

June 28, 2019

Program Manager
US Army Corps of Engineers
645 G St., Suite 100-921
Anchorage, AK 99501

RE: Pebble Project Draft Environmental Impact Statement and Application for Clean Water Act Permit - POA-2017-00271

Dear U.S. Army Corps of Engineers,

I am commenting on the draft environmental impact statement (DEIS) and proposed permit in my role as Executive Director for Bristol Bay Regional Seafood Development Association (BBRSDA). The BBRSDA's mission is to improve the value of commercial fisheries in the region. This means our organization represents the interests of more than 2,000 small fishing businesses who directly employ over 8,000 people in sustainable commercial fishing jobs.

BBRSDA is submitting additional comments through its counsel on this matter, Faegre Baker Daniels. My comments herein focus on my expertise as a fisheries economist and my role supporting the interests of Alaska's commercial seafood industry.

This project should not be permitted because it 1) contradicts and fails to account for the EPA's rigorous 2014 Bristol Bay Assessment, 2) has not been shown to be economically feasible, and 3) cannot survive a rigorous analysis specifically explaining how it would not affect regional salmon resources (which the Pebble Limited Partnership (PLP) has repeatedly claimed).¹

As you are aware, the Environmental Impact Statement (EIS) produced by the U.S. Army Corps of Engineers (USACE) must take a "hard look" at the direct, indirect and cumulative impacts of the proposed action and the alternatives. It is clear that the DEIS and the initial scoping work, which provided the foundation for the DEIS, does not represent a hard look at these impacts and avoids assessing the full area and time period that will be impacted by the mine. My comment addresses several areas where the DEIS fails to "take a hard look" at reasonably foreseeable impacts of the entire Pebble Mine project.

PROFESSIONAL BACKGROUND

My name is Andy Wink. I am the Executive Director for the Bristol Bay Regional Seafood Development Association (BBRSDA). Prior to joining BBRSDA in July 2018, I spent approximately eight years as a seafood economist and seafood industry analyst. For the vast majority of this period I acted as the lead research analyst (via contract working for a research and consulting firm) for the Alaska Seafood Marketing Institute, which markets Alaska seafood around the world. This unique job afforded me incredible access and resources to deeply understand 1) what drives seafood markets around the globe, 2) the attributes companies/regions use to market their products, 3) the best way to deploy marketing resources for the benefit of Alaska's seafood industry, and 4) which attributes increased demand for Alaska seafood. Alaska Fish Radio named me Alaska's 'top fish economist' from 2014-2017. Prior to specializing in

seafood-industry economics, I was a labor economist for the State of Alaska from 2014-2016 where I focused on resident hire analyses and training program performance.

BBRSDA is a 501c6 non-profit organization funded through a self-imposed 1% assessment on gross revenues in the Bristol Bay salmon driftnet fishery. The BBRSDA operates with a budget of \$1-3 million per year. Its mission is to maximize the sustainable economic value of commercial fisheries in Bristol Bay. The proposed Pebble Mine will do irreparable harm to BBRSDA and its members, and impede BBRSDA's ability to carry out its mission.

ENVIRONMENTAL RISKS FROM THE PROPOSED PEBBLE MINE

Conclusion: The proposed Pebble Mine will cause significant, foreseeable environmental consequences, which will result in substantial socioeconomic consequences. The DEIS falls well short of taking a "hard look" at the environmental consequences and adequacy of environmental protection measures, as well as the resulting socioeconomic hardships.

Numerous biologists, scientists, and mining experts have submitted comments to USACE addressing the significant environmental risks posed by the Pebble Mine project. Agencies implementing National Environmental Policy Act (NEPA) regulations are required to take a "hard look" at the environmental consequences of their actions. In the case of the Bristol Bay salmon fisheries, the environment is the primary driver behind the economic gains associated with the region's salmon resource. NEPA also requires agencies to consider the socioeconomic effects that result from a project's environmental impact. In the case of the proposed Pebble Mine, there are grave environmental and socioeconomic consequences to consider.

The DEIS falls well short of giving these reasonably foreseeable consequences a hard look. My comments below elaborate on a few of the areas where the DEIS either completely fails to investigate critical issues, or does so in a legally inadequate manner.

ECONOMIC IMPACTS TO THE BRISTOL BAY COMMERCIAL SALMON FISHERY

Conclusion: The DEIS fails to adequately consider or document the substantial economic benefits generated by the commercial salmon fishery in Bristol Bay, which are completely dependent upon abundant, pristine salmon habitats and jeopardized by the proposed Pebble Mine.

The commercial salmon fishery in Bristol Bay is the most valuable wild salmon fishery in the world.² It directly employs nearly 15,000 people in Alaska (i.e. fishermen, processors, fishery management staff, and tender operators) and creates over 8,000 additional jobs through secondary and downstream impacts³. All of the fishery's economic benefits rely on region's environment to produce marketable sockeye salmon in great abundance. Any analysis required to "take a hard look" at a proposed mining project should include a detailed analysis of the region's commercial fishery that will be put at risk by a large mining project. Section 3.6 of the DEIS includes an older economic assessment of the fishery from 2013, but it does not include sufficient data related to regional resident or Alaska resident involvement. It also does not attempt to quantify the value of commercial seafood assets held by stakeholders or the threat to that value posed by the mine. These are critical factors USACE must weigh in making its permitting decision.

Furthermore, there many other considerations that should be investigated by the DEIS but are either lacking in detail or are completely absent:

- Commercial fishery benefits are sustainable in perpetuity, will very likely increase over time, and are not limited in terms of a time period, as is the case with the proposed Pebble Mine project. The track record for fishery management has proven that the fishery can yield substantial amounts of salmon in perpetuity, provided that salmon habitat is not destroyed or compromised.

- Bristol Bay salmon fisheries are not reliant on hatcheries or other artificial means of support, but are rather completely dependent on productive spawning and rearing habitat. Including salmon hatcheries in Bristol Bay or built in other regions as mitigation measures is simply not an acceptable option for fishermen or many other Alaska residents. There is little evidence that abundant wild salmon runs can be restored once they are lost and we could find no evidence in the mine plan of a funding mechanism to pay for fishery remediation. These facts suggest that it is not possible or economically feasible to fix any resulting problems in the fishery. And doing so would destroy the biological and marketplace benefits of a wild, naturally reproducing fishery.

- The DEIS does not meaningfully examine or contextualize the regional impacts of the commercial salmon fishery. The salmon fishery is the economic foundation of the region, and yet it is not clear from the analysis exactly how important the fishery is to region's economic well-being.

- Fishermen and processors own \$1.2 billion worth of regional assets which are dependent upon the commercial fishery. These assets are primarily in the form of permits, fishery-specific vessels, factories, and land, and the vast majority of these assets cannot be moved to other fisheries. The investment exposure of thousands of existing U.S. businesses should be a critical element of any DEIS pertaining to the proposed Pebble Mine.

- Economic benefits resulting from commercial fisheries in Bristol Bay and all the downstream activity it creates far outweigh the potential economic benefits of the proposed mine. Furthermore, profits from the proposed mine would accrue to a foreign company creating significant leakage outside of the U.S. economy.

- The Pebble Mine would likely provide benefits to upriver communities in the form of employment and tax revenue, but the DEIS fails to examine what benefits are placed at risk downstream. Coastal communities in Bristol Bay are heavily dependent on the commercial salmon fishery for both employment and tax revenue. Any DEIS which is expected to survive legal scrutiny should obviously take a very hard look at these likely trade-offs.

- Commercial salmon fisheries in Bristol Bay produce large quantities of wild salmon for sale in the domestic market, as well as export markets. From 2013 to 2017, the commercial salmon fishery yielded an average of \$235 million worth of exports which helps offset the U.S. trade deficit and brings "new" money into the U.S. economy.

- The DEIS does not address the historical and cultural value of Bristol Bay salmon fisheries. Many people's connection to the Bristol Bay extends back for generations. It is part of their family history and is expected to be part of their family's future, whether they are involved in

commercial, subsistence, or sport fisheries. There are thousands of real people who have relied on Bristol Bay salmon for generations for food, income, and even personal fulfillment. The DEIS should have taken a hard look at impacts to the well-established existing stakeholders that rely on Bristol Bay salmon.

The DEIS does not adequately address the critical question of whether the proposed Pebble Mine can coexist with large wild salmon runs in perpetuity. There is no legitimate attempt to quantify specific risks, or to provide detailed explanations about how potential negative impacts will be tracked or what penalties and recourse actions would be implemented if the proposed mine does adversely impact regional salmon productivity. Where else has an open-pit mine of the size needed to be economically feasible in Bristol Bay coexisted for many decades with such a large wild salmon fishery? History, as well as common sense, suggests that a large open-pit mine of this nature would result in significant risk to regional fisheries. If PLP's claims regarding coexistence can be shown to be true, the DEIS fails to establish the evidence. The DEIS fails to cite a single historical example of a successful mining operation with similar features as the proposed Pebble Mine co-existing with a self-supporting, sustainable commercial fishery of this size without significant impact. And certainly the world's most valuable commercial salmon fishery should not be the "test case" for something that has never been successfully accomplished.

The DEIS should not only include a detailed analysis of the commercial fishery's economic impacts, but it should investigate the expected losses across a range of potential impacts. How much would be lost in gross present value terms with a 10, 20, 30 or even 50 percent loss in fishery value? What are the chances for such a loss in fishery value and/or abundance? What are the chances of a catastrophic event that would result in a loss of over 50 percent of harvest volume over 50, 100, 200, or 500 years? These are critical questions that need honest answers.

Furthermore, the DEIS should have thoroughly considered the commercial salmon fishery's future. The Bristol Bay commercial salmon fishery has been going through a period of transition dating back to roughly 2000. Fishermen and processors have invested heavily in improving quality and transitioning from a fishery focused on producing canned salmon to one which produces high-quality, premium fillets and smoked products. This transformation has created an opportunity to market Bristol Bay sockeye salmon as a unique, valuable product unlike anything else in the marketplace. No other wild salmon fishery can produce the abundance of a premium salmon species like Bristol Bay. In a world where farmed salmon production and global population continues to increase, the relative value of unique, wild salmon products is very likely to gain value as a niche product.

Finally, the DEIS fails to point out that many costs associated with fishing and wild salmon processing are relatively fixed in nature. Thus, most reductions in harvest volume/value would come out of profits for both fishermen and processors. Again, any analysis taking a "hard look" at the proposed mine plan would need to examine the potential impact on income, secondary impacts, and stakeholder equity.

ECONOMIC IMPACTS TO BRAND AND CONSUMER PERCEPTION

Conclusion: The DEIS incorrectly states that the Bristol Bay salmon fishery lacks brand identity. The DEIS fails to fully examine the potential impacts of damage to consumer perception of Bristol Bay salmon.

The DEIS's analysis of potential impacts to the marketability of Bristol Bay salmon is based on a flawed assumption that Bristol Bay salmon is a "price taker" and that it has no unique brand or identity to produce a premium value above farmed salmon:

Pebble Mine DEIS, Section 4.6-2 ...Bristol Bay salmon is a "price-taker;" it does not have cohesive brand identification as the Copper River fishery does to help drive prices higher. Therefore, Bristol Bay prices reflect both the market for wild Alaska salmon products and the broader market for all salmon products.

This analysis is simply not true, and the DEIS makes the assertion without any serious analysis or support. This assertion also does not consider the trajectory of marketing and quality development in the fishery. In the last few years, Bristol Bay fishermen (through BBRSDA) have invested heavily in building a specific brand identity for Bristol Bay Sockeye Salmon associated with higher quality product. See Attachment #1 for examples and information about the nature and scale of BBRSDA's regional marketing program.

In 2016, BBRSDA launched a branding program to promote Bristol Bay Sockeye Salmon from any verifiable source. This marketing platform has been very successful. We coordinated over 1,000 promotions for branded "Bristol Bay Sockeye Salmon" in 2018 at grocery stores across the United States (see Attachment #1). We are on pace to do even more promotions in 2019. The branded marketing program has consumed nearly all of BBRSDA's marketing expenses in recent years, and represents a growing investment of more than \$2 million (since 2016). Supporting evidence related to our branded marketing program can be found in Attachment #1.

Fishermen and processors have also made large investments focused on improving the quality of salmon in Bristol Bay. In 2008, only 16 percent of salmon caught in the Bristol Bay salmon driftnet fleet were chilled, but by 2018 this figure had increased to 86 percent.⁴ Chilled fish taste better and they pay better, but that improvement has come at a great cost for large numbers of small businesses. Many driftnet fishermen have installed refrigerated seawater (RSW) systems on their vessels or use ice to chill their catch. RSW systems often cost over \$50,000 to purchase and have installed properly. Also, processors pay a premium for chilled fish which adds up to tens of millions of dollars per year. Despite the costs, the fishery has found chilling and quality bonuses to be excellent investments that have led to better values in the fishery. Through BBRSDA's marketing activities and the industry's investment in quality, awareness of Bristol Bay sockeye salmon is increasing and is well on its way to being a large, premium wild salmon brand. However, that positive brand equity and investment is put at risk if consumers have a negative perception about the fishery due to the presence of a mine or concerns about toxins in the salmon.

Returns from investments in quality and marketing can be witnessed in the trend towards increasing ex-vessel and first wholesale value.⁵ Ex-vessel value refers to the amount of money

paid to fishermen by processors in exchange for fish. First wholesale value refers to the value of processed product when a processor sells product to buyers outside of their affiliated network. Since 2005, the largest harvest volumes have all come in the last four years (2015-2018). Initially ex-vessel price and value declined in 2015 with the increase in supply, but since then prices have increased to levels only seen during years with small harvests or prior to the large influx of farmed salmon. Developments in the Bristol Bay salmon industry aren't just good for Bristol Bay, they buoy the entire Alaska salmon industry. In 2018, Bristol Bay salmon accounted for 47 percent of the preliminary ex-vessel value of all salmon caught in Alaska.⁶ Once post-season price adjustments are factored in, Bristol Bay will almost certainly account for more than 50 percent of Alaska salmon fishery value in 2018. Several Alaska fishing regions have experienced poor salmon runs and/or declining halibut stocks. Good years in Bristol Bay have allowed processors to remain solvent and open for business in other regions.

The attributes of abundant supplies of high-quality sockeye salmon from a pristine environment are key value drivers for Bristol Bay sockeye salmon and other Alaska seafood products. Consumers pay more for wild sockeye salmon from Bristol Bay than they do for farmed salmon because Bristol Bay salmon come from a pristine environment with sustainable fisheries, and are free of antibiotics, dyes, and other substances consumers find disagreeable. The Bristol Bay salmon fishery owes a lot of its value to its unparalleled abundance (i.e. volume), but data shows that well over half of the fishery's ex-vessel value is related to its marketability and consumer perception which produces a price premium over farmed salmon.

Because the DEIS did not investigate this important factor, I will provide some relevant analysis. Table 1 below illustrates both the price difference between sockeye and farmed Atlantic salmon at retail, and provides a reasonable expectation for ex-vessel prices if retail prices for Bristol Bay sockeye salmon were to fall to the level of farmed salmon.

Table 1: Comparing Ex-Vessel & Retail Prices for Bristol Bay Sockeye Salmon with Farmed Atlantic Salmon Levels

	2015 Season	2018 Season
Final Average Ex-Vessel Price/lb. of Bristol Bay Sockeye	\$0.64	\$1.50
Average Promotional Retail Price/lb. of Fresh/Frozen Sockeye Fillets (Sept.-April)	\$8.90	\$11.15
Bristol Bay Sockeye Harvest Volume, in Millions of Pounds	185	216
Bristol Bay Sockeye as a Pct. of Global Sockeye Supply	46%	57%
Atlantic Salmon – Boneless Fillets (Sept.-April)	-	\$8.57
2018 Difference in Ex-Vessel Value between ex-vessel prices of \$1.50/lb. and \$0.64/lb.	-	- \$201 Million

Note: Sockeye promoted from September through April in the United States is largely comprised of Bristol Bay sockeye, as most other sockeye fisheries are smaller and sell a higher percentage product into fresh markets during the summer.

Sources: Ex-vessel prices: Alaska Department of Fish & Game (Commercial Operators Annual Report,

includes quality premiums and post-season adjustments), Promotional Retail Prices: (Urner Barry Retail Features Database), Harvest Volume and Pct. of Global Sockeye Supply: <https://bit.ly/2Xkjsxl>.

From September 2018 through April 2019 the average promotional price of sockeye salmon fillets sold in U.S. grocery stores was \$11.15 per pound.⁷ The vast majority of this sockeye sold at retail during the offseason comes from frozen Bristol Bay sockeye. The average promotional price of farmed Atlantic salmon during this period was \$8.57 per pound—a difference of 30 percent or \$2.58 per pound. The sockeye sold during this period was harvested in 2018 and that year Bristol Bay fishermen were paid an average of \$1.50 per pound, according to the Alaska Department of Fish and Game. What would happen if Bristol Bay sockeye salmon were priced on par with farmed salmon? Actually, the 2015 season provides a reasonable proxy. That year fishermen received an average ex-vessel price of only \$0.64 per pound and the average promotional retail price of sockeye salmon fillets (from September 2015 through April 2016) was \$8.90 per pound—still above, but relatively close to recent farmed salmon retail prices. There were 216 million (round) pounds of Bristol Bay sockeye salmon caught in 2018. In just ex-vessel value terms, the difference between an ex-vessel price of \$1.50/lb. and \$0.64/lb. is \$201 million. That’s just the lost ex-vessel value from one season! Consider the cumulative and equity effects of such a loss. If the marketability of Bristol Bay sockeye salmon falls to that of farmed salmon due to negative perceptions associated with the Pebble Mine, history tells us the fishery would likely lose approximately two-thirds of its value.

This is a very important issue for the commercial seafood industry. When our products go in the marketplace and are advertised as being top-quality, wild salmon from a pristine environment, we need to show that is really true. Examples of marketing leverage for the region’s pristine environment are included in Attachment #1. What happens if water in areas surrounding the mine is found to contain elevated levels of toxic chemicals? What happens if consumers no longer perceive that Bristol Bay salmon or their environment is pristine because of the proposed Pebble Mine? Adverse publicity could have devastating impacts on the marketability of Bristol Bay salmon.

Table 2: Long-Term Impacts of Declined Marketability for Bristol Bay Sockeye

Expected Difference in Ex-Vessel Price	(\$0.64-\$1.50) = -\$0.86
Average Harvest Volume of Bristol Bay Sockeye (1999-2018), in Millions of Pounds	149.4
Expected Decline in Ex-Vessel Value per Year	-\$128.5 Million
Expected Decline in Ex-Vessel Value over 20 years	-\$2.570 Billion
Expected Decline in Ex-Vessel Value over 78 years	-\$10.022 Billion
Estimated labor income of Pebble mine jobs (850 jobs at \$100,000 per job) over 78 years	\$6.630 Billion

Sources: Harvest volume: Alaska Department of Fish & Game, other figures are calculated or approximated.

The data in Table 2 calculates the long-term costs of reducing Bristol Bay sockeye prices to that of farmed Atlantic salmon. This one concern about the marketability of salmon, out of dozens of issues regarding this mine, would cost commercial fishermen nearly double the benefit gained from mining labor income! Jobs and labor income are the biggest benefit mine proponents cite regarding Pebble’s benefits. And this is assuming the mine miraculously somehow doesn’t

damage salmon productivity (i.e. harvest volume), in which case the difference between the two would be even greater.

The DEIS attempts to sidestep the potential negative impact to consumer perception by saying that resource extraction activities in Cook Inlet and Copper River do not result in lower prices for sockeye salmon from those regions (DEIS ES-p53). There are two issues here which require a deeper analysis. First, the comparison of resource extraction activities is not reasonable. Offshore oil/gas activities in Cook Inlet produce pollution on relatively small scale and have not been the subject of intense public scrutiny, as in the case of the proposed Pebble Mine. As for the Kennecott Mine near Copper River, that too is a poor comparison for numerous reasons. Rather than explain the reasons why a comparison between the proposed Pebble Mine and the Kennecott Mine is not reasonable and make a long comment even longer, I will cite a research paper entitled “Copper River and Bristol Bay: Comparison of Salmon and Mineral Resources” that was available to the USACE but ignored.⁸ To sum up this issue, the comparisons between Pebble and resource extraction activities in other Alaska regions are not reasonable proxies and this critical assumption made by USACE must be subjected to much greater scrutiny in the DEIS given the potential socioeconomic consequences.

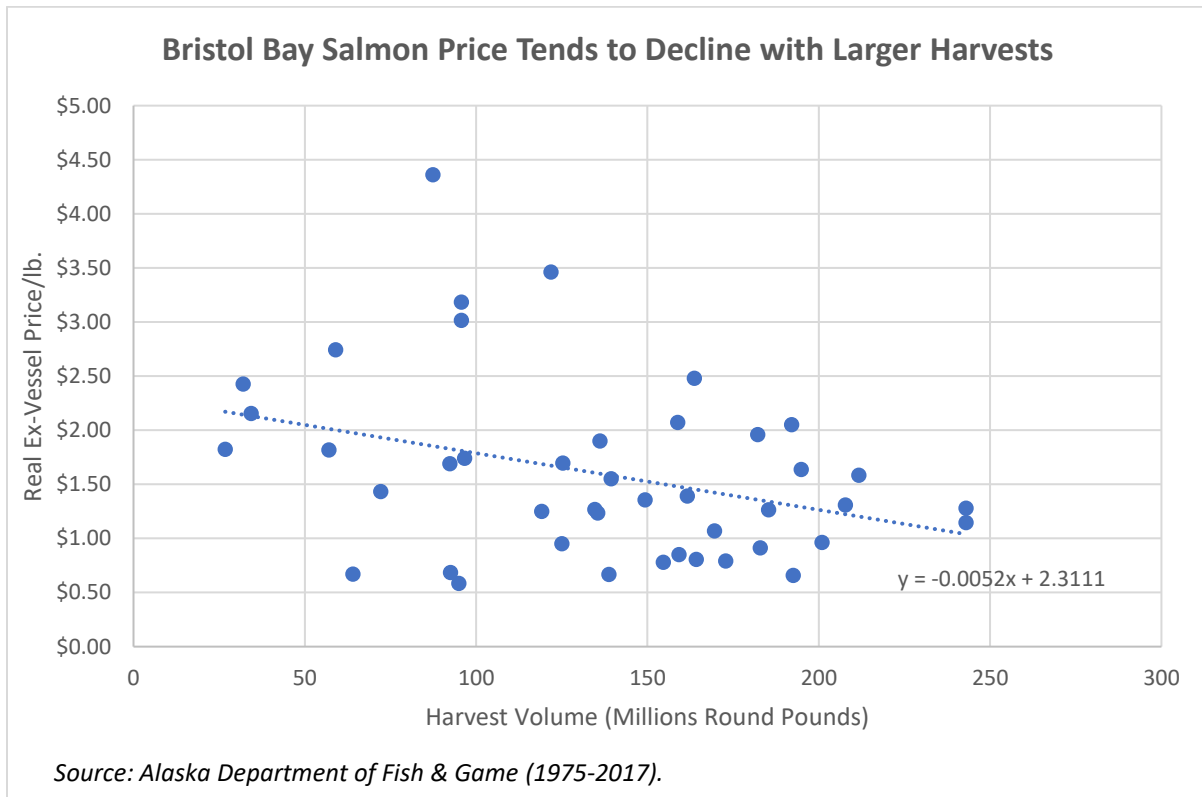
Second, while Bristol Bay sockeye salmon may currently fetch lower ex-vessel prices than sockeye fisheries in Prince William Sound (PWS), Cook Inlet, and Kodiak, this simplistic comparison ignores the obvious difference in harvest volume. Bristol Bay produced nearly 10 times as many sockeye as all the aforementioned areas combined in 2018.⁹ The Bristol Bay commercial salmon fishery also contained more actively fished permits than all those areas combined.¹⁰ Processors in other areas have to pay more to entice fishermen to catch smaller amounts of sockeye salmon, whereas in Bristol Bay fishermen can often accept a lower price because they can earn a healthy financial return by catching more fish than other areas on average. Also, it costs more to operate processing plants that primarily focus on sockeye salmon in western Alaska. This can be seen by comparing the price of Area M (Alaska Peninsula) sockeye to Bristol Bay. Both areas tend to be lower than PWS, Cook Inlet, and Kodiak. Ex-vessel price is a function not just of demand, but also supply and operating costs. The DEIS should have acknowledged these facts about price, volume, and the total value of fishery before dismissing the fishery as less valuable than other regions. When considering total value, it is easily the state’s most important commercial salmon fishery.

Additionally, the assertion that Bristol Bay is a “price taker” is false. The definition of a “price taker” is a company or entity that must accept the prevailing prices in the market of its product, with its own transactions or market supply being unable to affect the market price. Bristol Bay actually does more to set the market price for frozen wild salmon from Alaska than any other fishery because Bristol Bay represents the largest supply of premium wild salmon in the world and its own harvest volume certainly affects its ex-price. A simple analysis of 1975-2017 ex-vessel price and harvest volume from the Alaska Department of Fish & Game shows that for every 20 million pounds added to the Bristol Bay sockeye harvest, the ex-vessel price declines by approximately 10 cents/lb (with a trendline equation of $y = -0.0052x + 2.3111$). See Figure 1 below.

Interestingly, fishery prices and harvest volume have generally increased since 2015. Also, the correlation between wholesale prices for Alaska/Bristol Bay sockeye and Norwegian farmed

salmon has declined (from 0.48 to 0.36) since BBRSDA’s branding program went nationwide in 2017. Further, wholesale prices for frozen Alaska sockeye fillets are up 25% from the beginning of 2017 through the end of 2018, compared with just an 8% increase for imports of fresh farmed Norwegian salmon fillets. Now, wild sockeye salmon is a distinctly different product than farmed salmon, but they are still both salmon and of course there is going to be some level of interdependence. However, the fact that Bristol Bay prices have been less impacted by harvest volume in recent years and have moved even more independently from farmed prices provides evidence that marketing and quality investments made by the Bristol Bay salmon industry are resulting in better performance. Certainly, these findings show that Bristol Bay is not a price-taker and the DEIS needs to completely re-investigate this subject.

Figure 1. Plot of Bristol Bay Sockeye Salmon Harvest Volume and Real Ex-Vessel Price



In summation, the Bristol Bay salmon industry is in a fantastic market position. In a world with growing demand for salmon, and particularly wild salmon, it possesses the largest supply of a premium wild salmon species in the world. The USACE should consider not just the past value and market position of the regional salmon industry, but also its future market opportunity. I firmly believe that so long as salmon habitat is protected in Bristol Bay, the region’s salmon industry will become more valuable than most of the previous years witnessed over the past 30 years.

LACK OF ADEQUATE COST/BENEFIT ANALYSIS & MINE FEASIBILITY STUDY

The DEIS fails to provide an adequate analysis of the potential benefits of the proposed Pebble Mine compared to the potential costs related to the destruction or devaluation of regional salmon resources. The DEIS fails to acknowledge that there is an entire economy built around Bristol Bay salmon that has far reaching supply chains producing significant economic benefits at a regional, statewide, and national level. Damaging the environmental engine which creates these sustainable, perpetual economic benefits would have deep, painful costs to those stakeholders, their businesses, and their families.

The DEIS fails to contain any economic feasibility analysis for the proposed Pebble Mine. We have no idea what the minimum viable scale is for the mine and how to compare its hypothetical, non-renewable benefits against the renewable jobs and economic engine already provided by Bristol Bay salmon.

In the case of Bristol Bay, the natural environment creates enormous economic gains on a perpetual basis and provides a relatively large portion of the local food supply through subsistence harvests. Issuing a permit for the proposed mine without including 1) an economic feasibility study on the mine and 2) a cost/benefit analysis with regional salmon resources in the DEIS where it can be made available for public comment absolutely fails the test of USACE taking a “hard look” at the proposed mine’s direct, indirect and cumulative impacts.

OTHER PROBLEMS WITH THE PEBBLE MINE DEIS: TAILINGS DAM FAILURE ANALYSIS & INSUFFICIENT STUDY AREA SIZE

I adopt and incorporate by reference comments written by Cameron Wobus, Ph.D., on behalf of the Trustees for Alaska related to the hydrological impacts described in the Pebble Project DEIS. Specifically, I’d like to point out the deficiencies in the DEIS dealing with risks associated with a tailings dam failure of either the bulk tailings facility or the PAG tailings facility. After the scoping period, it became clear that USACE was not going to consider the potential impacts of significant tailings dam failures such as those witnessed in Canada and Brazil in recent years. This is a major oversight on the part of USACE. PLP and USACE would likely purport that the likelihood of a tailings dam failure at the bulk tailings facility is lower than other mines because the intent is that there would not be large quantities of water held back by the dam, but rather the water would be drained out of the facility. However, the mine plan and DEIS lacks sufficient detail to explain the precedent for this design, nor does it include requirements for water elevation that would trigger a stoppage of mining activities. If significant amounts of water are to be discharged out of the bulk tailings facility in perpetuity in one of the wettest climates in the United States, the mine plan does not address the cost and dedicated funding mechanism for such activities.

Furthermore, it is my understanding that the tailings dam failure model produced by Lynker Technologies and The Nature Conservancy for the BBRSDA¹¹ showed that in the event of a tailings dam failure toxic materials would be deposited downstream far outside of the study area referenced in the DEIS. This analysis would suggest that the study area used in the DEIS is too small, and should be expanded to capture all areas near the Nushagak and Kvichak Rivers.

The DEIS is seriously inadequate in its failure to analyze the risks associated with a tailings dam failure and request that USACE incorporate findings from the report entitled “A Model Analysis of Flow and Deposition from a Tailings Dam Failure at the Proposed Pebble Mine” produced by Lynker Technologies in March 2012.¹²

The creation of enormous, permanent tailings facilities in the headwaters of Bristol Bay would be like strapping a time-bomb to the area’s unique ecosystem and the people who depend on it. At some point it will explode. The destruction it creates will be the legacy for all those involved in its creation, especially USACE leadership.

Even if nothing goes wrong initially, there are economic consequences the DEIS did not examine. Catastrophic tailings dam failures have become more common in recent years.¹³ Permitting and building large tailings facilities upriver from the world’s most productive wild salmon fishing grounds has significant economic consequences, even before those dams inevitably fail. The existence and threat posed by these structures impacts investment risk in the fishery, and hence the value of assets used in the commercial salmon fishery. These are not trivial amounts. As of 2017, commercial fishermen owned \$303 million worth of salmon fishing permits and \$228 million worth of specialized Bristol Bay salmon fishing vessels. The value of processing plants and related processing assets was estimated at \$638 million. How much equity would be lost by American fishermen and how many small businesses would be essentially sacrificed so the Canadian mining company can have its mine? The DEIS fails to say, but four things are clear:

1. the value of a fishing boat, permit, or processing plant that contains an immovable time-bomb is much less valuable than those attached to a sustainable fishery with a pristine environment,
2. equity loss is an easily foreseeable impact which the DEIS is therefore required to examine,
3. the loss to small American businesses will be easy to calculate and will be felt immediately after the mine is built (if not sooner),
4. small American businesses should not have to bear the losses and risks of a project intended to satisfy the interests of a foreign mining company.

OTHER PROBLEMS WITH THE PEBBLE MINE DEIS: LACK OF PRECEDENT FOR TAILINGS DAM DESIGN

PLP claims the bulk TSF will be a “dry” TSF and that material from the PAG TSF will be returned to the mine pit after closure. These are monumental assumptions which require much greater scrutiny. First, the DEIS (Appendix B-62) states that the mine will use a Thickened Tailings Storage method during the operational period. So, the tailings will not really be dry, but rather a slurry with a target of 55% solids having a “molasses” consistency at best and the DEIS does not contain information about how the region’s relatively wet environment will not make the tailings material even more fluid. Second, a technical memorandum from AECOM (which was submitted to the USACE) shows there is no precedent for large thickened tailings storage facilities in environments like the proposed Pebble site.¹⁴ Here are some quotes from that document:

1. In response to RFI-010 Item 6 regarding examples of successful thickened TSFs in cold regions, PLP provided case history summaries and references on five mines (see Attachment A: RFI-010, Part 2, response). AECOM conducted an independent review of these mine sites, and found that they cannot readily be compared to Pebble, both individually and collectively.
2. Based on AECOM's review, it is concluded that there is a limited history of successful thickened tailings operations at large mines in cold regions, coupled with many site and operation differences between the Pebble plan and the other project operations.
3. Historically, this is the least common facility type in Canada. Based on our research, consistency of tailings product over time and lack of ability to achieve steep tailings slopes are a main concern with high density thickened / paste tailings.

The DEIS also provides scant evidence about how the mine operator will keep the bulk TSF "dry" in perpetuity and fails to provide real-life examples for such a claim given the weather patterns and hydrological conditions present in the area. Nor does the DEIS contain requirements or consequences for the mine operator about what happens if water levels in either TSF rise to certain levels. Given the importance of these assumptions and the likely outcome that the mine operator would seek to alter them to minimize costs, the DEIS should have extensively investigated the precedent for such assumptions and if such examples exist created a substantial set of stringent project requirements to ensure that in the event a permit is issued, these critical elements of the mine plan are preserved and prioritized in perpetuity. Adding such analyses to a FEIS would fail to provide the public with the opportunity to comment on important aspects of the mine plan, and would therefore require the DEIS to be amended and be put back out for public comment. As the DEIS is lacking in all these areas, the only conclusion to draw from the Lynker study (which is based on actual TSF failures) is that the USACE must incorporate findings from the Lynker study in its permitting decision. Barring substantial precedent for the proposed mine plan, the USACE should obviously deny the permit application given surrounding foreseeable environmental and socioeconomic consequences. Bristol Bay is not the place to try out untested mining activities and that is clearly what is being proposed by PLP.

OTHER PROBLEMS WITH THE PEBBLE MINE DEIS: IMPACTS ASSOCIATED WITH COPPER-LADEN DUST

The proposed Pebble Mine site is expected to produce 8,300 tons of fugitive dust per year, as well as substantial amounts of road dust each year. The Pebble Mine will be one of the largest copper mines in the world and there is no question that the dust created from mining activities will contain significant amounts of copper. In addition, copper will very likely leach into surrounding water via tailings facilities and other mine activities. Copper can have significant adverse effects on aquatic animals, such as salmon. Even relatively small amounts of copper concentrations in water has been shown to be highly toxic to aquatic life, decrease salmon's ability to migrate, and make juvenile salmon more vulnerable to predators.¹⁵ Many previous scientific studies available to the USACE have documented the detrimental impact of copper

upon wild salmon populations, and the socioeconomic consequences of this environmental impact are substantial.

Given PLP's claim that it intends to build a mine which would coexist with and not harm regional salmon populations, this issue should be examined deeply by the DEIS and the mine plan should contain extensive documentation about copper monitoring in downstream areas, as well as requirements about what levels would trigger a suspension of mining activities. Incredibly, the DEIS does not provide any adequate analysis of the potential negative environmental impacts stemming from elevated copper levels in surrounding water bodies and streams. This defect alone renders the DEIS fatally deficient.

OTHER PROBLEMS WITH THE PEBBLE MINE DEIS: INAPPROPRIATE MINE SCALE, STUDY AREA, AND TIMELINE

After public resistance about the size of its initial mine plan, PLP decided to submit a much smaller mine plan to the USACE with an operational timeframe of 20 years. However, the expected size and duration of actual mine activities is expected to be much larger.

PLP has provided no documentation that a mine of this size in this area is economically feasible. Richard Borden, a former Rio Tinto permitting expert, has submitted a letter to the USACE stating that PLP's smaller mine plan is "almost certainly not feasible."¹⁶ As Rio Tinto was a former investor in the Pebble Mine development and given the lack of an economic feasibility study, one would have to conclude the proposed mine plan is not feasible. I would not be surprised to see an economic feasibility study submitted at some point, if USACE indicated it would be required to receive a permit. However, under no circumstances should such an important study be considered by USACE without a rigorous, independent (from both PLP and USACE), and objective peer review process. Accepting such a study after the public comment period and without an independent peer review would constitute a breach of duty of the part of USACE and create further distrust about the mine permitting process.

USACE has a significant problem when it comes to its decision to permit the proposed Pebble Mine, regarding the issue of scale and duration. They have before them a mine plan which is very likely not feasible, a robust EPA assessment showing that a mine of even this smaller size would create unacceptable environmental risks, and statements from PLP leadership that they themselves view this mine project as a much larger, longer endeavor. Just months before PLP submitted an application for a dredge and fill permit to the USACE, the CEO and President of PLP's parent company (Northern Dynasty Minerals) made these remarks about the size and duration of Pebble project at the Denver Gold Forum¹⁷:

"You know, and finally, this project, it's a multi-generational opportunity. It's size and scale will lead to a very, very long life mine and the property we have hosts showings that we've got drillholes in that we believe there's other mining opportunities as well." (@1:25-1:46)... In some respects, some of the antagonists to Pebble say that, you know, this is too much for the region, but the reality is, you know, this represents development for many years, perhaps centuries into the future. And when you build the infrastructure in there and you've got a concentrator you can feed it forever. (@4:33-5:55)."

These statements cannot be squared with the proposed 20-year operational period under consideration. Nor can they be squared with the DEIS's failure to consider the cumulative impacts of expansion scenarios.

OTHER PROBLEMS WITH THE PEBBLE MINE DEIS: LACK OF REGIONAL SUPPORT

The Pebble Mine permitting process is not a "popularity contest" but surely public opinion, particularly of regional residents, should mean something. Public comments during the EPA's assessment show overwhelming opposition to this mine. USACE hearings in Bristol Bay communities, even in upriver areas away from the coast, show overwhelming opposition to this mine. Public opinion polls of Alaska residents show the majority oppose this mine. And I can say that a survey and comments we've received from BBRSDA members shows the vast majority of commercial salmon fishery strongly oppose this mine. If USACE truly thinks that the proposed project is economically beneficial, then they should be able to cite to evidence of strong local support for those benefits. The DEIS's failure to do so suggests that there is none, and that the DEIS's analysis of the project benefits is misguided.

CONCLUSION

The Pebble Mine DEIS does not take anything approaching a "hard look" at the foreseeable environmental or socioeconomic consequences of granting a permit to PLP to conduct large-scale mining activities in the Bristol Bay. PLP's mine plan and permit application are also lacking in critical areas pertaining to environmental protections for the region's substantial salmon resources.

USACE needs to be forthright with the American people about the true impacts associated with the Pebble project, and the DEIS does not come close to satisfying that obligation. USACE should stop this project in its tracks now and deny this permit application, before the mine's foreseeable destruction of the world's last great salmon run becomes the legacy for all those involved in its creation, including the agency and its leadership. If chooses to continue the permitting process, the only logical and legally defensible decision is to choose the "No Action Alternative."

Sincerely,

Andrew Wink
BBRSDA Executive Director

**ATTACHMENT #1:
BBRSDA MARKETING ASSETS FOR BRISTOL BAY SOCKEYE SALMON**

 **Bristol Bay Sockeye Salmon** ⋮
Published by Rising Tide Communications [?] · December 15, 2018 · 🌐

In 2018, 62.3 million sockeye salmon returned to Bristol Bay. If they were lined up nose-to-tail, that would nearly measure the circumference of the earth!



1,368 **110**
People Reached Engagements [Boost Post](#)

 Hannah Faith, Coy Austin Avalos and 22 others 8 Shares

 Like  Comment  Share 

 Write a comment...    

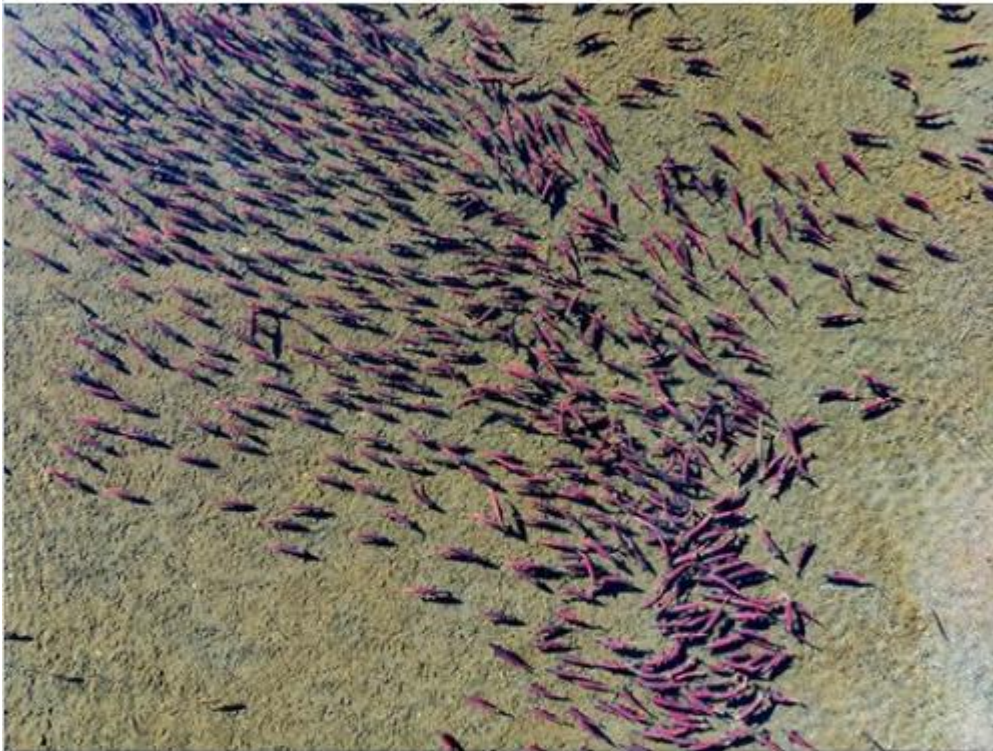


Bristol Bay Sockeye Salmon



Published by Rising Tide Communications [?] · February 21 · 🌐

Bristol Bay is a wild treasure. For over 130 years, fishing families have returned to these waters each summer to hand harvest wild sockeye salmon for the world to enjoy.



2,071

People Reached

176

Engagements

[Boost Post](#)



Arthur Maglalang, Steven Murbarger and 28 others

8 Shares



Like



Comment



Share



Write a comment...





Bristol Bay Sockeye Salmon



February 27 · 🌐

Spectacular, vast, and thriving, Bristol Bay is home to thousands of fishermen, six major river systems, and millions of salmon. Sustainability is the driving force in Bristol Bay.



Bristol Bay Sockeye Salmon

Food & Beverage Company

[Learn More](#)

10,883
People Reached

530
Engagements

[Boost Again](#)

Boosted on Feb 27, 2019

Completed

People Reached **9.1K**

Post Engagement **1.5K**

[View Results](#)

375

10 Comments 39 Shares

Like

Comment

Share





Bristol Bay Sockeye Salmon



March 4 · 🌐

Bristol Bay is a sprawling watershed of streams, rivers, wetlands, tundra, and forests - about the size of West Virginia! Preserving the place helps preserve what's on your plate.



1,073

People Reached

81

Engagements

[Boost Post](#)

Zane McCarthy, Alina Fairbanks and 20 others

7 Shares

Like

Comment

Share





WILD
TASTE
AMAZING
PLACE



PACIFIC NORTHWEST

We partner with
seafood harvesters
who are leaders in
sustainability.



BRISTOL BAY
ALASKA'S SOCKEYE SALMON



Bristol Bay Sockeye Salmon



March 29 at 11:00 AM · 🌐

"Bristol Bay sockeye salmon is one of the best sustainable proteins available. It's free of all pollutants and full of nutrients. It also drives a huge industry. It's really a win-win-win situation." -Kelly Stier of the F/V Honey Badger




1,184
People Reached

136
Engagements

Bristol Bay Sockeye Salmon April 2 at 11:00 AM · 🌐

The Bristol Bay watershed is an ecological wonderland. It provides vital habitat for 29 fish species, over 190 species of birds, and more than 40 land animals!





1,619 People Reached **178** Engagements

👍❤️ 28 1 Comment 17 Shares

👍 Like 💬 Comment ➦ Share 👤

Most Relevant ▾

 Write a comment... 🗨️ 📷 📧 🗨️

 **Shirley Eberle** It is so neat flying into Dillingham on a clear day
Like · Reply · 2d 👍 1

BBRSDA & HyVee Marketing Video: <https://www.youtube.com/watch?v=8ZfN5XxyDCI&t=52s>

BBRSDA Retail Marketing Program Video (summarizing our investment in the Bristol Bay Sockeye Salmon brand): <https://www.youtube.com/watch?v=gPTNZa83ewI>



Raley's

Friday at 9:58 AM · 🌐

NOW AVAILABLE

Wild. Sustainable. Downright delicious. That's **Bristol Bay Sockeye Salmon**. Hand harvested by fishermen from the world's largest wild sockeye salmon run, each fish is as delectable as it is nutritious. With rich flavor and gorgeous red color, this salmon's wild origins and premium quality are unmistakable.

SHOP & SAVE: <http://bit.ly/2rmhhro>

bristolbaysockeye.org

Pacific Seafood



BIT.LY

WILD TASTE FROM AN AMAZING PLACE - Bristol Bay Sockeye Sal...

Shop Now

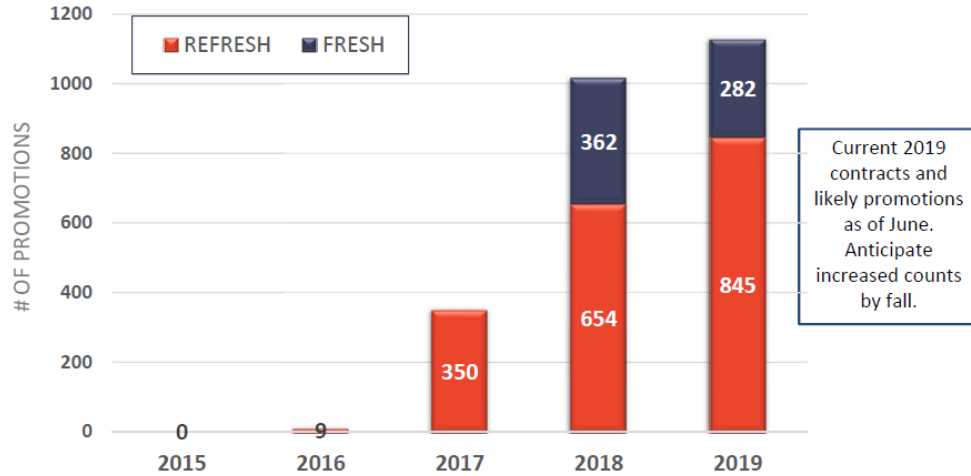


Write a comment...





BRISTOL BAY SOCKEYE SALMON IN STORES



Wild Taste
— AMAZING PLACE —

Grocery Stores



These are grocery store chains with whom BBRSDA has partnered with to promote Bristol Bay Sockeye Salmon since 2017.

ENDNOTES

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- ¹ <http://pebblepartnership.com/press-releases/2019/2/20/draft-eis-for-pebble-shows-path-to-success-for-permitting>
- ² Wink Research & Consulting, LLC. Economic Benefits of the Bristol Bay Salmon Industry. July 2018. Page 40. <http://bit.ly/2ZEfD3u>
- ³ Wink Research & Consulting, LLC. Economic Benefits of the Bristol Bay Salmon Industry. July 2018. <http://bit.ly/2ZEfD3u>
- ⁴ Northern Economics, Inc. 2018 BBRSDA Processor Survey. Prepared for Bristol Bay Regional Seafood Development Association. May 2019.
- ⁵ <http://bit.ly/2XWpO2R>
- ⁶ http://www.adfg.alaska.gov/static/fishing/pdfs/commercial/2018_preliminary_salmon_summary_table.pdf
- ⁷ Urner Barry Comtell, Retail Features Database.
- ⁸ http://www.pebblescience.org/pdfs/Kennecott_v_Pebble.pdf
- ⁹ http://www.adfg.alaska.gov/static/fishing/pdfs/commercial/2018_preliminary_salmon_summary_table.pdf
- ¹⁰ http://www.cfec.state.ak.us/gpbycen/2018/00_ALL.htm
- ¹¹ <http://bit.ly/2J59uXw>
- ¹² <http://bit.ly/2J59uXw>
- ¹³ <http://www.mining.com/web/catastrophic-mine-waste-spills-increasing-in-frequency-severity-and-cost-world-wide/>
- ¹⁴ Technical Memorandum to Bill Craig, AECOM (Re: Review of Tailings Thickening Experience in Cold Regions), June 28, 2018. <http://pebbleprojecteis.com/files/5c5dc4fe-317d-4f6c-b3ea-1c7d3138aec3>.
- ¹⁵ http://www.pebblescience.org/pdfs/2012-December/16%20June%202012_FINAL_%20Effects%20of%20Copper%20on%20Fish.pdf
- ¹⁶ <http://www.nrdc.org/sites/default/files/mccoyp-ebble-mine-economics-letter-20190328.pdf>
- ¹⁷ <http://www.denvergold.org/company-webcast/dgf17/NDM:CN/>