

**Department of Environmental Conservation
Response to Comments**

For

Donlin Gold Mine

POA-1995-120

Public Noticed June 13 – July 13, 2018

August 10, 2018

(updated April 4, 2019)

(updated May 6, 2020)



**Alaska Department of Environmental Conservation (DEC)
Wastewater Discharge Authorization Program
555 Cordova Street
Anchorage, AK 99501**

1 Introduction

1.1 Summary of Facility / Permit

Donlin Gold proposes the development of an open-pit, hard-rock gold mine in the Kuskokwim River watershed, 277 miles west of Anchorage, 145 miles northeast of Bethel, and 10 miles north of the community of Crooked Creek in the Kuskokwim watershed. There is no existing overland year-round access to the site, or a utility service to supply the mine.

The proposed Donlin Gold project includes land leased from Calista Corporation (Calista), The Kuskokwim Corporation (TKC) and CIRI Inc. All three are Alaska Native Claims Settlement Act (ANCSA) regional corporations. The remainder of potentially affected lands (principally pipeline impacts) are owned primarily by the State of Alaska or U.S. Bureau of Land Management (BLM).

A U.S. Army Corps of Engineers (USACE) permit pursuant to Section 10 of the River Harbors Act of 1899 (33 USC 403) and pursuant to Section 404 of the Clean Water Act (CWA) (33 USC 1344) is to be issued to Donlin Gold for the discharge of fill material into waters of the U.S. (WOUS), including wetlands, and the construction of structures in and under navigable waters. The USACE permit will authorize the Applicant's proposed action (Alternative 2 with North Option) which incorporates the North Route Pipeline option as detailed in the April 2018 Final Environmental Impact Statement (FEIS). This alternative incorporates all practicable avoidance and minimization measures.

To the extent practicable, the proposed project has been designed and modified to avoid impacts to WOUS and important cultural resources and wildlife habitats. The construction of all Project components (Mine Site, Transportation Corridor, and Pipeline) will result in the discharge of 4,368,300 cubic yards (cy) of fill material, permanently impacting 2,877 acres of wetland, 3 acres of fill below the Ordinary High Water Mark (OHWM) of the Kuskokwim River, and 172,944 linear feet of stream, and temporarily impacting 538 acres of wetland and 53,346 linear feet of stream.

The Project would have an average process throughput of 59,000 tons of ore per day, an estimated operational life of 27 years, and would produce approximately 30 million ounces of gold. Construction of the Project would take 3 to 4 years. Final reclamation and closure activities will take six years post operations. Approximately 45 years post-reclamation the mine pit will fill and there will be need for treatment in perpetuity of the wastewater discharged from the mine pit.

Major Project components include the proposed Mine Site, Transportation Corridor, and Pipeline. See the Donlin Gold FEIS, Section 2.3.2, Alternative 2 – Donlin Gold's Proposed Action with incorporation of the North Route Pipeline option (referred to as the Alternative 2 North Option)

for a detailed description of the Project. The three major project components are summarized as follows:

Mine Site

The Mine Site construction will result in the discharge of 2,943,005 cy of fill material, resulting in the permanent loss of 2,572 acres of wetland and 171,100 linear feet of stream. The primary Project subcomponents of the Mine Site include Donlin-Jungjuk road (East of Crooked Creek), Laydown areas, Mine Internal Roads, North and South Overburden Stockpile, Open Pit, Snow Gulch Freshwater Reservoir, Tailings Storage Facility (TSF), Treated Water Discharge Facility, Material sites and Stockpiles, and Waste Rock Facility (WRF).

Transportation Corridor

The Transportation Corridor construction will result in the discharge of 156,280 cy of material, resulting in the permanent impact to 105 acres of wetland, 3 acres below the OHWM of the Kuskokwim River, and 1,844 linear feet of stream. The primary Project subcomponents of the Transportation Corridor include a port facility at Angyaruaq (Jungjuk), a 30-mile mine access road from the port (West of Crooked Creek), a 5,000 foot airstrip, airstrip spur road, material sites.

Pipeline

The Pipeline construction will result in the discharge of 1,269,015 cy of material, resulting in the permanent loss of 200 acres of wetland and temporary impacts to 538 acres of wetland and 53,346 linear feet of stream. The Pipeline component includes the construction of a 14-inch-diameter steel Pipeline to transport natural gas approximately 316 miles from an existing 20-inch gas pipeline tie-in near Beluga, Alaska to the Mine Site power plant. Natural gas will be supplied to the Pipeline from existing Cook Inlet infrastructure. The Pipeline will require one compressor station at Milepost (MP) 0.4. An associated fiber optic line will be installed in the right-of-way (ROW) corridor parallel to the natural gas pipeline for operational needs and communications. The primary Project subcomponents of the Pipeline include access routes, airstrips, block valves, work camps, horizontal directional drill (HDD) workspace, material sites, pipeline storage yards, pipeline, water extraction sites, and work pads.

The permit requires compensatory mitigation for the direct impacts to WOUS, including wetlands.

Project Location: The Mine Site is located at Latitude 62.0179° N., Longitude 158.1884°W, 277-miles west of Anchorage and 10-miles north of Crooked Creek village. The river port (Jungjuk) is located on the north bank of the Kuskokwim River approximately 9-river miles south of Crooked Creek village at Latitude 61.7952° N, Longitude 158.2142° W. The Mine Site airstrip is located approximately 15.5-miles northwest of Crooked Creek village at Latitude 62.0319°N, Longitude 158.2351°W. The natural gas pipeline tie in near the community of Beluga at Latitude 61.2694° N Longitude 150.9017°W.

1.2 Opportunities for Public Participation

The Department of Environmental Conservation proposes to issue a Certificate of Reasonable Assurance in accordance with Section 401 of the Federal Clean Water Act (CWA) and Alaska Water Quality Standards (WQS) to Donlin Gold, LLC.

In July 2012, Donlin Gold submitted a CWA Section 404/10 preliminary permit application to the U.S. Army Corps of Engineers (Corps) for development of the Donlin Gold project. In response to the permit application, the Corps began preparing an EIS to fully evaluate and disclose impacts of the project in accordance with the National Environmental Policy Act (NEPA). The Corps conducted extensive public, agency, and tribal coordination during the NEPA process (refer to Corps Donlin Gold Project EIS webpage for additional information:

<http://www.donlingoldeis.com/Default.aspx>)

The Department formally published a 30-day public notice of the intent to issue a Certificate of Reasonable Assurance in the Anchorage Daily News on June 13, 2018, and accepted comments until July 13, 2018. The Department received comments from eight interested parties, including five citizens and three non-governmental organizations (Earth Justice, Earthworks, and Center for Science in Public Participation).

1.3 Informal Review

On October 19, 2018, the Director for the Division of Water rendered a decision to remand to staff the Certificate of Reasonable Assurance that was issued (August 10, 2018) to Donlin Gold, LLC, Donlin Gold Mine, POA-1995-120 Crooked Creek. The remand was based on a request for informal review filed by Earthjustice, dated September 28, 2018 in accordance with 18 AAC 15.185. Based on the informal review, the remand requests for staff to address the issues raised and to consider if any changes are needed to the 401 Certificate of Reasonable Assurance. Further clarification of the issues raised during the informal review are addressed in Section 11 Informal Review and Analysis (October 19, 2018).

On May 8, 2019, the Director for the Division of Water rendered a decision to remand to staff the Certificate of Reasonable Assurance that was issued (April 5, 2019) to Donlin Gold, LLC, Donlin Gold Mine, POA-1995-120 Crooked Creek. The remand was based on a request for informal review filed by Earthjustice, dated April 24, 2019. Further clarification of the issues raised during the informal review are addressed in Section 12 Informal Review (May 8, 2019)

This document summarizes the comments submitted and the justification for any action taken or not taken by DEC in response to the comments.

2 Comments on Policy and Section 401 Certificate of Reasonable Assurance Process

2.1 Comment Summary

A commenter expressed that it is not clear what the 401 certificate covers or how it interacts or overlaps other permits and other requirements (e.g., storm water pollution prevention plans [SWPPP] and best management practices [BMPs]).

2.1.1 Response

Section 401 of the federal CWA provides states with the legal authority to ensure that federal agencies will not issue permits or licenses that violate applicable water quality standards, or other applicable authorities, of a state or tribe through a process known as water quality certification. DEC reviews the project as described in the Corps project's public notice and other documents submitted to the department by the applicant; coordinates with other state and federal agencies and local governments; reviews any public comments; and either approves, approves with conditions, waives, or denies the certification based on compliance with the CWA, state water quality standards, and other applicable state laws. The Section 401 Certification can cover construction and operation of a proposed project. Conditions of the Section 401 Certification, if any, become conditions of the Federal permit or license.

The 401 Certificate of Reasonable Assurance to the Corps 404 permit (federal agency permitting activity) authorizes construction and operation of the Donlin Gold Mine as it applies to dredge and fill within waters of the U.S. Generally, wastewater discharge authorization permits do not overlap one another. Each permit authorizes a discrete discharge for the construction or operation of the project. Per CWA Section 402, the State of Alaska, Department of Environmental Conservation, Wastewater Discharge Authorization Program, Mining Section has also permitted the Donlin Gold Mine for discharges of effluent water (AK0055867) and proposed DEC Waste Management Permit, and the Multi-Sector General Permit (MSGP, AKR06AA92) authorization for storm water discharges. The applicant will also need to seek authorization under the Statewide Oil and Gas Pipeline general permit (AKG320000) for the pipeline segment of the project. Per the respective permit, storm water pollution prevention plans (SWPPPs) and best management practices (BMPs) are permit requirements for the permittee to develop and implement as means to manage the corresponding wastewater discharge. Other state permits are required by other agencies such as the Alaska Department of Fish and Game, and Alaska Department of Natural Resources, and Alaska Department of Environmental Conservation, Division of Air under their respective jurisdictions and authority.

2.2 Comment Summary

A commenter expressed that EPA regulations, consistent with the plain language of the CWA, require DEC to provide "reasonable assurance" that the entire "activity" - i.e., construction and operation of the mine - will not violate WQS. It is not sufficient to examine only the immediate fill material discharge authorized by the requested permit.

2.2.1 Response

See 2.1 Comment Response. The “activity” is described in greater detail in Block 18 – Nature of the Activity – of the Department of the Army permit application that is associated with dredge and/or fill. This includes the proposed mine area, transportation, and pipeline facilities. The intent of a FEIS is to disclose known or anticipated impacts, and communicate these issues to the public, tribes, and other governmental agencies. The FEIS, along with other information in the permit application and public agency comments, are used to inform the final 404 permit decision.

Subsequently, the 401 Certificate of Reasonable Assurance, is limited to and certifies that the direct activities authorized in the 404 permit will not violate the water quality standards, or other applicable authorities, of a state. The 401 Certification is not required to address issues outside of the scope of the 404 permit which will be addressed by other agencies and permitting programs.

2.3 Comment Summary

A commenter expressed that it is premature to issue a Section 401 certification at this point. DEC should wait until a Record of Decision has been issued to determine whether adequate mitigation measures will be put in place to addresses these risks.

2.3.1 Response

A complete application for a Department of the Army permit is designated by DEC as an application for State certification. The FEIS, along with other information in the permit application and public agency comments, are used to inform the final decision of the permit application. DEC coordinates with the Corps prior to issuance of the 401 Certificate and issuance of the Corps permit to resolve any significant issues. The 401 Certificate and any conditions specified in the certificate is incorporated into the U.S. Army Corps of Engineers permit as special conditions once it is issued (18 AAC 15.180).

2.4 Comment Summary

A commenter expressed that there are no mitigation measures that can accurately prevent impacts to water quality for a mine that will require water treatment in perpetuity to prevent downstream impacts.

2.4.1 Response

This is outside the scope of a 401 Certification, as the water treatment and its discharge is permitted under CWA Section 402. See comment 4.1. Waste prevention, reduction, and mitigation are measures to minimize impacts. Mitigation is one component of this hierarchy which is implemented and applied as part of a permit decision.

2.5 Comment Summary

A commenter expressed that the State should deny the 401 certification until a Supplemental EIS is commissioned and complete. The commenter expressed the current EIS does not fully or realistically analyze the risks to water of the US and is therefore, incomplete. With an incomplete

analysis of risks, the mitigation suggested in the EIS are therefore also incomplete and potentially inadequate.

2.5.1 Response

As the lead agency, the Corps is responsible for conducting the environmental review under National Environmental Policy Act (NEPA) and making final decision of preferred alternative and whether a Supplemental EIS is warranted. Further, the intent of the EIS is to inform federal decision (i.e., the Corps 404 permit). The 401 Certificate of Reasonable Assurance is the result of an analysis of the 404 permit's compliance with Alaska WQS, to which the analysis of risks and other information were evaluated and completed in the FEIS.

2.6 Comment Summary

The federal and state government should investigate a company's human rights and environmental practices allowing the company to operate.

2.6.1 Response

This concern is beyond the scope of consideration for issuance of a 401 Certification.

2.7 Comment Summary

DEC must have its own separate bond in place before a 401 certification can be issued. What type of budget does DEC have to make sure the 401 is carried out as permitted?

2.7.1 Response

The CWA and AS 46.03 do not require bonding for 401 Certifications or Alaska Pollutant Discharge Elimination System (APDES) permits. DEC required financial assurance for site closure and long-term maintenance, treatment, and monitoring is implemented through the Waste Management Permit under statutory and regulatory authorities AS 46.03.100, 18 AAC 60 and 18 AAC 72.

3 Comments on Tribal Consultation

3.1 Comments Summary

The permit and EIS information has not been properly distributed to tribal and non-tribal members who live along the Kuskokwim. There is a lack of information given that is understandable to our Yup'ik and Cup'ik speaking members. Donlin Gold and the State have not disseminated information to tribes in an effective and timely way.

3.1.1 Response

As the lead permitting agency, the Corps held 14 public scoping meetings and 17 public meetings for the Draft EIS. The Draft EIS public meetings had an open house component to allow the public to talk with members of the EIS team and ask questions. Additionally, as described in the FEIS Section 6.3.5, the Corps provided:

- 20 EIS overview and update presentations to stakeholder groups,

- Monthly visits between August 2014 and October 2015 to the Yukon-Kuskokwim region to provide updates of the EIS process and discuss specific concerns and answer questions about the Project and EIS process.
- Seven newsletters to inform the public and let them know of opportunities for public participation,
- Translation of a Draft EIS summary into Yup'ik, and
- Scoping, Draft EIS, and Final EIS notifications in local newspapers and on KYUK.

Additionally, TKC and Calista, the regional corporations which own the surface and mineral rights, were active participants in the EIS process.

4 Comments on Long-Term Risk to Water Quality

4.1 Comment Summary

Several commenters expressed concern that the development of a large-scale mine that requires continual water treatment poses an unacceptable risk to the integrity of the downstream water quality in Crooked Creek throughout the life of the project and beyond.

4.1.1 Response

Continual water treatment after reclamation and closure will result in a discharge to Crooked Creek authorized by Alaska Pollutant Discharge Elimination System (APDES) permit (AK0055867) to meet WQS and is not part of this 401 certification of 404 permit activities. The water treatment plant discharge undergoes a permit renewal cycle every five years under the APDES permitting program to ensure compliance with WQS. As part of the permit renewal, the adequacy of post-closure water treatment plant technology would also be reevaluated as effluent monitoring is conducted, and treatment technologies would be adjusted as necessary as a result of this evaluation. The pit lake is the primary source for the water treatment plant post operations of the mine site.

The Waste Management Plan (WMP) addresses long-term site management. Long-term management of the facility as proposed is not disallowed in State regulations.

4.2 Comment Summary

Operation of the mine would lead to violations of numeric state water quality standards for mercury, temperature, and arsenic, impair existing uses of streams for fish habitat, reduce streamflow, and damage rainbow smelt spawning areas. Therefore, there is no reasonable assurance that the project will not violate Alaska's WQS.

4.2.1 Response

Discharges at the Mine Site to Crooked Creek and its tributaries are subject to APDES permits and are not part of this 401 certification of the 404 permit activities. The APDES permits contain effluent quality limitations that are protective of existing uses. Impacts to water quality during construction of the Transportation Corridor and Pipeline components will also be subject to APDES permits. As a mitigation measure, a Rainbow Smelt Monitoring Program (FEIS, Section 5.2)

would establish baseline data with subsequent monitoring. If changes are attributed to Project related activities, Donlin Gold would implement an assessment of measures available or mitigate those activities. Such activities would be coordinated with the Donlin Advisory and Technical Review and Oversight Committee (DATROC) Subsistence Subcommittee. Flow impacts to Crooked Creek is also addressed as a component of the Aquatic Resources Monitoring Plan (ARMP, FEIS, Section 5.2). The ARMP for Crooked Creek is to be developed under the provisions of Title 16 fish habitat permits administered by Alaska Department of Fish and Game, and water use permits administered by Alaska Department of Natural Resources. The State has other means to address the commenter's issues outside the 401Cert but do pertain to water quality as explained above. (See Section 11 Informal Review and Analysis for further update.)

5 Comments on Potential Impacts on Fisheries

5.1 Comment Summary

Several commenters suggested that mine development, operations, and monitoring would adversely affect salmon, rainbow smelt and whitefish populations by altering their habitat and spawning areas.

5.1.1 Response

The project is highly location-dependent, as the geology of the region dictates the general location and dimension of the mine for the project, as the ore can only be developed where the mineral sources exist. Complete avoidance of surface water impacts is not possible if the project is to be completed. However, as proposed in selecting Alternative 2 and North Option of the FEIS, Donlin Gold has incorporated facility siting and transportation facility construction, operations, and closure procedures to avoid and minimize adverse impacts to wetlands and has committed to provide compensation for unavoidable wetland impacts. Wetland impact minimization was incorporated into the project design by reducing the construction footprint in areas near wetlands where avoidance was not practicable. A summary of the design features, standard permit conditions and best management practices (BMPs), and further additional measures proposed by the Corps and cooperating agencies listed as important in reducing impacts to wetlands is summarized in FEIS Chapter 3.11 Wetlands, Chapter 3.7 Water Quality, and further descriptions are provided in Chapter 5, Impact Avoidance, Minimization, and Mitigation.

Regulatory standards and criteria for the use of compensatory mitigation to offset unavoidable impacts to waters of the U.S., including wetlands, authorized under the CWA, were established in 2008, under 33 CFR 332 (Corps) and 40 CFR Part 230 (EPA). Compensatory mitigation for unavoidable impacts may be required to ensure that activities requiring a permit comply with Section 404(b)(1) Guidelines. Compensatory mitigation is the restoration (reestablishment or rehabilitation), establishment (creation), enhancement, and/or in certain circumstances preservation of aquatic resources to offset unavoidable adverse impacts. Compensatory mitigation may be achieved by purchasing credits through mitigation banks or in-lieu fee programs, by permittee-responsible mitigation, or by a combination of the three.

The proposed activity is expected to result in a physical alteration to the surface waters in the Project area. Donlin Gold has proposed compensatory mitigation as a means to preserve existing uses. The FEIS has summarized alternatives to avoid and minimize adverse impacts to the surface waters.

Donlin Gold has developed a Compensatory Mitigation Plan (CMP) in coordination with federal, state, and local governments and landowners (FEIS, Appendix M). The CMP explains how Donlin Gold proposes to compensate for the unavoidable losses of waters of the United States (WOUS) including wetlands, streams, ponds, and creeks in the Donlin Gold Project Area. The State reviewed the compensatory mitigation plan and 404(b)(1) analysis and finds a reasonable assurance that the 404 permitted activities are consistent with Alaska WQS.

5.2 Comment Summary

Two commenters suggested that the reduced streamflow in Crooked Creek would have significant adverse effects on fish habitat, which would impair the existing uses of the creek.

5.2.1 Response

The Alaska Department of Natural Resources Division of Water (DNR-Water) and DEC coordinate outside 401 process in regards to water use permits. DNR-Water is responsible for managing water rights in the State and has the authority to render a decision on whether establishment of a minimum instream flow is necessary to comply with the Anadromous Fish Act (AS 16.05.871-.901) and the Fish Passage Act (AS 16.05.841). Donlin Gold has stated they recognize the concerns regarding predicted flow losses in Crooked Creek and they have engaged the appropriate State agencies to work within the State permit process to address this issue. Since stream flow changes will occur slowly over an extended period of time and unknowns exist, the Alaska Department of Fish and Game (ADF&G) has recommended Donlin Gold incorporate the establishment of a field monitoring program into their ADF&G application with provisions for making adaptive changes as needed to ensure the proper protection of aquatic resources in Crooked Creek (See Final EIS Section 5.2, Table 5.2-1, Design Feature #A33, Crooked Creek Substrate Freezing Monitoring and Subsequent Mitigation Plan).

6 Comments on Subsistence

6.1 Comment Summary

Three commenters suggested that the mine poses a direct threat to the subsistence lifestyle and the river communities' way of life.

6.1.1 Response

See comments 4.2, 5.1, and 5.2. In reviewing a proposed project for issuance of a 401 Certificate of Reasonable Assurance the Department does consider subsistence use and considers the WQS impacts as it relates to the designated uses for the waterbody. In addition, the Corps, through the development of the FEIS, conducted a significant number of household interviews and testimony on traditional knowledge as the basis for understanding the contemporary subsistence way of life in

the project area. The project design includes several mechanisms for regulating water quality to address potential issues that have been anticipated and addressed. The Corps received a similar comment in regards to subsistence as a way of life for residents on the Yukon-Kuskokwim (Y-K) region and those on the Bering Sea coast (See FEIS – Appendix X, Comment Analysis Report Section 2.40 Subsistence, SUB 1). The Department concurs with the Corps that it believes that the impacts analysis presented in Section 3.21.6, is sound and based on thorough consideration of the overlaps between project activities/impacts and subsistence resource habitats and subsistence use areas in open water and winter seasons, including increased barge activity at the Bethel Port. Spill impacts are examined in detail in Section 3.24, and mitigation measures are described in Chapter 5.

7 Comments on Spills

7.1 Comment Summary

One commenter expressed concern that the environmental review did not provide an assessment or modeling of what would happen if there were chemical or fuel spills in the Kuskokwim or a spill from an ocean barge carrying fuel in the mouth of the Kuskokwim or lower river.

7.1.1 Response

The risks associated with spills is regulated by a variety of federal, state, and international standards. The FEIS, Section 3.24 outlines the risks associated with potential spills of five substances proposed for use in the Donlin Gold Project: ultra-low sulfur diesel fuel (diesel) transported in barges, trucks, pipelines and stored in tanks; liquid natural gas (LNG) releases; mercury or cyanide release to the environment during transport; and tailings behind the tailings dam. Diesel storage, transportation, and distribution would be managed according to required plans like Oil Discharge and Prevention Contingency Plans (ODPCPs) and Facility Response Plans (FRPs). LNG is managed by the Pipeline and Hazardous Materials Safety Administration (PHMSA) regulations, cyanide by the International Cyanide Management Code and other state and federal agencies, and mercury by various federal regulations. The safety of the tailings dam would be under authority of the Alaska Department of Natural Resources (ADNR).

Nine spill scenarios are presented in Section 3.24.5 that summarize potential causes, behavior, and volumes of spills that could occur during the transport and storage of materials, as well as potential impacts to each resource (those analyzed in Sections 3.1 to 3.23) and responses. The scenarios are a representative example of the types of spills that could occur, and do not represent “worst case” possibilities. The focus is on high-consequence, low probability occurrences; the analysis considers a variety of accidental spill types. The impacts described are not part of the project design, but represent upset or system failure.

As part of the project design, Donlin proposes to minimize the risk of any spill regarding barges by limiting the season for shipping to the ice-free period on the Kuskokwim River and through the use of double-hulled barges; so that even if there is a collision or grounding, the likelihood of breaching diesel-containing compartments is much lower than for a single-hulled vessel.

The 401 Certificate of Reasonable Assurance also includes a condition for reporting of spills. Spills must be reported in accordance with Discharge Notification and Reporting Requirements (AS 46.03.755, AS 46.09.010, and 18 AAC 75 Article 3). The applicant must contact by telephone the DEC Area Response Team for Central Alaska at (907) 269-3063 during work hours or 1-800-478-9300 after hours. Also, the applicant must contact by telephone the National Response Center at 1-800-424-8802.

7.2 Comment Summary

Two commenters claimed that the tailings breach risk assessment model presented in the EIS was inadequate because it suggested that 0.5 percent tailings breach was containable. One commenter asserted that the model should be based on actual spill data, which averages closer to 34 percent. Both commenters encouraged DEC to require the mine operator to completely remove the water from the tailings.

7.2.1 Response

This concern is in regards to a possible breach. Dam Safety is regulated under Alaska Dam Safety regulations and guidelines and is regulated by the Alaska Department of Natural Resources primarily under Alaska Statute 46.17 “Supervision of Safety of Dams and Reservoirs”, and 11 AAC 93 “Dam Safety”. DEC has also contacted DNR – Dam Safety in regards to this concern. The comment was also addressed in the USACE’s Comment Analysis Report, April 2018 (DAM 4) regarding the comment summary: “The Corps should analyze a tailings dam failure scenario of 20 percent or more of the tailings, rather than the scenario analyzed in the Draft EIS.”

DEC concurs with the USACE’s response:

“The scenarios presented in the document are from the early stage failure modes effects assessment (FMEA) and represent the most impactful of the scenarios that are not considered worst case. As described in Section 3.24.3.5.2 of the document, the early stage FMEA considered a variety of release scenarios, and found a partial tailings dam release to represent the most potentially impactful of the low probability-high consequence failure modes. Catastrophic worst-case failure was evaluated, and found to be very unlikely to occur, and not appropriate for the NEPA review process.

The request for a new scenario of 20 percent of the contents does not appear to have any precedent in NEPA, nor is it that the scenarios presented in the document industry practice to analyze or plan for an arbitrary failure rate that loses 20 percent of the material retained by a dam.

Emergency Action Plans will be required by the State of Alaska Dam Safety Program.”

Removing the water from the tailings refers to Alternative 5A of the EIS, Alternative 5A would use the dry stack tailings method instead of the subaqueous tailings method that would be used under Alternative 2. Under alternative 5A, tailings would be dewatered in a filter plant using specialized equipment to produce a partially saturated, compactable filter cake. Alternative 5A was considered in detail in the EIS to examine the potential for reducing impacts to the WOUS, but the technology is

not proven for mining operations at the planned throughput rate and was not selected as the preferred alternative.

8 Comments on Monitoring

8.1 Comment Summary

The mine operator cannot and must not be allowed to conduct their own testing. A third party must be contracted to do all the testing and reporting. Furthermore, the villages downriver must also have testing capability and the resources to respond in the event of any failure.

8.1.1 Response

Self reporting for compliance with permit monitoring requirements, combined with periodic regulatory inspection and data audits, is a hallmark of wastewater discharge permitting and management throughout the nation. Routine inspections and data audits assure data the permittee submits to comply with permit terms is accurate. In the rare cases the Department suspects the integrity of the reported data, it responds swiftly to resolve these issues with the permittee. Regarding the comment that suggests that, “villages downriver from the mine must also have testing capability and the resources to respond in the event of any failure,” is beyond the jurisdiction of the 401 certification. Any concerned party can submit water test results or other data to the Department for consideration if an unexpected and observed impact to the environment or public health is discovered without these conditions being mandated in the 401 Certificate of Reasonable Assurance.

9 Comments on Groundwater Connectivity

9.1 Comment Summary

Three commenters suggested that the assessment of groundwater connectivity with the pit was inadequate, concern for predicting transport of contaminants at depth equal to the lowest point in the pit, and recommend DEC require the mine operator to better understand the movement of groundwater prior to allowing any acid generating rock to be stored in the pit.

9.1.1 Response

Section 3.6, Groundwater Hydrology of the FEIS provides an analysis of the groundwater hydrology of the Project, and includes an assessment of the model robustness and accuracy. The results of the model’s calibration show that there is a match between model output and field observations is well within accepted groundwater industry standards, indicating that the model provides a reasonable representation at the project scale of the existing physical hydrogeologic system at the Mine Site.

Similar comments were previously submitted to the Corps in respect to the groundwater hydrology and are included in the FEIS Appendix X, Comment Analysis Report, Section 2-Groundwater Impacts, reference GRD #2 and #11. The Department concurs with the Corps Response (GRD #2) and finds that the well and pump tests provided for the model are adequate to characterize local and regional groundwater flow. As per the Corps response, the modeling confirmed that it is

unlikely that additional or deeper water level or pumping test data would materially change the characterizations or assessments made or the reliability of the model predictions. Nevertheless, as the project develops additional boreholes (i.e., exploration and geotechnical) will be drilled and hydrogeologic testing (e.g., dewatering well testing) will also be conducted; which the data will be used to provide future refinements to the Donlin Gold's water balance and water management practices. The groundwater flow model is a part of the overall site water management plan which is adopted by reference in the proposed DEC Waste Management Permit. This permit is re-evaluated every five years and includes a review of the updated water management plan.

Likewise, the DEC concurs with the Corps response (GRD #11) regarding transport of contaminants away from the pit. As per the Corps response, any regional flow system with the potential to transport contaminants away from the pit lake would have to exhibit water levels (or hydraulic head levels) in the aquifer below or adjacent to the pit lake lower than the maximum managed pit stage (or hydraulic head) of 331 ft above sea level. This is because water flows from areas of higher head to areas of lower head. At American or Crooked Creeks near the pit, for example, deep groundwater levels of 349 ft above sea level or higher were observed. Existing data and modeling results indicated that, with upward gradients, water levels (or hydraulic heads) would get higher at deeper levels. Should a regional flow system exist in this area with the potential to transport contaminants away from the pit lake, there would have to be a reversal of these gradients and hydraulic heads would need to exist that would be lower than 331 ft above sea level.

10 Comments on Mitigation Measures

10.1 Comment Summary

Several commenters recommended DEC require the mine operator to implement mitigation measures in the following areas:

- Groundwater hydrology and streamflow
- Fisheries
- Stream assessments
- Metal leaching
- Monitoring control stations
- Sampling and Analysis Plan
- Electrical leak detection survey
- Erosion and sediment controls
- Speed limits for barges

10.1.1 Response

Many of the recommended mitigation measures are outside the scope of the 401 certification or are part of the current Project design. DEC incorporated 11 additional mitigation measures into the 401 certification that address the spread of pollutants, erosion and sedimentation, which will be incorporated into the requirements of the Corps 404 permit.

11 Informal Review and Analysis (October 19, 2018)

On October 19, 2018, the Director for the Division of Water rendered a decision to remand to staff the Certificate of Reasonable Assurance that was issued (August 10, 2018) to Donlin Gold, LLC, Donlin Gold Mine, POA-1995-120 Crooked Creek. The remand was based on a request for informal review filed by Earthjustice, dated September 28, 2018 in accordance with 18 AAC 15.185. The remand requests for staff to address the issues raised and to consider if any changes are needed to the 401 Certificate of Reasonable Assurance.

11.1 Clarify the scope of the proposed activity under consideration and make a finding on whether the Certificate will, or already does, consider the operation in addition to construction for the proposed activity.

The Clean Water Act (CWA) allows consideration of both construction and operation of a proposed activity in §401 certificate. Title 33 of the United States Code (U.S.C.) §1341(a)(3) anticipates that operation will be evaluated when considering a certificate for construction because changes in the construction or operation of the facility since the construction certification was issued will prevent the construction certificate from fulfilling the requirement for an operation certificate. The scope of the §401 certificate, including whether there is consideration of construction and/or operation, should at a minimum be consistent with the §404 permit issued by the US Army Corps of Engineers (USACE).

The USACE §404 permit and the §401 Certificate of Reasonable Assurance (August 10, 2018) scope of the proposed activity covers the construction and operation of the Donlin Gold Project.

No changes were made to the Certificate of Reasonable Assurance based on this issue, however, the expiration date of the 401 certificate was aligned with the expiration date of the USACE §404 permit.

11.2 Determine whether there is reasonable assurance that runoff or discharges from construction not covered by Alaska Pollutant Discharge Elimination System (APDES) permits will not violate Alaska water quality standards (WQS).

Point source discharges, dredge and fill discharges, and nonpoint source discharges can all affect compliance with Alaska WQS. Point source discharges are regulated under CWA §402 and by APDES permits issued by DEC or National Pollutant Discharge Elimination System (NPDES) permits by EPA; each of which conducts a separate antidegradation analysis and findings per the respective permit. Dredge and fill discharges are regulated under CWA §404, and the subsequent analysis is to determine whether there is reasonable assurance that runoff or discharges from construction not covered by APDES permits will not violate Alaska WQS; while considering the authorities and requirements of different regulatory programs.

For the Donlin Gold Project, nonpoint source discharges, air pollution deposition, and water diversions are project activities that could affect Alaska WQS, including:

- Possible decrease in groundwater discharges and streamflow and resultant changes to water levels related to protection for existing uses of the water(s).

- Possible barge traffic could cause scouring and potential impeller-induced injury and mortality.
- Possible mine construction and operation which might violate numeric state water quality standards for mercury, arsenic, or temperature. Namely, mercury violations might result from atmospheric deposition, arsenic violations might result from groundwater leaching from the overburden stockpile, and temperature violations might result from dewatering processes.

The following is provided for the above mentioned activities.

11.2.1 Possible decrease in groundwater discharges and streamflow and resultant changes to water levels related to protection for existing uses of the water(s).

There is reasonable assurance the Donlin Project will meet water quality standards to support propagation of fish, shellfish, wildlife, and recreation uses even with projected effects from dewatering and stream diversion activities. Fish and aquatic resources are of a central importance to the livelihood of residents of the proposed project area. While other chapter sections of the FEIS (Section 3.5, Surface Water Hydrology, Section 3.7 Water Quality, and Section 3.21 Subsistence) discuss topics associated with fish and aquatic resources, FEIS Section 3.13 (Fish and Aquatic Resources) specifically characterizes the aquatic habitat and the diversity, abundance, and distribution of fish in the Kuskokwim River and the drainages affected by the proposed Project. Both federal and state laws protect fish and aquatic resources that would be affected by components of the proposed Project. Key laws and regulations include: the CWA, including Sections 402 and 404, which govern discharges to waters of the U.S.; the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), which governs protection of essential fish habitat; and state regulation of mining and water use and discharge permits as well as fish habitat protection requirements.

Considering where the dredge and fill activity will take place and impacts to the receiving water, under Alternative 2 – Donlin Gold’s Proposed Action, just under eight miles of streambed, (in American and Anaconda creeks and portions of Snow and Lewis gulches) would be eliminated to construct various Mine Site facilities. These and smaller tributary drainages that would be affected, represent about eight percent of the Crooked Creek watershed. Most of the segments of these tributaries that would be filled in do not support salmon. The greatest effects of flow reductions in Crooked Creek would occur upstream of Crevice Creek. Below this, tributary inflows/runoff from unaffected watersheds (e.g., Bell and Gemuna creeks) would overshadow flow reductions resulting from Construction and Operations.

The Corps is requiring compensatory mitigation for permanent loss of aquatic resources as a result of fill impacts from the proposed Project. Donlin Gold submitted a Conceptual Compensatory Mitigation Plan (CMP) in August 2015. A revised draft CMP was included in the December 2017 DA permit application (Block 23). In response to feedback from the Corps, EPA, and USFWS, Donlin Gold submitted a final CMP in July 2018 (Attachment B5 of the Joint Record of Decision (JROD) issued by the USACE and BLM) that is a condition of the Corps §404 permit. Donlin Gold

researched permittee responsible options focusing first on the immediate watershed (HUC-10), and then systematically assessing larger hydrologic units for compensatory mitigation opportunities. The CMP includes two permittee-responsible mitigation (PRM) projects, as well as in-lieu fee mitigation. The two PRM (Chuitna and Upper Crooked Creek) plans and in-lieu fee mitigation are summarized in 6.2.5.1, 6.2.5.2, and 6.2.5.3 of the JROD, respectively¹. The Upper Crooked Creek PRM Plan includes four distinct restoration projects within the watershed: restoration of lower Quartz Gulch, restoration of lower Snow Gulch, restoration of the wash plant tailings area along Crooked Creek, between Snow and Ruby Gulches, and restoration of lower Ruby and Queen Gulches. DEC concurs these mitigation measures will be protective of existing and designated uses.

In the FEIS Section 3.13 (Fish and Aquatic Resources), flow reduction was evaluated with respect to aquatic habitat. In the FEIS, Section 5 (Mitigation) and Section 5.2 (Design Features Proposed by Donlin) flow impacts to Crooked Creek are addressed as a component of the Aquatic Resources Monitoring Plan (ARMP)². The ARMP for Crooked Creek is to be developed under the provisions of Title 16 fish habitat permits administered by Alaska Department of Fish and Game, water use permits administered by Alaska Department of Natural Resources, and is listed as a design feature of the proposed Donlin Gold Project.

Subsequent to the issuance of the 401 Certificate (August 10, 2018) and DA Permit, a number (13) of Alaska Department of Fish and Game Fish Habitat Permits that were in development have been issued for the Donlin Gold Project. Fish habitat permit FH18-III-0191³ includes provision for the development of the ARMP. FH18-III-0192⁴ and FH18-III-0193⁵ have been issued for restoration of aquatic habitats in Ruby, Queen, and Snow Gulches which have been disturbed by historic placer mining. The restoration of these aquatic habitats is intended to offset habitat losses.

As specified in the Final EIS Section 5.2 (Design Feature A33), the objectives of the ARMP are to: 1) monitor for major changes to aquatic communities; 2) monitor for smaller-scale and incremental changes to aquatic communities; and 3) guide results-based refinement to the monitoring program. The plan would build on the existing baseline dataset, and include both biological and flow components, including fish presence/abundance, invertebrate and periphyton sampling, and fish metals analysis; flow monitoring and winter surface water sampling to characterize fish habitat/passage and freeze-down patterns; sediment sampling; and collection of additional geology and hydrology data to refine understanding of dewatering and groundwater/surface water flow dynamics (Donlin Gold 2018a,b; Owl Ridge 2017c – as cited in Chapter 5 of the Final EIS).

The ongoing data collection would be used in an adaptive management approach to refine the understanding of the dynamics surrounding Crooked Creek flow in winter, as well as the open water seasons; and to identify the most effective measures that can be used to ensure that minimum flows in Crooked Creek are maintained. If the Project results in minimal losses to Crooked Creek flows,

¹ [JROD at 6-5](#)

² [FEIS ID#A33 at 5-10](#)

³ [FH18-III-0191](#)

⁴ [FH18-III-0192](#)

⁵ [FH18-III-0193](#)

adaptive management measures may be unnecessary. If flow losses warrant a response, a range of measures could be considered that include, but would not be limited to, lining or relocating portions of the stream channel; augmenting flows from the Snow Gulch Reservoir; pumping water from the Kuskokwim River, or grouting areas of bedrock demonstrating high flow rates (Donlin Gold 2018a – as cited in Chapter 5 of the Final EIS).

DEC views the CMP and ARMP⁶ measure proposed as sufficiently binding; as the USACE views the design features proposed by Donlin Gold as part of the project, and considers Donlin Gold's proposed design measures as inherent to the Donlin Gold proposed action (Alternative 2), and the ARMP is a permit requirement in ADF&G's permit FH18-III-0191.

In considering where the fill would be placed and impacts to the receiving water from the fill activity, DEC has determined there is a reasonable assurance that state WQS will be met and views the mitigation, restoration, monitoring measures, and design features proposed as further protective of the designated and existing uses for the growth and propagation of fish, anadromous and resident fish and other aquatic life,

No changes were made to the Certificate of Reasonable Assurance based on this issue.

11.2.2 Possibility that barge traffic will cause scouring and potential impeller-induced injury and mortality.

As a non-point source discharge that could effect WQS, the FEIS indicates barge traffic along the Kuskokwim River has the potential to impair existing use by rainbow smelt as spawning habitat. It is possible that tugs and barges could cause scouring in the river, which could displace, injure, or kill rainbow smelt eggs.⁷ The scouring from increased traffic could affect the reproduction, feeding, or survival—with potential population-level impacts—of anadromous and resident fish and other aquatic life.⁸ Barge traffic may also result in propeller-induced injuries or mortalities to fish, especially in confined segments of the Kuskokwim River.⁹

The Kuskokwim River is a navigable river whose villages have been serviced by barges for more than fifty years, and provides an indicator that barging on the Kuskokwim River can be undertaken in a manner that is fully protective of aquatic resources. The FEIS has evaluated these impacts¹⁰ and has developed a series of mitigation and monitoring measures for the project which are listed in the FEIS 3.13.3.2.6 Mitigation and Monitoring for Alternative 2.¹¹ Mitigation measures include establishing navigational aids and developing procedures for queuing in narrow channels, state-of-the-art navigation and communication equipment, implanting barge guidelines for operating at certain river flow rates, and conduct ongoing surveys of the Kuskokwim River navigation channel to identify locations that should be avoided to minimize effects on bed scour and potential for barge

⁶ [FEIS ID#A33 at 5-10](#)

⁷ [FEIS at 3.13-125](#)

⁸ [Id. at 3.13-131](#)

⁹ [Id. at 3.13-131 to 3.13-134](#)

¹⁰ [Id. 3.13-123](#)

¹¹ [Id. 3.13-159](#)

groundings. These mitigation measures will minimize barge effect on rainbow smelt or other existing uses.

In addition, Donlin Gold recognizes the concerns that have been expressed regarding rainbow smelt and, accordingly, is committed to developing and implementing a rainbow smelt monitoring program¹² to establish additional baseline data for a better understanding of the species' occurrence and the character, use, and distribution of spawning habitat along the Kuskokwim River. If observed changes were attributed to Project-related activities, Donlin Gold would implement an assessment of measures available to address or mitigate those activities. Such activities would be coordinated with the Donlin Advisory and Technical Review Oversight Committee (DATROC), which includes participation by Donlin Gold's Native corporation partners, Calista Corporation and The Kuskokwim Corporation (TKC). As discussed in the FEIS, Donlin Gold has committed to and is in the process of forming two advisory subcommittees, the Barge Subcommittee and Subsistence Subcommittee, which would act in parallel to address two separate aspects of mitigation (barging and subsistence). The primary function of these subcommittees is to engage the local residents and communities to identify locations and times when subsistence activities occur, and opportunities to avoid, eliminate, or reduce conflicts that serve to restrict access to subsistence resources during construction, operations and post-closure. The Subsistence Subcommittee would also contribute to the identification of practical and effective monitoring measures to address concerns of subsistence users that subsistence resources may be adversely affected by Project-related activities and would support development of an information-sharing framework to efficiently and effectively share results of monitoring (and other Project-related technical information), at a practical level, with local subsistence users. The subcommittees would be encouraged to work through the DATROC to identify and/or recommend adaptive management needs.

DEC views the mitigation measures proposed as sufficiently binding; as the USACE views the design features proposed by Donlin Gold as part of the project, and considers Donlin Gold's proposed design measures as inherent to the Donlin Gold proposed action (Alternative 2) as well as applicable components of the other alternatives' descriptions.¹³ These measures, including any potential impacts associated with these measures, are part of the proposed action and other alternatives, and were considered during the FEIS and issuance of the JROD¹⁴.

DEC views the mitigation and monitoring measures and design features proposed in regards to the potential operational impacts of barge traffic on the Kuskokwim River will be fully protective for the designated and existing uses for the growth and propagation of rainbow smelt, anadromous and resident fish and other aquatic life.

No changes were made to the Certificate of Reasonable Assurance based on this issue.

11.2.3 Possibility that mine construction and operation may violate numeric state water quality standards for mercury, arsenic, or temperature. Namely, mercury violations

¹² [Id. 3.13-160, FEIS Item T17 at 5-16](#)

¹³ [FEIS, 5.2-5](#)

¹⁴ [JROD, B2-13](#)

might result from atmospheric deposition, arsenic violations might result from groundwater leaching from the overburden stockpile, and temperature violations might result from dewatering processes.

11.2.3.1 Mercury – atmospheric deposition

The FEIS indicates that mining operation will result in mercury emissions from numerous sources that could cause increased mercury deposition in nearby watersheds by about 40 percent.¹⁵ In combination with naturally elevated levels of mercury in surrounding waters, these emissions associated with the operation of the mine would result in additional inputs of mercury to surface water from both atmospheric and aqueous sources, which would likely cause an increase in exceedances of the 12 ng/L chronic criterion.¹⁶ As previously stated, point-source wastewater discharges are permitted under §402 APDES permits.

The FEIS summarized¹⁷ that in terms of intensity, estimates predict that the chronic total mercury surface water quality criteria may or may not be exceeded as a result of Project-related atmospheric deposition of mercury. Impacts would depend upon sample location, season, and existing natural concentrations. The estimated levels of impacts are predicated upon several conservative assumptions with regard to phase partitioning, environmental transport, and methylation rates. Total mercury concentrations for watersheds closest to the Mine Site could rise approximately 40 percent, to an average concentration that is close to or below water quality criteria. Effects decrease to negligible within 15 to 20 miles of the Mine Site. Based on an area-weighted average over a 20-mile radius from the Mine Site, total mercury in surface water is estimated to increase about 0.2 percent. Methylmercury concentrations within the 20-mile radius are predicted to rise about 4 to 5 percent in surface water and fish tissue to levels that would be below applicable methylmercury criteria for fish consumption.

The Crooked Creek ARMP includes fish metals analysis which is to be implemented by the CMP and ADF&G fish habitat permit. The objectives of the plan are to 1) monitor for major changes to aquatic communities, 2) monitor for smaller scale and incremental changes to aquatic communities, and 3) guide results-based refinement to the monitoring program. The plan would build on the existing baseline dataset and include both biological and flow components. The ongoing data collection would be used in an adaptive management approach to refine the understanding of the dynamics surrounding Crooked Creek flow in winter as well as the open water seasons and to identify the most effective measures. Additionally, point-source wastewater discharge permits (APDES AK0055867, MSGP authorization AKR06AA92) include monitoring requirements for metals (including mercury) with requirements for the discharges to meet WQS.

The pollution effects of atmospheric deposition are expressly considered and regulated under the Clean Air Act. For example, see 42 U.S.C. 7403(e)(4) which requires EPA to evaluate “the effects of air pollution on water quality” and 42 U.S.C. 7651(a)-(o) (Acid Deposition Control) where EPA sets

¹⁵ [Id. at 3.7-160](#)

¹⁶ [Id. at 3.7-151](#)

¹⁷ [Id. at 3.7-160](#)

regulations on the air pollution sources of acid rain. Courts have previously determined that air emissions are best regulated under the Clean Air Act and its accompanying regulations, and not under the Clean Water Act, despite potential impacts to water quality.¹⁸ The FEIS considered the issue of mercury via atmospheric deposition.

DEC Division of Air has issued an Air Quality Control Construction Permit.¹⁹ The air permit requires Donlin Gold to install best available control technology for its dust control and collection systems. The permit also includes specific requirements to control fugitive dust from the roads and facility operations.

DEC has determined the proposed mitigation, monitoring and project design features are sufficient at this time to conclude that there will be a reasonable assurance that mercury WQS will be met.

No changes were made to the 401 Certificate of Reasonable Assurance based on this issue.

11.2.3.2 Arsenic – groundwater leaching from the overburden stockpile.

The FEIS recognizes that water percolating through the South Overburden Stockpile (SOB) has the potential to leak into groundwater.²⁰ The SOB would contain terrace gravel and colluvium materials excavated from the open pits which are considered potentially metal leaching. Seepage and surface runoff that comes into contact with materials stored in the SOB may require collection and treatment. Surface and seepage runoff from the stockpile will be captured by a sediment pond and pumped to the lower contact water dam.

During operations, the inactive faces of the stockpile will be progressively reclaimed to minimize the potential for surface entrainment and infiltration. All materials placed in the SOB will ultimately be returned to the waste rock facility (WRF) over the course of mine operations and placed either as the base cover layer for final reclamation of the WRF or used as internal capping materials for the potential acid-generating (PAG) cells. The sediment pond is located near the edge of the cone of depression created by pit dewatering, so that the direction of groundwater flow during at least part of the operations period is assumed to be towards Crooked Creek. The quantity of groundwater that may flow away from the sediment pond would be relatively low as a result of the small size of the facility, the limited collection of water in the sediment pond, the relatively low hydraulic conductivity of the colluvial deposits at the site, the accumulation of silty sediments in the pond, and the temporary presence of the SOB soils.

Water percolating through the SOB also has the potential to enter groundwater and flow towards Crooked Creek. The quantity of water entering groundwater through this process may also be low as a result of the small size of the facility, the relatively low hydraulic conductivity of the SOB soils and the underlying soils, and the temporary presence of the soils. The fate and transport of this

¹⁸ See *Chemical Weapons Working Group, Inc. v. U.S. Dep't of Army*, 111 F.3d 1485 (10th Cir. 1997) (finding that stack emissions were beyond the reach of the Clean Water Act and construction would create a regulatory conflict between the Clean Water Act and Clean Air Act.

¹⁹ [DEC AQ0934CPT01P Permit](#)

groundwater is uncertain; however, the impacts on Crooked Creek may be minimal or nonexistent as a result of natural attenuation processes on dissolved constituents, such as sorption onto aquifer materials, chemical precipitation of dissolved constituents, dilution, and dispersion.²¹

DEC concurs with the FEIS evaluation that the impacts on Crooked Creek may be minimal or nonexistent. No changes were made to the 401 Certificate of Reasonable Assurance based on this issue.

11.2.3.3 Temperature - influence from dewatering processes.

The FEIS indicates stream diversion and dewatering will decrease groundwater discharges and streamflow in parts of Crooked Creek as well as in nearby tributaries.²² These changes to water levels can cause adverse impacts to availability of spawning areas and viability of incubating eggs, especially during low flow conditions, thereby degrading the water to the point of habitat loss.²³ The FEIS further states that groundwater that would normally flow to Crooked Creek will be diverted as part of the pit dewatering process and that during the summer, this reduction in groundwater input “could cause stream temperatures in reaches near the mine to be close to or above the State of Alaska’s water quality temperature standard...for egg/fry incubation and spawning and...migration and rearing.”²⁴

The FEIS in its evaluation of discharges of treated water to Crooked Creek concluded that based on available data, stream temperature downstream of the Mine Site is anticipated to remain relatively constant during construction (ARCADIS 2013a). Existing surface water temperatures downstream of the Mine Site vary between 0° and 9.16°C depending on the time of year, and construction activities are not expected to have any substantial impacts on surface water temperatures (ARCADIS 2013a).²⁵ The FEIS additionally recognized and evaluated water temperature impacts from the Donlin Project as it relates to fish and aquatic resources, noting that “[a]lthough Crooked Creek flows would be reduced due to flow diversions from the upper and lower contact water ponds and Snow Gulch for process water, the net heat energy per unit volume of water is expected to remain relatively unchanged.”²⁶

As previously stated in FEIS Section 3.13 (Fish and Aquatic Resources) flow reduction was evaluated with respect to aquatic habitat. In the FEIS, Section 5 (Mitigation) and Section 5.2 (Design Features Proposed by Donlin) flow impacts to Crooked Creek are addressed as a component of the Aquatic Resources Monitoring Plan (ARMP). The ARMP for Crooked Creek is to be developed under the provisions of Title 16 fish habitat permits administered by Alaska Department of Fish and Game, water use permits administered by Alaska Department of Natural Resources, and is listed as a design feature of the proposed Donlin Gold Project. The ongoing data collection from the ARMP would be used in an adaptive management approach to refine the understanding of the dynamics

²² [FEIS at 3.13-78.](#)

²³ [Id. at 3.13-89 to 3.13-90.](#)

²⁴ [Id. at 3.13-112.](#)

²⁵ [Id. 3.7-145](#)

²⁶ [Id. 3.13-99](#)

surrounding Crooked Creek flow in winter as well as the open water seasons and to identify the most effective measures that can be used to ensure that minimum flows in Crooked Creek are maintained. If the project results in minimal losses to Crooked Creek flows, adaptive management measures may be unnecessary. If flow losses warrant a response, a range of measures could be considered that include but would not be limited to: lining or relocating portions of the stream channel; augmenting flows from the Snow Gulch Reservoir; pumping water from the Kuskokwim River, or grouting areas of bedrock demonstrating high flow rates.²⁷

DEC views the ARMP²⁸ measure proposed as sufficiently binding; as the USACE views the design features proposed by Donlin Gold as part of the project, and considers Donlin Gold's proposed design measures as inherent to the Donlin Gold proposed action (Alternative 2), and is a permit requirement in ADF&G's permit FH18-III-0191.

DEC has determined there is reasonable assurance that reduced flow resulting from stream diversion and pit dewatering will not adversely affect the temperature of Crooked Creek.

No changes were made to the 401 Certificate of Reasonable Assurance based on this issues.

12 Informal Review (May 8, 2019)

On May 8, the Director for the Division of Water rendered a decision to remand to staff the Certificate of Reasonable Assurance that was issued (April 5, 2019) to Donlin Gold, LLC, Donlin Gold Mine, POA-1995-120 Crooked Creek. The remand was based on a request for informal review filed by Earthjustice, dated April 24, 2019 in accordance with 18 AAC 15.185. In summary, the informal review filed by EarthJustice proposed the following issues:

- Does the Certificate provide reasonable assurance that operation of the Donlin Mine will not violate water quality standards for mercury;
- Does the Certificate provide reasonable assurance that barge traffic on the Kuskokwim River will fully protect existing uses of the river for rainbow smelt, salmon, and other fish;
- Does the Certificate provide reasonable assurance that the project will fully protect existing uses despite streamflow changes;
- Does the Certificate provide reasonable assurance that the project will not violate water quality standards for temperature; and
- Does the Certificate provide reasonable assurance that the Donlin Mine will not violate water quality standards for arsenic.

The Director's remand requests that staff address the questions identified above. Staff responses are as follows:

²⁷ [Id. at 3.13-159](#)

²⁸ [FEIS Section 5.2, Table 5.2-1, Design Feature #A33 Crooked Creek Aquatic Resources Monitoring Plan, 5-10](#)

12.1 Issue #1: Does the Certificate provide reasonable assurance that operation of the Donlin Mine will not violate water quality standards for mercury.

EarthJustice-Informal Review asserts the FEIS finds that, in combination with naturally elevated mercury levels in surrounding waters, operations of the Donlin Mine “would result in additional inputs of mercury to surface water from both atmospheric and aqueous sources, which would likely cause an increase in exceedances of the 12 ng/L chronic criterion.”²⁹

12.1.1 Response:

Note atmospheric mercury deposition was discussed in the prior informal review, see RTC 11.2.3.1.

FEIS: In response to EarthJustice’s quote of the FEIS, staff notes that the FEIS (3.7-151) qualifies the above statement with some uncertainties, stating that:

“... exceedances of the 12 ng/L chronic criterion. Predicting changes in mercury concentrations in aquatic systems is challenging because a portion of mercury that is deposited to surface waters will be transported downstream, such that estimates of mercury deposition by watershed do not necessarily correspond to direct increases in mercury content in surface waters (ARCADIS 2014). Additionally, the importance of atmospheric deposition relative to runoff inputs to streams is another source of uncertainty. Studies of mercury mass balances in forest-dominated catchments have shown that mercury inputs to aquatic systems are more heavily dominated by contribution from wetland runoff than by atmospheric deposition.”

The FEIS (3.7-152) further states that the evaluation of estimated impacts to concentrations of total mercury to surface water in the FEIS is considered conservative because the majority of mercury potentially deposited as a result of the activities would be particulate mercury (ARCADIS 2014). Considering the high density of particulate mercury and the depositional environments in area streams, a substantial fraction of the particulate mercury from atmospheric deposition would be quickly removed from active cycling through burial in stream sediments (ARCADIS 2014). The evaluation is intended to identify an upper range of potential changes in total mercury concentrations in surface water resulting from the activities proposed.

The FEIS³⁰ and JROD³¹ each generally summarize that in combination with naturally elevated levels of mercury in surrounding waters, the addition of mercury deposition from Project sources and global sources could result in water and sediment quality that is likely to be within regulatory limits or natural variation on average, and may or may not be exceeded as a result of project-related atmospheric deposition of mercury. Impacts would depend upon sample location, season, and existing natural concentrations. The estimated levels of impacts are predicated upon several

²⁹ FEIS at 3.7-151.

³⁰ FEIS at 3.7-160, 3.7-151

³¹ JROD at B2.1.2.7, B2-22, B2.2.3, B3-6

conservative assumptions with regard to phase partitioning, environmental transport, and methylation rates.

During the NEPA review for the Project, concerns raised during scoping over mercury emissions triggered an in-depth review of the issue regarding mercury deposition. This included recognizing the naturally occurring levels of mercury currently in the ecosystem, a review of the various potential sources of mercury that could be added from the proposed mine operations, the applicable environmental and regulatory controls, and a focused risk assessment (FRA) which was added to the Final Environmental Impact Statement (FEIS) that quantified the potential for added risk (if any) to human health in the 20-mile radius surrounding the proposed mine area.³² The key finding of the FRA is that any potential increases in mercury concentrations along with other chemicals of potential concern (COPCs) around the mine site would not result in unacceptable risks to human populations who would have the highest exposure (i.e., residents, subsistence hunters, fishers, or harvesters).³³

NEPA Review, Modeling, and Existing Conditions

Direct discharges to water and potential deposition into the environment from air emissions associated with the Project are the primary pathways that could impact surface water quality. As described below under permitting controls, mercury levels in water discharges and depositions are predicted to be consistently less than background conditions. As documented in the FEIS, baseline water quality and air modeling results provided a basis upon which to estimate the possible increases in mercury concentrations in surface water in the vicinity of the mine site. Supporting materials and analyses are provided in *Monitoring of Baseline Air Concentration and Deposition of Mercury for the Donlin Gold Project* (Environ 2013), *Regional Atmospheric Mercury Modeling with CMAQ for the Donlin Gold Project* (Environ 2014), *Assessment of Mercury Fate in the Environment from Changes in Atmospheric Deposition* (ARCADIS 2014), and *Modeling of Local Impacts of Mercury Air Emissions from Stacks and Fugitive Sources, Advanced Water Treatment Scenario: Donlin Gold Mine, Alaska* (Environ 2015). Overall, at a broad level, precisely predicting such changes in mercury concentrations in aquatic systems is difficult, because a portion of mercury that is directly deposited from the atmosphere will be transported downstream, such that estimates of deposition by watershed do not necessarily correspond to direct increases in mercury content in those aquatic systems. To account for the uncertainty, very conservative assumptions were made in the modeling and the analysis over predicts the actual changes that would be expected and establishes an “upper limit” on potential impacts.

It is important to first understand the existing approved Alaska water quality standards for mercury are conservative in comparison to EPA’s own recommended criteria. The State of Alaska previously adopted, and EPA approved, freshwater aquatic life criteria for mercury of 2.4 µg/L for acute exposure and 0.012 µg/L for chronic exposure, both measured as total recoverable concentrations. The State of Alaska subsequently proposed revisions to its mercury freshwater aquatic life criteria of 1.4 µg/L and 0.77 µg/L for acute and chronic exposure both measured as dissolved concentrations,

³² The FRA is included in Appendix AB of the FEIS. This risk assessment was the outcome of a mercury workshop held with the cooperating agencies in 2016, following comments submitted on the Draft EIS.

³³ Appendix AB-FRS_FEIS-Eversion.pdf, p59.

respectively. These values are the same as EPA's National Recommended Water Quality Criteria (www.epa.gov/wqc/national-recommended-water-quality-criteria-aquatic-life-criteria-table). EPA has not formally approved the proposed revisions to date, and therefore, they cannot be used for certain Clean Water Act (CWA) purposes. For example, the effluent limits in the Donlin Gold Alaska Pollutant Discharge Elimination System (APDES) Permit are based on the more stringent, previous EPA-approved criteria. However, as indicated in the 2008 *Alaska Water Quality Criteria Manual for Toxic and Other Deleterious and Organic and Inorganic Standards*, the revised criteria are the measures that DEC uses to determine whether streams are achieving their aquatic life designated uses. In fact, using the revised State criteria, the most stringent applicable mercury criterion is 0.05 µg/l as total recoverable concentration for protection of human health (based on consumption of water and organisms). These numbers are highlighted in that EPA and DEC have endorsed mercury criteria higher than those relied upon by the FEIS and determined that these higher numbers will be protective of human health and the environment.

For the NEPA review, potential changes to mercury water quality concentrations were estimated based on the current rate of mercury deposition and the predicted increases in local deposition rates from the Project sources. In the Project area, the current rate of mercury deposition is estimated to be 8.4 µg/m²/y (Environ 2013, 2014, and 2015). Baseline water quality data in this watershed show an average total mercury concentration of 0.0078 µg/L.³⁴ Environ 2013 and 2015 describe the methods used to determine the expected deposition rates from stack and fugitive sources at the Project. With the Project emissions sources, the upper limit of mercury deposition rates were projected to increase from the current rates in the local watersheds by 2.3 and 4.7 µg/m²/y, with an average of 3.55 µg/m²/y. Because the rates of mercury transformation and transport in upland/wetland systems and aquatic sediments are not expected to change as a result of the project activities, a linear response between atmospheric deposition rates and mercury concentration in surface water was assumed. This is a very conservative assumption, especially when coupled with the following additional assumptions:

- Year 25 of the mine life was modeled; the year with the highest total mercury emissions. Mercury deposition levels are predicted to be lower in other years, especially early in the mine life.
- The mercury deposition into the watershed includes mercury deposited to the soil. Not all of the mercury deposited, therefore, reaches the water due to soil sequestration.
- As documented in Environ 2105, conservative assumptions were used related to the expected fugitive emissions of mercury from the Project tailing storage facility (TSF). Specifically, the TSF sources include fugitive emissions from the tailings beaches and the pond surface. The assumed mercury concentration for the beaches was derived from characterization of solid tailings from pilot-scale processing tests; the actual mercury concentrations in beach materials are expected to be lower. For the pond surface, the

³⁴ Section 3.7.2.1.1 of the FEIS notes that existing concentrations of total mercury in surface water measured as part of the Donlin Gold water quality characterization program exceeded the EPA-approved 0.012 µg/l chronic criterion in about 80 of the 564 samples collected between 2005 and 2015. In all cases, the background concentrations are below the 0.050 µg/l State Water Quality Standard for human health.

mercury concentration in tailings slurry from pilot-scale tests was used. In fact, the actual mercury concentrations should be lower because the solids portion of the slurry and associated mercury will settle to below the surface.

- The majority of mercury deposited due to the Project is particulate mercury; this form of mercury will typically rapidly settle out of the water column and become buried in stream sediments. This was not accounted for in the modeling when applying a linear response and could be expected to significantly reduce the potential increases in dissolved concentration and, to a degree, total recoverable concentrations in the water column.
- The modeling did not consider the re-volatilization into the atmosphere of elemental mercury that is deposited or converted from deposited divalent mercury. Environ 2015 notes that significant re-volatilization (33-50%) can be expected to occur and thereby reduce the potential increases in mercury concentrations in the immediate Project area.

Using the model and associated assumptions, the average and 95th percentile baseline mercury concentrations and the range of estimated possible increases resulting from the Project were calculated and are shown in Table 1 (Table 3.7-42 from the FEIS). Based on these results, the FEIS indicates that the Project activities have the potential to cause an increase in the average concentration of total mercury in surface water to 0.0114 µg/l, which is below both DEC's EPA-approved aquatic life chronic criterion of 0.012 µg/l and well below the Alaska Water Quality Standard of 0.050 µg/l for total recoverable mercury for human health. At the higher end of the estimates (note conservative assumptions), the resulting surface water concentrations of total mercury could exceed the current EPA-approved chronic criterion of 0.012 µg/l for fresh water aquatic life, but are still well below the State Water Quality Standard for human health and EPA's National Recommended Water Quality Criteria of 0.77 µg/l for the protection of aquatic life.

Table 1: Baseline and Predicted Mercury Concentrations in Surface Water in Mine Area

Statistic	Baseline Total Mercury (µg/l)	Estimated Total Mercury in Operations (µg/l)
Average ¹	0.0078	0.0114
95% Upper Confidence Limit ²	0.0235	0.0334
Notes: ¹ Based on data from 2005-2015 (SRK 2017b; Reiser 2017). ² Statistics generated from data collected 2005-2011 (ARCADIS 2014)		

In summary, Environ 2015 and the FEIS recognize that the mercury analysis provides an “upper limit” of potential water quality impacts, due to the application of numerous conservative approach assumptions as discussed above. More realistic constraints on the environmental transport and fate of mercury deposited from atmospheric sources within the Project area would likely reduce predictions of impacts to surface water quality.

Permitting Controls:

The most direct potential impact to existing surface water quality is from mine site water discharges. All contact water associated with the Donlin Gold Project are to be collected on-site. Prior to

discharge to surface water, contact water would be treated at the proposed water treatment plant (WTP) to meet effluent limits included in APDES Permit AK0053643. These limits are based on the most stringent EPA-approved Alaska Water Quality Standards and the standards must be met at the discharge point, as Donlin Gold did not apply for and was not granted any mixing zones. As shown in Donlin Gold's APDES Permit application and documented in the APDES Permit Fact Sheet, Donlin Gold has proposed an advanced WTP that will produce very high-quality discharge water that is predicted to be better quality than the natural background conditions of Crooked Creek. This includes the projected discharge concentrations of mercury. In addition, Section 1.5 of the APDES Permit requires surface water quality monitoring, including for mercury, immediately upstream and downstream of the mine area.

For non-contact stormwater runoff, the APDES Multi-Sector General Permit (MSGP, authorization AKR06AA92) likewise requires surface water quality monitoring for various metals, including mercury. The MSGP includes effluent limitations, monitoring, and reporting requirements that directly assess runoff for water quality impacts within the project impact area. A key component of the MSGP is the development and implementation of a Storm Water Pollution Prevention Plan which includes inspections, monitoring, and reporting requirements. If an exceedance of water quality is identified, the MSGP requires that the permittee take corrective actions and modify storm water controls to address the identified water quality concern, and to submit valid and verifiable data and information that are representative of ambient conditions and indicate that the receiving water is attaining water quality standards.

Donlin Gold is further developing an Aquatic Resources Monitoring Plan (ARMP) under the requirements of the Alaska Department of Fish and Games (ADF&G's) Title 16 Fish Habitat permits that have been issued for the mine area. The ARMP provisions will become enforceable requirements of the permits. The ARMP will include both surface water quality, sediment sampling, and aquatic resource (fish and macroinvertebrate populations, and fish tissue) biomonitoring throughout the Crooked Creek watershed. Water quality and aquatic resource monitoring will be conducted at the same locations to allow assessment as to whether any pollutants, including mercury, are causing adverse effects on aquatic life use in the watershed. The results will be reported annually for review to ADF&G staff for the duration of the Project. Through an adaptive management approach, the ARMP specifically requires Donlin Gold to develop and implement corrective actions to address any documented effects or concern; with oversight by ADF&G.

The Integrated Waste Management Permit (Permit No. 2017DB0001) issued by DEC on January 24, 2019 incorporates by reference Donlin Gold's *Plan of Operations: Monitoring Plan* (update submitted to DEC on June 3, 2019). The Plan includes operational surface water quality monitoring at two locations within Crooked Creek and single locations in Anaconda Creek and Snow Gulch in the Project area where water quality effects from mercury deposition could be the highest. Under Sections 2.6 (Reporting) and 2.7 (Corrective Action) of this Permit, Donlin Gold must immediately report to DEC any exceedances of Alaska Water Quality Standards above background conditions and implement, where necessary, "a plan for corrective actions to prevent adverse environmental impacts and avoid future exceedances."

To minimize potential stack emissions of mercury to the air, Donlin Gold has committed to install controls specifically designed for the capture and removal of mercury from the exhaust stacks of gold ore and gold concentrate processing sources (autoclaves, carbon regeneration kilns, electrowinning cells, mercury retort, and gold induction furnace). These controls will consist of condensers, venture scrubbers, dust collectors, and carbon filters to remove both forms of mercury (particulate and gaseous) from the exhaust of each process. The mercury retort will specifically be installed to remove mercury from the gold concentrate prior to melting in the induction furnace. The mercury control systems are required under 40 CFR 63 Subpart EEEEEEE and are designed to reduce mercury emissions to less than 25 percent of the emissions standard in this Subpart. The installation and proper operation of the stack emission controls were included in the Donlin permit application and are thus required by the State's Air Quality Control Construction Permit (Permit AQ0934CPT01). In addition, Permit AQ0934CPT01 requires implementation of Donlin Gold's proposed Fugitive Dust Control Plan (FDCP) included in Permit Section 14 that will limit potential releases of mercury from fugitive emission sources at the mine site.

Conclusion

In summary, the FEIS analysis provided an upper limit on potential changes to mercury concentrations within the Crooked Creek watershed. However, the analysis was based on a number of conservative (i.e., protective of the environment) assumptions. In part, this is because there is inherent uncertainty in predicting the effects of atmospheric deposition both from natural and man-made sources. As previously mentioned, the modeling estimates the Project activities have a potential to increase the average concentration for total mercury in surface water to 0.0114 µg/L, which is below both DEC's EPA-approved aquatic life chronic criterion of 0.12 µg/L and well below the Alaska Water Quality Standard of 0.050 µg/L for total recoverable mercury for human health. For the reasons cited above in regards to the conservative assumptions of the modeling, and that the estimated average concentration for total mercury in surface water is within water quality standards, there is, therefore, reasonable assurance that the Donlin Gold Project will protect existing uses in the Donlin-area watersheds and not cause exceedances of the applicable water quality standards for mercury above baseline levels. This will be further ensured through monitoring, reporting, and corrective action requirements included in the Integrated Waste Management Permit as well as the related provisions of the Air Quality, APDES, and Title 16 permits. A range of adaptive management options (e.g., reduced emissions and/or additional control measures) will be available if unanticipated effects are observed.

No changes were made to the 401 Certificate of Reasonable Assurance based on this issue.

12.2 Issue #2: Does the Certificate provide reasonable assurance that barge traffic on the Kuskokwim River will fully protect existing uses of the river for rainbow smelt, salmon, and other fish.

EarthJustice Informal Review asserts the following from the FEIS:

“The FEIS acknowledges that “salmon may be nearly or completely extirpated from Crooked Creek by hydrological changes from mine development, operation, and closure.”³⁵ Habitat in other stream segments in the Crooked Creek drainage would be altered or destroyed.³⁶ Furthermore, in the Section 810 Analysis included in the FEIS, the Bureau of Land Management concluded that “barging impacts may cause large reductions in the abundance and availability of fish resources important to subsistence users.”³⁷ The FEIS acknowledges these impacts would persist throughout the life of the mine.³⁸ The barge traffic would increase all the way from the ocean to the mine site, directly affecting the Tribes and other communities along much of the Kuskokwim River.³⁹”

“The FEIS predicts significant adverse effects to fish from the barge traffic, which causes scouring of the riverbed and propeller-induced injuries or mortalities to fish.⁴⁰ The trips would likely impact spawning adult fish, eggs in spawning redds, and juvenile fish by disturbing, or causing their direct injury or mortality, potential displacement or stranding, and from river bed scour and siltation.⁴¹ Affected species include salmon, broad and humpback whitefish, sheefish, and rainbow smelt, all of which are subsistence species important to villages on the river.⁴² These impacts may ‘cause large reductions in the abundance and availability of fish resources important to subsistence users on the Kuskokwim River...’⁴³”

“These findings make clear that existing uses for fish would not be fully protected, and ADEC offers no reasonable assurance to the contrary. Oddly, no analysis of barge traffic impacts appears in the Revised Antidegradation Analysis, despite the significant projected harm to existing uses of the river for fish. The agency addresses these impacts only in the Response to Comments.”

³⁵ FEIS at 3.21-140 (quoting App. N at 15).

³⁶ *Id.* at 3.21-158.

³⁷ *Id.* at 3.21-140 (quoting App. N at 17).

³⁸ *Id.* at 3.21-174-175.

³⁹ *Id.* at 2-8, 3.21-174.

⁴⁰ FEIS at 3.13-125, 131 to 134.

⁴¹ *Id.*, App. N at 16.

⁴² *Id.*, App. N at 16.

⁴³ *Id.*, App. N at 17.

Response:

Note, barge traffic issue was reviewed in the prior informal review, see RTC # 11.2.2.

DEC's §401 certification is an evaluation of the point source impacts⁴⁴ and potential non-point source impacts⁴⁵ of the dredge and fill activity under the CWA §404 permit.⁴⁶ DEC's tier 2 anti-degradation analysis within the §401 certification is specific to the activities in the area immediately surrounding the dredge and fill activities reviewed under the §404 permit.⁴⁷ In the Donlin Gold review, that tier 2 analysis appropriately did not address the barging traffic as it is not an activity in the immediate area of the dredge and fill activity.⁴⁸

DEC also has discretionary authority under the CWA §401(d) to consider and impose conditions on the project activity in general, and not merely on the discharge addressed under §401(a)(1), "if necessary" to assure compliance with the CWA and with any other appropriate requirements of state law.⁴⁹ For this project, as to non-point source activities, except for surface runoff, the §401 certification for Donlin Gold does not add any conditions based on that discretionary authority.

DEC reviews the construction and operation of facilities and activities as part of our review and comment process on an EIS. As a cooperating and commenting agency, DEC reviewed the activities of the proposed Donlin Gold project and provided comments during the NEPA process.

The FEIS looked at barging and concluded that "anticipated fish injuries or mortalities from tug and barge traffic along the navigation channel would range from unnoticeable to detectable depending on the seasonal timing of fish migration, life stages, time of day and the concentration of fish encountered by barge traffic relative to confined and shallow channel segments."⁵⁰ The FEIS concluded this analysis by stating that "incidents of injury or mortality may be detectable, but populations would remain within normal variation."⁵¹ The JROD concludes that any concerns are adequately addressed by the mitigation requirements of the project and states that

[t]he Corps finds that with the inclusion of the mitigation measures identified by the Applicant as part of the proposed Project, compensatory mitigation for unavoidable losses of WOUS, and additional mitigation measures in the form of special conditions, applied by the Corps (Section 6.0 of this JROD), the proposed Project would not cause or contribute to significant degradation of the WOUS. This last determination is based on the conclusions of factual determinations and technical evaluation factors of this analysis and takes into account the detailed analysis of impacts on specific physical, chemical, biological and human characteristics of the aquatic ecosystem conducted as part of the Final EIS.⁵²

⁴⁴ 33 U.S.C. §1341(a)(1), 33 U.S.C. §401(a)(1).

⁴⁵ 33 U.S.C. §1341(d); 33 U.S.C. §401(d).

⁴⁶ 33 U.S.C. §1344, 33 U.S.C. §404.

⁴⁷ 18 AAC 70.015; 18 AAC 70.016.

⁴⁸ 18 AAC 70.016(a)(1)(B).

⁴⁹ PUD No. 1 of Jefferson County v Wash. Dept. of Ecology (1994).

⁵⁰ FEIS at 3.13-3.14.

⁵¹ Id.

⁵² JROD at B2.1.1.3.

Monitoring requirements of the project will verify this conclusion and allow for rapid response if needed.⁵³

Donlin Gold has agreed to the following mitigation measures for barging traffic to further protect aquatic resources:

- Establishing navigational aids
- Developing procedures for queuing in narrow channels
- Including state-of-the-art navigation and communication equipment on tug/barges
- Implanting barge guidelines for operating at certain river flow rates
- Conducting ongoing surveys of the Kuskokwim River navigation channel to identify locations that should be avoided to minimize effects on bed scour and potential for barge groundings

In addition, Donlin Gold has committed to the following:

- Develop and implement a monitoring program⁵⁴ to establish and gather additional baseline data on the rainbow smelt occurrence and the character, use, and distribution of spawning habitat along the Kuskokwim River; and if changes are observed, an assessment of additional measures available to mitigate those changes or impacts
- Establish advisory subcommittees which would act to address barging and subsistence by engaging the local residents and communities to identify locations and times where subsistence activities occur, opportunities to avoid, eliminate, or reduce conflicts that serve to restrict access to subsistence resources during construction, operations and post-closure, and identify effective monitoring measures to address concerns of subsistence users that subsistence resources may be adversely affected

DEC recognizes that barges have serviced villages on the Kuskokwim River for more than fifty years and have, to our knowledge, operated in a manner that is protective of aquatic resources. DEC considered the additional barging traffic on the Kuskokwim River associated with the Donlin Gold project through the NEPA process and, after commenting in that process, did not impose conditions in the §401 certification as there were no additional conditions necessary to assure compliance with the water quality standards as Donlin had already agreed to mitigation and monitoring activities. The issuance of the DEC's §401 certification demonstrates DEC's assertion that the project satisfies the State's water quality standards at 18 AAC 70.

DEC retains the broad discretionary authority to regulate any activity, whether permitted or not, to ensure the water quality standards are not violated, and if they are, to take appropriate enforcement actions. For point source activities authorized under a §404 permit and reviewed under §401 certification that violate water quality standards, DEC would pursue a coordinated response with the federal permit authority, fully describing the nature of the water quality standard violation with the project developer and taking actions necessary to correct any violation. For non-point source water

⁵³ FEIS at 3.13.3.2.6.

⁵⁴ Id. at 3.13-160, FEIS Item T17 at 5-16.

quality violations that may occur, DEC may pursue a suite of actions to address the violation of the water quality standard, which could include determining potential waterbody impairments and/or a waterbody recovery plan.

No changes were made to the State's Certificate of Reasonable Assurance based on this issue.

12.3 Item #3: Does the Certificate provide reasonable assurance that the project will fully protect existing uses despite streamflow changes.

EarthJustice Informal Review asserts the following:

“The Project will involve groundwater dewatering and other processes that reduce the flow of water in Crooked Creek, dewatering salmon spawning beds in low flow conditions. Even taking into consideration all the proposed mitigation measures, the FEIS states there would be impacts to fish habitat: ‘Overall, impacts of streamflow changes and salmon spawning habitat as described above would involve noticeable changes in the character or quantity of aquatic habitat. The duration of these impacts may be expected to last during and beyond the life of the project. In some scenarios, the damage would be ‘acute or obvious.’ The FEIS comes to these conclusions notwithstanding all the proposed mitigation measures.”

12.3.1 Response:

See RTC Item 11.2.1 for an additional discussion of streamflow reductions related to protection for existing uses.

The FEIS, JROD, and the DEC acknowledge that the project will result in direct habitat removal, wetland removal, and streamflow changes. However, the impact is further clarified in the JROD (B2.1.2.5 at B2.19) “(t)hese effects would impact migration, spawning, or rearing life stages of Pacific salmon and other anadromous or resident fish species and aquatic habitat in the Crooked Creek drainage near the Mine Site. Just less than 8 miles of streambed (in American and Anaconda creeks and portions of Snow and Lewis gulches) would be eliminated to construct various Mine Site facilities. Of this, less than one mile is classified as anadromous waters and regulated as Essential Fish Habitat (EFH).”

JROD: (B2-13) “The District’s authority is limited to regulating the discharge of dredged or fill material into WOUS. The Alaska Department of Natural Resources Division of Water (ADNR-Water) is responsible for managing water in the State and has the authority to render a decision on whether establishment of a minimum instream flow is necessary to comply with the Anadromous Fish Act (AS 16.05.871-.901) and the Fish Passage Act (AS 16.05.841). Donlin Gold has stated they recognize the concerns regarding predicted flow losses in Crooked Creek and they have engaged the appropriate State agencies to work within the State permit process to address this issue. Since stream flow changes will occur slowly over an extended period of time and unknowns exist, the ADF&G has recommended Donlin Gold incorporate the establishment of a field monitoring program into their ADF&G application with provisions for making adaptive changes as needed to ensure the proper protection of aquatic resources in Crooked Creek (See Final EIS Section 5.2, Table 5.2-1,

Design Feature A33, Crooked Creek Substrate Freezing Monitoring and Subsequent Mitigation Plan).”

As previously discussed in RTC Item 11.2.1 in regards to streamflow reductions related to protection for existing uses, the Corps and state agencies are requiring a Compensatory Mitigation Plan (CMP), permittee-responsible mitigation projects for restoration of wash plant tailings along Crooked Creek, restoration of lower Ruby and Queen Gulches from historic placer mining to increase rearing habitat, and the Aquatic Resources Monitoring Plan (ARMP) to offset impacts.

The Applicant has incorporated measures to avoid and minimize impacts of the proposed Project to the aquatic ecosystem. Section B2.7 of the JROD summarizes key measures that relate to the discharge of fill material into waters of the U.S. to minimize adverse effects.⁵⁵ The JROD has determined that these measures are acceptable in determining the Least Environmentally Damaging Practicable Alternative (LEDPA) in satisfying the 404(b)(1) Guidelines⁵⁶, of which DEC finds is acceptable in accordance with 18 AAC 70.016 and that there is reasonable assurance that the project will fully protect existing uses despite streamflow changes.

No changes were made to the 401 Certificate of Reasonable Assurance based on this issue.

12.4 Issue #4: Does the Certificate provide reasonable assurance that the project will not violate water quality standards for temperature.

EarthJustice Informal Review asserts the following:

“The FEIS explains that groundwater that would normally flow to Crooked Creek will be diverted as part of the pit dewatering process. During the summer, this reduction in groundwater input “could cause stream temperatures in reaches near the mine to be close to or above the State of Alaska’s water quality temperature standard...for egg/fry incubation and spawning and...migration and rearing.”⁵⁷ These violations may affect “the duration and timing of egg incubation and availability of prey species.”⁵⁸ The FEIS further notes that these violations would occur in waters regulated as essential fish habitat “supporting key life stages of salmon that play a role in the Kuskokwim subsistence community.”⁵⁹ Despite these projected violations, ADEC concludes it has reasonable assurance reduced streamflow will not adversely affect the temperature of Crooked Creek.⁶⁰ ADEC’s failure to explain why it comes to the opposite conclusion of the FEIS is arbitrary.”⁶¹

12.4.1 Response:

See RTC Item 11.2.3.3 in regards to temperature and the influence from dewatering process.

⁵⁵ JROD B2.1.2.5 at B2-19

⁵⁶ JROD B2.1.3 at B2-23

⁵⁷ FEIS at 3.13-112.

⁵⁸ *Id.*

⁵⁹ *Id.*

⁶⁰ Revised Antidegradation Analysis at 11.

⁶¹ Earthjustice Informal Review Request, 4-24-19.

The FEIS and JROD did evaluate the impacts of temperature effects from the dewatering process and finds that the impacts will be limited. The references noted by EarthJustice are some of the potential impacts for the overall Mine Site in its evaluation for Fish and Aquatic Resources. However, the FEIS in its summary of the evaluation of these effects finds that the following:

FEIS (3.13-155) Table 3.13-26 Alternative 2 Impacts by Project Component

Injury and mortality from stream temperature changes in Crooked Creek assess the magnitude or intensity as follows: “Near the Mine Site – Incidents of injury or mortality to fish eggs may be detectable but populations would remain within normal variation. Lower Crooked Creek – No noticeable incidents of injury or mortality to individual fish or other aquatic biota; population level effects are not detectable.”

The JROD evaluated the streamflow changes and its effects where it found “Streamflow changes would be seasonal, with greatest reductions during winter months, affecting resident fish and overwintering Coho salmon. The greatest effects of flow reductions and temperature increase in Crooked Creek would occur upstream of Crevice Creek. Below this, tributary inflows/runoff from unaffected watersheds (e.g., Bell and Getmuna creeks) would restore flow reductions during construction and operations phases. Water management practices permitted by the State of Alaska for the Mine Site component would help avoid and mitigate effects on downstream aquatic resources, including EFH.”⁶²

The JROD as part of the Compensatory Mitigation Plan regarding some of the habitat losses finds that the “restoration of Quartz Gulch, Snow Gulch, Queen and Ruby Gulch restoration areas where the proposed hydraulic and geomorphic functional restorations on the fisheries resources list a number of benefits that will be achieved and will result in “better temperature regimes for resident and rearing fisheries populations resulting from the replacement of ditched flows with more natural and better shaded valley floor stream channels.”⁶³

The FEIS, JROD, and the DEC acknowledge that the project will result in direct habitat removal, wetland removal and streamflow changes. However, the impact is further clarified in the JROD (B2.1.2.5 at B2.19) (t)hese effects would impact migration, spawning, or rearing life stages of Pacific salmon and other anadromous or resident fish species and aquatic habitat in the Crooked Creek drainage near the Mine Site. Just less than 8 miles of streambed (in American and Anaconda creeks and portions of Snow and Lewis gulches) would be eliminated to construct various Mine Site facilities. Of this, less than one mile is classified as anadromous waters and regulated as Essential Fish Habitat (EFH). The Applicant has incorporated measures to avoid and minimize impacts of the proposed Project to the aquatic ecosystem. Section B2.7 of the JROD summarizes key measures that relate to the discharge of fill material into waters of the U.S. to minimize adverse effects.

The Antidegradation Analysis recognizes streamflow may affect temperature.⁶⁴ The FEIS also noted that construction activities are not expected to have any substantial impacts on surface water

⁶² JROD B2.3.2 at B2-34

⁶³ JROD D29

⁶⁴ Antidegradation Analysis, dated 4/4/2019, pg 10.

temperatures⁶⁵ and that the net heat energy per unit volume of water is expected to remain relatively unchanged⁶⁶, and while some streamflow losses are expected, all cost-effective and reasonable best management practices as proposed will be used, and the lowering of water quality to accommodate important economic development in the area is necessary in accordance with 18 AAC 70.016.

The JROD has determined that these measures are acceptable in determining the Least Environmentally Damaging Practicable Alternative (LEDPA) in satisfying the 404(b)(1) Guidelines of which DEC believes is acceptable in accordance with 18 AAC 70.016 and there is reasonable assurance that the project will not violate water quality standards for temperature.

No changes were made to the 401 Certificate of Reasonable Assurance based on this issue.

12.5 Issue #5: Does the Certificate provide reasonable assurance that the Donlin Mine will comply with arsenic standards.

EarthJustice asserts that the FEIS concludes that “[t]he intensity of impacts to local groundwater resources would be sufficient to exceed water quality regulatory limits and would persist through the life of the mine.”⁶⁷ ADEC addresses arsenic contamination in the Revised Antidegradation Analysis, but wholly fails to rebut or even address this finding in the FEIS.

First, the Revised Antidegradation Analysis focuses on seepage from the South Overburden Stockpile,⁶⁸ while the FEIS explains that the principal impacts will be from the Waste Rock Facility as well as from the pit to the surrounding deep bedrock groundwater.⁶⁹ Thus, ADEC simply looked in the wrong place.

Second, the Revised Antidegradation Analysis also focuses only on the impacts to surface water from arsenic that leaches through the groundwater.⁷⁰ This analysis ignores the impacts to the groundwater itself, which is protected by Alaska’s water quality standards.⁷¹ As explained above, the FEIS starkly predicts violations of these standards for arsenic and other metals in groundwater.

Third, even in its failure to focus on the correct sources of arsenic and the correct waters affected, the best the Revised Antidegradation Analysis can muster is that “the impacts on Crooked Creek may be minimal or nonexistent...”⁷² On its face, a finding that the impacts “may” be small fails to provide reasonable assurance of compliance with standards, as required by law. ADEC’s finding is arbitrary and unsupported.”

Response:

Earth Justice assertion in regards to the claim of the “intensity of impacts to local groundwater resources ...” and subsequent assertions are taken out of context. The following is the full text from

⁶⁵ FEIS at 3.13-145

⁶⁶ FEIS at 3.13-99.

⁶⁷ FEIS at 3.7-176.

⁶⁸ Revised Antidegradation Analysis at 9-10.

⁶⁹ FEIS at 3.7-176.

⁷⁰ Revised Antidegradation Analysis at 9-10.

⁷¹ 18 AAC 70.010(c).

⁷² Revised Antidegradation Analysis at 10.

the FEIS summary in regards to arsenic and other metals in regards to mine site impacts to groundwater quality.

FEIS (3.7 at 3.7-176) Summary of Mine Site Impacts to Groundwater Quality: (*emphasis added*)

“Due to effective water management during all project phases, impacts to groundwater quality would be limited to discrete portions of the project area. The principal mechanisms responsible for effects to groundwater quality at the Mine Site would be inputs of seepage from the WRF to shallow groundwater resources underneath and immediately adjacent to the WRF, and the discharge of water from the pit to the surrounding deep bedrock groundwater. Groundwater that would be contaminated by inputs of WRF seepage would flow towards the pit, and the spatial extent of the impacts would be limited because the contaminated groundwater would be intercepted by the pit and the pit dewatering system. The intensity of impacts to local groundwater resources would be sufficient to exceed water quality regulatory limits and would persist through the life of the mine. However, the intensity of groundwater impacts outside of the cone of depression would be the same as background levels, as groundwater outside of the cone of depression would be unaffected by mine contact water. The intensity of impacts resulting from temporary inputs of contaminated water from the pit to the deep bedrock groundwater following the cessation of pit depressurization would be sufficient to exceed water quality regulatory limits; concentrations of sulfate, antimony, arsenic and selenium would be expected to increase in the deep bedrock groundwater surrounding the pit during the early Closure period following cessation of pit depressurization. These effects would be localized within the extent of the pit rim, and overall hydraulic containment would be maintained during this period, due to strong topographic gradients from outside the pit area. Following that period, flow modeling indicates that groundwater would flow towards the pit lake radially from all directions (BGC 2014c), thereby limiting the extent of migration and ultimately recapturing the contaminated groundwater and restricting the extent or scope of the impact.

The TSF would not be expected to result in impacts to downgradient groundwater quality due to design features such as the liner, SRS, and MIWs. Impacts to drinking water well use are not expected to occur due to planned well siting, construction, and treatment design features that would take place under the oversight of ADEC source water assessment and drinking water protection programs.

Overall, the duration of direct impacts to groundwater resulting from Alternative 2 at the Mine Site would vary and may persist through the life of the mine. Groundwater quality would be reduced during the life of the project, and is expected to improve following reclamation of the WRF, but some seepage from this unlined facility would continue into post-Closure and would be captured by the pit, provided that the pit lake would be managed during the post-Closure period to ensure that the direction of groundwater flow is towards the pit from all directions. The intensity of local impacts to groundwater resources would be such that groundwater would not meet regulatory criteria at certain discrete locations within the Mine Site (e.g., in groundwater underlying the WRF during the operations period, and in deep bedrock groundwater in the near vicinity of the pit during the period following the cessation of pit depressurization activities).

However, there would be no impacts to groundwater quality outside the mine facilities area above background levels. In terms of context, there is an abundance of groundwater in the Project Area, the groundwater impacted by Mine Site facilities are not sources of drinking water, the impacted groundwater is not expected to be released to the environment outside of the pit lake, and the resource is governed by regulation.”

The JROD also evaluated the water in the context of the mine site waters and groundwater in its review of the FEIS Sections 3.5 (Surface Water Hydrology), 3.6 (Groundwater Hydrology), 3.7 (Water Quality), and 3.13 (Fish and Aquatic Resources).

“Prior to discharge to Crooked Creek, all mine contact water would be treated and would meet water quality standards (WQS); Mine Site waters outside the immediate mine area would also meet WQS. In the event of seepage recovery system (SRS) pump failure and overflow after Closure, the possibility exists that waters discharged to Anaconda and Crooked Creeks (WOUS) could exceed regulatory limits in WQS. There is also a possibility of contaminated groundwater migration from the South Overburden Stockpile towards Crooked Creek. Mitigation measures are described that would help reduce this potential impact. The Applicant has incorporated measures to avoid and minimize impacts of the proposed Project to water quality, circulation, and water fluctuation, as discussed in Section B2.1.2.2 and Subpart H.”⁷³

“Overall, impacts to water quality and chemistry are not expected to exceed regulatory limits. Discharges at the Mine Site to Crooked Creek and its tributaries would be subject to the APDES permit which was issued on May 24, 2018 and it contains effluent quality limitations that are protective of existing uses.”⁷⁴

The groundwater impacts are confined within the boundary of the treatment facility at the mine site and the JROD has determined that these measures are acceptable in determining the Least Environmentally Damaging Practicable Alternative (LEDPA) in satisfying the 404(b)(1) Guidelines of which DEC believes is acceptable in accordance with 18 AAC 70.016 and there is reasonable assurance that the Donlin Mine will comply with arsenic standards.

No changes were made to the 401 Certificate of Reasonable Assurance based on this issue.

⁷³ JROD B2.2.3 at B2-25

⁷⁴ JROD B2.2.3 at B2-26