No. 07-72420

UNITED STATES COURT OF APPEALS
FOR THE NINTH CIRCUIT

COOK INLETKEEPER, COOK INLET FISHERMEN'S FUND, NATIVE VILLAGE OF NANWALEK, NATIVE VILLAGE OF PORT GRAHAM, and UNITED COOK INLET DRIFT ASSOCIATION,

Petitioners,

v.

U.S. ENVIRONMENTAL PROTECTION AGENCY, and STEPHEN L. JOHNSON, Administrator of the U.S. Environmental Protection Agency,

Respondents,

and

UNION OIL COMPANY OF CALIFORNIA, and XTO ENERGY INC.,

Respondent-Intervenors.

PETITIONERS' OPENING BRIEF

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CORPORATE DISCLOSURE STATEMENT

Cook Inletkeeper, Cook Inlet Fishermen's Fund, and United Cook Inlet Drift Association have no parent corporations or publicly held corporations that own 10% or more of their respective stock.

The Native Village of Nanwalek and Native Village of Port Graham are tribal entities recognized by the United States.

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APA	Administrative Procedure Act
AR	Administrative Record
BAT	Best Available Technology Economically Achievable
CIGP	Cook Inlet General Permit
CV	Coefficient of Variation
CWA	Clean Water Act
DEC	Alaska Department of Environmental Conservation
ELG	Effluent Limitation Guidelines
EPA	U.S. Environmental Protection Agency and Administrator Stephen L. Johnson
ER	Excerpts of Record
$LTA_{a,c}$	Acute Long-Term Average Wasteload in Chronic Units
LTA_c	Chronic Long-Term Average Wasteload
NPDES	National Pollutant Discharge Elimination System
PAH	Polynuclear Aromatic Hydrocarbons
PE	Exhibits to Petitioners' Motion to Supplement the Administrative Record, to Require the Preparation of A Privilege Log, and for Alternative Relief (filed with the Court on October 8, 2008)
RMC	Reasonable Maximum Concentration
RPA	Reasonable Potential Analysis

RPMF	Reasonable Potential Multiplying Factor
RWC	Receiving Water Concentration
TAH	Total Aromatic Hydrocarbons
TAqH	Total Aqueous Hydrocarbons
TBEL	Technology-Based Effluent Limitation
TBPF	Trading Bay Production Facility
TSD	*Technical Support Document for Water Quality-Based Toxics Control*
WET	Whole Effluent Toxicity
WLA	Wasteload Allocation
WQBEL	Water Quality-Based Effluent Limitation
WQS	Water Quality Standards

JURISDICTIONAL STATEMENT

The Clean Water Act ("CWA") provides for "[r]eview of the Administrator's action . . . in issuing or denying any permit under section [402 of the CWA] . . . by any interested person in the Circuit Court of Appeals of the United States for the Federal judicial district in which such person resides or transacts business which is directly affected by such action." 33 U.S.C. § 1369(b)(1)(F). On June 14, 2007, Respondents U.S. Environmental Protection Agency and Administrator Stephen L. Johnson (collectively "EPA") reissued the *Authorization to Discharge Under the National Pollutant Discharge Elimination System (NPDES) for Oil and Gas Extraction Facilities in Federal and State Waters in Cook Inlet* ("Cook Inlet General Permit" or "CIGP") under section 402 of the CWA, *id.* § 1342(a)(1). On June 15, 2007, Cook Inletkeeper, Cook Inlet Fishermen's Fund, the Native Village of Nanwalek, the Native Village of Port Graham, and United Cook Inlet Drift Association (collectively "Inletkeeper") petitioned this Court for review of the Cook Inlet General Permit. The Court has jurisdiction to review this Petition for the following reasons: EPA issued the CIGP under section 402 of the CWA; Inletkeeper consists of "interested person[s]" that reside and transact business in the District of Alaska; Inletkeeper is directly affected by the CIGP; and Inletkeeper timely filed its petition. *Id.* § 1369(b)(1)(F).

STATEMENT OF THE ISSUES PRESENTED FOR REVIEW

1. Did EPA violate sections 401 or 402(o)(1) of the CWA, and its duties under the Administrative Procedure Act ("APA"), by allowing the "backsliding" of water quality-based effluent limitations when it reissued the CIGP without obtaining a lawful certification from the Alaska Department of Environmental Conservation ("DEC") that the CIGP will comply with the Alaska antidegradation policy?

2. Did EPA violate section 402 of the CWA, and its duties under the APA, by failing to incorporate technology-based effluent limitations into the CIGP that require the permit holders to install the "best available technology economically achievable" to control certain toxic pollutants?

3. Did EPA violate section 402 of the CWA, and its duties under the APA, by failing to include in the administrative record the computer modeling data on which it based the water quality-based effluent limitations in the CIGP?

4. Did EPA violate Section 402 of the CWA, and its duties under the APA, by failing to realistically model Cook Inlet so as to set water quality-based effluent limitations in the CIGP that meet all applicable water quality standards?

STATEMENT OF THE CASE

Inletkeeper seeks review of the Cook Inlet General Permit issued by EPA on June 14, 2007. ER 1-2. The CIGP permits oil and gas facilities in Cook Inlet, Alaska to discharge unlimited and increasingly polluted amounts of toxic pollution subject to less stringent pollutant limits than those in the previous permit. ER 332, 493-95. EPA's decision to reissue the CIGP is unlawful under section 402 of the CWA, 33 U.S.C. § 1342(a)(1), and violates its duties under the APA, 5 U.S.C. § 706(2). The Court must therefore hold the CIGP unlawful and set it aside. 5 U.S.C. § 706(2)(A), (D).

STATEMENT OF FACTS

Oil and gas facilities began discharging pollutants into Cook Inlet, Alaska in the 1960s. In 1979, EPA adopted Effluent Limitation Guidelines ("ELG"), pursuant to its duties under section 304(b) of the CWA, 33 U.S.C. § 1314(b), to limit pollution from these facilities based upon then-available technology. 44 Fed. Reg. 22069 (Apr. 13, 1979). EPA refers to the limits that it incorporates into CWA permits pursuant to the ELGs, or on a case-by-case basis where the ELGs are inapplicable, as technology-based effluent limits ("TBEL"). The 1979 ELGs prescribed the same pollutant limits for Cook Inlet as for all other locations in the U.S. that are in the "Coastal Subcategory" of the "Oil and Gas Extraction Point Source Category" of dischargers. *Id.* at 22077.

In 1996, EPA revised the ELGs for the "Coastal Subcategory" to prohibit all operators, except those in Cook Inlet, from discharging "produced water" and other waste streams. 61 Fed. Reg. 66086, 66127-29 (Dec. 16, 1996), *amended by* 62 Fed. Reg. 1680, 1681-82 (Jan. 13, 1997). Produced water is the mixture of water, oil, chemicals, and other pollutants pumped to the surface with oil and gas. 61 Fed. Reg. at 66097. It constitutes roughly 90% of the gross fluid produced by the Cook Inlet oil and gas facilities. The remaining production is comprised of oil and other waste streams such as drilling wastes and well treatment fluids. *See* ER 1 (listing the discharges covered by the CIGP).

The produced water discharged under the CIGP derives predominantly from "waterflood" operations through which the operators seek to achieve desired production levels by injecting Cook Inlet seawater into oil-producing formations, pumping it back to the surface with oil and other pollutants, removing as much of the pollutants as the CIGP requires, and discharging the polluted seawater (now classified as produced water) back into Cook Inlet. *See* ER 819 (discussing sources of produced water). Under the ELGs, "zero discharge" is the national standard for produced water, including for the rest of Alaska, except in Cook Inlet where oil and gas facilities are allowed to discharge produced water subject only to limits on the concentration of oil and grease.[1] 62 Fed. Reg. at 1681-82.

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[1] In revising the ELGs, EPA considered whether to require the Cook Inlet operators to reuse their produced water in their waterflood operations, thereby achieving zero discharge, but decided it would not be "economically achievable in Cook Inlet" because retrofitting the facilities would have adverse economic effects that "are significant and disproportionately worse than they are in the rest of the" United States. ER 817. Nonetheless, newer facilities in Cook Inlet have achieved zero discharge of produced water. *See* EPA, *NPDES Permit No. AK0053309* (not permitting discharge of produced water from the Osprey platform in Cook Inlet).

In 1999, EPA applied the 1996 ELGs to reissue the CIGP (EPA issued the first CIGP in 1986). Respondent-Intervenor Union Oil Company of California ("Unocal") generated roughly 95% of the discharge under the 1999 CIGP. *See* ER 493-94, 332 (indicating that produced water is the largest waste stream under the CIGP, and that the Unocal Trading Bay Production Facility discharges approximately 95% of permitted produced water). In Cook Inlet, produced water is the largest and fastest-growing waste stream, having nearly doubled since 1999 and projected to grow to 9,811,966 gallons *per day* under the CIGP. ER 493-94. The produced water discharged under the CIGP is a "toxic to moderately toxic" mixture of hydrocarbons, metals, and other pollutants. ER 332. As of 2002, the only year for which EPA provided such information, the 19 facilities covered by the CIGP annually discharged approximately 253 metric tonnes (279 tons, or 557,865 pounds) of oil and grease, 95% of which came from the Unocal Trading Bay Production Facility ("TBPF"). *Id.*

The Cook Inlet operators regularly violated each prior CIGP. They paid over $1 million to resolve thousands of alleged violations of the 1986 CIGP and paid hundreds of thousands of dollars to settle nearly 1,000 violations in just the first three years of the 1999 CIGP. Of the effluent limits in the 1999 CIGP, the facilities violated the produced water limits most often. ER 487.

In 2003, the Cook Inlet operators applied for a new CIGP that would permit them to discharge greater amounts of increasingly polluted produced water to accommodate levels of oil and gas production they desired.[2] *See* ER 664 (indicating that Unocal estimated increased produced water volume based on its assumptions of "future capital investment, well maintenance, waterflood, and production rate targets"), ER 689 (indicating that Unocal modeled increased produced water based on its assumption that "[p]roduction will be managed to maintain current production rates"). As the operators knew, accommodating these production levels would require the discharge of millions of additional gallons of produced water into Cook Inlet each day. ER 494-95.

On February 28, 2006, EPA issued the draft CIGP for public review and comment. 71 Fed. Reg. 10032, 10032 (Feb. 28, 2006). EPA closed the public comment period on May 31, 2006. 71 Fed. Reg. 20397, 20397 (Apr. 20, 2006). Nearly a year later, on May 18, 2007, the Alaska Department of Environmental Conservation ("DEC"), pursuant to its authority under section 401(a)(1) of the CWA, 33 U.S.C. § 1341(a)(1), certified that there was "reasonable assurance" that the CIGP will comply with applicable water quality standards ("WQS"). ER 65.

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[2] Under the CWA, National Pollutant Discharge *Elimination* System ("NPDES") permits – like the CIGP – are issued for a term of five years, but may be administratively extended, as EPA did for the 1999 CIGP. 40 C.F.R. § 122.46.

On June 14, 2007, EPA reissued the CIGP. ER 2. The new CIGP grants the operators most of the relaxed effluent limits and larger mixing zones they requested.[3] *Compare* ER 690 (applicants' requested mixing zones and dilution factors), *with* ER 74-76 (similar mixing zones and dilution factors). *See also* ER 218 (indicating that EPA set CIGP limits at applicants' maximum projected pollutant concentrations). In setting the TBELs in the CIGP, EPA refused to consider whether the Cook Inlet facilities could achieve zero discharge. ER 167. EPA did so despite the fact that toxic pollutants that were not addressed in the development of the 1996 ELGs – and still have not been addressed – now appear in the produced water under the CIGP, including the following: 1,2-dichlorobenzene; Acenapthene; Antimony; Arsenic; Chromium; Mercury; Selenium; Silver; Total Aromatic Hydrocarbons ("TAH"); and Total Aqueous Hydrocarbons ("TAqH"). *Compare* ER 235 (listing pollutants in produced water discharged from the Trading Bay Production Facility), *with* ER 827 (listing pollutants considered in adopting the 1996 ELGs). EPA also refused to limit the volume of the discharges and

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[3] Mixing zones are areas surrounding the discharge point in which a state allows its water quality standards to be violated. AR 10501. (Please note that Inletkeeper has cited a few documents to the Administrative Record because Inletkeeper omitted a few documents cited in this Brief from the Excerpts of Record due, in part, to the fact that Supplement I to the Administrative Record was not filed before the date this Brief was filed. Inletkeeper will file supplemental Excerpts of Record with its reply brief, if the documents are not included in the Respondents' Excerpts, and the Court does not request immediate supplementation).

relaxed – relative to the 1999 CIGP – water quality-based effluent limitations ("WQBEL") that apply to produced water for mercury, copper, TAH, TAqH, and Whole Effluent Toxicity ("WET"). *Compare* ER 790-92, *with* ER 30-33 (showing higher limits under the CIGP for these pollutants in the produced water at various facilities). The limits for these pollutants were not based on the ELGs. 40 C.F.R. §§ 435.42-435.47. They are, rather, WQBELs that EPA ostensibly set to protect Cook Inlet water quality, as required by section 301 of the CWA, 33 U.S.C. § 1311(b)(1)(C). ER 491-92.

DEC certified that the CIGP will comply with Alaska WQS even though DEC allowed mixing zones in which WQS may be exceeded that extend up to 3,644 meters, *or approximately 2.25 miles*, from the outfalls in any direction.[4] ER 74-75. These mixing zones are *80 to 1100 percent larger* than those under the 1999 CIGP. To determine the size of these mixing zones, and thus what portion of Cook Inlet could violate WQS, DEC used the EPA-approved "CORMIX" computer model to estimate the dilution of the discharge and determine the size of the mixing zones.[5] ER 69. EPA, in turn, relied on this modeling to identify which

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[4] The enlargement of mixing zones and corresponding weakening of WQBELs under the CIGP causes a corresponding increase in pollutant "loading" into Cook Inlet. *See* ER 175 ("The pollutant load contributed from produced water discharges in Cook Inlet has increased as oil and gas fields age and a greater volume of produced water may [be] generated.").

pollutants could cause or contribute to an exceedance of state or federal WQS and thus required WQBELs under section 301(b)(1)(C) of the CWA, 33 U.S.C. § 1311(b)(1)(C). ER 226. According to EPA, it conducted the process of determining the need for WQBELs – also called a Reasonable Potential Analysis ("RPA") under 40 C.F.R. § 122.44(d)(1) – as follows:

> For each parameter, the maximum *observed* effluent concentration was obtained from the NPDES permit application and effluent monitoring data. The maximum *potential* effluent concentration was then calculated based on the statistical distribution of the observed data. The *dilution factor* from the mixing zone analysis was then applied to the maximum potential effluent concentration to calculate the maximum potential concentration in the receiving water at the boundary of the mixing zone. Finally, this value was compared to the most stringent applicable water quality standard. If the concentration at the mixing zone boundary exceeds the standard, reasonable potential is shown and effluent limits for the parameter must be included in the permit.

Id. (emphasis added.)

Despite the unlimited and increasingly polluted discharge allowed under the CIGP, EPA claimed that the permit will have only "[l]ong-term minor adverse effects" on marine water quality, biological resources, and threatened and endangered species. ER 441-43. However, EPA based this conclusion largely on

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[5] CORMIX is a "software system for the analysis, prediction, and design of aqueous toxic or conventional pollutant discharges into diverse water bodies" that estimates the "geometry and dilution characteristics" of mixing zones based on information about the natural features and ambient conditions of the water body into which pollutants are proposed to be discharged. ER 829.

the absence of evidence, as opposed to evidence of absence, of such effects because "[l]ittle ambient data associated with oil and gas discharges in Cook Inlet presently exists." ER 301. Despite its assurance of "minor" impacts, EPA and other agencies have reported that the CIGP presents unknown environmental and human health risks to Inletkeeper and the public. For example, the U.S. Agency for Toxic Substances and Disease Registry has preliminarily concluded that polynuclear aromatic hydrocarbons ("PAH"), a component of oil and grease, "pose an *indeterminate* public health risk" for carcinogenic effects to consumers of Cook Inlet biota – like those represented by Inletkeeper – including fish, shellfish, and marine mammals. ER 366 (emphasis added). Additionally, EPA has reported that Cook Inlet Chinook salmon – an anadromous fish that provides subsistence, recreation, and livelihoods for Inletkeeper – carry high levels of PAHs. ER 365.

Notwithstanding the data gaps and evidence of risks from the pollutants discharged under the CIGP, EPA will fail to verify the requirements for effluent dilution on which it relies because EPA agreed not to require the industry dischargers to conduct a mixing zone verification study. *Compare* ER 535-36 (recommending revisions to produced water discharge study requirements because

"Industry does not want a mixing zone verification study, nor does EPA"), *with* ER 41 (study requirements).[6]

SUMMARY OF THE ARGUMENT

EPA has failed, in reissuing the Cook Inlet General Permit, to make reasonable progress toward eliminating the discharge of all pollutants, as section 301 of the Clean Water Act requires, 33 U.S.C. § 1311(b)(2)(A)(i). EPA has also failed to protect the water quality of Cook Inlet, as section 301 of the CWA requires, *id.* § 1311(b)(1)(C). EPA failed to do so, in part, by setting TBELs in the CIGP that do not require the "best available technology economically achievable" to control toxic pollutants. Furthermore, while EPA claimed to set WQBELs that control the pollution of Cook Inlet under "reasonable worst-case conditions," ER 497, EPA actually set *weaker* WQBELs in the CIGP than those in the prior permit by failing to realistically model the nature and dilution of the pollutant discharges into Cook Inlet.[7] As a result, the CIGP allows *millions* of additional gallons of

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[6] The Cook Inlet General Permit in the administrative record is missing page 48. ER 41-42. Supplement I to the record should contain the full permit.

[7] Inletkeeper refers to EPA for all the modeling and other decisions discussed in this Brief, even if actually performed by another agency or entity, because EPA relied on these decisions to carry out its mandate to ensure the sufficiency of the technology-based and water quality-based effluent limits in the CIGP. 33 U.S.C. §§ 1311(b)(1)(C), (b)(2)(A)(i). *See Natural Res. Def. Council v. EPA*, 279 F.3d 1180, 1186 (9th Cir. 2002) ("Under the CWA, the EPA has its own independent obligation to determine whether a permit will comply with the state's water quality standards.").

unlimited and increasingly polluted discharges to be discharged into Cook Inlet *each day*. Finally, in reissuing the CIGP, EPA failed to obtain a lawful certification that the CIGP and its weakened WQBELs would meet all applicable water quality standards, and failed to comply with its duties under the APA.

EPA violated the CWA and the APA in reissuing the CIGP. Section 402 of the CWA authorized EPA to issue a permit for the discharge of pollutants into Cook Inlet "upon condition that such discharge will meet . . . all applicable requirements under sections [301, 302, 306, 307, 308, and 403]" of the CWA. 33 U.S.C. § 1342(a)(1). Section 301 required the CIGP to require the installation of the "best available technology economically achievable" and include WQBELs that will meet all applicable WQS. *Id.* § 1311(b)(1)(C), (b)(2)(A)(ii). Sections 401 and 402(o)(1), moreover, requires EPA to obtain a valid certification from DEC that the permit will comply with the antidegradation policy of the Alaska WQS. EPA failed to meet these requirements, and in the process violated the APA. The Court must therefore hold unlawful and set aside the CIGP. 5 U.S.C. § 706(2).

ARGUMENT[8]

[8] In view of the complexity of the subject matter in this case, Inletkeeper respectfully direct the Court to two sources of useful information regarding the process of issuing Clean Water Act permits. First, EPA has placed a summary of the permitting process, titled "Water Permitting 101," on its website *at* http://www.epa.gov/npdes/pubs/101pape.pdf. Second, EPA has placed a more detailed primer, titled the "Permit Writer's Manual," on its website *at* http://cfpub.epa.gov/npdes/writermanual.cfm?program_id=45.

I. Standard of Review

Inletkeeper seeks judicial review of "[a]gency action made reviewable by statute" for which the APA provides the standard of review. 5 U.S.C. § 704. The APA provides that a

> reviewing court shall . . . hold unlawful and set aside agency action, findings, and conclusions found to be . . . arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law[,] . . . [or] without observance of procedure required by law.

5 U.S.C. § 706(2)(A), (D). According to the U.S. Supreme Court and this Court,

> [n]ormally, an agency rule would be arbitrary and capricious if the agency has relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise.

Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co., 463 U.S. 29, 43 (1983); *Natural Res. Def. Council v. EPA*, 526 F.3d 591, 602 (9th Cir. 2008). To decide whether agency action is "arbitrary and capricious," a court will "conduct a 'searching and careful inquiry into the facts,' carefully reviewing the record to ascertain whether the agency decision is founded on a reasoned evaluation of the relevant factors." *Inland Empire Pub. Lands Council v. Schultz*, 992 F.2d 977, 980 (9th Cir. 1993). *See Motor Vehicle Mfrs. Ass'n*, 463 U.S. at 43 ("[An] agency must examine the relevant data and articulate a satisfactory explanation for its action including a 'rational connection between the facts found and the choice made.'").

When interpreting a statute, a court may defer to an agency's interpretation *only* if all of the following requirements are met: First, the statute is ambiguous; second, Congress has explicitly or implicitly delegated authority to the agency to interpret the ambiguous provision; and third, the agency has interpreted the statute reasonably and consistent with congressional intent. *U.S. v. Mead Corp.*, 533 U.S. 218, 226-28 (2001); *Chevron, U.S.A., Inc. v. Natural Res. Def. Council*, 467 U.S. 837, 843 n.9 (1984). A court may defer to an agency interpretation of the agency's own regulation *only* if the regulation is ambiguous. *Christensen v. Harris County*, 529 U.S. 576, 588 (2000). Furthermore, agency interpretation of a statute or regulation that might otherwise qualify for deference, but which contradicts a prior interpretation by the agency, "merits little deference." *Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv.*, 524 F.3d 917, 928 (9th Cir. 2008).

If an agency uses a model – computer or otherwise – to predict the effects of a particular action, the model "may at some level make assumptions that are not perfectly consistent with natural conditions." *Am. Iron & Steel Inst. v. EPA*, 115 F.3d 979, 1004 (D.C. Cir. 1997). However, the "use of a model is arbitrary if that model 'bears no rational relationship to the reality it purports to represent.'" *Columbia Falls Aluminum Co. v. EPA*, 139 F.3d 914, 923 (D.C. Cir. 1998) (quoting *Am. Iron & Steel Inst.*, 115 F.3d at 1005). *See Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, 508 F.3d 508, 534-35 (9th Cir. 2007) (holding the use of a model "arbitrary and capricious" for failing to account for the monetary benefits of reduced carbon emissions). Furthermore, if a model is challenged, the APA requires the agency to "provide a full analytical defense." *Id.* (internal quotation omitted). An agency is also due no deference due to its expertise if the agency "ignores its own statistical methodology." *Earth Island Inst. v. Hogarth*, 484 F.3d 1123, 1129 (9th Cir. 2007).

II. EPA Violated Section 401 and the "Anti-backsliding" Prohibition in Section 402(o) of the CWA by Weakening WQBELs in the CIGP and Failing to Ensure Compliance with Alaska's Antidegradation Policy

Section 402(o)(1) – which is the "Anti-backsliding" provision of the CWA – establishes an express statutory prohibition against the relaxation of WQBELs. WQBELs may only be relaxed if EPA meets the requirements of either sections 402(o)(2) or 303(d)(4), 33 U.S.C. §§ 1342(o)(2), 1313(d)(4). First, under section 402(o)(2), EPA may only weaken WQBELs if one or more of the following exceptions is met: (1) There have been material and substantial alterations or additions to the permitted facility that justify the relaxation; (2) good cause exists due to events beyond the permittee's control and for which there is not reasonably available remedy; (3) the permittee has installed and properly operated and maintained required treatment facilities but still has been unable to meet the permit limitations; or (4) new information (other than revised regulations, guidance, or test methods) justifies relaxation (this last exception only applies where the revised limitations result in a net reduction in pollutant loadings and are not the result of another discharger's such reduction). 33 U.S.C. § 1342(o)(2).[9] None of these exceptions apply here for the following reasons: First, the facilities have not been upgraded so as to create the situations described; second, the discharges under the CIGP will increase, not reduce, pollutant loadings; and third, good cause does not exist. Furthermore, EPA has included no support in the administrative record or made *any* attempt to establish these exceptions.

Second, under section 303(d)(4)(B) of the CWA, which applies to waters that are "attain[ing]" WQS, such as Cook Inlet, a less stringent WQBEL is only permitted if the revised limit is consistent with the antidegradation policy of the state in which the discharge will occur. *Id.* § 1314(d)(4)(B).

Finally, even if any of these backsliding exceptions are applicable and met, section 402(o)(3) acts as a floor and prohibits the relaxation of WQBELs in all cases if there will be a violation of applicable ELGs or WQS, including "antidegradation" requirements under 40 C.F.R. § 131.12.

In this case, EPA allowed "backsliding" of WQBELs in the CIGP for mercury, copper, TAH, TAqH, and Whole Effluent Toxicity. *Compare* ER 790-

[9] There are two other exceptions in section 402(o)(2), but they do not apply to WQBELs. 33 U.S.C. § 1342(o)(2).

92, *with* ER 30-33 (showing higher limits under the CIGP for these pollutants in the produced water at various facilities). Since EPA made no attempt to establish the exceptions in section 402(o)(2) and there is no support in the record for them, this backsliding can *only* be allowed if it is consistent with Alaska's antidegradation policy. 33 U.S.C. § 1342(o)(1).

Section 401 required EPA to obtain a certification from DEC that the CIGP "will comply with" Alaska WQS, including Alaska's antidegradation policy. 33 U.S.C. § 1341(a)(1). For DEC to provide such a certification, EPA regulations require Alaska's WQS to include an "antidegradation policy *and* identify the methods for implementing such policy." 40 C.F.R. § 131.12(a) (emphasis added). "While the term 'antidegradation' is not defined within the CWA, the policy's purpose is to ensure that '[e]xisting instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.'" *Snoqualmie Indian Tribe v. Fed. Energy Regulatory Comm'n*, 545 F.3d 1207, 1217 (9th Cir. 2008) (quoting 40 C.F.R. § 131.12(a)). An antidegradation policy and methods to implement the policy are thus essential to maintaining and protecting the water quality of Cook Inlet and to DEC's ability to certify compliance with Alaska WQS. *Id.* *See N.W. Envtl. Advocates v. EPA*, 268 F. Supp. 2d 1255, 1265 (D. Or. 2003) (holding that implementation methods are an essential part of an antidegradation policy).

The Alaska WQS include an antidegradation policy, but no methods to implement the policy. 18 AAC 70.015; PE 1 at 2, 4.[10] According to EPA, antidegradation implementation procedures identify "the steps and questions that *must* be addressed when regulated activities are proposed that may affect water quality." EPA, *What are Water Quality Standards?* (last visited Dec. 15, 2008) (emphasis added).[11] Notwithstanding this requirement, EPA has known for *over a decade* that Alaska has failed to adopt these methods. PE 1 at 2, 4.

When EPA discovered this fact, in 1997, it directed DEC to adopt implementation "procedures" for its antidegradation policy so as to "encourage consistent application of the antidegradation policy and provide guidance to EPA," and to "deter [DEC] from adopting implementation methods which undercut or reinterpret the State's antidegradation policy so as to render it, in practice, inconsistent with the requirements of section 131.12(a)." As EPA knows, DEC never fulfilled this requirement. ER 567. EPA nevertheless accepted DEC's certification that the CIGP complied with Alaska's antidegradation policy. The certification was not only legally flawed – and the CIGP and its backsliding therefore illegal – because DEC lacked *any* methods to implement the policy, but

[10] On October 20, 2008, the Court referred Inletkeeper's Motion to the panel that will decide the merits of this case. (Docket No. 25). Inletkeeper has therefore cited certain exhibits to this Motion, where necessary.

[11] *At* http://www.epa.gov/waterscience/standards/about/adeg.htm.

EPA *knew* that DEC's failure to adopt these procedures had denied Inletkeeper the right to fully participate in the certification of the CIGP.

When DEC circulated its draft 401 certification for public comment, Inletkeeper commented to EPA that the draft certification mentioned the word "antidegradation" only on its first page – and never again. ER 567. Indeed, the draft certification provided *no* antidegradation analysis. ER 666-76, 594-605. Inletkeeper commented that this was particularly troubling since the antidegradation analysis required for the CIGP was the most rigorous under the antidegradation standards (because Cook Inlet meets WQS) and required DEC to consider social and economic factors, among other things. ER 566; 40 C.F.R. § 131.12(a)(2); 18 AAC 70.015. DEC addressed *none* of these issues in its draft 401 certification. In fact, DEC denied Inletkeeper and the public any opportunity to comment on the analysis that it belatedly provided in the final 401 certification. *See* ER 77-81 (DEC providing its "Antidegradation Analysis" for the first and only time in the final certification).

For EPA to rely on the final 401 certification for the CIGP, it was required to confirm that DEC had met the express *and* implied requirements of section 401. In *City of Tacoma v. Fed. Energy Regulatory Comm'n*, 460 F.3d 53, 68 (D.C. Cir. 2006), the D.C. Circuit held that a permitting authority must confirm that a certifying state has followed the "procedures for public notice" required under section 401. Similarly, in this case, EPA was required to ensure that DEC had certified compliance with the Alaska antidegradation policy consistent with the requirements of its antidegradation procedures. EPA, however, knew that such confirmation was impossible because it *knew* that DEC lacked any procedures to implement the policy. Section 401 thus prohibited EPA from relying on DEC's 401 certification for the CIGP. Absent a lawful certification that the CIGP, including the weakened effluent limits, complied with Alaska's WQS, including the antidegradation policy, EPA was without authority to reissue the CIGP. 33 U.S.C. §§ 1341(a)(1), 1342(o)(1); *City of Tacoma*, 460 F.3d at 68. EPA therefore violated sections 401 and 402(o)(1) when it reissued the CIGP, 33 U.S.C. §§ 1341(a)(1), 1342(o)(1), and violated the APA because its decision was not in accordance with law and because it failed to satisfactorily explain its decision, 5 U.S.C. § 706(2)(A), (D).

III. EPA Violated Section 301(b)(2)(A)(i) of the CWA by Failing to Incorporate TBELs into the CIGP That Require the Installation of the Best Available Technology Economically Achievable

Section 301(b)(2)(A)(i) of the CWA required EPA to set TBELs in the CIGP that control pollutants at the level achieved by the "best available technology economically achievable" ("BAT"). 33 U.S.C. § 1311(b)(2)(A)(i). *See* ER 484 (identifying BAT as the basis for produced water oil and grease limits). BAT is the most stringent technology-based standard that applies to existing discharges.

33 U.S.C. §§ 1311(b)(2), 1314(b)(2); *Chem. Mfrs' Ass'n. v. Natural Res. Def. Council*, 470 U.S. 116, 118, 135 (1985); *Natural Res. Def. Council v. EPA*, 822 F.2d 104, 123 (D.C. Cir. 1987). Unlike other less stringent technology-based standards, it requires dischargers to achieve the treatment level of the best-performing facility in their category or class. *Chem. Mfrs' Ass'n.*, 470 U.S. at 155. It is thus essential to the ability of the CWA to "force" technological innovation so as to achieve Congress' goal of eliminating the discharge of pollutants. *Id.*; 33 U.S.C. §§ 1311(b)(2)(A)(i), 1251(a)(1).

Inletkeeper commented to EPA that the CIGP should incorporate TBELs that prohibit pollution or, in other words, require "zero discharge." ER 606-12, 563-65. In response, EPA claimed that it can only consider TBELs that are more stringent than the BAT effluent limitation guidelines ("ELG"), which EPA adopted pursuant to section 304 of the CWA, 33 U.S.C. § 1314(b)(2), if a discharge is not covered by the ELGs or "there is a discharge of pollutants that are not addressed in the development of the ELGs," citing 40 C.F.R. § 125.3. ER 167. EPA ultimately refused to set stricter TBELs, asserting that the "operators are specifically covered by the ELGs. Therefore, EPA does not have the flexibility to develop additional [TBELs] unless the [ELG] is revised." *Id.*

EPA's response, however, cites a regulation that actually authorizes EPA to impose TBELs "[o]n a case-by-case basis under section 402(a)(1) of the Act . . . to the extent that EPA-promulgated effluent limitations are *inapplicable*." 40 C.F.R. § 125.3(c)(2) (emphasis added). Thus, while EPA claimed it could not consider TBELs on a case-by-case basis, it actually *could* for pollutants that were "not addressed in the development of the ELGs." By failing to consider TBELs that require BAT for various pollutants that were not addressed in developing the ELGs, EPA failed to carry out its duties under section 301(b)(2)(A)(i) of the CWA.

The ELGs that apply to the produced water discharges under the CIGP seek to limit "oil and grease under BAT as an indicator pollutant controlling the discharge of toxic and nonconventional pollutants." 61 Fed. Reg. at 66098. EPA claimed when it adopted them in 1996 that "[i]t has been shown . . . that oil and grease serves as an indicator for toxic pollutants in the produced water wastestream, including phenol, napthalene, ethylbenzene, and toluene." *Id.* At the time EPA reissued the CIGP in 2007, however, certain toxic pollutants that were not considered in developing the ELGs had appeared in produced water under the CIGP, including the following: 1,2-dichlorobenzene; Acenapthene; Antimony; Arsenic; Chromium; Mercury; Selenium; and Silver. *Compare* ER 753-54, 235 (listing pollutants in TBPF produced water), *with* ER 827 (listing pollutants considered in adopting the 1996 ELGs).

EPA entirely failed to consider TBELs for these pollutants in the CIGP and failed to explain why the ELGs applied to these pollutants in light of section 125.3.

ER 167. EPA thus violated 40 C.F.R. § 125.3(c)(2), and therefore section 301(b)(2)(A)(i) of the CWA, by failing to set TBELs in the CIGP that require the "best available technology economically achievable" to control all pollutants. 33 U.S.C. § 1311(b)(2)(A)(i). In so doing, EPA also violated the APA because its decision was not in accordance with law and because EPA entirely failed to consider an important aspect of the problem and failed to articulate a satisfactory explanation for its action. *See Motor Vehicle Mfrs. Ass'n*, 463 U.S. at 43.

IV. EPA Violated Section 706(2) of the APA by Failing to Include *Any* CORMIX Results in the Administrative Record that Correlate to the Mixing Zones and Receiving Water Concentrations EPA Used to Determine Whether Pollutants Had Reasonable Potential to Violate WQS

The record does not include *any* CORMIX results that provide the receiving water concentrations ("RWC") of pollutants at the edges of the mixing zones that EPA and DEC specified in the Fact Sheet and 401 certification. *Compare, e.g.,* ER 640-63 (EPA administrative record CORMIX runs), *with* ER 498-99, 75-76 (Fact Sheet and 401 certification providing different mixing zones). The RWCs at these mixing zone boundaries are *essential* elements of the process of setting WQBELs in the CIGP because EPA determined which pollutants had reasonable potential to exceed WQS – and thus required WQBELs – by comparing the RWCs at the mixing zone boundaries to all applicable WQS. ER 226.

The CORMIX runs in the record provide *none* of the information on which EPA based these determinations, however. For example, the CORMIX results in the record for TAH in produced water from the Trading Bay Production Facility – with the required "diffuser" – show that the mixing zone boundary is approximately 19.4 meters. ER 642. This is indicated through two adjacent lines of data that show an "X" (distance from the outfall) of "17.67" meters and an "S" (dilution factor) of "1879.3" followed immediately by an "X" of "20.20" meters and an "S" of "2009.0." ER 642. Through these outputs, CORMIX indicates that an "X" of 19.4 meters (the mixing zone) with an "S" of 1970 (the dilution factor for TAH) occurred between the aforementioned lines of data. *Id.* *See* ER 235 (providing the dilution factor for TAH of "1970").

A mixing zone of approximately 19.4 meters for TAH in TBPF produced water is a far cry from the established mixing zone of 2,418 meters in the Fact Sheet and 401 certification.[12] ER 498, 75-76. As this example illustrates, therefore, EPA failed to provide *any* CORMIX results in the record that provide the essential elements – the RWCs and mixing zone boundaries – on which EPA determined which pollutants had reasonable potential to violate WQS (by comparing the RWC *at* the mixing zone boundary to all applicable WQS). The record therefore provides *no* support for the WQBELs in the CIGP, and EPA's decision to reissue the CIGP was therefore "arbitrary and capricious" under the

[12] It must also be noted that the Fact Sheet provides the mixing zone for TAH in TBPF produced water with a diffuser, but not the larger mixing zone without the diffuser. *Compare* ER 498, *with* ER 75-76.

APA. *Inland Empire*, 992 F.2d at 980 (requiring the record to demonstrate that "the agency decision is founded on a reasoned evaluation of the relevant factors").

V. EPA Violated Section 402 of the CWA by Failing to Realistically Model Cook Inlet So As to Set Water Quality-Based Effluent Limitations in the CIGP That Meet All Applicable Water Quality Standards

After the close of the public comment period for the CIGP and the 401 certification, DEC provided Inletkeeper with the CORMIX results that correlate to the receiving water concentrations and mixing zones in the Fact Sheet and 401 certification. Two sequential groups of CORMIX runs, dated March 9 and 10, 2006 (and June 27, 2006 for the existing TBPF outfall), many of which are the subject of Inletkeeper's Motion to Supplement the Administrative Record filed with the Court on October 7, 2008, provide the modeling and – in the second group of results – the precise RWCs and mixing zone boundaries cited in the Fact Sheet and 401 certification. *Compare* PE 29 (CORMIX results showing RWCs and mixing zones), *with* ER 498-99, 74-76 (Fact Sheet and 401 certification showing same RWCs and mixing zones). These two sequential groups of CORMIX runs are therefore apparently the basis for the Reasonable Potential Analysis and thus the subject of the discussion in this section of this Opening Brief.

Section 301(b)(1)(C) of the CWA required EPA to incorporate WQBELs in the CIGP, based on these CORMIX results, to meet all applicable WQS. 33 U.S.C. § 1311(b)(1)(C). Like TBELs, WQBELs "protect the public health or welfare, enhance the quality of water and serve the purposes of [the CWA]." *Id.* § 1313(c)(2)(A). They are thus essential to achieving the goal of the CWA to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." *Id.* § 1251(a).

EPA governs the process of determining the need for, and calculating, WQBELs under 40 C.F.R. § 122.44. Section 122.44(d)(1)(i) required EPA to set WQBELs in the CIGP that "control all pollutants or pollutant parameters . . . [that] are or may be discharged at a level which will cause, have the *reasonable potential* to cause, or contribute to an excursion above any State [WQS]." 40 C.F.R. § 122.44(d)(1)(i) (emphasis added). Section 122.44(d)(1)(ii), in turn, required EPA to adhere to the following requirements to determine which pollutants had "reasonable potential" to cause or contribute to an exceedance of WQS:

> [w]hen determining whether a discharge causes, has the *reasonable potential* to cause, or contributes to an in-stream excursion above a narrative or numeric criteria within a State water quality standard, the permitting authority shall use procedures which account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant or pollutant parameter in the effluent, . . . and where appropriate, the dilution of the effluent in the receiving water.

Id. at § 122.44(d)(1)(ii) (emphasis added). If a pollutant had "reasonable potential" to exceed WQS, EPA was required to set a WQBEL for that pollutant.

The EPA *Technical Support Document for Water Quality-Based Toxics Control* ("TSD") interprets and implements section 122.44. *See* ER 853-54 (setting out the requirements of section 122.44). The TSD prescribes a detailed process for determining which pollutants have reasonable potential to violate WQS and calculating necessary WQBELs. *See* ER 853-54, 873, 899 (introducing the three essential steps in the process of determining potential to violate WQS and setting WQBELs). Since its adoption in 1991, the TSD has provided "the most current procedural recommendations and guidance for identifying, analyzing, and controlling adverse water quality impacts caused by toxic discharges." AR 10504. *See Am. Iron & Steel Inst. v. EPA*, 115 F.3d 979, 1001 (D.C. Cir. 1997) (citing the TSD as evidence of consistent EPA practice in determining reasonable potential to exceed WQS). Consequently, EPA claimed to follow the TSD in performing the Reasonable Potential Analysis for the CIGP. ER 226.

The TSD required EPA to undertake a series of three steps to perform the RPA and calculate WQBELs. First, EPA was required to calculate *estimated* maximum pollutant concentrations, or "reasonable maximum concentrations" ("RMC") as EPA called them, based on a statistical methodology that required EPA to account for "existing controls" on pollutants and the "variability of the pollutant[s]" in the effluent. 40 C.F.R. § 122.44(d)(1)(ii); ER 853-72. Second, EPA was required to determine if the discharge could violate WQS by comparing the concentration of each pollutant in the "receiving water" – the "receiving water concentration" – to applicable WQS in a manner that accounted for "the dilution of the effluent" in the mixing zones that DEC allowed for the CIGP. 40 C.F.R. § 122.44(d)(1)(ii); ER 873-98. Third, EPA was required to calculate WQBELs that were "derived from" and ensured compliance with "all applicable" WQS. 40 C.F.R. § 122.44(d)(1)(vii); ER 899-927.

EPA violated the CWA and the APA in conducting each of these steps.

A. EPA violated 40 C.F.R. § 122.44(d)(1)(ii) by failing to calculate estimated maximum pollutant concentrations that accounted for existing controls and the variability of the pollutants in the effluent

Estimating maximum pollutant concentrations is an essential step in the RPA process because it provides the basis for the subsequent steps in the RPA and because WQBELs often directly correlate to the estimated maximum pollutant concentrations, as many do in the CIGP. *See* ER 218 (EPA indicating that it set daily effluent limits at the calculated maximum pollutant concentrations for "pollutants with extended monitoring" data). *Compare* ER 234 (providing "Projected Maximum (ug/L) [microgram per liter]" concentrations in produced water discharges for [TAH], copper, and zinc), *with* ER 30 (providing similar daily maximum CIGP limits for these pollutants). If EPA inflates the estimated concentrations, EPA inflates the WQBELs, and more pollution – often much more – is discharged. Consequently, the TSD seeks to minimize uncertainty in estimating RMCs by requiring EPA to use *all* available, statistically-reliable information to calculate the RMCs. *See* ER 858 (describing the "ideal" situation as that with "minimal" uncertainty).

Section 122.44 and the TSD required EPA to "project receiving water concentrations [of discharged pollutants] based upon *existing effluent quality* to determine whether or not an excursion above ambient [water quality] criteria occurs, or has the reasonable potential to occur." ER 854 (emphasis added). Specifically, EPA was required follow a statistical methodology to estimate RMCs that required EPA to do the following: (1) Use all available, statistically-reliable[13] information and effluent data; (2) use actual samples of existing effluent quality; and (3) eliminate statistical outliers from the effluent samples.

EPA violated each of these requirements and the APA in estimating maximum pollutant concentrations for the CIGP.

1. EPA failed to use all available, statistically-reliable information

The statistical methodology in the TSD required EPA to estimate RMCs using all available, statistically-reliable information about existing effluent quality in recognition of the fact that maximum information provides the water quality protection envisioned by the CWA, especially for facilities with a long history of

[13] Statistically reliable means that EPA must disregard statistical "outliers," or extraordinarily clean or polluted effluent samples. *See, infra,* § V.A.2.

effluent data. *See* ER 858 (recommending that EPA use "any available effluent monitoring data"). Statistical certainty is particularly important for aging facilities with a history of effluent data – like those in Cook Inlet – because these facilities are often less efficient at removing pollutants, and the historical data helps assure certainty in effluent calculations.

In requiring EPA to use all available, statistically-reliable data, the TSD implements 40 C.F.R. § 122.44(d)(1)(ii), which requires EPA to use all available information to account for existing controls on pollution and the variability of the pollutants in the effluent:

> [T]he permitting authority *must* evaluate all available information to determine at what level pollutants are expected to exist in the current discharge. This determination is governed by 40 C.F.R. § 122.44(d)(1)(ii).

PE 3 at 3 (emphasis added).[14] In other words, section 122.44 required EPA to use all available information to estimate the RMCs.

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[14] EPA reiterated this interpretation of section 122.44 when it explained its Water Quality Guidance for the Great Lakes System:

> When determining whether a discharge causes, has the reasonable potential to cause, or contributes to an excursion above any State or Tribal water quality standard, the permitting authority *must* use all relevant available data, including facility-specific effluent monitoring data where available.

EPA, *Water Quality Guidance for the Great Lakes System: Supplementary Information Document (SID)* § VIII.E.1. (Mar. 1995) (emphasis added); *Am. Iron & Steel Inst.*, 115 F.3d at 999.

Under the statistical methodology in the TSD, failure to consider all available information inflates estimated pollutant concentrations and directly weakens WQBELs, as it did in the CIGP. The "statistical approach" in the TSD "combines knowledge of effluent variability as estimated by a coefficient of variation with the uncertainty due to a limited number of data points, in the form of discharge monitoring reports, to project an estimated maximum concentration for the effluent." *AR* at 10557. In this case, the extended term of the 1999 CIGP was 247 weeks, which means for limits requiring weekly sampling, 247 data points for pollutants requiring weekly sampling were available, and approximately 49 monthly data points were available, which are sample sizes that increase certainty for the statistical analysis. "EPA's review of the uncertainty associated with effluent variability suggests that a minimum of 10 samples is needed to reasonably quantify the [coefficient of variation]. *AR* at 10612. An essential variable in the statistical calculation is the coefficient of variation ("CV"), which in turn dictates the Reasonable Potential Multiplying Factor ("RPMF") that determines precisely how inflated the estimated RMC will be. For example, for a sample size of 1, which is less than 10, the TSD directs EPA to use a default CV of 0.6. *AR* at 10558. If EPA uses the default CV and one sample to estimate an RMC that has a 99% confidence level of not being exceeded,[15] the RPMF is 13.2. *AR* at 10559.

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[15] This statistical and mathematical problem is compounded by the use of a

For a sample size of more than 10, on the other hand, the CV is determined by a statistical calculation, but even if the CV is 0.6, the RPMF is significantly smaller: 3.0. *Id. See also* AR at 22815-23 (showing the number of samples used for the RPA), 25706-13 (showing the resulting RPMFs in the RPA). Thus, to put it simply, as the number of samples used in the statistical analysis decreases, the RMC rises and the WQBEL becomes less stringent. *See AR* at 10612; 25661 ("EPA agrees that the increase in [mixing zone] size is due, in part, to the maximum reasonable concentration and discharge rate approach used by [DEC] to develop the mixing zones.").

Notwithstanding the TSD and 40 C.F.R. § 122.44(d)(1)(ii), EPA failed to use "all available information" to estimate RMCs for various facilities and pollutants under the CIGP. In fact, EPA used single samples to estimate the RMCs for most pollutants at most facilities, ER 227, 691-99,[16] despite having hundreds of effluent samples available under the 1999 CIGP, *see* ER 790, 801 (providing discharge reporting requirements). As a result, the WQBELs in the CIGP are higher – that is, less stringent – than they would have been had EPA followed the

higher confidence level: "As the probability basis for the permit limits expressed in percentiles (e.g., 95 percent and 99 percent) increases, the value for the permit limits increases (becomes less stringent)." ER 911-12 (Figure 5-6). Thus, there are two factors in the equation that make the permit limits in the CIGP less stringent.

[16] EPA also failed to consider any samples after 2003, thereby ignoring over 3 years of data. ER 196, 226.

methodology in the TSD. When confronted by Inletkeeper on this issue, EPA could only defend itself with the following conclusory statement:

> EPA acknowledges that [the RPMFs in the CIGP RPA] do not incorporate all of the [available] effluent data . . . . EPA has, however, determined that the multipliers are a reasonable approximation particularly for parameters with extended long-term monitoring data.

ER 227. EPA did not further explain this statement. In reissuing the CIGP, therefore, EPA failed to consider all available information and estimated maximum pollutant concentrations that are more polluted than the actual effluent samples from the facilities. EPA consequently set WQBELs that are less stringent than EPA would have set under 40 C.F.R. § 122.44(d)(1)(ii) and the TSD. EPA therefore failed to account for existing controls on the effluent and the variability of the pollutants in the effluent, and took action that was not in accordance with law, entirely failed to consider an important aspect of the problem, and failed to satisfactorily explanation its actions.

2. EPA failed, in at least one instance, to eliminate a statistical outlier from the sampling data on which it estimated maximum pollutant concentrations

To avoid skewing the RMCs upward or downward, the TSD also directs EPA to eliminate statistical "outliers" – extraordinarily clean or polluted effluent samples – from the RMC calculations. *See* ER 962 (referring to W. Mendenhall, *et al., Mathematical Statistics with Applications* (2d ed. 1981)). EPA disregarded this methodology, however, and identified the *measured* maximum concentration of

TAH in TBPF produced water as 16,420 ug/L ("ug/L"). ER 235.[17] The TSD required EPA to perform a simple statistical calculation to assign a "z-score" to each available sample to identify those samples that were statistical outliers that must be disregarded in the calculation of the RMC. *See* ER 962 (referring to W. Mendenhall, *et al.*). A z-score simply measures how far a particular value is from the mean value. *Id.* It is calculated by subtracting the mean pollutant concentration in all the samples from the pollutant concentration in the sample in question and dividing the total by the standard deviation. *Id.* Calculated in this way, the z-score for TAH at TBPF is 3.4. *See* ER 697 (providing the mean, standard deviation, and measured maximum concentration of TAH for TBPF produced water which, if you calculate pursuant to the methodology prescribed in the TSD, yields a z-score of 3.4). It is thus an obvious outlier that EPA was required to eliminate from its calculation of the RMC.

The failure by EPA to disregard this value is particularly troubling because the mixing zone for TAH from the TPBF – the facility that generates approximately 95% of the produced water discharged under the CIGP – is the *largest* under the CIGP based on the miscalculation of this *estimated* maximum

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[17] EPA, in fact, acknowledged that it failed to disregard outliers, noting that "EPA sometimes allows removing obvious outlier data, but that step was not taken in this analysis." AR 22554. This fails to follow the methodology prescribed in the TSD, which *requires* EPA to disregard outliers. *See* ER 962 (referring to W. Mendenhall, *et al.*).

concentration of TAH by EPA. *See* ER 235 (calculating the "Projected Maximum" concentration of 19,704 ug/L for TAH based on the measured maximum concentration of 16,420 ug/L), ER 645 (CORMIX run indicating that EPA modeled an RMC of 19,704 ug/L for TAH, which is indicated by the notation that "C0 =0.1970E+5" and CUNITS= ppb"), ER 33 (showing daily maximum limit of 27 mg/L, which equals *27,000 ug/L*), ER 75 (showing the mixing zone of 3,644 meters for TAH at the TBPF). By failing to eliminate this value, EPA inflated the RMC and the resulting WQBEL, and allowed more pollution to be discharged into Cook Inlet. EPA thus failed to consider existing controls on the effluent, took action that was not in accordance with law, relied on a factor that Congress did not intend for it to consider, and failed to articulate a satisfactory explanation for its action.

3. <u>EPA, in at least one instance, fabricated a measured maximum pollutant concentration in calculating its estimated maximum pollutant concentrations</u>

As discussed above, the TSD and section 122.44 required EPA to estimate RMCs based on "existing effluent quality." ER 854. 40 C.F.R. § 122.44(d)(1)(ii). EPA inflated at least one RMC for the CIGP by using a fabricated measured maximum concentration of 103 ug/L for copper[18] in TBPF produced water. ER

[18] Copper is particularly important in the calculation of TBPF produced water WQBELs because the "dilution factor" for copper – that is, the number of times that TBPF produced water would need to be diluted with an equivalent amount of unpolluted water in order for copper to meet its acute WQS – was used

235. This concentration is *nearly 10 times higher* than the actual *measured* maximum concentration of 11 ug/L for copper. ER 697. Accordingly, it inflated the RMC by a corresponding amount, causing EPA to calculate an RMC for copper of *206 ug/L*, rather than the 22 ug/L that EPA would have calculated from the actual measured maximum concentration. ER 235. As a result, EPA set a monthly WQBEL of 47 ug/L and a daily WQBEL of 117 ug/L for copper, both of which exceeded the highest *measured* concentration of copper by *a multiple of at least 4*. ER 33. EPA failed to explain its use of this fabricated value in its RMC calculations, and thus failed to account for existing controls on this pollutant. In committing this error, furthermore, EPA acted in a manner that was not in accordance with law, relied on a factor that Congress did not intend for it to consider, entirely failed to consider a factor it *should* have considered, and failed to articulate a satisfactory explanation for its action.

4. <u>Conclusion</u>

EPA claimed to have set WQBELs in the CIGP that protect the water quality of Cook Inlet under "reasonable worst-case conditions." ER 497. EPA, however, failed to consider the "existing controls" on the discharges and "the variability of the pollutant[s]" in the effluent, as 40 C.F.R. § 122.44(d)(1)(ii) and the TSD

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for the RPA calculations for all other metals because it had the strictest dilution requirement. *See* ER 237 (explaining "driver" parameters).

required, by failing to use all available, statistically-reliable information, failing to eliminate outliers from its calculations, and fabricating an extraordinarily high pollutant concentration for copper in TBPF produced water. These failures inflated the RMCs and resulted in less stringent WQBELs for many pollutants. *See* ER 237 (EPA indicating that it set WQBELs at the estimated maximum pollutant concentrations for certain pollutants). In calculating the RMCs, therefore, EPA violated 40 C.F.R. § 122.44(d)(1)(ii), and thus the requirement under section 301(b)(1)(C) of the CWA that EPA set WQBELs in the CIGP that meet all applicable water quality standards, 33 U.S.C. §1311(b)(1)(C). EPA also acted arbitrarily and capriciously under the APA by entirely failing to consider important aspects of the problem, relying on factors that Congress did not intend for it to consider, and failing to articulate satisfactory explanations for its actions. 5 U.S.C. § 706(2)(A), (D); *Motor Vehicle Mfrs. Ass'n*, 463 U.S. at 43; *Natural Res. Def. Council*, 526 F.3d at 602; *Hogarth*, 484 F.3d at 1129.

B. *EPA violated 40 C.F.R. § 122.44(d)(1)(ii) by failing to account for the dilution of the effluent in the receiving water in determining whether the discharge had reasonable potential to exceed water quality standards*

The second step in the RPA process required EPA to determine if the receiving water concentration ("RWC") of each pollutant, based on the inflated RMCs, would meet all applicable WQS at the edges of the mixing zones. *See* ER 690 (mixing zone application), ER 226 (describing the RPA process). The

CORMIX results that EPA failed to include in the record – but which are discussed here – undercut its claim to have used CORMIX because it is "more conservative" than the PLUMES model used for the prior permit, ER 497, and undercut its claim to have used *more* data, including "site-specific current, temperature, and salinity data[,] to more accurately reflect the dispersion of pollutants" in the mixing zones, ER 69. EPA did no such thing. In fact, EPA used CORMIX to *fabricate* and *omit* critical conditions in Cook Inlet to make the pollutants appear as if they dispersed more rapidly than in reality, and thus could meet their WQS at the edges of the mixing zones requested by the dischargers.

After EPA calculated the RMCs in the first step of the RPA process, the TSD required EPA to determine the receiving water concentration of each pollutant at the appropriate mixing zone boundary. This step was essential to the RPA process because it was precisely where EPA made the fundamental determination whether a pollutant needed a WQBEL. Put simply, EPA had to compare the RWC to all applicable WQS at the edges of the mixing zones – in a manner that accounted for "the dilution of the effluent" in Cook Inlet – so as to determine which pollutants had "reasonable potential" to exceed WQS and thus required a WQBEL. 40 C.F.R. § 122.44(d)(1)(ii); ER 873-98. EPA failed to execute this methodology.

The relevant CORMIX results that are the subject of Inletkeeper's Motion to Supplement the Administrative Record indicate that EPA committed the following deliberate errors in modeling the RWCs and mixing zone boundaries: (1) EPA failed to model the actual outfall configurations of the TBPF and certain surface discharges; (2) EPA failed to model the discharges as toxic and failed to model the *actual* reasonable maximum concentrations it calculated; (3) EPA failed to model Cook Inlet as an estuary; and (4) EPA failed to model the "critical design" periods for estuaries *or* oceans. In committing each of these errors, EPA violated its duties under the APA.

1. EPA failed to model the actual outfall configurations of the TBPF and certain surface discharges

The existing TBPF outfall has two ports – or discharge points – through which the facility discharges its effluent. *See* ER 765 (depicting T-shaped TBPF outfall). When EPA modeled the estimated discharge through this outfall, the results showed that the effluent plume descended rapidly to the bottom of Cook Inlet, significantly reducing the dispersal of the effluent and posing a risk of contamination of bottom-dwelling organisms and bioaccumulation of pollutants through the consumption of these organisms by predators across the food web. *See* PE 14, 16, 17 (CORMIX results indicating "[b]ottom-attach[ment]," "plume becomes attached to the channel bottom," or other indication of bottom attachment and the resulting risk of "[h]igh benthic concentrations" of pollutants). EPA never ran the model again to determine the causes of these problems or to set appropriately protective WQBELs. Instead, EPA changed the outfall configuration to a single-port outfall with a smaller port than the *two* actual ports, thereby changing the trajectory of the discharge, increasing its velocity, and making the bottom contact and its attendant environmental risks disappear. *Compare* PE 24 (indicating that EPA modeled the TBPF outfall as if it had a single "0.36 [meter]" port), *with* ER 765 (indicating that the actual outfall size is made up of two 16" [0.41 meter] ports). EPA thus modeled the TBPF outfall under a fictional scenario that bears no relationship to reality and hid the effects of limited dilution, benthic impacts, and bioaccumulation, all without satisfactory explanation.

EPA also modeled the "generalized surface discharges" under the CIGP in a similarly unrealistic fashion. Various discharges under the CIGP come from outfalls located above the surface of Cook Inlet. EPA included the "Chemically Treated Miscellaneous Discharges" from Platforms Anna, Dolly Varden, Granite Point, Grayling, King Salmon, and Monopod in this category. ER 501-05. Though CORMIX is designed to model such surface discharges, ER 839, 705, EPA accepted, without verification or support, the operators' assertion that the model results for these discharges were somehow not "entirely plausible," ER 705. EPA thus allowed the applicants to model the discharges as if they originated from beneath the surface. ER 501-05. EPA explained this decision by saying that this manipulation was "[b]ased on suggestions from Robert Doneker, a co-developer of the CORMIX model." ER 502. However, nothing in the record reflects that EPA or anyone else informed Mr. Doneker that EPA had failed to model the "critical conditions" of tidal reversal and slack tide in Cook Inlet, *see infra* § V.B.3, 4, or that the actual discharges might have resulted in bottom contact (which is unknown since EPA never provided the supposedly implausible model results). Mr. Doneker's recommendation therefore may not have been fully informed. Thus, in modeling the existing TBPF outfall and the "Chemically Treated Miscellaneous Discharges," EPA failed to account for the dilution of the effluent in the receiving water. Additionally, in committing this error, EPA failed to act in accordance with law, failed to model conditions that bear a rational relationship to reality, entirely failed to consider an important aspect of the problem, relied on a factor that Congress did not intend for it to consider, and failed to satisfactorily explain its actions.

2. EPA failed to model the discharges as toxic and failed to model the *actual* estimated maximum pollutant concentrations

As noted in the Statement of Facts, the produced water discharges under the CIGP are "toxic to moderately toxic." ER 332. Notwithstanding this fact, in the first group of model runs on which EPA relied, it failed to enter into the model that the discharge was toxic, despite being prompted by CORMIX to do so. *See, e.g.,* PE 30, 39, 40 (indicating that the discharge has not been entered as toxic through notations that "NTOX = 0"). Among other effects of this decision, EPA thus eliminated the ability of CORMIX to properly account for toxicity in determining the dilution of the effluent. *See* ER 829, 831 (indicating that CORMIX emphasizes the "initial mixing zone" in which acutely toxic pollutant concentrations must be avoided). EPA failed to explain its decision.

In the second group of model runs on which EPA relied (that is, those that relied on the outputs of the aforementioned group of model runs and provided the actual RWCs and mixing zones specified in the Fact Sheet and 401 certification), EPA again modeled the discharges as non-toxic, but also made the run nonsensical by modeling the pollutant concentrations as 100 percent. *See, e.g.,* PE 29 (CORMIX model runs "TBPF diffuser (015) 03.09.06.prd" and "TBPF existing (015) 03.09.06.prd" indicating effluent concentrations of 100 percent through notations that "C0 =0.1000E+03" and "CUNITS= %"). This value is not even a relevant pollutant concentration and bears no rational relationship to the estimated maximum pollutant concentrations (RMCs) calculated by EPA in step one of the RPA process. It is therefore meaningless in the context of CORMIX because it fails, among other things, to indicate the magnitude of the discharge. *See, e.g.,* ER 235 (estimating a maximum pollutant concentration for TAH at the TBPF as 19704 ug/L). EPA used this bogus concentration for TAH at *all* facilities. Thus, in modeling the produced water discharges for the CIGP, EPA not only failed to account for existing controls on the effluent and the dilution of the effluent in the receiving water, but EPA also took action that was not in accordance with law, failed to model conditions that bear a rational relationship to reality, entirely failed to consider an important aspect of the problem, relied on a factor that Congress did not intend for it to consider, and failed to satisfactorily explain its actions.

3. <u>EPA failed to model Cook Inlet as an estuary</u>

Cook Inlet is plainly a tidal estuary. ER 314, 315, 323. Despite this fact, EPA purported to model it as an ocean, which it sought to rationalize by deferring to a draft response to comments by DEC that posited that it is "a matter of opinion as to whether Cook Inlet should or should not be considered an estuary." ER 545. This statement ignored myriad documents in the record, including EPA documents, that define Cook Inlet as having the characteristics of a "tidal estuary," including the "main channel reversing flow" with "differences in tides, riverine input, wind intensity and direction, and thermal and saline stratification" that together create the "complex circulation patterns" of an estuary. ER 880, 314-15, 323.

According to documents in the record, Cook Inlet has a main channel that flows into lower Cook Inlet, bifurcates at Kalgin Island, and gives way to the shallow river deltas of upper Cook Inlet. ER 767-77. Its tides reverse flow four times a day within a "sizable tidal range" that is "its main surface circulation driving force." *E.g.,* ER 315, 323, 77. Riverine input is a primary driver of its circulation patterns and "significantly" affects its thermal and saline stratification. ER 314, 323, 77. Moreover, "wind-driven waves and currents" affect the dilution of man-made substances in Cook Inlet. ER 323. It is therefore, as EPA recognizes, a "tidal estuary." ER 314. EPA nonetheless inexplicably failed to model Cook Inlet as an estuary. In so doing, furthermore, EPA failed to model the necessary estuarine conditions of tidal reversal, including slack tide and tidal reflux, that reduce available dilution in Cook Inlet, and *even failed to properly model Cook Inlet as an ocean.*

a. EPA failed to model tidal reversal

The TSD stresses the importance of modeling the "tidal nature" of estuaries because tidal activity impacts the dilution of polluted effluent. ER 880. *See* ER 867 (indicating challenges of modeling estuaries). Inletkeeper commented that EPA was required to model this aspect of Cook Inlet hydrology in order to account for the dilution of the effluent. ER 125. EPA, however, ignored Inletkeeper and the TSD, and inexplicably modeled Cook Inlet as if it was a river – *a nonexistent condition for an estuary or ocean* – with the tide flowing out at all times. PE 10 (simulating Cook Inlet currents as having all positive tides).[19] *See also* ER 702

[19] PE 10 provides the current speeds and directions modeled for the CIGP. It is a simple document that appears complicated at first glance. It consists of three separate sets of lists of current speeds that reflect, in reverse chronological order, the process by which EPA simulated the currents for the CIGP. The last 4 pages provide two parallel lists of actual currents recorded at Nikiski, Alaska for spring

(indicating that EPA agreed not to model tidal reversal). In short, EPA failed to model tidal reversal and, in so doing, failed to account for the dilution of the effluent in the receiving water, took action that was not in accordance with law, failed to model conditions that bear a rational relationship to reality, entirely failed to consider an important aspect of the problem, relied on a factor that Congress did not intend for it to consider, and failed to satisfactorily explain its actions.

b. EPA failed to model slack tide

The TSD specifies that slack tide – the period of least tidal movement at and around the time of tidal reversal – represents the "critical design" period of "lowest dilution" that must be modeled for estuaries like Cook Inlet that are stratified – have more than one horizontal layer in the water column – due to thermal or saline variation. ER 880. Inletkeeper commented that EPA was required to model this aspect of Cook Inlet hydrology. ER 139, 142. EPA ignored slack tide, however, asserting simply that the CORMIX model "terminate[d] after the plume travel[ed] a short distance." ER 541. EPA never conducted additional model runs to determine why the model terminated in this fashion, and EPA failed to provide

("Greatest") and neap ("Smallest") tide conditions. PE 10 at 9-12. The middle 4 pages provide three parallel lists comprised of the Nikiski spring ("High") and neap ("Low") tide currents *converted to all positive tides* (that is, the tide flows out at all times) with a third list ("Composite") that averages the now-all-positive spring and neap tide currents. PE 10 at 5-8. The first 4 pages, finally, list the all-positive "Composite" currents under column "y" alongside the percentile rankings for each current under column "pi." PE 10 at 1-4. It is these final – and unrealistic – current speeds that EPA used for the CIGP.

model runs to corroborate this problem. *Id.* This failure is particularly troubling because CORMIX generally terminates in this fashion only after indicating that there are problems with the ability of the receiving water to dilute the effluent, and providing corrective recommendations, or after indicating that CORMIX cannot project the dilution of the discharge due to unpredictable conditions.[20] As a result, by failing to model slack tide, EPA failed to account for the dilution of the effluent in the receiving water, took action that was not in accordance with law, failed to provide evidence in the record to support its claims, failed to model conditions that bear a rational relationship to reality, entirely failed to consider an important aspect of the problem, and failed to articulate a satisfactory explanation for its actions.

c. EPA failed to model tidal reflux

Tidal reflux is the mixing of the effluent plume with inadequately mixed, and thus more polluted, receiving waters when the tide reverses direction. It reduces dilution by increasing the concentration of pollutants in the receiving water. In other words, as the tide flows in and out of Cook Inlet, the facilities often discharge their pollutants into their own effluent plumes. *See* AR Supp. I 677 (indicating that the assumption of "steady-state ambient conditions" does not apply to "highly unsteady tidal reversing flows"). Inletkeeper commented that EPA was

[20] Inletkeeper notes that the CIGP administrative record contains no CORMIX "recommendation" [.rec] files that CORMIX is designed to generate in response to problematic model runs.

required to model this aspect of Cook Inlet hydrology. ER 157. EPA claimed that it considered, but chose not to analyze, tidal reflux because "Cook Inlet is a very dynamic water body, and because of the tremendous tidal exchange volumes." ER 541. This is specious logic that defied the TSD, which directed EPA *not* to assume that the dynamic nature of Cook Inlet would cause the effluent to be rapidly diluted. *See* ER 880 (indicating that dynamic water bodies "require that direct, empirical steps be taken to ensure that basic dilution characteristics of a discharge to salt water are determined"). EPA thus ignored the TSD and *assumed* – without modeling – that tidal reflux would not matter, and consequently failed to model this essential aspect of Cook Inlet hydrology, all without satisfactory explanation.[21] In failing to model tidal reflux, therefore, EPA failed to account for the dilution of the effluent in the receiving water, took action that was not in accordance with law, failed to model conditions that bear a rational relationship to reality, entirely failed to consider an important aspect of the problem, and failed to satisfactorily explain its actions.

<u>4. EPA failed to model the "critical design" conditions for estuaries *or* oceans</u>

[21] EPA, in fact, entirely failed to consider background pollution in setting WQBELs for the CIGP, *see* ER 624-39 (citing EPA WQBEL calculations that assume zero background or "[a]mbient" pollution), whether caused by tidal reversal, the failure to control other "point and nonpoint sources of pollution" in Cook Inlet, or other factors in Cook Inlet. *See* ER 327 (indicating other sources of pollution in Cook Inlet), 152 (same).

In addition to tidal reversal, slack tide, and tidal reflux, certain other "worst-case" conditions help make up the period of "minimal dilution" in any water body. Along with the aforementioned conditions, the TSD identifies these conditions as the "critical design" conditions that must be modeled to accurately account for the "dilution of the effluent" during periods of "minimal dilution." ER 880. Specifically, the TSD indicates that the "critical design conditions" for estuaries include periods of "maximum stratification . . . associated with high river inflows [*i.e.,* wet weather periods] and low tidal ranges (neap tide)."[22] ER 880 (emphasis added). Similarly, the TSD specifies the "critical design periods" for oceans as "periods with maximum thermal stratification, or density stratification," as well as "oceanographic conditions (spring and neap tide currents) [and] wet and dry weather periods" at the "10th percentile value from the cumulative frequency of each" of these parameters that "define *the period of minimal dilution*." *Id.* (emphasis added). Inletkeeper commented that EPA had to model these various conditions. ER 125, 136, 139, 184-85. EPA, however, despite its claim to have modeled "site-specific current, temperature, and salinity," ER 69, failed to properly model *any* of the following "critical design" conditions for estuaries *or* oceans: (a) Thermal or saline stratification; (b) realistic current speeds; (c) the low and high

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[22] Wet and dry weather periods are those periods with maximum and minimum freshwater input, respectively, and thus maximum and minimum saline stratification in the water column.

end currents; and (d) the actual Cook Inlet tidal cycle. In the process, furthermore, EPA violated the APA.

a. EPA failed to model thermal or saline stratification

Salinity and temperatures in upper Cook Inlet "change significantly with the seasons and reflect variations in the upper Cook Inlet freshwater input." ER 314. As a result, Cook Inlet is often stratified. ER 766-70, 720, 742. As the TSD indicates, stratification significantly affects effluent dilution. ER 880 (indicating the complexity of modeling estuaries due, in part, to "thermal and saline stratification"). CORMIX echoes this by indicating that dilution is "profoundly affected" if the effluent becomes trapped in a stratified layer of the water column. *See* ER 832 (explaining the meaning of CORMIX flow class "S1" as indicating that the effluent plume is "profoundly affected by the linear ambient density stratification" because it "gets trapped at some terminal (equilibrium) level"); PE 12 (showing unacknowledged model runs resulting in flow classifications that indicate that dilution is affected by stratification), 22 (same).

EPA nonetheless modeled Cook Inlet as either weakly stratified, based on unrepresentative conditions, or unstratified. *See, e.g.,* ER 640 (modeling the receiving water at the TBPF as a "Uniform density environment"); PE 41 (same), PE 7 (indicating that the modeling for the TBPF "assumes a non-stratified environment"), PE 21 (modeling weaker stratification than studies in the administrative record found for Cook Inlet, ER 716-46, 766-70, PE 49); Letter from Kenwyn George, DEC, to Dave LaLiberte, Liberte Envtl. Assocs., *Subject: Response to your letter* 2 (Aug. 10, 2007) (indicating that DEC used a study of hydrographic conditions in central and lower Cook Inlet during spring and fall, ER 719, to model "summer conditions" when Cook Inlet is more stratified due to increased river inflow from snow melt and rain).

When confronted by Inletkeeper on this point, EPA simply claimed that the "[u]se of the isohaline and isothermal conditions in dispersion modeling did not significantly affect the model results." ER 185. EPA again failed to provide model results that showed the *actual* stratification of Cook Inlet to enable the public to verify this statement. As a result, in failing to model thermal or saline stratification, EPA not only failed to account for the dilution of the effluent in the receiving water at the period of minimal dilution, EPA also took action that was not in accordance with law, failed to model conditions that bear a rational relationship to reality, entirely failed to consider an important aspect of the problem, and failed to articulate a satisfactory explanation for its actions.

b. EPA failed to model realistic current speeds

Overestimating current speeds generally overestimates available dilution. *See* ER 880 (EPA indicating that the 10th percentile current is generally the period of lowest dilution). EPA relied on a proprietary software program called "Tides and Currents for Windows (Nautical Software)" to simulate current speeds for the CIGP based on data from Nikiski, Alaska. ER 704. The raw velocity data for Nikiski, provided to Inletkeeper a year after the public comment period closed for the draft CIGP, indicates that EPA relied on simulated 1-hour velocities that are up to *10 times faster* than the velocities at Nikiski. *See* PE 10 (showing, for example, lowest velocity of .02 meters per second at Nikiski, with lowest velocity simulated for the CIGP of .2 meters per second). EPA never explained this discrepancy. EPA, quite simply, failed to account for the dilution of the effluent in the receiving water, and failed to articulate a satisfactory explanation for its action. In modeling current speeds, therefore, EPA took action that was not in accordance with law, failed to model conditions that bear a rational relationship to reality, entirely failed to consider an important aspect of the problem, relied on a factor that Congress did not intend for it to consider, and failed to satisfactorily explain its actions.

c. EPA failed to model the true spring and neap tide currents

The TSD directs EPA to model the 10th and 90th percentile current speeds (*i.e.,* low end and high end currents, respectively) that occur at a specific outfall.[23] *See* ER 880 (TSD directing EPA to model the low end current speeds and the "off-design" high end current speeds). Spring and neap tide currents represent the periods in which the tidal range is the largest and smallest, respectively, and the

[23] The 10th and 90th percentile currents are those that are slower than 10 percent and faster than 90 percent of the currents in a given data set, respectively.

currents are thus the fastest and slowest. These extreme spring and neap tide currents are essential to modeling the periods of "minimal dilution." ER 880. Rather than model these current speeds for the CIGP, however, EPA combined the simulated spring and neap tide current speeds, thereby eliminating the true high and low currents from the range of currents it modeled. PE 10 at 1 (calculating and using "Composite" of "High" spring and "Low" neap tide currents that resulted, for example, in doubling the neap tide current speed of .1 meters per second to an averaged current of .2 meters per second). As a result, EPA failed to model the periods of "minimal dilution" at the 10th percentile current speed, nor did it model the true 90th percentile current speeds at which certain model results that EPA did not acknowledge showed that the current drove the effluent plumes to the bottom, resulting in reduced dilution and the risks of benthic impacts and bioaccumulation (as occurred in the model results for the actual TBPF outfall). PE 17 (CORMIX showing bottom contact immediately following the discharge), 29 at 11 (CORMIX indicating bottom contact by identifying flow class "H1A3," which indicates bottom contact). So, by averaging the simulated spring and neap tide currents, EPA failed to account for the dilution of the effluent in the receiving water, and took action that was not in accordance with law, failed to model conditions that bear a rational relationship to reality, entirely failed to consider an important aspect of the problem, and failed to satisfactorily explain its actions.

d. EPA failed to model the actual Cook Inlet tidal cycle

Almost anyone who has been to the ocean knows that the tide comes in and goes out twice a day. Despite this fact, EPA modeled Cook Inlet as if it had a 48-hour tidal cycle. ER 704. The tidal cycle is essential to modeling the "critical design" conditions of a water body because it helps determine how often the periods of minimal dilution occur at various stages of the tidal cycle. ER 880. EPA nonetheless disregarded this fact and modeled Cook Inlet as if the tide reached its periods of minimal dilution every 48 hours, or *4 times* less often than it actually does. ER 315. EPA never explained this decision. By failing to accurately model the Cook Inlet tidal cycle, EPA failed to account for the dilution of the effluent in the receiving water, took action that was not in accordance with law, failed to model conditions that bear a rational relationship to reality, entirely failed to consider an important aspect of the problem, relied on a factor that Congress did not intend for it to consider, and failed to satisfactorily explain its actions.

5. Conclusion

In making each of these errors, EPA either ignored periods of "minimal dilution" or fabricated conditions so as to make the effluent appear to disperse more rapidly than it really would and thus meet its WQS at the edges of the mixing zones that the operators requested. *See* ER 880 (indicating the "critical design" conditions for estuaries and oceans). As a result, EPA failed to account for the "dilution of the effluent in the receiving water," in violation of 40 C.F.R. § 122.44(d)(1)(ii). EPA thus violated section 301(b)(1)(C) of the CWA, 33 U.S.C. § 1311(b)(1)(C), which required EPA to ensure that the WQBELs in the CIGP met all applicable WQS. EPA also violated the APA by taking action that was not in accordance with law, failing to model conditions that bear a rational relationship to reality, entirely failing to consider important aspects of the problem, relying on factors that Congress did not intend for it to consider, and failing to satisfactorily explain its actions. 5 U.S.C. § 706(2)(A), (D); *Columbia Falls*, 139 F.3d at 923; *Motor Vehicle Mfrs. Ass'n*, 463 U.S. at 43; *Natural Res. Def. Council*, 526 F.3d at 602.

C. *EPA violated 40 C.F.R. § 122.44(d)(1)(i) and (vii)(A) by failing to calculate water quality-based effluent limitations that ensure compliance with "all applicable" water quality standards*

After EPA determined which pollutants had "reasonable potential" to violate WQS, it was required to set WQBELs for these pollutants. 40 C.F.R. § 122.44(d)(1)(i), (vii)(A). The TSD required EPA to begin the process of calculating WQBELs with the "wasteload allocation" ("WLA") generated for each pollutant by the RPA.[24] ER 903. EPA was then required to account for the "variability of the pollutant or pollutant parameter in the effluent" and "the dilution

[24] A WLA is the concentration of the pollutant that meets all applicable acute and chronic WQS under "critical conditions." ER 902.

of the effluent in the receiving water," as 40 C.F.R. § 122.44(d)(1) requires, by calculating an "[a]cute long-term average wasteload in chronic units" ("$LTA_{a,c}$") and a "[c]hronic long-term average wasteload" ("LTA_c") based on the WLA for each pollutant. ER 904-07. The $LTA_{a,c}$ and LTA_c are treatment levels, or concentrations at the discharge point, that each pollutant must meet in order to meet its acute and chronic WLAs, respectively, at the edges of the mixing zones. *Id.* Once EPA calculates the $LTA_{a,c}$ and LTA_c, the TSD requires it to use the more stringent of the two values to calculate WQBELs. *Id.* EPA intends through this process to calculate WQBELs that will keep the effluent at or below the WLAs "under normal operating conditions virtually all the time." ER 902-03. *See also* ER 931 ("EPA must ensure that the limits will result in the attainment of [WQS] and protect designated water uses, including an adequate margin of safety.").

EPA, quite simply, failed to follow this methodology. Instead, EPA calculated the WQBELs for the CIGP by first categorizing the pollutants based on whether they are hydrocarbons, metals, or some other type of pollutant. ER 218. EPA then identified the pollutant in each category that required the greatest dilution to meet WQS (also called the "driver" parameter) and calculated a WQBEL for each pollutant based on the assumption that it would be as diluted as the "driver" parameter. ER 218. The TSD, in contrast, directed EPA to calculate the $LTA_{a,c}$ and LTA_c for each pollutant and then calculate WQBELs based on the most protective of the two values. ER 907. EPA entirely failed to calculate the $LTA_{a,c}$ for acute WET or acute TAH for various facilities, thereby preventing EPA from comparing this value to the LTA_c. ER 624-31. EPA, in fact, *fabricated* or *omitted* many of the values required to calculate the the $LTA_{a,c}$, thus rendering the calculation impossible. *See* ER 624-31 (EPA CIGPs limit calculations indicating "5000" or "NA" as the values for "acute dilution factor," acute WQS, and acute WLA, all of which are essential components of the $LTA_{a,c}$ calculation). These deliberate errors caused EPA to fail to calculate WQBELs that ensure compliance with "all applicable" WQS. The reissuance of the CIGP therefore violated 40 C.F.R. § 122.44(d)(1)(i) and (vii)(A), and thus section 301(b)(1)(C) of the CWA, 33 U.S.C. § 1311(b)(1)(C), and violated the APA because EPA took action that was not in accordance with law, entirely failed to consider an important aspect of the problem, and failed to articulate a satisfactory explanation for its action. *Motor Vehicle Mfrs. Ass'n*, 463 U.S. at 43; *Columbia Falls*, 139 F.3d at 923; *Hogarth*, 484 F.3d at 1129.

D. Conclusion

The TSD and 40 C.F.R. § 122.44(d)(1) governed the process of conducting the RPA and setting WQBELs. EPA was required to conduct this process in three steps: (1) Estimating maximum pollutant concentrations; (2) comparing the RWCs at the mixing zone boundaries to all applicable WQS; and (3) calculating the

WQBELs. EPA ignored its methodologies and manipulated the model results so as to violate the CWA at each analytical step. As a result of these errors, and for the reasons provided above, the RPA and its calculation of WQBELs were legally flawed. The reissuance of the CIGP therefore violated 40 C.F.R. § 122.44(d)(1)(i), (ii), and (vii)(A), and thus the requirement in section 301(b)(1)(C) of the CWA, 33 U.S.C. § 1311(b)(1)(C), that the CIGP include WQBELs that meet all applicable WQS. Furthermore, the reissuance of the CIGP was "arbitrary and capricious" under the APA because it was not in accordance with law and EPA failed to model conditions that bear a rational relationship to reality, entirely failed to consider important aspects of the problem, relied on factors that Congress did not intend for it to consider, and failed to articulate satisfactory explanations for its actions. 5 U.S.C. § 706(2)(A), (D); *Columbia Falls*, 139 F.3d at 923; *Motor Vehicle Mfrs. Ass'n*, 463 U.S. at 43; *Natural Res. Def. Council*, 526 F.3d at 602.

VI. Conclusion

The goals of the CWA are unmistakable, and their achievement is long overdue. *See* 33 U.S.C. § 1251(a)(1) (providing, *inter alia*, that "it is the national goal that the discharge of pollutants into the navigable waters be eliminated by 1985"). The effluent limits and resulting mixing zones in the CIGP allow unlimited and increasingly polluted discharges to be discharged into Cook Inlet by a handful of aging facilities. As a result of its failure to properly control the pollution from these facilities, some 35 years after Congress first enacted the CWA, the CIGP represents a step backward from Congress' goal to "restore and maintain" the integrity of the navigable waters of the United States.

For the reasons provided herein, EPA violated sections 401 and 402 of the CWA, 33 U.S.C. §§ 1341(a)(1), 1342(a)(1), and (o)(1), in reissuing the CIGP, and violated the "arbitrary and capricious" standard of section 706(2)(A), (D) of the APA, 5 U.S.C. § 706(2)(A), (D). *Motor Vehicle Mfrs. Ass'n*, 463 U.S. at 43; *Natural Res. Def. Council*, 526 F.3d at 602; *Columbia Falls*, 139 F.3d at 923; *Inland Empire*, 992 F.2d at 980; *Hogarth*, 484 F.3d at 1129. The Court must therefore hold unlawful and set aside the CIGP. 5 U.S.C. § 706(2)(A), (D).

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STATEMENT OF RELATED CASES

Appellants are unaware of any other case in this Court that would be deemed a related case under Ninth Circuit Rule 28-2.6.

CERTIFICATE OF COMPLIANCE PURSUANT TO FED. R. APP. P. 32(A)(7)(C) AND NINTH CIRCUIT RULE 32-1

This Brief is proportionately spaced, has a typeface of 14 points or more and contains 13,066 words.

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