEIS must meaningfully evaluate reasonable alternatives to comply with NEPA.

c. The DEIS Fails to Examine the 78-Year Mine Plan

The DEIS must fully evaluate the 78-year mine plan. This full analysis is required because the 78-year mine is a "connected action" under NEPA. This full analysis is also essential for properly analyzing the highly significant cumulative impacts of the Pebble Project, as discussed in Section D.j of these comments.

"Connected actions" must be considered in a single EIS.[189] As noted above, actions are connected if, among other things, they "[c]annot or will not proceed unless other actions are taken **previously**" or if they are "**interdependent parts of a larger action and depend on the larger action for their justification**."[190] Importantly, actions that are functionally or economically dependent must be evaluated together as connected actions.[191] Each of these criteria apply to the 78-year mine.

The Ninth Circuit applies an "independent utility" test to determine whether multiple actions are connected actions requiring consideration in a single EIS:[192]

> "Actions are "connected" if they "[c]annot or will not proceed unless other actions are taken

[186] *Natural Resources Defense Council, Inc. v. Morton*, 458 F.2d 827, 836 (D.C. Cir. 1972).
[187] *E.g.*, *Sierra Club v. Marsh*, 714 F. Supp. 539, 581 (D. Me. 1989).
[188] 40 C.F.R. § 230.10(a).
[189] *Thomas v. Peterson*, 753 F.2d 754, 758 (9th Cir. 1985).
[190] 40 C.F.R. § 1508.25 (emphasis added).
[191] E.g., *Delaware Riverkeeper Network, et al, v. Federal Energy Regulatory Commission*, 753 F.3d 1304, 1318 (D.C. Cir. 2014) (holding that EIS was improperly segmented under NEPA when "financially and functionally interdependent pipeline improvements were considered separately even though the there was no apparent logic to where one project began and the other ended" because projects lacked independent utility); *Florida Wildlife Federation v. U.S. Army Corps of Engineers*, 401 F.Supp.2d 1298, 1315 (2005) ("If proceeding with one project will, because of functional or economic dependence, foreclose options or irretrievably commit resources to future projects, the environmental consequences of the projects should be evaluated together.") (applying independent utility test and citing *Piedmont Heights Civic Club, Inc. v. Moreland,* 637 F.2d 430, 439 (5th Cir.1981)).
[192] *Northern Plains Resource Council, Inc. v. Surface Transp. Bd.*, 668 F.3d 1067, 1087 (9th Cir. 2011) (internal citations omitted).

> previously or simultaneously." We have explained that "[p]roposals or parts of proposals which are related to each other closely enough to be, in effect, a single course of action shall be evaluated in a single impact statement." "The purpose of this requirement is to prevent an agency from dividing a project into multiple actions, each of which individually has an insignificant environmental impact, but which collectively have a substantial impact." In determining whether there is a connection between projects, this circuit employs an "independent utility" test. The test asks whether "each of two projects would have taken place with or without the other." If the answer is yes, then the projects have "independent utility" and do not require the same EIS. "To prevail, plaintiffs must show that [the agency] was arbitrary and capricious in failing to prepare one comprehensive environmental statement."[193]

An EIS may not exclude full review of an environmentally damaging connected action in an effort to facilitate permitting:

> Just as a project may not be unlawfully segmented to avoid significance, the concept of "independent utility" should not be manipulated to avoid significance or ""troublesome" environmental issues, in order to expedite the permitting process.[194]

In *Florida Wildlife Federation*, the Court rejected an EIS that failed to review all phases of an integrated project because the record showed that the project "was conceptualized as an integrated whole, progressing in phases, and that the 535–acre project was never intended to stand alone—not, that is, until time came to apply for a CWA permit.[195] The Court explicitly rejected the EIS's *post hoc* use of the independent utility doctrine "to limit and expedite permit review."[196]

The 78-year mine plan is clearly a connected action requiring full evaluation in the DEIS for at least the following reasons:

(1) **The 78-year mine plan relies on the extensive construction and mining carried out under the Pebble Project 20-year mine plan, and the 78-year mine is both functionally and economically dependent on the Pebble Project 20-year mine.** PLP cannot carry out the 78-year mine without the infrastructure construction and mining that will be carried out under the Pebble Project 20-year mine. For example, the 78-year mine will use the same transportation system (with some additions), and will expand the 20-year plan mine pit. DEIS at Table 4.1-1, Table 4.1-2.

(2) **The Pebble Project 20-year mine is an interdependent part of the 78-year mine, and the Pebble Project 20-year mine requires a much larger phase of mining to be economically viable.** A March 2018 expert review of the economic feasibility of the Pebble Project 20-year mine concluded that the "20-year mine plan being considered by the Pebble EIS has a negative NPV [net present value] of approximately three billion dollars." [197] The review also noted that a more

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[193] *Northern Plains Resource Council*, 688 F. 3d at 1087-1088 (internal citations omitted).
[194] Florida Wildlife Federation v. U.S. Army Corps of Engineers, 401 F.Supp.2d 1298, 1315 (S.D. Fla. 2005).
[195] Florida Wildlife Federation, 401 F.Supp.2d at 1315.
[196] Florida Wildlife Federation, 401 F.Supp.2d at 1321 (ruling that the concept of independent utility may not be "developed posthoc as an avenue to limit and expedite permit review.")
[197] March 28, 2019 letter from Richard K. Borden, Owner Midgard Environmental Services LLC to Shane McCoy regarding "Pebble Mine Project Economics." Mr. Borden has over thirty years of experience in the mining and consulting industries, including 23 years with the global mining company Rio Tinto where he participated in and

rigorous economic evaluation was also "very unlikely to make the project have a positive rate of return on what is likely to be an extremely large and risky capital investment."[198] Critically, the report found that if the Pebble Project 20-year mine is approved, it would:

> "place prospective developers in a difficult situation because in order to create a profitable operation they would either need to 1) immediately begin a new EIS for a larger economically viable mine plan or 2) knowingly permit, fund and build an uneconomic mine in the hopes that a later EIS and permitting process would allow a larger, economically viable operation."[199]

If the 20-year mine plan is not economically feasible—which is highly likely based on the information provided in the expert review—the Pebble Project only makes sense as an economic enterprise if it is a precursor phase of a much larger mine proposal. At a minimum the Corps must independently verify the information regarding economic viability of the Pebble Project 20-year mine plan. As the first step in this verification, the Corps should require PLP to provide an economic feasibility report. The Corps must then verify the accuracy of that report.

(3) PLP clearly views the Pebble Project 20-year mine as the first segment of a multi-phase effort to mine the full Pebble deposit (i.e., the 78-year mine). Since at least 2004 when it began developing plans to exploit the Pebble deposit, PLP has consistently touted the value of the full deposit and a desire to mine the full deposit. As fully documented in the comments submitted by Trustees for Alaska, a previous version of Pebble's website explicitly acknowledged that PLPs "initial approach is for a 20-25-year mine" while noting that "it's possible that the project could extend for decades—**the Deposit may hold a century's worth of minerals**."[200] The Trustees for Alaska comments document many similar examples, including:

- In 2011, PLP submitted plans to the U.S. Securities and Exchange Commission that "outline several stages of mine development, the smallest being a 2.0-billion-ton mine and the largest being a 6.5-billion-ton mine . . . . "[201] According to this filing, the 2.0 billion ton mine would take 28 years to extract; the 6.5 billion ton mine 78 years.[202]

- In a September 29, 2017 webcast presentation at the Denver Gold Forum, CEO Ron Thiessen noted that Pebble has "about 500 sq. miles of mineral titles" and that "the reality is this represents development for many years, perhaps centuries into the future and when you build the infrastructure in there and you've got a concentrator you can feed it forever."[203]

- In January 2018, CEO Ron Thiessen stated:

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contributed to more than twenty financial and technical assessments of new major capital projects, divestments and potential acquisitions.

[198] Id.

[199] Id.

[200] Trustees for Alaska, et al, cite to The Pebble Partnership Plan, https://www.pebblepartnership.com/plan.html (as visited October 2017) (emphasis in original).

[201] Proposed Determination at ES–2.

[202] *Id*.

[203] *See* The Pebble Project, A Pathway to Permitting, Denver Gold Forum, Sept. 2017, The Pebble Partnership, Northern Dynasty Minerals, Ltd., at 3, http://wsw.com/webcast/dgf17/ndm.to/presentationDownload.pdf.

> "Well, I don't know too many mines that start off at a scale and don't change over time. I mean, one of the things is, you know, today I can't stand up here and tell you after 20 years what will be the next mining method. Will it be open pit, will it be underground, will we want to expand the concentrator, will we want to put a gold circuit in. . . . At 160,000 tons a day, the resource that we have actually could last for 200 years. I'll conclude with that."[204]

- In June 2019, PLP reiterated that the Pebble Deposit is "among the world's greatest stores of mineral wealth" and "the world's most extensive mineral system." [205] PLP again highlighted that the resource includes 6.5 billion tons of measured and indicated resources and 4.5 billion tons of inferred resources.[206] "The Pebble Project is thought to be the world's most significant undeveloped source of both gold and copper in the world. However, that doesn't even scratch the surface when it comes to the amount of material that could be in this mine."[207] PLP also emphasized that the "exploration potential is high" and that "Pebble may host other major deposits."[208]

6. NDM's Pebble Project Overview webpage notes that "[t]he Pebble deposit is one of the greatest stores of mineral wealth ever discovered, and the world's largest undeveloped copper and gold resource. The Pebble Project's tonnes, grade, metallurgy and geometry have the potential to support a modern, long-life mine."[209]

7. In NDM's most recent *Management's Discussion and Analysis*, which accompanies its audited yearly financial statement, NDM states "[t]he proposed project uses a portion of the currently estimated Pebble mineral resources. This does not preclude development of additional resources in other phases of the project in the future."[210]

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[204] *See* NDM Presentation by CEO Ron Thiessen at the Vancouver Resource Investment Conference, Jan. 22, 2018, https://www.youtube.com/watch?v=pBs1dnP_9eo at 28:14.

[205] *See The Pebble Project, The Future of U.S. Mining & Metals, Advancing the Permitting Process*, June 2019, The Pebble Partnership, Northern Dynasty Minerals Ltd., at 3, 26 and 28 https://www.northerndynastyminerals.com/site/assets/files/4617/northern_dynasty_june_2019-web.pdf; *see also The Pebble Project, The Future of U.S. Mining & Metals, A Fresh Start*, June 2018, at 3; The Pebble Project, A Pathway to Permitting, Denver Gold Forum, Sept. 2017, The Pebble Partnership, Northern Dynasty Minerals, Ltd., at 3, http://wsw.com/webcast/dgf17/ndm.to/presentationDownload.pdf.

[206] *The Pebble Project, The Future of U.S. Mining & Metals, Advancing the Permitting Process*, June 2019, at 5 and 32.

[207] Joshua Rodriguez, *Northern Dynasty Minerals (NAK) Stock: The Good, The Bad, The Ugly!*, CNA Finance, June 11, 2018, https://cnafinance.com/northern-dynasty-minerals-nak-stock-the-good-the-bad-the-ugly/19625.

[208] *See* The Pebble Project, The Future of U.S. Mining & Metals, Advancing the Permitting Process, June 2019, at 36–37.

[209] *See* Northern Dynasty Minerals Pebble Project – Project Overview, http://www.northerndynastyminerals.com/pebble-project/project-overview/.

[210] See Northern Dynasty Minerals, Ltd., Management's Discussions and Analysis, Year Ended December 31, 2018 at 8; *see also* Northern Dynasty Minerals, Ltd., Management's Discussions and Analysis, Year Ended December 31, 2017, Mar. 29, 2018, at 11 ("[t]he project proposed as envisaged in the Project Description uses a portion of the currently estimated Pebble mineral resources. This does not preclude development of additional resources in other phases of the project in the future.").

PLP's intent to expand the Pebble Mine beyond the 20-year plan has also been recognized by the Corps, which has required consideration of the 78-year mine plan as a reasonably foreseeable future action in the cumulative impacts analysis. DEIS at Table 4.1-1, Table 4.1-2

Even the egregiously flawed DEIS makes clear that the overwhelming damage caused by the Pebble Project 20-year mine would be vastly compounded by **at least 12,445 additional acres of wetland destruction** from the 78-year mine.[211] The DEIS, however, fails to provide any detailed analysis of the 78-year mine, the ecological implications of these additional wetland losses, or any of the other highly significant adverse impacts that would be caused by the 78-year mine.

The failure to include a full assessment of the 78-year mine can at best be interpreted as an improper attempt to "minimize" the appearance of harm in an effort to obtain a Clean Water Act permit for the project. It seems more likely that this failure is a deliberate attempt to conceal the true extent of the unimaginable harm from mining the Pebble deposit.

3. The Impacts Analysis Does Not Comply with NEPA

The DEIS fundamentally fails to adequately analyze the adverse impacts from the Pebble Project. Among many other problems, the impacts analysis: lacks scientific integrity and essential data and information, completely ignores impacts from a vast array of Project components, fails to assess the biological and ecological implications of habitat loss—including loss of vitally important connectivity, fails to consider the impacts of climate change, fails to meaningfully consider cumulative impacts, fails to assess the very real threat of a catastrophic failure of the tailings ponds, and fails to address the detailed and heavily documented findings in EPAs Proposed Determination. In short, despite containing a significant number of pages, the DEIS provides little meaningful information on adverse impacts. As a result of these failings, the DEIS vastly understates the true extent of the Pebble Project's devastating impacts to the Bristol Bay watershed.

The National Wildlife Federation highlights a number of these failings below. Significant additional information on the many failings with the DEIS impacts analysis are presented in the extensive comments submitted by the Trustees for Alaska and the comments submitted by the American Fisheries Society, and National Wildlife Federation urges the Corps to fully consider those comments which we incorporated by reference as though fully set forth herein.

Key NEPA Requirements:

In comparing and analyzing potential alternatives, the DEIS must examine, among other things, the direct, indirect, and cumulative environmental impacts of the different alternatives, the conservation potential of those alternatives, and the means to mitigate adverse environmental impacts. 40 C.F.R. § 1502.16. A robust analysis of project impacts is essential for determining whether less environmentally damaging alternatives are available.

Direct impacts are caused by the action and occur at the same time and place as the action. Indirect impacts are also caused by the action, but are later in time or farther removed from the location of the action. 40 C.F.R. § 1508.8. Cumulative impacts are:

[211] DEIS at 4.22-40.

> "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

40 C.F.R. § 1508.7. A cumulative impact analysis ensures that the agency will not "treat the identified environmental concern in a vacuum."[212]

An EIS must utilize "quantified or detailed information" when analyzing impacts.[213] The DEIS may not rely "on conclusory statements unsupported by data, authorities, or explanatory information."[214] The DEIS must supply supporting data and authorities, and explain how and why it has drawn the conclusion it has reached.

"Accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA."[215] Accordingly, the DEIS must be based on "high quality" science and information and the Corps must "insure professional integrity, including scientific integrity, of the discussions and analysis in environmental impact statements."[216] Importantly, if information that is essential for making a reasoned choice among alternatives is not available, the Corps **must** obtain that information unless the costs of doing so would be "exorbitant."[217]

The Corps must also candidly disclose the risks of its proposed action and respond to adverse opinions held by respected scientists:[218]

> "'Where scientists disagree about possible adverse environmental effect, the EIS must inform decision-makers of the full range of responsible opinion on the environmental effects.' Where the agency fails to acknowledge the opinions held by well respected scientists concerning the hazards of the proposed action, the EIS is fatally deficient."[219]

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[212] *Grand Canyon Trust v. FAA*, 290 F.3d 339, 346 (D.C. Cir. 2002).
[213] *Neighbors of Cuddy Mountain v. U. S. Forest Service*, 137 F.3d 1372, 1379 (9th Cir. 1998); *Ecology Center v. Castaneda*, 574 F.3d 652, 666 (9th Cir. 2009) (requiring "quantified or detailed data"); *Natural Resources Defense Council v. Callaway*, 524 F.2d 79, 87 (2d Cir. 1975).
[214] *Id*.
[215] 40 C.F.R. § 1500.1(b).
[216] 40 C.F.R. § 1502.24 ("Agencies shall insure professional integrity, including scientific integrity, of the discussions and analysis in environmental impact statements"); *Earth Island Inst. v. U.S. Forest Service*, 442 F.3d 1147, 1159-60 (9th Cir. 2006) (quoting 40 CFR §1502.24).
[217] 40 C.F.R. § 1502.22. During the November 9, 2015 Public Meeting on the DEIS (in Eastpoint, FL), a representative of the Corps advised the public that the Corps would not research a public comment on a technical issue unless the comment was accompanied by data and analysis that demonstrates the point made. This demonstrates a severe misunderstanding of the rules that govern preparation of an EIS. As noted above, the Corps (not the public) must obtain information that is essential for making a reasoned choice among alternatives. It is also the Corps responsibility to prepare the EIS in a manner that complies with NEPA, and that includes obtaining and providing important information on alternatives and possible impacts.
[218] *Seattle Audubon Soc'y v. Mosely*, 798 F.Supp. 1473, 1482 (W.D. Wash. 1992) (citing *Friends of the Earth v. Hall*, 693 F.Supp. 904, 934, 937 (W.D.Wash. 1988).
[219] *Friends of the Earth v. Hall*, 693 F. Supp. 904, 934 (W.D. Wash. 1988)(citations omitted).

It is not sufficient to include information on adverse opinions from resource agencies or other well-respected experts in an Appendix or some other document, the expert comments must be included and appropriately responded to in the impacts section of the DEIS.[220]

The impacts analysis must be based on, and present, "quantified or detailed information."[221] "General discussion of an environmental problem over a large area" is not sufficient and cannot satisfy NEPA.[222] Unsupported conclusory statements likewise cannot satisfy NEPA:

> "A conclusory statement unsupported by empirical or experimental data, scientific authorities, or explanatory information of any kind not only fails to crystalize the issues, but affords no basis for a comparison of the problems involved with the proposed project and the difficulties involved in the alternatives."[223]

The DEIS abjectly fails to satisfy these critical NEPA requirements.

a. Wetlands and Aquatic Ecosystems

The Pebble Project will destroy vast swaths of pristine streams and wetlands in a watershed that currently contains intact and connected habits from the headwaters to the ocean. These unique conditions play a vital role in maintaining Bristol Bay's diverse and abundant fish and wildlife populations. The DEIS fundamentally fails to assess the true extent of adverse impacts to these precious wetland and stream resources, and fails completely to assess the ecological implications of those losses. As a result, the horrific wetland and stream losses acknowledged in the DEIS barely scratch the surface of the true extent of those losses.

To conduct a meaningful assessment of wetland and stream impacts, the DEIS must start with an accurate assessment of the existing resources and their hydrologic drivers. The DEIS must then carefully assess the Project's full range of direct, indirect, and cumulative impacts including from direct losses, "dewatering", stream flow alterations, fragmentation, and changes to groundwater recharge.

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[220] *Id*.

[221] *Neighbors of Cuddy Mountain v. U. S. Forest Service*, 137 F.3d 1372, 1379 (9th Cir. 1998); *Ecology Center v. Castaneda*, 574 F.3d 652, 666 (9th Cir. 2009) (requiring "quantified or detailed data"); *Natural Resources Defense Council v. Callaway*, 524 F.2d 79, 87 (2d Cir. 1975).

[222] *South Fork Band Council v. U.S. Dept. of Interior*, 588 F.3d 718 (9th Cir. 2009); *Neighbors of Cuddy Mountain v. U.S. Forest Service*, 137 F.3d 1372, 1379-80 (9th Cir. 1998).

[223] *Seattle Audubon Society v. Moseley*, 798 F. Supp. 1473, 1479 (W.D. Wash. 1992), *aff'd* 998 F.2d (9th Cir. 1993); *see also, e.g.*, *Klamath-Siskiyou Wildlands Ctr. v. BLM*, 387 F.3d 989,995-996 (9th Cir. 2004) ("generalized or conclusory statements" in cumulative effects analyses do not satisfy NEPA); *Friends of the Earth v. Army Corps of Engineers*, 109 F. Supp. 2d 30, 38 (D.D.C. 2000) (ruling that the Corps must "provide further analysis" to satisfy NEPA because the Corps did not provide "the basis for any" of its claims that the project would have an insignificant impact or that fish and other organisms would simply move to other areas); *Sierra Club v. Norton*, 207 F. Supp. 2d 1310, 1335 (S.D. Ala. 2002) (stating "Defendant's argument in this case would turn NEPA on its head, making ignorance into a powerful factor in favor of immediate action where the agency lacks sufficient data to conclusively show not only that proposed action would harm an endangered species, but that the harm would prove to be 'significant'").

Understanding the full extent of hydrologic changes is critical because **"[h]ydrology is probably the single most important determinant of the establishment and maintenance of specific types of wetlands and wetland processes**":

> "Biota ranging from microbial communities, to vegetation, to waterfowl are all constrained or enhanced by hydrologic conditions. . . .Hydrology affects the species composition and richness, primary productivity, organic accumulation, and nutrient cycling in wetlands. . . . Water depth flow patterns, and duration and frequency of flooding, which are the result of all the hydrologic inputs and outputs, influence the biochemistry of the soils and are major factors in the ultimate selection of the biota of wetlands. . . . the hydrology of a wetland directly modifies and changes its *physiochemical environment* (chemical and physical properties), particularly oxygen availability and related chemistry, such as nutrient availability, pH, and toxicity (e.g., the production of hydrogen sulfide)"[224]

Even "small changes in hydrology can result in significant biotic changes"[225] and produce ecosystem-wide changes:

> "When hydrologic conditions in wetlands change even slightly, the biota may respond with massive changes in species composition and richness and in ecosystem productivity."[226]

The DEIS abjectly fails to meaningfully assess the wetland and stream impacts of the Pebble Project. This failure starts with a notable lack of critical baseline data on wetland and stream resources. Among other problems:

- The DEIS does not map all the wetlands in the Project area. "For Alternative 1, PLP's preferred alternative, field-verified wetland mapping through 2018 covers the entire project footprint except for the pipeline crossing of Cook Inlet, and the 0.5-mile pipeline corridor and compressor station near Anchor Point on the Kenai Peninsula."[227]

- The DEIS does not include a functional wetlands assessment, and PLP does not plan to develop one in the future. The DEIS provides only a general discussion of wetland functions and values. A project-specific functional assessment is critical for evaluating the full implications of wetland losses.

- The DEIS lacks information on critically important riffle and pool complexes. "Riffle and pool complexes occur in an undetermined portion of the upper perennial and intermittent stream channels."[228]

[224] William J. Mitsch and James G. Gosselink, *Wetlands* (5thd ed.) (2015) at 111-112 (emphasis in original).
[225] *Id*. at 112.
[226] *Id*. at 112.
[227] DEIS at 3.22-4. It should also be noted that PLP's field data for the mine site is considered out-of-date under Corps of Engineers national policy because that data was collected in 2004, 2007, and 2008. *See* RGL 16-01, October 2016.
[228] DEIS 4.22-5, 4.22-21, 4.22-28

- The DEIS lacks information on the extent of riverine wetlands. "The extent of riverine wetlands in the watershed is not known."[229]

- The DEIS lacks information on bogs and fens. "The total extent of bogs and fens within the watershed was not mapped and remains unknown."[230] "The extent of bogs in the watershed is not known."[231]

- The DEIS lacks information on the ecological importance of different wetland types within the watershed. "To assess the relative magnitude and extent of impacts within an ecological context, project impacts were compared to the relative proportion of common wetland types in each watershed. USGS Hydrologic Unit Code Tenth Level (HUC 10) watersheds were used for this purpose."[232]

The DEIS compounds the problems created by this lack of fundamental data by failing to assess the impacts of dewatering, stream flow changes, project-induced changes to groundwater recharge, and climate change. Dewatering can significantly alter, and in some cases completely eliminate, wetland hydrology. The significant changes in stream flow recognized in the DEIS can result in wetland losses through reductions in overbank flows and reduced groundwater recharge. Changes in stream flow can also affect stream form and function and the viability and ecological productivity of streams, riparian areas, wetlands, and downstream waters. Wetlands and streams that are directly lost to the project will also affect groundwater recharge and downstream hydrology leading to further wetland losses. Climate change is playing an ever-increasing role in the region's hydrology and ecosystem functions.

The DEIS also fails to assess the impacts of the extensive fragmentation of stream and wetland habitats that will be caused by the Pebble Project. For example, as discussed in Section 3.g of these comments, roads, culverts, bridges, and other stream crossings, will impede and alter the hydrological connectivity between scores of streams that are used for salmon and other passage and upper reaches of streams. Alteration or disruption of flow can cause water quality impairment and diminish habitat quality through siltation, blockage, and other impacts. Indeed, stream crossings cause changes in water velocity, spread of disease, altering of stream beds and substrates, elevated levels of sedimentation and erosion, loss of breeding habitat, and decreases in egg survival among other impacts.[233] Salmon and other fish passage and habitat can be blocked, negatively impacted, or destroyed by culverts and road crossing.

The DEIS also fails to assess the impacts of culverts and other blockages over time. The Pebble Project includes multiple phases, including a 20-year mining phase. Active mining is likely to last much, much longer—potentially for centuries as discussed in Section D.2.c of these comments. Under all scenarios, the transportation corridor will remain in place, including to assist in ensuring required maintenance of the mine site into perpetuity. This presents the likelihood of additional, significant adverse impacts from culverts and stream crossings, including because streams move over time, depending upon their flow and sediment regimes and the compositions of their beds, floodplains, and banks can change over time, especially with predicted climate change. The long-term implications to ecosystem health must be analyzed in the DEIS.

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[229] *Id.* at 4.22-9, 4.22-15.
[230] *Id.* at 4.22-9
[231] *Id.* at 4.22-16
[232] DEIS at ES-59.
[233] See Comments of the American Fisheries Society.

The DEIS also improperly attempts to minimize the wetland impacts it does identify by arguing that the losses account for just "a small percentage of aquatic resources" in an area where wetlands and aquatic resources "are abundant and in a natural state." DEIS at 5-24; *see also* e.g., DEIS at 4.22-8 to 4.22-9 and DEIS 4.22-39 to 4.22-40. However, the courts have made clear that the Corps may not attempt to "minimize" the environmental impacts of the Pebble Project by adopting a scale of analysis that is so broad that it marginalizes the site-level impact of the project on ecosystem health.[234] EPA also explicitly rejected this approach in its Proposed Determination:

> "This perspective is flawed because it assumes that these habitats are less ecologically valuable than streams, wetlands, and other aquatic habitats elsewhere in the watershed and ignores the important role that individual streams or stream reaches, wetlands, lakes, ponds, and other aquatic habitats can play in protecting the genetic diversity of Bristol Bay's salmon. In the Bristol Bay region, hydrologically diverse riverine and wetland landscapes provide a variety of salmon spawning and rearing habitats. Environmental conditions can differ among habitats in close proximity, and recent research has highlighted the potential for local adaptations and fine-scale population structuring in the Bristol Bay and neighboring watersheds (Quinn *et al*. 2001, Olsen *et al*. 2003, Ramstad *et al*. 2010, Quinn *et al*. 2012). Losses that eliminate local, unique populations would erode the genetic diversity that is crucial to the stability of the overall Bristol Bay salmon fisheries (Hilborn *et al*. 2003, Schindler *et al*. 2010, EPA 2014a: Appendix A, EPA 2014b)." Proposed Determination at 2-12.

Notably, the Proposed Determination also pointed out that this approach:

> "is inconsistent with [Corps] guidance in effect since 1989. In this 1989 guidance, [Corps] Headquarters specifically criticizes New Orleans District [Corps]'s assertion that wetland losses associated with a project under review were "inconsequential" because ". . . project alterations of wetlands represents a very small portion of similar habitat within the project vicinity and coastal Louisiana . . . only 2.39% of the saline marsh on Grand Isle and only 0.005% of the saline marsh in coastal Louisiana . . . ." The 1989 guidance finds that this approach ignores the fact that the cumulative effects of many projects could add up to very significant wetlands loss and notes that the proposed destruction of 22 acres of special aquatic sites in the case under review by New Orleans District could not simply be "dismissed as unimportant" ([Corps] 1989).[235]

For these and many other reasons, the DEIS fails to meaningfully evaluate the impacts of wetland and stream losses from the Pebble Project. This fundamental failure violates NEPA and taints every other analysis in the DEIS.

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[234] *Pac. Coast Fed'n of Fishermen's Ass'n v. Nat'l Marine Fisheries Serv.*, 265 F.3d 1028, 1035 (9th Cir. 2001); *Oregon Natural Res. Council Fund v. Brong*, 492 F.3d 1120, 1130 (9th Cir. 2007) (BLM's attempt to dilute the effects of proposed logging by averaging the snag retention over a wide area is improper because under this approach, "any adverse environmental effect could be 'diluted to insignificance.'"); *Anderson v. Evans*, 371 F.3d 475, 489-93 (9th Cir. 2004) (finding that agency conclusion that indigenous whale hunting would not impact the overall coastal whale population not relevant to the impacts on the local whale population, which must be analyzed under NEPA).

[235] Proposed Determination at 2-12 to 2-13 citing U.S. Army Corps of Engineers 404(q) permit elevation, May 9, 1989.

b. Water quality

The significant problems with the DEIS analysis of water quality are discussed in detail in Section B.2 of these comments. In short, the DEIS fails to adequately assess the Pebble Project's adverse impacts on water quality. Those impacts will be highly significant, extremely damaging, and dangerous. Significant risks of new and/or ongoing water quality contamination will remain **forever**. The DEIS does not discuss the significant impacts of water quality contamination on fish—including salmon—and wildlife species.

The National Wildlife Federation also notes that PLP would require a significant infusion of capital to be able to ensure management and operation of water treatment and maintenance into perpetuity (and to ensure effective reclamation and mitigation (assuming that mitigation is even possible)).[236] If PLP or any successor company is unable or unwilling to pay the considerable costs of water treatment and the significant costs that will be needed to attempt to clean up almost certain toxic contamination, the burden to do so will fall on the American taxpayer—and that burden will likely remain for centuries. No mine that requires water treatment in perpetuity should be permitted.

c. Fish

As noted above, the DEIS' failure to meaningfully assess wetland, stream, and water quality impacts fundamentally taints the entire DEIS. The DEIS compounds these problems by also failing to meaningfully assess the significant damage that the Pebble Project will cause to the rich fisheries resources in the Bristol Bay watershed.

As succinctly stated in the comments on the DEIS submitted by the American Fisheries Society:

> "Bristol Bay is extraordinary because it produces about half of the world's wild Sockeye Salmon supply with runs averaging 37.5 million fish per year (Chambers et al. 2012; USEPA 2014; Woody 2018). The wild salmon fishery in Bristol Bay has been managed in a sustainable manner since 1884 and was valued at $1.5 billion in 2010. In addition to Sockeye Salmon, Bristol Bay and the watershed support one of the world's largest remaining wild Chinook Salmon runs and healthy Coho, Chum, and Pink Salmon runs (Johnson and Blossom 2018). These salmon, as well as resident trout, sustain lucrative commercial and recreational fisheries and provide jobs and food security to 25 rural Alaska Native villages and thousands of people. The high salmon production brings huge levels of marine-derived nutrients to the watersheds in which salmon spawn, fueling sustainable populations of grizzly bears, moose, estuarine birds, and indigenous Yup'ik and Dena'ina peoples. The latter peoples represent two of the planet's last salmon-based subsistence cultures, which were once widespread along the entire North American Pacific Coast. These wilderness-compatible economic sectors support 14,000 workers, including 11,500 in commercial fisheries, 850 in sport fisheries, and 1,800 in sport hunting and recreation (Chambers et al. 2012; USEPA 2014; Woody 2018).
>
> Based on our review of the DEIS, we find it fails to meet basic standards of scientific rigor in a region that clearly demands the highest level of scrutiny and thoroughness. The DEIS is an inadequate assessment of the potential impacts of the project. Specifically, as described below, we find the DEIS is deficient because 1) impacts and risks to fish and their habitats are

[236] *See* Northern Dynasty Minerals, Ltd, Consolidated Financial Statements For The Years Ended December 31, 2018 and 2017.

underestimated; 2) many conclusions are not supported by the data or analysis provided; and 3) critical information is missing."[237]

The American Fisheries Society comments highlight the importance of the "portfolio effect" that drives the remarkable annual productivity of this region:

> "The Bristol Bay watershed is pristine with exceptionally high-water quality and habitat diversity, closely connected surface-ground water systems, and an absence of channel fragmentation by roads, pipelines, or dams (Woody 2018). These factors lead to extremely high levels of genetic diversity among hundreds of locally adapted unique salmonid populations, which in turn support high levels of salmon production and system-wide stability. Because of this *portfolio effect*, there is remarkable annual productivity regionally despite considerable fluctuation in any single river system or any single year (Schindler et al. 2010). Similar portfolio conditions have been erased from the salmon rivers of Canada and the USA to the south, by activities associated with resource extraction, human overpopulation, and economic development."

The significance of this portfolio effect is also highlighted and discussed in detail in the comments of Trustees for Alaska. A recent study by Sean Brennan, a post-doctoral researcher at the University of Washington School of Aquatic and Fishery Sciences, confirms the value of the portfolio effect:

> "We quantified how shifting habitat mosaics are expressed across a range of spatial scales within a large, free-flowing river, and how they stabilize the production of Pacific salmon that support valuable fisheries. The strontium isotope records of ear stones (otoliths) show that the relative productivity of locations across the river network, as both natal- and juvenile-rearing habitat, varies widely among years and that this variability is expressed across a broad range of spatial scales, ultimately stabilizing the interannual production of fish at the scale of the entire basin."
>
> * * *
>
> "Our results demonstrate how multiple dimensions of biocomplexity operating across a continuum of nested spatial and temporal scales integrate to stabilize salmon production and fisheries at the scale of the Nushagak River watershed."[238]

In layman's terms, the study finds "that the areas where fish are born and grow flicker on and off each year in terms of productivity."[239] In short, wiping out a huge swath of the watershed—as the Pebble Project would do—will adversely affect the health and abundance of Bristol Bay salmon.

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[237] June 13, 2019 Comments of the American Fisheries Society on the Pebble Mine Draft Environmental Impact Statement at 2. A copy is provided at Attachment D to these comments.

[238] Brennan, S. R., D. E. Schindler, T. J. Cline, T. E. Walsworth, G. Buck, and D. P. Fernandez. 2019. *Shifting habitat mosaics and fish production across river basins*. Science 364:783-786. A copy of this study is provided at Attachment D to these comments.

[239] *See* Michelle Ma, *Hot Spots in Rivers that Nurture Young Salmon 'Flicker On and Off' in Alaska's Bristol Bay region*, UW News, May 23, 2019.

d. Wildlife

The DEIS analysis of wildlife impacts is blatantly inadequate. The problems start with the wholesale lack of a meaningfully assessment of the true extent and ecological implications of habitat losses that will result from the Pebble Project. To properly assess impacts to wildlife, the DEIS must first properly assess the direct, indirect, and cumulative impacts to wetland, stream and other habitats. This includes understanding the significant impacts of changes in flow and hydrology, fragmentation, and loss of connectivity.

Once baseline habitat losses and their ecological implications are determined, the implications of those changes must be assessed for the wildlife species that rely on the affected habitats. These impacts must be assessed in light of the full life cycle needs of species and an understanding of the current population levels and existing stressors on the full range of species that utilize the project area. The DEIS must also examine the impacts on wildlife of such things as: lost (or significant intrusions into) critical travel and migration corridors; increased toxic contamination and bioaccumulation, reductions or loss of essential food sources—particularly salmon; mortality from traffic accidents and increased hunting; and increased human-wildlife interactions. None of this has been done in the DEIS.

This section highlights just some of the many species-specific failings in the DEIS assessment of wildlife impacts. The failure of the DEIS to meaningfully assess impacts to marine mammals is discussed in Section E of these comments. As noted above, these failings are profoundly compounded by the lack of an adequate assessment of the Pebble Project's direct, indirect, and cumulative impacts to wildlife habitat.

(1) Small Mammals

The DEIS lumps together a diverse array of species under its discussion of small terrestrial vertebrates.[240] Many of the "small terrestrial vertebrate" species mentioned in the DEIS are identified by the State of Alaska as "Species of Conservation Need," including the: snowshoe hare (*Lepus americanus*), Alaska hare (*Lepus othus*),[241] collared pika (*Ochotonoa collaris*), wood frog (*Lithobates sylvaticus*), and various unnamed species of lemmings, shrews, and voles.

Despite the state's recognized concern, the DEIS did conduct project-specific surveys for any of the small mammal "Species of Conservation Need"—and indeed did not conduct project-specific surveys for any other small mammal species. Instead the presence of these species was allegedly "incidentally recorded during biological surveys in the EIS analysis area." DEIS at 3.23-21. As a result, the DEIS lacks any type of meaningful information on the number of species of small mammals that utilize the Project area or on the Project-area population levels of those species.

As importantly, the DEIS provides only the most vague and generic conclusions regarding potential impacts to small mammals—conclusions that even a child could have come up with. According to the DEIS, in general these species will be impacted by direct loss of habitat and mortality caused by construction and traffic. Some species will avoid the area, and some will be affected by increased predation while trying to avoid the area.

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[240] The DEIS discussion of wood frogs, which is also included in this discussion, is addressed in Section D.3.d.(3) of these comments.

[241] The DEIS refers to this species both as the Arctic hare and as the tundra hare.

The total "analysis" of these impacts is limited to the repetitive, generic conclusions provided in these few paragraphs:

- "Some small mammals present at the mine site at the beginning of construction are anticipated to vacate the area due to presence of humans and equipment. Other species may be attracted to the mine site, due to newly created shelter. Some individual small mammals and wood frogs (*Lithobates sylvaticus*) may be more susceptible to predation during the process of mine site development as they vacate the area. Any habitat avoidance during construction and operations would be additive to the direct habitat loss at the mine site."

  "The magnitude and extent of impacts would be that some small terrestrial vertebrates would avoid the transportation and natural gas pipeline corridors and Amakdedori port due to loss of habitat, and resulting edge impacts (e.g., increased predation along edge habitats and habitat changes). In summary, the magnitude of impacts would include behavioral avoidance of the project because many smaller terrestrial mammals may avoid areas during construction; but some species, such as red foxes, may eventually become accustomed to the presence of the mine. The duration would last for the life of the project, and extent would include the entire project." DEIS at 4.23-18.

- "Small mammal species have the potential for injury and mortality from a variety of sources, and impacts are often species-specific. Blasting and removal of rock and vegetation during construction and operations of the mine (including clearing and vegetation removal) may cause injury and mortality, especially to small mammal and wood frogs that have limited abilities to move away or avoid heavy machinery. In terms of extent, some species may experience injury and mortality due to collisions with project vehicles, especially along the transportation and natural gas pipeline corridors. In terms of magnitude, there would be frequent use of the mine and port access roads by vehicles, especially while mine equipment and construction materials would be delivered to the Amakdedori port and transported on the road. Given speed restrictions and the noise of heavy equipment moving along the road, the risk of injury or mortality due to collisions with some wildlife on the road may be reduced. Some species, such as Arctic ground squirrels (*Spermophilus parryii*), may experience an increase in roadkill mortality due to their use of dirt roads for burrowing. The risk of injury and mortality from collisions with vehicles would be higher for young-of-the-year wildlife, and during limited visibility such as during the winter, twilight hours, and during inclement weather. When roads are icy, increased slowing and stopping distances, coupled with decreased visibility, may lead to increased mortality. Additionally, small mammals may experience increased predation from predatory species using the newly created edge habitat."

  "In summary, the magnitude and extent of impacts may include mortality of individual small mammals along the 78 miles of new roads. The duration would last for the life of the project and the extent would generally include the transportation corridor and to a lesser extent the mine site. Due to speed limits, vehicles would move slower within the mine site and hence the potential for vehicle collisions would be reduced. There would be the potential for injury or mortality, especially since smaller terrestrial wildlife may forage along roadsides and experience mortality. DEIS at 4.23-21 to 4.23-22.

- "These species would experience a direct loss of habitat during construction and operations of the project. Some of the habitat would be restored and likely repopulated by these species, but the pit lake would remain a permanent loss of habitat. In summary, the magnitude of habitat loss would be 9,317 acres, because the home ranges of small mammals would be directly removed. The duration would last for the life of the project, and longer for permanent impacts such as the pit lake. The extent would encompass all project components and would be expected to occur if the project is permitted and constructed." DEIS at 4.23-25.

This so-called "analysis" of impacts to small terrestrial mammals is, in reality, no assessment at all. It does not come close to the level of analysis required by NEPA.

(2) Brown Bears

The DEIS fails to consider the direct, indirect, and cumulative impacts on brown bears and their habitat. Alaska houses virtually all of the brown bear population of the United States, and the vast majority of the brown bear population in North America.[242] Brown bear density on the Alaska Peninsula is extremely high, approaching one bear per square mile in certain areas, due to the abundance of high quality food sources.[243]

The Pebble Project fractures vital bear habitat and significantly increases opportunities for bear and human conflicts. For example, the preferred alternative transportation corridor would come within 250 feet of the boundary to the McNeil River State Game Sanctuary and Refuge, an area of high bear usage, and the port facility would be located within two miles of McNeil's boundary. DEIS at 3.2–11 and 3.5–1.

The following are just some of the many deficiencies in DEIS assessment of brown bear impacts:

- The DEIS imposes arbitrary limitations on the scope of the analysis of Brown bear impacts. The DEIS also fails to provide adequate information to assess Brown bear impacts or the need for, or efficacy of, potential mitigation measures.

- The DEIS does not address impacts of the road corridor or of the other roads associated with the Pebble Project. The proposed road bisects important and high density use bear areas and adds significant traffic (about 80 truck trips per day). The DEIS acknowledges that some bear "individuals would experience disturbance, but impacts would not be expected to result in population-level impacts," DEIS at 4.23-18, but fails to conduct any meaningful analysis of those disturbances. The negative impacts of roads are well recognized and include increased human and wildlife conflicts, habitat fragmentations, etc. Moreover, NEPA does not allow the DEIS to ignore impacts that do not reach "population-level impacts." We also note that the DEIS does not clarify what scale of brown bear population levels it is evaluating.

- The DEIS does not address the impacts of the Pebble Project on important brown bear corridor habitat. This is particularly important in light of the significant habitat damage that will be caused by the Pebble Project, since bears must expend effort to navigate around patches of

[242] Young, Taylor B. & Little, Joseph M., May 2019. *The Economic Contributions of Bear Viewing in Southcentral Alaska*. University of Alaska Fairbanks, prepared for Cook Inletkeeper. (Young, 2019)
[243] *See* Alaska Dep't of Fish & Game, Website, Brown Bear (Ursus arctos) http://www.adfg.alaska.gov/index.cfm?adfg=brownbear.printerfriendly.

poor quality habitat. For example, a 2007 study of functional brown bear corridors in Alaska utilized GPS-derived density, speed, and angular deviation of brown bear movement to develop a corridor identification technique to assist managers in preserving landscape features that will preserve habitat connectivity for brown bears.[244] This technique should be used to assess and avoid impacts to important brown bear corridor habitat.

- The DEIS does not meaningfully examine the impacts of human habituation resulting from the Project-created increases in bear-human contact. Bears can become habituated to humans when there is increased bear-human interaction and stop viewing humans as a threat. Habituated bears have a higher likelihood of mortality than bears that avoid humans. The Pebble Project will result in a significant increase in the number of people in the Project area (including in the field camps; at construction sites; at operational facilities; and on the roads including while transporting equipment, supplies, and processed ore). The impacts of all of these activities on habituating bears through significantly increasing bear-human interactions is not examined. For example, a 2002 study on brown bear use of the Kulik River in Alaska found that disturbance and mortality from significant human interactions reduced the effectiveness of the habitat for brown bears by approximately 70 percent.[245]

- The DEIS does not address the potential for, or the impact of, diminished food sources—including notably, the potential for significantly diminished salmon runs. Loss of food sources can affect the health and viability of bear populations. Loss of food sources can also create additional significant stressors on bear populations by increasing competition among, and conflict between, bears.

- The DEIS does not address the impacts of Increased hunting, poaching, and other bear kills from human interaction (such as vehicle traffic) due to increased road activity and human access and development.

- The DEIS does not address the impacts to bears from avoidance behavior resulting from increased human use and activity in the project area.

- The DEIS does not address the secondary impacts of a reduction in brown bear (or salmon) numbers in the Bristol Bay watershed or the Project area, including particularly the impacts to the health of riparian forests. For example, a 2006 study of streams in southwest Alaska "suggests that nitrogen (N) influx to the riparian forest is significantly increased in the presence of both salmon and bear, but not by either species individually. The interactions of salmon and bear may provide up to 24% of riparian N budgets."[246]

These impacts must be properly assessed by the DEIS.

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[244] Tabitha A. Graves, Farley S., Goldstein M.I., Servheen C., *Identification of functional corridors with movement characteristics of brown bears on the Kenai Peninsula, Alaska*, Landscape Ecol (2007) 22:765–772, DOI 10.1007/s10980-007-9082-x.

[245] Tom S. Smith, *Effects of Human Activity on Brown Bear Use of the Kulik River, Alaska, Ursus* Vol. 13 (2002), pp. 257-267 (available at https://www.jstor.org/stable/3873206?seq=1/subjects).

[246] James M. Helfield, R.J. Naiman, *Keystone Interactions: Salmon and Bear in Riparian Forests of Alaska*, Ecosystems, Vol. 9, No. 2 (Mar., 2006), pp. 167-180, DOI: 10.1007/sl0021-004-0063-5 (available at http://www.jstor.org/stable/25470328).

(3) Amphibians

The DEIS does not adequately address impacts to the wood frog, which is listed by the state of Alaska as a "Species of Conservation Need."[247] The state recognizes the wood frog as an important "sentinel species" which the state relies on:

> "as indicators of ecosystem health or environmental change (Caro and O'Doherty 1999; Pearce and Venier 2005). Because global climate change is expected to have large effects on ecosystems and wildlife in Alaska (see Threats chapter), species that are expected to show shifts in distribution or changes in abundance as a result of climate change make logical sentinel species."[248]

According to the DEIS:

> "Occupancy surveys for wood frogs were conducted in the mine survey area in 2007 to determine their distribution and rate of occupancy for waterbodies in the mine survey area, and to describe the important habitat characteristics associated with breeding waterbodies. ABR conducted ground-based surveys in May 2007, in which 119 randomly selected waterbodies (out of 1,668 potential waterbodies) were sampled for wood frogs. Surveys were conducted by passive listening for vocalizing male wood frogs from these preselected waterbodies at locations spaced around each waterbody, following standard amphibian-calling survey protocols, with slight modifications for time of day (USGS 2005). The sampling design involved a repeat survey for each waterbody (2 to 4 days apart) during peak breeding.
>
> Wood frogs were detected at waterbodies throughout the mine survey area, and the occupancy rate of wood frogs breeding in the mine survey area was estimated at approximately 50 percent of all waterbodies surveyed (ABR 2011a). In the mine site facilities, several waterbodies contained wood frogs. Deep waterbodies, greater than 5 feet deep, were 10 times more likely to be occupied by wood frogs than waterbodies less than 5 feet deep. Wood frogs seemed to prefer waterbodies with herbaceous, low shrub shoreline vegetation and aquatic vegetation."[249]

Despite the recognized importance of the wood frog as a sentinel species and the demonstrated importance of the Project Area to the wood frog, the entire discussion of impacts to this species is lumped together into the few vague paragraphs in the DEIS that discuss generic impacts to small terrestrial invertebrates. These entirely inadequate paragraphs are included and discussed at Section D.3.d.(3) of these comments.

In addition to the fundamental failures of these generic paragraphs to meet the requirements of NEPA, we note that the habitat needs and life-cycle processes of amphibians are entirely different than those of small mammals. For example, amphibians thrive in cool wetland environments and small, isolated wetlands play especially important roles in amphibian productivity.[250] Amphibian populations thrive

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[247] Alaska Wildlife Action Plan 2015 at Appendix A, page 4 of 13.
[248] Alaska Wildlife Action Plan 2015 at 32.
[249] DEIS at 3.23-22.
[250] Gibbons, J. Whitfield, Christopher Winne, et. al. 2006. Remarkable Amphibian Biomass and Abundance in an Isolated Wetland: Implications for Wetland Conservation. Conservation Biology Volume 20, No. 5, 1457–1465.

when there are a variety of small ecosystems within a regional landscape in which a "dynamic equilibrium" of different populations becomes established.[251] Habitat fragmentation can disturb this dynamic equilibrium by disruption patterns of amphibian emigration and immigration.

The Alaska Department of Fish and Game had determined that it is important to prevent the loss of known breeding areas for wood frogs.[252] Alaska Fish and Game also provides the following information on the life-cycle and threats in Alaska facing the wood frog:

> "Widespread and relatively common in Alaska, especially on mainland, although overall population and trends are unknown. Recent high incidence of abnormalities reported in core of range is cause for concern. Recent increase in residential development in center of range threatens habitat availability and quality."
>
> ***
>
> "Explosive breeder, with all egg laying in a given pond generally occurring within a brief period of several days."
>
> ***
>
> "Migrates up to several hundred meters between breeding ponds and nonbreeding terrestrial habitats. After leaving the breeding pond, usually remains in an area without moving more than 100 m. In the Shenandoah Mountains, dispersal data indicated that ponds separated by a distance greater than 1000 m should experience little gene flow (Berven and Grudzien 1991). In Minnesota, populations were very similar in allelic frequencies even at distances greater than several kilometers, suggesting large individual movements (Squire and Newman 2002). However, sample sizes and number of loci examined were small, and genetic patterns do not necessarily reflect movement distances."
>
> ***
>
> **"State trend**
> Population trend is unknown but probably stable to slightly declining. Numerous reports from the Kenai Peninsula, the Anchorage Bowl, and Talkeetna area that indicate wood frogs are no longer present at historical breeding sites (Gotthardt, pers. comm. 2004)."
>
> ***
>
> **"State threat**
> One factor affecting this species is loss and fragmentation of habitat due to rapid residential and commercial development, particularly in southcentral Alaska. Filling or draining of wetland breeding habitat and alterations to ground or surface water flow from development are potential hazards. Recent studies in Alaska National Wildlife Refuges (NWRs) have found a

[251] Mann, W., P. Dorn, and R. Brandl. 1991. Local distribution of amphibians: The importance of habitat fragmentation. Global Ecology and Biogeography Letters 1:36-41.
[252] Alaska Department of Fish and Game, Wood Frog Species Information, https://www.adfg.alaska.gov/static/species/speciesinfo/_aknhp/Wood_Frog.pdf (accessed June 30, 2019).

prevalence of abnormalities in wood frogs, including missing, shrunken, or misshapen limbs, or abnormal eyes. Highest incidence of abnormalities reported from Kenai NWR ranged from 5.5% to 9.9% (0 to 19% at individual ponds) (Trust and Tangerman 2002); abnormalities were also detected in frogs from the Arctic NWR. Reasons for the abnormalities are unknown and are currently under investigation. Abnormalities from other geographic areas have been linked to disease agents, increased UV-B exposure, nutritional deficiencies, exposure to environmental contaminants, or a combination of these factors (Trust and Tangerman 2002)."

***

"State conservation and management needs
Prevent loss of known breeding areas. The current population trend should be evaluated, and threats to populations identified. If specific threats are identified, priority should be placed on reducing these threats such that the population would remain secure into the future."[253]

This information strongly suggests that the extensive loss of wood frog habitat that would result from Pebble Mine should be prevented, and that the extensive fragmentation and loss of habitat could be of significant concern, particularly in light of climate change induced impacts to amphibians. Despite the current relative abundance in Alaska, the future stability of Alaska's wood frog population is not at all guaranteed.

Indeed, amphibians in general are at critical risk worldwide. In the United States, the IUCN Red List of Threatened Species lists 56 amphibian species and 37 reptile species as known to be critically endangered, endangered, or vulnerable.[254] Worldwide, at least 1,950 species of amphibians are threatened with extinction of which 520 species are critically endangered, 783 are endangered, and 647 species are vulnerable. This represents 30 percent of all known amphibian species.[255] In 2004, scientists estimated that most of 1,300 other amphibian species are also threatened though sufficient data are currently lacking to be able to accurately assess the status of those species.[256]

A recent study demonstrates the increasingly dire conditions of amphibians worldwide:

> "Current extinction rates are most likely 136–2707 times greater than the background amphibian extinction rate. These are staggering rates of extinction that are difficult to explain via natural processes. No previous extinction event approaches the rate since 1980 (Benton and King, 1989).
>
> Despite the catastrophic rates at which amphibians are currently going extinct, these are dwarfed by expectations for the next 50 yr (Fig. 1). If the figure provided by Stuart et al. (2004)

[253] Id.
[254] IUCN Red List version 2013:2, Table 5: Threatened species in each country (totals by taxonomic group), available at http://cmsdocs.s3.amazonaws.com/summarystats/2013_2_RL_Stats_Table5.pdf (visited on November 24, 2013.)
[255] IUCN Red List version 2013:2, Table 3a: Status category summary by major taxonomic group (animals), available at http://cmsdocs.s3.amazonaws.com/summarystats/2013_2_RL_Stats_Table3a.pdf (visited on November 24, 2013).
[256] Science Daily, Amphibians In Dramatic Decline; Study Finds Nearly One-Third Of Species Threatened With Extinction (October 15, 2004), available at http://www.sciencedaily.com/releases/2004/10/041015103700.htm (visited on November 24, 2013).

is true (but see Pimenta et al., 2005; Stuart et al., 2005), one-third of the extant amphibians are in danger of extinction. This portends an extinction rate of 25,000–45,000 times the expected background rate. Episodes of this stature are unprecedented. Four previous mass extinctions could be tied to catastrophic events such as super volcanoes and extraterrestrial impacts that occur every 10 million to 100 million years (Wilson, 1992). The other mass extinction seems to be tied to continental drift of Pangea into polar regions leading to mass glaciation, reduced sea levels, and lower global temperatures (Wilson, 1992). The current event far exceeds these earlier extinction rates suggesting a global stressor(s), with possible human ties."[257]

Recent studies also point to the role of global climate change in promoting potentially catastrophic impacts to amphibian populations. For example:

- Global climate change will result in changes to weather and rainfall patterns that can have significant adverse effects on amphibians. Drought can lead to localized extirpation. Cold can induce winterkill in torpid amphibians. It is possible that the additional stress of climate change, on top of the stresses already created by severe loss of habitat and habitat fragmentation may jeopardize many amphibian species.[258]

- Recent studies suggest that climate change may be causing global mass extinctions of amphibian populations. Particularly alarming is the fact that many of these disappearances are occurring in relatively pristine area such as wilderness areas and national parks.[259] One recent study suggests that climate change has allowed the spread of a disease known as chytridiomycosis which has led to extinctions and declines in amphibians. Climate change has allowed this disease to spread by tempering the climate extremes that previously kept the disease in check.[260] About two-thirds of the 110 known harlequin frog species are believed to have vanished during the 1980s and 1990s because of the chytrid fungus *Batrachochytrium dendrobatidis.* Other studies indicate that amphibians may be particularly sensitive to changes in temperature, humidity, and air and water quality because they have permeable skins, biphasic life cycles, and unshelled eggs.[261]

[257] McCallum, M. L. (2007). "Amphibian Decline or Extinction? Current Declines Dwarf Background Extinction Rate. *Journal of Herpetology* 41 (3): 483–491. doi:10.1670/0022-1511(2007)41[483:ADOECD]2.0.CO;2.
[258] Sjogren, P. 1993a. Metapopulation dynamics and extinction in pristine habitats: A demographic explanation. Abstracts, Second World Congress of Herpetology, Adelaide, Australia, p. 244; Sjogren, P. 1993b. Applying metapopulation theory to amphibian conservation. Abstracts, Second World Congress of Herpetology, Adelaide, Australia, p. 244-245.
[259] Pounds, J. A., and M. L. Crump. 1994. Amphibian declines and climate disturbance: The case of the golden toad and the harlequin frog. Conservation Biology 8:72-85; Lips, K. R. 1998. Decline of a Tropical Montane Amphibian Fauna. Conservation Biology 12:106-117; Lips, K., F.Brem, R. Brenes, J.D. Reeve, R.A. Alford, J. Voyles, C. Carey, L. Livo, A. P. Pessier, and J.P. Collins 2006. Emerging infectious disease and the loss of biodiversity. Proceedings of the National Academy of Sciences 103:3165-3170.
[260] Pounds, J.A., M.P.L. Fogden, J.H. Campbell. 2006. Biological response to climate change on a tropical mountain. Nature 398, 611-615.
[261] Carey, C., and M. A. Alexander. 2003. Climate change and amphibian declines: is there a link? Diversity and Distributions 9:111-121.

- Climate change may also affect amphibian breeding patterns.[262] Amphibians spend a significant part of the year protecting themselves from cold or shielding themselves from heat. They receive cues to emerge from their shelters and to migrate to ponds or streams to breed from subtle increases in temperature or moisture. As the earth warms, one potential effect on amphibians is a trend towards early breeding, which makes them more vulnerable to snowmelt-induced floods and freezes common in early springs. Some studies already indicate a trend towards earlier breeding in certain amphibian species.[263]

- Increases in UV-B radiation in the northern hemisphere due to ozone depletion is also having an adverse impact on amphibians.[264] One study suggests that ultraviolet-B (UV-B) radiation adversely affects the hatching success of amphibian larvae.[265] High levels of UV-B also induced higher rates of developmental abnormalities and increased mortality in certain species (*Rana clamitans* and *R. sylvatica*) than others that were shielded from UV-B.[266] UV-B also can have detrimental effects on embryo growth.

The failure of the DEIS to meaningfully evaluate the impacts to wood frogs renders the DEIS inadequate.

e. Birds and Waterfowl

As fully documented in the comments by Trustees for Alaska, the Bristol Bay Watershed draws tens of millions of birds of more than 100 species from around the world. These migratory birds and waterfowl use the rich and productive waters of the watershed to breed, forage, and rest. The Bristol Bay watershed is one of the most productive areas in the world for marine birds. The Bristol Bay watershed and it's coast are recognized as an area of continental significance to North American ducks, geese, swans, shorebirds and other species.

Key coastal and marine bird species dependent on the Bristol Bay region include: Steller's Eider (threatened under the Endangered Species Act), King Eider (Audubon Watchlist), Black Scoter (International Union for Conservation of Nature Red List, Audubon Watchlist), Brant (Audubon Watchlist), Emperor Goose (International Union for Conservation of Nature Red List, Audubon Watchlist), Black-legged Kittiwake, Bar-tailed Godwits (Audubon Watchlist), Kittlitz's Murrelet (International Union for Conservation of Nature Red List), Glaucous-winged Gull, and Rock Sandpiper.

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[262] Carey, C., and M. A. Alexander. 2003. Climate change and amphibian declines: is there a link? Diversity and Distributions 9:111-121.

[263] Beebee, T. J. C. 1995. Amphibian Breeding and Climate. Nature 374:219-220; Blaustein, A. R., L. K. Belden, D. H. Olson, D. M. Green, T. L. Root, and J. M. Kiesecker. 2001. Amphibian breeding and climate change. Conservation Biology 15:1804-1809; Gibbs, J. P., and A. R. Breisch. 2001. Climate warming and calling phenology of frogs near Ithaca, New York, 1900-1999. Conservation Biology 15:1175-1178.

[264] Blumthaler, M., and W. Ambach. 1990. Indication of increasing solar ultraviolet-B radiation flux in alpine regions. Science 248:206-208; Kerr, J. B., and C. T. McElroy. 1993. Evidence for large upward trends of ultraviolet-B radiation linked to ozone depletion. Science 262:1032-1034.

[265] Blaustein, A. R., P. D. Hoffman, D. G. Hokit, J. M. Kiesecker, S. C. Walls, and J. B. Hays. 1994a. UV repair and resistance to solar UV-B in amphibian eggs: A link to population declines? *Proceedings of the National Academy of Science* 91:1791-1795.

[266] Grant, K. P., and L. E. Licht. 1993. Effects of ultraviolet radiation on life history parameters of frogs from Ontario, Canada. Abstracts, Second World Congress of Herpetology, Adelaide, Australia, p. 101.

The DEIS fundamentally fails to meaningfully assess the direct, indirect and cumulative impacts to the birds and waterfowl that utilize the Bristol Bay watershed. Instead, the DEIS takes an entirely inappropriate broad brush approach to all bird and wildlife impacts asserting that:

> "Impacts to all wildlife species from each variant are discussed collectively, and not subdivided based on species grouping (birds, terrestrial wildlife, and marine mammals), because many of the impacts from the variants would be similar across species groups." DEIS at 4.23-2.

This is a fundamentally incorrect conclusion that taints the entire impacts analysis. The DEIS repeats this flawed conclusion in its so-called analysis of impacts to birds:

> "The project has the potential to directly and indirectly impact breeding, wintering, migrating, and staging bird populations through behavioral disturbance, injury and mortality, and habitat changes as detailed in the following sections. The magnitude, extent, duration, and likelihood of impacts to raptors, waterbirds, landbirds, and shorebirds would be anticipated to differ among individual species; however, impacts are discussed collectively herein for the majority of avian groups." DEIS at 4.23-4.

Even the DEIS recognizes that lumping these species together makes no sense since impacts "would be anticipated to differ among species." The food source, breeding, resting, migratory, and other patterns of many bird species are entirely different, which can cause species to react to impacts in fundamentally different ways. For example, species that eat fish will respond differently to a loss of salmon than species that do not eat fish. Hawks and raptors have fundamentally different food source, breeding, and other life cycle needs than waterfowl and songbirds. And the list of differences goes on and on.

As with impacts to other species, the DEIS provides only the most general assessment of impacts. For example:

> "Birds may experience a wide range of impacts from noise sources within the mine site, transportation corridor, at the ferry terminals, at the port, and the natural gas compressor station on the Kenai Peninsula. In terms of duration, some of the noise sources would occur over the short term, (such as noise from construction of the mine facilities, installation of the natural gas pipeline, blasting in the road bed and material sites, and aircraft noise at Amakdedori port, among others), while others would occur during operations (blasting in the pit), and some for the life of the project (vehicle/equipment noise)." DEIS at 4.23-4.

* * *

> "In summary, the magnitude of the impact would be removal of 9,317 acres of habitat occupied by a variety of avian species. There would be loss of territories, potential abandonment of previous nesting locations, and interspecific species completion from habitat loss. However, the project would not be anticipated to result in population-level impacts for any bird species. The duration would be for the life of the project, however, some portions of the project would be restored and eventual revegetation would provide habitat post-mining. The extent of direct impacts would include the footprint of all components, plus additional surrounding habitat that would be indirectly impacted through behavioral avoidance, fugitive dust, potential for invasive plants, altered fire frequency, etc. Impacts would be expected to be noted because they would affect multiple bird species across many habitat types." DEIS at 4.23-13.

The DEIS also runs through a laundry list of problems that can result from noise and other impacts. For example:

> "Bird use of otherwise suitable habitat may be reduced due to sensitivity to noise. The degree of disturbance would vary among individuals, species, and time of year. Noise can change the composition of avian communities in favor of more noise-tolerant species, thereby reducing nesting species richness (number of species), although not necessarily density. Predatory birds may avoid noisy areas because it could mask their calls or make it more difficult to locate prey, thereby causing nests in noisier areas to be safer from predators (Francis et al. 2009). Birds migrating through the area may avoid the project vicinity during noisy periods rather than stopping over during migration. In terms of magnitude, noise may impact birds through changes in behavior (such as altered nesting and foraging locations and patterns), ability to communicate with conspecifics, ability to detect and recognize predators, decreased hearing sensitivity (both temporarily and permanently), increased stress that may lead to altered reproductive success, and potential interference with breeding individuals and populations (Dooling and Popper 2007). Some bird species are sensitive, at least during the breeding season, to noise levels; and the extent of impacts from disturbance can vary from several feet to more than 2 miles (Kaseloo and Tyson 2004)." DEIS at 4.23-4 to 4.23-5.

However, nowhere does the DEIS assess the actual impacts that are likely to occur as a result of the Pebble Project. For example, how many birds are expected to be effected from each species? Will at-risk species be affected and if so how much? Will species that are particularly important given their niche in the Bristol Bay ecosystem be affected and if so how much? Merely cataloguing potential impacts does not qualify as the hard look required by NEPA.

Notably, the DEIS also fails to meaningfully assess such things as indirect impacts to piscivorous birds from loss of salmon streams; acute and chronic impacts to birds from exposure to contaminants from potential tailings spills and leaks, or from exposure to contaminants in the pit lake and tailings ponds; impacts from spills of toxic reagents. The DEIS also fails to account for the significant cumulative impacts of climate change, which can significantly exacerbate impacts and can particularly exacerbate impacts to migratory birds (and mammals). The impacts of climate change on migratory species is discussed in detail in Section D.j.(2) of these comments.

f. Endangered Species

As a fundamental matter, NEPA requires a different level of analysis of impacts to threatened and endangered species than required under the Endangered Species Act (ESA). This is because the legal obligations under NEPA and the ESA are entirely separate, and each law applies fundamentally different standards. While full compliance with the ESA Section 7 prohibition against jeopardizing the continued existence of a species is absolutely critical, such compliance will not necessarily satisfy NEPA's

requirements to analyze significant impacts that fall short of the threat of extinction.[267] "Clearly, there can be a significant impact on a species even if its existence is not jeopardized."[268]

Notably, the analyses of impacts to listed species suffers from the same problems that taint the analyses of other impacts, as discussed throughout these comments. These failings will be compounded when assessing impacts to species that are already on the brink of extinction.

The failure to meaningfully address the adverse impacts to endangered species and critical habitat are discussed at length in Section E and Section B.3 of these comments.

g. Pipeline and Transportation Corridor Impacts

The DEIS fails to examine a wide array of impacts from the Pebble Project's pipeline and transportation corridor. These failings taint the entire impacts analysis.

Construction and use of the Pebble Project's major pipeline and transportation infrastructure will have significant impacts on wildlife and natural resource values. The Pebble Project includes an 83-mile long transportation corridor that stretches from the mine site to a port on Cook Inlet. This transportation corridor includes a 30-mile road, a ferry terminal, an 18-mile crossing of Lake Iliamna, another ferry terminal, a 35-mile road, a port facility and jetty for lightering and supply barges, offshore lightering locations, a 188-mile gas pipeline, and associated facilities. The reasonably foreseeable 78-year mine plan would add an entirely new pipeline, road, and deep-water port. This will directly destroy and fragment habitat, and add substantial vehicle, vessel and other traffic and otherwise increase human/wildlife interactions and disturbances in this largely intact and wild landscape.

The DEIS fails to examine numerous impacts from road and pipeline construction:

- **Habitat Fragmentation.** The impacts of habitat fragmentation are documented and well-known. Studies have shown that the fragmentation of a species' habitat can threaten that species survival for a variety of reasons. These include: reduction of total habitat area; vulnerability during dispersal to other patches of habitat (increased risk of predation to species during movement); isolation of a species population; edge effects (e.g., more "edge" habitat that changes the type and distribution of species); changes in microclimate (e.g., forested areas tend to be shadier, more humid and less windy, but more edge can alter these micro climates).[269]

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[267] *See Greater Yellowstone Coalition v. Flowers*, 359 F.3d 1257, 1275-76 (10th Cir. 2004) (recognizing that FWS' conclusion that the action is not likely to cause jeopardy does not necessarily mean the impacts are insignificant); *Makua v. Rumsfeld*, 163 F. Supp.2d 1202, 1218 (D. Haw. 2001) ("A FONSI . . . must be based on a review of the potential for significant impact, including impact short of extinction. Clearly, there can be a significant impact on a species even if its existence is not jeopardized."); *National Wildlife Federation v. Babbitt*, 128 F. Supp.2d 1274, 1302 (E.D. Cal. 2000) (requiring EIS under NEPA even though mitigation plan satisfied ESA); *Portland Audubon Society v. Lujan*, 795 F. Supp. 1489, 1509 (D. Or. 1992) (rejecting agency's request for the court to "accept that its consultation with [FWS under the ESA] constitutes a substitute for compliance with NEPA.").

[268] *Makua v. Rumsfeld*, 163 F. Supp.2d 1202, 1218 (D. Haw. 2001) ("A FONSI . . . must be based on a review of the potential for significant impact, including impact short of extinction. Clearly, there can be a significant impact on a species even if its existence is not jeopardized.")

[269] *See*, *e.g.*, The Wildlife Society, Fact Sheet, Wildlife Habitat Fragmentation, *available at*, http://wildlife.org/wp-content/uploads/2014/05/Wildlife-Habitat-Fragmentation.pdf (last visited June 25, 2019).

- **Truck Accidents.** In addition to fatalities, truck accidents along these roads could also release toxics and other contaminants into the environment. These accidents could release sodium ethyl xanthate, cyanide, other process chemicals, or molybdenum product concentrate to streams or wetlands, resulting in toxic effects on invertebrates and fish.[270] These impacts are not examined.

- **Spills.** The Project would use "approximately 16 million gallons of diesel annually." DEIS at 4.27-4. Fuel spills could contaminate Cook Inlet, the Bristol Bay headwaters, Lake Iliamna (at the ferry terminals and lake crossing corridor), streams along the corridor route, Amakdedori port or an alternative port location. The DEIS only considers larger spills and ignores the risks of other spills without justification. The transportation corridor provides opportunities for multiple spills, which either individually or cumulatively could have significant impacts.

    - The DEIS fails to analyze small spills. It only evaluates spills of over 3,000 gallons of diesel from a tanker truck; of approximately 3,850 gallons of copper-gold ore concentrate from a pipeline; of 5,700 gallons of copper-gold ore concentrate from a tanker truck; and of over 300,000 gallons of diesel from a marine barge. The DEIS acknowledges that "[s]mall spills of diesel (e.g., less than 50 gallons) are very common…." DEIS at ES-66. The DEIS should look at the impacts of smaller spills, which can have potentially significant impacts, both individually and collectively.

    - The DEIS fails to analyze the impact of heavy fuel oil spills, especially cumulatively over time, from ore carriers (this is compounded by the fact that the area experiences bad weather which could increase the number of spills and make responses slower and less effective).

    - Spills from ports are not analyzed, though as the comments of Trustees for Alaska et al point out, shore-based and marine facilities spills account for 1 out of 20 spills.

    - Spills at transfer points are not evaluated.

    - Spill response times are not properly analyzed, nor is the difficulty of responding in difficult weather conditions in a remote place, where it can often be extremely difficult to get equipment and people to the site of a spill and operate such equipment in icy, windy, stormy, or other difficult positions.

- **Fugitive dust.** The DEIS provides essentially no discussion about the impacts of dust from the road system. S*ee* DEIS at 4.14–3. The DEIS also fails to evaluate the impacts of dust once it enters freshwater aquatic ecosystems. The impacts of fugitive dust, which can contain highly toxic contaminants and completely cover critical vegetation, must be fully examined.

[270] USEPA 2014 Assessment at 19.

h. Tailings Failure

The DEIS fails to account for the all-too-real possibility of a full breach of the tailings storage facility. According to the DEIS the "probability of a full breach" of the tailings storage facility "was assessed to be extremely low" and as result a massive catastrophic release was "deemed unlikely" and "ruled out for analysis in the EIS." DEIS at 4.27-72 and 4.27-75.

Contrary to these assertions, it is well documented that large mine storage tailings facilities collapse with dangerous frequency, and when they do, the results are catastrophic to people and the environment. The Corps' failure to evaluate the impacts of a full breach of the Pebble Mine tailings facility is a fundamental—and unconscionable—violation of NEPA.

It is well documented that tailings dam failures for large mines are common and occur frequently.[271] For recent examples, one need look no further back than April of 2019.[272] A 2019 study found that the frequency and magnitude of tailings storage facility failures has doubled over the last 50 years.[273] A 2015 report titled *The Risk, Public Liability & Economics of Tailings Storage Facility Failure*, also found that the rate of serious tailings dams failures is increasing; that the rate of failures is propelled by, not in spite of, modern mining practices; and that the cost of cleanup exceeds what mining companies can afford.[274] This report concluded that regulators must "look beyond 'mechanisms of failure' to the fundamental financials of the miner, the mine, and mega trends that shape decisions and realities at the level of miner and individual mine."[275]

Notably, a tailings storage facility at the Pebble Mine could have as high as a 20% probability of failure over a 100-year life of the mine—and such a failure would release millions of tons of toxic waste into the Nushagak River, its floodplains, and eventually Bristol Bay.[276] The tailings facility's susceptibility to failure is evident on the face of its basic characteristics: the facility will be located in a seismically active and geologically and hydrologically sensitive area; the facility will contain acid- and selenium-generating rock; the facility eventually may reach 226 meters high, making it one of the tallest tailings storage facilities in the world; and the facility must be maintained in perpetuity.

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[271] *See e.g.*, World Information Service on Energy Uranium Project, Website*, Chronology of Major Tailings Dam Failures* (last updated June 5, 2019).
[272] World Information Service on Energy Uranium Project*, Chronology of Major Tailings Dam Failures* (last updated June 5, 2019).
[273] Santamarina, L. A., and R. C. Torres-Cruz. 2019. Why coal ash and tailings dam disasters occur. Science 364:526–528.
[274] Lindsay Newland Bowker & David M. Chambers, *The Risk, Public Liability, & Economics of Tailings Storage Facility Failures* (July 21, 2015) https://earthworks.org/cms/assets/uploads/archive/files/pubs-others/BowkerChambers-RiskPublicLiability_EconomicsOfTailingsStorageFacility%20Failures-23Jul15.pdf.
[275] *Id.* at 2.
[276] Wobus, T. 2019. A model analysis of flow and deposition from a tailings dam failure at the proposed Pebble Mine. Contract Number LYNK-2018-179. The Nature Conservancy, Boulder, Colorado.; DeMarban, A. 2019. Fishermen's group calls Corps' analysis of potential tailings dam failure at Pebble 'woefully inadequate.' Anchorage Daily News (March 1) (available at https://www.adn.com/business-economy/2019/03/02/fishermens-group-calls-corps-analysis-of-potential-tailings-dam-failure-at-pebble-woefully-inadequate/.)

A detailed analysis[277] of the impacts of a complete breach of the Pebble Mine tailings facility prepared for the Nature Conservancy reached the following chilling conclusions:

> "Under all of the scenarios tested, our model results indicate that the tailings from a dam breach would travel more than 75 kilometers (~50 miles) downstream, beyond the confluence with the Mulchatna River, where the majority of our simulations end. Over the entire modeled reach, the mudflow fills the valley bottoms, spreading tailings across the off-channel habitat in the floodplains. The tailings within this limited model domain alone would be deposited in approximately 250 kilometers (155 miles) of streams that are mapped as salmon habitat (Johnson and Blossom, 2018), and approximately 700 kilometers (435 miles) of streams that have been identified as potentially suitable for salmon spawning and/or rearing (Woll et al., 2012). In these simulations, up to 80% of tailings are still moving through the downstream boundary of the model.
>
> In the limited number of simulations where we expanded our model domain, the results indicate that the tailings under most scenarios would continue beyond the confluence with the Nushagak River, more than 130 kilometers (~80 miles) downstream. In these simulations, approximately 50% of the tailings are still moving through the downstream boundary of this model. Given the fine-grained nature of the material, it is extremely likely that these tailings would continue to Bristol Bay, where they would eventually settle out in the Nushagak River estuary. While we do not simulate the long-term fate of these tailings after the initial flood wave passes, the DEIS itself acknowledges that clean-up would be unrealizable in the event of a large-scale failure, and that natural attenuation would likely take decades.
>
> With more than 130 years of sustainable harvest, Bristol Bay ranks among the most important wild salmon fisheries on earth (Hilborn etal. 2003, Knapp etal 2013). Yet the risks associated with a large-scale failure of the proposed tailings storage facility at Pebble have not been evaluated in the Draft Environmental Impact Statement that is currently under review (USACE 2019). Based on our analysis, the impacts of such a failure could be catastrophic to salmon habitat in the Nushagak watershed and should not be ignored in the EIS process."[278]

As noted by the American Fisheries Society, "[t]hree recent tailings storage facility failures reinforce the high risk of mining in the Bristol Bay headwaters and the specific risk of attempting to retain tailings and contaminated water behind an unstable earthen tailings storage facility in perpetuity. The Mount Polley Mine in British Columbia and the Fundao, and Feijo mines in Brazil all experienced tailings facility failures

[277] Wobus, T. 2019. A model analysis of flow and deposition from a tailings dam failure at the proposed Pebble Mine. Contract Number LYNK-2018-179. The Nature Conservancy, Boulder, Colorado. This analysis "used publicly available data describing the physiography and hydrology of the region, and data published by PLP describing the proposed TSF design and other mine site characteristics, to build a model of tailings release and downstream transport. We developed our model using the FLO-2D software package, one of the few flood modeling packages capable of simulating the non-Newtonian flows that characterize tailings failures, and one that is commonly utilized by the mining industry for similar purposes (e.g., Knight Piesold, 2014; Tetra Tech, 2015). We used a comprehensive sensitivity analysis to evaluate how outcomes vary with different model parameters, and we developed a set of failure scenarios to bracket the range of potential downstream impacts for different release volumes and durations."

[278] Id. at Executive Summary.

in similar mining situations causing impacts such as human deaths, contaminated drinking water, destruction of aquatic life, and fisheries impacts."[279]

The failure to examine the full implications of a catastrophic failure of the tailings facility is a fundamental violation of NEPA.

i. Tribes

The Corps has identified at least 35 Tribes that may be affected by the Pebble Project. The DEIS, however, fails to adequately evaluate the impacts of the Pebble Project on the health, well-being, and culture of these Tribes. As noted above, Native Alaskans have lived in Bristol Bay for thousands of years, relying on the region's healthy waters and abundant salmon to sustain their way of life. Bristol Bay salmon remain the cornerstone of the cultures and communities of the region's Tribes.

Notably, a significant loss of salmon resources—which is highly likely as a result of the Pebble Project—could adversely affect the cultural stability of the Tribes. For example, the National Wildlife Federation has been advised through the Native American Rights Fund that:

- Tribal diets, which are heavily dependent on wild foods, particularly salmon, would be changed from a highly nutritious diet to one based on store-bought processed foods.

- Social networks and the current social support systems, which are highly dependent on procuring salmon (fish camps) and sharing salmon and wild food resources, would be appreciably degraded.

- Meaningful family-based multi-generational work that takes place in fish camps or similar subsistence settings, transmission of cultural values, and language learning would be impacted with resulting impacts to family cohesion.

- Values and the belief system that are represented by interaction with the natural world through salmon practices, clean water practices, and symbolic rituals would be challenged potentially resulting in a breakdown of cultural values, mental health degradation and behavioral disorders.

- Reductions in salmon populations could require a transition from part-time wage employment that provides adequate time for harvesting and processing wild foods to full-time wage employment that would impact subsistence-gathering capabilities.

- Shared subsistence practices have created a high degree of cultural uniformity that could be damaged by lack of salmon resources, potentially provoking increased tension and discord both between villages and among village residents.

In addition, Project-caused toxic contamination and reduced water quality would affect the health of Tribes and all people in the Bristol Bay watershed.

The DEIS fails to meaningfully assess these critical impacts.

[279] Comments of the American Fisheries Society.

j. Cumulative Impacts

The cumulative impacts analysis is a critical component of NEPA review. It ensures that the reviewing agency will not "treat the identified environmental concern in a vacuum."[280] Cumulative impacts are defined as:

> "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."[281]

In evaluating cumulative impacts:

> "The analyst's primary goal is to determine the magnitude and significance of the environmental consequences of the proposed action in the context of the cumulative effects of other past, present, and future actions. Much of the environment has been greatly modified by human activities, and most resources, ecosystems, and human communities are in the process of change as a result of cumulative effects. **The analyst must determine the realistic potential for the resource to sustain itself in the future and whether the proposed action will affect this potential; therefore, the baseline condition of the resource of concern should include a description of how conditions have changed over time and how they are likely to change in the future without the proposed action.** The potential for a resource, ecosystem, and human community to sustain its structure and function depends on its resistance to stress and its ability to recover (i.e., its resilience). Determining whether the condition of the resource is within the range of natural variability or is vulnerable to rapid degradation is frequently problematic. Ideally, the analyst can identify a threshold beyond which change in the resource condition is detrimental. More often, the analyst must review the history of that resource and evaluate whether past degradation may place it near such a threshold. For example, the loss of 50% of historical wetlands within a watershed may indicate that further losses would significantly affect the capacity of the watershed to withstand floods. **It is often the case that when a large proportion of a resource is lost, the system nears collapse as the surviving portion is pressed into service to perform more functions.**"[282]

A meaningful assessment of cumulative impacts must identify:

> "(1) the area in which effects of the proposed project will be felt; (2) the impacts that are expected in that area from the proposed project; (3) other actions – past, present, and proposed, and reasonably foreseeable – that have had or are expected to have impacts in the

[280] *Grand Canyon Trust v. FAA*, 290 F.3d 339, 346 (D.C. Cir. 2002).
[281] 40 C.F.R. § 1508.7.
[282] Council on Environmental Quality, *Considering Cumulative Effects Under the National Environmental Policy Act* (January 1997) at 41 (emphasis added).

same area; (4) the impacts or expected impacts from these other actions; and (5) the overall impact that can be expected if the individual impacts are allowed to accumulate."[283]

In conducting the cumulative impacts assessment, it is not enough to simply catalog past, present, and reasonably foreseeable future actions. An EIS instead must determine the specific impacts on the system of those actions and determine whether those impacts combined with the proposed action would significantly affect the ecological health and functioning of the area impacted by the project.

The DEIS fundamentally fails to assess cumulative impacts to determine the overall impacts that will occur if the individual impacts are allowed to continue.

In the case of the Pebble Project, the 78-year mine plan and climate change are two of the most significant cumulative impacts that must be examined. However, the DEIS fundamentally fails to look at either of those impacts in any type of meaningful way. For example, the baseline hydrologic data relied upon in the DEIS "reflect[s] only recent historical hydrologic variability at the mine site"[284] despite the fact that water management is not static and the hydrologic system is already undergoing changes as a result of climate change, as discussed in more detail below.

(1) 78-Year Mine Impacts

As discussed in Section D.2.c of these comments, the DEIS must fully evaluate the 78-year mine plan because it is a "connected action" under NEPA. This full analysis is also essential for properly analyzing the highly significant cumulative impacts of the Pebble Project.

While the DEIS acknowledges that at least at least 12,445 additional acres of wetlands would be destroyed by the 78-year mine,[285] the DEIS fundamentally fails to fully account for the full extent of the 78-year mine impacts or the cumulative impacts of that project. The few general sentences touching on the 78-year mine in the cumulative impact section provide nothing more than a description of the possible buildout of that project and do not provide any data, analysis or supporting information whatsoever.

The DEIS instead simply states—in numerous sections—that the 78-year mine expansion may impact, disturb or destroy more habitat for a longer period of time. For example:

- "These impacts would be additive to those of the proposed project. The expansion would increase the magnitude, duration, and geographic extent of the wetland impacts described under Alternative 1." DEIS at 4.22-40.

- The impacts for the 78-year mine "would be similar to those described previously in this section [for the 20-year case] but take place over a geographic area combining components of Alternatives 1 and 3." DEIS at 4.24-37.

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[283] *TOMAC, Taxpayers Of Michigan Against Casinos v. Norton*, 435 F.3d 852 (D.C. Cir. 2006) (quoting Grand Canyon Trust, 290 F.3d at 345); *Fritiofson v. Alexander*, 772 F.2d 1225, 1245 (5th Cir. 1985) (holding this level of detail necessary even at the less detailed review stage of an Environmental Assessment).
[284] *Id.*
[285] DEIS at 4.22-40.

- "The primary potential future impacts to fish from the Pebble mine expansion would be direct loss of habitat; fish displacement and injury; habitat degradation; and changes in the natural flow regime. These impacts would be similar to those described previously in this section, but take place over a geographic area combining components of Alternatives 1 and 3. With the mine expansion, the duration of these impacts would be extended by an additional 58 years of mining and 20 years of additional milling." DEIS at 4.24-37.

- "With the mine expansion, the duration of these impacts would be extended by an additional 78 years." DEIS 4.24–39.

- "At the mine site, an additional 21,546 acres of habitat would be lost. The habitat and wildlife species affected would be similar to those described above under "Alternative 1 – Applicant's Proposed Alternative." The expanded development would increase the magnitude, extent, duration, and likelihood of impacts. The longer duration would also increase the likelihood of injury or mortality and cause longer habitat avoidance of nearby areas." DEIS at 4.23-45.

This is fundamentally insufficient. Moreover, any assertion that impacts from an additional 78 years of mining would simply be similar or just "more of the same" is a gross mischaracterization of the impacts of the massive 78-year mine. The footprint impacts at the mine site alone would be monumental, along with the impacts of an entirely new road, pipeline, and deep-water port facility. The toxic contamination from mine operations combined with the direct and indirect habitat losses would be exponentially worse than the already untenable impacts of the proposed Pebble Projects.

The DEIS must look in detail at the full extent of the adverse impacts to streams, wetlands, water quality, hydrology, fish, wildlife, Tribes and the economy of the 78-year mine, and the full implications of the additive effect of those impacts and the Pebble Project's impacts on the ecological health of the Bristol Bay watershed. Like all other analyses in the DEIS, the cumulative impacts analysis must be supported by scientifically sound data and information.

(2) Climate Change Impacts

The DEIS must analyze the impacts of climate change in the cumulative impacts analysis. Indeed, the Ninth Circuit Court of Appeals has ruled that analyzing the impacts of climate change is "precisely the kind of cumulative impacts analysis that NEPA requires agencies to conduct."[286]

Climate change is already causing significant impacts in Alaska and these impacts will likely grow, as recognized by the recently released Fourth National Climate Assessment:[287]

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[286] *Center for Biological Diversity v. Nat'l Hwy Traffic Safety Administration*, 538 F.3d 1172, 1217 (9th Cir. 2008); *Center for Biological Diversity v. Kempthorne*, 588 F.3d 701, 711 (9th Cir. 2009) (NEPA analysis properly included analysis of the effects of climate change on polar bears, including "increased use of coastal environments, increased bear/human encounters, changes in polar bear body condition, decline in cub survival, and increased potential for stress and mortality, and energetic needs in hunting for seals, as well as traveling and swimming to denning sites and feeding areas.")

[287] Unless otherwise noted, all quotations from the Fourth National Assessment are from the following report and all internal citations have been omitted: Markon, C., S. Gray, M. Berman, L. Eerkes-Medrano, T. Hennessy, H. Huntington, J. Littell, M. McCammon, R. Thoman, and S. Trainor, 2018: Alaska. In *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II* [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington,

- "Climate warming is causing damage to infrastructure that will be costly to repair or replace, especially in remote Alaska. . . . These effects are very likely to grow with continued warming."

- "Climate change will likely affect management actions and economic drivers, including fisheries, in complex ways. The use of multiple alternative models to appropriately characterize uncertainty in future fisheries biomass trajectories and harvests could help manage these challenges. As temperature and precipitation increase across the Alaska landscape, physical and biological changes are also occurring throughout Alaska's terrestrial ecosystems. Degradation of permafrost is expected to continue, with associated impacts to infrastructure, river and stream discharge, water quality, and fish and wildlife habitat."

- "The rate at which Alaska's temperature has been warming is twice as fast as the global average since the middle of the 20th century. Statewide average temperatures for 2014–2016 were notably warmer as compared to the last few decades, with 2016 being the warmest on record. Daily record high temperatures in the contiguous United States are now occurring twice as often as record low temperatures. In Alaska, starting in the 1990s, high temperature records occurred three times as often as record lows, and in 2015, an astounding nine times as frequently."

- "[A]verage annual precipitation increases are projected for all areas of the state."

- "Annual maximum one day precipitation is projected to increase by 5%–10% in southeastern Alaska and by more than 15% in the rest of the state, although the longest dry and wet spells are not expected to change over most of the state."

- "Alaska, is projected to receive more precipitation in the winter and spring."[288]

- "The distribution of many ocean fish species is shifting northward as the ranges of warmer-water species expand and colder-water species contract in response to rising ocean temperatures (Ch. 9: Oceans, KM 2), with the confirmed presence of 20 new species and 59 range changes in the last 15 years in the Chukchi and Beaufort Seas. In the Bering Sea, Alaska pollock, snow crab, and Pacific halibut have generally shifted away from the coast and farther from shore since the early 1980s. These changes reflect possible northward shifts in species distributions, particularly in the Bering Strait region.

The Fourth National Climate Assessment further concludes that:[289]

DC, USA, pp. 1185–1241. doi: 10.7930/NCA4.2018.CH26. Available at https://nca2018.globalchange.gov/chapter/alaska.

[288] Easterling, D.R., K.E. Kunkel, J.R. Arnold, T. Knutson, A.N. LeGrande, L.R. Leung, R.S. Vose, D.E. Waliser, and M.F. Wehner, 2017: Precipitation change in the United States. In: *Climate Science Special Report: Fourth National Climate Assessment, Volume I* [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 207-230, doi: 10.7930/J0H993CC.

[289] Each of these quotations come from: **Taylor**, P.C., W. Maslowski, J. Perlwitz, and D.J. Wuebbles, 2017: Arctic changes and their effects on Alaska and the rest of the United States. In: *Climate Science Special Report: Fourth National Climate Assessment, Volume I* [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 303-332, doi: 10.7930/J00863GK."

- "Annual average near-surface air temperatures across Alaska and the Arctic have increased over the last 50 years at a rate more than twice as fast as the global average temperature (*very high confidence*)."

- "Rising Alaskan permafrost temperatures are causing permafrost to thaw and become more discontinuous; this process releases additional carbon dioxide and methane, resulting in an amplifying feedback and additional warming (*high confidence*). The overall magnitude of the permafrost–carbon feedback is uncertain; however, it is clear that these emissions have the potential to compromise the ability to limit global temperature increases."

- "Arctic land and sea ice loss observed in the last three decades continues, in some cases accelerating (*very high confidence*). It is *virtually certain* that Alaska glaciers have lost mass over the last 50 years, with each year since 1984 showing an annual average ice mass less than the previous year. Based on gravitational data from satellites, average ice mass loss from Greenland was −269 Gt per year between April 2002 and April 2016, accelerating in recent years (*high confidence*). Since the early 1980s, annual average arctic sea ice has decreased in extent between 3.5% and 4.1% per decade, become thinner by between 4.3 and 7.5 feet, and began melting at least 15 more days each year. September sea ice extent has decreased between 10.7% and 15.9% per decade (*very high confidence*). Arctic-wide ice loss is expected to continue through the 21st century, *very likely* resulting in nearly sea ice-free late summers by the 2040s (*very high confidence*)."

- "It is *very likely* that human activities have contributed to observed arctic surface temperature warming, sea ice loss, glacier mass loss, and Northern Hemisphere snow extent decline (*high confidence*)."

The Alaska Wildlife Action Plan acknowledges that climate change is the "most impactful threat to wildlife in Alaska""

> "Climate change is likely the most impactful threat to wildlife in Alaska. Species that inhabit the northern edge of the continent, or that depend on sea ice, are most vulnerable to climate change because their niche is not just shifting, it is disappearing. Climate change has been the principle driver of ESA listing petitions in Alaska in the last 15 years, and is the basis for recent positive findings with respect to ice seals and polar bears. Even though these species may be fairly abundant at present, there is uncertainty about their status in the future. For many marine aquatic species, the potential for climate change, and associated oceanographic effects (e.g., current patterns, acidification, temperature rise) could affect entire food chains. For these reasons, climate change is a very high priority threat."[290]

As also discussed in Section D.3.e and Section E of these comments, the impacts of climate change are particularly significant for marine mammals and migratory birds. As recognized by the United Nations Environment Program and the Convention on the Conservation of Migratory Species of Wild Animals, migratory wildlife is particularly vulnerable to the impacts of climate change:

[290] Alaska Wildlife Action Plan 2015 at 144.

> "As a group, migratory wildlife appears to be particularly vulnerable to the impacts of Climate Change because it uses multiple habitats and sites and use a wide range of resources at different points of their migratory cycle. They are also subject to a wide range of physical conditions and often rely on predictable weather patterns, such as winds and ocean currents, which might change under the influence of Climate Change. Finally, they face a wide range of biological influences, such as predators, competitors and diseases that could be affected by Climate Change. While some of this is also true for more sedentary species, migrants have the potential to be affected by Climate Change not only on their breeding and non-breeding grounds but also while on migration."
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> "Apart from such direct impacts, factors that affect the migratory journey itself may affect other parts of a species' life cycle. Changes in the timing of migration may affect breeding or hibernation, for example if a species has to take longer than normal on migration, due to changes in conditions *en route*, then it may arrive late, obtain poorer quality breeding resources (such as territory) and be less productive as a result. If migration consumes more resources than normal, then individuals may have fewer resources to put into breeding . . . ."
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> * * *
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> "Key factors that are likely to affect all species, regardless of migratory tendency, are changes in prey distributions and changes or loss of habitat. Changes in prey may occur in terms of their distributions or in timing. The latter may occur though differential changes in developmental rates and can lead to a mismatch in timing between predators and prey ("phenological disjunction"). Changes in habitat quality (leading ultimately to habitat loss) may be important for migratory species that need a coherent network of sites to facilitate their migratory journeys. Habitat quality is especially important on staging or stop-over sites, as individuals need to consume large amounts of resource rapidly to continue their onward journey. Such high quality sites may [be] crucial to allow migrants to cross large ecological barriers, such as oceans or deserts."[291]

Migratory seals and birds are at particular risk from climate change. The climate change impacts on seal populations include changes in the distribution, abundance, and community composition of their food supply; impacts of warmer waters on reproduction; and "loss of undisturbed haul-out sites, due to sea-level rise, which are used for breeding, nurseries and resting."[292] Migratory birds are affected by changes in water regime, mismatches with food supply, sea level rise, and habitat shifts, changes in prey range, and increased storm frequency.[293]

A 2011 study published in *Science,* concludes that average geographical range shifts for marine communities due to climate change over the past 50 years are from 1.4 to 28 km per decade—or 0.9 to

[291] UNEP/CMS Secretariat, Bonn, Germany, *Migratory Species and Climate Change: Impacts of a Changing Environment on Wild Animals* (2006) at 40-41 (available at http://www.cms.int/publications/pdf/CMS_CimateChange.pdf).
[292] *Id*. at 42.
[293] *Id*. at 42-43.

17.4 miles per decade.[294] Shifts in seasonal timing for marine species are advancing an average of 4.3 days per decade in the oceans.[295] This study also concludes that range shifts in the ocean are from 1.5 to 5 times faster than range shifts on land, likely due to the more homogeneous nature of surface water temperature changes in the ocean than on land, and shifts in the timing of spring temperatures were 30 to 40% faster in the ocean than on land (from 1960–2009).[296] A 2010 study published in *Global Ecology and Biogeography* also concludes that range shifts occurred much faster in marine systems than terrestrial systems, and noted that most of the species documented as shifting their range were coastal species.[297] A 2009 study published in *Fish and Fisheries*, projected a climate-change induced range shift for marine fish and invertebrates of "45–59 km per decade"—or 28 to 37 miles per decade.[298]

The impacts of climate change must be fully addressed and accounted for in the DEIS.

4. The Mitigation "Analysis" Does Not Comply with NEPA

The DEIS "analysis" of mitigation is profoundly deficient. It ignores longstanding NEPA requirements and does not come close to achieving the fundamental purpose of the mitigation analysis, which is to ensure that the Corps and the public can properly evaluate the severity of the harm from the Pebble Project. Among many other significant problems, the compensatory mitigation discussion proposes no mitigation at all for a vast array of extensive impacts and only proposes mitigation that is guaranteed to fail to replace the functions and values of the remaining vital habitat lost to the project.

The DEIS must provide "a reasonably complete discussion of possible mitigation measures" to ensure that the Corps and the public "can properly evaluate the severity of the adverse effects" of Pebble Mine.[299] To achieve this objective, mitigation measures must be discussed with "sufficient detail to ensure that environmental consequences have been fairly evaluated."[300] "A mere listing of mitigation measures is insufficient to qualify as the reasoned discussion required by NEPA."[301] A "perfunctory description" of mitigation measures is likewise not sufficient.[302] The mitigation analysis must also provide "an assessment of whether the proposed mitigation measures can be effective,"[303] and that

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[294] Michael T. Burrows, Schoeman D.S., Buckley L.B., et al, The Pace of Shifting Climate in Marine and Terrestrial Ecosystems. Science, Vol 334: 652-55 (Nov. 4, 2011).
[295] *Id*.
[296] *Id*.
[297] Cascade J. B. Sorte, S.L. Williams and J.T Carlton, Marine range shifts and species introductions: comparative spread rates and community impacts**,** Global Ecology and Biogeography (2010) 19, 303–316. The study defines range shifts "as any changes in the distributions of native species that are not directly human mediated." The study also concludes that "[r]ange shifts of native species and introductions of non-native species are analogous in that both are fundamentally biological invasions, involving the movement of individuals from a donor community into a recipient community." A copy of this study is attached to these comments.
[298] William W.L. Cheung, V.W.Y. Lam, J.L. Sarmiento, K. Kearney, R. Watson and D. Pauly, Projecting global marine biodiversity impacts under climate change scenarios, Fish and Fisheries, 10, 235–251 (2009).
[299] *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 352 (1989).
[300] *Id*.
[301] *Northwest Indian Cemetery Protective Assn. v. Peterson*, 764 F.2d 581, 697 (9th Cir. 1985), rev'd on other grds, 485 U.S. 439 (1988).
[302] *Neighbors of Cuddy Mountain v. U.S. Forest Service*, 137 F.3d 1372, 1380 (9th Cir.1998).
[303] *S. Fork Band Council of W. Shoshone of Nev. v. U.S. Dep't of the Interior*, 588 F.3d 718, 727 (9th Cir. 2009); *Neighbors of Cuddy Mountain v. U.S. Forest Serv.*, 137 F.3d 1372, 1381 (9th Cir. 1998) (disapproving an EIS that lacked an assessment of mitigation effectiveness); *Sierra Club v. Bosworth* (*Bosworth II*), 510 F.3d 1016, 1029 (9th

assessment must be supported by "substantial evidence in the record."[304] A bald assertion that mitigation will be effective is not sufficient.

The Corps may **not** defer compliance with these mitigation assessment requirements until the Clean Water Act 404 permitting process is complete, as doing so would dramatically undermine the action-forcing purpose of the DEIS. The Corps also may **not** simply defer to the Draft Conceptual Mitigation Plan prepared by PLP as the Corps "bears the primary responsibility to ensure that it complies with NEPA," including the NEPA mitigation requirements.[305]

These longstanding requirements have been applied by the Courts to reject vague, perfunctory, and unsupported mitigation discussions like the one in the DEIS. For example:

- In *Neighbors of Cuddy Mountain*, the Ninth Circuit Court of Appeals rejected a mitigation discussion that provided only a "perfunctory description of mitigating measures"[306] and failed to assess mitigation effectiveness.

> "The Forest Service's discussion of mitigation consisted of the following:
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> > [S]mall increases in sedimentation and other effects of logging and road construction in Grade and Dukes creeks would be mitigated by improvements in fish habitat in other drainages.... Even minor improvements in other drainages, such as Wildhorse River or the Weiser River, would affect more fish habitat than exists in Grade and Dukes creeks. . . . Offsetting mitigation would include such projects as riparian enclosures (fences around riparian areas to keep cattle out) and fish passage restoration (removing fish passage blockages). These activities can be effective but cannot be quantified with present data."[307]
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> * * *
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> "While acknowledging that the Grade/Dukes sale would negatively impact the redband trout by increasing sedimentation levels, the Forest Service did not discuss which (or whether) mitigating measures might decrease the increased sedimentation in the three creeks affected by the timber sale. In fact, we read the EIS as suggesting that the Forest Service did not even consider mitigating measures for the creeks actually affected by the sale, apparently because the Forest Service believes that mitigating measures elsewhere

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Cir. 2007) (stating an agency must also provide supporting analytical data discussing the effectiveness of the relevant mitigation measures).

[304] *Wyoming Outdoor Council v. U.S. Army Corps of Eng'rs*, 351 F. Supp. 2d 1232, 1252 (D. Wyo. 2005); *Sierra Club v. Bosworth* (*Bosworth II*), 510 F.3d 1016, 1029 (9th Cir. 2007) (stating an agency must also provide "supporting analytical data" discussing the effectiveness of the relevant mitigation measures); *Neighbors of Cuddy Mountain v. U.S. Forest Serv.*, 137 F.3d 1372, 1381 (9th Cir. 1998) (disapproving an EIS that lacked an assessment of mitigation effectiveness).

[305] *Department of Transp. v. Public Citizen*, 541 U.S. 752, 765 (2004); 'Ilio'ulaokalani Coalition v. Rumsfeld, 464 F.3d 1083, 1092 (9th Cir. 2006); *see also Friends of the Clearwater v. Dombeck*, 222 F.3d 552, 559 (9th Cir.2000) ("Compliance with NEPA is a primary duty of every federal agency; fulfillment of this vital responsibility should not depend on the vigilance and limited resources of environmental plaintiffs.")..

[306] *Neighbors of Cuddy Mountain v. U.S. Forest Serv.*, 137 F.3d 1372, 1380 (9th Cir. 1998).

[307] *Id*. at 1380.

> in Payette could "compensate" for the harms caused to the three creeks in the Grade/Dukes area. It is also not clear whether any mitigating measures would in fact be adopted. Nor has the Forest Service provided an estimate of how effective the mitigation measures would be if adopted, or given a reasoned explanation as to why such an estimate is not possible."[308]

- In *Idaho Sporting Congress*, the Ninth Circuit Court of Appeals rejected a mitigation discussion that lacked "analytical data to support the proposed mitigation measures":

> "The Forest Service also argues that water quality will not be affected by the proposed logging because of the mitigation measures described in the EA that will be undertaken. However, since the effects of the sale will not be known until the EIS is prepared we cannot know whether the mitigation measures are sufficient. In the context of an EIS, an agency is required to "discuss the extent to which adverse effects can be avoided" by mitigation measures. "A mere listing of mitigation measures is insufficient to qualify as the reasoned discussion required by the NEPA." Without analytical data to support the proposed mitigation measures, we are not persuaded that they amount to anything more than a "mere listing" of good management practices."[309]

- In *Northwest Indian Cemetery Protective Association*, the Ninth Circuit Court of Appeals rejected mitigation discussions in two EISs that merely described "mitigation measures in part" but did not "analyze[] the mitigation measures in detail or explain[] how effective the measures would be."[310] The Ninth Circuit clarified that "[a] mere listing of mitigation measures is insufficient to qualify as the reasoned discussion required by NEPA."[311]

- In *South Fork Band Council of West Shoshone*, the Ninth Circuit Court of Appeals rejected a mitigation discussion that did "not in fact assess the effectiveness of the mitigation measures relating to groundwater" but instead said only that "[f]easibility and success of mitigation would depend on site specific conditions and details of the mitigation plan."[312]

- In *High Sierra Hikers Association*, the U.S. District Court for the Northern District of California rejected a Forest Service mitigation discussion that provided only a vague description of measures that the Forest Service knew would not work:

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[308] *Id*. at 1381.

[309] *Idaho Sporting Congress v. Thomas*, 137 F.2d 1146, 1151 (9th Cir. 1998) (internal citations omitted). Note that an unrelated finding in *Idaho Sporting Congress*, but not the *Idaho Sporting Congress* decision, was overruled by *The Lands Council v. McNair*, 537 F.3d 981, 997 (9th Cir. 2008) ("To the extent we suggested in *Idaho Sporting Congress v. Thomas,* 137 F.3d 1146 (9th Cir.1998), that habitat cannot be used as a proxy when there is an "appreciable habitat disturbance," *id.* at 1154, *Thomas* is overruled. A habitat disturbance does not necessarily mean that a species' viability will be threatened. Thus, a planned disturbance to a habitat does not preclude the Forest Service from using the habitat as a proxy approach to establish a species' viability when the disturbance does not reduce the suitable habitat so as to threaten that species' viability.")

[310] *Northwest Indian Cemetery Protective Assoc. v. Peterson*, 795 F.2d 688, 697 (9th Cir.1986), rev'd on other grounds, Lyng v. Northwest Indian Cemetery Protective Assoc., 485 U.S. 439 (1988).

[311] *Id*.

[312] *South Fork Band Council of W. Shoshone of Nev. v. U.S. Dep't of the Interior*, 588 F.3d 718, 727 (9th Cir. 2009).

> "[T]he Forest Service has failed to provide specific information regarding mitigation measures to protect Yosemite Toad habitat. Instead, the Forest Service simply assigns responsibility for stock management to the packstock operators despite the fact that it is 'likely packstock could drift into breeding areas on occasion even under close management.' . . . Relying on the packstock operators to monitor their stock to exclude them from breeding habitat despite the reality that even close management will not prevent drift of stock into that sensitive habitat does not constitute an adequate discussion of mitigation measures or the requisite hard look at this issue." [313]

By contrast, the Ninth Circuit found that a Forest Service mitigation analysis was sufficient where the Forest Service conducted computer modeling to predict the quality and quantity of environmental effects, discussed the monitoring measures to be put in place, ranked the probable efficacy of the different measures, detailed steps to achieve compliance should the measures fail, and identified the environmental standards by which mitigation success could be measured. This EIS described mitigation measures for a gold mine project, including comprehensive monitoring, methods to prevent overflow from the project from affecting water quality, and further methods for achieving water quality standards if initial methods fail. Each mitigation process was also evaluated separately and given and effectiveness rating. This mitigation discussion was deemed to be adequate in part because the project's adverse effects were "uncertain, and the EIS considered extensively the *potential* effects and mitigation processes. . . ."[314]

The DEIS fails to satisfy the important NEPA mitigation requirements for at least the following reasons.

a. Mitigation Is Not—And Cannot Be—Meaningfully Assessed Because Project Impacts Are Not Adequately Assessed

The DEIS does not—and cannot—properly assess the extent to which adverse impacts can be avoided through mitigation because it does not meaningfully evaluate the full range and extent of direct, indirect, and cumulative adverse environmental impacts that will result from construction and operation of Pebble Mine and its attendant transportation and pipeline infrastructure. The many failings with the DEIS impacts analyses are discussed in detail throughout these comments.

It is not possible to know the type and amount of needed mitigation until the full extent of impacts are known. It also is not possible to assess the potential effectiveness of mitigation measures without knowing the full extent of the project's adverse impacts, the specific impacts that will be mitigated and the targeted ecological success criteria, and specific information on the proposed mitigation measures, among other things.

While the DEIS is not required to include a completed mitigation plan, the mitigation discussion must be vastly more extensive and robust than the one contained in the DEIS. As noted above, the Corps has the primary responsibility of complying with the NEPA mitigation requirements, and it may not defer identifying impacted resources, identifying needed mitigation, and providing a sufficiently detailed discussion of mitigation measures until after the public comment period or after finalization of a Clean Water Act permit. Doing so would fundamentally undermine the action-forcing purpose of NEPA.

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[313] *High Sierra Hikers Assn v. Weingardt*, 521 F.Supp.2d 1065, 1087 (2007).
[314] *Okanogan Highlands Alliance v. Williams, 236* F.3d *468, 473–77 (*9th Cir*. 2000)*.

b. Mitigation Is Not Discussed with Sufficient Detail to Ensure Fair Evaluation of Environmental Consequences

The DEIS fails to discuss mitigation measures with "sufficient detail to ensure that environmental consequences have been fairly evaluated," as required by law.[315] In direct violation of NEPA, the DEIS provides: (a) only the most general description of efforts taken to avoid adverse impacts; (b) only a general list of measures that might be incorporated into the project to minimize adverse impacts; and (c) only the most perfunctory and unformulated discussion of a possible "approach" to compensatory mitigation.

(1) Measures to Avoid Adverse Impacts

As discussed in Section B of these comments, the DEIS provides only the most general description of efforts taken to avoid adverse impacts in the first instance—and the DEIS fundamentally fails to demonstrate that the proposed alternative is the least environmentally damaging practicable alternative, as required by the Clean Water Act.

(2) Measures to Minimize Adverse Impacts That Cannot Be Avoided

In direct violation of NEPA, the DEIS provides only the most generic description of measures that might be used to help minimize adverse impacts that cannot be avoided. These descriptions are contained in a single Table entitled "Proposed Mitigation Incorporated into the Project," which provides only a few perfunctory sentences on these possible measures. DEIS at 5-6, Table 5-2. Table 5-2 is devoid of any detail, analytical data, or discussion of effectiveness.

The DEIS contends that:

> "To the extent possible, these [Table 5-2] measures, including any potential impacts associated with these measures, were considered when assessing the impacts of the project on the resources, as described in Chapter 4, Environmental Consequences. Where there is insufficient detail to determine effectiveness, the measure could not be incorporated into the impact analysis, but serves to inform the public of PLP's commitments."

DEIS at 5-5. However, neither Chapter 4 nor Chapter 5 identify which, if any, of these measures have sufficient detail to determine effectiveness.

Notably, the National Wildlife Federation was unable to locate any substantive discussion of the effectiveness of the Table 5-2 mitigation measures in Chapter 4. For example:

- Table 5-2 references a Fugitive Dust Control Plan, but Chapter 4 does not provide any details on the plan or its effectiveness, and instead merely states that such a plan will be developed.

- Table 5-2 references an Aquatic Resources Monitoring Plan, but there is no mention of that plan in the Chapter 4 discussion of impacts to aquatic resources.

[315] Robertson v. Methow Valley Citizens Council, 490 U.S. 332, 352 (1989).

- Table 5-2 references a Storm Water Pollution and Prevention Plan, but Chapter 4 does not provide any details on that plan or its effectiveness, and instead merely states that such a plan will be developed.

- Table 5-2 references a Wildlife Management Plan, but Chapter 4 does not provide any discussion of the effectiveness of such a plan despite providing some information on the types of issues that the plan will address:

    - "The WMP would include measures to reduce the attractiveness of the mine site to common ravens and other species, as well as adaptive management measures. These effects from roadkill and mine site management practices would be of longterm duration." DEIS at 4.23-11.

    - "Although the WMP would include methods to exclude large mammalian wildlife from the pit lake, there is a potential that waterbirds would use the pit lake, especially during migration." DEIS at 4.23-11.

    - "Although the landfill would be operated according to permit conditions (if issued), the WMP would detail additional measures, should food-conditioned wildlife become a problem." DEIS at 4.23-14.

    - "The WMP would outline ways to reduce the potential for wildlife mortality along the road; however, varying weather and seasonal conditions would likely cause periods of increased mortality for some species (such as increased moose mortality during winter months, and reduced bear mortality during hibernation). The duration of these impacts would be long term, lasting through the life of the project." DEIS at 4.23-19.

Table M-1 in Appendix M does purport to address the effectiveness of "avoid and minimize" mitigation measures suggested by the Corps, cooperating agencies, and the public during the scoping process. However, this Table is bereft of any actual analysis of effectiveness, is devoid of analytical data, and typically uses just a single word to proclaim a measure's alleged level of effectiveness. Of the 23 different mitigation measures identified in Table M-1:

- 15 pronounce the level of effectiveness with a **single word**—10 use "Yes"; 3 use "Potentially"; 1 uses "No"; 1 uses "Unknown".

- 7 pronounce the level of effectiveness with a **single sentence**—2 use "Yes" plus one sentence, 2 use "No" or "Not" plus one sentence; 2 use "Potentially" plus one sentence, 1 uses "Unknown" plus one sentence.

- 1 pronounces the level of effectiveness with **two sentences** ("Yes" plus two sentences).

DEIS, Table M-1, Appendix M.

In short, the DEIS fundamentally fails to evaluate the ability of the proposed mitigation measures to effectively minimize adverse impacts, as required by law.[316]

(3) Compensatory Mitigation Measures

The DEIS discussion of compensatory mitigation measures is patently inadequate. It provides no details on potential measures and no information on potential effectiveness. Indeed, the only information that can be gleaned from the demonstrably inadequate discussion of compensatory mitigation is that there is **no chance at all** that the proposed mitigation will replace the lost functions and values of the vast array of aquatic resources that will be destroyed and damaged by the Pebble Project.

a. The DEIS Proposes No Compensatory Mitigation for a Vast Array of Highly Significant Adverse Impacts

The DEIS proposes no compensatory mitigation at all for a vast array of highly significant adverse impacts to aquatic resources and wildlife habitat that are recognized in the DEIS—and as discussed throughout these comments, the full extent of the harm from Pebble Mine will be much, much greater.

The DEIS is only proposing compensatory mitigation "for 3,524 acres of unavoidable impacts to WOUS and aquatic resource functions in the watersheds" despite acknowledging that at least 6,415 acres of wetlands and 81 miles of salmon streams will be destroyed or severely damaged. DEIS at 5-24. The DEIS also acknowledges that 10,341 acres of wildlife habitat would be permanently lost to the project.[317] DEIS 4.23-33. However, the DEIS:

- Explicitly **rejects** compensatory mitigation for so-called "temporary impacts" to 513 acres of pristine wetlands based on a wholly unsubstantiated claim that those wetlands and "their functions would be expected to be reclaimed." DEIS at 5-24.

- Proposes **no** compensatory mitigation for the 449 acres of wetlands that will be dewatered by the project, despite the obvious loss of wetland functions caused by such dewatering.

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[316] *S. Fork Band Council of W. Shoshone of Nev. v. U.S. Dep't of the Interior*, 588 F.3d 718, 727 (9th Cir. 2009); *Sierra Club v. Bosworth* (*Bosworth II*), 510 F.3d 1016, 1029 (9th Cir. 2007) (stating an agency must also provide supporting analytical data discussing the effectiveness of the relevant mitigation measures); *Neighbors of Cuddy Mountain v. U.S. Forest Serv.*, 137 F.3d 1372, 1381 (9th Cir. 1998) (disapproving an EIS that lacked an assessment of mitigation effectiveness); *Wyoming Outdoor Council v. U.S. Army Corps of Eng'rs*, 351 F. Supp. 2d 1232, 1252 (D. Wyo. 2005); *Sierra Club v. Bosworth* (*Bosworth II*), 510 F.3d 1016, 1029 (9th Cir. 2007) (stating an agency must also provide "supporting analytical data" discussing the effectiveness of the relevant mitigation measures).

[317] While in general, wildlife habitat of course includes wetlands, the DEIS does not make clear whether this acreage impact number includes wetlands or is limited to non-wetland habitat. DEIS 4.23-3 ("In terms of magnitude, construction and operations of the transportation and natural gas pipeline corridors would result in loss of wildlife habitat detailed in Chapter 2, Alternatives (Table 2-2). Habitat removal would result in edge effects, such as wildlife traveling along the road in winter (especially if the road would be plowed), dust accumulation on surrounding vegetation, changes in plant phenology due to earlier spring melt in vegetation along the road prism, and other vegetation changes that directly affect foraging habitat for wildlife species. The magnitude and extent of impacts would be the loss of 10,341 acres, which includes all mine components. The duration would last for the life of the project, and the extent would include all of the mine components.")

- Proposes **no** compensatory mitigation for the significant loss of wetland functions that will result from blanketing 1,896 acres of wetlands and other waters with "fugitive dust."

- Proposes **no** compensatory mitigation for the 81 miles of pristine streams that will be destroyed by the project.

- Proposes **no** compensatory mitigation of the functions lost due to significant changes in stream flows.

- Proposes **no** compensatory mitigation for the virtually certain, highly significant adverse impacts to water quality.

- Proposes **no** compensatory mitigation for thousands of acres of non-aquatic wildlife habitat.[318]

- Proposes **no** compensatory mitigation for any of the highly significant indirect and cumulative impacts.

- Proposes **no** compensatory mitigation to address temporal impacts or to account for the high probability that mitigation efforts will not fully replace lost functions and values.

As a result, the proposed mitigation is **guaranteed to be entirely ineffective** at replacing the lost functions and values of many thousands of acres of pristine wetlands, many dozens of miles of untouched streams, and many thousands of acres of other wildlife habitat that will be damaged and destroyed by the Pebble Project. The proposed mitigation would also be entirely ineffective for minimizing the impacts of the Pebble Project on the long-term productivity of Bristol Bay salmon. A recent study has determined that the most productive Bristol Bay salmon habitat shifts location from year to year, potentially magnifying the harm from the streams and wetlands that will be lost to the project [319]

b. The Discussion of Compensatory Mitigation that is Proposed is Shamelessly Deficient

The nominal discussion of the compensatory mitigation "for 3,524 acres of unavoidable impacts to WOUS and aquatic resource functions in the watersheds" that the DEIS does propose is shamelessly deficient. DEIS at 5-24. That discussion provides **no detail at all**, let alone the sufficient detail required to ensure that the environmental consequences of the Pebble Project have been fairly evaluated.

According to the DEIS, on-site and in-kind compensatory mitigation is not practical and compensatory mitigation efforts will "primarily focus on opportunities that benefit water quality and enhance or restore fish habitat through out-of-kind mitigation" that may or may not be carried out within the project area watershed:

[318] Mitigation for these impacts must be considered in the DEIS even though such mitigation is not required for obtaining a Clean Water Act permit.

[319] Sean R. Brennan, Schindler D.E., Cline T.J., et al, *Shifting habitat mosaics and fish production across river basins*, *Science* 364 (6442), 783-786 (May 2019), DOI: 10.1126/science.aav4313.

> "The draft CMP evaluates compensatory mitigation options based on the results of the watershed analysis, and concludes that the watershed approach and on-site and in-kind compensatory mitigation are not practical to meet the project's compensatory mitigation needs, as options for restoration, enhancement, establishment, and preservation of wetlands and aquatic resources are non-existent in the CMP analysis area. Options are non-existent because the limited development has caused negligible degradation to wetlands and other aquatic habitats. Therefore, PLP proposes consideration of off-site, in-kind, or out-of-kind mitigation opportunities, which would necessitate evaluation of mitigation opportunities beyond the HUC 10 watersheds directly impacted by the project. PLP notes that mitigation opportunities may be predominantly limited to wetlands preservation in the surrounding watersheds, or even further afield.
>
> According to the draft CMP, there are potential out-of-kind mitigation opportunities within the directly affected watersheds and surrounding areas, to further enhance aquatic habitat by minimizing environmental impacts and future threats through water quality improvement projects, invasive species identification and eradication, and similar activities. There are also opportunities for fish habitat restoration in directly affected and neighboring watersheds through culvert rehabilitation and other fish passage improvements that have the potential to benefit the greater Bristol Bay and Cook Inlet watershed areas. **Consequently, PLP's approach to compensate for the permanent loss of wetlands and aquatic habitat in the CMP analysis area resulting from the project will primarily focus on opportunities that benefit water quality and enhance or restore fish habitat through out-of-kind mitigation. Although the preference is to seek such opportunities within the CMP analysis area, PLP indicated that they will also search for opportunities outside the directly impacted watersheds. If these opportunities are not sufficient, PLP may propose preservation as compensatory mitigation, but that would be the least preferred form."**

DEIS at 5-24 (emphasis added). The draft Conceptual Mitigation Plan in Appendix M is equally vague and unformulated:

> "PLPs approach to compensate for the permanent loss of wetlands and aquatic habitat in the Analysis Area resulting from the Project will primarily focus on opportunities that benefit water quality and enhance or restore fish habitat through out-of-kind mitigation. Although the preference is to seek such opportunities within the Analysis Area, PLP will also search for opportunities outside the directly impacted watersheds. If these opportunities are not sufficient, PLP may propose preservation as compensatory mitigation, but that would be the least preferred form."[320]

In short, the DEIS is essentially proposing no mitigation at all for wetland impacts and, at best, only the most minimal efforts to potentially improve some fish access to streams located outside of the watershed.[321] Ecologically successful mitigation for wetland losses is extremely difficult to achieve

[320] DEIS, Appendix M, Draft Conceptual Compensatory Mitigation Plan at 26.

[321] In the best of circumstances, restoring the ecological health of a degraded stream is "tough, complicated work" and often does not work. Margaret A. Palmer, Hodula K.L, Koch B.J., *Ecological Restoration of Streams and Rivers: Shifting Strategies and Shifting Goals*, Annu. Rev. Ecol. Evol. Syst. 2014. 45:247–69 at 262 (2014); doi: 10.1146/annurev-ecolsys-120213-091935. A copy of this study is provided at Attachment E. Indeed, to date the vast majority of projects designed to restore riverine habitat have not resulted in biological restoration. *Id*. at 259.

under any circumstances,[322] and it simply is not possible to replace the functions lost by destroying and damaging many thousands of acres of wetlands in one watershed by modifying culverts in an entirely different watershed. For example, the critical habitat, water filtration, groundwater recharge, and flood damage reduction benefits provided by the project area wetlands simply cannot be replaced by modifying culverts in another watershed.[323] This is recognized by the 2008 Mitigation Rule which defines "*Out-of-kind as* a resource of a different structural and functional type from the impacted resource." 33 CFR §332.2. By suggesting that fixing some culverts in a different watershed can somehow mitigate for these important benefits, the DEIS presents a false picture of the severity of the harm that will be caused by the Pebble Project.

The DEIS attempts to "justify" this wholesale failure to meaningfully discuss compensatory mitigation by arguing that this vaguely described minimal, out-of-kind, and out-of-watershed compensatory mitigation is somehow appropriate because the Pebble Mine would impact only "a small percentage of aquatic resources" in an area where wetlands and aquatic resources "are abundant and in a natural state" and that "the primary threats to these resources arises from impacts associated with contaminated sites and community sanitary systems." DEIS at 5-24. This disingenuous attempt to avoid clear mitigation requirements is both inappropriate and unacceptable. The Corps may not attempt to "minimize" the environmental impacts of the Pebble Project by adopting a scale of analysis that is so broad that it marginalizes the site-level impact of the project on ecosystem health.[324]

The DEIS also suggests that a more detailed mitigation plan may not be developed, noting instead that "revised (or even new) mitigation measures may be developed" in the future once the public and agencies comment on the draft conceptual mitigation plan:

> "At this stage in the environmental review process, PLP has prepared a **draft conceptual** Compensatory Mitigation Plan (CMP) (draft CMP) outlining their proposed approach for compensatory mitigation to offset environmental losses resulting from unavoidable impacts to aquatic resources (see Appendix M). The public review period, as well as extensive agency

[322] A 2001 study evaluating wetlands mitigation success found that the program was fostering a net loss of approximately 80 percent of wetlands. Even when compensatory mitigation projects meet all permit conditions, they "are slow to attain functional equivalency with their reference sites or with the sites they replace – if they ever do attain equivalency." Turner, R.E., A.M. Redmond and J.B. Zedler. 2001. Count it by Acre or Function: Mitigation Adds Up to Net Loss of Wetlands. National Wetlands Newsletter Vol. 23 No. 26. .

[323] National Research Council, *Compensating for Wetland Losses under the Clean Water Act*, (2001). This seminal report places emphasizes the importance of landscape position to the functioning of wetlands and underscores the importance of proper placement of compensatory mitigation in the landscape. Observing that even with a suitable landscape location, the establishment of wetlands functions is not guaranteed, the NRC noted, "Landscape position, hydrological variability, species richness, biological dynamics, and hydrological regime are all important factors that affect wetland restoration and mitigation of loss." Based on this reasoning, the NRC recommended paying particular attention to site suitability, in terms of hydrology, ability to be self-sustaining, and other factors. The NRC recommended, in particular, that "[r]iparian wetlands should receive special attention and protection, because their value for stream water quality and overall stream health cannot be duplicated in any other landscape position." *Id*. at 5.

[324] *Pac. Coast Fed'n of Fishermen's Ass'n v. Nat'l Marine Fisheries Serv.*, 265 F.3d 1028, 1035 (9th Cir. 2001); *Oregon Natural Res. Council Fund v. Brong*, 492 F.3d 1120, 1130 (9th Cir. 2007) (BLM's attempt to dilute the effects of proposed logging by averaging the snag retention over a wide area is improper because under this approach, "any adverse environmental effect could be 'diluted to insignificance.'"); *Anderson v. Evans*, 371 F.3d 475, 489-93 (9th Cir. 2004) (finding that agency conclusion that indigenous whale hunting would not impact the overall coastal whale population not relevant to the impacts on the local whale population, which must be analyzed under NEPA).

> evaluation, will assist in identifying impacted aquatic resources, as well as watershed priorities for conservation, restoration, and enhancement. The public/agency evaluation will also allow for the review and comment of the draft CMP, **after which revised (or even new) mitigation measures may be developed** to ensure that the proposed project would adequately offset unavoidable impacts to WOUS. The CMP would be amended in the future to include proposed mitigation plans."

DEIS at 5-24 (emphasis added).

As discussed in detail in Section B of these comments, the out-of-kind, out-of-watershed mitigation proposed by the DEIS does not comply with the Clean Water Act, and the mitigation analysis in the DEIS fails to touch on even a single assessment required by the Clean Water Act 404(b)(1) Guidelines or a single component of an adequate compensatory mitigation plan as set forth in the 2008 Mitigation Rule. Notably, these mitigation requirements are not modified or eliminated by the 2018 Alaska Mitigation Memorandum of Agreement, which explicitly does **not** change any legal requirements. To the contrary, the Alaska Mitigation MOA explicitly states that the "Clean Water Act provisions and regulations described in this document contain legally binding requirements. This document does not substitute for those provisions or regulations, does not create legally binding requirements, nor is it a regulation itself."[325]

E. The Pebble Project Does Not Comply with the Endangered Species Act

Section 7(a)(2) of the Endangered Species Act requires the following:

> "Each Federal agency shall, in consultation with and with the assistance of the Secretary [of the Interior], insure that any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary, after consultation as appropriate with affected States, to be critical."[326]

While Biological Assessments were prepared for the Pebble Project by both the U.S. Fish and Wildlife Service (FWS BA) and the National Marine Fisheries Service (NMFS), the findings of "no effect" in both Biological Assessments are flawed and illegal. DEIS Appendix G (FWS BA); DEIS Appendix H (NMFS BA). A Biological Opinion must be prepared that includes reasonable and prudent measures that will avoid jeopardy or adverse modification of designated critical habitat.

The NMFS BA looked at potential impacts to two populations of Humpback Whale, Fin Whale, Beluga Whale, and Steller Sea Lion. The USFWS BA looked at impacts to the Northern Sea Otter, Steller's Eider, and Short-tailed Albatross.

Beluga whales (*Delphinapterus leucas*) have seen a major reduction in numbers over the last forty years in Cook Inlet – from about 1,300 individuals in 1979 to 327 today. Appx H, National Marine Fisheries

[325] Memorandum of Agreement between the Department of the Army and the Environmental Protection Agency concerning Mitigation Sequence for Wetlands in Alaska under Section 404 of the Clean Water Act, June 15, 2018 (Alaska Mitigation MOA) at 10.
[326] *Id*. § 1536(a)(2).

Service, Biological Assessment (NMFS BA), at 4.3, p. 12. They feed on salmon and other fish in the Inlet. *Id*. at 4.3, p. 12-13. It is unknown why the population continues to drop after sustenance hunting – which stressed the population – was virtually eliminated. The whales are near shore species that are not recovering and at risk of extirpation. As detailed below, NMFS has identified two areas of critical habitat for the beluga whale in Cook Inlet, at least one of which will be directly and adversely modified by the Project.

Steller's eiders (*Polysticta stelleri*) are sea ducks that occupy nearshore areas of lower Cook Inlet, Kodiak Island, and the Alaska Peninsula during winter.[327] Many eiders winter in Cook Inlet.[328] Potential threats include oil spills.

The southwest distinct population segment (DPS) of the northern sea otter (*Enhydra lutris kenyoni*) also occupies nearshore marine waters of lower Cook Inlet, Kodiak Island, and the Alaska Peninsula, as well as the Aleutian Islands. They may occur there year-round. They are threatened by oil spills and other impacts, including impacts to habitat.[329]

The western population of the Steller sea lion's (*Eumatopias jubatus*) range includes Lower Cook Inlet.[330] The Project, as well as the substantial infrastructure associated with it, if properly considered, will almost certainly adversely affect listed species – in particular the beluga whale. As described below, many potential effects on these species are not properly considered in either the BAs or the DEIS.

A Biological Opinion should have been prepared concluding that the Pebble Project may adversely affect listed species. The Biological Assessments' conclusions of "no effect" are flawed and illegal.

The analysis of threatened and endangered species in both the Biological Assessments and the DEIS are inadequate in several respects.

(1) The Biological Assessments Do Not Establish the Environmental Baseline

The BAs fail to establish the environmental baseline against which they are measuring impacts. In order to measure the effects of a project on listed species, the BA must set forth an "environmental baseline," which "includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process."[331] Neither BA sets forth an environmental baseline, making it impossible to evaluate what its effects determinations are measured against.

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[327] *See* US FWS, Winter Distribution and Abundance of Steller's Eiders (*Polsticta stelleri*) in Cook Inlet, Alaska 2004–2005, OCS Study MMS 2006-066, https://www.boem.gov/BOEM-Newsroom/Library/Publications/2006/2006_066.aspx.
[328] *Id*.
[329] *See* US FWS, Southwest Alaska Distinct Population Segment of the Northern Sea Otter (Enhyra lutris kenyoni) Recovery Plan, July (2013), *available at* https://ecos.fws.gov/docs/recovery_plan/Recovery%20Plan%20SW%20AK%20DPS%20Sea%20Otter%20Aug13.pdf
[330] *See* NOAA, Steller Sea Lion, https://www.fisheries.noaa.gov/species/steller-sea-lion (last visited June 25, 2019).
[331] 50 C.F.R. § 402.02.

(2) The Action Areas Used in the Biological Assessments Are Too Narrow

Under the ESA, federal agencies must examine the impacts to listed species in the action area. The action area is defined as: "All areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action."[332] The NMFS and USFWS BAs only look at Port Construction, Pipeline Construction, Spread Anchor Mooring Systems, and Navigation Buoy Placement. NMFS BA at 2.2, p. 4-6; Appx G, USFWS, Biological Assessment, Dec. 2018, 2.2, p. 4-5 (USFWS BA). This is far too narrow. The BAs ignore significant infrastructure that should be included in the action area including the building of roads and culverts, the building of a 188 mile-long gas pipeline, increased air traffic activity, and the mine and associated tailings pond and discharges. The limited focus on just the marine areas exclude several areas "to be affected directly or indirectly by the Federal action." As such, the BAs are both fatally flawed by this failure to appropriately consider the entire action area.

(3) The Biological Assessments and the DEIS Fail to Consider Significant Impacts that Could Adversely Affect Listed Species

The BAs and the DEIS completely fail to examine the following potential adverse effects on listed species:

- **The impact of catastrophic spills.** The tailings pond will hold up to 1.1 billion gallons of mining waste. Tailings dams have high failure rates with an approximately 20% chance of failing over an approximately 100 year life of the mine (as opposed to the 20 examined by the DEIS), often as well as long term regional toxic impacts that have direct impacts to listed species through toxicity and other substantial impacts like food system collapse and long term toxicity of food sources. [333] Also, a collapse of salmon runs, shellfish, and/or benthic food sources would adversely affect several species like beluga whales, Steller sea lions, Steller's eidesr, and northern sea otters. This would adversely affect those species and requires a biological opinion to properly assess these impacts.

- **The Impacts from Failure of Proper Treatment of Contaminants.** As discussed in detail in Section B.2 of these comments, the systems designed to protect water quality from discharges from the mine, which will contain a cocktail of metals and other toxic contaminants, are untested and unproven. The DEIS nevertheless assumes with no supporting information, that these systems will operate effectively. Pebble Mine will use an extremely complex and untested water treatment system to process billions of gallons of highly toxic wastewater in the seismically active and extremely difficult conditions in the Bristol Bay watershed. Even under less hostile conditions, 92% of U.S. open pit copper mines fail to adequately capture and treat wastewater resulting in significant impacts to water quality.[334] As detailed in the comments of the American Fisheries Society,[335] copper contamination in water – even at relatively low levels

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[332] 50 C.F.R. § 402.02.

[333] *See* Wobus, T. 2019. A model analysis of flow and deposition from a tailings dam failure at the proposed Pebble Mine. Contract Number LYNK-2018-179. The Nature Conservancy, Boulder, Colorado. https://static1.squarespace.com/static/56b0dfb660b5e98b87fc3d52/t/5c9a42bba4222fa3768a60ad/1553613518877/Lynker_TSF_Pebble_Model+-+Final+Report.pdf.

[334] Bonnie Gestring, Earthworks, *Pebble Mine: Unprecedented Waste Water and Perpetual Pollution*, Feb. 2019, available at, https://earthworks.org/blog/pebble-mine-unprecedented-waste-water-and-perpetual-pollution/.

[335] Comments of American Fisheries Society, to Program Manager, US Army Corps of Engineers, June 13, 2019.

– can negatively impact salmon and other fish. It impairs olfactory function, can make them more susceptible to predation, and impairs their ability to locate their natal streams.[336] As EPA previously determined in 2014, mining copper will degrade streams throughout the basin, negatively impacting salmon and other fish populations.[337] Thus, even short of catastrophic failure, pollution can contaminate the food chain and ecosystem of the region, adversely affecting whales, eiders, and otters that depend on these food sources and the health of this system.

- **Failure to look at the full timeline and scale of the project.** The BAs and DEIS only look at 20 years of mining. However, it is likely that given the amount of minable assets that this will be a 78 year mine with 98 years of ore and waste processing. The DEIS acknowledges that this expansion of the Project is reasonably foreseeable, which would make the mine a 78-98 year project instead of the 20 years examined by the DEIS. DEIS at Tbl.4.1-1. In order to fully assess the impacts on listed species, the BAs need to look at the full scope of likely mining. The full impacts of these interconnected actions need to be considered. They are not. This failure means that several potential risks – including the risks of further development and related impacts, increased chances for dam failure and water contamination, and other impacts are not considered.

- **The impacts of road construction**. The roads will result in the construction of multiple culverts. In total there will be a private, two-lane, an 83 mile road plus miles of smaller access roads associated with the project, with a total of over 200 culverts, about 80 of which will be used for fish passage. The presence of roads can have major impacts on streams that serve to support listed species, particularly salmon runs which are food sources for beluga whales and Steller sea lions. For example, culverts pose a serious likely impediment to fish passage that could have significant impacts on salmon habitat. According to a 2014 EPA analysis, culverts fail for multiple reasons with impacts on fish passage and habitat:

  > "Culverts commonly fail to allow free passage of fish. They can become blocked by debris or ice that may not stop water flow but that create a barrier to fish movement. Fish passage also may be blocked or inhibited by erosion below a culvert that "perches" the culvert and creates a waterfall, by shallow water caused by a wide culvert and periodic low streamflows, or by excessively high gradients. If blockages occurred during adult salmon immigration or juvenile salmon emigration and were not cleared for several days, production of a yearclass (i.e., fish spawned in the same year) would be lost from or diminished in the stream above the culvert.
  >
  > Culverts can also fail to convey water due to landslides or, more commonly, floods that wash out undersized or improperly installed culverts. In such failures, the stream would be temporarily impassible to fish until the culvert is repaired or until erosion re-establishes the channel. If the failure occurs during a critical period in salmon migration, effects would be the same as with a debris blockage (i.e., a lost or diminished year-class).

[336] *Id*.

[337] US EPA, An Assessment of Potential Mining Impacts of Salmon Ecosystems of Bristol Bay, Alaska, Executive Summary, Jan. 2014 (USEPA 2014 Assessment), *available at*, https://www.epa.gov/sites/production/files/2015-05/documents/bristol_bay_assessment_final_2014_es.pdf.

> Culvert failures also would result in the downstream transport and deposition of silt, which could cause returning salmon to avoid a stream if they arrived during or immediately following the failure.
>
> Deposition of silt would smother salmon eggs and alevins if they were present, and would degrade downstream habitat for salmonids and the invertebrates that they eat. Blockages of culverts could persist for as long as the intervals between culvert inspections. We assume that the transportation."[338]

EPA adds that:

> "[L]ong-term fixes may not be possible until conditions are suitable for culvert replacement, and these fixes may not fully address fish passage, which may be reduced or blocked for longer periods."[339]

Finally, EPA's 2014 analysis finds that, "In surveys of road culverts, 30 to 61% are impassable to fish at any one time."[340] This means that "salmon spawning may fail or be reduced and the streams would likely not be able to support long-term populations of resident species able to support long-term populations of resident species."[341]

Especially given the region's extreme weather, it can be expected that culvert failures and fish blockages may take some time to be identified and addressed. Moreover, the impacts of these failures could be more extreme over time, making the failure of the BAs and DEIS to properly examine the likely full life (78-98 years) of the project even more significant.

Culverts are not the only impacts from the roads. The roads will also add increased runoff, siltation, salt, and other impacts that could reduce salmon and other fish populations in the area. These impacts on salmon – a key food source for beluga whales and Steller sea lions – could adversely impact both species and are not addressed by the BAs or the DEIS. Additionally, the DEIS and BAs fail to look at potential impacts from climate change. Faster snow melts and more intense rain events could add to stormwater and other pollution from roads and increase culvert failure, further impeding fish passage.[342]

The impact from roads – particularly on salmon, a key food source for both beluga whales and Steller sea lions – will likely have an adverse effect on these species. Yet, these impacts are not considered.

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[338] *Id*. at 18
[339] *Id*. at 19
[340] *Id*. at 17
[341] *Id*.
[342] *See* USEPA 2014 Assessement at 29 (discussing the exacerbating effects of climate change on the Project's impacts).

- ***Aerial Impacts Are Not Examined***. An additional 5-10 flights per week will be occurring in the area. DEIS at 4.12.2.2 p. 4-12-4. This could add to the potential collision impacts for the eider and potential noise impacts for northern sea otters, Steller sea lions, and beluga whales. These impacts need to be evaluated.

The Biological Assessments and DEIS fail to adequately examine several impacts that are touched on:

- In order to conclude that there would be no effect on species from incidental spills from activities in the identified action areas, such as diesel spills from trucks, the BAs simply assume that spill prevention control plans would work. USFWS BA at 7.1.3, p. 26. However, spill prevention plans often fail or are not followed, especially in a remote location with challenging weather conditions. The BAs do not account for the impacts of an incidental spill where spill prevention control plans are not followed or fail.

- Vessel strike impacts assume that speed and mitigation measures will work and do not account for increased private use, such as recreational use, that may result due to increased use due to more workers being present as a result of the mine, second homes, or other use that may be spurred by the Project and its accompanying infrastructure. NMFS BA at 5.2, p. 21-23; USFWS BA at 5.2, p. 17-18, 6.3, p. 24. This omission is particularly relevant to beluga whales, as the BA acknowledges that beluga whales "may be somewhat susceptible to strike by a fast-moving small fishing boat," as well as for northern sea otters and Steller's eiders which also may be susceptible to smaller, faster boat strikes. NMFS BA at 7.3.2, p. 33. For instance, the USFWS BA acknowledges that otter pups are vulnerable to strikes. USFWS BA at 7.1.2, p. 25.

- Northern sea otters and Steller's eiders are benthic feeders and rely on benthic biota for food. The BA says 10.7 acres of benthic feeding habitat will be buried and says this is a small fraction of the total area of Kamishak Bay. *See* USFWS BA at 7.1.4, at 26. Regardless of the fact that this alone is a substantial amount of important near shore habitat, the BA does not say what percentage of benthic feeding habitat this represents, so the comparison is meaningless in assessing what other available benthic feeding habitat remains.

The Biological Assessments and the DEIS also fail to look at indirect, cumulative, and Interrelated or interdependent effects. The Endangered Species Act requires examination of "the direct and indirect effects of an action on the species and critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline."[343] "Indirect effects" are "those that are caused by the proposed action and are later in time, but still are reasonable foreseeable."[344] Under the ESA, "cumulative effects" encompass the effects of future state or private activities reasonably certain to occur within the project area.[345]

The BAs examination of cumulative impacts are not adequate because they do not look at non-federal projects and they are, as discussed above, too narrow. The BAs state that other cumulative activity "will have associated mitigation and monitoring plans." USFWS BA at 9, p. 29; NMFS BA at 9, p. 37. However, non-federal activities like increased recreational activities, such as boating at higher speeds than project

[343] 50 C.F.R. § 402.02.
[344] *Id*.
[345] *Id*.

related vessels, increased housing and second homes and related development, etc., are not examined as part of the cumulative and indirect impacts section of either BA. In 2014, EPA noted the potential of possible induced growth that may come with the infrastructure – cabins and second homes, worker homes, shops, increased boat activity, etc.[346] However, neither the EA or the DEIS address these potential indirect or cumulative impacts on listed species.

The BAs also do not look at interconnected and interrelated activities like the likely mining and infrastructure beyond the 20 year mining scope considered by the BAs and DEIS.

Notably, neither the BAs nor the DEIS meaningfully examine the impacts of climate change, which are particularly significant for marine mammals and migratory birds. As recognized by the United Nations Environment Program and the Convention on the Conservation of Migratory Species of Wild Animals, migratory wildlife is particularly vulnerable to the impacts of climate change:

> "As a group, migratory wildlife appears to be particularly vulnerable to the impacts of Climate Change because it uses multiple habitats and sites and use a wide range of resources at different points of their migratory cycle. They are also subject to a wide range of physical conditions and often rely on predictable weather patterns, such as winds and ocean currents, which might change under the influence of Climate Change. Finally, they face a wide range of biological influences, such as predators, competitors and diseases that could be affected by Climate Change. While some of this is also true for more sedentary species, migrants have the potential to be affected by Climate Change not only on their breeding and non-breeding grounds but also while on migration."
>
> "Apart from such direct impacts, factors that affect the migratory journey itself may affect other parts of a species' life cycle. Changes in the timing of migration may affect breeding or hibernation, for example if a species has to take longer than normal on migration, due to changes in conditions *en route*, then it may arrive late, obtain poorer quality breeding resources (such as territory) and be less productive as a result. If migration consumes more resources than normal, then individuals may have fewer resources to put into breeding . . . ."
>
> * * *
>
> "Key factors that are likely to affect all species, regardless of migratory tendency, are changes in prey distributions and changes or loss of habitat. Changes in prey may occur in terms of their distributions or in timing. The latter may occur though differential changes in developmental rates and can lead to a mismatch in timing between predators and prey ("phenological disjunction"). Changes in habitat quality (leading ultimately to habitat loss) may be important for migratory species that need a coherent network of sites to facilitate their migratory journeys. Habitat quality is especially important on staging or stop-over sites, as individuals need to consume large amounts

[346] USEPA 2014 Assessment, at 6.

> of resource rapidly to continue their onward journey. Such high quality sites may [be] crucial to allow migrants to cross large ecological barriers, such as oceans or deserts."[347]

Migratory seals and birds are at particular risk from climate change. The climate change impacts on seal populations include changes in the distribution, abundance, and community composition of their food supply; impacts of warmer waters on reproduction; and "loss of undisturbed haul-out sites, due to sea-level rise, which are used for breeding, nurseries and resting."[348] Migratory birds are affected by changes in water regime, mismatches with food supply, sea level rise, and habitat shifts, changes in prey range, and increased storm frequency.[349]

A 2011 study published in *Science,* concludes that average geographical range shifts for marine communities due to climate change over the past 50 years are from 1.4 to 28 km per decade—or 0.9 to 17.4 miles per decade.[350] Shifts in seasonal timing for marine species are advancing an average of 4.3 days per decade in the oceans.[351] This study also concludes that range shifts in the ocean are from 1.5 to 5 times faster than range shifts on land, likely due to the more homogeneous nature of surface water temperature changes in the ocean than on land, and shifts in the timing of spring temperatures were 30 to 40% faster in the ocean than on land (from 1960–2009).[352] A 2010 study published in *Global Ecology and Biogeography* also concludes that range shifts occurred much faster in marine systems than terrestrial systems, and noted that most of the species documented as shifting their range were coastal species.[353] A 2009 study published in *Fish and Fisheries*, projected a climate-change induced range shift for marine fish and invertebrates of "45–59 km per decade"—or 28 to 37 miles per decade.[354]

The failure to conduct these required assessments makes the Biological Assessments and the DEIS flawed, inadequate, and illegal.

(4) Failure to Consider Impacts on the Cook Inlet Beluga Whale and Its Critical Habitat

FWS and NMFS fail to provide an appropriate reason why formal consultation regarding the effects of this Project are not required for the Cook Inlet beluga whale in particular, which will likely be adversely affected by the project and have its critical habitat adversely modified. Absent proper consideration of the Project's impact on threatened and endangered species, it cannot be determined that the Project is

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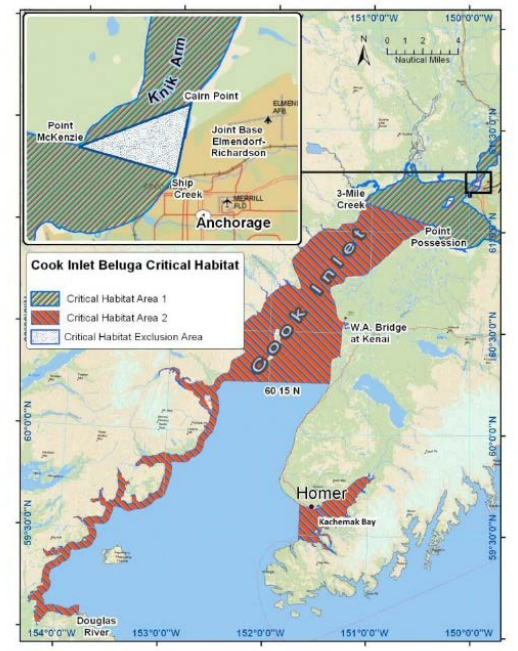
[347] UNEP/CMS Secretariat, Bonn, Germany, *Migratory Species and Climate Change: Impacts of a Changing Environment on Wild Animals* (2006) at 40-41 (available at http://www.cms.int/publications/pdf/CMS_CimateChange.pdf).
[348] *Id*. at 42.
[349] *Id*. at 42-43.
[350] Michael T. Burrows, Schoeman D.S., Buckley L.B., et al, The Pace of Shifting Climate in Marine and Terrestrial Ecosystems. Science, Vol 334: 652-55 (Nov. 4, 2011).
[351] *Id*.
[352] *Id*.
[353] Cascade J. B. Sorte, S.L. Williams and J.T Carlton, Marine range shifts and species introductions: comparative spread rates and community impacts**,** Global Ecology and Biogeography (2010) 19, 303–316. The study defines range shifts "as any changes in the distributions of native species that are not directly human mediated." The study also concludes that "[r]ange shifts of native species and introductions of non-native species are analogous in that both are fundamentally biological invasions, involving the movement of individuals from a donor community into a recipient community." A copy of this study is attached to these comments.
[354] William W.L. Cheung, V.W.Y. Lam, J.L. Sarmiento, K. Kearney, R. Watson and D. Pauly, Projecting global marine biodiversity impacts under climate change scenarios, Fish and Fisheries, 10, 235–251 (2009).

in compliance with the ESA or meets the requirements of the 404(b)(1) guidelines, as discussed in Section B of these comments.

Beluga whales have seen a major reduction in numbers over the last forty years in Cook Inlet – from about 1,300 individuals in 1979 to 327 today. NFMS BA at 4.3, p. 12.[355] The Cook Inlet beluga whale distinct population segment (DPS) was listed as an endangered species under the ESA in 2008.[356] The Cook Inlet beluga DPS's stock declined 47% between 1994 and 1998, due to overharvesting by subsistence hunting.[357] Harvesting has essentially stopped since 1999, but the population has continued to decline.[358] Critical habitat for Cook Inlet beluga whales was designated in two areas of Cook Inlet:[359]

- **Area 1**. Marine waters of Cook Inlet north of a line from the mouth of Threemile Creek connecting to Point Possession, including waters of the Susitna River south of 61°20.0' N., the Little Susitna River south of 61°18.0' N., and the Chickaloon River north of 60°53.0' N.

- **Area 2**. All marine waters of Cook Inlet south of a line from the mouth of Threemile Creek to Point Possession and north of 60°15.0'N., including waters within 2 nautical mi seaward of mean high water (MHW) along the western shoreline of Cook Inlet between 60°15.0' N. and the mouth of the Douglas River; all waters of Kachemak Bay east of 151°40.0' W.; and waters of the Kenai River below the Warren Ames bridge at Kenai, Alaska.



Map of Cook Inlet beluga whale critical habitat. (NOAA)

[355] *See* NOAA, Beluga Whale, available at https://www.fisheries.noaa.gov/species/beluga-whale (last visited June 25, 2019).
[356] 73 Fed. Reg. 62,919 (Oct. 22, 2008).
[357] *Id*. at Fed. Reg. 62,920.
[358] *See* NOAA, Beluga Whale, available at https://www.fisheries.noaa.gov/species/beluga-whale (last visited June 25, 2019).
[359] 76 Fed. Reg. 20,180 (Apr. 11, 2011).

The population continues to slowly decline and the state of this population is fragile. NMFS has stated that:

> "[T]he baseline condition for Cook Inlet beluga whales is characterized by: (1) very low abundance; (2) lack of recovery; and (3) a high probability of extinction within the next 100 years (Hobbs and Shelden 2008)."[360]

NFMS has included the Cook Inlet beluga whale population as a species among "the most at risk of extinction in the near future"[361] and a species "whose extinction is almost certain in the immediate future because of rapid population decline or habitat destruction" as well as "a species that conflicts with construction, other developmental projects, or other forms of economic activity."[362] As identified by the Cook Inlet beluga whale's recovery plan,[363] threats include noise and cumulative effects of multiple stressors,[364] and habitat loss or degradation.[365] NMFS has concluded that "[p]rojects that reduce anadromous fish runs could . . . negatively impact the foraging success of Cook Inlet beluga whales."[366]

The Pebble Project presents many threats to the beluga whale in Cook Inlet, such as:

- The beluga whale feed on salmon. NMFS BA at 4.3, p.12-13. As such, a failure of major salmon run could constitute a "catastrophic event" leading towards the population's extirpation. *See id*. at p.13.

- Beluga whales are susceptible to vapor from increase air traffic. *Id*.

- Increased noise from pile driving, more boats, more planes, more noise, more recreational traffic, etc.

- Increased risk of spills of oil and other contaminants.

The Cook Inlet beluga whale population also faces threats from adverse modification of its critical habitat. The Project will adversely affect the Cook Inlet beluga whale and its critical habitat. The Project's port facility is located within the designated critical habitat for the beluga whale.[367] As indicated above, NMFS has stated that development of the beluga's coastal habitat is a major threat to

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[360] NMFS ESA Section 7(a)(2) Biological Opinion Port of Anchorage Test Pile Project and Associated Proposed Issuance of Incidental Harassment Authorization and NWP Verification, Mar. 2, 2016, at 38.
[361] *Id*.
[362] *Id*.
[363] NMFS, *Recovery Plan for the Cook Inlet Beluga Whale (Delphinapterus leucas)* (2016), *available at* https://repository.library.noaa.gov/view/noaa/15979.
[364] *Id*. at Exec. Summ., xiii.
[365] *Id*.; 76 Fed. Reg. at 20,202.
[366] NMFS, Final RIR/4(b)(2) Prepatory Assessment/FRFA of Critical Habitat Designation of Cook Inlet Beluga Whale 2-1 to -2 (Aug. 11, 2010) (NMFS 2010 RIR/FRFA), at 2-1, *available at*, https://www.fisheries.noaa.gov/resource/document/final-rir-4b2-preparatory-assessment-frfa-critical-habitat-designation-cook-inlet.
[367] 76 Fed. Reg. 20,180 (Apr. 11, 2011).

the future survival and recovery of the species.[368] Beluga whales are predominantly concentrated in nearshore areas, which means that impacts to these areas have higher consequences to the whales.[369]

The Endangered Species Act defines "Critical habitat" as:

> "the specific areas within the geographical area occupied by the species, at the time it is listed . . . on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection;" and (2) "specific areas outside the geographical area occupied by the species at the time it is listed . . . upon a determination by the Secretary that such areas are essential for the conservation of the species."[370]

An action results in adverse modification of critical habitat if it causes a "direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of a listed species."[371] Adverse modification includes "significantly impairing essential behavioral patterns, including breeding, feeding or sheltering."[372]

NMFS unequivocally recognizes development in the beluga's coastal habitat as a threat to the future survival and recovery of the species. Moreover, the Cook Inlet beluga whale Conservation Plan explicitly acknowledges that it **"is imperative that beluga habitat is protected" for the future survival and recovery of the species.**[373]

The Pebble Project's port facility is located within the formally designated critical habitat for the federally endangered Cook Inlet beluga whale.[374] This designated critical habitat consists of two areas covering approximately 3,013 square miles of marine habitat that is of vital importance to the beluga's recovery and survival.[375] Area 2 consists of 2,275 of those square miles.[376] It "contains anywhere from one to all of the identified physical or biological features essential to the whale's conservation"[377] and is used by belugas in the late-summer, fall and winter for feeding, likely because of the salmon runs.[378]

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[368] NMFS, Conservation Plan for the Cook Inlet Beluga Whale 1 (2008) (Conservation Plan), at 54, *available at*, https://www.fisheries.noaa.gov/resource/document/conservation-plan-cook-inlet-beluga-whale-delphinapterus-leucas. Notably, the "Pebble Mine with a marine terminal in Iniskin Bay" was specifically noted as a potentially threatening development project within the NMFS Conservation Plan for Cook Inlet beluga whales. *Id*. at 56.
[369] *Id*. at 54.
[370] 16 U.S.C. § 1532(5)(A). Features to be considered when making a critical habitat designation include: "(1) Space for individual and population growth, and for normal behavior; (2) Food, water, air, light, minerals, or other nutritional or physiological requirements; (3) Cover or shelter; (4) Sites for breeding, reproduction, rearing of offspring, germination, or seed dispersal; and generally; (5) Habitats that are protected from disturbance or are representative of the historical geographical and ecological distributions of a species." 50 C.F.R. §424.12(b).
[371] 50 C.F.R. § 402.02.
[372] 50 C.F.R. § 17.3.
[373] NMFS, Conservation Plan for the Cook Inlet Beluga Whale 1 (2008) (Conservation Plan) at 3, 54 (*available at*, https://www.fisheries.noaa.gov/resource/document/conservation-plan-cook-inlet-beluga-whale-delphinapterus-leucas). Notably, the "Pebble Mine with a marine terminal in Iniskin Bay" was specifically noted as a potentially threatening development project within the NMFS Conservation Plan for Cook Inlet beluga whales. *Id*. at 56.
[374] 76 Fed. Reg. 20,180 (Apr. 11, 2011).
[375] 76 Fed. Reg. 20,180 et seq.
[376] *Id.* at 20,205.
[377] *Id*. at 20,183.
[378] *Id.* at 20,182–20,183.

Beluga whales are predominantly concentrated in nearshore areas, which means that impacts to these areas have higher consequences to the whales.[379]

The DEIS acknowledges that approximately 10.7 acres of formally designated critical habitat for the beluga whale will be permanently affected by the placement of fill for the port construction. An additional 11.5 acres will be temporarily impacted for the installation of the 188 mile-long natural gas pipeline. DEIS at 4.25-7.

While the DEIS discussion of the destruction and adverse modification of beluga whale critical habitat is sometimes contradictory, it is clear that the impacts will be significant. According to the DEIS:

> "The magnitude and extent of project impacts on the physical or biological features of beluga whale critical habitat would be disturbance or resuspension of sediments in the water column, installation of structures, and discharges of fill into marine waters during construction. . . . Additional critical habitat Primary Constituent Elements . . . that may be impacted include disturbance to primary prey species, and in-water noise levels resulting in abandonment of critical habitat areas. . . . The magnitude of impacts to Cook Inlet beluga whale critical habitat from construction of project components would include seafloor disturbance and habitat alteration in the form of increased turbidity and physical partitioning from project activities."[380] DEIS at 4.25-7

Notably, the Pebble Project impacts to beluga whale critical habitat would be permanent:

> "The duration of time that Cook Inlet beluga whales may be exposed to habitat alteration would be permanent for the life of the project. The duration of these impacts would be permanent. In terms of likelihood, these impacts on critical habitat would be certain to occur if the project is permitted and built." DEIS at 4.25-9.

However, neither the NMFS BA nor the DEIS meaningfully assess the implications of the Pebble Project's impacts on critical habitat, including:

(1) **Noise Impacts:** Like other marine mammals, Beluga whales rely heavily on sound to navigate, communicate, and hunt.[381] This is especially important for the whales in the turbid waters of Cook Inlet,[382] where the whales live largely near shore.[383] Excessive noise from anthropogenic sources, can cause harassment, and in-turn, avoidance or abandonment of essential habitat.[384]

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[379] *Id*. at 54.

[380] The DEIS attempts to downplay these impacts by claiming that the impacts will only occur in "the area immediately surrounding the port," DEIS at 4.25-9, and that construction would occur "during summer months when beluga whales are generally absent, and mitigation measures would be implemented to prevent harassment of beluga whales, in-water noise levels during construction are not likely to cause abandonment of critical habitat areas." DEIS at 4.25-7. However, the DEIS contradicts this latter statement by acknowledging that the "area has less-concentrated spring and summer beluga whale use," which by definition is different than the whales being "generally absent. *Id*.

[381] 76 Fed. Reg.at 20,203.

[382] *Id*.

[383] *Id*.

[384] *Id*.; *see also* National Marine Fisheries Service. 2008. Conservation Plan for the Cook Inlet beluga whale (Delphinapterus leucas). National Marine Fisheries Service, Juneau, Alaska (the Conservation Plan) at 58–59

Noise above ambient levels can injure beluga whales' delicate hearing and extreme noise can cause death.[385] NMFS has established levels of in-water noise that define what constitutes harassment or injury to the species. Harassment of the Cook Inlet beluga whale occurs at 160 dB re: 1 µPa for impulsive sounds, such as pile-driving; injury occurs at impulsive noise levels above 180 dB re: 1 µPa.[386] For continuous noise, harassment and injury is deemed to occur at 120 dB re: 1 µPa.[387] Noise in the Cook Inlet beluga whales' designated critical habitat at or above these levels presents a serious threat to the continued survival and recovery of this endangered species.[388]

However, noise levels below these thresholds may also have impacts on the whales and those impacts may be chronic over time.[389] Noise over distance may also impact the beluga whales, and NMFS noted that belugas can be displaced at distances of up to 20 km from a sound source.[390]

Noise is identified as a high concern that can impact beluga acoustic perception, communication, echolocation, and behavior, including habitat displacement.[391] The port will generate noise during the construction and operation phases of the project that will likely adversely impact the endangered Cook Inlet beluga and adversely modify the critical habitat. The comments of Trustees et al. details studies showing that pile-driving and construction activities will likely occur at levels that would harass beluga whales and create harm, including displacing them from their habitat. These activities could occur over several months. The DEIS and the BA fail to properly consider these impacts.

(2) **Rearing and Foraging Impacts:** The Cook Inlet beluga whales are often located close to shore for nursing and foraging purposes, as well as to escape predators.[392] As a result, coastal development can have serious impacts on the whales and be disruptive to the whale's ability to use critical habitat for nursing and foraging. The DEIS and the BA fail to adequately consider potential loss of habitat and displacement due to noise and vessel activity on beluga calving, rearing and other interactions.

(3) **Toxic Contamination Impacts:** Cook Inlet beluga whales may be adversely affected by toxic contamination from activities around the port such as ship loading and fuel spills, which could also adversely modify critical habitat and restrict use.[393] Pollution and spill risk can harm food

(noting that "Alaska Native beluga whale hunters with [Cook Inlet Marine Mammal Council] have said that the Cook Inlet beluga whales are very sensitive to boat noise, and will leave areas subjected to high use;" and "[B]eluga whales were observed to react to [noise producing] ice-breaking ships at distances more than 80 km, showing strong avoidance, apparent alarm calls, and displacement." (internal citation omitted)).

[385] 76 Fed. Reg. at 20,203.

[386] Conservation Plan, at 66–67.

[387] *Id*.

[388] 76 Fed. Reg. at 20,203.

[389] *See* NMFS Recovery Plan. at III-13

[390] 71 Fed. Reg. 27997, 28004 (May 15, 2006).

[391] Recovery Plan at III–3, III-10 to III-13.

[392] Conservation Plan, at 13 (internal citation omitted); NMFS 2010 RIR/FRFA.

[393] *See* DEIS at 4.27-26 ("The magnitude of potential impacts from the proposed diesel scenario on the Cook Inlet beluga whale (*Delphinapterus leucas*) is high, because the stock and its critical habitat are only found in Cook Inlet.").

sources for the beluga whale and the whale directly. The DEIS and BA fail to take a hard look at these impacts on the beluga whale.

(4) **Turbidity Impacts:** The recovery plan indicates that the increased turbidity from disposing of dredged materials can have a direct impact on the beluga's echolocation performance and a cumulative impact by amplifying negative effects from anthropogenic noise sources.[394] These activities could impact critical habitat. The DEIS and BA fail to consider these impacts.

(5) **Vessel Strike Impacts:** The DEIS dismisses the likelihood of vessel strikes in critical habitat by asserting that there have been no vessel strikes in the analysis area, DEIS at 4.23–28, and errs by stating that the port and associated vessel activity would not change marine mammal behavior because there is already existing infrastructure and vessel traffic in Cook Inlet. DEIS at 4.23–27. The increase in traffic (at least 23%) would be significant. The DEIS and BA fail to take a hard look at impacts including displacement from critical habitat due to increased vessel activity.

These extensive impacts to critical habitat combined with the direct and indirect impacts of the Pebble Project—including particularly, the Project-induced losses to salmon productivity—could also jeopardize the continued existence of the Cook Inlet beluga whale. Additional detailed information on the significant impacts to designated critical habitat and listed species that would be caused by the Pebble Project is provided in the comments on the DEIS submitted by Trustees for Alaska.

Historically, Cook Inlet supported an estimated 1,300 beluga whales. These numbers have dropped dramatically, however, and just 375 beluga whales were estimated to exist in Cook Inlet in 2008, with a future rate of declined estimated at 1.5 percent per year.[395] However, despite the removal of a number of obvious stressor, the rate of decline remains much greater. By 2015, the Cook Inlet beluga whale population had dropped to just 312 beluga whales.[396] It would not take much additional stress to push this species to extinction.

The Corps must take measures to ensure that Pebble's project will not jeopardize the continued existence and overall recovery of this rare species or result in the destruction or adverse modification of critical habitat.[397] It does not. Neither the NMFS BA nor the DEIS properly assess the potential adverse effects and adverse modification of the beluga whale and its critical habitat.

F. The Pebble Project Does Not Comply with the Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) prohibits the "take" of migratory birds, their nests or eggs, except as permitted by regulation.[398] The statute's prohibition states that taking is unlawful "at any time, by any means or in any manner."[399] In December of 2017, the Department of Interior Solicitor General's Office issues an M-Opinion concluding – wrongly – that the MBTA did not apply to incidental takes of

[394] NMFS Recovery Plan, at III-10.
[395] Conservation Plan at 1.
[396] Alaska Wildlife Action Plan 2015 at 142.
[397] 16 U.S.C. § 1536(a)(2).
[398] 16 U.S.C. § 703. "Take" is defined by the MBTA as: "pursue, hunt, shoot, capture, collect, kill, or attempt to pursue, hunt, shoot, capture or kill." 16 U.S.C. § 715(n).
[399] 16 U.S.C. § 703(a).

migratory birds.[400] NWF, along with other groups, is challenging this illegal interpretation in court. We believe that the MBTA is plain in its intent to apply to incidental takes and that it is applicable to incidental takes that may occur as a result of the Project.

The MBTA clearly applies to the Pebble Project as the Bristol Bay Watershed is an area rich in bird life, drawing tens of millions of birds and over 100 species to forage, breed, or stopover.[401] It is especially important to waterfowl and shore birds, and bird species – many of which are on the Audubon Watchlist or the IUCN Red List. Species in the region include the threatened Steller's Eider, King Eider, Black Scoter, Brant, Emperor Goose, Bar-tailed Godwits), and the Kittlitz's Murrelet. The importance of Bristol Bay to migratory birds is more thoroughly discussed in the comments of Trustees of Alaska, et al.

The Pebble Project will take birds in violation of the MBTA during both the construction and operation phases of the project.[402] The DEIS acknowledges several impacts that would result in takes of birds under the MBTA, including:

- Disturbances and displacement due to noise.

- Disturbances and collisions due to vessels, vehicles, and airport activity. Disturbances could, among other impacts, result in the disruption of pair bonds, reductions in clutch size, egg mortality, nest abandonment, and increased nest predation. DEIS at 4.23-7.

- The project would add miles of road through nesting bird habitat, increasing collisions, nest predation, and causing other impacts. Increased air traffic (5-10 trips per week) could add to collision mortalities. Lighting, power lines, and other structures also offer opportunities for collision. Project infrastructure gives predators additional opportunities to kill birds or take eggs.

- Disturbances that would occur during pipeline construction.

- Exposure to toxic substances, including the toxic mine pond.

Oil spills or discharges or dam failures that result in contamination of water with toxic metals would also result in illegal takes of birds under the MBTA. Indeed, the DEIS concludes that, "The magnitude of injury and mortality impacts on avian species would be anticipated to affect a wide range of taxonomic groups, at various stages, and across all component of the project. . . . The duration would be for the life of the project, and the extent would include the footprints of all project components." DEIS at 4.23-12.

The Pebble Project would violate the MBTA and the DEIS does not address how it will comply with the MBTA.

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[400] Memorandum M-37050 From Principal Deputy Solicitor to Secretary (Dec. 22, 2017), *available at* https://www.doi.gov/sites/doi.gov/files/uploads/m-37050.pdf

[401] *Citing* Letter from Nils Warnock, Exec. Dir., Audubon Alaska, to Scott Pruitt, Administrator, EPA, Re: Formal Comments for Proposal to Withdraw Proposed Determination to Restrict the Use of An Area as a Disposal Site; Pebble Deposit Area, Southwest Alaska (82 Federal Register 33123, July 19, 2017) (Oct. 17, 2017), at 2.

[402] Although "the MBTA provides no private cause of action against the United States government to enforce its provisions, ... the law of this Circuit is clear: a plaintiff may sue a federal agency under the APA for violations of the MBTA." *Fund for Animals v. Norton*, 281 F. Supp. 2d 209, 217 (D.C. Cir. 2003) (citations omitted).

G. Conclusion

The National Wildlife Federation staunchly opposes the Pebble Project and we urge the Corps to reject the requested permit, as required by law, and withdraw the DEIS. The Bristol Bay watershed is far too important to wildlife, communities, jobs, and the economy to risk to the Pebble Project and to such flawed decision making.

Respectfully submitted,

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