Dynegy Morro Bay, LLC
NPDES Discharge Description Summaries

Table 1A: Discharges to Outfall 001 [Discharge No.'s 001A through 001F]

Outfall 001 is a combination of once-through cooling water flow and miscellaneous process waste streams as detailed below. In-plant processes that contribute to 001, including 001A through 001F, are described in Tables 1A and 1B.

#	Discharge Name	Description	Volume (GPD)	Discharge Frequency	Potential Constituents[1]
Outfall 001 is a combination of once-through cooling water flow and miscellaneous process waste streams as detailed below. In-plant processes that contribute to 001, including 001A through 001F, are described in Tables 1A and 1B.					
001A: Once Through Cooling. Discharge 001A is primarily Once Through Cooling but also includes minor in-plant discharges that are not associated with the process waste streams described in 001B through 001F.					
001.A.1	Once Through Cooling Water and Auxiliary Salt Water Cooling System	The main circulating water system provides cooling water from Morro Bay for the main condensers and the cooling water heat exchangers. After passing through the main condensers, the cooling water is discharged. Condenser micro-fouling control is accomplished by chlorination. This discharge is primarily seawater.	Min: 2×10^6 [units off-line] Avg: 4×10^6 [units operating] Max: 7.25×10^6 [permitted limit]	Continuous	Seawater
001.A.2	Condensate Dump	If a significant main condenser tube leak occurs, depending on the severity of the leak and the amount salt water introduced into the condensate, condensate would be drained from the condenser directly to one of the surge chambers. This procedure is known as a "condensate dump".	5.5×10^4	Infrequent	Condensate & Seawater
001.A.3	Surface Impoundment Pond (SIP) Groundwater Removal System	Groundwater accumulated from under the SIPs* is routed directly to one of the surge chambers.	5×10^4	Intermittent	Ground Water

1. The Potential Constituent column lists the name of the discharge source, which is characteristically described in detail in Table 1B, titled Discharge Source Characterization.

Dynegy Morro Bay, LLC
NPDES Discharge Description Summaries

Table 1A: Discharges to Outfall 001 [Discharge No.'s 001A through 001F]

#	Discharge Name	Description	Volume (GPD)	Discharge Frequency	Potential Constituents[1]
001B: Intake Screen Washes					
001.B	Intake Screen Wash	Debris from the bay is washed from the traveling screen at the Intake Structure using seawater. The screen wash water, along with the debris is routed to a refuse collection sump and then combined and discharged with the once-through cooling water. To prevent the pumps from clogging with debris (trash, eelgrass and other seaweed), the refuse sump is periodically forced to overflow. Overflow from the refuse sump is directed through an opening in the face of the Intake Structure back into Morro Bay.	1.2×10^6	Intermittent	Seawater and marine debris
001C: The Make-Up Water System: This system produces several discharges to maintain ultra-pure water the boiler system requires to minimize corrosion in the boiler tubes and to control the accumulation of silica.					
001.C.1	Seawater Evaporator "Brine" Discharge	Boilers require high purity water to make-up for losses. This water is produced by a two step process which includes seawater evaporation followed by purification using a demineralizer (ion-exchange). The evaporation process generates high-salinity water (brine) as a by-product. Brine and any seawater overflow from the evaporator are discharged to Outfall 001.	2.4×10^5	Intermittent	Evaporator "Brine"
001.C.2	Seawater Evaporator "Start-up Product" Water	During start-up, the product water from the evaporator is discharged directly to Outfall 001.	2 to 5,000	Intermittent	Evaporator "Start-up Product" Water
001.C.3	Demineralizer Start-Up Rinsewater	When the demineralizer ion-exchange trains are spent, they are changed out. During start-up with the new trains, the water purity is not optimal for boiler make-up water. Until desired purity is obtained, the demineralized water is discharged directly to Outfall 001.	2 to 5,000	Intermittent	Demineralized Water
001D: Discharge eliminated in 1995.					

1. The Potential Constituent column lists the name of the discharge source, which is characteristically described in detail in Table 1B, titled Discharge Source Characterization.

Dynegy Morro Bay, LLC
NPDES Discharge Description Summaries

Table 1A: Discharges to Outfall 001 [Discharge No.'s 001A through 001F]

#	Discharge Name	Description	Volume (GPD)	Discharge Frequency	Potential Constituents[1]
001E: Surface Impoundment Ponds (SIPs): The SIPs are intended for treatment of hazardous waste streams. They are also utilized to manage a number of non-hazardous waste streams. As a result, they can contain any combination of the waste streams listed below and the discharge rate may vary. The maximum discharge to Outfall 001 is listed below for each waste stream. Ponds closed in June 2009.					
001.E.1	Treated Boiler Chemical Metal Cleaning and Rinse Wastes	Approximately every 10-15 years, the steam side of the boiler units are chemically cleaned to remove accumulated scale and corrosion deposits using either EDTA or hydrochloric acid as the cleaning aid. Wastewater generated during boiler cleaning may be treated in the SIPs* or utilizing a permitted temporary treatment unit (TTU) to remove contaminants.	Up To: 1.5×10^5	Infrequent	Treated Boiler Chemical Metal Cleaning and Rinse Waste Treated Boiler Chemical Metal Cleaning Rinse Waste
001.E.2	Treated Fireside Wash Water	The fireside components (fire side boiler tubes, air preheaters and stack internals) of the boiler units accumulate ash from combustion that may need to be washed. The waste water generated during the wash may utilizing a permitted TTU to remove potential contaminants.	Up To: 1.5×10^5	Infrequent	Treated Fireside Wash Water
001.E.3	Boiler Blowdown	A small percentage of boiler water is continuously circulated out of the boiler and treated to control the purity of the water. This process stream is known as "boiler blowdown". The boiler blowdown is routed to the Boiler Blowdown Storage Tank (BBST) from which it can be recycled through an ion-exchange water treatment system for re-use as boiler make-up water. If this normally high quality water is too concentrated with silica, or if the BBST is too full, the boiler blowdown may be discharged directly to Outfall 001. This waste stream is non-hazardous. No treatment occurs prior to discharge to Outfall 001.	Up To: 1.5×10^5	Intermittent	Boiler Blowdown
001.E.4	Boiler Lay-Up	During periods of extended boiler inactivity, the water sides of the boiler are protected with a lay-up solution to minimize corrosion. Prior to returning the boiler to service, the lay-up solution is drained directly to Outfall 001. This waste stream is non-hazardous. No treatment occurs prior to discharge to Outfall 001.	Up To: 1.5×10^5	Infrequent [two to four times per year]	Boiler Lay-up

1. The Potential Constituent column lists the name of the discharge source, which is characteristically described in detail in Table 1B, titled Discharge Source Characterization.

Dynegy Morro Bay, LLC
NPDES Discharge Description Summaries

Table 1A: Discharges to Outfall 001 [Discharge No.'s 001A through 001F]

#	Discharge Name	Description	Volume (GPD)	Discharge Frequency	Potential Constituents[1]
001F: Oily Water Separator: Treated effluent from the OWS is discharged to Outfall 001.					
001.F	OWS Effluent Discharge	The oil water separator (OWS) receives and physically treats water from various sources throughout the plant Source steams to the OWS include: ▪ Floor Drains in and around the Main Power Building and Intake Structure that collect equipment wash down water and other miscellaneous drips and leaks from various operating equipment throughout the facility. . ▪ Bearing Cooling Water System drips and discharges from either equipment leaks or intentional drainage to conduct maintenance. ▪ Fire Suppression System water associated with fire suppression activities. ▪ Storm water entering the OWS from the: – yard drains adjacent to, and along the west side of the main power building, – floor drains, and – the bermed containment area within which the oil-water separator system itself is located. ▪ Condensate from steam vents on main steam lines during a unit start-up that is directed to the basement sumps, and then to the OWS.	3 to 1 x 10^5 [Rate is dependent on plant maintenance activities, operating conditions and precipitation/ weather]	Continuous	Treated Oily Water

1. The Potential Constituent column lists the name of the discharge source, which is characteristically described in detail in Table 1B, titled Discharge Source Characterization.

Table 1B: Discharge Source Characterization

Discharge Source	Description	Potential Contaminants
Seawater: Main Condenser and Auxiliary System Cooling Once-Through Cooling Water	During unit operation, the main condenser cooling water and auxiliary systems cooling water are dosed as needed with sodium hypochlorite to control biofouling.	To ensure affective biofouling control, the seawater is chlorinated by adding 12.5% Sodium Hypochlorite in the intake. The injection process is automated and controlled to ensure that total residual chlorine in the discharge does not exceed 70 parts per billion (ppb).
Boiler Blowdown [Boiler Water]	Boiler make-up water injected with treatment chemicals to control oxygen.	Demineralized water with Trace amounts of: ▪ Trisodium phosphate ▪ Corrosion products including - copper - iron ▪ pH between 9 and 11 pH units ▪ Hydrazine
Boiler Lay-Up	Boiler water or distillate treated with oxygen scavengers to control corrosion during long lay-up periods.	Units 3 & 4 Demineralized water with trace amounts of: ▪ Hydrazine ▪ Ammonia Units 1 & 2: ▪ Sodium Sulfite
Condensate [a.k.a. Feedwater]	Steam condensed in the main condensers (condensate) is routed to a boiler for reheating into steam. These two processes form a closed loop steam cycle. When the condensed steam is circulated to the boilers (boiler feedwater) Hydrazine is added to control oxygen.	Trace quantities of the contaminants and treatment chemicals present in boiler water/boiler blowdown (defined above).
Demineralized Water [a.k.a. Boiler Make-Up Water]	High purity water produced from seawater using mechanical vapor compression evaporation followed by deionization. To minimize scale formation within the evaporator, feed water to the evaporator is dosed with a commercial product called ID-204 which contains the sodium salt of phosphonic acid (~20%) and sodium hydroxide (1-2%).	Potentially trace quantities of scale inhibitor.
Evaporator “Brine”	High-salinity seawater generated as a by-product in the seawater evaporator that produces boiler make-up water. Evaporator stilling tank overflow is combined with the evaporator brine before discharged.	Dissolved and suspended solids and potentially residual chlorine

Table 1B: Discharge Source Characterization

Discharge Source	Description	Potential Contaminants
Evaporator "Start-up Product" Water	Evaporator product water during the initial operation of the unit until the product water quality is optimized as feed water to the demineralizer, where it is further refined to make Boiler Make-Up Water. To minimize scale formation within the evaporator, feed water to the evaporator is dosed with a commercial product called ID-204 which contains the sodium salt of phosphonic acid (~20%) and sodium hydroxide (1-2%).	Potentially trace quantities of scale inhibitor (see Boiler Make-Up Water/ Demineralized Water)
Fire Fighting Water	Water used to fight a fire that may be blended with a fire suppression agent.	Potentially foam and trace amounts of protein based fires suppression agents.
Groundwater	Untreated groundwater pumped from beneath the SIPs.	Typical groundwater constituents
Treated Oily Water	Oily water that has been physically treated to remove oil & grease and suspended solids.	Trace oil & grease and suspended solids
Bearing Cooling Water	A commercially available solution is added to the closed cycle bearing cooling water system to provide corrosion control and protection.	▪ Sodium nitrate ▪ Sodium molybdate dihydrate ▪ Sodium tetraborate pentahydrate
Treated Boiler Chemical Metal Cleaning Waste	Boiler chemical cleaning waste following treatment with Temporary Treatment Unit	Trace iron, copper and nickel below permitted limits.
Treated Boiler Chemical Metal Cleaning Rinse Waste	Boiler chemical cleaning waste following treatment with Temporary Treatment Unit.	Trace iron, copper and nickel below permitted limits.
Treated Fireside Wash Water	Fireside wash water following treatment with Temporary Treatment Unit	Trace suspended solids and metals below permitted limits.
Surface Impoundment Pond: Characterization of Boiler Cleaning Solutions and Waste Streams Discharged to the Ponds.		
Boiler Chemical Metal Cleaning Waste	Boiler sides can by cleaned using one of two cleaning agents. 1. EDTA (preferred): Ammoniated EDTA solution (ethylenediaminetetraacetic acid) containing <1% free ammoniated EDTA and 1% corrosion inhibitor. 2. Acid (alternative): This is a two step process involving first filling the boilers with a solution containing <1% ammonium hydroxide, <1% ammonium carbonate, and <1% sodium bromate. The boiler is then drained, rinsed, and again filled, only this time with a solution containing approximately 5% hydrochloric acid, <1% thiourea, and <1% corrosion inhibitor.	EDTA Cleaning Process: ▪ Ammoniated EDTA ▪ Corrosion inhibitor Acid Cleaning Process: ▪ Hydrochloric acid neutralized with sodium hydroxide ▪ Thiourea ▪ Corrosion inhibitor Corrosion by-products (chelated metals): ▪ iron ▪ copper ▪ nickel

Table 1B: Discharge Source Characterization

Discharge Source	Description	Potential Contaminants
Boiler Chemical Metal Cleaning Rinse Waste	Boiler make-up water with boiler cleaning chemicals removed during a rinse. 1. EDTA Following the initial cleaning stage with ammoniated EDTA, the boiler is rinsed. This rinse water is simply a dilute version of the original EDTA cleaning solution. 2. Acid The rinse waters following an acid cleaning are typically neutralized in-line with caustic soda to increase the pH and promote precipitation. The rinses are simply diluted versions of the boiler drains from the first stage ammonium bromate and second stage hydrochloric acid washings.	Dilute solution of Boiler Chemical Metal Cleaning Waste described above.
Fireside Wash Water	Well water (potentially alkalized) used to wash the fireside components (fire side boiler tubes, air preheaters and stack internals) of the boiler. This was mostly required when Fuel Oil #6 was burned as an alternate fuel, which caused ash and soot containing various metals characteristic of the fuel (vanadium, iron, nickel, chromium, vanadium and zinc) to accumulate on the fireside components. Any future fireside washes will have decreased amounts of the potential contaminants listed as Fuel Oil #6 was discontinued in 1994.	▪ Suspended ash and soot ▪ Rust and sediments such as dirt and refractory dust ▪ Dissolved and suspended metals - vanadium - zinc - nickel - chromium - iron

Dynegy Morro Bay, LLC
NPDES Discharge Descriptions

Table 2: Discharges to the Surface Impoundment Ponds (SIPs)

Discontinuance of Surface Impoundment Inspections and Sampling Pursuant to Waste Discharge Requirements & Monitoring and Reporting Program (WDR & MRP R3-2004-105 and WDR 95-28) and Transfer of Pond Management Under General Industrial Storm Water Permit occurred in 2009.

Discharge Name	Description	Volume	Discharge Frequency	Potential Constituents[1]
The Surface Impoundment Ponds (SIP) receive influent from several process waste streams, all of which are described below. Following any required testing to ensure compliance with all discharge limitations and prohibitions, the treated waste streams are combined with the once through cooling water to Outfall 001 (see Table 1A and 1B).				
Boiler Chemical Metal Cleaning Waste & Rinse Wastes	Approximately every 10-15 years, the steam side of the boiler units are chemically cleaned to remove accumulated scale and corrosion deposits using either EDTA or hydrochloric acid as the cleaning aid. The chemical cleaning wastewaters utilizes a permitted TTU to remove contaminants. The treated wastewater will be transported offsite for disposal, as WDR R3-2004-105, which previously permitted this discharge, has been rescinded.	2×10^5 (Gallons) Batch Discharge	Infrequent	Boiler Chemical Metal Cleaning Waste and Rinse Waste
Fireside Wash	The fireside components (fire side boiler tubes, air preheaters and stack internals) of the boiler units accumulate ash from combustion that may need to be washed. The wastewater generated during the wash utilizies a permitted TTU to remove potential contaminants. The treated wastewater will be transported offsite for disposal, as WDR R3-2004-105, which previously permitted this discharge, has been rescinded.	5×10^4 (Gallons) Batch Discharge	Infrequent	Fireside Wash Water

1. The Potential Constituent column lists the name of the discharge source, which is characteristically described in detail in Table 1B, titled Discharge Source Characterization.

Dynegy Morro Bay, LLC
NPDES Discharge Descriptions

Table 2: Discharges to the Surface Impoundment Ponds (SIPs)

Discontinuance of Surface Impoundment Inspections and Sampling Pursuant to Waste Discharge Requirements & Monitoring and Reporting Program (WDR & MRP R3-2004-105 and WDR 95-28) and Transfer of Pond Management Under General Industrial Storm Water Permit occurred in 2009.

Discharge Name	Description	Volume	Discharge Frequency	Potential Constituents[1]
Boiler Blowdown	A small percentage of boiler water is continuously circulated out of the boiler and treated to control the purity of the water. This process stream is known as "boiler blowdown". The boiler blowdown is routed to the Boiler Blowdown Storage Tank (BBST) from which it can be recycled through an ion-exchange water treatment system for re-use as boiler make-up water. If this normally high quality water is too concentrated with silica, or if the BBST is too full, the boiler blowdown may be discharged directly to Outfall 001. This waste stream is non-hazardous. No treatment occurs prior to discharge to Outfall 001. (See Table 1A, 001.E.3)	2×10^4 (GPD)	Intermittent	Boiler Blowdown
Boiler Lay-up	During periods of extended boiler inactivity, the water sides of the boiler are protected with a lay-up solution to minimize corrosion. Prior to returning the boiler to service, the lay-up solution is drained to Outfall 001 This waste stream is non-hazardous. No treatment occurs prior to discharge to Outfall 001. (See Table 1, 001.E.4)	9×10^4 (Gallons) Batch Discharge	Infrequent [two to four times per year]	Boiler Lay-Up

1. The Potential Constituent column lists the name of the discharge source, which is characteristically described in detail in Table 1B, titled Discharge Source Characterization.

Dynegy Morro Bay, LLC
NPDES Discharge Descriptions

Table 2: Discharges to the Surface Impoundment Ponds (SIPs)

Discontinuance of Surface Impoundment Inspections and Sampling Pursuant to Waste Discharge Requirements & Monitoring and Reporting Program (WDR & MRP R3-2004-105 and WDR 95-28) and Transfer of Pond Management Under General Industrial Storm Water Permit occurred in 2009.

Discharge Name	Description	Volume	Discharge Frequency	Potential Constituents[1]
Storm Water from Stack-area Yard Drains	Storm water falling adjacent to the southern side of the plant (in the vicinity of the three stacks and combustion air fans) is collected by various yard drains and directed to the metal cleaning waste sump from which it is Connected to the Storm Water Conveyance System via a butterfly valve.	1×10^5 (GPD)	Intermittent [during wet season]	Storm Water

* **Discharges to the Surface Impoundment Ponds (SIPs)**

Discontinuance of Surface Impoundment Inspections and Sampling Pursuant to Waste Discharge Requirements & Monitoring and Reporting Program (WDR & MRP R3-2004-105 and WDR 95-28) and Transfer of Pond Management Under General Industrial Storm Water Permit occurred in 2009.

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1. The Potential Constituent column lists the name of the discharge source, which is characteristically described in detail in Table 1B, titled Discharge Source Characterization.