ALASKA POLLUTANT DISCHARGE ELIMINATION SYSTEM

PERMIT FACT SHEET –DRAFT

Permit Number: AK0026603

Beluga Power Plant

DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Wastewater Discharge Authorization Program

555 Cordova Street

Anchorage, AK 99501

Public Comment Period Start Date: 12/7/2015
Public Comment Period Expiration Date: 1/8/2016
Alaska Online Public Notice System

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Proposed issuance of an Alaska Pollutant Discharge Elimination System (APDES) permit to

CHUGACH ELECTRIC ASSOCIATION

For wastewater discharges from

Beluga Power Plant
PO Box 196300
Anchorage, AK, 99519

The Alaska Department of Environmental Conservation (the Department or DEC) proposes to issue an APDES individual permit (permit) to Chugach Electric Association. The permit authorizes and sets conditions on the discharge of pollutants from this facility to waters of the United States. In order to ensure protection of water quality and human health, the permit places limits on the types and amounts of pollutants that can be discharged from the facility and outlines best management practices to which the facility must adhere.

This fact sheet explains the nature of potential discharges from the Beluga Power Plant and the development of the permit including:

- information on public comment, public hearing, and appeal procedures
- a listing of proposed effluent limitations and other conditions
- technical material supporting the conditions in the permit
- proposed monitoring requirements in the permit

Public Comment

Persons wishing to comment on, or request a public hearing for the draft permit for this facility, may do so in writing by the expiration date of the public comment period.

Commenters are requested to submit a concise statement on the permit condition(s) and the relevant facts upon which the comments are based. Commenters are encouraged to cite specific permit requirements or conditions in their submittals.

A request for a public hearing must state the nature of the issues to be raised, as well as the requester's name, address, and telephone number. The Department will hold a public hearing whenever the Department finds, on the basis of requests, a significant degree of public interest in a draft permit. The Department may also hold a public hearing if a hearing might clarify one or more issues involved in a permit decision or for other good reason, in the Department's discretion. A public hearing will be held at the closest practicable location to the site of the operation. If the Department holds a public hearing, the Director will appoint a designee to preside at the hearing. The public may also submit written testimony in lieu of or in addition to providing oral testimony at the hearing. A hearing will be tape recorded. If there is sufficient public interest in a hearing, the comment period will be extended to allow time to public notice the hearing. Details about the time and location of the hearing will be provided in a separate notice.

All comments and requests for public hearings must be in writing and should be submitted to the Department at the technical contact address, fax, or email identified above (see also the public comments section of the attached public notice). Mailed comments and requests must be postmarked on or before the expiration date of the public comment period.

After the close of the public comment period and after a public hearing, if applicable, the Department will review the comments received on the draft permit. The Department will respond to the comments received in a Response to Comments document that will be made available to the public. If no substantive comments are received, the tentative conditions in the draft permit will become the proposed final permit.

The proposed final permit will be made publicly available for a five-day applicant review. The applicant may waive this review period. After the close of the proposed final permit review period, the Department will make a final decision regarding permit issuance. A final permit will become effective 30 days after the Department's decision, in accordance with the state's appeals process at 18 AAC 15.185.

The Department will transmit the final permit, fact sheet (amended as appropriate), and the Response to Comments to anyone who provided comments during the public comment period or who requested to be notified of the Department's final decision.

The Department has both an informal review process and a formal administrative appeal process for final APDES permit decisions. An informal review request must be delivered within 15 days after receiving the Department's decision to the Director of the Division of Water at the following address:

Director, Division of Water
Alaska Department of Environmental Conservation
555 Cordova Street
Anchorage, AK 99501

Interested persons can review 18 AAC 15.185 for the procedures and substantive requirements regarding a request for an informal Department review.
See http://www.dec.state.ak.us/commish/InformalReviews.htm for information regarding informal reviews of Department decisions.

An adjudicatory hearing request must be delivered to the Commissioner of the Department within 30 days of the permit decision or a decision issued under the informal review process. An adjudicatory hearing will be conducted by an administrative law judge in the Office of Administrative Hearings within the Department of Administration. A written request for an adjudicatory hearing shall be delivered to the Commissioner at the following address:

Commissioner
Alaska Department of Environmental Conservation at
410 Willoughby Street, Suite 303
Juneau AK, 99811-1800.

Interested persons can review 18 AAC 15.200 for the procedures and substantive requirements regarding a request for an adjudicatory hearing. See http://www.dec.state.ak.us/commish/ReviewGuidance.htm for information regarding appeals of Department decisions.

Documents are Available

The permit, fact sheet, and related documents can be obtained by visiting or contacting DEC between 8:00 a.m. and 4:30 p.m. Monday through Friday at the addresses below. The permit, fact sheet and other information are located on the Department's Wastewater Discharge Authorization Program website: http://www.dec.state.ak.us/water/wwdp/index.htm.

Alaska Department of Environmental Conservation Division of Water Wastewater Discharge Authorization Program 555 Cordova Street Anchorage, AK 99501 (907) 269-6285	Alaska Department of Environmental Conservation Division of Water Wastewater Discharge Authorization Program 43335 Kalifornsky Beach Rd. - Suite 11 Soldotna, AK 99669 (907) 262-5210

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1.0 APPLICANT

This fact sheet provides information on the Alaska Pollutant Discharge Elimination System (APDES) permit for the following entity:

Name of Facility:	Beluga Power Plant
APDES Permit Number:	AK0026603
Facility Location:	61° 11'10", 151°2'13"
Mailing Address:	PO Box 196300, Anchorage, AK, 99519
Facility Contact:	Mr. Mike Brodie

The map in Appendix A to the Fact Sheet shows the location of the treatment facility and the discharge location.

2.0 FACILITY INFORMATION

The Beluga Power Plant (Facility) is located 40 miles due west of Anchorage on the Western side of Cook Inlet sited within the Beluga River Gas Field. The Facility is operated by the Chugach Electric Association (CEA), was placed into operation in the 1960s, and began discharging to Krause Creek in 1982. The completed National Pollutant Discharge Elimination System (NPDES) Permit Rating Worksheet resulted in classifying the Facility as a "minor discharger." (See Section 5.2 below for the facility's wastewater permit history.)

More than half of the Facility's 385 megawatts of power generation originates from four gas turbines operating in simple-cycle mode. The simple-cycle turbines generate approximately 173 megawatts using natural gas as their fuel source. Hot gasses produced during the combustion process turn the turbines and generate electricity. An additional 212 megawatts is produced by two combined-cycle units. The combined cycle turbines also burn natural gas to power turbines and generate electricity, but they capture excess heat during the combustion of natural gas and use the heat to generate steam in a separate steam turbine. The steam turbine is known as "Unit 8" and resulted in a discharge to Krause Creek in September 1982.

Two existing groundwater wells at the Facility provide intake water. The intake water is conveyed to oxidant tanks where potassium permanganate is mixed with the intake water in order to oxidize iron and manganese so they can precipitate out during filtration. Water travels from the oxidant tanks to a greensand filter. The greensand filter is backwashed approximately every five days, producing an average of 1,100 gallons per day (GPD) of backwash that is sent to the effluent cooling pond.

After filtration, the intake water enters the water softener and de-mineralizer for processing for boiler use. Water softening and de-mineralizing is accomplished by two vertical ion exchange resin beds. Regeneration water is generated periodically through the process of restoring the exchange sites on the resin beds. Regeneration is achieved with a sulfuric acid solution rinse of the cation bed and a warm sodium hydroxide solution rinse of the anion bed. Regeneration occurs approximately twice per week, generating about 1,200 GPD of wastewater. Wastewater produced from these regenerations is directed to the batch neutralizer system for treatment.

The area of the Facility that houses the water softener and demineralizer and stores the water treatment chemicals while they're in use is referred to as the "Chemical Area." The Chemical Area floor drains

provide drainage to a sump and once the maximum sump level is reached, pumps are activated and approximately 325 GPD of wastewater is routed to the batch waste neutralizer system for treatment.

The treated water from the softener and de-mineralizer is fed to the boilers. Approximately 12,500 GPD of continuous boiler blowdown is produced when water is wasted from the boiler to avoid concentration of impurities during evaporation of steam. Boiler blowdown is stored in a continuous effluent treatment tank. Both the continuous waste (boiler blowdown) and the batch waste (Chemical Area floor drains and the water softener and de-mineralizer) are treated by automatic adjustment of the pH by an acid injection system. If required, caustic chemicals are added manually through a pump. Chemicals used to neutralize the batch and continuous wastes include sulfuric acid.

Floor drains in the turbine and boiler area are routed to an oil/water separator. The oily portion from the separation process is collected and hauled offsite to a DEC-permitted disposal facility. The water portion amounts to approximately 1,200 GPD of wastewater. The turbine and boiler area floor drain wastewater, the batch wastewater (Chemical Area floor drains and the water softener and de-mineralizer) and the boiler blowdown all flow to the effluent cooling pond where the temperature of the boiler blowdown is reduced.

Flow is recorded continuously via flow meters for all wastestreams downstream of their respective processes. Meters are read daily to calculate a total discharge to the effluent cooling pond. Discharge from the effluent cooling pond to Krause Creek is intermittent in nature. A vertical discharge pipe on the East end of the cooling pond only allows discharge to occur to Krause Creek when the water level of the pond is higher than the elevation of the pipe.

When effluent exits the effluent cooling pond, it enters the “plant effluent water filter.” The water filter is located northwest of the cooling pond outside a fenced area. The water filter is an enclosed underground trench sized approximately 55 feet long, 6 feet wide, and 11 feet deep. Cooling pond discharges enter and exit through High Density Polyethylene (HDPE) piping with filter fabric covered grates on both ends. The trench is lined with geotextile filter fabric on all sides and filled with 1-3 inch diameter rock.

After exiting the water filter, effluent flows through ten inch diameter HDPE piping at an 18% grade for approximately 50 feet prior to discharge into Krause Creek, located northwest of the Facility. Krause Creek originates in a bog approximately two miles northwest of the Facility and flows into Cook Inlet approximately 4.1 miles east of the Facility. The Alaska Department of Fish and Game, Anadromous Waters Catalog describes Krause Creek as an anadromous fish stream east of the Beluga Highway. The outfall to Krause Creek that the Facility discharges from is located west of the Beluga Highway in a non-anadromous portion of the stream.

The domestic wastewater generated onsite from Facility personnel is treated by a domestic wastewater treatment plant prior to being discharged to a DEC-approved drain field north of the Facility living quarters. Accordingly, the domestic wastewater generated onsite is not discharged to surface water and is therefore not authorized by the permit.

It should also be noted that while hazardous waste is stored and handled onsite, no hazardous waste is mixed with the wastewater discharge stream and discharged to Krause Creek.

2.1 Background

State of Alaska wastewater disposal permits have been issued to CEA for the Facility since 1986 to authorize the discharge of wastewater associated with electrical power generation. The permits generally authorized the discharge of boiler blowdown, filter backwash, and water softener regeneration and demineralization. CEA submitted a NPDES permit application to the Environmental Protection Agency (EPA) on January 11, 1979 and again on January 31, 1986. EPA assigned NPDES permit number AK0026603 to the application, and responded to CEA's applications on August 26, 1986 with a letter indicating that EPA determined that the pollutant discharges from the Facility were minor in nature and therefore assigned a low priority for permit issuance.

In response to TAH and TAqH limits imposed in permit 0223-DB001, CEA undertook a study of total aromatic hydrocarbons (TAH) and total aqueous hydrocarbons (TAqH) in the Facility's effluent during 2002-2003. Concurrently, CEA evaluated both upstream and downstream receiving water TAH and TAqH concentrations in Krause Creek. Sampling for the study occurred on a monthly basis for one year. Based on the results of the sampling, the Alaska Department of Environmental Conservation (DEC or the Department) concluded that there was not reasonable potential for the Facility's effluent to exceed water quality criteria for TAH and TAqH, and subsequently removed the end of pipe limits for TAH and TAqH via a permit modification on August 20, 2003. The permit modification also reduced the monitoring frequency for the subject parameters from quarterly to biannual.

EPA ultimately did not issue an NPDES permit prior to authority to administer the NPDES Program transferred to DEC. CEA submitted an APDES permit application to the Department on February 11, 2013. In their 2013 application, CEA requested an increased quarterly average flow limit from 27,000 GPD to 65,000 GPD. On June 25, 2014, the Department requested additional information necessary to complete CEA's application. The Department received the information on October 24, 2014, including a statement withdrawing CEA's previously requested flow rate increase.

3.0 COMPLIANCE HISTORY

Discharge Monitoring Reports (DMRs) from the third quarter of 2010 through the second quarter of 2015 were reviewed to determine the Facility's compliance with effluent limits. Two violations of the quarterly average effluent flow rate limit of 27,000 GPD were observed (32,563 GPD during the fourth quarter of 2012 and 30,391 during the first quarter of 2011). The Facility has otherwise been in compliance with the effluent limits for flow and temperature. DEC conducted a routine inspection on June 12, 2007 and no defects were noted. Table 1 presents the performance of the Facility as reported on quarterly DMRs available in DEC files submitted between 2010 and 2015.

Table 1: Performance Summary of Beluga Power Plant, 2010-2015[a]

Parameter	Units	Minimum Observed	Maximum Observed	Mean
Quarterly Average Flow	GPD	508	32,563	16,098
Maximum Daily Flow	GPD	6,991	72,804	36,496
Temperature	Degrees Celsius (°C)	2.7	12.8	6.6
pH	SU	6.7	8.1	7.4
TSS	Milligrams per Liter (mg/L)	2.3	39	8.5
TAH	Micrograms per Liter (µg/L)	Non Detect (ND)	ND	N/A
TAqH	µg/L	ND	ND	N/A

a. Dataset size is 11 for TAH and TAqH, 15 for TSS and 17 for flow, temperature and pH. The size of the dataset was determined by the availability of data in DEC files for the Facility.

4.0 EFFLUENT LIMITS AND MONITORING REQUIREMENTS

4.1 Basis for Permit Effluent Limits

The Clean Water Act (CWA) requires that the limits for a particular pollutant be the more stringent of either technology-based effluent limits (TBELs) or water quality-based effluent limits (WQBELs). TBELs are set according to the level of treatment that is achievable using available technology. The TBELs that apply to the discharge from this Facility are found in the Effluent Limitation Guideline (ELG) 40 CFR 423, the Steam Electric Power Generating Point Source Category. The Facility is regulated under the Best Practicable Control Technology Currently Available (BPT) standards, which are the most stringent standards for existing sources. These TBELs limit pH, oil and grease, and TSS, and prohibit the discharge of polychlorinated biphenyl compounds (PCBs).

A WQBEL is designed to ensure that the Water Quality Standards (WQS) of a water body are met. WQBELs may be more stringent than TBELs. Numeric water criteria found in 18 AAC 70 have been applied in the permit as limits for pH and temperature. TAH and TAqH effluent limits were removed during the previous permit cycle, however, the permit continues the previous

permit's requirement to monitor TAH and TAqH on a biannual basis. The basis for the proposed effluent limits in the permit is provided in Appendix B.

4.2 Basis for Effluent and Receiving Water Monitoring

In accordance with AS 46.03.110(d), the Department may specify in a permit the terms and conditions under which waste material may be disposed. Monitoring in a permit is required to determine compliance with effluent limits. Monitoring may also be required to gather effluent and receiving water data to determine if additional effluent limits are required and/or to monitor effluent impact on the receiving water body quality.

4.3 Effluent Limits and Monitoring Requirements

The permit contains both TBELs and WQBELs. Table 2 summarizes the effluent limits and monitoring requirements of the previous State of Alaska wastewater disposal permit (permit number 0223DB001). Table 3 summarizes the proposed effluent and receiving water limits and monitoring requirements (see Appendix B for more details).

Table 2: Previous Permit Effluent Limits and Monitoring Requirements

Parameter	Effluent Limits		Monitoring Requirements		
	Daily Maximum	Units	Sample Location	Sample Frequency	Sample Type
Total Discharge Flow	27,000[a]	GPD	Effluent	1/Quarter	Measured and Calculated
Temperature	15[b]	˚ C	Effluent	1/Quarter	Grab
pH	Report	SU	Effluent	1/Quarter	Grab or Composite
TSS	Report	mg/L	Effluent	1/Quarter	Grab or Composite
TAH	Report	µg/L	Effluent	2/Year	Grab or Composite
TAqH	Report	µg/L	Effluent	2/Year	Grab

Notes:
a. Quarterly average
b. Or ambient temperature, whichever is greater.

Table 3: Outfall 001 Effluent and Receiving Water Limits and Monitoring Requirements

Parameter	Effluent Limits				Monitoring Requirements			
	Daily Minimum	Monthly Average	Daily Maximum	Quarterly Average	Units	Sample Location	Sample Frequency	Sample Type
Chronic Toxicity	N/A	N/A	Report	N/A	Chronic Toxic Units (TU_c)	Effluent	1/Year[a]	Grab
Copper[b]	N/A	N/A	Report	N/A	µg/L	Effluent	1/Quarter[c]	Grab
Hardness	N/A	N/A	Report	N/A	mg/L	Receiving Water	2/Year[d]	Grab
Oil & Grease	N/A	15	20	N/A	mg/L	Effluent	1/Quarter	Grab
		9.12[e]	12.14		Pounds per Day (lbs/day)			
Oily Sheen	No Discharge Allowed				N/A	Effluent Cooling Pond	Daily	Visual
PCBs[f]	No Discharge Allowed				µg/L	Effluent	1/Year	Grab
pH	6.5	N/A	8.5	N/A	SU	Effluent	5/Week	Grab
TAH	N/A	N/A	Report	N/A	µg/L	Effluent	2/Year	Grab
TAqH	N/A	N/A	Report	N/A	µg/L	Effluent	2/Year	Grab
Temperature	N/A	N/A	15	N/A	˚ C	Effluent	1/Quarter	Grab
Total Discharge Flow	N/A	N/A	N/A	27,000[g]	GPD	Effluent	Continuous	Recorded and Calculated
TSS	N/A	30	100	N/A	mg/L	Effluent	2/Year	Grab
		18.22	60.73		lbs/day			
Zinc	N/A	N/A	Report	N/A	µg/L	Effluent	2/Year	Grab

Notes:

a. Once per year means taking one sample per calendar year, alternating between taking a sample during the summer months (June 1-September 30) and the winter months (October 1-May 31) each time.
b. All metals shall be reported as total recoverable metals.
c. Quarterly means the time period of three months based on the calendar year beginning with January.
d. Twice per year consists of taking one sample in the summer months (June 1– September 30) and one sample in the winter (October 1-May 31) each year.
e. Mass-based limits calculated using maximum observed flow from the past five years- 72,804 GPD.
f. There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid (40 CFR §423.15(b)).
g. The flow shall not exceed an average of 27,000 gallons per day, calculated on a quarterly basis.

4.4 Effluent Monitoring

The permit requires monitoring of the effluent for flow, TSS, temperature, oil and grease, pH, and PCBs to determine compliance with the effluent limitations. In addition, the permit includes requirements to monitor the effluent for chronic whole effluent toxicity, copper, TAH, TAqH and zinc, in order to conduct a future reasonable potential analysis to determine if the discharge might cause an exceedance of the WQS for these pollutants in the receiving water body.

Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the Facility's performance. Effluent limits for oil and grease, TSS, PCBs, and pH are TBELs and therefore must be monitored at a minimum frequency of once per year per 40 CFR 122.44(i)(2). DEC took the Facility's historic performance into consideration when evaluating the appropriate monitoring frequency for each pollutant.

The frequency of monitoring for TSS was reduced from quarterly in previous State of Alaska wastewater disposal permit to twice per year in the APDES permit. The basis for this reduction is that for the most recent five years of performance, as well as the past 23 years of Facility operation, the ratio of the average discharge of TSS to the proposed average monthly permit limit (30 mg/L) for TSS is 25% or less. pH will be monitored on a more frequent (5 times per week) basis to ensure compliance with permit limits. This pH monitoring frequency is common in APDES permits of all types and appropriate given the nature of the Facility's discharge and chemical additions necessary to buffer pH levels. PCBs are monitored at the minimum allowed frequency of once per year because there are no transformers containing PCBs at the Facility. Oil and grease is monitored on a quarterly basis. DEC chose this frequency because TAH and TAqH are going to be monitored twice per year in order to ensure compliance with WQS.

The Department retained the temperature limit from the previous permit of "May not exceed 15°C", which is the numeric water quality criteria. The portion of the previous permit's temperature limit that stipulated that the Facility could discharge effluent at a temperature higher than 15°C if the receiving water temperature was higher than 15°C is not carried forward in the APDES permit. This stipulation is not consistent with the WQS, and Facility performance data illustrated that it was unnecessary. The frequency for monitoring effluent temperature remains unchanged.

The permittee has the option of taking more frequent samples than required under the permit. These additional samples can be used for averaging if they are conducted using the Department – approved test methods (generally found in 18 AAC 70 and 40 CFR Part 136 [adopted by reference in 18 AAC 83.010]), and if the Method Detection Limits (MDLs) are less than the effluent limitations.

A September 2014 sample collected from the Facility's effluent cooling pond and historical data and information from the State wastewater disposal permit file, such as intake water monitoring data, were used to determine pollutants of concern. Pollutants that were detected in the effluent, but whose quantitation was an estimation, are not included for further monitoring. Neither are pollutants that were detected but for which there are no applicable WQS. Copper and zinc were selected for additional monitoring due to their high concentrations as reported in the September 2014 monitoring. These pollutants were present at levels that exceeded or were close to exceeding conservatively estimated (estimated due to lack of recent hardness data with which to calculate metals water quality criteria) WQS in the receiving water. CEA states the pollutants are present in the effluent due to their presence in the intake water, and subsequent concentration via water treatment.

4.5 Receiving Water Limits and Monitoring Requirements

The Department is requiring the permittee to monitor for hardness in the receiving water body, as depicted in Table 3. Hardness will be monitored at a location upstream from the influence of the Facility's effluent. Hardness monitoring is required to help establish a robust, representative dataset for receiving water hardness. Receiving water hardness data is necessary to establish accurate numeric water quality criteria for some metals that are hardness dependent (for example copper and zinc) in Krause Creek. WQS numeric criteria must be ascertained for hardness dependent parameters prior to performing a reasonable potential analysis during the next permit reissuance.

4.6 Whole Effluent Toxicity Monitoring

18 AAC 83.435 requires that a permit contain limitations on whole effluent toxicity (WET) when a discharge has reasonable potential to cause or contribute to exceedances of WQS. The permit does not establish WET effluent limits because no effluent monitoring data is currently available for a determination of reasonable potential to cause or contribute to an exceedance of the chronic WET numeric water quality criterion of 1.0 chronic toxic units (TU_c) found in 18 AAC 70.030. The permit requires WET testing once per year, alternating between performing the tests during the summer months and the winter months as detailed in Table 3. The permit implements a WET trigger of 1.0 TU_c. If WET tests exceed the toxicity trigger, the permittee is required to perform accelerated testing. WET results from this permit issuance will be used when the permittee applies for reissuance of the permit to ensure the applicable criteria of 18 AAC 70.030 are met.

WET tests are laboratory tests that measure total toxic effect of an effluent on living organisms. WET tests use small vertebrate and invertebrate species and/or plants to measure the aggregate toxicity of an effluent. The two different durations of toxicity tests are acute and chronic. Acute toxicity tests measure survival over a 96-hour exposure. Chronic toxicity tests measure reductions in survival, growth, and reproduction over a 7-day exposure. The parameters that will be measured in the WET tests are survival and reproduction of the water flea (*Ceriodaphnia dubia*) and survival and growth of the fathead minnow (*Pimephales promelas*).

5.0 RECEIVING WATER BODY

5.1 Water Quality Standards

Regulations in 18 AAC 70 require that the conditions in permits ensure compliance with the Alaska Water Quality Standards (WQS). The state's WQS are composed of use classifications, numeric and/or narrative water quality criteria, and an antidegradation policy. The use classification system designates the beneficial uses that each water body is expected to achieve. The numeric and/or narrative water quality criteria are the criteria deemed necessary by the state to support the beneficial use classification of each water body. The antidegradation policy ensures that the beneficial uses and existing water quality are maintained.

Water bodies in Alaska are designated for all uses unless the water has been reclassified under 18 AAC 70.230 as listed under 18 AAC 70.230(e). Some water bodies in Alaska can also have site–specific water quality criterion per 18 AAC 70.235, such as those listed under 18 AAC 70.236(b). The receiving water for the discharge, Krause Creek, has not been

reclassified, nor have site-specific water quality criteria been established. Therefore, the creek must be protected for all fresh water designated use classes listed in 18 AAC 70.020(a)(1).

5.2 Water Quality Status of Receiving Water

Any part of a water body for which the water quality does not or is not expected to meet applicable WQS is defined as a "water quality limited segment" and placed on the state's impaired water body list. Krause Creek is not included on *Alaska's Final 2010 Integrated Water Quality Monitoring and Assessment Report*, July 15, 2010. Accordingly, a total maximum daily load has not been prepared, or approved for Krause Creek.

6.0 ANTIBACKSLIDING

18 AAC 83.480 requires that "effluent limitations, standards, or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit." 18 AAC 83.480(c) also states that a permit may not be reissued "to contain an effluent limitation that is less stringent than required by effluent guidelines in effect at the time the permit is renewed or reissued." The Facility is considered a new discharger, meaning it has not previously held an APDES permit. As this is the first APDES permit for the Facility, further regulatory analysis under antibacksliding regulations is not warranted.

7.0 ANTIDEGRADATION

Section 303(d)(4) of the CWA states that, for water bodies where the water quality meets or exceeds the level necessary to support the water body's designated uses, WQBELs may be revised as long as the revision is consistent with the State's antidegradation policy. The Antidegradation Policy of the WQS (18 AAC 70.015) states that the existing water uses and the level of water quality necessary to protect existing uses must be maintained and protected. This section analyzes and provides rationale for the Department's decisions in the permit issuance with respect to the Antidegradation Policy.

The Department's approach to implementing the Antidegradation Policy, found in 18 AAC 70.015, is based on the requirements in 18 AAC 70 and the Department's *Policy and Procedure Guidance for Interim Antidegradation Implementation Methods*, dated July 14, 2010. Using these procedures and policy, the Department determines whether a water body, or portion of a water body, is classified as Tier 1, Tier 2, or Tier 3, where a higher numbered tier indicates a greater level of water quality protection. At this time, no Tier 3 waters have been designated in Alaska. Cook Inlet is not listed as impaired on DEC's most recent *Alaska's Final 2010 Integrated Water Quality Monitoring and Assessment Report*; therefore, a Tier 1 designation is not warranted. Accordingly, this antidegradation analysis conservatively assumes that the discharge is to a Tier 2 water body.

The State's Antidegradation Policy in 18 AAC 70.015(a)(2) states that if the quality of water exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water (i.e. Tier 2 waters), that quality must be maintained and protected. The Department may allow a reduction of water quality only after finding that five specific requirements of the antidegradation policy at 18 AAC 70.015(a)(2)(A)-(E) are met. The Department findings follow:

1. **18 AAC 70.015 (a)(2)(A).** Allowing lower water quality is necessary to accommodate important economic or social development in the area where the water is located. Based on the evaluation required under 18 AAC 70.015(a)(2)(D) below, the Department has determined that the most reasonable and effective polluting prevention, control, and treatment methods are being used and that the localized lowering of water quality is necessary.

   According to CEA's antidegradation analysis submitted with their APDES application, during 2011 CEA spent $36.3 million dollars within the local Anchorage economy on goods and services. CEA employs 25 people that work at the Facility, and estimates at least 50 other offsite jobs exist that support the Facility in some way. The Facility provides electricity for the Municipality of Anchorage, the most populous area in Alaska. The Facility provides power to over 85,000 metered locations.

   The Department concludes that the operation of the Facility and the authorization of the discharge accommodates important economic development proximal to where the water is located and that the finding is met.

2. **18 AAC 70.015 (a)(2)(B).** Except as allowed under this subsection, reducing water quality will not violate the applicable criteria of 18 AAC 70.020 or 18 AAC 70.235 or the whole effluent toxicity limit in 18 AAC 70.030.

   The discharge authorized by the permit conforms to the water quality criteria requirements of 18 AAC 70.020. No water quality variance in the form of a mixing zone is authorized and all water quality criteria must be met at the end of pipe prior to discharge. Site-specific criteria as allowed by 18 AAC 70.235 have not been established for Krause Creek and are therefore not applicable. WET testing is required once per year. If WET tests reveal that the discharge has toxicity, the permittee shall perform accelerated testing and identify the source of the toxicity. The permittee must notify DEC of the exceedance in writing within 14 days of receipt of test results. WET results from this permit issuance will be used when the permittee applies for reissuance of the permit to ensure the applicable criteria of 18 AAC 70.030 are met. The Department finds that the reduced water quality will not violate applicable water quality criteria and that the finding is met.

3. **18 AAC 70.015(a)(2)(C).** The resulting water quality will be adequate to fully protect existing uses of the water.

   The water quality criteria, upon which the permit effluent limits are based, serve the specific purpose of protecting the existing and designated uses of the receiving water. No water quality variance in the form of a mixing zone is authorized and all water quality criteria will be met at the end of pipe prior to discharge. After a review of the expected volume of discharge, the types and amounts of regulated pollutants, and the effluent limits imposed in this permit, the Department concludes that the resulting water quality will be adequate to fully protect existing uses and that the finding is met.

4. **18 AAC 70.015(a)(2)(D).** The methods of pollution prevention, control, and treatment found by the Department to be most effective and reasonable will be applied to all wastes and other substances to be discharged.

   The Department finds the most effective and reasonable methods of prevention, control, and treatment are the practices and requirements set out in the APDES permit and described in Section 2.0 of this fact sheet. This type of treatment and associated discharge is similar in nature

to other like facilities and their discharges located throughout the United States. Further, because of the widespread employment of this type of treatment and subject wastewater discharge, EPA promulgated technology-based ELGs to regulate this group of industrial discharges in November of 1982 (40 CFR 423, Steam Electric Power Generating Point Source Category), of which, the TBELs have been incorporated in this permit. The permit also requires the permittee to implement an approved Best Management Practices (BMP) Plan. The BMP Plan includes pollution prevention measures and controls to prevent and/or minimize the generation and release of pollutants from the Facility. The Department concludes that the methods of pollution prevention, control, and treatment to be the most effective and reasonable and the finding is met.

5. **18 AAC 70.015(a)(2)(E).** All wastes and other substances discharged will be treated and controlled to achieve (i) for new and existing point sources, the highest statutory and regulatory requirements; and (ii) for nonpoint sources, all cost-effective and reasonable best management practices.

   For Outfall 001, applicable "highest statutory and regulatory treatment requirements" are defined in 18 AAC 70.990(30) (as amended June 26. 2003) and in the previously referenced July 14, 2010 DEC guidance titled "*Policy and Procedure Guidance for Interim Antidegradation Implementation Methods.*" Accordingly, there are three parts to the definition, which are:

   (A) Any federal technology-based effluent limitation identified in 40 CFR §125.3 and 40 CFR §122.29, as amended through August 15, 1997, adopted by reference;

   (B) Minimum treatment standards in 18 AAC 72.040; and

   (C) Any treatment requirements imposed under another state law that is more stringent than a requirement of this chapter.

   The first part of the definition includes all federal technology-based ELGs, which would include those that applied to the Facility at 40 CFR 423. The permit implements the ELGs; therefore, this requirement is met.

   The second part of the definition 18 AAC 70.990(B) (2003) appears to be in error, as 18 AAC 72.040 describes discharges to sewers and not minimum treatment. The correct reference appears to be the minimum treatment standards found at 18 AAC 72.050, which refers to domestic wastewater discharges only. The Facility treats and discharges domestic waste via a subsurface drain field that is not authorized via the APDES permit; therefore, further analysis for this particular finding is not warranted.

   The third part of the definition includes any more stringent treatment required by state law, including 18 AAC 70 and 18 AAC 72. The correct operation of equipment, visual monitoring, and implementing BMPs, as well as other permit requirements like WQBELs derived from 18 AAC 70, will control the discharge and satisfy all applicable federal and state requirements. The Department concludes that all wastes and other substances discharged will be treated and controlled to achieve the highest statutory and regulatory requirements and finds that the finding is met.

8.0 OTHER PERMIT CONDITIONS

8.1 Quality Assurance Project Plan

The permittee is required to develop procedures to ensure that the monitoring data submitted are accurate and to explain data anomalies if they occur. The permittee is required to update the Quality Assurance Project Plan (QAPP) within 120 days of the effective date of the final permit. Additionally, the permittee must submit a letter to the Department within 120 days of the effective date of the permit stating that the plan has been implemented within the required time frame. The QAPP shall consist of standard operating procedures the permittee must follow for collecting, handling, storing and shipping samples; laboratory analysis; and data reporting. The QAPP shall be retained onsite and made available to the Department upon request.

8.2 Best Management Practices Plan

In accordance with AS 46.03.110 (d), the Department may specify in a permit the terms and conditions under which waste material may be disposed. This permit requires the permittee to develop a BMP Plan in order to prevent or minimize the potential for the release of pollutants to waters and lands of the State of Alaska through plant site runoff, spillage or leaks, or erosion. The permit contains certain BMP conditions that must be included in the BMP Plan. The permit requires the permittee to provide written notice to DEC that they have developed or updated and implemented a BMP Plan within 180 days of the effective date of the final permit. The BMP Plan must be kept onsite and made available to the Department upon request.

8.3 Standard Conditions

Appendix A of the permit contains standard regulatory language that must be included in all APDES permits. These requirements are based on the regulations and cannot be challenged in the context of an individual APDES permit action. The standard regulatory language covers requirements such as monitoring, recording, reporting requirements, compliance responsibilities, and other general requirements.

9.0 OTHER LEGAL REQUIREMENTS

9.1 Endangered Species Act

The Endangered Species Act (ESA) requires federal agencies to consult with the National Oceanic and Atmospheric Administration (NOAA) Marine Fisheries and the U.S. Fish and Wildlife Service (USFWS) if their actions could beneficially or adversely affect any threatened or endangered species. As a state agency, DEC is not required to consult with these federal agencies regarding permitting actions; however, DEC voluntarily contacted the agencies to notify them of the proposed permit issuance and to obtain listings of threatened and endangered species near the discharge.

The USFWS has directed the Department to consult their Information, Planning, and Conservation System http://ecos.fws.gov/ipac/gettingStarted/map to obtain lists of threatened and endangered species within the jurisdiction of the USFWS in the Facility's area. The Department used this website to determine that there does not appear to be any endangered or

threatened species or critical habitat areas under USFWS jurisdiction in the area of Krause Creek where the discharge occurs.

NOAA has directed the Department to consult their Marine Mammal Species Range and Critical Habitat Interactive map at this http://alaskafisheries.noaa.gov/mapping/esa/. The Department used this website to confirm that no endangered species utilize the area of Krause Creek that The Facility discharges to.

9.2 Essential Fish Habitat

Essential fish habitat (EFH) includes the waters and substrate (sediments, etc.) necessary for fish from commercially-fished species to spawn, breed, feed, or grow to maturity. The Magnuson-Stevens Fishery Conservation and Management Act (January 21, 1999) requires federal agencies to consult with NOAA when a proposed discharge has the potential to adversely affect (reduce quality and/or quantity of) EFH. As a state agency, DEC is not required to consult with NOAA on EFH; however, DEC voluntarily contacted NOAA to notify them of the proposed permit issuance and to obtain listings of EFH in the area. NOAA has directed the Department to consult their Essential Fish Habitat Mapper http://www.habitat.noaa.gov/protection/efh/efhmapper/index.html to obtain locations of Essential Fish Habitat in the area of Krause Creek that The Facility discharges to. The Department used this website to determine that there is no EFH in the permit area.

9.3 Permit Expiration

The permit will expire five years from the effective date of the permit.

10.0 References

1. Alaska Department of Environmental Conservation, 2003. *Alaska Water Quality Criteria Manual for Toxics and Other Deleterious Organic and Inorganic Substances*, as amended through December 12, 2008.
2. U.S. Environmental Protection Agency, 2010. *National Pollution Discharge Elimination System (NPDES) Permit Writers' Manual*. Office of Wastewater Management, Water Permits Division State and Regional Branch Office of Water Regulations and Standards. Washington DC, September 2010. EPA-833-K-10-001.
3. Alaska Department of Environmental Conservation, 2010. *Alaska's Final 2010 Integrated Water Quality Monitoring and Assessment Report*, July 15, 2010.
4. Alaska Department of Environmental Conservation, 2013. *Interim Antidegradation Implementation Methods*. Retrieved from http://www.dec.state.ak.us/water/wqsar/Antidegradation/docs/P&P-Interim_Antidegradation_Implemenation_Methods.pdf
5. U.S. Environmental Protection Agency. 1991. *Technical Support Document for Water Quality-based Toxics Control*. Office of Water Enforcement and Permits, Office of Water Regulations and Standards. Washington DC, March 1991. EPA/505/2-90-001.
6. NMFS, Office of Habitat Conservation, 2013. *Essential Fish Habitat Mapper v3.0*. Retrieved from http://www.habitat.noaa.gov/protection/efh/habitatmapper.html.
7. Alaska Department of Fish and Game, 2013. *Fish Resource Monitor*. Retrieved from http://gis.sf.adfg.state.ak.us/FlexMaps/fishresourcemonitor.html?mode=awc.
8. Alaska Department of Environmental Conservation, 2003, *Water Quality Standards*, as amended June 26, 2003, Alaska Department of Environmental Conservation 18 AAC 70.
9. U.S. Environmental Protection Agency. 1982. *Development Document for Final Effluent Limitations Guidelines, New Source Performance Standards, and Pretreatment Standards for the Steam Electric Point Source Category*. Office of Water and Waste Management, Washington DC, November 1982.
10. U.S. Environmental Protection Agency, 1982. *Steam Electric Power Generating Point Source Category*, November 19, 1982. U.S. Environmental Protection Agency, 40 CFR Part 423.
11. Alaska Department of Environmental Conservation, 2014. *Alaska Pollutant Discharge Elimination System (ADPES) Permits Reasonable Potential Analysis and Effluent Limits Development Guide*, as amended June 30, 2014.

APPENDIX A. FACILITY INFORMATION

Figure 1: Beluga Power Plant Vicinity Map

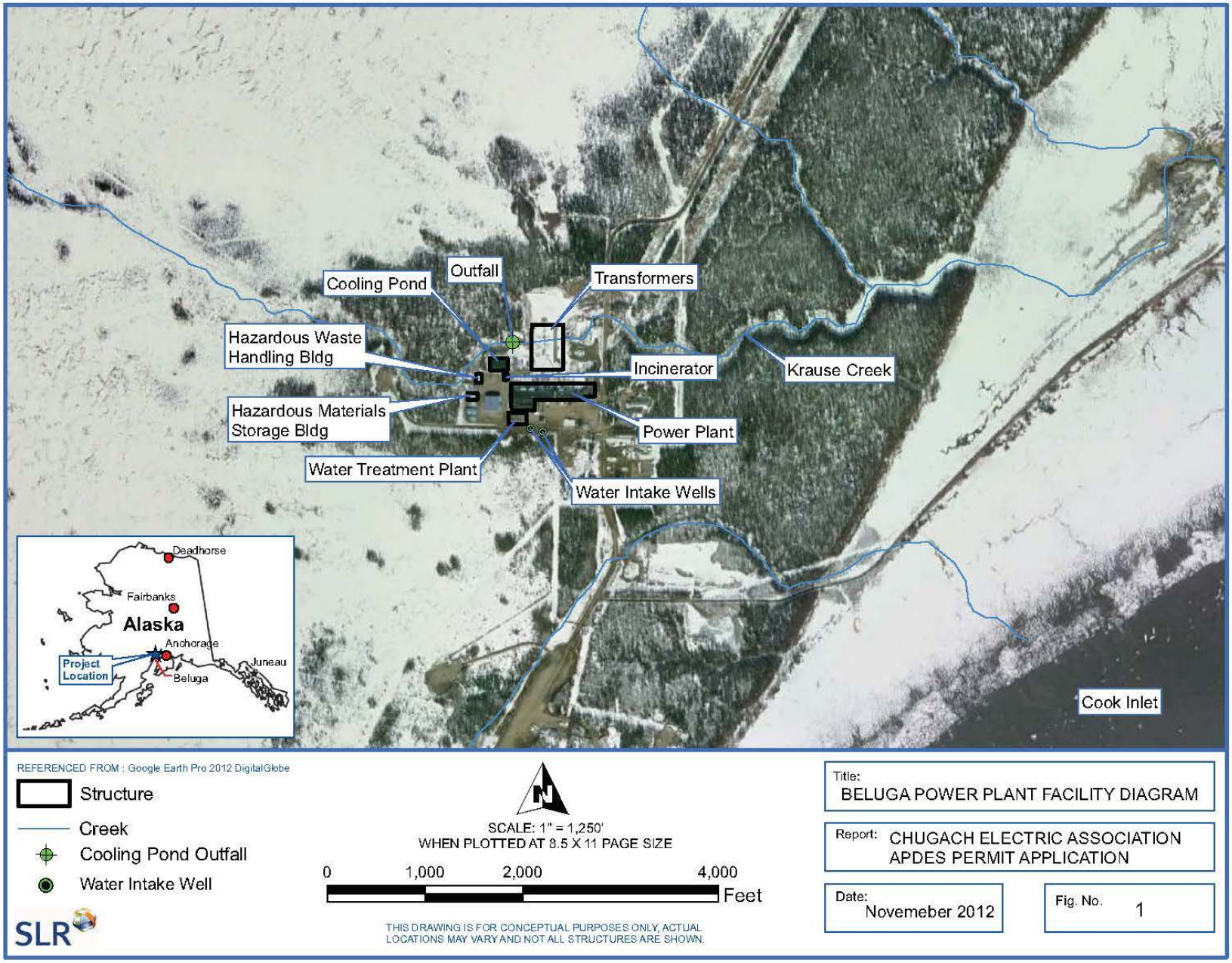
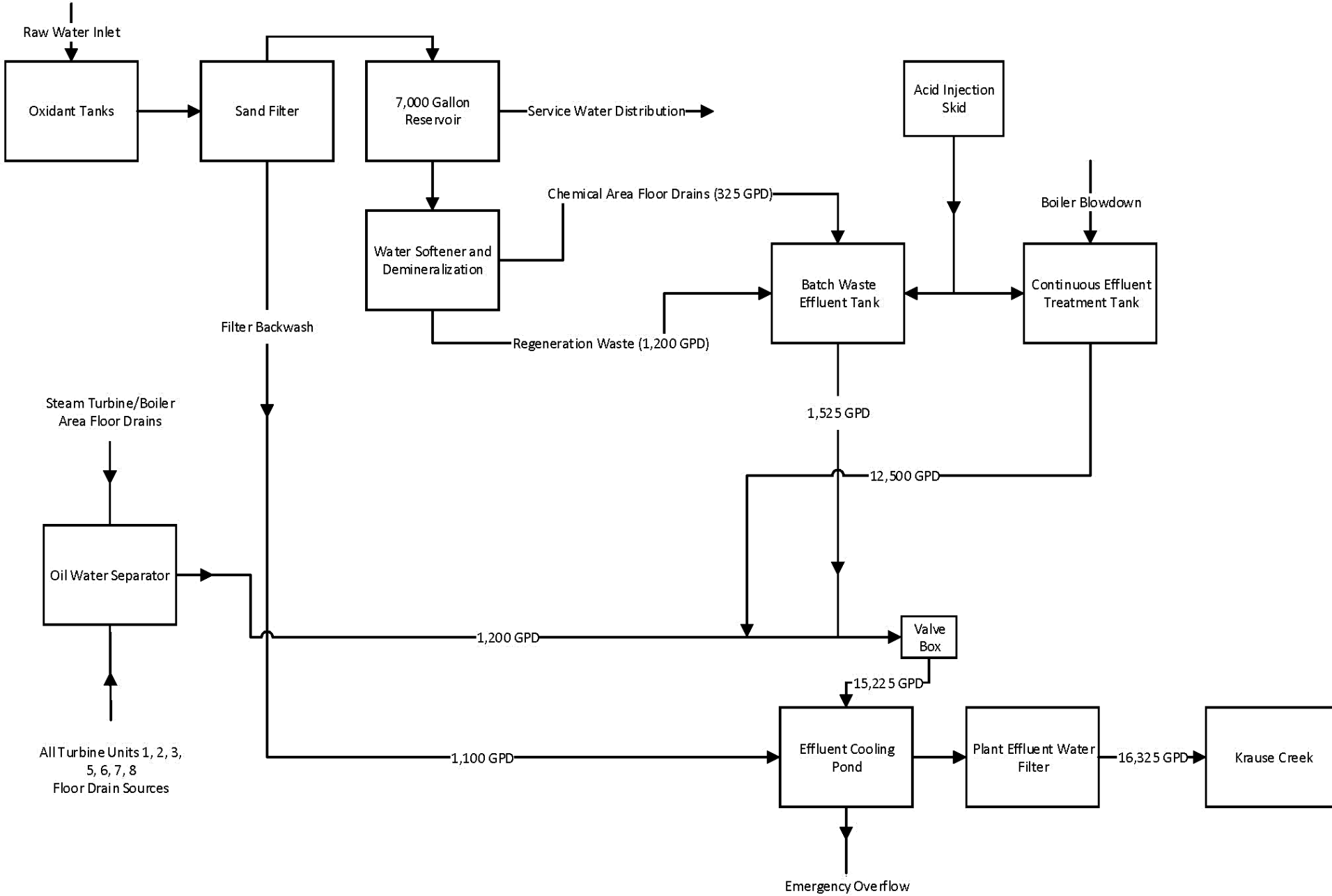


Figure 2: Beluga Power Plant Process Flow Diagram



APPENDIX B. BASIS FOR EFFLUENT LIMITATIONS

The Clean Water Act (CWA) requires steam electric power generation facilities to meet effluent limits based on available wastewater treatment technology, specifically, technology-based effluent limits (TBELs). TBELs are national in scope and establish performance standards for all facilities within an industrial category or subcategory. The Department may find, by analyzing the effect of an effluent discharge on the receiving water body, that TBELs are not sufficiently stringent to meet state water quality standards (WQS). In such cases, the Department is required to develop more stringent water quality-based effluent limits (WQBELs), which are designed to ensure that the WQS of the receiving water body are met.

TBELs for steam electric power generation facilities do not limit every parameter that may be present in the effluent. TBELs have only been developed for total suspended solids (TSS), oil and grease, pH, and Polychlorinated Biphenyls (PCBs). Depending on where the Beluga Power Plant (Facility) draws its water and how it handles its water for their purposes, their effluent might contain metals and other potentially toxic pollutants.

If a pollutant may cause or contribute to an exceedance of a WQS, a WQBEL for the pollutant must be established in the permit. Since this is the first Alaska Pollutant Discharge Elimination System (APDES) permit issued to Chugach Electric Association (CEA) for the Facility, reasonable potential for pollutants of concern could not be determined due to a lack of available effluent monitoring data. However, CEA provided monitoring data with their APDES permit application that allowed the Department to determine pollutants of concern in the effluent. CEA will be required to conduct additional monitoring of these pollutants during the term of the permit so that reasonable potential analysis can be determined during the next permit reissuance.

B.1 Technology-Based Effluent Limitations

B.1.1 Mass-Based Limitations

The regulation at 18 AAC 83.540 requires that effluent limits be expressed in terms of mass, if possible. As there isn't a record of the monthly design flow of the Facility, the Department used the highest average daily flow rate from the average daily flows reported over the past five years. The value selected (72,804 GPD) is representative of the actual flow likely to occur during the term of the permit. The mass-based limits are expressed in pounds per day (lbs/day) and are calculated as follows:

Mass-based limit (lbs/day) = concentration limit (milligrams per liter (mg/L)) × design flow (Million Gallons per Day (mgd)) × 8.341[1]

B.1.2 Effluent Limitation Guidelines

On September 30, 2015, the Environmental Protection Agency (EPA) promulgated an update to the Steam Electric Power Generating Point Source Category Effluent Limit Guideline (ELG), 40 CFR 423. The steam electric power plant ELG regulates discharges from the operation of generation units by establishments primarily engaged in the generation of electricity for distribution and sale, which results primarily from utilizing fossil fuel in conjunction with a thermal cycle employing the steam water system as the thermodynamic medium. The Facility produces wastewater that results from power generation processes that use natural gas in conjunction with a thermal cycle, employing steam to drive

[1] 8.341 is a conversion factor with units (lb x L) / (mg x gallon x 10^6)

turbines connected to electric generators. Specifically, the Facility generates wastewater in the form of boiler blowdown, filter backwash, ion exchange water treatment system, and various floor drains. These wastestreams qualify as low volume waste sources as defined in the Steam Electric Power Generating ELG at 40 CFR 423.11(b).

The steam electric ELG contains limits for New Source Performance Standards (NSPS), Best Practicable Control Technology (BPT), Best Available Technology Economically Achievable (BAT), Pretreatment Standards for Existing Sources (PSES), and Pretreatment Standards for New Sources (PSNS). Because the steam electric power plant ELG was promulgated on September 30, 2015, a new source would be any steam electric power generating Facility that discharges pollutants, the construction of which started after September 30, 2015. The Facility commenced construction of the steam turbine referred to as Unit No. 8 in the early 1980s, and Unit No. 8 began discharging to Krause Creek in September of 1982. The Facility is therefore considered an existing rather than a new source for regulation per the ELG. The Facility is a point source discharge directly to Krause Creek, not an indirect discharge to a Publically Owned Treatment Works (POTW), therefore it is not regulated under PSES or PSNS.

As an existing source, the Facility is regulated under BAT and BPT. DEC compared the existing source performance standards, BAT and BPT, to each other and applied the more stringent technology level of control for each pollutant. The BAT effluent limits in the steam electric power plant ELG prohibit the discharge of PCBs, but do not otherwise regulate wastestreams that the Facility discharges, focusing on cooling tower blowdown and cooling water. BPT effluent limits also prohibit the discharge of PCBs, but contain limits for low volume waste sources, which are the Facility's primary wastestream. Table B-1 describes the BPT TBELs in detail.

Table B-1: Technology-Based Effluent Limits

(40 CFR §423.12, Best Practicable Control Technology Currently Available-BPT)

Parameter	Average Monthly Limit	Maximum Daily Limit	Range
Oil and grease	15 mg/L	20 mg/L	N/A
TSS	30 mg/L	100 mg/L	N/A
pH	N/A	N/A	6.0 – 9.0 Standard Units (SU)
PCBs	No discharge	No discharge	No discharge

B.2 Water Quality – Based Effluent Limitations

B.2.1 Statutory and Regulatory Basis

18 AAC 70.010 prohibits conduct that causes or contributes to a violation of the WQS. 18 AAC 70.090 requires that permits include terms and conditions to ensure criteria are met, including operating, monitoring, and reporting requirements. The regulations require the permitting authority to make this evaluation using procedures that account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant in the effluent, species sensitivity (for toxicity), and where appropriate, dilution in the receiving water body. The limits must be stringent enough to ensure that WQS are met and must be consistent with any available wasteload allocation (WLA).

While the Department was able to determine pollutants of concern using the monitoring results submitted with CEA's APDES application, the Department has not calculated WQBELs for those

pollutants that appeared to exceed WQS. The Department has chosen to require CEA to conduct further monitoring of pollutants of concern to build a robust data set that defines the variability of the pollutants in the effluent. This will allow the Department to conduct an accurate, statistically robust reasonable potential analysis during permit reissuance. A dataset of eleven Total Aromatic and Total Aqueous Hydrocarbons (TAH and TAqH) effluent sampling results exists, and illustrates that these pollutants have not been detected in the effluent when sampling has occurred twice per year for the past five years. End of pipe water quality criteria limits, which are WQBELs, have been assigned for pH, oil and grease, and temperature. TAH and TAqH will continue to be monitored twice per year to ensure there is no reasonable potential to exceed numeric WQS.

B.2.2 Specific Water Quality-Based Effluent Limits

B.2.2.1 pH

The criteria for water supply (aquaculture), water recreation (contact and secondary), and growth and propagation of fish, shellfish, other aquatic life, and wildlife found in 18 AAC 70.020(b)(6) are the most stringent WQS for pH. These standards state that fresh waters, "May not be less than 6.5 or greater than 8.5 pH units."

B.2.2.2 Oil and Grease

18 AAC 70.020(b)(5) specifies the WQS numeric criteria for "petroleum hydrocarbons, oils and grease" for fresh water uses. The criteria for water supply (aquaculture) and growth and propagation of fish, shellfish, other aquatic life, and wildlife are the most stringent WQS for oil and grease. These standards state that "Total aqueous hydrocarbons (TAqH) in the water column may not exceed 15 micrograms per liter (µg/l). Total aromatic hydrocarbons (TAH) in the water column may not exceed 10 µg/l. There may be no concentrations of petroleum hydrocarbons, animal fats, or vegetable oils in shoreline or bottom sediments that cause deleterious effects to aquatic life. Surface waters and adjoining shorelines must be virtually free from floating oil, film, sheen, or discoloration."

The WQS contains numeric criteria for TAH and TAqH. TAqH is defined as "collective dissolved and water-accommodated monoaromatic and polynuclear aromatic petroleum hydrocarbons that are persistent in the water column; does not include floating surface oil and grease". TAH is defined as "…the sum of the following volatile monoaromatic hydrocarbon compounds: benzene, ethylbenzene, toluene, and the xylene isomers, commonly called BTEX."

B.2.2.3 Temperature

18 AAC 70.020(b)(10) contains numeric temperature criteria to protect water supply uses (drinking, culinary and food processing). The criteria state that temperature "May not exceed 15°C." The Department applied the criteria directly as a limit in the permit, as was the case in the previous permit.

B.2.3 Selection of Most Stringent Limitations

B.2.3.1 pH

The permit's pH limit of a minimum of 6.5 SU and a maximum of 8.5 SU are identical to the more stringent WQS numeric criteria and shall apply at the end-of-pipe.

Table B-2: Selection of pH Permit Limits

Limit Type	Minimum Daily (SU)	Maximum Daily (SU)
Technology Based Limits	6.0	9.0
WQS Numeric Criteria	6.5	8.5
Selected Limits	6.5	8.5

B.2.3.2 Oil and Grease

The steam electric power plant ELG contains numeric limits for the discharge of oil and grease. The TBEL for oil and grease limits hexane extractable material, which includes relatively nonvolatile hydrocarbons, vegetable oils, animal fats, waxes, soaps, greases and related matter. The WQS for "petroleum hydrocarbons, oils and grease, for fresh water uses" contain numeric criteria for TAH and TAqH, as well as a narrative criteria that states "There may be no concentrations of petroleum hydrocarbons, animal fats, or vegetable oils in shoreline or bottom sediments that cause deleterious effects to aquatic life. Surface waters and adjoining shorelines must be virtually free from floating oil, film, sheen, or discoloration."

This WQS does not specify a numeric limit for oil and grease as limited by the steam electric power plant ELG, although it does contain a narrative criteria. The WQS limits additional hydrocarbon pollutants (TAH and TAqH) in a more stringent fashion than the TBEL. Because the Department is required to compare WQBELs to TBELs and select the most stringent effluent limits, the permit implements TBELs for oil and grease, but requires continued monitoring for TAH and TAqH to ensure the more stringent WQS numeric criteria continue to be protected. TAH and TAqH effluent limits are not implemented in the permit, because a robust dataset (both current and historical) exists illustrating that these pollutants are not present in detectable amounts in the effluent.

Table B-3: Selection of Oil and Grease Permit Limits

Limit Type	Average Monthly Limit	Maximum Daily Limit	Pollutant	Units
Technology-Based Effluent Limits	15	20	Oil and Grease	mg/L
WQS Numeric Criteria	N/A	10	TAH	µg/L
		15	TAqH	µg/L
WQS Narrative Criteria	There may be no concentrations of petroleum hydrocarbons, animal fats, or vegetable oils in shoreline or bottom sediments that cause deleterious effects to aquatic life. Surface waters and adjoining shorelines must be virtually free from floating oil, film, sheen, or discoloration.			
Selected Limits	15	20	Oil and Grease	mg/L
	9.11	12.14		lbs/day
	There may be no concentrations of petroleum hydrocarbons, animal fats, or vegetable oils in shoreline or bottom sediments that cause deleterious effects to aquatic life. Surface waters and adjoining shorelines must be virtually free from floating oil, film, sheen, or discoloration.			