4.4.3 Non-Storm Water Discharges

The plant has a variety of close-loop water sources. Examples of some of these close-loop systems are the cooling tower, chiller tower, and other water uses in the facility. None of these sources will be discharged into the storm drain.

The primary non-storm water stream discharge will be from the circulating ion reduction plant. This discharge will be to the evaporation ponds. The ion reduction plant will be an advanced treatment system design to recover essentially all water for reuse, leaving only a very small stream for disposal in the evaporation ponds. This stream will be a brine, with very high concentrations of total dissolved solids and other nonhazardous constituents. The expected water quality of each stream for the plant is provided in **Table 3**. The typical flow rate will be approximately 60 gallons per minute (gpm). This stream will be discharged to the evaporation ponds where the remaining water will be evaporated.

The only other non-storm water stream will be from the sanitary sewer system. This system will be an onsite septic system designed to meet local and state regulatory requirements.

4.5 Employee Training

Project employees will receive HAZWOPER and internal training in handling chemicals and responding to spills. This training will include cleanup and decontamination procedures. As a result of this HAZWOPER training and yearly updates, the SWPPP should not require the introduction of a new training program. Additionally, Caithness will emphasize spill prevention, good housekeeping, and sound chemical management internal training programs during initial employee orientation, during onsite job training, and during periodic employee meetings. The goals of these training programs will be the elimination of sources, processes, procedures, and/or incidents that may result in the pollution of the storm water drainage system.

4.6 Inspection

The plant will be inspected weekly by the Environmental/Safety Engineer. The inspection procedure selected will ensure all monitoring, safety and emergency equipment, security devices, and facility that are vital to prevent or respond to environmental or human health hazards are kept in good working order and potential pollution issues are addressed. Part of the weekly inspection will be to check all chemical storage areas, the general plant, the storm water drainage system, and the sanitary sewer system. As a weekly inspection, all seasons of the year will be covered, including the rainy wet season. A copy of the proposed onsite visual inspection Checklist is provided in **Appendix B**.

Table 3. Expected Water Quality of Evaporation Ponds for Big Sandy Energy Plant

Constituent	Units	Evaporation Pond Influents
Calcium	ppm as CA	460.78
Magnesium	ppm as Mg	153.59
Sodium	ppm as Na	1,919.90
Potassium	ppm as K	76.80
Sulfate	ppm as SO4	1,535.92
Chloride	ppm as Cl	1535.92
pH	none	
Silica (Total)	ppm as SiO2	191.99
Silica (Reactive)	ppm as SiO2	191.99
Iron	ppm as Fe	7.68
Specific Conductivity	mhos/cm	11,519.40
Total Dissolved Solids	ppm as TDS	5,759.70
Total Suspended Solids	ppm as TSS	38.40
Nitrate	ppm N	11.52
Phosphate	ppm as PO4	3.84
M Alkalinity	ppm as CaCO3	2,111.89
P Alkalinity	ppm as CaCO3	0.00
Ammonia	ppm as NH3	7.68
Silt Density Index (0.45 m)	none	15.36
Turbidity	NTU	53.76
Biological Oxygen Demand	ppm BOD	23.04
Total Organic Carbon	ppm as C	7.68
Total Nitrogen	ppm as N	15.36
Aluminum	ppm as Al	3.84
Arsenic	ppm as Ba	0.77
Barium	ppm as Ba	0.77
Boron	ppm as B	8.45

Table 3. Expected Water Quality of Evaporation Ponds for Big Sandy Energy Plant		
Cadmium	ppm as Cd	0.02
Copper	ppm as Cu	0.08
Cyanide	ppm as CN	0.08
Fecal Coliform	NMP/100 ml	76.80
Flouride	ppm as F	30.72
Hexavalent Chromium	ppm as Cr	0.12
Total Chromium	ppm as Cr	0.12
Lead	ppm as Cr	0.23
Mercury	ppm as Hg	0.12
Nickel	ppm as Ni	0.08
Selenium	ppm as Se	0.15
Strotium	ppm as Sr	0.08
Tin	ppm as Sn	0.15
Zinc	ppm as Zn	3.84

A general seasonal review of items covered during the storm drainage system inspection is provided as follows:

- Dry Season Inspection (May through September) - Requires checking the storm water drains in the main plant area for the presence of non-storm discharges and contaminants. Requires the checking of evaporation ponds for buildup of silt or non-storm discharges and contaminants. Requires examination of boundary drainage channels for the present of non-storm discharges and contaminants.

- Wet Season Inspection (October through August) - Requires taking grab samples of storm water runoff into the evaporation ponds. When possible, these samples should be taken monthly during the rainy seasons. These grab samples will be physically examined for floating or suspended material, oil and grease, discolorations, turbidity, and odor. Requires two additional annual grab samples be taken at the storm water discharge into the evaporation ponds. These samples will be analyzed for prescribed pollutants such total suspended solids (TSS), conductivity, total organic carbon (TOC), oil & grease (O&G), semi-volatile organic compounds (SVOCs), and pH. The grab samples taken at a proposed "L-shaped" berm will be analyzed for TSS, conductivity, and TOC.

4.7 Environmental Work Instruction for Secondary Containment Areas

The Environmental/Safety Engineer has developed general work instruction for visually examining secondary containment areas after each storm event to insure that only clean water is drained into the main plant storm water drainage system. A copy of these general work instructions is provided in **Appendix C**.

4.8 Waste Handling and Recycling

Although the Big Sandy Energy Project will have a U.S. EPA Identification Number for the disposal of hazardous material from the site, significant quantities of hazardous waste are not expected to be routinely generated at the facility. Almost all of the chemicals used at the plant will be consumed as part of the facility operation.

Hazardous waste generated at the facility will be mostly from maintenance of equipment or off-spec materials. An example of a maintenance activity which could generate a short-term high level of waste is the 3 to 5 year -maintenance on the Heat Recovery Steam Generators. Normal maintenance activities will generate small levels of waste materials. An example of an off-spec material waste source would be used transformer mineral oil. All of these major sources of waste will be handled and recycled through maintenance contracts on the equipment.

The normal small quantities of waste generated at the facility will be stored in the facility's covered chemical storage facility in an appropriate container. The container will be labeled according to Resource Control and Recovery Act (RCRA) regulations. Additionally, this facility will be designed to store hazardous materials. This material will be disposed of by an approved contractor at a licenced facility which handles the waste.

As mentioned earlier, the chemical storage facility will be located within the main plant area. Therefore, all drains in the area of the chemical storage facility will be to the evaporation ponds.

4.9 Erosion Control and Site Stabilization

The main plant area will be covered with asphalt or concrete or with rock. Therefore, soil erosion from this area should not be a problem.

The area near the evaporation ponds will be soil. This soil, however, will be compacted to minimize erosion. Additionally, theWikieup region has a low annual rainfall (10 inches), and the plant property does not have a history of flash flooding. Therefore, significant erosion of this area is not anticipated.

Portions of the plant's perimeter and interior may be landscaped with native vegetation. This vegetation could provide some erosion control and soil stability in localized areas.

5.0 MONITORING AND RECORD KEEPING

5.1 Annual Inspection

An annual inspection of the storm water drains will be conducted by the Environmental/Safety Engineer. The results of the inspection will be provided to the ADEQ during annual reports. These annual SWPPP reports will include a summary of monitoring, observations, and test results. All annual reports submitted to the ADEQ will be certified by the Environmental/Safety Engineer.

5.2 Monitoring of Storm Water

During the wet season, the Environmental/Safety Engineer will take runoff grab samples from two different storm events during the wet season. Whenever possible, the first storm event of the wet season will be sampled. Reasons for not sampling during this first storm event will be provided in the annual storm water report to the ADEQ. The location of these grab samples will be at the main storm water channel into the evaporation pond. These grab samples will be taken after one hour of continuous rain. The Environmental/Safety Engineer will transport the samples to, have the samples shipped to, or have them picked up by a certified laboratory approved for performing the analyses required in the SWPPP. All samples taken will be maintained under chain-of-custody at all times. Additionally, the samples will be stored properly in accordance with U.S. EPA protocol

Analytical results will be submitted to the Environmental/Safety Engineer and kept on file for a period of five years. Additionally, the analytical results will be included in the annual updated reports to the ADEQ.

The monitoring of storm water will be performed to assure that BMPs are conducted and updated in areas of potential pollution identified in this SWPPP. Potential sources of pollution, the potential pollutants in areas, and the analytes to be tested are summarized in **Table 4.** The analytical test methods, frequency, and sampling protocol for potential pollutants at the plant are provided in **Table 5**.

5.3 Record Keeping

All storm water annual related records and the SWPPP will be held in the Environmental/Safety Engineer office. Annual records must be kept for a period of five years. These annual records will include the following items.

- The date, time, personnel involved, site locations, and other recorded information during the weekly inspections.

Table 4. STORM WATER POLLUTION PREVENTION PLAN		
Areas of Potential Sources of Pollution	**Potential Pollutants**	**Analytes to be Tested**
Main Plant Area	Acids, Caustics, and Oils.	Total suspended solids (TSS), conductivity, total organic carbon (TOC), oil & grease (O&G), semi-volatile organic compounds (SVOCs), and pH.
Evaporation Ponds	Sediments	Total suspended solids (TSS), conductivity, total organic carbons (TOCs), and pH.

Table 5. STORM WATER SAMPLING AND REPORTING PARAMETERS

Test Constituents	Title 40, CFR, Part 433.14, Storm Water Discharge Permit				SW-846, Sampling Protocol			
	Maximum One Day	**Monthly Average Night**	**Test Method**	**Frequency**	**Minimum for Analyses**	**Preservation Method**	**Maximum Holding Time**	**Recommended Container**
Total suspended solids (TSS)	60 mg/L	31 mg/L	160.1	2 Storm Events	1 Liter	Cool, 4°C	7 Days	Plastic or Glass
Conductivity	2,500 µmho/cm	-	120.1	2 Storm Events	100 ml	Field Determined	None	Plastic or Glass
Total Organic Carbon (TOC)	52 mg/L	-	415.2	2 Storm Events	Four 15 ml	Cool, 4°C HCl to pH<2	28 Days	Glass Only
Oil & Grease (O&G)	62 mg/L	26 mg/L	413.1	2 Storm Events	100 ml	Cool, 4°C HCl to pH<2	28 Days	Amber Glass Only
Semi-Volatile Organic Compounds (SVOCs)	-	-	624	2 Storm Events	1 Gallon	Cool, 4°C	7 Days	Amber Glass Only
pH	6.0 to 9.0	6.0 to 9.0	150.1	2 Storm Events	25 ml	Field Determined	None	Plastic or Glass
Certification	-	-	Monitoring Program	Annual	-	-	-	-
Non-Compliance Reporting	-	-	Monitoring Program	Annual	-	-	-	-
Annual Site Inspection	-	-	Monitoring Program	Annual	-	-	-	-
Dry Season Observation	-	-	Monitoring Program	Annual	-	-	-	-
Wet Season Observation	-	-	Monitoring Program	1 Storm Event per Month (first hour)	-	-	-	-

- The date, exact place, time, personnel involved, and general physical observations of grab samples taken during monthly storm water events.

- The date, exact place, time, personnel involved, physical observations, and chain-of-custody for the two annual analytical grab samples.

- The analytical results of all annual grab samples.

- The date, exact places inspected, and personnel involved in annual inspections of the storm water drainage system.

- The information on all Storm Water Committee meetings.

- The information on any changes made to the storm water drainage system.

- The reasons and completion date for any SWPPP projects, if additional projects are required.

Appendix A. Wind Roses for Project Area

Appendix B. Environmental Weekly On-Site Inspection Checklist

Environmental Weekly Inspection On-Site Visual Inspection Checklist					
Item Number	**Unit Description**	**Remarks**	**Any Work Orders Submitted**	**In Compliance**	
				Yes	**No**
1	Gas Turbine No. 1 Area				
2	Gas Turbine No. 2 Area				
3	Steam Turbine Area				
4	Transformer Areas				
5	Fuel Gas Metering Location				
6	Circulating Water Pumps				
7	Circulating Cooling Water Towers				
8	Mechanical Scrubbers				
9	Reverse Osmosis and Water Treatment Area				
10	Heat Recovery Steam Generator No. 1				
11	Heat Recovery Steam Generator No. 2				
12	Boiler Blowdown Area				
13	Pipe Bridge Area				
14	Emergency Diesel Water Pump				
15	Ammonia Storage Area				
16	Chiller Compressor Area				
17	Chiller Condenser Towers				
18	Evaporation Pond No. 1				
19	Evaporation Pond No. 2				
20	Workshop				
21	Laboratory				
22	Chemical and Waste Storage Area				

Inspectors(s) Name _____ Date _____

Checklist Items for All Locations:

- Fire extinguishers have current inspection.
- Check visible electrical wiring for obvious fraying or damage.
- Check piping for leaks.
- Check housekeeping practices.
- Verify phones are operational and emergency phone numbers are provided.
- Verify emergency eyewash and shower are operational.
- Verify personal protection equipment (PPE) is available.
- Verify SPCC Plan or other spill response information is available.
- Check all spill containment and decontamination equipment is present.
- Verify Material Safety Data Sheets (MSDSs) are present.
- Check secondary containment areas and tanks for leaks.
- Check evacuation maps and exit signs are present and accurate.
- Inspect locks for signs of vandalism.
- Verify proper signs (e.g., high voltage, no smoking, hazardous material, etc.) are located at area.
- Verify no unlabeled containers are stored at the site.
- Check all containers for rust or damage.
- Check five random drains for contamination.

Appendix C. Environmental Work Instructions for Secondary Containment Systems

Environmental Work Instructions for Secondary Containment Systems

PURPOSE: The purpose of this work instruction is to detail the Environmental/Safety Engineer activities concerning rainwater in secondary containment systems. The Operational Area Supervisor or his/her designated representative will be responsible for visually inspecting the water inside of secondary containment systems after each storm event, to insure that only clean storm water is drained into the storm water drainage system. If the area contains chemicals which cannot be visually detected, the Operational Area Supervisor or his/her representative will chemically test the water inside of the containment area prior to discharge to the storm water drainage system. The chemical test will be provided in the area's operational handbook.

DAILY OPERATIONS: The secondary containment system is equipped with a block valve to contain all liquids inside of the area or the area will be manually pumped. If a block valve is used, it will be to be kept closed during normal daily operations to insure no spills are introduced into the storm water drainage system. If a block valve is not present, the area must be manually pumped out.

The following steps are to be taken after each storm event and prior to opening the block valve or pumping liquids from the secondary containment basin:

1. Check with the Environmental/Safety Engineer concerning any reported spills in the area since the last storm event.
2. Visually inspect the storm water inside of the containment area for oily sheens on top of the storm water. If chemicals are stored in the area which cannot be visually, inspected, samples of the storm water must be taken and sent to the laboratory for further examination.
3. If any oily sheen is found or if test results indicate the presence of chemicals in the water, pump contaminated rainwater with a vacuum tanker or other container (e.g., 55-gallon drum or bowser), and transport the liquid to the chemical storage facility. All containers will be labeled with the contents in them.
4. If no oily sheen is observed or if test results indicate no contamination, contact the Environmental/Safety Engineer or his/her representative for authorization to open the secondary containment block valve or to pump out the rainwater from the area.
5. If authorization is provided, the rainwater in the secondary containment system can be discharged to the main plant storm water drainage system. This authorization should be noted in the facility log book.
6. Close the catch basin valve after all accumulated rainwater is drained from the secondary containment system. Leave the valve closed during normal operations in the area to insure containment of any possible spills.