UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

July 22, 2008

In Reply Refer To: WTR-7

Willem Martins, General Manager
COS Samoa Packing Company, Inc.
P.O. Box 957
Pago Pago, Tutuila, American Samoa 96799

Re: April 2, 2008 Clean Water Act Inspection

Dear Mr. Martins:

Enclosed is the July 22nd report for our April 2, 2008 inspection of the Chicken of the Sea, Samoa Packing Company. Please submit a short response to the findings in Sections 1 through 3 of this report to EPA and ASEPA, by **August 30, 2008**. The main findings are summarized below:

1 COS Samoa consistently complies with the NPDES permit limits for conventional pollutants, nutrients, and certain toxics that apply to the wastewater discharges into the Joint Cannery Outfall. Compliance is reached through (1) well-designed and sized primary solids removal, and (2) the diversion of high-strength wastes to marine disposal by ship.

2 The Joint Cannery Outfall continues to be a significant asset that benefits overall water quality in the harbor. Any increase in outfall throughput would require further pollutant removals likely involving secondary biological treatment and solids digestion. Expanded treatment, especially in conjunction with Starkist, could be a viable investment particularly if it eliminates marine disposal and recovers biogas for energy.

3 COS Samoa reclaims two significant waste streams, heavy fish solids into fish meal and assorted waste oils from in-plant and island off-site sources into boiler feed fuel.

4 Receiving water monitoring has not registered definitive evidence of impact in Pago Pago Harbor from the combined discharges from COS Samoa and Starkist through the Joint Cannery Outfall. This inspection did not cover the marine disposal by ship.

I appreciate your helpfulness of that of your staff to me during this inspection. We remain available to COS Samoa Packing and the Territory of American Samoa to assist in any way. Please do not hesitate to call me at (415) 972-3504, or e-mail arthur.greg@epa.gov.

Sincerely,

Original signed by:

Greg V. Arthur
CWA Compliance Office

cc: Lt. Matt Vojik, ASEPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION 9

CLEAN WATER ACT COMPLIANCE OFFICE

NPDES COMPLIANCE EVALUATION INSPECTION

NPDES Permittee:	Chicken of the Sea, Samoa Packing Company, Inc. Atu'u, Maoputasi
Facility:	P.O. Box 957, Pago Pago, Tutuila Island, American Samoa Discharged through the Joint Cannery Outfall (NPDES Permit No. AS0000027)
Receiving Water:	Pago Pago Harbor
Date of Inspection:	April 2, 2008

Inspection Participants:

US EPA:	Greg V. Arthur, CWA Compliance Office, (415) 972-3504
ASEPA:	None
COS Samoa:	Willem Martins, General Manager, (684) 644-1206 Sam Augspurger,Utilities Manager Poni Tupufai, Utilities Supervisor Ann Ele, Administrator
Report Prepared By:	Greg V. Arthur, Environmental Engineer, USEPA Region 9 July 22, 2008

1.0 Scope and Purpose

On April 2, 2008, EPA conducted an NPDES compliance evaluation inspection of the Chicken of the Sea, Samoa Packing Company ("COS Samoa"). The purpose was to ensure compliance with the NPDES permit and applicable Federal regulations covering the discharge of non-domestic wastewaters and storm water runoff into waters of the United States. A secondary purpose was also to identify and verify the conditions to be in future NPDES permits. In particular, it was to ensure:

- Classification in the proper Federal category;
- Application of the correct standards at the correct sampling points;
- Application of effective best management practices;
- Consistent compliance with the standards and best management practices; and
- Fulfillment of Federal self-monitoring requirements.

COS Samoa is one of the dischargers of storm or industrial wastewater to waters of the United States whose compliance was assessed as part of evaluations of the NPDES permitted discharges in American Samoa conducted in the past year. Inspection participants are listed on the title page of this report. Arthur conducted the inspection on April 2.

1.1 Background

COS Samoa is a tuna cannery sited on the northeastern side of Pago Pago Harbor in the village of Atu'u. COS Samoa is one of two canneries in American Samoa located adjacent to each other on the harbor, along with an electric power plant, can making plant, and a repair facility for tuna fishing and processing ships. COS Samoa produces cooked tuna products and fish meal. Independent contractors deliver unprocessed tuna frozen in the holds of their ships. The tuna cannery work involves dock receiving, cooking, processing, packing, refrigeration, and rendering. COS Samoa does not manufacture cans, shipping pallets, mylar packaging, or packaging labels. American Samoa Power Authority provides electrical, water, and sewer utilities. COS Samoa has boilers and stand-by electrical generation capacity. COS Samoa provides a disposal service for on-island sources of waste oil. See Sections 1.3 and 1.4 on pages 3 and 4 for further description of on-site processes.

On February 25, 2008, US EPA issued a revised NPDES permit No. AS0000027 to COS Samoa for its discharge to the harbor. Since 1992, industrial wastewater from COS Samoa and the other cannery have discharged together through the deep water Joint Cannery Outfall to the outer harbor, although each cannery holds an individual permit. The current permit became in effect on April 1, 2008 and is set to expire on March 31, 2013. The previous permit was issued on December 21, 2000. See Section 2.0 for further description of the permit requirements.

1.2 Facility SIC Code

COS Samoa is assigned the SIC code for canned and cured fish and seafoods (SIC 2091).

1.3 Facility Description

COS Samoa consists of a few interconnected buildings located adjacent to each other along a long dock on Pago Pago harbor. See the photographic documentation of this inspection in Section 1.6 of this report.

Loading Dock - Containers of frozen tuna are unloaded from fishing ships into metal holding bins stacked on the dock. The dock runs the length of the facility with curbing along the harbor and around the dock forming containment. The metal holding bins of frozen tuna are stacked within a thawing bay for circulating spray quenching. All wastewaters associated with the dock operations, including storm water run-off, process drainage, thaw water, and dock wash down, are captured within the curbing and drain into the low-strength wastewater treatment system. See Photos #1 and #2 in Section 1.6 on page 6.

Butchering - Thawed fish are loaded on moving conveyers for cutting and gutting. The blood, entrails, and eviscera go through a grinder into a floor drain leading to the high-strength waste disposal system.

Precooking - The butchered fish are loaded into tray bins for steam cooking in a series of retort cookers. The bins of pre-cooked fish are water quenched in the chilling bay. The retort condensate and cook juice generated from the retort cookers drain to the high-strength waste disposal system.

Packing - The precooked and chilled fish are loaded onto moving conveyer tables for manual skinning, boning, and sorting by grade. Tuna meat is then delivered to product lines for packaging, canning, broth/oil addition, lid seaming, retort cooking of the filled and sealed cans and packages, and final labeling and boxing. The bone and skin scrap is fed into a corkscrew auger for delivery as solids to the rendering plant. The recooked cans and mylar packages are air quench cooled. The cans and lids arrive pre-made. Boxes, labeling, and mylar packaging arrive pre-printed. Final products are shipped out by shipping container.

Refrigeration and Utilities - COS Samoa employs ammonia chillers. Plant utilities also include boilers, standby electric power generators, and air compressors. Utility room drainage collects in blind sumps. Condensate, boiler blowdown, chiller blowdown and utility room drainage all drain or are pumped into the low-strength wastewater treatment system. Plant, equipment, flooring, and conveyances are washed down with hot water plant-wide into the low-strength wastewater treatment system during the graveyard shift from 3:00am to 6:00am. Tramp oil from the blind sumps are burned in the boilers.

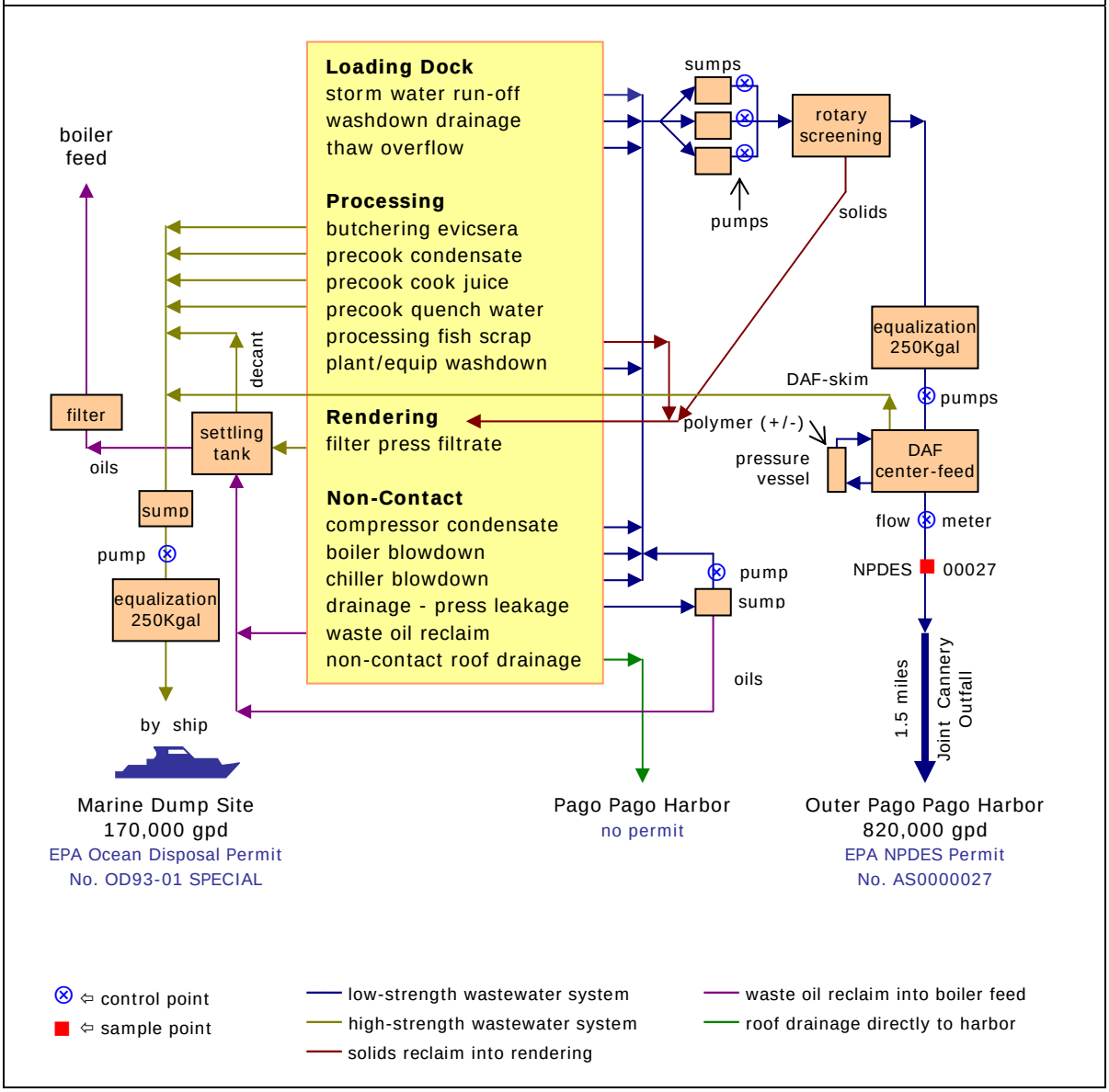
Rendering - COS Samoa produces a fish meal product from processing scrap. The rendering process involves re-cooking, drying through a filter press and a dryer, bone separation, and final bagging. The filter press filtrate is pumped to a settling tank in order to reclaim the fish oil. The settling tank decant drains through a floor trench to the high-strength wastewater disposal system. The fish oil is skimmed for burning as fuel in the boilers.

Waste Oil Reclaim - COS Samoa receives waste oil by barrel from off-site sources to burn in the boilers. These sources include on-island automotive shops, ships, and fish processing.

1.4 Facility Wastewater Sources, Handling and Discharge

COS Samoa uses between 1.0 and 1.5 million gallons per day of ASPA-provided fresh water. The resulting plant and equipment washdown, thaw and quench waters, steam condensate, and various equipment blowdowns, along with fish processing wastes, storm water run-off, and off-site waste oil are handled for disposal and discharged in five principle ways.

Figure 1.4.1
COS Samoa Packing Company - Configuration



Low-Strength Wastewaters – Plant and equipment washdowns, contact storm water run-off, and non-contact utility waters generated through out the facility discharge to facility-wide floor drainage systems leading to low-strength wastewater treatment with a design capacity of 1.4 mgd. These low-strength wastewaters carry fish slime, blood, some entrails and other solids, oils, and chemical cleaners. The low-strength wastewaters collect in a series of sumps

that feed drainage through rotary screen filters to remove bulk solids. The screened waste-waters drain to an equalization tank for pumping through a center-feed dissolved air flotation ("DAF") clarifier to further remove light solids. A mid-level tap located distant from the center-feed inlet draws decanted wastewater for pressurization. Both cationic and anionic polymers are added to the pressure vessel. The pressurized contents produce dissolved air upon release in the DAF unit. The DAF decant discharges through a flume to a 14-inch pipeline for discharge through the 1.5-mile Joint Cannery Outfall. COS Samoa discharges 820,000 gallons per day on average to the outfall. The discharge flume serves as the NPDES permit sample point, designated in this report as NPDES-00027. The low-strength waste-waters from both COS Samoa and Starkist feed through the outfall for combined discharge to the Outer Pago Pago Harbor. See Photos #3, #4, #5, #7 and #8 in Section 1.6 on pages 6 - 7.

High-Strength Wastes - The high-strength solids and wastewaters from butchering and pre-cooking collect into a sump for pumping to an equalization tank with over a day of storage. The equalization tank contents are pumped to a ship, the Blue Moon, for off-site hauling to an EPA-approved ocean dump site. COS Samoa generates ~170,000 gallons of high-strength waste per day. See Photos #5 and #6 in Section 1.6 on page 7.

Non-Contact Wastewaters - The non-contact wastewaters associated with the plant utilities drain to the low-strength wastewater system. These wastewaters include non-contact air compressor condensate, boiler blowdown, chiller blowdown, and utility room drainage, which is captured in and pumped from a small sump. Non-contact roof drainage discharges by downspouts directly to the ocean. See Photo #5 in Section 1.6 on page 7.

Solids - Processing scrap from packing is delivered by auger through floor trenching to an on-site rendering plant to produce fish meal. Fish processing scrap and rotary screenings removed from the low-strength wastewater feed into a cooker followed by a filter press, dryer, bone separation, and bagging. The filter press filtrate processes through a settling tank for the skimming of the oils, with the water-fraction decant discharged by floor drain to the high-strength wastewater inlet sump. See Photo #9 in Section 1.6 on page 7.

Waste Oil - Skimmed fish oil from the rendering plant and waste oils from off-site sources are decanted and filtered as feed for the facility boilers. Compressor hydraulic leakage is blotted by adsorbent for off-site disposal. See Photo #10 in Section 1.6 on page 7.

1.5 Facility Wastewater Composition

Low-Strength Wastewater - These wastewaters, discharged through the Joint Cannery Outfall, and which average 3,000 mg/l-BOD influent and 800 mg/l-BOD effluent, contain fish blood, slime, solids, and oils, as well as the chemical cleaners used in plant and equipment washdown. Fish-related products would be expected to contain organics, non-petroleum fats and oils, suspended solids, ammonia-nitrogen, and trace elements in the fish tissue such as iron, phosphorus, and mercury. The chemical cleaners contain alkaline non-phosphated cleaners and emulsifying degreasers (*hydroxides, metasilicates*), as well as chlorinated non-foaming cleaners (*sodium dichloroisocyanurate*).

High-Strength Wastes - These wastes (>50,000 mg/l-BOD), shipped out to an ocean dump site, would be expected to entrain the same contaminants as the low-strength wastewaters, but at higher concentrations.

Roof Drainage - These flows, discharged directly to the harbor by downspout, would not be expected to entrain pollutants beyond possibly zinc from galvanized metal roofing as well as slightly oily atmospheric grime.

1.6 Photo Documentation

Nine of the 11 digital photographs taken during this inspection and one of 21 taken from Starkist are depicted here in this section. The COS Samoa photographs are saved as *samoa-cos-01.jpg through -11.jpg*. The Starkist photograph is saved as *samoa-starkist-14.jpg*.

Photo #1: Harbor Dock - Shows Curbing / Washdown
Taken By: Greg V. Arthur
Date: 04/02/08

Photo #2: Harbor Dock - Fish Slime from Thawing
Taken By: Greg V. Arthur
Date: 04/02/08

Photo #3: Low-Strength Wastewater - DAF Unit
Taken By: Greg V. Arthur
Date: 04/02/08

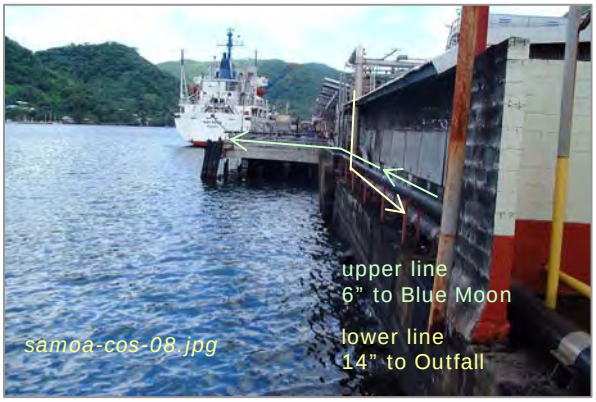


Photo #4: Outfall and High-Strength Lines
Taken By: Greg V. Arthur
Date: 04/02/08

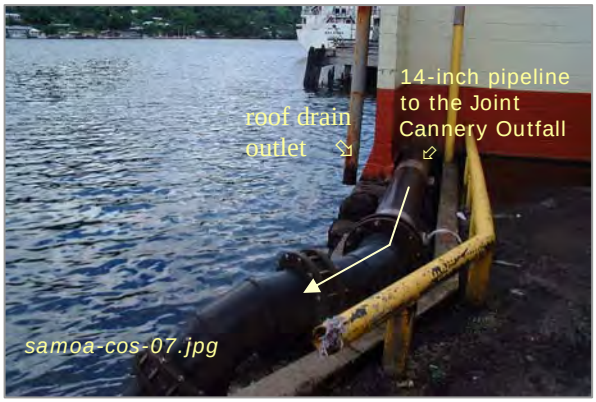


Photo #5: Line to the Joint Cannery Outfall
Taken By: Greg V. Arthur
Date: 04/02/08

Photo #6: Blue Moon - Ship to Ocean Dump Site
Taken By: Greg V. Arthur
Date: 04/03/08

Photo #7: NPDES Sample Point - 00027
Taken By: Greg V. Arthur
Date: 04/02/08

Photo #8: NPDES Sample Point - Flow Meter
Taken By: Greg V. Arthur
Date: 04/02/08

Photo #9: Processing Scrap - Auger to Rendering
Taken By: Greg V. Arthur
Date: 04/02/08

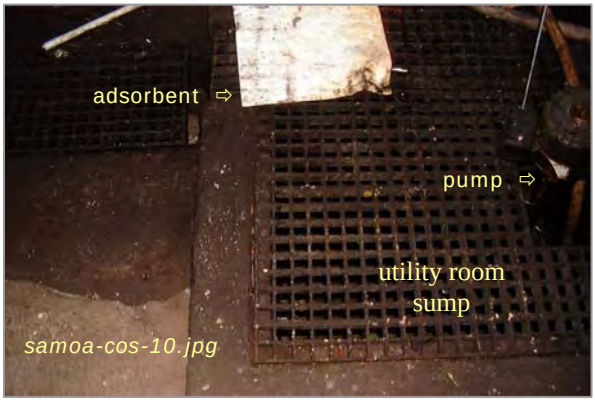


Photo #10: Utility Room Sump - Adsorbent
Taken By: Greg V. Arthur
Date: 04/02/08

2.0 NPDES Permit Requirements

The NPDES permit must apply Federal BAT/NSPS standards to all regulated sources and the American Samoa water quality standards to the discharge to the ocean.

Summary

The NPDES permit authorizes the discharge of low-strength wastewater through the Joint Cannery Outfall. The permit imposes effluent discharge limits that apply both Federal standards for tuna processing and American Samoa water quality standards to the discharge from COS Samoa into the Joint Cannery Outfall. The Federal standards impose production-based limits for total suspended solids, oil and grease, and pH. The American Samoa water quality standards establish effluent discharge limits for phosphorus, total nitrogen, ammonia, copper, zinc, and mercury, as well as a number of narrative and numerical receiving water limits for the combined discharge from the Joint Cannery Outfall. Finally, the NPDES permit requires COS Samoa to develop best management practices for spill and drainage control, a pollution minimization plan for the sources of copper, zinc, and mercury, and a chronic toxicity study. See Sections 2.3 through 2.4 for NPDES permit narrative requirements and permit limits.

Requirements

- None.

Recommendations

- The NPDES permit should specifically identify the compliance sampling point for the discharge of effluent from COS Samoa into the Joint Cannery Outfall.

2.1 Permit Applicability

NPDES Permit AS0000027 currently in effect was issued February 28, 2008. The previous version was issued effective on January 23, 2000. The Federal regulations in 40 CFR 122.21(d) allowed the administrative extension of the permit because COS Samoa submitted its application for permit renewal at least 180 days before it expired. All versions of the NPDES permit apply the Federal categorical standards and American Samoa water quality standards to the effluent discharge from COS Samoa into the Joint Cannery Outfall, identified as the effluent flume and designated in this report as the sample point NPDES-0000027. The NPDES permit also applies the American Samoa water quality standards to the receiving waters around the Joint Cannery Outfall, which is designated in the permit as Discharge Point 001. The NPDES permit does not authorize any other discharges from COS Samoa.

The discharge of high-strength waste by ship to a Federally-permitted ocean disposal site is authorized under a separate permit (EPA Ocean Disposal Permit No. OD93-01 SPECIAL). This inspection did not include a compliance evaluation of the ocean dumping permit.

2.2 Federal BAT/NSPS Categorical Standards

The Federal categorical standards for tuna processing in 40 CFR 408 Subpart N apply to the effluent discharge from COS Samoa to the Joint Cannery Outfall. They are not applied to the outfall discharge to the harbor. The Federal standards impose loading limits for total suspended solids and oil and grease, based on a maximum average daily production of 450 tons of tuna processed per day. The Federal standards also impose pH limits. COS Samoa does not generate any wastewaters regulated under any other Federal categorical standard in 40 CFR 407-471.

2.3 Effluent Discharge Limits

The NPDES permit applies Federal categorical standards and American Samoa water quality standards limits to the effluent discharge from COS Samoa into the Joint Cannery Outfall, designated in this report as the sample point NPDES-00027.

Figure 2.3
NPDES Permit - Discharge Standards and Limits for COS Samoa Packing Company

NPDES Permit ① AS00027 §I.A Table 1	Before April 1, 2008 d-max	Before April 1, 2008 mo-avg	After April 1, 2008 d-max	After April 1, 2008 mo-avg	monitoring frequency	sample type
flow (mgd)	1.40	-	②	-	continuous	flume
BOD (mg/l)	②	②	②	②	weekly	24-hr
TSS (lbs/d)	5976	2376	7470	2970	weekly	24-hr
oil and grease (lbs/d)	1512	605	1890	756	weekly	grab ④
total nitrogen (lbs/d)	1935	800	1935	800	2/week	24-hr
total phosphorus (lbs/d)	271	208	271	208	2/week	24-hr
ammonia-N (lbs/d)	-	-	1953	973	weekly	24-hr
mercury (lbs/d)	-	-	0.06	0.02	2/year	24-hr
copper (lbs/d)	-	-	1.37	0.68	2/year	24-hr
zinc (lbs/d)	-	-	26.7	13.3	2/year	24-hr
ammonia-N (mg/l)	133	-	167	83	weekly	24-hr
mercury (µg/l)	-	-	4.72	1.80	2/year	24-hr
copper (µg/l)	108	66	117	58	2/year	24-hr
zinc (µg/l)	1770	1545	2284	1138	2/year	24-hr
temperature (ºF)	95ºF	90ºF	95ºF	90ºF	continuous	probe
pH - min/max (s.u.) ③	6.5 - 8.6	-	6.5 - 8.6	-	continuous	probe
acute toxicity (t.u.)	②	②	-	-	-	-

① These limits apply at the flume discharge into the Joint Cannery Outfall (NPDES-00027).
② Monitoring only – No limits.
③ Time outside limits cannot exceed 7 hrs 26 min / month - No excursion can exceed 60 min.
④ Manual composites of four grab samples per day

The NPDES permit applies Federal production-based standards established as mass-loading limits for total suspended solids, and oil and grease, as well as a limit for pH. The NPDES

permit also applies American Samoa water quality standards established as limits based on the dilution available through the use of the Joint Cannery Outfall for phosphorus, nitrogen, ammonia, copper, zinc, mercury, and temperature. An acute toxicity limit was not included in the current NPDES permit because two pollutants with specific limits, ammonia and zinc have been identified as the likely causes of any toxicity found in the discharge.

2.4 Site-Specific Receiving Water Limits

The NPDES permit applies American Samoa water quality standards as receiving water limits that apply to both COS Samoa and Starkist for the combined discharge from the Joint Cannery Outfall into Pago Pago Harbor.

Figure 2.4.1
NPDES Permit - General Receiving Water Prohibitions

§I.A	Discharges are only authorized from the Joint Cannery Outfall outlet.
§I.B.1	Discharges shall be substantially free from materials attributable to sewage, industrial wastes ... that will produce objectionable color, odor, or taste in the harbor or biota.
§I.B.2	Discharges shall be substantially free from visible floating materials, grease, oil, scum, foam, and other floating material attributable to sewage, industrial wastes ...
§I.B.3	Discharges shall be substantially free from materials attributable to sewage, industrial wastes ... that will produce visible turbidity or settle to form objectionable deposits.
§I.B.4,6	Discharges shall be substantially free from substances and conditions ... which may be toxic to humans, animals, plants, and aquatic life, or produce undesirable aquatic life.
§I.B.5	Discharges shall not cause a >1.5°F change, >1°F hourly fluctuation, or exceed 85°F.

Figure 2.4.2
NPDES Permit - Zone of Initial Dilution Prohibitions

§I.B.7	Discharges shall not cause turbidity to exceed 0.75 Nepholmetric Units.
§I.B.8	Discharges shall not cause a light penetration depth <65 feet for >50% of the time.
§I.B.9	Discharges shall not cause dissolved oxygen of <70% saturation, or <5.0 mg/l.

Figure 2.4.3
NPDES Permit - Zone of Mixing Prohibitions

§I.C.1	Discharges shall not cause a water column concentration >0.05 µg/l mercury.
§I.D.1	Discharges shall not cause concentrations >30.0 µg/l total phosphorus.
§I.D.2	Discharges shall not cause concentrations >200.0 µg/l total nitrogen.
§I.D.3	Discharges shall not cause concentrations >1.0 µg/l chlorophyll-a.

The NPDES permit requires COS Samoa to conduct semi-annual self-monitoring of the receiving waters at the following five sampling stations: Station 5 reference site, Station 14 at the end-of-pipe, Stations 8 and 8a at the zone of initial dilution boundary, and Station 16 at the zone of mixing boundary.

3.0 Compliance with NPDES Permit Requirements

Industrial and storm water discharges are authorized only from the Joint Cannery Outfall into Pago Pago Harbor and from a commercial vessel, the Blue Moon, to an off-shore EPA-permitted ocean disposal site. [NPDES Permit §I.A]

Industrial waste and storm water discharges from the Joint Cannery Outfall must comply with the NPDES permit discharge limitations set forth as the application both of Federal standards and the American Samoa water quality standards. [NPDES Permit §I.A]

Combined discharges from COS Samoa and Starkist must not cause adverse impacts in the receiving waters around the Joint Cannery Outfall. [NPDES Permit §I.B, C, and D]

Summary

COS Samoa consistently complies with its NPDES permit effluent limits for conventional pollutants (*total suspended solids, pH, oil and grease*), and for nutrients (*total nitrogen, total phosphorus*). Compliance is reached through primary solids removal with rotary screening, equalization, dissolved air flotation (all well-designed and sized), and the effective diversion of high-strength wastes to marine disposal by ship. Any increase in outfall throughput would require further removals likely involving biological treatment and solids digestion. Expanded treatment, especially in conjunction with Starkist, could be a viable investment if it involves the elimination of the marine disposal by ship and the recovery of biogas for energy. COS Samoa also is expected to consistently comply with its NPDES permit effluent limits for toxics (*ammonia, mercury, copper, zinc*) and is not expected to introduce other toxics in toxic amounts (*petroleum distillates, pesticides, PCBs, solvents*). Finally, receiving water monitoring does not indicate measurable impacts in Pago Pago Harbor from the combined discharges from COS Samoa and Starkist through the Joint Cannery Outfall.

Requirements

- None.

Recommendations

- COS Samoa should determine the feasibility of expanding treatment to recover the waste energy content and perhaps eliminate the marine disposal of high-strength wastewaters.

3.1 NPDES Permit Effluent Limits for COS Samoa

See Appendix 1 for sampling results of the discharge to the Joint Cannery Outfall for conventional pollutants, nutrients, and metals, as well as for a single priority pollutants scan.

Conventional Pollutants - COS Samoa consistently complies with its NPDES permit limits for the discharge of conventional pollutants into the Joint Cannery Outfall. Fish parts and wastes comprise the sources of conventional pollutants in the discharge. Primary solids

removal, involving well-designed and properly-sized rotary screening, equalization, and dissolved air flotation, resulted in average and 99th% peak concentrations of 184.1 and 348.3 mg/l total suspended solids ("TSS"), 868.2 and 2791.5 mg/l biochemical oxygen demand ("BOD"), and 61.7 and 148.6 mg/l oil and grease. The resulting removal rates averaged 75% for TSS, 80% for oil and grease, and 60% for BOD. As a result, consistent compliance with the NPDES permit limits is expected to continue, through primary solids removal and the effective diversion of high-strength wastes to marine disposal by ship.

Nutrients - COS Samoa consistently complies with its NPDES permit limits for the discharge of total nitrogen and total phosphorus into the Joint Cannery Outfall. Fish parts and wastes comprise the source of nutrients in the discharge. Primary solids removal resulted in average and 99th% peak concentrations of 98.2 and 131.2 mg/l total nitrogen, and 14.4 and 21.3 mg/l total phosphorus. The removal rates averaged 40% for both nitrogen and phosphorus. These removal rates are roughly half that for the conventional pollutants, which indicates that the nutrients exist more in a dissolved state and not in the oil fraction. Nevertheless, primary solids removal and diversion of high-strength wastes to marine disposal, removes enough of the nutrients to result in continued consistent compliance with the NPDES permit limits.

Toxic Pollutants - COS Samoa consistently complies with its NPDES permit limits for the discharge of toxics into the Joint Cannery Outfall. The permit establishes limits only for mercury, copper, and zinc, all thought to come from fish parts and wastes, and for ammonia, which is also entrained in fish parts and wastes, a fraction of which, depending on the pH of the receiving water, is in the un-ionized toxic form. Primary solids removal resulted in average and 99th% peak concentrations of 0.069 and 0.169 µg/l mercury, 5.98 and 11.4 µg/l copper, 355.1 and 635.5 µg/l zinc, and 35.8 and 55.9 mg/l ammonia. A single priority pollutants scan also indicated the presence of a very limited set of other toxics not associated with fish parts and waste (*toxic metals, toxic organics, cyanide, pesticides, solvents, petroleum products, PCBs*), with most results below their method detection limits. The site inspection confirms that there are a few well-controlled entry points to the sewers from oil storage areas, and the use of a limited set of cleaners (*hydroxides, metasilicates, dichloroisocyanurate*).

Temperature and pH - COS Samoa consistently complies with its NPDES permit limits for the pH and temperature of the discharge into the Joint Cannery Outfall.

3.2 NPDES Permit Receiving Water Limits

See Appendix 2 for the sample results of the receiving waters in and around the discharge from the Joint Cannery Outfall for dissolved oxygen, nutrients, ammonia and metals.

Conventional Pollutants - Dissolved oxygen and visual observations of the harbor surface are the measures in the receiving waters reflective of the impacts of conventional pollutants from the combined discharge from the Joint Cannery Outfall to the Pago Pago Harbor. These measures do not indicate a measurable impact in the receiving waters from the outfall discharge of conventional pollutants. In particular, no oily slicks, floating solids, or cloudy conditions were seen around the outfall, and nearly all samples met the standard for dissolved oxygen at the four sampling stations influenced by the outfall discharge. Moreover, the two

sample results below 5.0 mg/l (2 of 72 samples), are not conclusive evidence of a measurable impact in violation of the NPDES permit requirements. One was from a station influenced by the outfall but within the zone of mixing and thus not regulated by permit for dissolved oxygen, and the other was from a reference station away from the influence of the outfall discharge.

Nutrients - Nutrient levels over the water quality standards were found at all stations sampled for nutrients, specifically at all three stations influenced by the outfall discharge, and at one reference station away from influence. Nevertheless, for a number of reasons, the numerous sample results above 200 µg/l-total nitrogen (20 of 48 samples) and the few above 30 µg/l-total phosphorus (3 of 48 samples) are not conclusive evidence of a measurable impact from the Joint Cannery Outfall discharge in violation of the NPDES permit requirements. First, nitrogen levels exceeded standards at all of the stations including the reference station. Second, the total nitrogen and phosphorus standards are applied only at the zone of mixing boundary and outward. Third, COS Samoa complies with the permit effluent limits for total nitrogen and phosphorus in its discharge into the Joint Cannery Outfall. Finally, any measurable impacts in the receiving waters from the Joint Cannery Outfall discharge are not solely the the responsiblity of COS Samoa.

Toxics - The NPDES permit applies water quality standards for toxics only at the zone of mixing boundary and for only mercury. All samples, including those taken from at the zone of mixing station, met the NPDES permit limits. Moreover, COS Samoa complies with the permit effluent limits for ammonia, copper, zinc, and mercury in its discharge into the Joint Cannery Outfall.

3.3 Expanded Treatment

Within the loading limits in the NPDES permit, the Joint Cannery Outfall has some available capacity to accept additional wastewater flow and pollutant loadings from COS Samoa. Specifically, over the past year, peak flow rates reached 70% of permitted capacity. For pollutants, the percent of permitted capacities reached were 60% for oil and grease, 45% for total suspended solids, 85% for total nitrogen, 55% for total phosporus, and 45% for ammonia. Therefore, in particular because of total nitrogen loadings, any increase in outfall throughput would require further removals that would likely involve biological treatment and solids digestion. Expanded treatment, especially in conjunction with Starkist, could be a viable investment if it involves the elimination of the marine disposal by ship and the recovery of biogas for energy.

Overall, discharges from COS Samoa by ship or through the outfall average approximately 1.0 million gallons per day and total roughly 85,000 lbs/day-BOD. Through anaerobic digestion the organics loadings totals could produce as much as 500,000 ft^3/day methane biogas with an energy content up to 120 therms/day (3,500 kilowatts/day). Together with Starkist, a joint biological treatment plant with anaerobic digestion could process as much as 200,000 lbs/day of volatile solids resulting in the production of biogas with an energy content up to 275 therms/day (8,000 kilowatts/day).

Appendix 1.1
COS Samoa Packing Company
Sampling Results for Conventionals and Nutrients (March 2007 – February 2008)

pollutants	Influent			Effluent ①			violation rates		sample
	mean	99th%	max	mean	99th%	max	d-max	mo-av	count
flow rate (mgd)				823542	979276	958100	-	-	98
total susp solids (lbs/d)				1277.2	2389.4	2105.7	0 / 49	0 / 12	49
total nitrogen (lbs/d)				674.6	960.0	1081.8	0 / 98	0 / 12	98
total phosphorus (lbs/d)				99.2	148.1	155.3	0 / 98	0 / 12	98
oil and grease (lbs/d)				420.2	906.0	971.8	0 / 25	0 / 12	25
total susp solids (mg/l)	754.3	1441.6	1825.0	184.1	348.3	295.0	-	-	49
total nitrogen (mg/l-N)	165.1	280.8	501.2	98.2	131.2	139.3	-	-	98
total phosphorus (mg/l)	22.8	38.8	71.3	14.4	21.3	22.3	-	-	98
oil and grease (mg/l)	322.7	719.0	857.1	61.7	140.2	148.6	-	-	25
BOD (mg/l)	2062.9	4429.1	4983.3	868.2	2347.9	2791.5	-	-	12
temperature (°C)				83ºF	-	90ºF	0 / 365	-	②
pH minimum (s.u.)				-	6.6 min	8.0 max	0 / 365	-	②

① Effluent samples collected from IWD-00027 before discharge into the Joint Cannery Outfall.
② Continuous monitoring

Appendix 1.2
COS Samoa Packing Company
Sampling Results for Metals and Toxics (January 2006 - June 2008)

pollutants	Influent			Effluent ①			violation rates		sample
	mean	99th%	max	mean	99th%	max	d-max	mo-av	count
ammonia (mg/l-N)	46.5	82.9	104.8	35.8	55.9	58.5	0 / 50	0 / 1	50
mercury (µg/l)				0.096	0.169	0.162	0 / 1	0 / 1	9
copper (µg/l)				5.98	11.39	9.65	0 / 9	0 / 5	9
zinc (µg/l)				355.1	635.5	497.7	0 / 9	0 / 5	9
ammonia (lbs/d)				-	-	331.0	0 / 1	0 / 1	1
mercury (lbs/d)				-	-	0.001	0 / 1	0 / 1	1
copper (lbs/d)				-	-	0.027	0 / 1	0 / 1	1
zinc (lbs/d)				-	-	1.76	0 / 1	0 / 1	1

① Effluent samples collected from IWD-00027 before discharge into the Joint Cannery Outfall.

Appendix 1.3
COS Samoa Packing Company
Sampling Results for Priority Pollutants (September 22 - 23, 2004)

toxic inorganics and metals		toxic organics, pesticides, and PCBs	
aluminum (µg/l)	87.1	bromide (µg/l)	< 300
antimony (µg/l)	< 40	endosulfan I (µg/l)	0.0074
arsenic (µg/l)	17.7	4,4'-DDE (µg/l)	0.012
barium (µg/l)	3.5	chloromethane (µg/l)	< 0.31
beryllium (µg/l)	< 0.4	vinyl chloride (µg/l)	< 0.58
boron (µg/l)	77.1	bromomethane (µg/l)	< 0.81
cadmium (µg/l)	< 5.0	chloroethane (µg/l)	< 0.46
chromium (µg/l)	< 3.0	1,1-dichloroethene (µg/l)	<0.48
cobalt (µg/l)	< 5.0	methylene chloride (µg/l)	<0.21
copper (µg/l)	5.0	chloroform (µg/l)	< 0.21
total cyanide (µg/l)	< 3.0	1,1-dichloroethane (µg/l)	< 0.34
iron (µg/l)	495	1,1,1-trichloroethane (µg/l)	< 0.45
lead (µg/l)	< 2.0	carbon tetrachloride (µg/l)	< 0.38
manganese (µg/l)	13.3	benzene (µg/l)	0.27
mercury (µg/l)	0.230	1,2-dichlorothane (µg/l)	< 0.12
molybdenum (µg/l)	9.5	bromodichloromethane (µg/l)	< 0.17
nickel (µg/l)	< 20	dibromochloromethane (µg/l)	< 0.15
selenium (µg/l)	8.0	toluene (µg/l)	29.0
silver (µg/l)	< 5.0	ethylbenzene (µg/l)	1.6
sulfates (µg/l)	11,700	phenol (µg/l)	300
sulfites (µg/l)	19,000	naphthalene (µg/l)	3.6
sulfides (µg/l)	970	fluorene (µg/l)	1.3
zinc (µg/l)	286	phenanthrene (µg/l)	1.8
		di-n-butyl phthalate (µg/l)	0.58
		bis(2-ethylhexyl)phthalate (µg/l)	14.0
		total phenolics (µg/l)	90
		MBAS (µg/l)	40
		other volatiles	②
		other semivolatiles	②
		other organochlorine pesticides	②
		other PCBs	②

① Effluent samples collected from IWD-00027 before discharge into the Joint Cannery Outfall.
② Less than the method detection limits for EPA methods 608, 624, 625

Appendix 2
Joint Cannery Outfall
Receiving Water Monitoring (2006 - 2007) ①

parameters	Station 5 - Outer Harbor			Station 8 - ZID			Station 8A - ZID		
	mean	max	over ②	mean	max	over ②	mean	max	over ②
dissolved oxygen (mg/l)	6.39	6.01	0 / 12	6.11	5.50	0 / 12	5.81	5.22	0 / 12
total nitrogen (mg/l)	0.219	0.676	**3 / 12**	0.264	0.794	**4 / 12**	0.275	0.636	**7 / 12**
total phosphorus (mg/l)	0.014	0.030	0 / 12	0.023	0.040	**1 / 12**	0.020	0.030	0 / 12
ammonia (mg/l-N)	0.009	0.024	0 / 9	0.010	0.042	0 / 12	0.016	0.080	0 / 12
copper (µg/l)	0.337	0.740	0 / 12	0.337	0.750	0 / 12	0.215	0.320	0 / 12
zinc (µg/l)	2.17	5.90	0 / 12	1.49	3.16	0 / 12	1.02	1.72	0 / 12
mercury (µg/l)	0.0059	0.0135	0 / 12	0.0053	0.0193	0 / 12	0.0039	0.0137	0 / 12

parameters	Station 13 - Inner Harbor			Station 14 - Outfall			Station 16 - ZOM		
	mean	max	over ②	mean	max	over ②	mean	max	over ②
dissolved oxygen (mg/l)	5.89	2.89	**1 / 12**	5.88	4.97	**1 / 12**	6.14	5.82	0 / 12
total nitrogen (mg/l)	-	-	-	-	-	-	0.213	0.419	**5 / 12**
total phosphorus (mg/l)	-	-	-	-	-	-	0.022	0.040	**2 / 12**
ammonia (mg/l-N)	0.044	0.120	0 / 12	0.015	0.041	0 / 12	0.007	0.015	0 / 12
copper (µg/l)	0.722	1.460	0 / 12	0.229	0.440	0 / 12	0.360	0.960	0 / 12
zinc (µg/l)	3.51	9.36	0 / 12	1.06	2.61	0 / 12	4.82	38.7	0 / 12
mercury (µg/l)	0.0017	0.0036	0 / 12	0.0022	0.0051	0 / 12	0.0074	0.0397	0 / 12

① Semi-annual sampling at three water column depths for each station.
② Indicates the rate of water column samples exceeding the water quality standards.

Reference Stations	Stations Influenced by the Outfall Discharge
Station 5 - Outer Harbor in Ocean Transition Zone	Station 14 - Outfall Discharge
Station 13 - Inner Harbor in Uppermost Zone	Station 8 - Zone of Initial Dilution (Lower Boundary)
	Station 8A - Zone of Initial Dilution (Upper Boundary)
	Station 16 - Zone of Mixing Boundary