August 24, 2020

Submitted via email to:
Alaska Department of Environmental Conservation
Division of Water
Wastewater Discharge Authorization Program/401 Certification
555 Cordova Street
Anchorage, Alaska 99501-2617
dec-401cert@alaska.gov

Re: State Water Quality Certification, Army Corps of Engineers' Public Notice (PN) Reference Number POA-2017-00271, Multiple Waterbodies, Pebble Project

Dear Alaska Department of Environmental Conservation,

We have carefully reviewed the Final Environmental Impact Statement (Final EIS) for the Pebble Project, the Pebble Limited Partnership's (PLP) Section 404 dredge and fill permit application, and supporting documentation offered by PLP and its consultants regarding its proposed mining operations, water treatment, and water management. Based on our review and for the reasons detailed in the attached comments, DEC must deny water quality certification for the proposed Pebble Mine Project.

Our organizations collectively represent the interests of fifteen Tribal governments throughout the Bristol Bay region of southwest Alaska, as well as the interests of BBNC's 10,300 shareholders of Yup'ik, Denai'na, and Alutiq heritage with ancestral ties to Bristol Bay. In addition, Bristol Bay Economic Development Corporation represents the economic interests and opportunities for the residents of 17-member communities throughout the region. The Bristol Bay Regional Seafood Development Association represents the economic interests of over 8,000 commercial salmon fishermen who hail from Alaska and 47 other U.S. states. Together, our organizations represent the economic, cultural, and social foundations of Bristol Bay, Alaska, home of the world's most prolific wild sockeye salmon fishery.

Today, the U.S. Army Corps of Engineers found the following:[1]

> [U]under section 404 of the Clean Water Act that the project, as proposed, would likely result in significant degradation of the environment and would likely result in significant adverse effects on the aquatic system or human environment. This finding is based on factual determinations, evaluations, and tests required by subparts (b) and (g), and after

[1]https://www.army.mil/article/238426/army_finds_pebble_mine_project_cannot_be_permitted_as_proposed.

consideration of subparts (c) through (f) and (h) of the 404 (b)(1) guidelines. This record is laid out in the environmental impact statement published on July 24, 2020.

Therefore, the Corps finds that the project, as currently proposed, cannot be permitted under section 404 of the Clean Water Act.

We could not agree more. PLP has long stated that its mine proposal should be judged on its scientific merits, and it has had ample time to make its case. The Corps' finding of "significant degradation" states what we have known for many years: that Pebble mine cannot coexist with Bristol Bay's salmon. While the Corps provides PLP with 90 days to further make its case that it can compensate for Pebble's impacts, there simply is no mitigation in Bristol Bay's pristine environment that could offset the destruction that Pebble would bring, as compensatory mitigation is not Pebble's only challenge.

In addition to falling woefully short on a compensatory mitigation plan, PLP has failed to provide sufficient information to prove that water discharges from the Pebble Project will comply with the CWA and Alaska Water Quality Standards. Furthermore, the limited information available from PLP about its water treatment and management plans demonstrates that the development of the Pebble mine would result in water quality violations related to water temperature and flow, total dissolved solids, selenium, mercury, copper, and arsenic in the Nushagak and Kvichak watersheds.

All of these issues are addressed in our attached detailed comments, and each of them leads to the conclusion that DEC should deny water quality certification for the Pebble Project.

Sincerely,

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EPA-6692-0003731

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Enclosure

EPA-6692-0003732

Bristol Bay Native Corporation, United Tribes of Bristol Bay, Bristol Bay Economic Development Association, Bristol Bay Regional Seafood Development Association, and Bristol Bay Native Association

Comments on Alaska Department of Environmental Conservation CWA Section 401 Certification for the Pebble Mine Project (POA-2017-00271)

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I. Bristol Bay Commenters

The Bristol Bay organizations herein requesting the Alaska Department of Environmental Conservation (DEC) deny state water quality certification for the proposed Pebble Mine Project consist of members and supporters who live and/or work in Bristol Bay and near the location of the proposed Pebble Mine Project and have long-standing interests in the world-class fisheries of Bristol Bay. Our concerns with the proposed Pebble Mine Project have been well-documented, including via comment letters submitted during summer 2019 articulating the many inadequacies of the U.S. Army Corps of Engineers' (USACE) Draft Environmental Impact Statement and the Pebble Limited Partnership's (PLP) Clean Water Act (CWA) 404 permit application. Based on our years of involvement in the National Environmental Policy Act (NEPA) and CWA 404 permitting processes for the proposed Pebble Mine Project and our review of CWA 404 permit applications and supporting documentation, it is evident that PLP has failed to provide sufficient information for DEC to certify that water discharges from the proposed Pebble Mine Project will comply with the CWA and Alaska Water Quality Standards. We urge DEC to deny state water quality certification.

Below, we introduce each member organization and their interests relative to the proposed Pebble Mine Project and Bristol Bay's pristine ecosystem and waters and its one-of-a-kind salmon fishery.

Bristol Bay Economic Development Corporation (BBEDC) is a 501(c)(4) non-profit corporation whose mission is to promote economic growth and opportunities for residents of its member communities through sustainable use of the Bristol Bay and Bering Sea resources. BBEDC undertakes programs and management to foster economic and social benefits for the residents and communities of Bristol Bay in order to ensure sustainability of the region's renewable natural resources, including its salmon fisheries and other fish stocks and fisheries.

Bristol Bay Native Association, Inc. (BBNA) is a non-profit corporation serving 31 federally recognized tribes in the Bristol Bay regions in southwest Alaska. BBNA's mission is to advance the social, cultural, and economic interests of the Tribes and Alaska Native people of the Bristol Bay Region, including by prioritizing protection of Bristol Bay's salmon fisheries (commercial, subsistence, and sport) and salmon habitat in all land management decisions.

United Tribes of Bristol Bay (UTBB) is a tribally chartered consortium of 15 federally recognized tribal governments in Bristol Bay that represent over 80% of the population of Bristol Bay. UTBB's mission is to protect the Yup'ik, Dena'ina, & Alutiiq indigenous way of life from unsustainable development in Bristol Bay.

Bristol Bay Regional Seafood Development Association, Inc. (BBRSDA) is a 501(c)(6) nonprofit corporation with the mission of maximizing the value of the Bristol Bay commercial salmon fishery for the benefit of its members. BBRSDA's membership consists of all 1,863 Bristol Bay salmon driftnet permit holders and is funded by a self-assessment of 1% on the ex-vessel value from driftnet landings. BBRDSA operates a successful branding and marketing program for Bristol Bay Sockeye Salmon which relies heavily on the fishery's abundance and positive reputation for pristine habitat.

Bristol Bay Native Corporation (BBNC) is a for-profit ANCSA regional corporation with more than 10,300 shareholders. BBNC was created by Congress in 1971 pursuant to ANCSA to represent the economic, social, and cultural interests of Alaska Native people from the Bristol

Bay region. Since its inception, BBNC has taken seriously its responsibility to protect the assets entrusted to its care as well as the interests of its shareholders. BBNC remains actively engaged in a variety of efforts to preserve Bristol Bay's salmon fisheries, which serve as the basis for the region's social, cultural, and economic well-being. In order to fulfill these duties and carry out the will of its Alaska Native shareholders, BBNC has a strong interest in protection of the water and salmon resources of Bristol Bay, as well as the associated subsistence, commercial and sport fishing, and cultural values of its shareholders.

II. Proposed Pebble Mine Project – Unprecedented Destruction of Pristine Waters, Unprecedented Water Treatment and Conceptual Water Treatment and Management Proposal

The proposed Pebble Mine Project poses unacceptable risks to the Bristol Bay watershed and to the Bristol Bay salmon fisheries. Under normal operations, the proposed Pebble Mine Project would, at minimum, directly destroy at least 3,000 acres of wetlands and 100 miles of streams in the Bristol Bay watershed. It would bring about salmon avoidance in productive Bristol Bay headwaters designated by the State of Alaska as anadromous habitat. In addition, a catastrophic failure of any one of the mine's seven large embankments would have disastrous impacts to the watershed—and well beyond—and lead to years to decades of water quality violations and irreparable harm to the world's greatest wild salmon fishery.

PLP is proposing a 20-year mine plan mine, extracting approximately 12 percent of the known deposit, that would directly destroy far more anadromous waters and other rivers and streams than any other mine project proposed or developed in Alaska and likely the world. PLP also proposes a conceptual approach to water treatment that is unprecedented in Alaska, and appears to be unproven elsewhere in the mining world, in terms of technical complexity, engineering feasibility, and water quantity and quality. PLP's water treatment proposal is orders of magnitude greater than any other mine permitted in Alaska, while situated at the headwaters of the most prolific salmon fishery in the state. Finally, PLP's proposal would require the placement of seven large embankments in salmon-bearing streams, holding back 1.2 billion tons of bulk and pyritic tailings and 18 billion gallons of untreated contact water exceeding water quality criteria.

Impacts from the project would have far-reaching consequences for water quality in the short term through construction and placement of dredge and fill material into salmon streams and tributaries and over the long term requiring water capture and treatment in perpetuity.[2]

Subsequent to publication of the Final EIS, USACE has determined that—based on the direct impacts of the proposed Pebble Mine Project on wetlands and streams in the Bristol Bay region—the project as proposed "would cause unavoidable adverse impacts to aquatic resources and, preliminarily, that those adverse impacts would result in significant degradation to those aquatic resources."[3]

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[2] As disclosed in the Pebble Final Environmental Impact Statement, during Closure Phases 3 and 4, the influent water into the water treatment plants will exceed the state's numeric water quality criteria for: TDS, sulfate, aluminum, antimony, arsenic, beryllium, cadmium, cobalt, copper, iron, lead, manganese, mercury, molybdenum, nickel, selenium, silver, and zinc. *See*, Pebble Final Environmental Impact Statement, Appendix K4.18, pages 56-59, *available at*: https://pebbleprojecteis.com/ (hereinafter "Pebble Final EIS").

[3] Letter from David S. Hobbie, Regional Regulatory Division Chief, U.S. Army Corps of Eng'rs, to James Fueg, Pebble Limited Partnership (Aug. 20, 2020), available at: https://pebbleprojecteis.com/documents/mitigation.

A. Impacts to Waters from Fill Material

The Final EIS finds that the proposed Pebble Mine Project would impact over 4,500 acres of wetlands and more than 190 miles of streams in the Nushagak and Kvichak drainages, where 60-70% of Bristol Bay's tens of millions of sockeye salmon return every year. These Final EIS impact estimates are only a fraction of the damage the mine would cause in its lifetime, as the Final EIS only assessed the impacts of a 20-year mining plan that would extract 12% of the ore body. The Final EIS also documents that an expanded mine plan targeting 55% of the ore deposit would impact more than 15,000 acres of wetlands and 500 miles of streams, including the permanent destruction of 43.5 miles of anadromous streams.

Table 1. Pebble Mine Final EIS – Quantified Impacts to Waters and Fish Habitat[4]

Impact	20-year mine (Alt. #3; 12.7% of deposit)	78-year mine (~55% of deposit[5])
Wetlands and Other Waters		
Direct & permanent impacts – loss of wetlands	2,232 acres of wetlands and other waters	10,987 acres of wetlands and other waters
Direct & permanent impacts – loss of streams	105.4 miles of streams	435.9 miles of streams
Direct & temporary impacts (construction access) – wetlands and other waters	773 acres of wetlands and other waters	773 acres of wetlands and other waters
Direct & temporary impacts (construction access) – streams	6.2 miles of streams	6.2 miles of streams
Indirect impacts – fugitive dust, dewatering, and fragmentation	1,609 acres of wetlands and other waters 79.5 miles of streams	3,438 acres of wetlands and other waters 96.5 miles of streams
Total Impacts	**4,614 acres of wetlands impacted** **191.1 miles of streams impacted**	**15,198 acres of wetlands impacted** **538.6 miles of streams impacted**
Fish Habitat		
Direct & permanent impacts – mine site – fish habitat loss	• 8.5 miles of anadromous fish habitat permanently lost • 12.7 additional miles of resident fish stream habitat permanently lost • Total 21.2 miles of fish-bearing streams permanently lost (blocked or filled by mine components)	43.5 miles of anadromous fish habitat permanently lost (blocked or filled by mine components)
Direct & permanent impacts – transportation corridor – total stream crossings	205 stream crossings, including 17 bridges	205 stream crossings, including 17 bridges
Direct & permanent impacts – transportation corridor – fish passage stream crossings	54 fish stream crossings	54 fish stream crossings

[4] Table 1 data is found in Pebble Final EIS, Executive Summary, at page 93. *See also*, pages 4.22-15, 4.24-3 to 5, and 4.24-64.
[5] *See*, Pebble Final EIS Chapter 4, Table 4.1-1 ("Pebble Project expansion—develop 55% of delineated resources").

No mine or development project in Alaska comes close to directly destroying the amount of wetlands, waters, and salmon streams as PLP proposes to do here.

Table 2. Section 404 Permit Alaska Project Comparison Chart[6]			
	Salmon & Fish Streams	All Streams	Wetlands, Lakes, Ponds, & Marine Waters
Pebble Mine (**Alt #3**) 20-Year Proposal (targeting 12.7% of resource)	– More than 8 miles anadromous-cataloged streams destroyed – More than 20 miles of fish-bearing streams destroyed.	– At least 105.4 miles destroyed. – Water flow and water quality impacts could affect 79.5 more miles.	– At least 2,232 acres direct and permanent loss (plus 773 acres temporary impact and 1,609 acres indirect impacts from dust, dewatering, and fragmentation)
Pebble Mine 78-Year Expanded Development Scenario (targeting 55% of resource)	Over 43 miles anadromous-cataloged streams destroyed at the mine site	435.9 miles permanently destroyed	10,987 acres permanently destroyed
Greens Creek Mine	0 linear miles	Not quantified.	– Impacts through 2003 not quantified. – 10.2 additional acres (2003 tailings) – 14.5 additional acres (2013 expansion)
Fort Knox Mine	0 linear miles. Burbot and grayling habitat only. No ADF&G anadromous waters catalog designations in or around mine site area.	Not quantified.	– 480 acres (1995 tailings construction) – 57.6 additional acres (2007 heap leach facility) – 15.64 additional acres (2011 TSF dam raise); 2 additional acres (2015 waste rock dump expansion); 0.97 additional acres (2018 phase 10 pit expansion)
Kensington Mine	No permanent loss and Slate Creek dam not located in designated anadromous waters.	Not quantified.	– 83.4 acres permitted
Pogo Mine	0 linear miles	Not quantified.	306 acres
Red Dog Mine	Not quantified.	Not quantified.	– 1,402.6 acres (observed 1984-2009) – 119 additional acres (2009 Aqqaluk expansion)
Oil & Gas Projects in Alaska			
Nanushuk	0 linear miles	0 linear miles	288 acres
Point Thompson Development Project	0 linear miles salmon streams. Not quantified, but ROD discusses avoidance of work in anadromous fish habitat	Not quantified in ROD, impacts not clear	267.1 acres
Northstar Project	0 linear miles	0 linear miles	23.3 acres for Seal Island construction
Liberty (Hilcorp)	0 linear miles	0 linear miles	88.1 acres
ASRC Colville River Consolidated Gravel Material Site 1998-2018+	0 linear miles	0 linear miles	580 acres (cumulative, phases 1 through 3 from 1998-present and beyond)

[6] For supporting citations to Section 404 Permit Alaska Project Comparison Chart, see page 7, https://www.bbnc.net/wp-content/uploads/2020/07/FEIS-Inadequate-to-Support-Clean-Water-Act-Permit.pdf.

Particular to fish-bearing streams, according to the Final EIS, the proposed Pebble Mine Project would permanently destroy 105 miles of streams, including 8 miles of designated anadromous habitat and another 12.7 miles of resident fish streams, totaling more than 20 miles of permanent destruction of Bristol Bay's fish-bearing waters.[7] The waters permanently destroyed and inundated with fill material and tailings are home to important King salmon spawning and rearing population, sockeye and coho spawning and rearing, and abundant resident fish and aquatic organisms that support salmon rearing habitat.[8] Again, no other project permitted in Alaska has directly and permanently destroyed this extent of salmon-bearing waters.

B. Conceptual and Unprecedented Water Treatment and Management Plans

With respect to water management and treatment, the proposed Pebble Mine far exceeds treatment volumes of any other hardrock mine in Alaska and proposed treatment for mine effluent is far more complicated and conceptual:

Table 3. Water Treatment Capacities at Alaska Hardrock Mines

Mine	Gallons per Day	Process/Equipment	Pebble vs others
Pebble Mine Water Treatment Plants (WTPs) (proposed), 20 year mine	38,779,012 (combined based on two proposed WTPs)[9]	chemical precipitation, filtration, high-pressure membranes filtration, and reverse osmosis	--
Pebble Mine WTPs (proposed), 78 year mine	53,902,829 (approximate)[10]	unknown	--
Kensington Mine WTP	2,160,000[11]	Co-precipitation	Pebble 20 year mine requires water treatment **18 times** that of Kensington; 78 year plan is **25 times**
Greens Creek Mine WTP	3,600,000[12]	Co-precipitation	Pebble 20 year mine requires water treatment **10.8 times** that of Greens Creek; 78 year plan is **15 times**
Red Dog Mine WTP	6,624,000[13]	Chemical precipitation	Pebble 20 year mine requires water treatment **5.9 times** that of Red Dog; 78 year plan is **over 8 times**
Donlin WTP (proposed)	6,840,000 (max. capacity)[14]	Oxidation, clarification, and filtration	Pebble 20 year mine requires water treatment **5.7 times** that proposed for Donlin; 78 year plan is **nearly 8 times**

Bristol Bay is an extremely wet environment. The Pebble ore deposit exists in a "transitional climatic zone with a strong maritime influence,"[15] and receives an average of 40-50 inches of

[7] Pebble Final EIS, at page 4.24-3.
[8] *See*, Pebble Final EIS, Appendix I—Essential Fish Habitat Assessment, at Figure 4-1.
[9] Final EIS, Executive Summary, at page 13 (two water treatment plans proposed to treat influent of 14 cfs and 46 cfs (60 cfs total) converts to 26,929.87 gallons per minute).
[10] Final EIS, Chapter 4.1, Table 4.1-2: Assumptions for Pebble Project Expansion ("For the purpose of this analysis, the increase in water required for production and treatment would increase by 39%, commensurate with the increase in production.") (60 cfs increased by 39% results in 83.4 cfs, which converts to 37,432.52 gallons per minute).
[11] Water Engineering Technologies, Inc., White Paper on Water Treatment Process, prepared for Pebble Limited Partnership (July 24, 2012), p. 5, available at https://pebbleprojecteis.com/files/25246462-5d2d-47a2-8bfb-c8370b4a5481 (Kensington Mine process rate of 1,500 gallons per minute)
[12] *Id* at p. 5 (Greens Creek Mine process rate of 2,500 gallons per minute)
[13] *Id* (Red Dog Mine process rate of 4,600 gallons per minute).
[14] Donlin APDES permit, available at http://dec.alaska.gov/Water/WPSdocs/AK0055867_docs.pdf (based on 4,750 gallons per minute permitted capacity).

precipitation annually.[16] A compounding problem arises from the nature of open-pit mining itself, as noted by the Final EIS, "the nature of open-pit mining would lead to a complex interaction between groundwater, surface water, and a number of water-related resources."[17] This means that PLP must have a plan to treat vastly more water than other hard rock mines. Under PLP's 20-year mine plan, which targets less than 13% of the Pebble ore deposit, the Final EIS states that PLP must treat nearly 39 million gallons of water per day. For the 78 year plan, which targets 55% of the ore deposit, this number jumps to nearly 54 million gallons per day. Because of the composition of the tainted water at Pebble, this water treatment involves multiple complex processes and equipment, including chemical precipitation, filtration, high-pressure membrane filtration, and reverse osmosis.

Should PLP's water treatment approach fail, the resulting pollution would flow directly into Bristol Bay's salmon-rich waters. Indeed, as the Final EIS admits, the water management pond water and water contained in the tailings storage facilities "would exceed water quality standards."[18] Pebble's uniquely sensitive location requires the highest level of precaution in mine design, especially including water treatment of these magnitudes. Yet, PLP only presented USACE, and now DEC with concept-level technology to treat massive amounts of water. As stated in the Final EIS:

- "The water treatment process design will continue as the project advances, and would be required to comply with applicable regulatory requirements of the State of Alaska."[19]
- "Additional detail would be developed and included in updates to these plans as the project proceeds through the state permitting process."[20]
- "Specific details on [closure water treatment] compliance monitoring and a detailed monitoring plan would be developed during the state permitting process."[21]

Indeed, even the receiving waters for water treatment plan effluent are themselves conceptual. PLP's most recent permit application shows three WTP outfalls – two outfalls from WTP #1 located at Upper Talarik Creek and Frying Pan Lake and South Fork Koktuli and one outfall from WTP #2 located at North Fork Koktuli.[22] However, these locations have changed over the four iterations of PLP's permit applications and, as the Final EIS discloses, are not the final proposal: "PLP will work with ADF&G to further optimize the project water discharge strategy through state permitting. This could include the evaluation of alternate discharge strategies, discharge locations, or the use of constructed wetlands to further optimize the plan (PLP 2020-RFI 071d)."[23]

In short, and as described in more detail in Section V below, the information put forth by PLP on its water management and treatment fails to support DEC's state water quality certification that the project will not violate Alaska's water quality standards.

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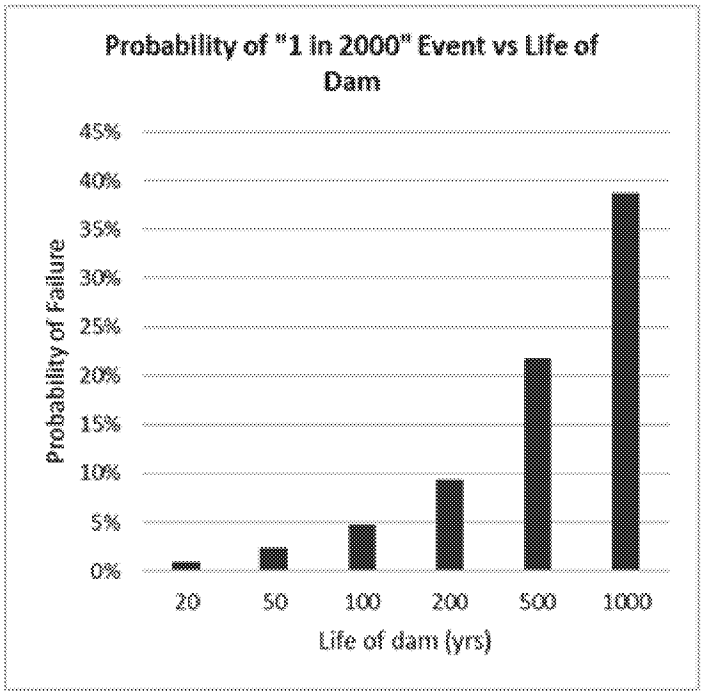
[15] Pebble Final EIS, at page 3.20-9.
[16] Pebble Final EIS, at page 3.20-10.
[17] Pebble Final EIS, Executive Summary, at page 56.
[18] Pebble Final EIS, Section 4.18, Table 4.18-1.
[19] Pebble Final EIS, Appendix D, page D-273
[20] Pebble Final EIS, at page 2-33.
[21] Pebble Final EIS, at page 2-38.
[22] Pebble Limited Partnership, Pebble Project Department of the Army Application for Permit POA-2017-271 (June 2020), at Attachment B Project Description, available at: https://pebbleprojecteis.com/documents/background.
[23] Pebble Final EIS, at page 5-27.

C. Spill Risk – Conceptual Tailings Embankments and Concentrate Pipeline

PLP is proposing to construct seven major embankments in the headwaters of Bristol Bay, holding back 1.2 billion tons of bulk and pyritic tailings and 18 billion gallons of water, all of which will exceed water quality standards and require collection and treatment in perpetuity. And yet, as admitted to by PLP (see Table 4 below), PLP's plans for these embankments and the management and treatment of water contained behind these embankments is entirely conceptual and will require future field studies and advanced engineering. The proposed embankments are located in a highly seismic area and, considering the embankments will hold back wastes exceeding water quality standards in perpetuity, DEC cannot make a finding of reasonable assurance that the project will meet state water quality standards based on the current available information.



Using the estimated annual probability of a tailings dam failure of approximately 1 in 2000[24] the probability of a dam failure over the life of a dam approaches 5% at 100 years of dam life, and skyrockets higher from there. For a project proposing 7 major dams in a seismically-active region, the probability of a failure is reasonably foreseeable and undermines any DEC finding that the project will meet state water quality standards.

As to the materials held behind these seven embankments, the Pebble Final EIS admits that the water and tailings waste will exceed a multitude of numerical water quality standards and will require capture and treatment:

- "Tailings fluids (contact water used to mix the bulk tailings slurry, and pyritic supernatant fluid) would contain concentrations of some metals that exceed WQC. Tailings fluids from both [bulk and pyritic TSs] would have elevated concentrations of the following metals relative to the applicable WQCs: antimony, arsenic, beryllium, cadmium, copper, lead, manganese, mercury, molybdenum, selenium, silver, and zinc, with the addition of cobalt for the pyritic tailings."[25]
- "Contact water stored in the main WMP would be elevated in several metals that would exceed WQC, [such as] elevated levels of aluminum, arsenic, beryllium, cadmium, copper, lead, manganese, mercury, molybdenum, nickel, selenium (a metalloid), silver, and zinc in exceedance of the most stringent WQC."[26]

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[24] Davies, M. P. (2002). Tailings Impoundment Failures Are Geotechnical Engineers Listening?. *GEOTECHNICAL NEWS-VANCOUVER-*, *20*(3), 31-36. Chambers, D. M., & Higman, B. (2011). Long term risks of tailings dam failure. *Center for Science in Public Participation, Bozeman, Montana.*
[25] Pebble Final EIS, Executive Summary, at page 104.
[26] Pebble Final EIS, Executive Summary, at page 106.

Table 4. Water Quality Concerns and PLP's Conceptual Embankments[27]

	Embankment(s) & Waterbody	Contents & Water Quality Concerns	Examples of Gaps & Agency Concerns Unaddressed
Bulk Tailings Storage Facility (TSF)	Two Embankments: • Main = 545 feet high on the North Fork Koktuli • South = 300 feet high on the South Fork Koktuli *proposed "thickened tailings" and flow-through dam design*	1.14 billion tons of bulk tailings **Exceed WQC for**: antimony, arsenic, beryllium, cadmium, copper, lead, manganese, mercury, molybdenum, selenium, silver, and zinc, TDS	**Agency/AECOM Concerns** • EPA: support for no failure analysis of bulk TSF "is limited given the simplified conceptual dam designs, lack of operational, monitoring, and closure plans and lack of representative seismic analysis for the bulk TSF." - EPA comments (July 1, 2019) • SOA/DNR: "concerned about deferral of spill responsibility to [SOA] Dam Permitting Process where an inundation analysis would occur but a full breach analysis will not be conducted." - cooperating agency meeting notes (Nov. 18, 2019) • AECOM: explanation of no dam failure analysis for Main WMP despite agency requests: "unable to evaluate failure of WMP as there are no comparable for a lined WMP [*sic*] of this size." - cooperating agency meeting notes (Nov. 18, 2019) • EPA: "Minimal information regarding the design of the seepage collection system is provided in the EIS and therefore, it cannot be assumed that it would be effective in preventing groundwater contamination. We recommend that either a double-liner be considered [for the Pyritic TSF and Main WMP], or additional information be provided regarding the seepage collection system." - EPA comments (July 1, 2019) **PLP Responses** • PLP: "The tailings testing program, which is expected to be completed during the preliminary design phase of the Alaska Dam Safety Program [ADSP], will include [field testing] to determine the characteristics [of] the tailings." - PLP response to RFI 006c (Aug. 12, 2019) • PLP: "Development of the embankment design, construction, and management during operations will be completed based on the ADSP program guidelines […]. Ongoing evaluations of the design criteria and concepts will be completed throughout the preliminary and detailed design phase and will be updated based on information gathered during future studies."- PLP response to RFI 008h (Sept. 20, 2019) • PLP: "A tailings deposition plan, to be included in the operations, maintenance and surveillance (OMS) manual, will be completed prior to operations. PLP response to RFI 006c (Aug. 12, 2019) • PLP: "The condition of the competent bedrock will be evaluated during site investigations to confirm material strength…" - PLP response to RFI 006c (Aug. 12, 2019)
Pyritic Tailings Storage Facility (TSF)	Three Embankments: • North = 335 feet high on the North Fork Koktuli • South = 215 feet high on the South Fork Koktuli • East = 225 feet high on the South Fork Koktuli	155 million tons of potentially acid generating tailings and slurry water; waste sludge from water treatment **Exceed WQC for**: antimony, arsenic, beryllium, cadmium, copper, lead, manganese, mercury, molybdenum, selenium, silver, zinc, cobalt, TDS	
Water Management Ponds (WMPs)	Main WMP One Embankment: Main = 190 feet high on the North Fork Koktuli Open Pit WMP One Embankment: Main = 100 feet high on the South Fork Koktuli	18.33 billion gallons (56,000 ac-ft) of untreated excess and contact water in the Main WMP **Exceed WQC for**: aluminum, arsenic, beryllium, cadmium, copper, lead, manganese, mercury, molybdenum, nickel, selenium (a metalloid), silver, and zinc	

[27] Information on proposed embankments and contents is found in Pebble Limited Partnership, Pebble Project Department of the Army Application for Permit POA-2017-271 (June 2020), at Attachment B Project Description, available at: https://pebbleprojecteis.com/documents/background. Information about WQC exceedences is found in Pebble Final EIS Executive Summary.

The exceedances of water quality criteria behind these embankments is a realistic threat to water quality of Bristol Bay's headwaters, especially, as noted by PLP's contractor, because PLP's tailings embankment design is conceptual and unproven and without the necessary field testing:

> testing completed to date on the bulk tailings has been minimal. [...] Thus, the summary of expected particle size sorting behavior [...] in the RFI response [from PLP] is incomplete and misleading. [...] The ability to operate as a flow-through drained facility can only be confirmed with Pebble-specific tailings testing [...] We remain concerned that there are uncertainties as to whether the 55 percent thickened tailings planned by PLP would segregate enough to promote reduction of the phreatic surface near the embankment, which translates to uncertainties regarding the effect of tailings segregation on embankment stability.[28]

PLP's conceptual embankment and tailings management designs were also recently questioned by the State of Alaska Department of Natural Resources, noting the EIS analysis of failures "based on a marginally developed, conceptual design, and the exclusion of other risks including the other relatively large, water management dams, does not represent a thorough assessment of risk from potential failure modes and potential impacts."[29]

Indeed, the Pebble Final EIS explains that spills from these TSF and WMP embankments would lead to water quality violations far down the Koktuli River into the Mulchatna River and Nushagak River:

> For the bulk tailings release, based on mean annual discharge (MAD) levels of stream flow:
>
> - Copper concentrations would exceed the most stringent WQC to the Koktuli River below the NFK and SFK confluence, about 23 miles downstream from the mine site.
> - Molybdenum, zinc, lead, and manganese concentrations would exceed the most stringent WQC until the Mulchatna River below the Koktuli River confluence, about 62 miles downstream.
> - Cadmium concentrations would exceed the most stringent WQC until the Mulchatna River below the Stuyahok River confluence, about 78 miles downstream from the mine site.
>
> For the higher-volume pyritic tailings release, based on MAD levels of stream flow:
>
> - Copper would remain at levels exceeding the most stringent WQC until the Mulchatna River below the Koktuli River confluence, about 80 miles downstream of the mine site.

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[28] AECOM, Technical Memorandum to Bill Craig, AECOM (Dec. 13, 2019), Pebble Project EIS – Bulk TSF Embankment Seismic Stability Analysis, at pp. 1-2, *available at* https://pebbleprojecteis.com/files/86882482-1f9a-4846-8fa5-354c4f5a8230.

[29] Letter from ADNR, to USACE (March 23, 2020), *available at*: https://www.bbnc.net/wp-content/uploads/2020/05/BBNC-Compendium-Pebble-PFEIS-Expert-Agency-Critique-May-6-2020.pdf (page 18).

- Zinc, lead, and manganese would remain at levels exceeding the most stringent WQC until the Nushagak River below the Mulchatna River confluence, about 122 miles downstream of the mine site.
- Cadmium and molybdenum would remain at levels exceeding the most stringent WQC as far downstream as the Nushagak River Estuary where it enters Nushagak Bay, part of the greater Bristol Bay, about 230 miles downstream from the mine site.[30]

In addition to the risk and likelihood of water quality violations occurring from embankment failures, PLP's CWA 404 permit application amended in June 2020 details its plans to build and operate a 6.25-inch diameter gold-copper concentrate pipeline from the mine site to a port at Iliamna Bay.[31] PLP's concentrate pipeline – located alongside the transportation corridor – would traverse more than 200 stream crossings along the northern shore of Iliamna Lake, including at least 54 streams with known salmon presence, spawning, and rearing.[32]

While the Final EIS does not analyze the likelihood and risks from a concentrate pipeline failure, according to EPA, in its 2014 Bristol Bay Watershed Assessment, the risk of failure of a concentrate pipeline is "considered particularly high,"[33] "could convey contaminants to Iliamna Lake,"[34] and would "degrade habitat quality for fish and benthic invertebrates."[35]

III. Waters Impacted by the Proposed Pebble Mine Project – Existing Uses and Protections of Bristol Bay's Waters

The waters of the Koktuli River, Upper and Lower Talarik Creek, Mulchatna and Nushagak Rivers, Iliamna Lake, Newhalen River and countless other lakes and creeks serve as sources of drinking water, the basis for a traditional way of life dating back thousands of years, religious ceremonies, and a commercial and subsistence salmon fishery that has sustained the economy and people of the Bristol Bay region for generations. In recognition of the importance of Bristol Bay's pristine waters, the State of Alaska has taken many efforts over the years to protect these waters through its land and fisheries management policies, mineral closure orders, protective fisheries management, and designations protective of clean water and aquatic life.

Many of the proposed project components are located on state-owned lands and waters designated under the Kenai Area Plan and Bristol Bay Area Plan for uses such as recreation, subsistence, and public recreations and tourism.[36] In addition, waters at the mine site and along the transportation corridor were closed to mineral entry through Mineral Closure Order (MCO) 393. The Alaska Department of Natural Resources (DNR) issued MCO 393 in 1984, closing to mineral entry about 214,000 acres of land along the corridors of 64 streams important for the spawning and rearing of salmon in the Bristol Bay region, as shown in the map below.

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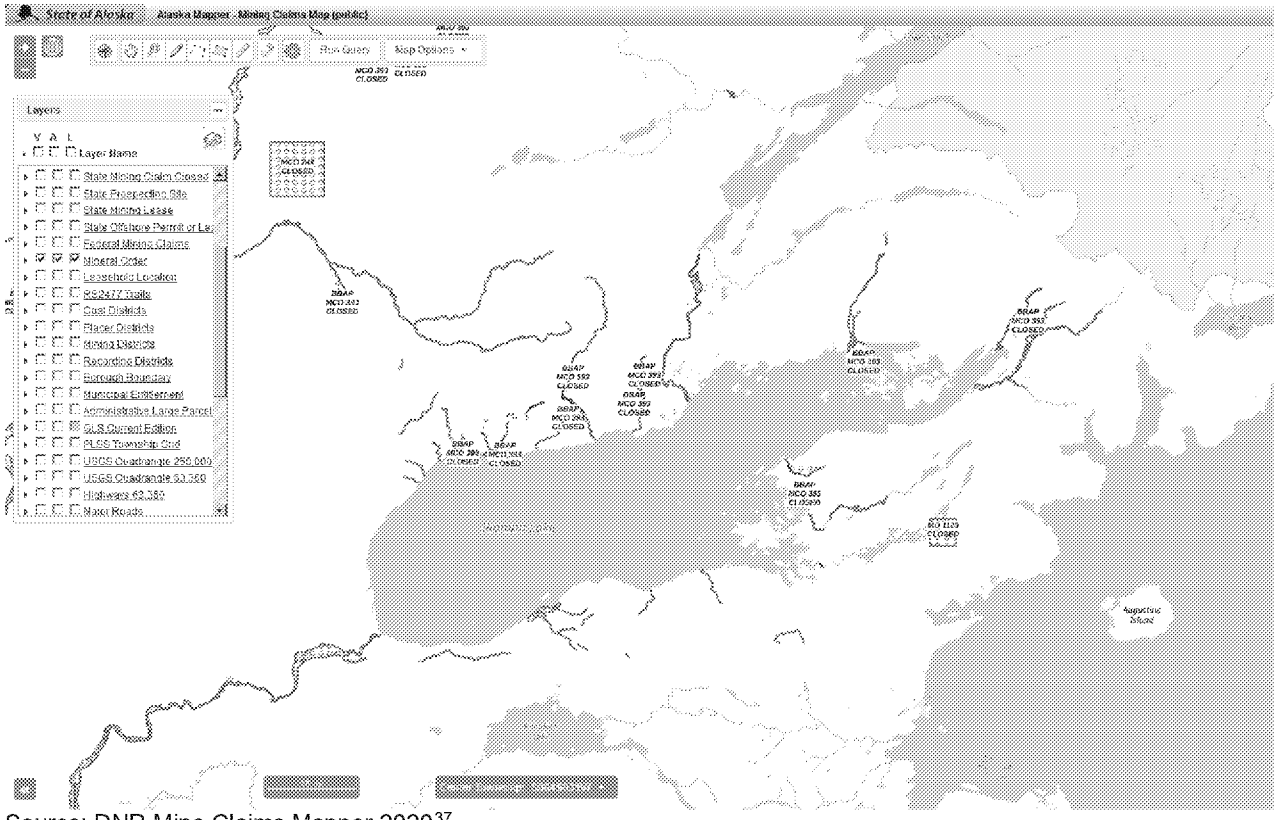
[30] Pebble Final EIS, Executive Summary, at page 104.
[31] Pebble Limited Partnership, Pebble Project Department of the Army Application for Permit POA-2017-271 (June 2020), *available at*: https://pebbleprojecteis.com/documents/background.
[32] Pebble Final EIS, at page 4.24-5.
[33] EPA, Bristol Bay Watershed Assessment (Jan. 2014), at page 11-1, *available at* https://www.epa.gov/bristolbay [herein after "BBWA" or "Watershed Assessment"].
[34] BBWA, at page 11-7.
[35] BBWA, at page 11-9.
[36] *See* Bristol Bay Area Plan, *available at*: http://dnr.alaska.gov/mlw/planning/areaplans/bristol/2013/ and Kenai Area Plan, *available at*: http://dnr.alaska.gov/mlw/planning/areaplans/kenai/.



Source: DNR Mine Claims Mapper 2020[37]

DNR is authorized by statute to close land to mineral entry when the Commissioner "makes a finding that mining would be incompatible with significant surface uses on the state land."[38] Consistent with this statutory authority, DNR's issuance of MCO 393 was based on its finding that "[t]he development of mining claims within the active stream channel of designated anadromous streams and adjacent uplands ... creates an incompatible surface use conflict with salmon propagation and production, and jeopardizes the economy of the Bristol Bay region and the management of the commercial, sport, and subsistence fisheries in the Bristol Bay area."[39] Thus, by closing stream corridors to mineral entry in MCO 393, DNR precluded all surface uses and activities relating to the development of mining claims as well, including but not limited to the discharge of dredged or fill material, the installation of structures, and the disposal of mining waste. Pertaining to PLP's mining claims held at the Pebble deposit, 185 mining claims touch MCO 393-designated streams, including Upper Talarik Creek, South Fork Koktuli, North Fork Koktuli, and unnamed smaller tributaries of Lake Iliamna. Meanwhile, as the map above illustrates, the MCO 393 lands and waters exist along PLP's northern transportation corridor at the Newhalen River, Pile River, and Iliamna River.

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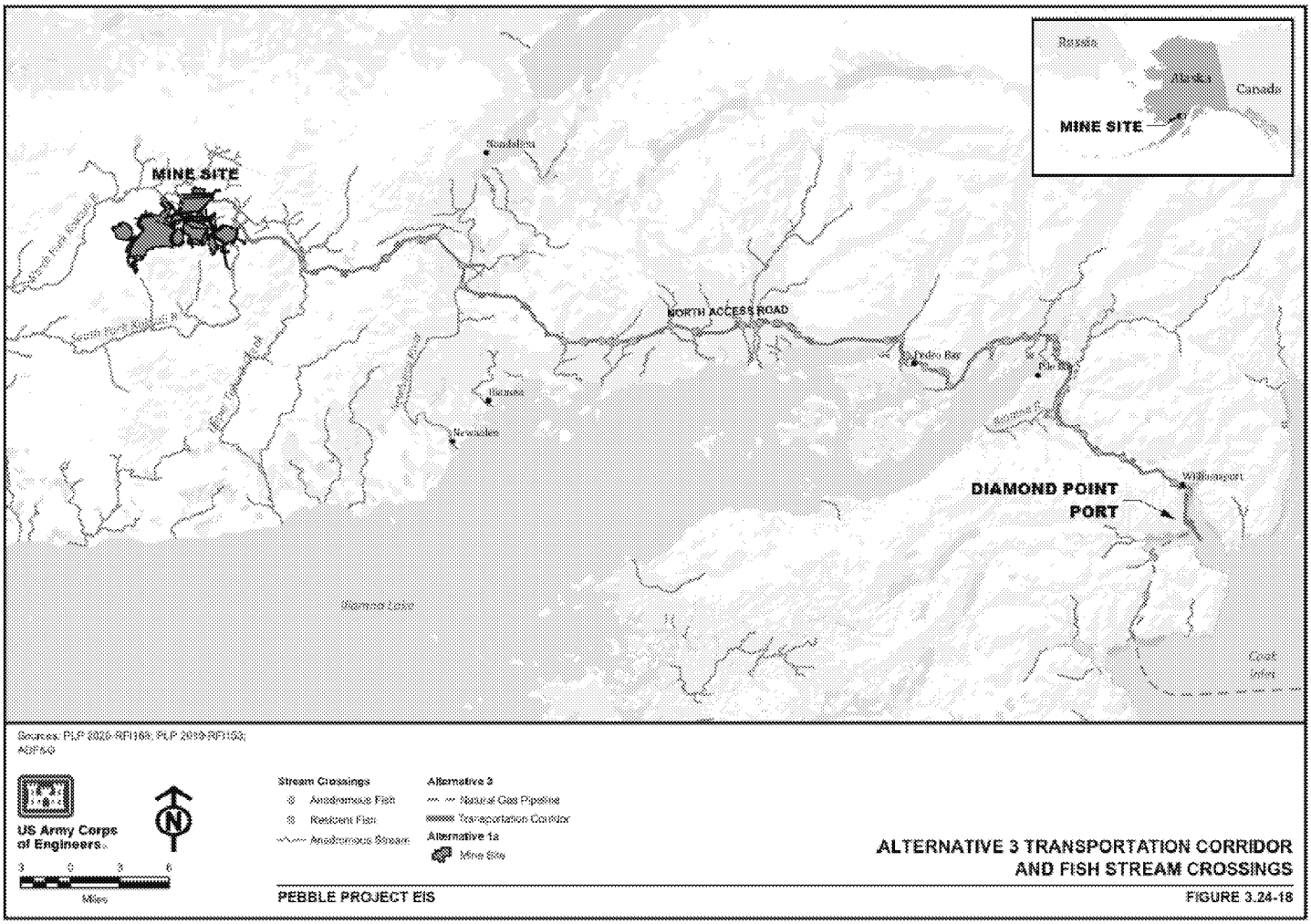
[37] DNR Mine Claims Mapper available at http://akmining.info/ (last accessed Aug. 23, 2020).
[38] AS § 38.05.185(a).
[39] MCO 393, at p. 2 (emphasis added) (on file with the authors and available from DNR). While MCO 393 does not affect "valid existing rights" in existence at the time DNR adopted the order in 1984, *see* MCO 393, at p. 1, all of the Pebble deposit mining claims post-date DNR's adoption of MCO 393 and thus cannot be considered valid existing rights. To the extent the mining claims in the Pebble deposit post-date 1984 and yet erroneously include lands protected by MCO 393, those mining claims are void ab initio. *See Kile v. Belisle*, 759 P.2d 1292, 1295 and 1295 n. 5 (Alaska 1988) (applying the "general rule" that "mining claims located upon lands withdrawn from mineral entry are void ab initio") (citations omitted).

In addition, nearly all of the waters impacted by the proposed Pebble Mine Project are designated anadromous in the Alaska Department of Fish and Game's (ADF&G) anadromous waters catalog, including waters at the mine site proposed for inundation and fill behind massive embankments and 54 streams along the north shore of Iliamna Lake proposed for crossing with a road, natural gas pipeline, and concentrate slurry pipeline.[40] These waters provide important spawning and rearing habitat for all five Pacific salmon species and resident salmonids and other fish.

Final EIS map showing AWC-designated streams highlighted:



In recognition of the importance of these waters for the state's most prolific salmon run, the State of Alaska Department of Fish and Game (ADF&G) has placed instream flow reservations throughout Bristol Bay, protecting water flows sufficient to sustain salmon populations. Waters impacted by the proposed Pebble Mine Project and protected by instream flow reservations issued to ADF&G include the Nushagak, Newhalen, and Iliamna Rivers.[41]

[40] Pebble Final EIS, at page 4.24-5.
[41] LAS 28241 (Nushagak River), LAS 24379 (Newhalen River), and LAS 28861 (Iliamna River).

Table 5. Waterbody Protections and Designations | Examples of Impacts from the Proposed Pebble Mine Project					
Waterbody	**AWC Designation[42]**	**MCO Designation**	**Instream Flow Reserv.**	**Placement of Dredged & Fill; Water Flow Impacts[43]**	**Water Quality Impact**
Koktuli River	AWC Code: 325-30-10100-2202-3080 Species at Mouth: CHs, COsr, Ksr, Pp, Ssr, ACp, Wp	MCO 393—Closed to Mineral Entry	LAS 26543 and LAS 26544—Applications filed in 2007 (Curyung Tribal Council), applications complete LAS 28241—Certificate Issued (ADF&G): Reservation applies to Nushagak River to confluence with Mulchatna River	Flow reductions for miles downstream	Embankment failures – According to Final EIS, WQC exceedances for TSS, copper, molybdenum, zinc, lead, manganese, and cadmium expected to reach entire Koktuli River to confluence with Mulchatna River
North Fork Koktuli	AWC Code: 325-30-10100-2202-3080-4083 Species at Mouth: CHs, COsr, Ksr, Ssr	MCO 393—Closed to Mineral Entry	--	Anadromous tributaries permanently filled and inundated; three large embankments	WTP #2 outfall (proposed); groundwater seepage from Bulk TSF; Bulk TSF, Pyritic TSF, and Main WMP embankments failures
South Fork Koktuli	AWC Code: 325-30-10100-2202-3080 Species at Mouth: CHs, COsr, Ksr, Pp, Ssr, ACp, Wp	MCO 393—Closed to Mineral Entry	--	Anadromous tributaries permanently filled and inundated; four large embankments	WTP #1 outfall (proposed); dust deposition; Bulk TSF and Pyritic TSF embankments failures
Upper Talarik Creek	AWC Code: 324-10-10150-2183 Species at Mouth: CHs, COsr, Ks, Pp, Ssr, ACp	MCO 393—Closed to Mineral Entry	--	Flow reductions for miles downstream	WTP #1 outfall (proposed); dust deposition; concentrate pipeline and road crossings
Newhalen River	AWC Code: 324-10-10150-2207 Species at Mouth: COp, Ks, Ss, ACp	MCO 393—Closed to Mineral Entry	LAS 24379—Certificate Issued (ADF&G): Reservation applies to streamflow from origin at Sixmile Lake to mouth at Lake Iliamna	Two water extraction sites reducing flows: • WES-N29 – 1,000 gallons per minute; 8 million gallons annually for the life of the mine • WES-N30 – 1,000 gallons per minute; 5 million gallons annually for 3 construction years	placement of fill material into waters; dust deposition from transportation; concentrate pipeline spills
Pile River	AWC Code: 324-10-10150-2341 Species at Mouth: Ss, ACp	MCO 393—Closed to Mineral Entry	--	Water extraction site: WES-N13 – 1,000 gallons per minute; 8 million gallons annually for 3 construction years	placement of fill material into waters; dust deposition from transportation; concentrate pipeline spills
Iliamna River	AWC Code: 324-10-10150-2402 Species at Mouth: CHp, COp, Kp, Pp, Ss, DVp	MCO 393—Closed to Mineral Entry	LAS 28861—Certificate Issued (ADF&G): Reservation applies to streamflow from mouth at Lake Iliamna to 9 miles upriver	Water extraction site:WES-N10 – 1,000 gallons per minute; 8 million gallons annually for the life of the mine	placement of fill material into waters; dust deposition from transportation; concentrate pipeline spills

[42] AWC abbreviations: s=spawning, r=rearing, p=present. S=sockeye, CO=coho, K=king, CH=chum, P=pink, AC=Arctic char, DV=Dolly Varden
[43] Water extraction site information found at Pebble Final EIS, Appendix K2, pages 36-39.

A. Mine Site Waters – Upper Talarik Creek and Koktuli River Forks

Two main watersheds sit at the heart of PLP's proposed Pebble Mine Project – the Nushagak River and the Kvichak River. Two tributaries of the Nushagak River will be directly and permanently impacted, with designated anadromous fish habitat permanently destroyed – the North Fork and South Fork of the Koktuli River. A tributary of Iliamna Lake and the Kvichak River system – Upper Talarik Creek – also sits at the proposed mine site and would be adversely impacted by dewatering anadromous fish habitat, mine site dust deposition, and from a proposed WTP effluent outfall. These three pristine tributaries are home to significant populations of coho, King, and sockeye salmon as well as other resident salmonids and aquatic life and have long been protected by the State of Alaska with a Mineral Closure Order, land managed for recreation and subsistence, and with anadromous habitat designations. Existing uses of these waters include salmon propagation and rearing, wildlife use, subsistence use, recreation, the locations of native allotments, and drinking water.

1. Upper Talarik Creek

Upper Talarik Creek drains the eastern portion of the Pebble deposit and flows into the Kvichak River via Iliamna Lake, the largest undeveloped lake in the United States.[44] Coarse-textured glacial drift in the Upper Talarik Creek drainage promotes high groundwater contributions to these streams, resulting in stable flows through much of the year.[45] According to EPA, the upper reaches and larger tributaries of Upper Talarik Creek are considered medium streams (0.15 to 2.8 m^3/s) while the middle to lower portions are considered a small river (2.8 to 28 m^3/s).[46]

Upper Talarik Creek supports all five species of Pacific salmon, as well as Arctic char and is designated by ADF&G as anadromous habitat for coho spawning and rearing, sockeye spawning and rearing, King salmon spawning, chum salmon spawning, and pink salmon presence.[47] The stream is also known for its rainbow trout population.[48] ADF&G conducts aerial index counts that target peak sockeye salmon spawning periods on Upper Talarik Creek[49] and between 1955 and 2011, sockeye salmon counts in Upper Talarik Creek ranged from 0 to 70,600, with an average of 7,021 over 49 count periods.[50]

Beaver populations and beaver ponds are the source of significant anadromous habitat in Upper Talarik Creek, providing both summer and winter rearing opportunities for anadromous and resident fish species.[51] Upper Talarik Creek and its surrounding lakes and wetlands are important migratory stopover locations of large flocks of waterfowl such as swans, geese, ducks, and gulls[52] as well as supporting raptor species such as bald eagles, osprey, and other raptors and hawks.[53] The area contains important habitat for moose in the ponds and drainages surrounding the mine site footprint that contain preferred vegetative forage and cover.[54] The

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[44] BBWA, at page ES-2.
[45] BBWA, at page 3-16.
[46] BBWA, at page 3-23.
[47] AWC code: 324-10-10150-2183.
[48] BBWA, at page 7-11.
[49] BBWA, at page 7-12.
[50] BBWA, at page 7-13.
[51] BBWA, at page 7-31.
[52] Pebble Final EIS, at page 3.23-10.
[53] Pebble Final EIS, at page 3.23-51.
[54] Pebble Final EIS, at page 3.23-21.

area is also home to brown bears and one wolf den.[55] Brown bear utilize the stream for feeding during the salmon spawning season.[56] At the mouth of Upper Talarik Creek at beaches along the northeastern portion of Iliamna Lake are known Iliamna freshwater seal feeding sites.[57]

Upper Talarik Creek supports important recreational sport fishing opportunities for trout.[58]

State lands around Upper Talarik Creek and the waters themselves managed by DNR as General Use but with particular protections for anadromous fish and wildlife resources and habitat (especially for moose and caribou) and recreation and pristine waters:

> The unit is designated General Use (Gu) and is to be managed for a variety of uses including mineral exploration and development, public recreation and tourism, and protection of anadromous fish and wildlife resources and habitat. Upper Talarik Creek and its riverine area are to be protected, for its habitat, recreation, and water resource values.[59]

Upper Talarik Creek is closed for mining activities by the State of Alaska's Mineral Closure Order 393.[60]

2. *Koktuli River Forks*

The North and South Forks of the Koktuli River drain the western portion of the Pebble deposit and flows into the Nushagak River via the Mulchatna River.[61] The area is heavily influenced by past glaciation with extensive glacial sand and gravel deposits and permeable shallow aquifers, and upward hydraulic gradients.[62] According to EPA, the upper reaches and forks of the Koktuli River are considered medium streams (0.15 to 2.8 m^3/s) while the mainstem is considered a small river (2.8 to 28 m^3/s).[63]

The Koktuli River, including in particular the North Fork Koktuli, supports a large King salmon run that is especially important for subsistence users.[64] The Koktuli River supports abundant recreational opportunities. Sport anglers catch Arctic grayling across the Koktuli River.[65] The river also supports Dolly Varden[66] and whitefish.[67]

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[55] Pebble Final EIS, at page 3.23-21 and 22.
[56] Alaska DNR, Bristol Bay Area Plan (2013), page 3-159, *available at*: http://dnr.alaska.gov/mlw/planning/areaplans/bristol/2013/pdf/bbap_amend2013_complete.pdf.
[57] Pebble Final EIS, at page 3.23-48.
[58] Alaska DNR, Bristol Bay Area Plan (2013), page 3-106, *available at*: http://dnr.alaska.gov/mlw/planning/areaplans/bristol/2013/pdf/bbap_amend2013_complete.pdf.
[59] Alaska DNR, Bristol Bay Area Plan (2013), page 3-159, *available at*: http://dnr.alaska.gov/mlw/planning/areaplans/bristol/2013/pdf/bbap_amend2013_complete.pdf.
[60] Alaska DNR, Bristol Bay Area Plan (2013), page 3-146, *available at*: http://dnr.alaska.gov/mlw/planning/areaplans/bristol/2013/pdf/bbap_amend2013_complete.pdf.
[61] BBWA, at ES-2.
[62] BBWA, at page 3-12.
[63] BBWA, at page 3-23.
[64] BBWA, Appendix D, page 133.
[65] BBWA, Appendix B, at page 29.
[66] BBWA, Appendix B, at page 17.
[67] BBWA, Appendix B, at page 8.

In recognition of the river's outstanding fish resources, recreation opportunities, clean water, and support for subsistence and commercial fishing, DEC currently has a petition before it to designate the river as Alaska's first designated Outstanding National Resource Water.[68]

The Koktuli River, including both the North and South Forks, is closed for mining activities by the State of Alaska's Mineral Closure Order 393.[69]

The Koktuli River and its adjoining uplands and floodplains are designated by the state for public recreation and tourism: "This unit is designated Public Recreation and Tourism-Public Use Site (Rp) and is to be managed for public recreation and retained in public ownership."[70] Downstream, the Koktuli River meets the Mulchatna River. This river and its adjoining uplands and floodplains are designated by the state for public recreation and tourism.[71] Further downstream, the Mulchatna meets the Nushagak River which then flows to the Nushagak Bay. The Mulchatna and Nushagak Rivers are also governed by a specific Recreation Management Plan "to provide the basis for the management of recreation uses and structures on state land within the Nushagak and Mulchatna drainage basin."[72]

B. Transportation Corridor Waters – Newhalen River, Iliamna River, Pile River, and other Iliamna Lake Tributaries

The proposed Pebble Mine Project would require the placement of dredge and fill materials in 205 streams along the north shore of Iliamna Lake,[73] including a proposed 95 culvert crossings and 17 bridges.[74] PLP's plan is to utilize a concentrate pipeline to transport ore slurry 84 miles from the mine site to the port site on the Cook Inlet, traversing these 205 water crossings, including 54 streams designated by the State of Alaska as anadromous habitat.

While each waterbody crossing along the north shore of Iliamna Lake has its own important considerations and unique impacts, here we focus on three large waterbody crossings that are uniquely important for subsistence, recreation, clean water, fish habitat, wildlife habitat, and the way of life for people in the Bristol Bay region.

1. Newhalen River

The Newhalen River watershed consists of a drainage area of 3,451 square miles and is one of the largest rivers in the area with an average discharge of 15,000 cubic feet per second (cfs) during open flow season (May to October).[75] The watershed contains mountainous terrain with peak flows occurring during spring and summer snowmelt and during late summer to early fall

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[68] Nomination of the Koktuli River (North Fork, South Fork, Main Fork) Alaska's First Outstanding National Resource Water, *available at*: https://akmininginfo.files.wordpress.com/2012/09/koktuli-onrw-nomination1.pdf.
[69] Alaska DNR, Bristol Bay Area Plan (2013), page 3-146, *available at*: http://dnr.alaska.gov/mlw/planning/areaplans/bristol/2013/pdf/bbap_amend2013_complete.pdf.
[70] Bristol Bay Area Plan, page 3-106 to 125, *available at* http://dnr.alaska.gov/mlw/planning/areaplans/bristol/2013/pdf/bbap_amend2013_complete.pdf.
[71] Bristol Bay Area Plan, page 3-124 to 125, *available at* http://dnr.alaska.gov/mlw/planning/areaplans/bristol/2013/pdf/bbap_amend2013_complete.pdf.
[72] Bristol Bay Area Plan, at page 4-17, *available at* http://dnr.alaska.gov/mlw/planning/areaplans/bristol/2013/pdf/bbap_amend2013_complete.pdf.
[73] Pebble Final EIS, at page 4.24-5.
[74] Pebble Limited Partnership, Pebble Project Department of the Army Application for Permit POA-2017-271 (June 2020), at Attachment C Culvert Schedule, available at: https://pebbleprojecteis.com/documents/background.
[75] Pebble Final EIS, Section 3.16, at page 25.

rainfall events.[76] Flow and discharge is consistent throughout the open water months, due to the attenuating effect of upstream Lake Clark on summer dry periods.[77]

The Newhalen River is the site of extensive fish harvest by local communities.[78] The Nondalton Tribal Council has identified the Newhalen River Traditional Cultural Landscape as a potential historic property, based on the importance of the river and surrounding lands to local identity and subsistence.[79] Archeological field surveys of the Newhalen River bridge crossing identified five sites for cultural and archeological materials,[80] including the remains of a hunting camp, a multicomponent prehistoric archeological site, and the possibility of multiple hearths along the riverbank.[81] USACE, in the Pebble Final EIS has identified that "[f]urther work is required to identify potential cultural resources sites in the transportation corridor, including more detailed literature review, field survey, and consultation."[82]

Residents of Iliamna Lake communities and Nondalton use the Newhalen River for transportation between villages.[83] In addition, the Newhalen River is home to commercial rafting and jetboat tours.[84] The river boasts an average 1,800 to 2,900 angler days annually.[85]

The Newhalen River and its tributaries contain important anadromous fish habitat and large numbers of adult and juvenile sockeye, coho, and king salmon.[86] Sockeye return to spawn in the Newhalen River and tributaries to Sixmile Lake and Lake Clark.[87] According to the State of Alaska, the Newhalen River is "noteworthy for its clear water and good habitat; the river and its tributaries are important sockeye spawning grounds, contributing to 16 percent of the world's commercial wild red salmon harvest."[88] Aerial counts of the annual sockeye salmon run on the mainstem Newhalen River average around 85,000 fish and range to a high of 730,900 fish, while bankside tower counts of the annual sockeye salmon run range between 147,000 to 3 million fish.[89] King salmon spawning has been documented in the lower 9 miles of the Newhalen River, downstream from the proposed Newhalen River bridge crossing.[90] The river serves as an "important link" between Lake Clark and Iliamna Lake, especially for coho salmon spawning in these lakes and for the large populations of coho salmon supported by this lake and river system.[91] Rainbow trout and Arctic grayling are popular sport fish in the Newhalen River.[92]

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[76] Pebble Final EIS, Section 3.16, at page 27.
[77] BBWA, at page 3-16.
[78] Pebble Final EIS, Section 3.7, at page 16.
[79] Pebble Final EIS, Section 3.7, at pages 12-13.
[80] Pebble Final EIS, Section 3.7, at page 14 (sites: ILI-00302, ILI-00303, ILI-00304, ILI-00305, and ILI-00306).
[81] Stephen R. Braund & Associates, Summary Report of 2019 Cultural Resource Field Activities, prepared for PLP and the Army Corps (Sept. 30, 2019), at pages 8-10, attached to RFI 117a, *available at*: https://pebbleprojecteis.com/files/ca9d2dc6-4ee2-4081-918f-c11c997e9c5b.
[82] Pebble Final EIS, Section 3.7, at pages 14-15.
[83] Pebble Final EIS, Section 3.12, at page 7.
[84] Pebble Final EIS, Section 3.5, at page 9.
[85] Pebble Final EIS, Section 3.6, at page 33.
[86] Pebble Final EIS, Section 3.24, at page 61.
[87] EPA, Bristol Bay Assessment, at page 10-1.
[88] Alaska DNR, Bristol Bay Area Plan (2013), page 3-132, *available at*: http://dnr.alaska.gov/mlw/planning/areaplans/bristol/2013/pdf/bbap_amend2013_complete.pdf (emphasis added).
[89] Pebble Final EIS, Section 3.24, at page 68. *See also*, EPA, Bristol Bay Assessment, Ch. 10, pages 10-11.
[90] Pebble Final EIS, Section 3.24, at page 68.
[91] Pebble Final EIS, Section 3.24, at page 68.
[92] Pebble Final EIS, Section 3.24, at page 69.

The river is also home to many wildlife species observed at the proposed crossing site, including: caribou;[93] waterbirds such as harlequin ducks, swans, and geese;[94] tundra swans;[95] raptors and eagles;[96] brown bear;[97] wolf;[98] beaver;[99] red fox; and river otter.[100] According to the Final EIS, prior to construction, "additional permitting would likely be necessary with the USFWS to determine potential impacts to all bald and golden eagle nests" around the Newhalen River crossing, including additional nest surveys prior to any construction activities.[101]

The entire length of the Newhalen River is considered navigable by the State of Alaska and the Coast Guard.[102] The river is closed for mining activities by the State of Alaska's Mineral Closure Order 393.[103] Under the Bristol Bay Area Plan, the State of Alaska has designated the Newhalen River for Habitat and Public Recreation and Tourism-Dispersed.[104] According to the State's Area Plan:

> The Lake Clark-Newhalen River area is an important recreation corridor for outdoor recreation activities, especially sport fishing, river excursions, and wildlife viewing. The corridor contains at least half a dozen commercial recreation lodges with up to a dozen more located around Lake Clark itself. The Newhalen River is also utilized for commercial rafting and jetboat tours. The Newhalen River Gorge is Class V+ water and provides a thrilling experience for those interested in white water adventure. The clear turquoise-colored waters of the river contain all five species of anadromous Pacific salmon, trout, Arctic grayling, and Dolly Varden. The corridor is also used by wildlife such as eagles, other raptors, brown bear, moose, and caribou.[105]

2. *Pile River*

Pile River, located on the eastern side of Iliamna Lake, is 30.2 miles long with an average width of 100 feet and an average depth of 36 inches, with depth ranging from 30 inches to 60 inches.[106] Normal summer flow runs between 250 and 300 cfs.[107] The river is sourced from glacial streams and is "subject to occasional severe flooding."[108] Peak streamflows range from an estimated 3,600 cfs for a 2-year flood event to upwards of 14,000 cfs for a 200-year flood

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[93] Pebble Final EIS, Section 3.23, at page 64.
[94] Pebble Final EIS, Section 3.23, at pages 27-29, 52
[95] Pebble Final EIS, Section 3.23, at page 57.
[96] Pebble Final EIS, Section 3.23, at pages 6, 26, 51-52.
[97] Pebble Final EIS, Section 3.23, at page 21.
[98] Pebble Final EIS, Section 3.23, at page 22.
[99] Pebble Final EIS, Section 3.23, at page 38.
[100] Pebble Final EIS, Section 3.23, at page 38.
[101] Pebble Final EIS, Section 4.23, at pages 63-64.
[102] Alaska DNR, Navigable Waters Map, http://dnr.alaska.gov/mlw/nav/map/. *See also*, Pebble Final EIS, Section 3.12, pages 9-10.
[103] Alaska DNR, Mineral Orders, http://asgdc.alaska.gov/#127.
[104] Alaska DNR, Bristol Bay Area Plan (2013), page 3-133, *available at*: http://dnr.alaska.gov/mlw/planning/areaplans/bristol/2013/pdf/bbap_amend2013_complete.pdf.
[105] Alaska DNR, Bristol Bay Area Plan (2013), page 3-131, *available at*: http://dnr.alaska.gov/mlw/planning/areaplans/bristol/2013/pdf/bbap_amend2013_complete.pdf.
[106] DOI, United States Fish and Wildlife Serv. Special Scientific Report—Fisheries No. 488, Spawning Ground Catalog of the Kvichak River System, Bristol Bay, Alaska (June 1964) at pages 84-85, https://spo.nmfs.noaa.gov/sites/default/files/legacy-pdfs/SSRF488.pdf.
[107] *Id. See also*, BBWA Table 10-1 (identifying Pile River as one of Bristol Bay's "small rivers" with a mean annual discharge between 2.8 and 28 m^3/s.), *and see* Pebble Final EIS, Appendix K3.16, Table K3.16-7 showing instantaneous discharge measurements in summer 2004 between 1,533.1 and 212.4 cubic feet per second.
[108] *Id.*

event.[109] According to EPA, roadways near Pile River "may be especially susceptible to [...] runoff events, as demonstrated in late 2003 when storm runoff washed out several culverts on the state-maintained Pile Bay Road."[110]

The Pile River watershed is more than 100,000 acres in area[111] and the river consists of an alluvial valley bottom, active, braided channels,[112] and meandering channels with actively eroding floodplains.[113] The river contains a major sockeye salmon spawning area near its confluence with Iliamna Lake. Sockeye salmon annual runs on Pile River average approximately 6,500 fish and range up to 39,000 fish.[114] Pile River is home to moose,[115] trumpeter swans,[116] bears,[117] and beaver.[118]

Pile River – as part of the more than 2,000 average annual angler days on Iliamna Lake and its tributaries[119] – has itself a "measurable recreational fishing effort."[120]

Pile River is considered navigable by the State of Alaska.[121] The river is closed for mining activities by the State of Alaska's Mineral Closure Order 393.[122] Moreover, eastern Iliamna Lake, in the waters at the mouth of the Pile River, itself is designated by the state for public recreation and tourism and habitat. "The designations of Public Recreation and Tourism-Dispersed (Rd) and Habitat (Ha) apply to Iliamna Lake. The navigable waters of this Lake are to be managed so that its public recreation and habitat values are maintained. [...] Authorizations within these waterbodies should not interfere with navigability, important habitat values, or recreational uses."[123] Moreover, the islands within Eastern Iliamna Lake are designated by the state for public recreation and tourism: "Islands within Iliamna Lake are designated Public Recreation and Tourism-Dispersed. These management units, because of their unique scenic and cultural values, are to be retained in state ownership. Development authorizations, if issued, must ensure that public recreation and scenic values be maintained."[124]

3. Iliamna River

Iliamna River, located on the eastern side of Iliamna Lake, is 11.0 miles long at the main stem, with an additional 17.9 miles long at the right fork and 18.0 miles long at the left fork.[125] The

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[109] Pebble Final EIS, Appendix K3.16, Table K3.16-10.
[110] BBWA, at page 6-19,
[111] Pebble Final EIS, Section 4.22, Table 4.22-39.
[112] Pebble Environmental Baseline Document, prepared by Knight Piesold, Chapter 4 Physiography (May 10, 2011), at page 5, *available at* https://pebbleprojecteis.com/files/5d047c27-a3d4-469f-9766-6f71efd52f79
[113] *Id.* at page 6.
[114] BBWA, at Table 10-2.
[115] Pebble Final EIS, Section 3.23, at page 64.
[116] Pebble Final EIS, Section 3.23, at page 57.
[117] Pebble Final EIS, Section 3.23, at page 66.
[118] Pebble Final EIS, Section 3.23, at page 66.
[119] Pebble Final EIS, Section 3.6, at page 33.
[120] Pebble Final EIS, Section 4.6, at page 4.
[121] Alaska DNR, Navigable Waters Map, http://dnr.alaska.gov/mlw/nav/map/. *See also*, Pebble Final EIS, Section 3.12, page 9.
[122] Alaska DNR, Bristol Bay Area Plan (2013), page 3-146, *available at*: http://dnr.alaska.gov/mlw/planning/areaplans/bristol/2013/pdf/bbap_amend2013_complete.pdf.
[123] Bristol Bay Area Plan, Ch. 3, Region 9, page 3-143, *available at* http://dnr.alaska.gov/mlw/planning/areaplans/bristol/2013/pdf/bbap_amend2013_complete.pdf.
[124] *Id.*
[125] DOI, United States Fish and Wildlife Serv. Special Scientific Report—Fisheries No. 488, Spawning Ground Catalog of the Kvichak River System, Bristol Bay, Alaska (June 1964) at pages 91-101, https://spo.nmfs.noaa.gov/sites/default/files/legacy-pdfs/SSRF488.pdf.

entire length of all forks is accessible to salmon.[126] At the main stem, the average width is 100 feet, ranging from 90 to 200 feet, and the average depth is 48 inches, ranging from 24 to 120 inches.[127] The entire watershed is 201 square miles,[128] and consists of a "wide alluvial valley and actively meandering channel"[129] and an "actively eroding floodplain[]."[130] According to Department of Interior, the watershed is "[s]ubject to frequent and sometimes severe flooding."[131] Measured flow in September is around 250 cfs[132] and it is considered by EPA to be a small river based on mean annual discharge between 2.8 and 28 m^3/s.[133]

At the proposed Iliamna River bridge crossing location, the Final EIS notes the presence of the following anadromous fish: sockeye salmon, king salmon, pink salmon, coho salmon, chum salmon, and Dolly Varden.[134] Indeed, according to the Final EIS and the EPA's assessment of the watershed, the Iliamna river provides "important spawning habitat for sockeye salmon," with aerial survey estimates indicating "that hundreds of thousands of spawning sockeye salmon use the system"[135] and with a range up to 400,000 spawning sockeye salmon.[136]

In addition, according to the Final EIS, surveys of the Iliamna River crossing have identified an abundance of wildlife, including the presence of Iliamna Lake Seal,[137] raptors and eagles,[138] waterbirds such as harlequin ducks, loons, swans, and cranes,[139] black bears,[140] and a lone wolf.[141]

According to the Final EIS, the Iliamna River contains "recreational use opportunities"[142] with an average of 990 angler days annually.[143] The Final EIS notes that construction and use of a bridge at Iliamna River "would displace fish at river/stream crossings, which would particularly affect fishing at the road crossings" and "all project phases would adversely affect fishing experiences and opportunities along the transportation corridor."[144] The Final EIS also notes that "the instream pilings would represent an increased risk of allision to vessels."[145]

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[126] *Id.*
[127] *Id* at page 91.
[128] *Id.*
[129] Pebble Environmental Baseline Document, prepared by Knight Piesold, Chapter 4 Physiography (May 10, 2011), at page 5, *available at* https://pebbleprojecteis.com/files/5d047c27-a3d4-469f-9766-6f71efd52f79
[130] *Id.* at pages 6-7.
[131] DOI, United States Fish and Wildlife Serv. Special Scientific Report—Fisheries No. 488, Spawning Ground Catalog of the Kvichak River System, Bristol Bay, Alaska (June 1964) at page 91, https://spo.nmfs.noaa.gov/sites/default/files/legacy-pdfs/SSRF488.pdf.
[132] *Id.*
[133] BBWA, Chapter 10, at page 8.
[134] Pebble Final EIS, Section 3.24, page 67.
[135] Final EIS, Section 3.24, page 72. *See also*, BBWA, Chapter 10, at page 10 (noting the Iliamna River averages over 100,000 spawning sockeye salmon).
[136] BBWA, Chapter 10, at Table 10-2.
[137] Pebble Final EIS, Section 3.23, page 68.
[138] Pebble Final EIS, Section 3.23, page 54.
[139] Pebble Final EIS, Section 3.23, page 5.
[140] Pebble Final EIS, Section 3.23, page 66.
[141] Pebble Final EIS, Section 3.23, page 66.
[142] Pebble Final EIS, Section 3.5, page 15
[143] Pebble Final EIS, Section 3.6, page 33.
[144] Pebble Final EIS, Section 4.5, page 20.
[145] Pebble Final EIS, Section 4.12, page 16.

Iliamna River is considered navigable by the State of Alaska.[146] The river is closed for mining activities by the State of Alaska's Mineral Closure Order 393.[147]

C. Pristine Surface Waters as Drinking Water Sources and Cultural Significance

The Alaska Native people of Bristol Bay come from three different cultural traditions—Aleut, Eskimo, and Athabascan. Salmon are a revered renewable resource that has been harvested sustainably in the region for millennia, and salmon harvesting is central to the cultural traditions of these diverse Alaska Native peoples. Indeed, subsistence activities play a major role in defining Alaska Native families and communities through the passing on of knowledge and traditions from one generation to the next and the reinforcement of Native values, such as generosity, respect for elders, self-esteem, and cultural respect.[148]

Bristol Bay communities are also geographically isolated from the rest of Alaska and, in most cases, from one another.[149] These communities are self-reliant, operating without the benefit of interconnected road and utility systems, and subsistence use of wild resources is the most consistent and reliable component of the local economy.[150] As a consequence, studies have shown that the vast majority of households in the region rely on subsistence fishing, hunting, and gathering for a large percentage of their food.[151] Given the extremely high cost of groceries in rural Alaska, replacing the salmon harvest with store-bought meat would cost approximately $7,500 for the average Alaska Native family, representing nearly 20% of the average Alaska Native household income.[152] Commercial fishing is also the major economic engine for Bristol Bay and other Alaskan coastal communities.[153] Any damage to salmon resources in Bristol Bay would lead to poorer nutrition, as well as economic, social, and cultural hardship.[154]

In addition to the important subsistence and sense of place and culture from Bristol Bay's waters, residents throughout the Bristol Bay region rely on the clean, pristine waters for their drinking water and for religious significance.

As to drinking water, the Pebble Final EIS documents that many of the communities in the region obtain their drinking water from wells and surface water sources. As disclosed in the

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[146] Alaska DNR, Navigable Waters Map, http://dnr.alaska.gov/mlw/nav/map/. *See also*, Pebble Final EIS, Section 3.12, page 9.
[147] Alaska DNR, Mineral Orders, http://asgdc.alaska.gov/#127.
[148] *See* Fall, James A., et al., An Overview of the Subsistence Fisheries of the Bristol Bay Management Area, at 2-3, ADF&G Special Public. No. BOF 2009-07 (Nov. 2009), *available at* www.adfg.alaska.gov/specialpubs/SP2_SP2009-007.pdf.
[149] *See id.*; Duffield et al., *Revised Final Report, Economics of Wild* Salmon *Watersheds:* Bristol Bay, *Alaska*, at 23 (Feb. 2007) (prepared by University of Montana and Bioeconomics, Inc. for Trout Unlimited-Alaska), *available at* http://www.bber.umt.edu/pubs/survey/Economics%20of%20Wild%20Salmon%20Ecosystems%20in%20Bristol%20Bay_2007.pdf.
[150] *See* Fall, *supra note* 155, at 2.
[151] Between 1975 and 2007, subsistence salmon harvests have averaged about 152,000 fish per year. *See id.*, at 5; Callaway, Don, A Statistical Description of the Affected Environment as it Pertains to the Possible Development of the Pebble mine—17 Communities in Bristol Bay at 17 (2012) (a study funded by Bristol Bay Native Corporation).
[152] *Id.* at 27-28.
[153] *See* Alaska Commercial Fisheries Entry Comm'n, 2012 Annual Report, at 1 (2013), *available at* http://www.cfec.state.ak.us/mnu_Annual_Reports.htm.
[154] *See* Knapp, Gunnar, et al., Institute of Social and Econ. Research, Univ. of Alaska Anchorage, The Economic Importance of the Bristol Bay Salmon Industry (April 2013), *available at* http://www.iser.uaa.alaska.edu/Publications/2013_04-TheEconomicImportanceOfTheBristolBaySalmonIndustry.pdf [hereafter ISER Report].

Final EIS, three community water systems in the Iliamna Lake area extract surface water for domestic use: Nondalton, Kokhanok, and Igiugig.[155] In addition, individuals use the surface water in Iliamna Lake and along the Nushagak River as a source of drinking water. While according to the Final EIS, "It is unknown/not documented if private users use surface water as a drinking water source"[156] it is documented in work from PLP's contractor as well as in public hearing testimony to USACE that people throughout the region use surface water as drinking water:

- "our water intake is from Lake Iliamna that provides drinking and cooking water."[157]
- "Iliamna Lake is so pristine to where we drink it."[158]
- "we're able to take a drink right out of the lake as we're traveling around."[159]
- If you ever had a drink of Lake Iliamna water, you know the magnitude of how important this is [...] If this mine is permitted, I'm concerned we will no longer be able to drink this water, whether it's from dust pollution, spills, or [...] from runoff and effluent near a new road or a tailings pond failure."[160]
- "Our clean water is so pristine that we can go down to the beach and drink off of it."[161]

In the Environmental Protection Agency's 2014 Bristol Bay watershed assessment appendix *Traditional Ecological Knowledge and Characterization of the Indigenous Cultures of the Nushagak and Kvichak Watersheds, Alaska* Dr. Boraas and Dr. Knott note the religious significance of clean water for the Great Blessing of the Water at Nushagak River ice sites every winter.[162] They further explain the interconnected sacredness of salmon and water to the residents of Bristol Bay this way:

> They continue to practice a first salmon ceremony paying homage to the first salmon caught in the spring and the renewal of their cycle of life. The rivers are blessed by priests annually in the Great Blessing of the Water at Theophany, celebrating the baptism of Christ and symbolically purifying the water of contamination preparing it for the return of the salmon. This ceremony, for Orthodox Yup'ik and Dena'ina, is the pure element of God expressed as sanctified nature. The holy water of the rivers derived from this ceremony is used to bless the homes, churches, and people and is believed to have curative powers.[163]

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[155] Pebble Final EIS, at page 3.16-61.
[156] Pebble Final EIS, at page 4.27-5.
[157] Pebble Project—Scoping Meeting, Kokhanok, Alaska (April 10, 2018) Volume I, page 12, available at: https://pebbleprojecteis.com/documents/scoping.
[158] Pebble Project—Scoping Meeting, Kokhanok, Alaska (April 10, 2018) Volume I, page 13, available at: https://pebbleprojecteis.com/documents/scoping.
[159] Pebble Project—Draft Environmental Impact Statement Public Hearing, Homer, Alaska (April 11, 2019), Volume I, page 9, available at: https://pebbleprojecteis.com/documents/publichearing.
[160] Pebble Project—Draft Environmental Impact Statement Public Hearing, Igiugig, Alaska (March 28, 2019), Volume I, page 37, available at: https://pebbleprojecteis.com/documents/publichearing
[161] Pebble Project—Draft Environmental Impact Statement Public Hearing, New Stuyahok, Alaska (March 29, 2019), Volume I, page 20, available at: https://pebbleprojecteis.com/documents/publichearing
[162] BBWA, Appendix D.
[163] BBWA, Appendix D, pages 2-3.

D. Ecological and Economic Importance of Bristol Bay's Pristine Waters

The Bristol Bay region is vast, containing approximately 40 million acres of land and water. It contains myriad mountains, rivers, lakes, wetlands, and marine waters. Much of the region lies within the Bristol Bay watershed—a unique sprawling, permeable, and porous network of creeks and streams that produce large numbers of salmon.[164] The waters of Bristol Bay contain locally-adapted and genetically distinct populations of salmon that help ensure the long-term health and stability of salmon stocks across the watershed.[165] For generations upon generations, tens of millions of salmon reliably return to Bristol Bay.[166]

The importance of Bristol Bay's extraordinary salmon resource extends beyond local communities and provides important economic and recreational opportunities for Alaska residents and fishermen from around the nation. Bristol Bay is a sought-after destination for sport anglers around the world, who are drawn to the Kvichak River, Nushagak River, Upper Talarik Creek and other legendary Bristol Bay waterways by the world's largest sockeye salmon run and extraordinarily large and powerful rainbow trout. The waters of Bristol Bay support the most valuable commercial sockeye salmon fishery in the world, supplying nearly half of the world's wild sockeye salmon catch.[167] Salmon is also by far the most valuable commercial fish managed by the State of Alaska, and Bristol Bay is Alaska's richest commercial fishery.[168]

Bristol Bay's commercial salmon fishery provides enormous economic benefits to both the Alaska and national economies.[169] Nearly one-third of all of Alaska's salmon harvest earnings come from the Bristol Bay region[170] and the seafood industry contributes $5.8 billion to the Alaska economy and 78,500 jobs.[171] The 2017 sockeye salmon catch in Bristol Bay had a direct harvest value of $214.6 million and—owing to Bristol Bay processing and sustainable management—was almost double the 20-year average of $108.9 million.[172] And in 2018, 62.3 million sockeye salmon returned to Bristol Bay, the largest salmon season ever, based on records dating back to 1893, marking the fourth consecutive year that inshore sockeye salmon

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[164] *See* Pebble Science, Moran R., Water-Related Impacts at the Pebble mine (2007), *available at* http://www.pebblescience.org/Pebble-Mine/water-impact.html ("The extensive glacial gravel deposits are highly permeable; a characteristic that contributes to salmon productivity but also provides pathways for water and potentially for mine wastes to move between surface and groundwater and between river basins.").

[165] EPA, 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 3-49 to 3-52, *available at* https://www.epa.gov/sites/production/files/2014-07/documents/pebble_pd_071714_final.pdf [hereinafter "Proposed Determination" or "PD"]. *See also* Schindler, Daniel E., et al., Population Diversity and the Portfolio Effect in an Exploited Species, 465 NATURE 609 (June 3, 2010), *available at* http://www.nature.com/nature/journal/v465/n7298/full/nature09060.html.

[166] *See id.*

[167] *See* ISER Report, Executive Summary at 1. *See also* Dan, Tyler H., et al., Genetic Stock Composition of the Commercial Harvest of Sockeye Salmon in Bristol Bay, Alaska, 2009, at 1, ADF&G Fishery Data Series No. 11-21 (July 2011), *available at* http://www.adfg.alaska.gov/FedAidpdfs/FDS11-21.pdf.

[168] *See* ADF&G, Commercial Fisheries: Information by Fishery, *available at* http://www.adfg.alaska.gov/index.cfm?adfg=fishingCommercialByFishery.main.

[169] *See* ISER Report.

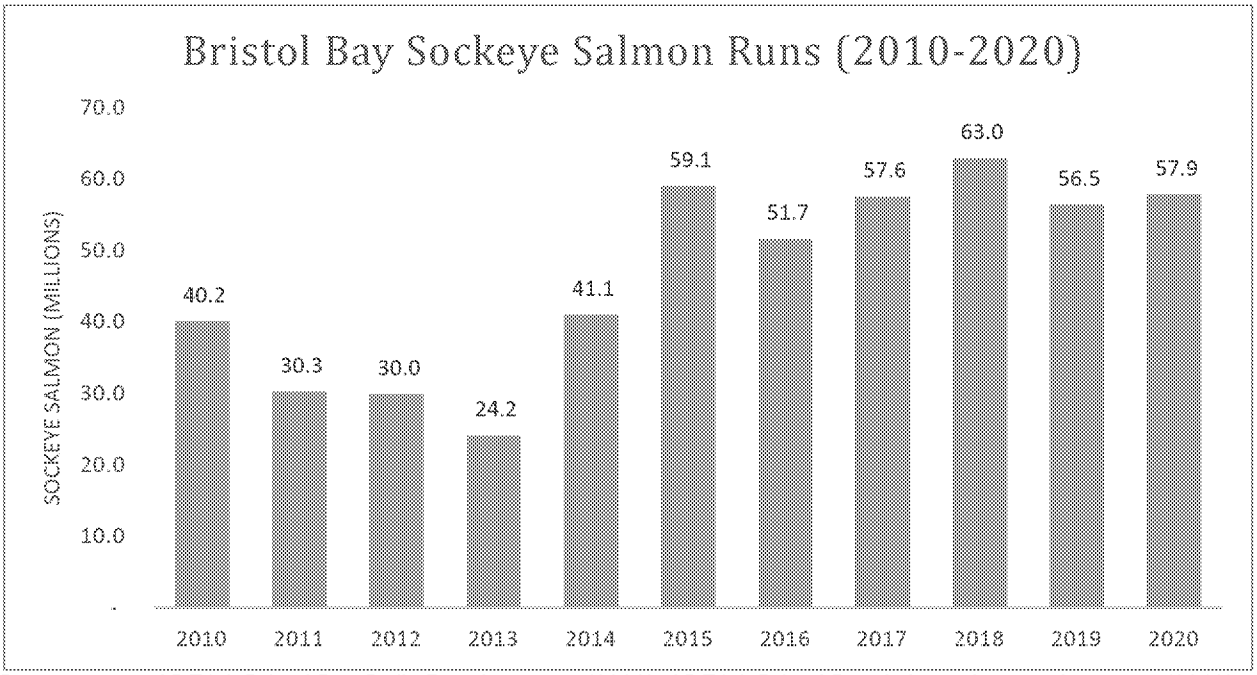
[170] *See* Woodby, D., et al. Commercial Fisheries of Alaska, ADF&G Special Public. No. 05-09 (June 2005), *available at* https://alaskafisheries.noaa.gov/sustainablefisheries/sslmc/may-06/adfg/05-adfg-report.pdf.

[171] *See* Alaska Dept. Fish & Game (ADF&G), Commercial Fisheries, *available at* http://www.adfg.alaska.gov/index.cfm?adfg=fishingCommercial.main. *See* Alaska Commercial Fisheries Entry Comm'n, 2012 Annual Report, at 1 (2013), *available at* http://www.cfec.state.ak.us/mnu_Annual_Reports.htm.

[172] *See* ADF&G, 2017 Bristol Bay Salmon Season Summary (Sept. 14, 2017), http://www.adfg.alaska.gov/static-f/applications/dcfnewsrelease/865497019.pdf.

runs exceeded 50 million.[173] The Nushagak and Kvichak River systems alone accounted for more than 50 million returning sockeye in 2018, or more than 80% of the entire Bristol Bay run. The 2018 season also ranks first in the history of the fishery's exvessel value, with a preliminary estimate of $281 million, or 242% above the 20-year average of $116million.[174] On an average year, the secondary wholesale value increases to more than $503 million when additional shipping, secondary processing, and distribution expenditures are added to the estimate.[175]

These trends continued through 2019 and 2020 with both years supporting returning sockeye salmon runs of over 50 million fish, marking six years in a row that sockeye salmon runs exceeded 50 million fish.



Data sources: ADF&G Bristol Bay Daily Run Summary (2020), ADF&G Bristol Bay Salmon Season Summary (2019), and ADF&G Annual Management Reports (2010-2018).

The nationwide benefits of the Bristol Bay commercial fishery are also compelling. The nearly 14,000 seasonal fishing and processing jobs created by the Bristol Bay salmon fishery give rise to an additional 5,852 year-round jobs for United States residents, which generate an estimated $411.7 million in earnings for these workers.[176] On an average year, Bristol Bay salmon fisheries thus create a total economic output value of $1.5 billion.[177]

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[173] *See* ADF&G, 2018 Bristol Bay Salmon Season Summary (Sept. 18, 2018), http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/989536277.pdf
[174] *Id.*
[175] *See* ISER Report, Main Report at 34.
[176] *See id* at 21
[177] ISER Report, Executive Summary at 2.

IV. Legal Background – State Water Quality Certification and the State's Anti-Degradation Policy

The overarching objective of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."[178] To further this objective, the CWA requires that any discharge of pollutants into the nation's waters must comply with water quality standards established by the state within which the discharges will occur.[179] The Alaska water quality standards are found in Title 18, Chapter 70 of the Alaska Administrative Code. The standards include an "anti-degradation policy,"[180] designated uses for each water body (e.g. drinking water supply, recreation, growth and propagation of fish), and "criteria" for specific pollutants that are designed to protect the designated uses of the water body.[181]

When USACE seeks to issue a CWA Section 404 permits for pollutant discharges into waters of the U.S. within Alaska, the State of Alaska must issue a "401 certification" that the discharges will comply with state water quality standards.[182]

If the State denies this certification, then the permit may not be issued.[183] Likewise, under federal regulations, USACE cannot issue a permit if the discharge of dredged or fill material causes or contributes to "violations of any applicable State water quality standard" or violates "any applicable toxic effluent standard."[184]

Alaska Antidegradation Policy

18 AAC 70.015. Antidegradation policy. (a) It is the state's antidegradation policy that

(1) existing water uses and the level of water quality necessary to protect existing uses must be maintained and protected;

(2) if the quality of a water exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality must be maintained and protected [...]

(3) if a high quality water constitutes an outstanding national resource, such as a water of a national or state park or wildlife refuge or a water of exceptional recreational or ecological significance, the quality of that water must be maintained and protected; [...]

(b) An applicant for a permit, certification, or approval who seeks to reduce water quality as described in (a) of this section shall provide to the department all information reasonably necessary for a decision on the application [...].

V. Certification Must Be Denied – PLP Has Failed to Provide Adequate Information about its Water Treatment and Management Plans for DEC to Issue Certification

In order for DEC to certify that the proposed Pebble Mine Project will not violate applicable water quality standards, PLP must put forth substantial evidence that the agency can rely on to

[178] 33 U.S.C. § 1251(a).
[179] 33 U.S.C. § 1341(a).
[180] 18 AAC 70.015(a).
[181] 18 AAC 70.010(b).
[182] 33 U.S.C. § 1341(a)(1).
[183] *Id.*
[184] 40 C.F.R. § 230.10(b). This includes the state's antidegradation policy requirements to protect the growth and propagation of fish, shellfish, other aquatic life, and wildlife under 18 AAC 70.020.

make findings about the project's impacts on receiving waters. As explained in this comment letter, PLP's proposed project and all of its documentation, plans, and consultant reports submitted in support of its proposed project fail to adequately describe the proposed project and its impacts on the state's water quality. In fact, PLP has failed to submit any of the DEC permit applications regarding management of its mine wastes, tailings, and water as required by state law. PLP has also failed to advance anything beyond conceptual water management and treatment plans in its CWA Section 404 permit application to USACE. Fieldwork remains incomplete and is ongoing for a number of important water quality parameters such as groundwater flow, acid rock drainage, geotechnical design, and wetlands mapping. And moreover, PLP's tailings embankments, concentrate pipeline, and water treatment plants have not been through the advanced design and engineering required for state permitting. PLP has not even identified the precise receiving waters for its water treatment effluent.

The failure of PLP to put forth adequate information about its proposed project means that DEC cannot certify that the project will comply with state water quality standards.

A. Reasonable Assurance Standard and Additional Information Required to Inform State Water Quality Certification

To issue state water quality certification for the proposed Pebble Project, DEC must determine "that there is a reasonable assurance that the activity will be conducted in a manner which will not violate applicable water quality standards."[185] According to the Alaska Supreme Court, DEC's "reasonable assurance" finding must be supported by "substantial evidence."[186] Moreover, EPA regulations require that certifications include a "statement that there is a reasonable assurance that the activity will be conducted in a manner which will not violate applicable water quality standards."[187]

DEC's own regulations require that, in order to certify the project will comply with state water quality requirements, PLP must provide to DEC "information [] necessary in order for the department to determine whether the discharge will comply with the applicable provisions,"[188] including state water quality standards and the state's antidegradation policy. DEC's regulations allow for an applicant to provide "additional information" to show that an activity will comply with state water quality requirements and, absent such information, DEC may deny state water quality certification.[189]

Under DEC's regulations, the burden is on PLP to show that its proposal will comply with state water quality standards. It has failed to do so here. DEC's regulations in 18 AAC § 15.130(b) provide a framework for DEC to request more information from an applicant in order to make the necessary findings related to water quality certification, but there is no indication that PLP would have the evidence necessary to assist DEC's determination, as the proposal is missing key field work and advanced design and engineering. As detailed below, PLP has failed to supply DEC with important details, advanced engineering, baseline data, and state permit applications necessary to inform the state's water quality certification. DEC should deny water quality certification based on the failure of PLP to provide adequate evidence that the project will comply with state water quality standards.

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[185] 40 C.F.R. § 121.2(a)(3).
[186] *Miners Advocacy Council, Inc. v. State, Dep't of Envtl. Conservation*, 778 P.2d 1126, 1139 (Alaska 1989).
[187] 40 C.F.R. § 121.2(a)(3).
[188] 18 AAC 15.130(b).
[189] *Id.*

B. No Integrated Waste Management Permit Application, Clean Water Act Section 402 APDES Permit Application, or Clean Water Act Section 402 Stormwater Construction and Discharge Permit Application

DEC has jurisdiction over a variety of permitting requirements for the proposed Pebble Mine project. These permitting requirements inform DEC's review and analysis of the project's impacts on water quality and compliance with the state's water quality requirements. PLP will be required to submit applications to DEC for (1) Integrated Waste Management Permit; (2) CWA Section 402 APDES Permit; and (3) CWA Section 402 Stormwater Construction and Multi-Sector General Permit and Stormwater Discharge Pollution Prevention Plan.

Together, these permits address tailings disposal, waste rock disposal, water discharges from water treatment plants at the mine site, and surface water runoff discharges at the mine, road, and port site. To date, PLP has provided none of these permit applications and supporting plans and information to DEC. Without details on how the proposed Pebble Project will comply with waste management, APDES, and stormwater requirements, DEC cannot certify that the project will comply with state water quality requirements.

PLP must obtain "prior authorization" from DEC[190] before taking "any action that results in the disposal or discharge[191] of solid or liquid waste material… into the waters or onto the land of the state."[192] For PLP, this prior authorization from DEC must take the form of an integrated waste management and disposal authorization, covering "multiple related or unrelated waste management or disposal activities to be conducted at a facility, including generation, treatment, storage, and disposal of solid or liquid waste."[193]

Integrated waste management permits (IWMP) cover a variety of components for hardrock mines.[194] For example, the IWMP covers disposal of waste to tailings storage facilities, waste rock and ore stockpiles (including overburden dumps), solid waste landfills for mining camps, and groundwater and surface water collection, treatment, and monitoring systems within the mining boundary area.[195] In addition, an IWMP will require PLP to submit "proof of financial responsibility" to manage and close the facility responsibly.[196] "For a mining waste disposal facility, the department may accept" the reclamation bond in order to fulfill this requirement.[197] The IWMP also covers monitoring requirements for the mine pits, waste rock, and ore stockpiles; characterization of acid rock drainage; and seepage collection systems. Additionally, this permit covers reclamation and closure activities of the TSF, waste rock, and mine pits, including disposal to the mine pits as approved by the department.

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[190] AS 46.03.900(6).
[191] AS 46.03.900(7).
[192] AS 46.03.100(a).
[193] AS 46.03.100(d).
[194] *See, e.g.*, State of Alaska Department of Environmental Conservation Waste Management Permit for Teck Alaska, Inc., Permit No. 2016DB0002, Sept. 23, 2016 at 3, http://dnr.alaska.gov/mlw/mining/largemine/reddog/pdf/decwmp2016db0002.pdf; *see also* State of Alaska Department of Environmental Conservation Waste Management Permit for Sumitomo Metal Mining Pogo LLC, Permit 2011DB0012, Feb. 7, 2012 at, available at http://dnr.alaska.gov/mlw/mining/largemine/pogo/pdf/pogowmp7feb2012.pdf.
[195] *See* Red Dog Waste Management Permit at 1.
[196] AS 46.03.100(f).
[197] *Id.*

An APDES permit must assure compliance with all CWA requirements applicable to the discharge being permitted.[198] Permits must contain effluent limitations for any discharged pollutants based on applicable technological standards ("technology-based effluent limits"), as well as any more stringent effluent limitations needed to ensure compliance with state water quality standards.[199] In addition, permits generally contain monitoring and reporting requirements, standard conditions, and special conditions. For a APDES permit, PLP will be required to provide the location of outfalls, identification of receiving waters, the sources of pollution and treatment technologies.[200] In addition to providing effluent characteristics for those pollutants or parameters identified above, PLP must provide the estimated daily maximum, daily average and source of that information for each outfall for all the conventional and nonconventional pollutants.[201]

Discharges of storm water from the proposed Pebble Mine Project and all associated construction and infrastructure will also require an APDES permit for storm water discharges from construction activities and DEC general permit for storm water discharges from a number of industries, including the mining industry (the "multi-sector general permit" or MSGP).[202]

PLP has failed to submit a single permit application to DEC for its compliance with the state's ADPES and IWMP requirements. Failure of PLP to submit this information means that DEC cannot with "reasonable assurance" certify that the project will comply with state water quality standards.

C. Receiving Waters Not Specified

DEC regulations require that PLP's application for a CWA Section 402 permit describe the receiving waters for effluent discharges. However, PLP's CWA 404 permit application fails to do this with any specificity and certainty, and PLP has failed to submit a CWA 402 permit application for DEC's review in connection with this 401 certification. This lack of information alone would justify DEC's denial of certification for the proposed Pebble Mine Project.

PLP's most recent permit application shows three WTP outfalls – two outfalls from WTP #1 located at Upper Talarik Creek and Frying Pan Lake and South Fork Koktuli and one outfall from WTP #2 located at North Fork Koktuli.[203] However, these locations have changed over the four iterations of PLP's permit applications and, as the Final EIS discloses, are not the final proposal: "PLP will work with ADF&G to further optimize the project water discharge strategy through state permitting. This could include the evaluation of alternate discharge strategies, discharge locations, or the use of constructed wetlands to further optimize the plan."[204]

In addition to failing to specify the mine site waters receiving waters, the Final EIS fails to include supporting details about the more than 200 stream crossings proposed for the north of

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[198] *Id.* at § 1342(a) & (b).
[199] *Id.* at §§ 1311(b)(1)(A), 1311(b)(1)(C), 1312(a), 1314(b). Dischargers must meet water quality-based effluent limitations if they release pollution that may contribute to, cause or have the reasonable potential to cause violations of water quality standards. *Id.* at §§ 1311(b)(1)(C), 1312(a), and 1313(e)(3)(A); 40 C.F.R. § 122.44(d).
[200] 18 AAC 83.360(a).
[201] 18 AAC 83.360(b)(2)–(3).
[202] *See* DEC Multi-Sector General Permits at http://dec.alaska.gov/water/wnpspc/stormwater/MultiSector.htm and DEC Construction General Permit at http://dec.alaska.gov/water/wnpspc/stormwater/Index.htm.
[203] Pebble Limited Partnership, Pebble Project Department of the Army Application for Permit POA-2017-271 (June 2020), at Attachment B Project Description, *available at*: https://pebbleprojecteis.com/documents/background.
[204] Pebble Final EIS, at page 5-27.

Iliamna Lake, including important baseline information on flow and chemical characteristics of these waters. According to the Final EIS, at least 54 of these 205 stream crossings will require fish passage.[205] These streams will be crossed by a two-lane dirt road, natural gas pipeline, a concentrate slurry pipeline, and a return water pipeline.[206] This proposal from PLP is recent—formulated with a new project description in May 2020—and has not been engineered with any specificity and without associated fieldwork. Indeed, as disclosed in the Final EIS and PLP's CWA 404 permit application (June 2020 version), more fieldwork is needed to characterize these water crossings, the bridge and culvert plans are "conceptual plans" based on LIDAR and satellite imagery and the ordinary high water level is "approximate" and "to be verified by future stream crossing surveys."[207] However, the Final EIS discloses impacts to water quality from these stream crossings, noting "impacts from sedimentation and turbidity during bridge and culvert installation."[208]

Given the unique and hazardous threat posed by a concentrate pipeline on these salmon-bearing waters, DEC must require more evidence from PLP about its proposed Iliamna Lake tributary crossings in order for the agency with "reasonable assurance" determine that the project can achieve compliance with water quality standards. Indeed, according to EPA, the risk of failure of a concentrate pipeline is "considered particularly high,"[209] "could convey contaminants to Iliamna Lake,"[210] and would "degrade habitat quality for fish and benthic invertebrates."[211]

Finally, according to the Final EIS, PLP plans to extract 121 million gallons annually from streams along the north of Iliamna Lake for its road construction and operation needs.[212] However, the exact proposals and state permits required for these activities have not been proposed by PLP. Indeed, according to the Final EIS, "Estimated average extraction rates would range from 500 to 1,000 gallons per minute, depending on the streamflow/volume of the waterbody. Final estimated quantities for specific uses would be determined during final design and permitting."[213] In addition to extracting massive quantities of water from fish-bearing tributaries of Iliamna Lake, PLP will have to implement water management techniques during construction to prevent violations of water quality standards such as TDS, TSS, flow, and temperature. However, yet again, PLP has not submitted to DEC the required APDES and stormwater permit applications for DEC to make a finding with reasonable assurance that PLP's proposal will comply with the state's water quality standards.

D. Treatment System Conceptual and Unproven

The Pebble Final EIS discloses that PLP's water treatment plant proposals are purely conceptual, not tested, and are subject to future modifications and changes during the APDES permitting process:

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[205] Pebble Final EIS, at page 4.24-5.
[206] Pebble Limited Partnership, Pebble Project Department of the Army Application for Permit POA-2017-271 (June 2020), at Attachment B Project Description, available at: https://pebbleprojecteis.com/documents/background.
[207] PLP, Third Revised Application for Clean Water Act 404 Dredge and Fill Permit—Bridge Plans and Typical Sections (June 2020), *available at*: https://pebbleprojecteis.com/documents/background.
[208] Pebble Final EIS, at page 4.24-5.
[209] BBWA, at page 11-1.
[210] BBWA, at page 11-7.
[211] BBWA, at page 11-9.
[212] Pebble Final EIS, Appendix K2.0, at pages 38-39.
[213] Pebble Final EIS, Executive Summary, at page 63.

> During detailed design of WTPs, additional process water and mass balance modeling, heat transfer engineering, and pilot plant test work would be performed to provide updates to water quality predictions in support of APDES permitting (PLP 2019-RFI 021h). Additional modeling and pilot plant testing would further evaluate the feasibility of WTP processes, assess maintenance requirements, reduce uncertainties, and refine discharge water quality predictions.[214]

According to the Final EIS, PLP has yet to evaluate its WTP efficiencies to ensure the project will not exceed water quality criteria as it treats contact water, tailings water, and other waste streams that the Final EIS discloses contain contaminants that exceed water quality criteria:

> [PLP will] Conduct the following evaluations of WTP processes during design engineering and permitting:
> - Further evaluate proposed treatment solutions to confirm the nature and potential for remobilization of precipitation solids.
> - Further evaluate conditions in the pyritic TSF and the potential for remobilization of salt mass to validate treatment assumptions.
> - Further evaluate the proposed removal efficiencies for various constituents to fully assess proposed treatment solutions; in particular, review the use of biological treatment technologies for selenium removal.[215]

The Final EIS discloses that the water associated with the project's construction and operation will exceed water quality criteria for many contaminants many times over, for example:

Table 6. Predicted Water Quality Exceedances (mg/L) (90th Percentile) during Pebble Mine Operations[216]

Parameter and WQC		Open Pit WMP	Bulk TSF	Main Embankment Seepage Pond	Pyritic TSF	Main WMP
TDS	(500 mg/L)	--	4,233	4,196	3,276	3,088
Sulfate	(250 mg/L)	--	2,350	2,350	1,760	1,747
Aluminum	(0.087 mg/L)	5.23	--	--	--	--
Antimony	(0.006 mg/L)	0.00783	0.0576	0.200	0.0291	0.0645
Arsenic	(0.01 mg/L)	0.0271	0.0780	0.260	0.0456	0.0869
Cadmium	(0.00008 mg/L)	0.0141	0.0318	0.0100	0.0185	0.0179
Copper	(0.00219 mg/L)	1.47	0.0100	0.0100	0.0100	0.0100
Lead	(0.00039 mg/L)	0.00411	0.057	0.0500	0.0304	0.0372
Manganese	(0.05 mg/L)	3.74	2.00	2.00	2.00	1.85
Mercury	(0.000012 mg/L)	0.000220	0.000346	0.000500	0.000182	0.000262
Molybdenum	(0.01 mg/L)	0.289	3.09	12.0	1.38	3.65
Selenium	(0.005 mg/L)	0.0342	0.058	0.0550	0.0361	0.0397
Silver	(0.0011 mg/L)	--	0.00271	0.0100	0.001236	0.00311
Nitrate	(10 mg/L)	--	--	11.19	10.83	--

For TDS, sulfate, antimony, arsenic, cadmium, copper, lead, manganese, mercury, selenium, and silver, the predicted water quality during operations is between two to seventy times the most stringent water quality criteria. Treatment of such high levels of contaminants is very

[214] Pebble Final EIS, Chapter 5, page 30.
[215] Pebble Final EIS, Chapter 5, at page 31.
[216] Predicted water quality parameters found in Pebble Final EIS, Appendix K4.18; WQC standards found in Pebble Final EIS, Appendix K3.18.

complex and subject to many different failure scenarios. The project's ability to maintain compliance with state water quality standards is entirely dependent on the success of the water treatment systems.[217] Even then, the Final EIS acknowledges that the mine is likely to cause exceedances of water quality standards: "over 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."[218]

PLP's own consultant analyzed hardrock mine and other water treatment facilities worldwide and concluded that high-capacity installations like the one proposed by PLP are not used anywhere in the mining industry.[219] In addition, the Pebble EIS contractor, AECOM, expressly acknowledged that PLP's proposed water treatment technology is untested and unproven and diverges from standard industry practice. In a November 2019 cooperating agency meeting, AECOM stated that the proposed approach for treating selenium "is very novel approach has not been demonstrated in industry, does not use industry standard of the biological approach."[220] AECOM itself "[v]oiced some concern" that the required water treatment "could be accomplished on scale proposed."[221]

Echoing this concern from AECOM, and based on its review of the Preliminary Final EIS, EPA stated: "We believe further evaluation of water treatment is important to ensure that the treatment will be technically viable and effective at meeting water quality standards."[222] And, as explained by DEC Division of Water in its comments on the Pebble Preliminary Final EIS, regarding PLP's conceptual treatment plans and deferral to state permitting processes: "It is not clear if deferring analysis is appropriate."[223]

With a conceptual approach to treating water and with DEC and many cooperating agencies and PLP's own contractor admitting water treatment of this complexity and scale has never been accomplished, PLP has not provided sufficient evidence to DEC that it will comply with state water quality standards.

E. No Pre-Testing Evaluation and Inadequate Testing for Potentially Acid-Generating Rock

The transportation corridor associated with the proposed Pebble Project presents unique risks to water quality associated with the placement of fill or dredged materials into waters and wetlands and the geochemistry of the region. As the Final EIS discloses, "Mercury is naturally present at low levels in some rock formations in the project area."[224] And yet, PLP has not

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[217] Pebble Final EIS, at page 4.18–13 ("Assuming these protections are adopted, direct and indirect impacts of treated contact waters to off-site surface water are not expected to occur.").
[218] Pebble Final EIS, at page 4.18–13.
[219] Water Engineering Technologies, Inc., White Paper on Water Treatment Process, prepared for Pebble Limited Partnership (July 24, 2012), p. 10, *available at* https://pebbleprojecteis.com/files/25246462-5d2d-47a2-8bfb-c8370b4a5481 ("reference installations are provided to illustrate that high-capacity WTPs are in use around the world, albeit not in the mining industry."
[220] Technical meeting notes at 7, Pebble Project EIS (Nov. 20, 2019), available at: https://www.bbnc.net/wp-content/uploads/2019/12/2019-12-13-Coop-Agency-Mtgs-Compilation-Final.pdf (at page 29).
[221] *Id.*
[222] EPA Comments on Pebble Preliminary Final EIS (March 2020), available at: https://www.bbnc.net/wp-content/uploads/2020/05/BBNC-Compendium-Pebble-PFEIS-Expert-Agency-Critique-May-6-2020.pdf (at page 91).
[223] State of Alaska Comments on Pebble Preliminary Final EIS (March 2020), available at: https://www.bbnc.net/wp-content/uploads/2020/05/BBNC-Compendium-Pebble-PFEIS-Expert-Agency-Critique-May-6-2020.pdf (at page 65).
[224] Pebble Final EIS, at page 4.27-87.

tested its proposed fill material for containments such as mercury that may naturally be present in the very rock it plans to use to fill streams and wetlands in the region.

The proposed transportation corridor would require the blasting and extraction of 7,364,000 cubic yards of rock, sand, and gravel for its construction.[225] The project will require permanent placement of this material for in road construction, bridge and culvert stream crossings, and to fill wetlands, lakes, and ponds along the transportation corridor. The proposed Pebble Project will also require the temporary filling of wetlands and streams along the transportation, natural gas pipeline, and concentrate pipeline corridor, resulting in direct impacts to 773 acres of wetlands and other waters and 6.2 miles of streams. PLP estimates that these construction impacts to wetlands and streams "will occur over a period of approximately one year" and would "require the temporary placement of fill consisting of mixed vegetative matter and topsoil, or rock and soil from cuts" into streams and wetlands.[226]

To decide whether a section 404 permit for discharge of dredged or fill material may be issued, pursuant to the CWA 404(b)(1) guidelines, USACE must, among other things, make factual determinations on physical substrate; water circulation, fluctuation, and salinity; suspended particulates/turbidity; contaminants; aquatic ecosystem and organisms; proposed disposal sites; cumulative effects on the aquatic ecosystem; and secondary effects on the aquatic ecosystem.[227] These factual determinations are reviewed to determine whether the project file is sufficient to support findings or whether USACE must require pre-testing evaluation as described in 40 C.F.R. § 230.60-61.[228] The Guidelines direct that "[i]f there is a reasonable probability of chemical contamination, conduct the appropriate tests according to the section on Evaluation and Testing (§230.61)."[229] Therefore, one of the findings required by the Guidelines is whether testing is necessary to determine whether the material proposed for discharge has the potential to release contaminants at unacceptable levels.[230]

USACE failed to require PLP to conduct testing of its proposed dredged and fill materials during the EIS process and this failure means that DEC cannot find with reasonable assurance that the proposed project will comply with water quality standards. Indeed, with evidence of mercury in the bedrock, and with the potential for acid-generating rock at the mine site quarried material used to construct the earthen embankments (see section V.F. below), DEC and USACE should require testing for potential contaminants in the rock prior to allowing PLP to use it for fill material. Indeed, there is a "possibility … substantial natural deposits of minerals or other substances … could be released to the aquatic environment in harmful quantities by man-induced discharge activities."[231]

Likewise, PLP has not completed field work and lab bench testing necessary to assess potential acid generating (PAG) rock versus non-potentially acid generating (NAG) rock in the quarried material it is planning to place in waters for use in its embankments, roads and culverts, and deposited as waste rock into tailings facilities. At the outset of the EIS process, EPA recommended that USACE provide "the criteria that will be used to distinguish NPAG and non-metal leaching (ML) waste from PAG and ML waste and discuss how the NPAG/PAG determinations will be made during active mining. These details are typically provided in EISs

[225] Pebble Final EIS, Appendix 2.0, at page 36.
[226] Pebble Final EIS, Appendix M2.0—PLP Draft Compensatory Mitigation Plan (Jan. 2020) at page 3.
[227] 40 C.F.R. § 230.11
[228] 40 C.F.R. § 230.5(g).
[229] 40 C.F.R. § 230.5(i).
[230] 40 C.F.R. § 230.60, 230.61.
[231] 40 C.F.R. § 230.60(b)(6).

for mining projects and are necessary to evaluate the effectiveness of the NPAG/PAG separation and potential environmental impacts from tailings and waste management."[232]

Despite these criticisms from EPA, the Final EIS defers field investigation of PAG rock to later state permitting processes and construction: "The State of Alaska would require the final determination of site-specific NP/AP ratio used for separation of rock material to be determined in coordination with the State during the permitting process."[233] Meanwhile, the Final EIS also notes the importance of separating PAG rock to meeting water quality criteria: "Confirmation and use of NAG material in construction would reduce the risk of impacts to water and sediment quality from ARD."[234]

In addition, PLP is currently in the field undertaking studies to confirm properties of the rock for acid generating potential.[235] PLP's data collection on PAG and acid rock generating potential is incomplete at the mine site and nonexistent along the transportation corridor. With the proposal to use tens of millions of the region's rock to construct its roads, stream crossings, and embankments, PLP has not provided DEC with the necessary geotechnical evidence it needs to determine with reasonable assurance that the project as proposed will not violate water quality standards.

F. Inadequate Hardness Measurements for Hardness-Based WQCs

Alaska's numeric water quality criteria for cadmium, copper, chromium III, lead, nickel, silver, zinc are based on measurements of water hardness in the receiving streams. Hardness values are closely correlated with metals concentrations in waterbodies and increasing hardness values can assist to precipitate metals out of water and thus lessen the impacts on aquatic life. As described in the Final EIS describes this on page 4.27-145: "as metals toxicity generally decreases with increasing hardness, hardness correction is applied to establish aquatic life criteria protective of sensitive aquatic organisms."[236]

The Pebble Final EIS contains water quality criteria figures for cadmium, copper, chromium III, lead, nickel, silver, zinc based on estimations of the water chemistry in receiving streams.[237] As disclosed in the Final EIS, receiving waters at the mine site have very low hardness values of around 17-20 mg/L.[238] At the transportation corridor, the receiving streams have not been sampled for their water quality values, including hardness,[239] but surveys of Iliamna Lake also suggest low hardness values around 16-18 mg/L.[240] Despite the low hardness values of the receiving streams, the Final EIS uses a 100 mg/L value for computing the estimated numeric WQC standards that will apply to discharges at the proposed Pebble Mine.[241] These WQC

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[232] EPA, Pebble Project EIS Consolidated Comments Table, Chapter 2, p. 4, *available at* https://pebbleprojecteis.com/files/3482e979-5119-415a-8cbd-d01c1b34a880.
[233] Pebble Final EIS, Chapter 5, page 23.
[234] Pebble Final EIS, Chapter 5, at page 23.
[235] *See, e.g.*, PLP, Pebble Project 2019 Reclamation Report MLUP No. 6118 (Dec. 31, 2019), at page 7, *available at*: http://dnr.alaska.gov/mlw/mining/largemine/pebble/reclamation-reports/plprec2019.pdf (regarding its acid rock drainage test location on state mining claims "set up to evaluate real time weathering and acid generation potential in area rock … During the 2019 field season, the ARD test site was inactive … Testing is scheduled to resume in spring 2020.").
[236] Pebble Final EIS, at page 4.27-145.
[237] Pebble Final EIS, at page K3.18-4.
[238] Pebble Final EIS, Appendix K3.18 pages 23 to 31.
[239] Pebble Final EIS, Appendix K3.18, at page 37.
[240] Pebble Final EIS, Appendix K3.18, at page 45.
[241] Pebble Final EIS, Appendix K3.18-3.

standards would assume a hardness level five times that of the actual receiving streams. Thus, the calculations used to set the WQC relied on in the Final EIS document will likely diverge from actual experience.

Because the Final EIS hardness values for calculating WQC standards are so divergent from actual receiving water hardness values, DEC cannot rely on the Final EIS analysis of compliance with WQC standards to certify that the project will comply with state water quality standards. Moreover, PLP has not surveyed the geochemical characteristics of all stream crossing along the transportation corridor north of Iliamna Lake for DEC to rely on hardness assumptions in developing hardness-based WQC for those waters. Without this information, DEC cannot with reasonable assurance certify that the project as proposed will comply with state water quality standards. Indeed, as the relatively low hardness of Bristol Bay's receiving waters indicates its aquatic life and fish populations would be even more susceptible to metals contained in mine effluent, dust, and from uncontrolled releases from embankments and the concentrate pipeline.

G. Groundwater and Surface Water Flow Testing is Incomplete and On-Going

According to public documents filed by PLP and its parent company Northern Dynasty Minerals, the company is currently undertaking field work to collect baseline groundwater data and to confirm groundwater characteristics at the mine site.[242] As to the transportation corridor, PLP's 404 permit application makes clear that all 205 stream crossings are currently "conceptual plans" based on LIDAR and satellite imagery and the hydrologic characteristics and baseline data are "to be verified by future stream crossing surveys."[243]

Data on surface water flow and water chemistry and groundwater exchange is necessary to inform whether the project would lead to violations of state water quality standards. As described in Section VI.C. below, understanding flow and groundwater recharge is essential to understanding impacts to receiving waters on temperate, TDS, turbidity, and contaminant leaching from tailings facilities. Without this information, DEC cannot with reasonable assurance conclude that the project as proposed will comply with state water quality standards.

H. Embankment and Tailings Designs are Conceptual Only; Further Geotechnical Work Required

Pebble plans to store 1.140 billion tons of bulk tailings in a Bulk Tailings Storage Facility (TSF) and 155 million tons of pyritic tailings in a Pyritic TSF.[244] The water and waste held behind these embankments contain water exceeding the state's water quality criteria for multiple

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[242] PLP, Pebble Project 2019 Reclamation Report MLUP No. 6118 (Dec. 31, 2019), *available at*: http://dnr.alaska.gov/mlw/mining/largemine/pebble/reclamation-reports/plprec2019.pdf ("During 2019 PLP drilled six new exploratory boreholes to conduct and monitor aquifer pump tests. Monitoring equipment was installed at four of these sites, while the remaining two sites were retained to conduct additional aquifer pump tests in the future [...] All six of the 2019 installations remain active and are used to periodically collect groundwater data required for baseline studies and engineering designs."). See also, Northern Dynasty Minerals, Management's Discussion and Analysis Year eneded December 31, 2019 (filed with the SEC on March 31, 2020), at page 12, *available at* https://www.sec.gov/Archives/edgar/data/1164771/000149315220005442/ex99-6.htm ("A major review of the groundwater model was advanced early in 2019. Follow-up geotechnical drilling began in September; six holes were drilled at the Pebble site, east of the proposed pit. Preparations were completed in the fourth quarter for future pump tests to confirm groundwater characteristics.")

[243] PLP, Third Revised Application for Clean Water Act 404 Dredge and Fill Permit—Bridge Plans and Typical Sections (June 2020), *available at*: https://pebbleprojecteis.com/documents/background.

[244] Pebble Final EIS, at page 2-15.

parameters.[245] As discussed in Section II.C. above, PLP's seven embankment designs are entirely conceptual and subject to advanced engineering and on-site geotechnical surveys. As noted by PLP, the location and design of these embankments is still under review and could be subject to change. Alaska Department of Natural Resources has questioned the ability of these conceptual designs to properly assess the project's impacts, safety, and stability both at operations and closure.[246] As has the EIS contractor AECOM.[247]

The Final EIS acknowledges this uncertainty, concluding that PLP's conceptual design "has implications for embankment stability."[248] Given the serious concerns noted by the Final EIS, DNR, AECOM, and other cooperating agencies about the embankment stability to hold back water and waste exceeding state water quality standards, DEC cannot with reasonable assurance certify that the proposed Pebble Mine Project will comply with water quality standards. Only with advanced engineering, further geotechnical and seismic stability studies, and state permit applications can DEC properly analyze the impacts and risks of the proposed tailings facilities on the headwaters of Bristol Bay.

I. Concentrate and Return Water Pipeline Designs and Return Water Management Conceptual Only

In June 2020, PLP updated its CWA Section 404 permit application to add its proposal to use a gold-copper ore concentrate pipeline to deliver ore to the port site at Iliamna Bay and a water return pipeline for mine process water from the port site to the mine site. This proposal is described in a few short paragraphs in PLP's permit application and scantly analyzed in the Final EIS document. The Final EIS fails to assess the spill risks of PLP's proposal in the seismically and avalanche-active area for the transportation corridor north of Iliamna Lake. There is also scant details about PLP's management and treatment of the process water used to liquify the ore concentrate for transport in the pipeline. This water, once separated from the ore at the mine site, is mine process water that must be

Given the unique and hazardous threat posed by a concentrate pipeline on these salmon-bearing waters, DEC must require more evidence from PLP about its proposed concentrate pipeline design and operations in order for the agency with "reasonable assurance" determine that the project can achieve compliance with water quality standards. Indeed, according to EPA, the risk of failure of a concentrate pipeline is "considered particularly high,"[249] "could convey contaminants to Iliamna Lake,"[250] and would "degrade habitat quality for fish and benthic invertebrates."[251]

Moreover, regarding the plans for process water at port sites, we agree with EPA and DEC that PLP is not allowed to discharge mine process water (in this case, the return water) into waters of the U.S. without treatment. According to EIS documents, PLP does not believe the CWA

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[245] *See, e.g, supra* Table 6.
[246] State of Alaska Comments on Pebble Preliminary Final EIS (March 2020), *available at*: https://www.bbnc.net/wp-content/uploads/2020/05/BBNC-Compendium-Pebble-PFEIS-Expert-Agency-Critique-May-6-2020.pdf (at pages 10-18).
[247] AECOM, Technical Memorandum to Bill Craig, AECOM (Dec. 13, 2019), Pebble Project EIS – Bulk TSF Embankment Seismic Stability Analysis, at pp. 1-2, *available at* https://pebbleprojecteis.com/files/86882482-1f9a-4846-8fa5-354c4f5a8230.
[248] Pebble Final EIS, Appendix K, at page K4.15-54
[249] BBWA, at page 11-1.
[250] BBWA, at page 11-7.
[251] BBWA, at page 11-9.

requirements prohibit it from discharging "the concentrate filtrate at the port site."[252] That PLP is trying to avoid compliance with the CWA is concerning. However, as EPA and DEC state, any discharge of process water at the port site, or in any other water of the U.S. would violate the CWA.[253] Given that the mine process water would contain metals and TDS in exceedance of state water quality standards, PLP must not be allowed to discharge it as part of its concentrate pipeline design.

J. Incomplete Information on Groundwater Exchange with Bulk TSF

The Pebble Final EIS discloses the potential for groundwater to surface water exchanges and the possibility of water and pollution from the bulk tailings facility impacting downstream surface waters through the porous and faulted nature of the mine site bedrock.[254] Concerns over groundwater to surface water exchange was also raised by EPA in its Watershed Assessment:

> Given the high likelihood of complex groundwater–surface water connectivity in the deposit area, predicting and regulating flows to maintain key ecosystem functions associated with groundwater– surface water exchange would be particularly challenging.[255]

The Pebble Final EIS notes the location of a significant fault line along the western margin of the proposed Bulk TSF location with hydraulic conductivity to North Fork Koktuli.[256] As determined by PLP's contractor, this fault "could influence seepage pathways from the facility."[257] The Bulk TSF is proposed to be an unlined facility holding 1.14 billion tons tailings with water elevated in concentrations of "the following metals relative to the applicable WQCs: antimony, arsenic, beryllium, cadmium, copper, lead, manganese, mercury, molybdenum, selenium, silver, and zinc."[258] As such, this fault line, originating from the Bulk TSF, has the potential to become a point source of significant pollution into the North Fork Koktuli:

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[252] Request for Information #158, Feedback on Permitting for Discharge of Process Water at Port Sites (December 13, 2019), available at https://pebbleprojecteis.com/documents/library. See also, Request for Information #066, Concentrate Pipeline Concept Description (Oct. 17, 2018), *available at* https://pebbleprojecteis.com/documents/library.

[253] The Clean Water Act regulations at 40 C.F.R. 440, Subparts J and L apply to the proposed port site discharges of process wastewater. 40 C.F.R 440 Subpart J(b) "there shall be no discharge of process water to navigable waters from mills that use the froth-flotation process alone, or in conjunction with other processes, for the beneficiation of copper, lead, zinc, gold, silver, or molybdenum ores or any combination of these ores."

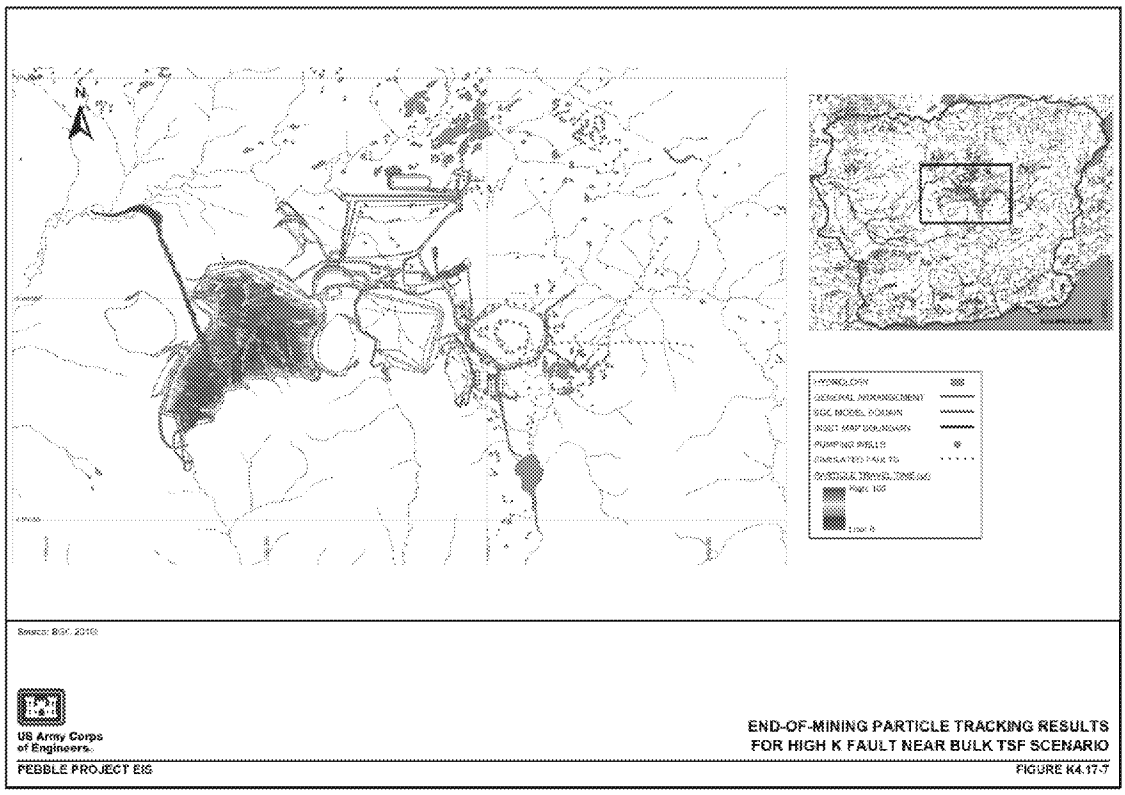
[254] Pebble Final EIS, Sections 3.17 and 4.17 and Appendix K4.17.

[255] BBWA, at page 7-53.

[256] Pebble Final EIS, Appendix K4.17-13 and Figure 3.17-1.

[257] Pebble Final EIS, at page K4.17-13.

[258] Pebble Final EIS, Executive Summary, at page 104.



And yet, PLP has not fully described this fault line but has rather deferred further study of the fault line and hydraulic conductivity and potential measures to mitigate pollution into the North Fork Koktuli to future field work and advanced engineering:

> Further hydrogeologic data collection at future stages of project design to characterize the hydraulic properties of the bedrock in the vicinity of this interpreted fault to allow for design of appropriate mitigation (e.g., grouting, partial liner placed over the fault trace, seepage collection wells) is recommended.[259]
>
> Additional data would be collected to characterize the hydraulic properties of the bedrock in the vicinity of the interpreted fault mapped along the western margin of the bulk TSF to inform design of the facility. [To] [a]void impacts to ground and surface water resulting from uncontrolled seepage.[260]

The Pebble Final EIS presents a serious concern for Bulk TSF waters becoming a point source of pollution into the North Fork Koktuli and yet PLP's field work and Bulk TSF design is incomplete for addressing this likely source of pollution. DEC cannot certify that the project will comply with water quality standards given the lack of information on the groundwater to surface water exchange between the unlined Bulk TSF and the surrounding surface water.

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[259] Pebble Final EIS, at page K4.17-14.
[260] Pebble Final EIS, at page 5-25.

K. Mine Expansion and Use of Cyanide

The mine plan described in the Pebble Final EIS is an incomplete proposal, with subsequent phases touted by PLP and its parent company Northern Dynasty Minerals to the mining investment community and described under the cumulative impacts section of the Final EIS. One such incomplete component of PLP's proposal is the extraction of gold through secondary recovery processes, such as with the use of cyanide. PLP has publicly stated that by forgoing secondary gold recovery, they will be leaving behind 12 percent of the potentially recoverable gold in the pyritic tailings.[261] PLP has stated that forgoing cyanide was done with the intent to "enhance the probability of us getting a permit."[262] Even as recently as August 11, 2020, the CEO of PLP's parent company mentioned that the use of secondary gold recovery to obtain the gold PLP is leaving behind in tailings would begin only three to six years after the start of production.[263]

During development of the Pebble EIS, and based on concerns from the public, USACE sought information from PLP regarding its secondary gold recovery and plans to use cyanide. In response, PLP admitted that it is "indeed likely that any future expanded development could include some form of secondary gold recovery. Cyanide is one of the few chemicals that has the ability to put gold into solution and thus has been the traditional means used in the mining industry for the recovery of microscopic-sized gold that cannot be separated from gangue minerals by purely physical processes."[264]

As such, the Final EIS discloses:

> PLP has not ruled out that cyanide could be used for additional gold recovery during mine expansion. Therefore, it is assumed that sodium cyanide could be transferred in watertight sparge tank-tainers to the port as cargo and stored there until trucked to the mine site. A secure storage area with secondary containment could be constructed at the mine, and a cyanide solution would be prepared and applied in a leach process. After tailings leaching, processed tailings could be treated using sulfur dioxide to detoxify residual cyanide, and discharged to tailings storage.[265]

These four sentences is the entire treatment of PLP's plans to use cyanide in the entire Final EIS document. USACE, by including PLP's plans to use cyanide in its expansion scenario,

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[261] Statement of Doug Allen, Northern Dynasty VP Corporate Communications, at the Vancouver Investment Conference (Jan. 20-21, 2019), *available at* https://www.youtube.com/watch?v=EPFmt_mzEDQ&feature=youtu.be (@6:45-7:52).
[262] *Id.*
[263] NDM Webcast Presentation, John Tumazos Very Independent Research 2020 Annual Conference (Aug. 11, 2020), *available at* https://zoom.us/webinar/register/WN_2fKTGX2IQ8eYr9-OfRO1hQ (at 19:06-19:52, "We decided that we wouldn't have cyanide. Without cyanide, you cannot have secondary gold recovery plans. So at this juncture, we will not have that."). *See also*, Smith Weekly Research Discussion with Ron Thiessen pt 2 (January 23, 2019), audio *available at*: https://www.smithweeklyinternational.com/online/Wq36PU9b5ir8D901JhsdF90cgA1/files/2lAwi82yp2_SWR-DISCUSSIONS-RTHIESSEN-NAK1.mp3 ("people have a mental image, a mental thing about cyanide. Let's not use it. Let's just say, 'Okay. We'll take cyanide circuit out. We'll leave it aside.' And in future if people want us to recover more gold, because that enhances the value for taxation. It enhances the royalties for the state of Alaska, and it will enhance the returns that will come. We'll look at it then.")
[264] PLP, Response to RFI 62a (posted to Pebble EIS website June 5, 2019), *available at*: https://pebbleprojecteis.com/documents/library.
[265] Pebble Final EIS, at page 4.1-23.

made the determination that the use of cyanide was "reasonably foreseeable." Cyanide is a toxic substance, extremely harmful to human health, and regulated by DEC in its water quality criteria standards.[266] The Final EIS and supporting documentation from PLP fail to disclose in detail how the project will manage the use of cyanide and prevent spills and releases into receiving waters. Indeed, as disclosed by the Final EIS, "In the Pebble Project expansion scenario, there is a potential spill risk of cyanide spills at the mine site or on the transportation corridor."[267] The lack of information about treatment and management of this very serious toxic pollutant in PLP's plans means that DEC does not have adequate information on which to conclude with "reasonable assurance" that the project can achieve compliance with water quality standards.

VI. Certification Must Be Denied – PLP's Proposal Will Not Comply with Existing Water Quality Requirements and Would Harm Designated Uses

Despite the lack of information put forth by PLP for DEC to certify the project will comply with Alaska's water quality requirements, what information is known about the proposed project shows that the project will indeed fail to comply with Alaska's water quality requirements. The Pebble Project would harm designated uses of Bristol Bay's pristine waters, violate the state's antidegradation policy, and violate narrative and numeric water quality standards.

A. The Pebble Project Would Harm Designated and Existing Uses

PLP proposes to build a massive hardrock mine in the headwaters of Bristol Bay's Kvichak and Nushagak watersheds. To do so, as the Pebble Final EIS notes, would lead to the permanent and direct destruction of 2,323 acres of wetlands and 105 miles of streams, including more than 8 miles of streams designed by the State of Alaska as anadromous. This area of Bristol Bay has long been protected and managed by the State of Alaska for pristine waters supporting the world's largest salmon fishery, abundant recreation and sport fishing opportunities, and the subsistence way of life for thousands of people. These designated uses and protections, described in Section III above, would be adversely impacted by the proposed Pebble Mine Project.

The Pebble Final EIS notes a variety of impacts to salmon, the commercial fishery, and subsistence lifestyles directly from the destruction of anadromous habitat and Bristol Bay's headwaters and through reductions in water quality from spills and during normal operations:

- Direct Impacts to Fish and Fish Habitat at the Mine Site: "Potential impacts to fish values at the mine site include: direct loss of aquatic habitat in the NFK and SFK drainages; fish displacement, injury and mortality; changes in surface water and groundwater flows that could impact fish spawning, rearing, and off-channel habitat; increased sedimentation and turbidity in streams; impacts to fish migration; changes in surface water temperatures; and changes to surface water chemistry. In summary, development of the mine site would permanently remove approximately 99 miles of streambed habitat in the NFK and SFK drainages. Direct effects on fish, including displacement, injury, and mortality, would occur with the permanent removal of stream habitat in the NFK and SFK drainages due to mine site construction. Stream productivity in the NFK and SFK drainages would be reduced to some degree with the loss of physical and biological inputs. These impacts would be permanent, and certain to occur. The magnitude and

[266] 18 AAC 70.990(62)
[267] Pebble Final EIS, at page 4.27-170.

extent of impacts from the change in streamflows would be to directly change the quantity and quality of instream spawning and rearing habitat for resident and anadromous fish. Changes in flows could also directly alter available habitat for benthic macroinvertebrate production, which is important for fish growth and survival."[268]

- Direct Impacts to Fish and Fish Habitat from Transportation Corridor: "The magnitude and extent of habitat loss from development of the transportation corridor and onshore portions of the natural gas pipeline under Alternative 3 would eliminate 5.7 miles of streambed habitat and 7.7 acres of riverine wetland habitat."[269]
- Impacts to Commercial and Recreational Fisheries: "Project construction and operations could have an impact on the commercial fishing community (e.g., crew members or processing), on the recreational sector via recreational fishing, and on revenue generated to state and local government. Potential impacts are influenced by project-related effects on fish population, habitat, and runs, as well as real and perceived effects on the quality of the fish, environment, and fishing experience."[270]
- Impacts to Special Aquatic Sites: "Special aquatic sites that would be directly and permanently impacted under Alternative 3 include mudflats, riffle and pool complexes, vegetated shallows, and wetlands. [...] The greatest magnitude of impact to special aquatic sites would be to wetlands (2,090 acres), including regionally important riparian wetlands (132 acres), fens (72 acres), forested wetlands (5 acres), estuarine wetlands (less than 1 acre), followed by riffle and pool habitat (92 acres, including 88.5 miles of upper perennial stream), mudflats (57 acres), and vegetated shallows (4 acres)."[271]
- Cumulative Impacts to Wetlands and Other Waters: "Cumulative impacts to wetlands and other waters associated with the proposed Alternatives and the Pebble Project expansion scenario would transect 13 watersheds. [..] a maximum cumulative impact of 15,331 acres of wetlands and other waters (Alternative 1a), [...] would be lost or degraded with expansion of the mine."[272]

Indeed, as cooperating agencies, including the State of Alaska noted about the proposed Pebble Mine Project during the EIS process:

- Environmental Protection Agency: "this project as described [...] may have substantial and unacceptable adverse impacts on fisheries resources in the project area watersheds, which are aquatic resources of national importance."[273]
- Department of Interior: "The DOI is concerned that developing an open pit mine and associated infrastructure at the headwaters of critical salmon habitat could cause permanent, adverse impacts to the ecologically and economically important Bristol Bay watershed, its world-class fisheries, and the commercial, recreational, and subsistence users who depend on them."[274]
- U.S. Fish & Wildlife Service: "the proposed permanent placement of dredged or fill material [...] for the purpose of developing a surface mine and associated infrastructure

[268] Pebble Final EIS, Executive Summary, at page 81.
[269] Pebble Final EIS, Executive Summary, at page 84.
[270] Pebble Final EIS, Executive Summary, at page 86.
[271] Pebble Final EIS, Executive Summary, at page 98.
[272] Pebble Final EIS, Executive Summary, at page 99.
[273] EPA, Comments on the U.S. Army Corps Draft Clean Water Action 404 Permit to Pebble Limited Partnership (July 1, 2019), at page 3, *available at*: https://www.epa.gov/bristolbay/epas-comments-us-army-corps-engineers-draft-section-404-permit.
[274] DOI, Comments on the Pebble Draft Environmental Impact Statement (July 1, 2019), at page 5, *available at*: https://pebbleprojecteis.com/files/3a2302b2-830b-43e8-8339-61b71a76d054.

in the Bristol Bay watershed, will have an unacceptable and substantial impact on aquatic resources of national importance."[275]

- State of Alaska: "The proposed Pebble Project, specifically the mine pit, and associated ore processing and tailings storage areas straddle the headwaters of two drainages that support highly productive and valuable fishery resources. [...] the project has the potential to impact a biologically productive and sensitive part of Alaska"[276]

Subsequent to publication of the Final EIS, USACE has determined that—based on the direct impacts of the proposed Pebble Mine Project on wetlands and streams in the Bristol Bay region—the project as proposed "would cause unavoidable adverse impacts to aquatic resources and, preliminarily, that those adverse impacts would result in significant degradation to those aquatic resources."[277]

The Pebble Final EIS findings, cooperating agency concerns including from the State of Alaska, and our vast experiences with managing and protecting Bristol Bay's lands, waters, salmon fishery, and way of life all support denying the 401 certification based on the project's harm to designated uses.

B. The Pebble Project Would Violate the State's Antidegradation Policy

The proposed Pebble Mine Project fails to comply with Alaska's antidegradation policy. In order to certify that the proposed project will not violation water quality standards, DEC must conduct a Tier 2 antidegradation analysis. This requires for DEC to certify with "reasonable assurance" and with "substantial evidence"[278] that PLP's proposed project will maintain and protect water quality levels "necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water."[279]

As described throughout this comment letter, the proposed Pebble Mine Project will cause a measurable change in water quality through the placement of dredged or fill materials into salmon-bearing waters as well as through the generation of billions of gallons of water and billions of tons of waste rock requiring treatment for elevated water quality criteria in perpetuity. PLP has not put forth the substantial evidence necessary for DEC to support a finding that the project will maintain and protect Tier 2 water quality levels in Bristol Bay's headwaters.

Indeed, as detailed in the following section, evidence from the Pebble Final EIS, PLP's CWA 404 permit application, supporting documentation, and cooperating agency expert opinions shows the project will in fact violate water quality standards for flow, temperature, total dissolved solids, salts, dissolved oxygen, selenium, mercury, arsenic, copper, and other metals. These water quality violations demonstrate that the proposed Pebble Mine Project, if permitted, would violate the state's antidegradation policy.

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[275] USFWS letter to Col. Borders, USACE (July 25, 2019), *available at*: https://www.bbnc.net/wp-content/uploads/2020/05/PebbleSalmonImpact.pdf (page 373).
[276] State of Alaska letter to USACE (June 29, 2018), *available at* https://www.bbnc.net/wp-content/uploads/2020/05/PebbleSalmonImpact.pdf (page 384).
[277] Letter from David S. Hobbie, Regional Regulatory Division Chief, U.S. Army Corps of Eng'rs, to James Fueg, Pebble Limited Partnership (Aug. 20, 2020), *available at*: https://pebbleprojecteis.com/documents/mitigation.
[278] 40 C.F.R. § 121.2(a)(3). *Miners Advocacy Council, Inc. v. State, Dep't of Envtl. Conservation*, 778 P.2d 1126, 1139 (Alaska 1989).
[279] 18 AAC 70.015(a)(2).

C. The Pebble Project Would Violate Numeric and Narrative Water Quality Standards

As disclosed in the Pebble Final EIS, the water contained in PLP's proposed tailings storage facilities and water management ponds will exceed numeric water quality criteria for: aluminum, antimony, arsenic, beryllium, cadmium, cobalt, copper, lead, manganese, mercury, molybdenum, nickel, selenium, silver, and zinc.[280] Contact water and dust at the mine site would contain the same contaminants in levels that exceed water quality standards.[281] As also disclosed in the Final EIS, the project would require water treatment in perpetuity—during Closure Phases 3 and 4 the influent water into the water treatment plants will exceed the state's numeric water quality criteria for: TDS, sulfate, aluminum, antimony, arsenic, beryllium, cadmium, cobalt, copper, iron, lead, manganese, mercury, molybdenum, nickel, selenium, silver, and zinc.[282] Moreover, the Final EIS discloses reductions of flow, increases of temperature, increases of total suspended solids and salts, increases of total dissolved solids, and changes to dissolved oxygen content from mine site operations and construction.

Below we describe some of the projected violations of Alaska water quality criteria resulting from construction and operation of the Pebble Mine Project, based on information found in the Final EIS and supporting documentation and from cooperating agencies. Based on this information, DEC cannot issue certification for the proposed Pebble Mine Project, as the agency cannot with "reasonable assurance" determine that the project can achieve compliance with water quality standards.

1. Flow

PLP's proposal would violate water quality standards by eliminating flow into receiving streams of North Fork Koktuli, South Fork Koktuli, and Upper Talarik Creek. As disclosed in the Final EIS, PLP proposes to approach its water treatment with incomplete treatment system design that, if needing modification during operation, the company plans to undertake such modifications by diverting influent to its Main Water Management Pond (WMP).[283] This approach would require PLP to divert 60 cfs (approximately 27,000 gallons per minute) away from its WTPs and receiving streams and into the 18-billion-gallon capacity Main WMP.[284]

When addressing concerns with the effectiveness of PLP's proposed water treatment system, the Final EIS merely states: "The operational capacity of the main WMP provides flexibility (equivalent to 3 average years of water discharge time) to allow time for addressing process interruptions."[285] More specifically, the Final EIS notes that if PLP needs to modify its treatment plants with the addition of unit processes "such as further RO trains and/or salt removal techniques such as thermal evaporation," then it will employ the water diversion to the Main WMP.[286] However, the Final EIS itself questions the ability of PLP to make the necessary modifications within the 3-year timeframe allotted: "the ability to implement such significant

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[280] Pebble Final EIS, Executive Summary, at pages 104 and 106.
[281] Pebble Final EIS, at page 4.18-4 and Executive Summary, at page 106
[282] Pebble Final EIS, at page K4.18-56 to 59.
[283] Pebble Final EIS, at page 4.18-13 and K4.18-50.
[284] Pebble Final EIS, Executive Summary, at page 13 (describing two water treatment plans proposed to treat influent of 14 cfs and 46 cfs (60 cfs total) converted to 26,929.87 gallons per minute).
[285] Pebble Final EIS, at page 4.18–13.
[286] Pebble Final EIS, at page K4.18-50.

changes to the treatment processes within a 3-year period requires further evaluation to determine if engineering and construction can be completed.[287]

Reduction of flow into the North Fork Koktuli, South Fork Koktuli, and Upper Talarik Creek – three streams with salmon spawning and rearing habitat – will constitute the entirety of all brood years for salmonids. In other words, because of its 3-year life cycle, all salmon populations in all brood years for these streams will be impacted by the reduced flow. EPA's Bristol Bay Watershed Assessment identified that adverse impacts from streamflow alteration "could jeopardize the long-term sustainability of these fisheries."[288] EPA found that drawdown would alter streamflows by more than 20% in approximately 9 miles of stream and that such a chance could pose unacceptable adverse impacts to the salmon fisheries of both the South Fork Koktuli and North Fork Koktuli.[289]

Likewise, ADF&G raised this as an issue in cooperating agency comments, stating: "When the natural flow regimes are altered in headwater streams, the water quality downstream may change."[290] And the Final EIS itself highlights the importance of discharged water from the water treatment system to maintaining downstream water volumes and habitat during projected normal operations: "Water from both treatment plants would be strategically discharged in a manner that would optimize downstream aquatic habitat, based on modeling and monitoring during discharge."[291]

As a result of the proposed changes to flow in the North Fork Koktuli, South Fork Koktuli, and Upper Talarik Creek, these streams would no longer be able to support their designated uses for salmon habitat.

2. Temperature

One pollutant compounded by and increased by the proposed project's changes in flow and water management is temperature. The Pebble Final EIS discloses that the temperature of the surface water at the mine site is highly influenced by groundwater connectivity.[292] However, PLP's modeling of groundwater influence on surface water is incomplete and, as to temperature, not supported with field data. As noted by ADF&G in its comments on the Preliminary Final EIS, conclusions of groundwater attenuation of surface water temperature impacts on developing salmon eggs and alevins an unfounded and not based on field data: "The statement that GW [groundwater] will attenuate unnaturally higher surface water temperatures and that NO impacts to incubating eggs or alevin is expected is not supported by field studies and should be correctly described as unknown."[293]

Moreover, as to surface water effluent modeling relied on by PLP, the Pebble Final EIS discloses a lack of information regarding real-life temperature fluctuations at the mine site used in the watershed model, thus undermining the surface water temperature predictions: "Temperature inputs to the watershed model are mean monthly values and do not fully capture

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[287] Pebble Final EIS, at page K4.18–50.
[288] BBWA, at page 4–27.
[289] BBWA, at page 4–28.
[290] ADF&G comments on Pebble Preliminary Final EIS, *available at*: https://www.bbnc.net/wp-content/uploads/2020/05/BBNC-Compendium-Pebble-PFEIS-Expert-Agency-Critique-May-6-2020.pdf (page 47).
[291] Pebble Final EIS, at page 4.18–13.
[292] Pebble Final EIS, at page 4.24-19 to 23.
[293] ADF&G comments on Pebble Preliminary Final EIS, *available at*: https://www.bbnc.net/wp-content/uploads/2020/05/BBNC-Compendium-Pebble-PFEIS-Expert-Agency-Critique-May-6-2020.pdf (page 49).

the effects of this short time scale increase in temperature."[294] The Final EIS acknowledges that treated water discharges may be elevated +2.8°C (approximately 5°F) into the North Fork Koktuli, South Fork Koktuli, and Upper Talarik Creek.[295]

Increased surface water temperatures, be it from diverting groundwater flows and effluent away from receiving streams or from water treatment methods that require increases in temperature, would lead to water quality violations and would negatively impact salmon populations. Indeed, the Final EIS concludes that "[c]onstruction and operations may lead to changes in water temperature in downstream locations that have the potential to impact fish."[296] Because the Final EIS modeled temperature changes based on a lack of information about PLP's water treatment plans and based on mean monthly temperature values that cannot capture the true variability of baseline temperatures at the mine site, DEC cannot conclude with reasonable assurance that the proposed project will not cause temperature-related water quality violations.

As a result of increased temperature into the North Fork Koktuli, South Fork Koktuli, and Upper Talarik Creek, and because of the negative impact of increased temperature on salmon populations and the aquatic life that supports salmon populations, these streams would no longer be able to support their designated uses. Indeed, as stated by the EPA, the EIS "appears to have limited data and capabilities to quantifiably demonstrate that water temperature alterations will not have significant impacts to fish, especially incubating developing eggs."[297]

3. Dissolved Oxygen

Like temperature, dissolved oxygen (DO) is influenced by flow as well as by increased sediment resulting from construction and dust deposition. As identified in the Final EIS, the proposed Pebble Mine Project construction and operation would change the DO content in receiving streams at the mine site and along the transportation corridor:

> The magnitude and extent of indirect impacts could include changes to dissolved oxygen content, or an increase or decrease in biologic activity in waterbodies resulting from the mine project. The duration and likelihood of impacts would be long-term, and certain to occur if the mine is permitted and constructed. A water management plan would be implemented for construction and operation phases.[298]

The amount of DO in a stream may impact salmonid use of a waterbody[299] and egg development and hatch/emergence.[300] The Final EIS notes that construction mitigation techniques will be employed to lessen the project's impacts on DO,[301] however the exact details of these plans and the APDES permit applications for stormwater management have not been submitted by PLP to DEC. Given this lack of information about how PLP would comply with

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[294] Pebble Final EIS, at page K3.16-33.
[295] Pebble Final EIS, at 4.18-4, Table 4.18-1; 4.18-18.
[296] Pebble Final EIS, at page 4.24-22.
[297] EPA Comments on the Preliminary Final EIS, *available at*: https://www.bbnc.net/wp-content/uploads/2020/05/BBNC-Compendium-Pebble-PFEIS-Expert-Agency-Critique-May-6-2020.pdf (page 74).
[298] Pebble Final EIS, Executive Summary, at page 70.
[299] Pebble Final EIS, at page 3.24-77 ("Water quality data showed that coho preferred warmer (2°C) bottom habitat, despite low levels of dissolved oxygen (3 mg/L), rather than surface waters that had high dissolved oxygen (8 mg/L) but were colder (0.6°C).")
[300] Pebble Final EIS, at page 4.24-23 ("Numerous other factors affect the timing of hatch/emergence beyond water temperatures, including dissolved oxygen").
[301] Pebble Final EIS, at page 4.18-15.

state water quality requirements for sediment and DO and because, as the Final EIS discloses, changes to DO impacts biological activity in receiving waterbodies, DEC cannot with reasonable assurance find that the project as proposed will comply with state water quality standards. If the project as proposed moves forward and changes to DO occur from construction and operation, the receiving streams at the mine site and transportation corridor would no longer be able to support their designated uses for salmon habitat.

4. Total Dissolved Solids and Salts

The Final EIS admits that TDS will be elevated as a result of PLP's proposed water treatment: "the potential exists for an increase in TDS during operations, requiring adaptive management of WTP processes."[302] In particular, the Final EIS notes that TDS is a concern based on the overall inability of PLP's proposed water treatment design to operate at scale:

> There are concerns that the approach has not been commercially demonstrated at the proposed scale; that removal efficiencies assumed for selenium are optimistic; and that salts could build up over time in the pyritic TSF, leading to increased total dissolved solids (TDS) concentrations requiring treatment.[303]

The Final EIS additionally concludes that "concerns regarding potential long-term increased TDS levels may require further investigation as design progresses."[304]

DEC Division of Water also questions the ability of PLP's proposed water treatment plans to adequately manage salts and how this might impact treatment for other parameters: "It is not clear what the salts are comprised of and their anticipated solubilities. It is also not clear how the salts and selenium are going to be prevented from re-mobilizing and entering the system within the pyritic TSF if water quality conditions change."[305]

Based on currently available information about PLP's proposed water treatment plants, the Final EIS and DEC Division of Water conclusions that the project may not comply with water quality standards for TDS, salts, and, in turn, selenium means that DEC cannot with reasonable certainty certify that the project will comply with state water quality criteria. As a result of the potential water quality violations for TDS and salts in the North Fork Koktuli, South Fork Koktuli, and Upper Talarik Creek, these streams would no longer be able to support their designated uses for salmon habitat.

5. Selenium

The Final EIS discloses that the concentration of selenium in contact water contained in the main embankment seepage pond will be approximately eleven times the numeric water quality standard throughout the operation and closure phases.[306]

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[302] Pebble Final EIS, at page 4.18-4.
[303] Pebble Final EIS, at page 4.18–13.
[304] Pebble Final EIS, at page 4.18–22.
[305] State of Alaska Comments on Pebble Preliminary Final EIS (March 2020), *available at*: https://www.bbnc.net/wp-content/uploads/2020/05/BBNC-Compendium-Pebble-PFEIS-Expert-Agency-Critique-May-6-2020.pdf (at page 65).
[306] Appendix K4.18, tables K4.18–4 through K.18–8.

Indeed, as DEC Division of Water stated in its comments on the Pebble Preliminary Final EIS, more evidence, including modeling and lab testing, is needed from PLP to explain how it will comply with water quality criteria related to selenium:

> Please explain what the salts are comprised of and their anticipated solubilities. Please describe how salt and selenium are going to be prevented from re-mobilizing and entering the system within the pyritic TSF if water quality conditions change. Please also outline what would happen at closure when the tailings are re-located and submerged in the main pit. Please consider additional studies (modeling and laboratory testing) to determine the composition of the salts, their corresponding solubilities, and the potential for remobilization within the pyritic TSF, transfer to the open pit at closure, and at final closure when the deposited sub-aqueously into the open pit.[307]

Clearly, as stated by DEC, more information is needed about PLP's proposal to treat selenium in order for the agency to find with reasonable assurance that the proposed Pebble Mine Project will meet water quality standards for selenium. Exceedances of water quality criteria for selenium pose a threat to human health in drinking water and to aquatic life, and would therefore no longer support designated and current uses of Kvichak and Nushagak River systems for drinking water and salmon habitat.

6. Mercury

According to the predicted water quality values in the Pebble Final EIS, concentrations of mercury in the main embankment seepage collection pond will be approximately forty (40) times the state's water quality standards throughout operation and closure phases.[308] However, the Final EIS notes that even this exceedance is theoretical and further evaluation of the project's mercury concentrations in influent water require further evaluation:

> The mercury concentration in treated water is estimated as a function of mass balance equations based on solubility curves and membrane performance specifications, which indicate results below the EPA Method 1631 mercury detection limit of 0.5 ng/L. Further evaluation would be required to validate these assumptions during the permitting process as described in Appendix M1.0, Mitigation Assessment.[309]

Mercury is particularly concerning for aquatic life and human health because of the metal's ability to bioaccumulate as methylmercury in fish tissue. As noted by US Fish and Wildlife Service in its comments on the Preliminary Final EIS, methylmercury (MeHg) is a particular concern for wetlands habitats and from dust transport and spills:

> offsite migration of even very small amounts of total mercury into anoxic sediments, such as those occurring in wetlands throughout Alaska and the project area, will result in methylation to MeHg, the toxic and bioavailable form of mercury. MeHg is toxic, bioaccumulates, biomagnifies, and is higher in watersheds that have been mined compared to those that have not. Elevated

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[307] State of Alaska Comments on Pebble Preliminary Final EIS (March 2020), *available at*: https://www.bbnc.net/wp-content/uploads/2020/05/BBNC-Compendium-Pebble-PFEIS-Expert-Agency-Critique-May-6-2020.pdf (at page 65).
[308] *See* Appendix K4.18, tables K4.18–4 through K.18–8. *See also*, supra Table 6.
[309] Pebble Final EIS Appendix K4.18, page 52.

> MeHg in fish (particularly resident freshwater fish) and consumers of those fish is a real and likely impact of many of the spill scenarios resulting specifically from tailings spills and incorporation into bedloads of low-flow water bodies and wetlands.[310]

In addition to the proposed Pebble Mine Project creating a significant source of mercury contamination at the mine site, the transportation corridor and naturally-occurring mercury in the region's rock and soil presents a source of contamination from dredged and fill operations to build and operate the road.[311] With only a conceptual-level proposal for treating contaminants like mercury at the mine site despite water quality concentrations approximately 40 times that of the state's water quality criteria and with PLP failing to test its dredged and fill material along the transportation corridor route for the presence of naturally-existing mercury, DEC cannot certify with reasonable assurance that the project will not exceed state water quality standards for mercury. Indeed, given the risk to aquatic life and human health posed by water quality exceedances for mercury, any exceedance beyond water quality standards from the proposed project would harm existing and designated uses of Bristol Bay's waters.

7. Arsenic

As described throughout this letter, PLP's conceptual water treatment plans are insufficient for DEC to determine that the proposed Pebble Mine Project will not violate state water quality standards. Moreover, as to arsenic, the Final EIS notes elevated levels of arsenic persist in soils throughout the Bristol Bay region and notes the potential for ground disturbance activities to increase arsenic levels in waters.[312] The background levels of arsenic in fact exceeded concentrations that may have an adverse effect on benthic organisms.[313] However, PLP has failed to conduct sufficient soils and rock testing to confirm that its use of tens of millions of cubic yard of dredged or fill material, namely rock and soil extracted onsite in quarries and materials sites, is free of constituents that would lead to water quality violations.

In addition, the risk of arsenic exceeding water quality standards is particularly acute as to the proposed project's dust deposition impacts. As noted in the Final EIS in relation to mine site dust deposition, "The presence of naturally occurring arsenic above the ADEC level is readily apparent, with a reported mean of 10.2 milligrams per kilogram (mg/kg)."[314]

Given the high level of arsenic naturally present in soils and bedrock of the mine site area, and the lack of field baseline studies from PLP to confirm the absence of arsenic in the particular rock and soil it intends to use as fill material, DEC cannot certify with reasonable assurance that the project will not exceed water quality standards for arsenic. Given the serious human health risks and risks to aquatic life posed by exceedances of arsenic in waters, any exceedance beyond water quality standards from the proposed project would harm existing and designated uses of Bristol Bay's waters.

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[310] Letter from Dep't of Interior to Army Corps on Preliminary Final EIS, *available at*: https://www.bbnc.net/wp-content/uploads/2020/05/BBNC-Compendium-Pebble-PFEIS-Expert-Agency-Critique-May-6-2020.pdf (at page 163).
[311] Pebble Final EIS, at page 4.27-87 ("Mercury is naturally present at low levels in some rock formations in the project area.").
[312] Pebble Final EIS, at page 3.18-10 ("Baseline concentrations of nickel and arsenic in the UTC are roughly two to three times that of the NFK or SFK, respectively. Concentrations of nickel and arsenic are likely the result of bedrock chemistry and natural processes involving the release of metals.").
[313] Pebble Final EIS, at page 3.18-15.
[314] Pebble Final EIS, at page 4.14-13.

8. *Copper*

As the Final EIS discloses, waters at the mine site will exceed water quality criteria for copper. In fact, according to data in the Final EIS, copper concentrations at the Open Pit WMP, located upriver from Frying Pan Lake, are predicted to be 1.47 mg/L during operations.[315] This concentration of copper is *671 times greater* than Alaska's water quality criteria for copper disclosed in the Final EIS of 0.00219 mg/L. The capacity of PLP to treat and manage this high concentration of copper in its mine process water is unproven and its plans are conceptual only. On this basis alone, DEC cannot certify that the proposed Pebble Mine Project will comply with water quality criteria for copper.

In addition, the Final EIS modeled copper dust deposition on Frying Pan Lake in the course of normal operations. Based on this modeling, the Final EIS concludes that copper deposition into waters would not cause violations of water quality standards for copper. However, this model is based on a massively flawed assumption undermined by PLP's own proposal. That is, the model assumes a constant volume of clean effluent discharged into Frying Plan Lake of 30 cfs in order to dilute the effects of copper concentration in dust deposition.[316] As described above, PLP's plans to discharge at these levels are subject to their mine treatment plants functioning as intended, and the company plans to hold water in its Main WMP for up to three years if its WTP designs need modification. During these years, there will be no ameliorating effect of "clean" effluent to dilute copper dust.

Because PLP's WTP plans are conceptual, DEC cannot certify that the project will meet state water quality standards for copper. Copper, even in very low concentrations, has a negative impact on salmonids and other aquatic life and, as such, the project as proposed would harm existing and designated uses of Bristol Bay's waters.

9. *Other Metals (aluminum, antimony, cadmium, iron, lead, manganese, mercury, molybdenum, nickel, zinc)*

As described throughout this letter, PLP's conceptual water treatment plans are insufficient for DEC to determine that the proposed Pebble Mine Project will not violate state water quality standards. Moreover, for metals parameters requiring hardness receiving water determinations (such as cadmium, copper, lead, nickel, silver, zinc) and for metals found naturally in Bristol Bay's rock and soil (such as mercury), additional field work is required to evaluate the baseline conditions of rock, soil, and waters in order to assess the propose project's impacts on water quality.

Metals such as aluminum, antimony, cadmium, iron, lead, manganese, mercury, molybdenum, nickel, and zinc would exist in concentrations exceeding state water quality standards in PLP's tailings and water management storage facilities throughout the life of the project and after closure and would require water management and treatment in perpetuity. And yet, PLP knows little about the geologic and seismic conditions of the specific sites for its proposed embankments, including the potential for faults beneath the unlined Bulk TSF that may transport contaminated water from the Bulk TSF to surface waters downstream.

These metals pose significant threats to existing uses of water (salmon spawning and rearing habitat and drinking water) at the mine site and along the transportation corridor, as well as to

[315] Pebble Final EIS, Appendix K4.18-15.
[316] Pebble Final EIS, Appendix K4.19-64.

public health. A single spill or accident along the transportation corridor, from the concentrate pipeline, or at the mine site would lead to these metals persisting in the aquatic environment for decades and would threaten existing uses of Bristol Bay's pristine waters. As such, DEC cannot with reasonable assurance certify that the proposed Pebble Mine Project would comply with state water quality standards, including the state's antidegradation policy.

VII. Waters at the Proposed Pebble Mine Are Subject to At Least Tier 2 Protections Without Exception. The Use of Variances, Mixing Zones, or Re-Classification of Waterbody Tiers are Unacceptable

DEC's regulations provide for exceptions to Alaska's water quality standards and Tier 2 protections.[317] However, none of the exceptions are applicable to the waters impacted by the proposed Pebble Mine Project and indeed lowering water quality standards for Bristol Bay's headwaters will not support important social or economic development,[318] but would rather would harm existing social and economic values supported by the region's pristine water quality.

As described in Section III above, the waters impacted by the proposed Pebble Mine Project support spawning and rearing for all species of Pacific salmon that in turn make up the basis of the region's culture and economics, support a wide variety of recreational opportunities, provide local drinking water, and are of spiritual significance for people in the region. Under the state's anti-degradation policy, the quality of these waters must be maintained to support current and future uses. And as described in Section II above, the proposed Pebble Mine Project will result in the direct and permanent destruction of 2,232 acres of wetlands and 105 miles of streams.

Under the state's antidegradation policy,[319] all waters of the state are presumed to be Tier 2 if they "exceed levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water."[320] The state's policy directs that for these waters "quality must be maintained and protected" unless otherwise authorized by the state through variances, mixing zones, or re-classification of waterbodies.[321]

The waters affected by the proposed CWA 404 discharge and other elements of the proposed Pebble Mine Project are "pristine quality,"[322] and are entitled to at least Tier 2 protections for all water quality parameters. Indeed, based on the available baseline information provided in the Final EIS and PLP's own field work, the waters in the region consist of cool, clear waters with near-neutral pH that are well-oxygenated, low in alkalinity, and generally low in nutrients and other trace elements"[323] and, according to the Final EIS, "in no instance did the mean concentration of trace elements exceed the most stringent water quality guidelines."[324] Moreover, all the waters impacted are designated as anadromous habitat and support salmon spawning and rearing.

Under the state's antidegradation policy, waters of the state are considered Tier 3 waters if "a high quality water constitutes an outstanding national resource, such as [...] a water of

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[317] 18 AAC 70, Art. II, Exceptions to Statewide Standards (April 2020).
[318] 18 AAC 70.015(a)(2)(A).
[319] Alaska's antidegradation policy requires that DEC undertake an antidegradation analysis and make antidegradation findings for its 401 certifications. *See*, 18 AAC 70.016(a)(1)(B).
[320] 18 AAC 70.015(a)(2).
[321] 18 AAC 70.015(a)(2).
[322] *See* BBWA, at 1-1.
[323] Pebble Final EIS, at page 3.18-7.
[324] Pebble Final EIS, at page 3.18-7.

exceptional recreational or ecological significance."[325] Pursuant to DEC's regulations, Tier 3 water quality "must be maintained and protected"[326] and only "temporary and limited degradation may be authorized in Tier 3 water."[327] DEC has before it a petition to list the Koktuli River (main fork, north fork, and south fork) as a Tier 3 water, or an Outstanding Natural Resource Water (ONRW) for its importance to the most productive salmon fishery in the world, its pristine water sustaining the fish and wildlife populations, subsistence lifestyle, and commercial and sportfishing economies of Bristol Bay.[328]

For DEC to allow water quality reductions in Tier 2 waters, through use of a mixing zone, variance, or reclassification of waters, as an initial matter, PLP must provide DEC with "evidence in support" of an application for reduction in water quality.[329] As explained throughout this comment letter, PLP's 404 permit application and supporting materials lacks sufficient evidence in support of its plans for water management and treatment. Moreover, PLP has failed to submit to DEC the necessary state permit applications related to its water and waste management and treatment plans.

To allow a reduction in the quality of Tier 2 waters, DEC must find that: 1) lowering water quality is necessary to accommodate important economic or social development in the area where the waters are located; 2) there will be no violation of applicable water quality criteria; 3) water quality adequate to protect existing uses will be maintained; 4) for point sources, all discharges will be treated and controlled to achieve the highest statutory and regulatory requirements; and 5) for non-point sources, all discharges will be treated and controlled to achieve all cost-effective and reasonable best management practices.[330] As evidenced throughout this comment letter, DEC cannot support any of these five findings required to allow for a reduction in the water quality of Bristol Bay's headwaters.

There is no other applicable exception to Alaska's water quality standards that would enable DEC to issue a section 401 certification in spite of the water quality problems and significant habitat degradation described herein. DEC cannot issue a variance to water quality standards, as variances are for short-term impacts only.[331] Likewise, the water quality impacts and habitat degradation described herein extend well beyond any treatment works "installed" or "designed" by PLP that might exempt the proposed project from water quality standards.[332] And mixing zones are not authorized "in a spawning area of any of the five species of anadromous Pacific salmon found in the state," nor can they "adversely affect the present and future capability of an area to support spawning, incubation, or rearing" of those species.[333] DEC could not authorize a mixing zone in the headwaters of the Bristol Bay fishery.

Finally, we note that any attempt by PLP or DEC to allow for a variance, mixing zone, or re-classification of Bristol Bay's waters must be subjected to public review and comment and opportunity for public hearings, per DEC's regulations.[334]

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[325] 18 AAC 70.015(a)(3).
[326] 18 AAC 70.015(a)(3).
[327] 18 AAC 70.016(a)(1)(B).
[328] Nomination of the Koktuli River (North Fork, South Fork, Main Fork) Alaska's First Outstanding National Resource Water, *available at*: https://akmininginfo.files.wordpress.com/2012/09/koktuli-onrw-nomination1.pdf.
[329] 18 AAC 70.015(a)(2).
[330] 18 AAC 70.015(a)(2).
[331] 18 AAC 70.200.
[332] 18 AAC 70.010(c).
[333] 18 AAC 70.240(e).
[334] 18 AAC 70.016(b)(5)(A), 18 AAC 70.205(c), 18 AAC 70.230(b).

VIII. Inadequate Public Process; DEC Must Provide Public Notice of an Application for State Water Quality Certification

On July 24, 2020, attached at the end of USACE's public notice of availability of the Final EIS for the Pebble Mine Project, was a one-page notice of application for state water quality certification for the proposed Pebble Mine Project.[335] This notice, ostensibly issued by DEC but published solely by USACE, appears nowhere in the Alaska Online Public Notices System, as is the standard practice for all state public notices.[336] This notice also appears nowhere on DEC's website, despite DEC Division of Water's "Current Events" page listing other recent public notices.[337]

To the layman observer, there is no notice from DEC anywhere soliciting public comments on the Pebble Project's state water quality certification. And USACE's public notice itself was buried on the Alaska District's website under "Special Public Notices" and was not separately and widely distributed throughout Bristol Bay communities. Our groups are only aware of the opportunity to submit comments because of our diligent efforts following the federal permitting process for the proposed project. But it is not the responsibility of the public to diligently follow permitting processes in order to seek out comment periods not otherwise noticed by the agencies through proper channels. It is the obligation of DEC to ensure it is following the Clean Water Act's requirement to "establish procedures for public notice in the case of all applications for certifications ..."[338] Indeed, in other 401 certification cases for large mine projects and other projects, DEC has provided ample public notice on its own website as well as on the Alaska Online Public Notices System.[339]

Moreover, the as detailed throughout this letter, the details on PLP's proposal are insufficient and its proposed project is consistently changing. Indeed, PLP is currently undertaking field work to collect data for its 404 permit application And PLP has yet to submit DEC permit applications necessary for the agency and the public to weigh the impacts of the proposed project on water quality. These facts alone warrant that DEC seek additional information from PLP pursuant to 18 AAC § 15.130(b) and toll any public comments until more information about PLP's proposal is known.

We request that DEC toll the deadline to submit comments on Pebble Project water quality certification in order to issue a proper public notice that complies with the agency's past practices and the standard practice for all Alaska agencies. We then ask that DEC provide the public with 30 days to comment on this public notice. Attaching the water quality certification public notice to a federal public notice that was not widely distributed in the middle of busy subsistence and commercial fishing seasons and during pressing village and tribal responses to the COVID pandemic is not an appropriate course for soliciting public input.

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[335] *See* U.S. Army Corps of Engineers, Special Public Notice, Notice of Availability for the Pebble Project Final Environmental Impact Statement (July 24, 2020), https://www.poa.usace.army.mil/LinkClick.aspx?fileticket=HYntNq9bfrU%3d&portalid=34.
[336] https://aws.state.ak.us/OnlinePublicNotices/.
[337] *See*, https://dec.alaska.gov/water.aspx
[338] 33 C.F.R. § 1341(a)(1).
[339] *See, e.g.*, Notice of Application for State Water Quality Certification - Donlin Gold Project (June 13, 2018), https://aws.state.ak.us/OnlinePublicNotices/Notices/View.aspx?id=190378 (notice on the Alaska Online Public Notices System) and https://dec.alaska.gov/water.aspx (DEC Water homepage featuring Donlin Mine 401 Certification documents).