

US EPA ARCHIVE DOCUMENT

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
UGUM SURFACE WATER TREATMENT FACILITY PERMIT
FACT SHEET
April 2010

Permittee Name: Guam Waterworks Authority
Mailing Address: P.O. Box 3010, Hagatna, GU 96932
Facility Location: #308 Paulino Heights Road, Talofof, GU 96932
Contact Person(s): Paul Kemp
NPDES Permit No.: GU0020371

I. STATUS OF PERMIT

Guam Waterworks Authority (the “permittee”) has applied for a National Pollutant Discharge Elimination System (“NPDES”) permit to allow the discharge of treated effluent from Ugu Surface Water Treatment Facility to the Ugu River. A complete application was submitted on April 13, 2009. EPA Region IX has developed this permit and fact sheet pursuant to Section 402 of the Clean Water Act, which requires point source dischargers to control the amount of pollutants that are discharged to waters of the United States through obtaining a NPDES permit.

This permit has been classified as a Minor discharger.

II. GENERAL DESCRIPTION OF FACILITY

The Ugu Surface Water Treatment Facility (Ugu SWTF) will treat surface water from the Ugu River using an aluminum chlorohydrate solution coagulant membrane filtration process. The product of the Ugu SWTF will be a potable water supply for the municipal drinking water system of Guam.

The treatment facility is under renovation and upgrading from a conventional sand filtration plant to a submerged membrane plant. In its previous design, the plant did not discharge wastewater.

This new membrane filtration rate at the Ugu SWTF will be maintained by regular backwashing of membrane submodules. The resulting backwash goes to a clarifier so the solids can be separated and hauled off as sludge. However, the backwashing process does not remove 100% of the foulants on the membrane surface and results in a reduction of filtrate flow over time. Regular chemical cleaning is necessary to remove these residual foulants. Chemical cleaning will be performed by the Clean-in-Place (CIP) and Chemical Enhanced Backwash (CEBW) sequences. A CEBW is similar to a CIP, but is a shorter cycle conducted at a lower

chemical concentration. A flow diagram of both processes were provided by the applicant and included in **Appendix A** of this fact sheet.

III. DESCRIPTION OF RECEIVING WATER

Ugum SWTF will discharge into the Ugum River, a Category S-2 Medium surface water as defined in the Guam Water Quality Standards. The Ugum River flows to Talofof Bay. A site map of Ugum SWTF and the surrounding watershed was supplied by the applicant and included in **Appendix B** of this fact sheet.

The Ugum River is listed in Guam’s 303(d) report as impaired for sediments. It has a TMDL for sediment.

IV. DESCRIPTION OF DISCHARGE

A sodium hypochlorite (chlorine) solution and acid solution will be used in the chemical cleaning process. After the cleaning process, the spent sodium hypochlorite solution and acid solution will be neutralized. The neutralized chlorine and acid wastes generated by the chemical cleaning process will be discharged into the Ugum River downstream of the intake structure.

The following are the estimated values of pollutants from form 2D, part V submitted by the application for the two applicable industrial processes: Chemical Enhanced Backwash (CEBW) and Clean-in-Place (CIP) sequences:

Estimated Effluent Characteristics

Pollutant	CEBW Average ¹	CIP Average ¹	Units
Biological Oxygen Demand	Not expected	70	Parts per million (ppm)
Chemical Oxygen Demand	Not expected	83	ppm
Total Organic Carbon	22	7	ppm
Total Suspended Solids	29	9	ppm
Flow	31	96	Gallons per minute
Ammonia (As N)	Not expected	Not expected	N/A
Temp (Summer)	25-35	25-35°	°C
Temp (Winter)	25-35	25-35°	°C
pH	6.5-9.0	6.5-9.0	Standard units
Total Dissolved Solids	235	500	ppm

¹According to engineer’s or MEMCOR estimate.

According to form 2D, part III.C, the discharge through the single outfall (No. 001) will be the result of the two industrial backwash processes described above. The frequency and duration of the processes are described below:

Process	Outfall No.	Frequency	Max Daily Flow	Duration
Chemical Enhanced Backwash	001	Daily	.030 MGD	8 hours
Clean-in-Place	001	Monthly	.046 MGD	8 hours
Concurrent CIP and CEBW	001	Monthly	.046 MGD	8 hours

Effluent limitations shall be enforced at outfall no. 001 for discharge resulting from all types of industrial backwash processes.

V. DETERMINATION OF NUMERICAL EFFLUENT LIMITATIONS

EPA has developed effluent limitations and monitoring requirements in the permit based on an evaluation of the technology used to treat the pollutant (e.g., “technology-based effluent limits”) and the water quality standards applicable to the receiving water (e.g., “water quality-based effluent limits”). EPA has established the most stringent of applicable technology based or water quality based standards in the proposed permit, as described below.

A. Applicable Technology-based Effluent Limitations

There are no applicable national or Guam criteria for drinking water treatment plants. There are, however, NPDES general permits for the water treatment industry in other states. Below is a comparison of technology based effluent limits for Mississippi, South Carolina, South Dakota, and Washington (proposed) and the criterion which best approximates for each pollutant the average using Best Professional Judgment (BPJ):

Maximum Daily Limits

Parameter	Units	Mississippi	South Carolina	South Dakota	Washington	Average
Settleable Solids	mg/L	45	60	90	45	45
pH	s.u.	6.0-9.0	5.0-8.5	6.5-9.0	6.0-9.0	6.5-9.0
Residual Chlorine	mg/L	.019	.5	.05	.15	.05
Iron	mg/L	1.0	-	-	-	-
Dissolved Solids	mg/L	-	-	1000	-	1000
Ammonia	mg/L	-	-	1.0	-	-

Maximum Monthly Average

Parameter	Units	Mississippi	South Carolina	South Dakota	Washington	Average
Settleable Solids	mg/L	30	30	90	30	30
pH	s.u.	6.0-9.0	6.5-8.5	6.5-9.0	6.0-9.0	6.5-9.0
Residual Chlorine	mg/L	.011	.25	.05	.07	.05
Iron	mg/L	1.0	-	-	-	-
Dissolved Solids	mg/L	-	-	1000	-	1000
Ammonia	mg/L	-	-	1.0	-	-

B. Water Quality-Based Effluent Limitations (“WQBELs”)

Water quality-based effluent limitations, or WQBELS, are required in NPDES permits when the permitting authority determines that a discharge causes, has the reasonable potential to cause, or contributes to an excursion above any water quality standard. (40 CFR 122.44(d)(1))

The Ugum River is classified as a Category S-2 Medium Surface Water. Guam Water Quality Standards establish designated uses for this category as: whole body contact recreation, use as potable water supply after adequate treatment is provided, and propagation and preservation of aquatic wildlife and aesthetic enjoyment.

Below are the applicable water quality standards for S-2 waters:

Parameter	Units	Daily Maximum	Monthly Average
pH	s.u.	6.5-9.0	6.5-9.0
Aluminum	mg/L	1.0	-

C. Total Maximum Daily Load Requirements

The Ugum River is listed as an impaired water body according to the CWA Section 303(d) List of Water Quality Limited Segments for sediment. A sediment TMDL was prepared and approved for the Ugum Watershed in February 2007. The TMDL established daily and annual load allocations for the sediment and an instream turbidity target to address the sediment impairment in the Ugum Watershed.

The TMDL does not account for any point sources on the river, so the assigned wasteload allocation for point sources of sediment is zero. The TMDL, however, does not take into account the recent renovation of the Ugum SWTF which will allow the facility to treat up to 4 MGD of raw river water, according to the engineer’s estimate and flow diagram provided in the application. The facility currently operates at 2.2 MGD according to Guam Waterworks Authority’s 2006 *Water Resource Master Plan* Executive Summary. This increase of 1.8 MGD will remove approximately .5 tons of additional sediment per day. The sediment discharge limit of 17.3 lbs/day (.009 tons/day) incorporated into this permit is well below the amount of sediment removed by the increased treatment provided by the facility. Additionally, the TSS concentration limit incorporated into the permit (30 mg/L) is well below the average receiving water body TSS concentration (approximated at 77 mg/L by the applicant).

As explained above, the Ugum SWTF is removing .4991 tons of sediment from the river per discharge and not adding sediment into the Ugum Watershed (.5 tons removed by plant – .009 tons returned to river = .4991 tons removed from river). This additional removal of sediment from the river is consistent with the TMDL which includes daily loads and load reduction for the Ugum subwatershed to which the Ugum SWTF discharges. Also, in order to ensure consistency

with the TMDL, EPA has incorporated the TMDL Numeric Target of 12.5 NTU for turbidity in the permit as an instantaneous maximum.

D. Rationale for Effluent Limits

EPA evaluated the typical pollutants expected to be present in the effluent and selected the most stringent of applicable technology-based standards or water quality-based effluent limitations. Where effluent concentrations of toxic parameters are unknown or are not reasonably expected to be discharged in concentration that have the reasonable potential to cause or contribute to water quality violations, EPA may establish monitoring requirements in the permit. Where monitoring is required, data will be re-evaluated and the permit may be re-opened to incorporate effluent limitations as necessary.

Flow.

No limits established for flow, but flow rates must be monitored and reported. Monitoring is required weekly.

TSS.

Limits for TSS are developed based on BPJ as described in section A and are incorporated into the permit. Under 40 CFR Section 122.45(f), mass limits are also required for TSS. Based on the design flow, the mass based limits are based on the following calculations:

Average Monthly Mass Limits:

Design Flow (daily average)	Average Monthly Concentration Limit	Conversion factor	Weekly Average Mass Limit
.046 mgd	30 mg/l	8.345	11.5 lbs/day

Daily Max Mass Limits:

Design Flow (daily maximum)	Average Weekly Concentration Limit	Conversion factor	Weekly Average Mass Limit
.046 mgd	45 mg/l	8.345	17.3 lbs/day

Turbidity

The limit and multiple discrete monitoring requirement for turbidity is based on the numeric target set forth in the Ugum Watershed TMDL and Guam Water Quality Standards and incorporated into the permit.

pH

Limits for pH are adopted based both on water quality standards and technology based limits and are incorporated into the permit.

Total Residual Chlorine (TRC)

The limits for TRC are developed based on BPJ as described in section A and are incorporated into the permit.

Total Dissolved Solids (TDS)

Limits for TDS are developed based on BPJ as described in section A and are incorporated into the permit.

Aluminum

The limit for total aluminum is adopted from the Guam WQS because Aluminum Chlorohydrate Solution is being used as a coagulant.

E. Antidegradation Policy

EPA's antidegradation policy at 40 CFR 131.12 and Guam's antidegradation policy at GWQS 5101.B. requires that existing water uses and the level of water quality necessary to protect the existing uses be maintained.

As described in this document, the permit establishes effluent limits and monitoring requirements to ensure that the TMDL requirements and all applicable water quality standards are met. The permit does not include a mixing zone, therefore these limits will apply at the end of pipe without consideration of dilution in the receiving water.

Therefore, due to the low levels of toxic pollutants present in the effluent, high level of treatment being obtained, and water quality based effluent limitations, it is not expected that the discharge will adversely affect receiving water bodies.

VI. NARRATIVE WATER QUALITY-BASED EFFLUENT LIMITS

Section 5103.A. of the Guam WQS contain narrative water quality standards applicable to the receiving water. Therefore, the permit incorporates applicable narrative water quality standards.

VII. MONITORING AND REPORTING REQUIREMENTS

The permit requires the permittee to conduct monitoring for all pollutants or parameters where effluent limits have been established, at the minimum frequency specified. Additionally, where effluent concentrations of toxic parameters are unknown or where data is insufficient to

determine reasonable potential, monitoring may be required for pollutants or parameters where effluent limits have not been established.

The permittee shall conduct effluent monitoring to evaluate compliance with the proposed permit conditions. The permittee shall perform all monitoring, sampling and analyses in accordance with the methods described in the most recent edition of 40 CFR 136, unless otherwise specified in the proposed permit. All monitoring data shall be reported on monthly DMR forms and submitted quarterly as specified in the proposed permit.

VIII. RECEIVING WATER MONITORING

As described above, the Ugum River is an impaired water body with a TMDL for sediment. The permittee shall not contribute to the sediment loading in the river. Accordingly, receiving water monitoring is required in order to ensure the facility does not contribute to the impairment.

The permittee shall take samples both upstream and downstream of the outfall during discharge events monthly. The downstream sample shall be collected at least 200 feet downstream of the outfall to ensure proper effluent mixing with the receiving water.

Additional parameter monitoring is required in order to determine compliance with narrative Guam WQS. The narrative portion of the Guam WQS describes limits while allowing flexibility to account for ambient concentrations. Downstream samples shall be used as a compliance point, while upstream samples shall be used as reference for ambient concentrations. Hence, the downstream compliance sample must be higher than the upstream background sample in order to constitute a violation. EPA acknowledges statistical variations due to randomness in comparing downstream to upstream receiving water samples and will exercise enforcement discretion accordingly.

IX. MAJOR/MINOR CLASSIFICATION

New dischargers are subject to major/minor classification. After completing the NPDES Permit Rating Work Sheet, EPA has classified Ugum WTF as a minor discharger receiving 60 points (80 points required for major classification).

X. OTHER CONSIDERATIONS UNDER FEDERAL LAW

A. Impact to Threatened and Endangered Species

Section 7 of the Endangered Species Act of 1973 (16 U.S.C. § 1536) requires federal agencies to ensure that any action authorized, funded, or carried out by the federal agency does not jeopardize the continued existence of a listed or candidate species, or result in the destruction or adverse modification of its habitat.

The following species are listed as endangered or threatened in Guam by the Pacific Islands Fish and Wildlife Services Office:

Mammals:

- Bat, little Mariana fruit (*Pteropus tokudae*)
- Bat, Mariana fruit (*Pteropus mariannus*)

Birds:

- Crow, Mariana (aga) (*Corvus kubaryi*)
- Kingfisher, Guam Micronesian (*Halcyon cinnamomina cinnamomina*)
- Moorhen, Mariana common (*Gallinula chloropus guami*)
- Rail, Guam except Rota (*Rallus owstoni*)
- Swiftlet, Mariana gray (*Aerodramus vanikornsis bartschi*)

Sea Turtles:

- Sea turtle, hawksbill (*Eretmochelys imbricata*)
- Sea turtle, green except where endangered (*Chelonia mydas*)
- Sea turtle, leatherback (*Dermochelys coriacea*)
- Sea turtle, loggerhead (*Caretta caretta*)

Plants:

- Iagu, Hayun (*Serianthes nelsonii*)

Of the two mammal, five bird, four sea turtle and one plant species, none have any geographic nexus, other than speculative incidental contact, with the Ugum River and downstream Talofofo Bay with the exception of the Mariana common moorhen and the Mariana gray swiftlet.

The Mariana common moorhen is known to habituate the Talofofo Floodplain. Moorhens feed on both plants and animals in and near the floodplain. Although the Ugum River contributes to the stagnant water in the floodplain, it is one of many contributors including the Pacific Ocean. Because Ugum SWTF's discharge is a very small proportion (<.5%) of the Ugum River's flow and the river's flow is further diluted in the floodplain, Ugum SWTF's contribution to the floodplain may be considered *de minimis*. Additionally, this permit was written to protect the beneficial uses of the river which include propagation and preservation of aquatic wildlife. Therefore, it is EPA's determination that the discharge will not affect the Mariana common moorhen ("no effect").

The Mariana gray swiftlet is known to nest and roost in deep caves. Although the guano of swiftlets have been found near Talofofo Bay, its potential interactions with the water from the river would only be indirect. Thus it can be determined that the Mariana gray swiftlet has no nexus with the Ugum River other than speculative incidental contact.

In considering all the information available during the drafting of this permit, EPA believes that a No Effect determination is appropriate for this federal action. A copy of the draft fact sheet

and permit will be forward to the Pacific Islands Office of the United States Fish and Wildlife Service as well as the National Marine Fisheries Service, Pacific Islands Regional Office for review and comment prior to and during the 30-day public review period.

B. Impact to Coastal Zones

The Coastal Zone Management Act ("CZMA") requires that Federal activities and licenses, including Federally permitted activities, must be consistent with an approved state Coastal Management Plan (CZMA Sections 307(c)(1) through (3)). Section 307(c) of the CZMA and implementing regulations at 40 CFR 930 prohibit EPA from issuing a permit for an activity affecting land or water use in the coastal zone until the applicant certifies that the proposed activity complies with the State (or Territory) Coastal Zone Management program, and the State (or Territory) or its designated agency concurs with the certification.

A copy of the proposed permit has been sent to the Guam Coastal Management Program for review.

C. Impact to Essential Fish Habitat

The 1996 amendments to the Magnuson-Stevens Fishery Management and Conservation Act ("MSA") set forth a number of new mandates for the National Marine Fisheries Service, regional fishery management councils and other federal agencies to identify and protect important marine and anadromous fish species and habitat. The MSA requires Federal agencies to make a determination on Federal actions that may adversely impact Essential Fish Habitat ("EFH").

The proposed permit contains technology-based effluent limits and numerical and narrative water quality-based effluent limits as necessary for the protection of applicable aquatic life uses. The proposed permit does not directly discharge to areas of essential fish habitat. Therefore, EPA has determined that the proposed permit will not adversely affect essential fish habitat.

A copy of the proposed permit has been sent to the National Marine Fisheries Service for review.

D. Impact to National Historic Properties

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to consider the effect of their undertakings on historic properties that are either listed on, or eligible for listing on, the National Register of Historic Places. Pursuant to the NHPA and 36 CFR § 800.3(a)(1), EPA is making a determination that issuing this proposed NPDES permit does not have the potential to affect any historic properties or cultural properties. As a result, Section 106 does not require EPA to undertake additional consulting on this permit issuance.

E. Section 401 Water Quality Certification

In accordance with 40 CFR 124.53, under section 401 of the CWA, EPA may not issue a permit until certification is granted or waived in accordance with that section by the State or Territory in which the discharge originates. Territorial certification under section 401 of the CWA shall be in writing and shall include the conditions necessary to assure compliance with

referenced applicable provisions of sections 208(e), 301, 302, 303, 306, and 307 of the CWA and appropriate requirements of Territory law. In a letter dated February 22, 2010, EPA received a section 401 certification from GEPA generally endorsing this NPDES permit. Conditions of the certification have been inserted into the permit. The certification has been added as an appendix to this fact sheet (see Appendix C).

XI. STANDARD CONDITIONS

A. Reopener Provision

In accordance with 40 CFR 122 and 124, this permit may be modified by EPA to include effluent limits, monitoring, or other conditions to implement new regulations, including EPA-approved water quality standards; or to address new information indicating the presence of effluent toxicity or the reasonable potential for the discharge to cause or contribute to exceedances of water quality standards.

B. Standard Provisions

The permit requires the permittee to comply with EPA Region IX Standard Federal NPDES Permit Conditions, dated July 1, 2001.

XII. ADMINISTRATIVE INFORMATION

A. Public Notice (40 CFR 124.10)

The public notice is the vehicle for informing all interested parties and members of the general public of the contents of a draft NPDES permit or other significant action with respect to an NPDES permit or application.

B. Public Comment Period (40 CFR 124.10)

Notice of the draft permit will be placed in a daily or weekly newspaper within the area affected by the facility or activity, with a minimum of 30 days provided for interested parties to respond in writing to EPA. After the closing of the public comment period, EPA is required to respond to all significant comments at the time a final permit decision is reached or at the same time a final permit is actually issued.

C. Public Hearing (40 CFR 124.12(c))

A public hearing may be requested in writing by any interested party. The request should state the nature of the issues proposed to be raised during the hearing. A public hearing will be held if EPA determines there is a significant amount of interest expressed during the 30-day public comment period or when it is necessary to clarify the issues involved in the permit decision.

D. Water Quality Certification Requirements (40 CFR 124.53 and 124.54)

For States, Territories, or Tribes with EPA approved water quality standards, EPA is requesting certification from the affected State, Territory, or Tribe that the proposed permit will

meet all applicable water quality standards. Certification under section 401 of the CWA shall be in writing and shall include the conditions necessary to assure compliance with referenced applicable provisions of sections 208(e), 301, 302, 303, 306, and 307 of the CWA and appropriate requirements of Territory law.

XIII. CONTACT INFORMATION

Comments submittals and additional information relating to this proposal may be directed to:

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Marincola.jamespaul@epa.gov

EPA Region IX
75 Hawthorne Street (WTR-5)
San Francisco, California 94105

XIV. REFERENCES

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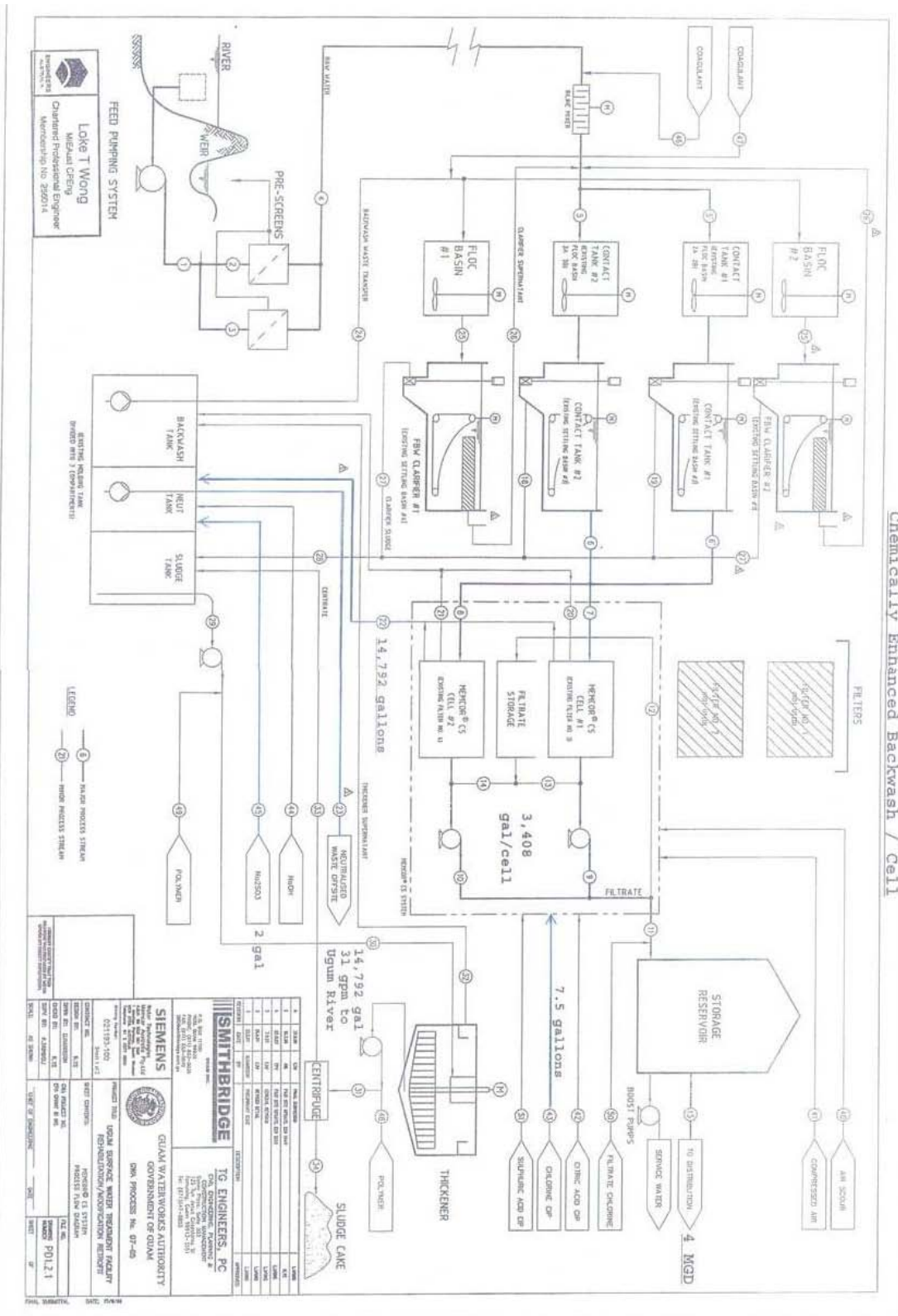
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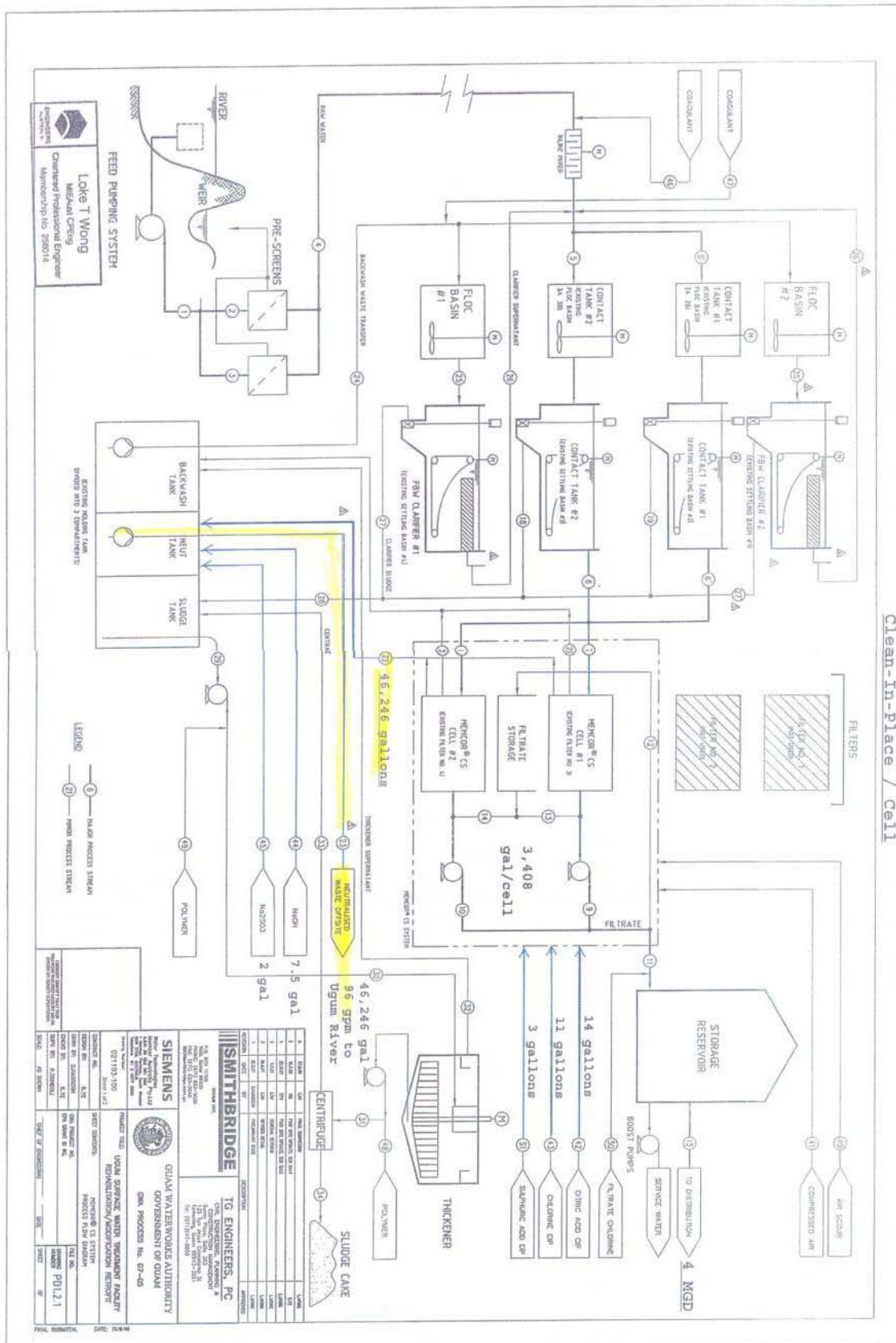
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Appendix A: Flow Diagrams for Chemically Enhanced Backwash Process and Clean-In-Place Process



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**Appendix C: Section 401 Water Quality Certification from Guam
Environmental Protection Agency.**