

ADEQ OPERATING AIR PERMIT

Pursuant to the Regulations of the Arkansas Operating Air Permit Program, Regulation #26:

Permit #: 286-AOP-R2

IS ISSUED TO:

Great Lakes Chemical Corporation-West Plant
5821 Schuler Road
Marysville, AR 71753
Union County
CSN: 70-0101

THIS PERMIT AUTHORIZES THE ABOVE REFERENCED PERMITTEE TO INSTALL, OPERATE, AND MAINTAIN THE EQUIPMENT AND EMISSION UNITS DESCRIBED IN THE PERMIT APPLICATION AND ON THE FOLLOWING PAGES. THIS PERMIT IS VALID BETWEEN:

March 9, 1998

and

March 8, 2003

AND IS SUBJECT TO ALL LIMITS AND CONDITIONS CONTAINED HEREIN.

Signed:

Keith A. Michaels

Date Modified

SECTION I: FACILITY INFORMATION

PERMITTEE: Great Lakes Chemical Corporation-West
Plant
CSN: 70-0101
PERMIT NUMBER: 286-AOP-R2

FACILITY ADDRESS: 5821 Schuler Road
Marysville, AR 71753

COUNTY: Union

CONTACT POSITION: Pete Howard
TELEPHONE NUMBER: (870) 864-1543

REVIEWING ENGINEER: Wesley Crouch

UTM North-South (X): Zone 15 :3671.7
UTM East-West (Y): Zone 15: 505.73

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SECTION II: INTRODUCTION

Summary

Great Lakes Chemical Corporation-West Plant operates a bromine recovery facility at 5821 Schuler Road in Marysville, Arkansas. This modification allows Great Lakes to install a boiler previously located at the Newell facility. It will replace the #1 boiler (SN-101). This boiler is rated at 68 MMBtu/hr and will be utilized as a standby boiler. This modification will result in permitted emissions decreases of 1.4 tpy PM, 1.4 tpy PM₁₀, 17.7 tpy CO, and 274.7 tpy NO_x and a permitted increase of 0.2 tpy VOC. Emissions from the boiler (SN-101A) are less than the PSD significance levels.

Process Description

Bromine-rich brine is pumped to the surface from the underlying Smackover foundation at Great Lakes Chemical Corporation (GLCC) brine supply wells. The brine contains dissolved sour gas, which must be separated from the brine before the brine is sent to the bromine towers.

Gas separation begins at the well site. At the facility, the brine is further degassified. Oil separated at the plant site is stored and sold. The degassified brine is sent to the bromine towers for bromine production. The sour gas is normally transported to Lion Oil Company (via GLCC's El Dorado Plant) for sweetening. Alternatively, the sour hydrogen sulfide gas can be converted to sodium hydrosulfide (NaHS) and sold.

Boilers supply steam for bromine production and for other plant uses.

The major processes at the facility are brine supply pre-treatment, scrubber brine cooling system, NaHS, flare, boilers, bromine production, and fuel storage.

Brine Supply Pre-Treatment

The incoming brine is acidified and sent to a stripper system, which removes additional sour gas. Most of the stripped brine goes directly to the bromine towers. The remaining brine will be routed to the scrubber brine cooling system (SBCS).

Scrubber Brine Cooling System

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The brine is cooled by non-contact heat exchange. The cooled brine from the SBCS flows through a scrubber brine surge tank and is then used in direct contact cooling (DCC) units at the bromine towers and in brine vent scrubbers. The cooled brine surge tank located in the SBCS and the scrubber brine surge tank are open to the atmosphere.

NaHS

The sour gas from the hydrogen sulfide strippers is combined with sour gas from the wells and routed to a reactor where the hydrogen sulfide in the gas is reacted with sodium hydroxide to form NaHS. The mixture is routed to a reactor/separator where the liquid NaHS is separated from the “sweetened” gas. The NaHS is routed to product storage tanks; the sweetened gas is routed to the boilers. When one or both boilers are down, the sweetened gas can be routed to the flare.

Flare

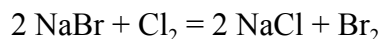
The facility is equipped with a flare to burn sour gas in the event that it cannot be routed to Lion Oil or the NaHS production unit. “Sweet” gas from the NaHS unit is also flared when Boiler #1 or Boiler #2 is down.

Boilers

The facility operates three natural gas boilers which supply process steam. Boiler #2 is permitted to burn “sweet” gas discharged by the NaHS plant. In addition, the natural gas consumption is based on maximum capacity for both the pounds per hour and tons per year.

Bromine Production

Brine, steam, and chlorine are introduced into the four bromine towers, where bromine is removed by the following simplified reaction:



The bromine vapor is condensed and purified.

From the purification process, bromine is transferred to storage in tanks. From the tanks it is transferred to tank trucks or ISO's. Spent acid from the acid dryers is routed to the tail brine system.

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The debrominated brine is cooled in “heat recovery units”. The cooled brine is then reduced, neutralized and transferred to the tail brine system, where it is reinjected into the Smackover formation.

Bromine storage and transfer vents are controlled by two caustic scrubbers operating in parallel. Blowdown from the storage and transfer scrubbers is discharged to the feed brine system. Residual bromine is removed from returned ISO’s and tank trucks. This removal operation also vents to these scrubbers.

Fuel Storage

Gasoline and diesel fuel for Great Lakes and contractor vehicles is stored in two tanks at the site. The tanks are under a shed.

This facility is subject to regulation under the *Arkansas Air Pollution Control Code* (Regulation 18), the *Regulations of the Arkansas Plan of Implementation for Air Pollution Control* (Regulation 19), the *Regulations of the Arkansas Operating Air Permit Program* (Regulation 26), and 40 CFR Part 60, Subpart Dc, *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units*.

The following table is a summary of emissions from the facility. Specific conditions and emissions for each source can be found starting on the page cross referenced in the table.

EMISSION SUMMARY					
Source No.	Description	Pollutant	Emission Rates		Cross Reference Page
			lb/hr	tpy	
Total Allowable Emissions		PM	2.9	10.0	
		PM ₁₀	2.9	10.0	
		SO ₂	141.6	312.3	
		VOC	1.7	6.4	
		CO	39.6	167.2	
		NO _x	24.7	93.0	
		HCl	0.7	3.1	
		HBr	0.1	0.5	
		Br ₂	8.2	20.8	

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EMISSION SUMMARY					
Source No.	Description	Pollutant	Emission Rates		Cross Reference Page
			lb/hr	tpy	
201	NaHS Flare Natural Gas (0.125 MMBtu/hr)	PM	0.1	0.5	11
		PM ₁₀	0.1	0.5	
		SO ₂	@	*	
		SO ₂	0.1	0.5	
		VOC	0.1	0.5	
		CO	0.1	0.5	
		NO _x	0.1	0.5	
301	HCl/HBr Storage Tank	HCl	0.7	3.1	11
		HBr	0.1	0.5	
001	Bromine Tower #1	Br ₂	1.0 ¹ 0.1 ²	0.8	13
002	Bromine Tower #2	Br ₂	1.0 ¹ 0.1 ²	0.8	13
005	Bromine Towers Common Vent	Br ₂	2.2	8.8	13
006	Bromine Storage and Packaging Tank	Br ₂	2.0	8.8	13
007	Bromine Tower #3	Br ₂	1.0 ¹ 0.1 ²	0.8	13
009	Bromine Tower #4	Br ₂	1.0 ¹ 0.1 ²	0.8	13
101A	Boiler #1 Natural Gas (68 MMBtu/hr)	PM	1.0	1.7	17
		PM ₁₀	1.0	1.7	
		SO ₂	0.1	0.1	
		VOC	0.4	0.7	
		CO	2.4	4.2	
		NO _x	9.6	16.7	

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EMISSION SUMMARY					
Source No.	Description	Pollutant	Emission Rates		Cross Reference Page
			lb/hr	tpy	
102	Boiler #2 Natural Gas and NaHS Plant Sweet Gas (106 MMBtu/hr)	PM	0.4	1.8	17
		PM ₁₀	0.4	1.8	
		SO ₂ ³	@	*	
		SO ₂ ⁴	0.6	*	
		VOC	0.6	2.7	
		CO	22.1	96.8	
		NO _x	6.5	28.5	
103	Boiler #3 Natural Gas (97 MMBtu/hr)	PM	1.4	6.0	17
		PM ₁₀	1.4	6.0	
		SO ₂	0.1	0.3	
		VOC	0.6	2.5	
		CO	15.0	65.7	
		NO _x	8.5	37.3	

1 - This emission rate is based on 720 hours per year for the changing of the caustic in the Bromine Tower Scrubber (SN-05).

2 - This emission rate is for the remaining 8,040 hours per year.

3 - The sulfur dioxide emissions while the NaHS plant is on line.

4 - The sulfur dioxide emissions while the NaHS plant is off line.

@- The sulfur dioxide emissions while the NaHS plant is on or off line shall not exceed 138.6 lbs/hr from boiler #2 and NaHS flare combined, excluding the sulfur dioxide emissions from the natural gas combustion.

* - The total emissions of sulfur dioxide from boiler #2 and SN-201 shall not exceed 312.0 tpy.

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SECTION III: PERMIT HISTORY

Permit #286-A to construct and operate was issued on February 3, 1975.

Permit #286-AR-1, which was issued on November 4, 1987, allowed the construction of a sodium hydrosulfide unit and the tail gas from this unit was routed to either or both of the facility's two boilers.

Permit #1647-A was issued on June 27, 1995. This air permit allowed the construction of a third bromine tower and construction of a scrubber brine cooling system (SBCS) to replace the feed brine pond. Other changes included the transport of hydrogen sulfide (sour gas) to Lion Oil Company via GLCC's El Dorado plant. The sour gas is sweetened and returned to the El Dorado plant for combustion.

Permit #286-AR-2 was issued on August 13, 1996. This air permit covered consolidating permit #1647-A with #286-AR-2. In addition, this modification allowed for the installation of a fourth bromine tower.

Permit # 286-AOP-R0 was this facility's initial Title V permit. It was issued on March 9, 1998 and a third boiler was permitted for the first time in this permit. Several previously permitted sources were designated as insignificant.

An administrative amendment was performed on permit #286-AOP-R0 on June 10, 1999. This amendment corrected several typographical errors and SN-302 through 307 were removed.

Permit 286-AOP-R1 was issued on July 12, 2000. It allowed the installation of a smaller third boiler (SN-103) than the one permitted in permit # 286-AOP-R0.

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SECTION IV: EMISSION UNIT INFORMATION

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SN-201 and SN-301
Brine Supply Wells, Brine Pre-Treatment, and Sodium Hydrosulfide

Source Description

The Great Lakes Chemical Company currently operates brine supply wells in conjunction with the West Plant. These wells produce brine that contains dissolved sour gas. Since the gas interferes with the operation of the bromine towers, Great Lakes removes as much of it as possible before the bromine is recovered.

The gas separation begins at the well site. The gas separated at the well is cooled and transported to the West Plant through a buried pipeline. The brine is sent to the plant in a separate pipeline. At the plant, incoming brine is acidified to make gas removal easier and then sent to a vacuum stripper. After the vacuum stripper, most of the brine is sent directly to the bromine towers. The remaining brine is sent to the scrubber brine cooling system (SBCS) and then the bromine towers. The acid used to treat the brine is stored on site. This storage tank is equipped with a scrubber (SN-301) which uses degassed brine, fresh water or caustic as the scrubbing media.

The sour gas stripped at the well sites is combined with the gas removed from the vacuum stripper. The combined sour gas stream is then routed to the El Dorado Plant, where it is combined with the sour gas from other GLCC plants and routed to Lion Oil Company (LOC) for sweetening. LOC returns the sweetened gas to the El Dorado (Central) Plant for combustion in the facility's boilers. When LOC's amine sweetener plant is down for an extended duration for maintenance or other reasons, the sour gas will be used to produce NaHS at the West and El Dorado Plants. In the NaHS units H_2S in the gas reacts with sodium hydroxide to form sodium hydrosulfide. The tail gas leaving the West Plant's NaHS unit is sent to either the #1 or #2 boiler.

In the event the NaHS reactor train is down, the plant is equipped with a flare (SN-201) to burn the sour gas. In addition, some brine supply wells are equipped with a flare, when necessary, these flares are only used in extreme emergencies.

The scrubber brine cooling system was installed to replace the feed brine ponds. The SBCS consists of a non-contact heat exchanger, support structures, and feed pumps. The system is also equipped with instrumentation to monitor the surge tank level and the brine temperature (Previously the brine was pumped into a pond where it was cooled by evaporation. The pond had H_2S emissions but they were fugitive and not point source emissions).

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Specific Conditions

1. Pursuant to §19.501 of the Regulations of the Arkansas State Implementation Plan for Air Pollution Control, effective February 15, 1999 (Regulation 19) and 40 CFR Part 52, Subpart E, the permittee shall not exceed the emission rates set forth in the following table. Compliance shall be demonstrated through compliance with Specific Condition #3.

SN-#	Description	Pollutant	lb/hr	tpy
201	NaHS Flare	PM	0.1	0.5
	Pilot Flame	PM ₁₀	0.1	0.5
	Natural Gas (0.125 MMBtu/hr)	SO ₂ ¹	*	*
		SO ₂ ²	0.1	0.5
		VOC	0.1	0.5
		CO	0.1	0.5
		NO _x	0.1	0.5

- 1.- The sulfur dioxide emissions while the NaHS plant is on or off line shall not exceed 138.6 lbs/hr from boiler #1, boiler #2, and NaHS flare combined, excluding the sulfur dioxide emissions from the natural gas combustion.
- 2.- Sulfur dioxide emissions while not flaring the NaHS gas.

2. Pursuant to §18.501 of the Arkansas Air Pollution Control Code, effective February 15, 1999 (Regulation 18) and A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311 , the opacity shall not exceed 5% from the NAHS flare (SN-201). The permittee will show compliance by burning natural gas.
3. Pursuant to §19.705 of Regulation 19, A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311 and 40 CFR 70.6, the permittee shall only use natural gas as a fuel for the flare (SN-201). Great Lakes shall only flare NaHS plant tail gas when Boiler #1 and Boiler #2 are down and shall report in accordance with Section 18.11 of Regulation 18 other flaring operations when Boiler #1 and Boiler #2 are operational.
4. Pursuant to §18.801 of Regulation 18 and A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311, the permittee shall not exceed the HAP and Non-Criteria emission rates set forth in the following table. Compliance shall be demonstrated through compliance with Specific Condition #7.

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SN-#	Description	Pollutant	lb/hr	tpy
301	HCl/HBr Storage Tank	HCl	0.7	3.1
		HBr	0.1	0.5

5. Pursuant to §18.501 of Regulation 18 and A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311, the opacity shall not exceed 5% from the HCl/HBr acid storage tank (SN-301). Compliance shall be demonstrated through compliance with Specific Condition #6.
6. Pursuant to §18.1004 of Regulation 18 and A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311, the permittee shall conduct weekly observations of the opacity from these sources and keep a record of these observations. If visible emissions are detected, the permittee shall take corrective action and perform the observation again. If visible emissions are still present, the permittee shall conduct a 6-minute opacity reading in accordance with EPA Reference Method #9. The results of these readings shall be kept on site and made available to Department personnel upon request.
7. Pursuant to §18.1003 of Regulation 18 and A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311, the permittee shall maintain a minimum flow rate of 5 gallons per minute to the acid tank scrubber (SN-301) during acid transfer operations. Flow rate shall be monitored and recorded at a minimum of once during each acid transfer operation. Records of flow rate shall be maintained on site and provided to Department personnel upon request.
8. Pursuant to §18.1004 of Regulation 18 and A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311, the permittee shall use only degassed brine, fresh water, and/or caustic as the scrubbing media in the acid tank scrubber (SN-301). Compliance shall be demonstrated through compliance with Specific Condition #9.
9. Pursuant to §18.1004 of Regulation 18 and A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311, the permittee shall maintain records of the scrubbing media used at SN-301. These records shall be updated any time the scrubbing media being used is changed. These records shall be maintained on site and made available to Department personnel upon request.
10. Pursuant to §18.1003 of Regulation 18 and A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311, the NaHS plant shall not operate more than 4,320 hours per year for any consecutive twelve month period. Compliance with this condition shall be verified by maintaining monthly records of the amount of hours operated. These records shall be kept on site and shall be provided to Department personnel upon request. Records shall be submitted in accordance with General Provision 7.

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SN-001, SN-002, SN-005 through SN-007, SN-009
Bromine Production

Source Description

Bromine containing brine occurs naturally in specific south Arkansas geological formations. When the brine first comes out of the ground it contains sour gas and sodium bromide. This gas is separated and sent to Lion Oil via the El Dorado or NaHS plant for treatment (see page 10 for details.) Most of the degassed brine goes directly to the bromine towers where it is mixed with chlorine. The rest is sent to a scrubber brine cooling system (SBCS). Liquid chlorine is unloaded from trucks and stored. Chlorine gas is then injected into the bromine towers under flow control.

In the bromine towers the brine is chlorinated to remove the bromine that is steam stripped and condensed. The bromine vapors are condensed, purified and then packaged in tank trucks, ISO's or bulk containers. Each bromine tower has its own scrubber (SN-001, SN-002, SN-007, and SN-009) but vapors are normally routed to a final vent scrubber (SN-005) which vents to the atmosphere. Vapors leaving SN-001, SN-002, SN-005, SN-007, and SN-009 are continually monitored in the bromine control room by a color TV camera. Bromine is highly visible even when present in very low concentrations. The TV camera arrangement allows early detection of possible process upsets.

Bromine vapors displaced during the storage and packaging operations are controlled by two scrubbers operating in parallel (SN-006). The scrubbers media is analyzed once per shift.

The debrominated brine flows from the towers, through heat recovery systems and then to the tail brine system, where it is reinjected into the Smackover formation. Great Lakes uses lime, caustic, or ammonia to neutralize the tail brine.

Specific Conditions

11. Pursuant to §18.801 of Regulation 18 and A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311, the permittee shall not exceed the Non-Criteria emission rates set forth in the following table. Compliance shall be demonstrated through compliance with Specific Condition #14.

SN-#	Description	Pollutant	lb/hr	tpy
001	Bromine Tower #1	Br ₂	1.0 ¹ 0.1 ²	0.8

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SN-#	Description	Pollutant	lb/hr	tpy
002	Bromine Tower #2	Br ₂	1.0 ¹ 0.1 ²	0.8
005	Bromine Towers Common Vent	Br ₂	2.2	8.8
006	Bromine Storage and Packaging Tank	Br ₂	2.0	8.8
007	Bromine Tower #3	Br ₂	1.0 ¹ 0.1 ²	0.8
009	Bromine Tower #4	Br ₂	1.0 ¹ 0.1 ²	0.8

1.-This emission rate is based on 720 hours per year for the changing of the caustic in the Bromine Tower (SN-005).

2.-This emission rate is for the remaining 8,040 hours per year.

12. Pursuant to §18.501 of Regulation 18 and A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311, the opacity shall not exceed 5% from the Bromine Tower #1, #2, #3, #4 (SN-001, SN-002, SN-007, and SN-009), Bromine Towers Common Vent (SN-005), and Bromine Storage and Packaging Tank (SN-006) except when changing caustic in SN-005. Compliance shall be demonstrated through compliance with Specific Condition #13.
13. Pursuant to §19.705 of Regulation 19 and 40 CFR Part 52 Subpart E, the permittee shall conduct weekly observations of the opacity from SN-001, SN-002, SN-005, SN-006, SN-007, and SN-009 and keep a record of these observations. If visible emissions are detected, then the permittee shall conduct a 6-minute opacity reading in accordance with EPA Reference Method #9. The results of these observations or readings shall be recorded in a log which shall be kept on site and made available for inspection upon request.
14. Pursuant to §18.1003 of Regulation 18 and A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311, the permittee shall maintain a minimum scrubbing media flow rate of 25 gallons per minute to the Bromine Towers scrubbers (SN-001, SN-002, SN-007, and SN-009). Flow rate shall be monitored and recorded at a minimum of once per week. Records of flow rate shall be maintained on site and provided to Department personnel upon request.

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15. Pursuant to §18.1003 and §18.1004 of Regulation 18 and A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311, the permittee shall maintain a minimum scrubbing media flow rate of 2 gallons per minute to the Bromine Towers Common Vent (SN-005). Flow rate shall be monitored and recorded at a minimum of once per week. Records of flow rate shall be maintained on site and provided to Department personnel upon request.
16. Pursuant to §18.1002 of Regulation 18 and A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311, the permittee shall measure the bromine emissions from Bromine Towers Common Vent (SN-005) once during the term of each Title V permit in accordance with an EPA approved test method.
17. Pursuant to §18.1003 and §18.1004 of Regulation 18 and A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311, the permittee shall maintain a minimum scrubbing media flow rate of 2 gallons per minute to the Bromine Storage and Packaging Tank (SN-006). Flow rate shall be monitored and recorded at a minimum of once per week. Records of flow rate shall be maintained on site and provided to Department personnel upon request.
18. Pursuant to §18.1002 of Regulation 18 and A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311, the permittee shall measure the bromine emissions from Storage and Packaging (SN-006) once during the term of each Title V permit in accordance with an EPA approved test method.
19. Pursuant to §18.1003 and §18.1004 of Regulation 18 and A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311, the bromine loading rate shall not exceed 30 gallons per minute and 300,000 B-lots per year for any consecutive twelve month period. Compliance with this condition shall be verified by maintaining monthly records of the amount of bromine shipped. These records shall be kept on site and shall be provided to Department personnel upon request.
20. Pursuant to §18.1003 of Regulation 18 and A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311, the permittee shall use only degassed brine, fresh water, and/or caustic as the scrubbing media in the Bromine Tower #1 (SN-001), Bromine Tower #2 (SN-002), Bromine Tower Common Vent (SN-005), Bromine Storage and Packaging Tank (SN-006), Bromine Tower #3 (SN-007), and Bromine Tower #4 (SN-009). This scrubbing media shall be measured once per shift. The permittee may use degassed brine, fresh water, and/or caustic as the scrubbing media for any of the above-mentioned sources, if the permittee has conducted emission testing while simultaneously sampling the scrubbing media concentration in order to establish alternative operating parameters for each of the proposed scrubbing media which will not exceed the permitted emission limits.

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SN-101, SN-102, and 103
Boilers

Source Description

Great Lakes has permitted three boilers (#1, #2, and #3) at the West Plant.

Boiler #1 (SN-101), boiler #2 (SN-102), boiler #3 (SN-103) have a rated capacity of 68, 106, and 97 million Btu per hour, respectively. Boiler #2 can burn both natural gas and waste gas from the sodium hydrosulfide (NaHS) unit. Boilers #1 and #3 will be equipped with low NO_x burners and will only use natural gas.

Boiler #1 (SN-101) and #2 (SN-102) were installed before June 19, 1984; therefore, they are not subject to 40 CFR Part 60. They are subject to the SIP and Air Code. Boiler #3 (SN-103) is subject to 40 CFR Part 60, Subpart Dc -- *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units*.

Great Lakes will maintain an O₂ monitor on the #2 boiler. NO_x and CO emissions are interdependent and directly related to the manner in which the boiler is operated. The O₂ monitor is required to verify the relationship between O₂ and NO_x and O₂ and CO emissions.

Specific Conditions

21. Pursuant to §19.501 of Regulation 19 and 40 CFR Part 52, Subpart E, the permittee shall not exceed the emission rates set forth in the following table. Compliance shall be demonstrated through compliance with Specific Conditions #25, #26, and #27.

SN-#	Description	Pollutant	lb/hr	tpy
101	Boiler #1 Natural Gas (68 MMBtu/hr)	PM	1.0	1.7
		PM ₁₀	1.0	1.7
		SO ₂	0.1	0.1
		VOC	0.4	0.7
		CO	2.4	4.2
		NO _x	9.6	16.7

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SN-#	Description	Pollutant	lb/hr	tpy
102	Boiler #2 Natural Gas and NaHS Plant Sweet Gas (106 MMBtu/hr)	PM	0.4	1.8
		PM ₁₀	0.4	1.8
		SO ₂ ¹	*	*
		SO ₂ ²	0.6	*
		VOC	0.6	2.7
		CO	22.1	96.8
		NO _x	6.5	28.5
103	Boiler #3 Natural Gas (97 MMBtu/hr)	PM	1.4	6.0
		PM ₁₀	1.4	6.0
		SO ₂	0.1	0.3
		VOC	0.6	2.5
		CO	15.0	65.7
		NO _x	8.5	37.3

*- The total emissions of sulfur dioxide from boiler #2 shall not exceed 312.0 tpy.

- 1- The sulfur dioxide emissions while the NaHS plant is on or off line shall not exceed 138.6 lbs/hr from boiler #2 and NaHS flare combined, excluding the sulfur dioxide emissions from the natural gas combustion.
 - 2.- The sulfur dioxide emissions while the NaHS plant off line.
22. Pursuant to §18.501 of Regulation 18 and A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311, the opacity shall not exceed 5% from the Boiler #1 (SN-101), Boiler #2 (SN-102), and Boiler #3 (SN-103) while burning natural gas. The permittee will show compliance by burning natural gas.
 23. Pursuant to §19.503 of Regulation 19 and 40 CFR Part 52, Subpart E, the opacity shall not exceed 20% from Boiler #2 (SN-102) while burning NaHS gas. Compliance shall be demonstrated through compliance with Specific Condition #24.
 24. Pursuant to §19.703 of Regulation 19, 40 CFR Part 52 Subpart E and A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311, the permittee shall conduct weekly observations of the opacity from SN-102 and keep a record of these observations when burning NaHS gas. If visible emissions are detected, then the permittee shall conduct a 6-minute opacity reading in accordance with EPA Reference Method #9. The results of these observations or readings shall be recorded in a log which shall be kept on site and made available for inspection upon request.

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25. Pursuant to §19.705 of Regulation 19, A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311 and 40 CFR 70.6, the permittee is allowed to burn only natural gas or NaHS gas in boiler #2 (SN-102).
26. Pursuant to §19.705 of Regulation 19, A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311 and 40 CFR 70.6, the permittee is allowed to burn only natural gas in boilers #1 (SN-101) and #3 (SN-103).
27. Pursuant to §19.705 of Regulation 19, A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311 and 40 CFR 70.6, the permittee shall operate the NaHS plant so that the gas leaving this plant (NaHS gas) and being routed to #2 contains less than 73.7 pounds per hour of H₂S. Compliance shall be demonstrated through compliance with Specific Condition #28.
28. Pursuant to §19.702 of Regulation 19 and 40 CFR Part 52, Subpart E, the permittee shall measure the H₂S concentration of the gas leaving the NaHS unit every two hours when the plant is running at a constant sour gas flow and every 15 minutes when the flow is not constant using the Tutweiler procedure. In addition, the permittee may use ASTM E-260, or the method contained in 40 CFR 60.648, or an equivalent method provided it is first approved by the Department. The measured H₂S concentration shall be converted to pounds of SO₂ out the boiler stack through the use of a mass balance. These records shall be submitted in accordance with General Provision 7.
29. Pursuant to §19.703 of Regulation 19, 40 CFR Part 52, Subpart E, and A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311, the permittee shall maintain and operate an O₂ monitor to continuously monitor and record the excess oxygen in boiler #2. These records shall be submitted in accordance with General Provision 7.
30. Pursuant to §19.304 of Regulation 19 and 40 CFR, Part 60 Subpart Dc, *Standards of Performance for Small Industrial, Commercial, Institutional Steam Generating* SN-103 is considered an affected source due to a heat input capacity less than 100 MMBtu/hr and installation after June 19, 1984. A copy of Subpart Dc is provided as Attachment A.
31. Pursuant to §19.304 of Regulation 19 and 40 CFR Part 60, Subpart Dc, §60.48c(g), the permittee shall record and maintain records of the amount of fuel combusted at SN-103. These records shall be maintained on a monthly basis and made available to Department personnel upon request. These records shall be submitted in accordance with General Provision #7.
32. Pursuant to §19.705 of Regulation 19, A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311, and 40 CFR 70.6, the heat input of boiler #3 (SN-103) shall not exceed 97 MMBtu/hr. The permittee shall maintain records sufficient to demonstrate compliance

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with this limit. These records shall be maintained on site and made available to Department personnel upon request. These records shall be submitted in accordance with General Provision #7.

33. Pursuant to §19.705 of Regulation 19, §18.1004 of Regulation 18, A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311 and 40 CFR Part 70.6, the permittee shall not use more than 233.6 MMscf of natural gas as fuel at SN-101 per consecutive twelve month period. Compliance shall be demonstrated through compliance with Specific Condition #34
34. Pursuant to §19.705 of Regulation 19, §18.1004 of Regulation 18, A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311 and 40 CFR Part 52, Subpart E, the permittee shall maintain records of the amount of natural gas used as fuel at SN-101. These records shall be maintained on a monthly basis and updated by the 15th day of the month following the month to which the records pertain. A copy of these records shall be maintained on site and made available to Department personnel upon request. These records shall be submitted in accordance with General Provision #7.

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SECTION V: COMPLIANCE PLAN AND SCHEDULE

Great Lakes Chemical Corporation-West Plant is in compliance with the applicable regulations cited in the permit application. Great Lakes Chemical Corporation-West Plant will continue to operate in compliance with those identified regulatory provisions. The facility will examine and analyze future regulations that may apply and determine their applicability with any necessary action taken on a timely basis.

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SECTION VI: PLANTWIDE CONDITIONS

1. Pursuant to §19.704 of Regulation 19, 40 CFR Part 52, Subpart E, and A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311, the Director shall be notified in writing within thirty (30) days after construction has commenced, construction is complete, the equipment and/or facility is first placed in operation, and the equipment and/or facility first reaches the target production rate.
2. Pursuant to §19.410(B) of Regulation 19, 40 CFR Part 52, Subpart E, the Director may cancel all or part of this permit if the construction or modification authorized herein is not begun within 18 months from the date of the permit issuance or if the work involved in the construction or modification is suspended for a total of 18 months or more.
3. Pursuant to §19.702 of Regulation 19 and/or §18.1002 of Regulation 18 and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311, any equipment that is to be tested, unless stated in the Specific Conditions of this permit or by any federally regulated requirements, shall be tested with the following time frames: (1) Equipment to be constructed or modified shall be tested within sixty (60) days of achieving the maximum production rate, but in no event later than 180 days after initial start-up of the permitted source or (2) equipment already operating shall be tested according to the time frames set forth by the Department or within 180 days of permit issuance if no date is specified. The permittee shall notify the Department of the scheduled date of compliance testing at least fifteen (15) days in advance of such test. Compliance test results shall be submitted to the Department within thirty (30) days after the completed testing.
4. Pursuant to §19.702 of Regulation 19 and/or §18.1002 of Regulation 18 and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311, the permittee shall provide:
 - a. Sampling ports adequate for applicable test methods
 - b. Safe sampling platforms
 - c. Safe access to sampling platforms
 - d. Utilities for sampling and testing equipment
5. Pursuant to §19.303 of Regulation 19 and A.C.A. §8-4-203 as referenced by A.C. A. §8-4-304 and §8-4-311, the equipment, control apparatus and emission monitoring equipment shall be operated within their design limitations and maintained in good condition at all times.

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6. Pursuant to Regulation 26 and A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311, this permit subsumes and incorporates all previously issued air permits for this facility.
7. Compliance with the conditions of this permit shall be deemed compliance with all applicable requirements, as of the date of permit issuance, included in and specifically identified in item A of this condition:

- A. The following have been specifically identified as applicable requirements based upon information submitted by the permittee in an application dated June 11, 1996.

Source No.	Regulation	Description
Facility	Arkansas Regulation 19	Compilation of Regulations of the Arkansas State Implementation Plan for Air Pollution Control
Facility	Arkansas Regulation 26	Regulations of the Arkansas Operating Air Permit Program
SN-103	40 CFR 60, Subpart Dc	Boiler installed after June 19, 1984, and has a heat input capacity greater than or equal to 2.9MW (10 million Btu/hour), but less than 29 MW (100 million BTU/hr).

- B. The following requirements have been specifically identified as not applicable, based upon information submitted by the permittee in an application dated June 11, 1996.

Description of Regulation	Regulatory Citation	Affected Source	Basis for Determination
New Source Performance Standards for Small Industrial Commercial-Institutional Steam Generating Units	40CFR60 Subpart Db	SN-101	Boiler installed in 1965.
New Source Performance Standards for Small Industrial Commercial-Institutional Steam Generating Units	40CFR60 Subpart Db	SN-102	Boiler installed in 1983.
National Emission Standards for Hazardous Air Pollutants for Industrial Process Cooling Towers	40CFR63 Subpart Q	N/A	None of the cooling towers at the facility are treated with chromium based chemicals.

- C. Nothing shall alter or affect the following:
 Provisions of Section 303 of the Clean Air Act;

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The liability of an owner or operator for any violation of applicable requirements prior to or at the time of permit issuance;

The applicable requirements of the acid rain program, consistent with section 408(a) of the Clean Air Act; or

The ability of the EPA to obtain information under Section 114 of the Clean Air Act.

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SECTION VII: INSIGNIFICANT ACTIVITIES

Pursuant to §26.304 of Regulation 26, the following sources are insignificant activities. Any activity for which a state or federal applicable requirement applies is not insignificant even if this activity meets the criteria of §304 of Regulation 26 or is listed below. Insignificant activity determinations rely upon the information submitted by the permittee in an application dated March 30, 2001.

Description	Category
Gasoline Storage Tank (1000 gallons)	Group A #3
Diesel Storage Tank (500 gallons)	Group A #3
Caustic Storage Vent	Group A #4
Vacuum Breaker Vents on Tail Brine Piping System	Group A #13
Cooled Brine Storage	
Scrubber Brine Surge Tank	
Brine Overflow Tanks	
Feed Brine Surge Tanks	
Brine Tower #1-Heat Recovery Vent	
Brine Tower #2-Heat Recovery Vent	
Brine Tower #3-Heat Recovery Vent	
Brine Tower #4-Heat Recovery Vent	
Tail Brine Cooling Tower	
Non-Process Cooling Water	

Pursuant to §26.304 of Regulation 26, the emission units, operations, or activities contained in Regulation 19, Appendix A, Group B, have been determined by the Department to be insignificant activities. Activities included in this list are allowable under this permit and need not be specifically identified.

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SECTION VIII: GENERAL PROVISIONS

1. Pursuant to 40 CFR 70.6(b)(2), any terms or conditions included in this permit which specify and reference Arkansas Pollution Control & Ecology Commission Regulation 18 or the Arkansas Water and Air Pollution Control Act (A.C.A. §8-4-101 *et seq.*) as the sole origin of and authority for the terms or conditions are not required under the Clean Air Act or any of its applicable requirements, and are not federally enforceable under the Clean Air Act. Arkansas Pollution Control & Ecology Commission Regulation 18 was adopted pursuant to the Arkansas Water and Air Pollution Control Act (A.C.A. §8-4-101 *et seq.*). Any terms or conditions included in this permit which specify and reference Arkansas Pollution Control & Ecology Commission Regulation 18 or the Arkansas Water and Air Pollution Control Act (A.C.A. §8-4-101 *et seq.*) as the origin of and authority for the terms or conditions are enforceable under this Arkansas statute.
2. Pursuant to 40 CFR 70.6(a)(2) and §26.701(B) of the Regulations of the Arkansas Operating Air Permit Program (Regulation 26), effective August 10, 2000, this permit shall be valid for a period of five (5) years beginning on the date this permit becomes effective and ending five (5) years later.
3. Pursuant to §26.406 of Regulation #26, it is the duty of the permittee to submit a complete application for permit renewal at least six (6) months prior to the date of permit expiration. Permit expiration terminates the permittee's right to operate unless a complete renewal application was submitted at least six (6) months prior to permit expiration, in which case the existing permit shall remain in effect until the Department takes final action on the renewal application. The Department will not necessarily notify the permittee when the permit renewal application is due.
4. Pursuant to 40 CFR 70.6(a)(1)(ii) and §26.701(A)(2) of Regulation #26, where an applicable requirement of the Clean Air Act, as amended, 42 U.S.C. 7401, *et seq* (Act) is more stringent than an applicable requirement of regulations promulgated under Title IV of the Act, both provisions are incorporated into the permit and shall be enforceable by the Director or Administrator.
5. Pursuant to 40 CFR 70.6(a)(3)(ii)(A) and §26.701(C)(2) of Regulation #26, records of monitoring information required by this permit shall include the following:
 - a. The date, place as defined in this permit, and time of sampling or measurements;
 - b. The date(s) analyses were performed;
 - c. The company or entity that performed the analyses;

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- d. The analytical techniques or methods used;
 - e. The results of such analyses; and
 - f. The operating conditions existing at the time of sampling or measurement.
6. Pursuant to 40 CFR 70.6(a)(3)(ii)(B) and §26.701(C)(2)(b) of Regulation #26, records of all required monitoring data and support information shall be retained for a period of at least 5 years from the date of the monitoring sample, measurement, report, or application. Support information includes all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by this permit.
7. Pursuant to 40 CFR 70.6(a)(3)(iii)(A) and §26.701(C)(3)(a) of Regulation #26, the permittee shall submit reports of all required monitoring every 6 months. If no other reporting period has been established, the reporting period shall end on the last day of the anniversary month of this permit. The report shall be due within 30 days of the end of the reporting period. Even though the reports are due every six months, each report shall contain a full year of data. All instances of deviations from permit requirements must be clearly identified in such reports. All required reports must be certified by a responsible official as defined in §26.2 of Regulation #26 and must be sent to the address below.

Arkansas Department of Environmental Quality
Air Division
ATTN: Compliance Inspector Supervisor
Post Office Box 8913
Little Rock, AR 72219

8. Pursuant to 40 CFR 70.6(a)(3)(iii)(B), §26.701(C)(3)(b) of Regulation #26, and §19.601 and 19.602 of Regulation #19, all deviations from permit requirements, including those attributable to upset conditions as defined in the permit shall be reported to the Department. An initial report shall be made to the Department by the next business day after the discovery of the occurrence. The initial report may be made by telephone and shall include:
- a. The facility name and location,
 - b. The process unit or emission source which is deviating from the permit limit,
 - c. The permit limit, including the identification of pollutants, from which deviation occurs,
 - d. The date and time the deviation started,
 - e. The duration of the deviation,
 - f. The average emissions during the deviation,
 - g. The probable cause of such deviations,

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- h. Any corrective actions or preventive measures taken or being taken to prevent such deviations in the future, and
- i. The name of the person submitting the report.

A full report shall be made in writing to the Department within five (5) business days of discovery of the occurrence and shall include in addition to the information required by initial report a schedule of actions to be taken to eliminate future occurrences and/or to minimize the amount by which the permits limits are exceeded and to reduce the length of time for which said limits are exceeded. If the permittee wishes, they may submit a full report in writing (by facsimile, overnight courier, or other means) by the next business day after discovery of the occurrence and such report will serve as both the initial report and full report.

9. Pursuant to 40 CFR 70.6(a)(5) and §26.701(E) of Regulation #26, and A.C.A. §8-4-203, as referenced by §8-4-304 and §8-4-311, if any provision of the permit or the application thereof to any person or circumstance is held invalid, such invalidity shall not affect other provisions or applications hereof which can be given effect without the invalid provision or application, and to this end, provisions of this Regulation are declared to be separable and severable.
10. Pursuant to 40 CFR 70.6(a)(6)(i) and §26.701(F)(1) of Regulation #26, the permittee must comply with all conditions of this Part 70 permit. Any permit noncompliance with applicable requirements as defined in Regulation #26 constitutes a violation of the Clean Air Act, as amended, 42 U.S.C. 7401, *et seq.* and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. Any permit noncompliance with a state requirement constitutes a violation of the Arkansas Water and Air Pollution Control Act (A.C.A. §8-4-101 *et seq.*) and is also grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.
11. Pursuant to 40 CFR 70.6(a)(6)(ii) and §26.701(F)(2) of Regulation #26, it shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.
12. Pursuant to 40 CFR 70.6(a)(6)(iii) and §26.701(F)(3) of Regulation #26, this permit may be modified, revoked, reopened, and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or of a notification of planned changes or anticipated noncompliance does not stay any permit condition.

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13. Pursuant to 40 CFR 70.6(a)(6)(iv) and §26.701(F)(4) of Regulation #26, this permit does not convey any property rights of any sort, or any exclusive privilege.
14. Pursuant to 40 CFR 70.6(a)(6)(v) and §26.701(F)(5) of Regulation #26, the permittee shall furnish to the Director, within the time specified by the Director, any information that the Director may request in writing to determine whether cause exists for modifying, revoking and reissuing, or terminating the permit or to determine compliance with the permit. Upon request, the permittee shall also furnish to the Director copies of records required to be kept by the permit. For information claimed to be confidential, the permittee may be required to furnish such records directly to the Administrator along with a claim of confidentiality.
15. Pursuant to 40 CFR 70.6(a)(7) and §26.701(G) of Regulation #26, the permittee shall pay all permit fees in accordance with the procedures established in Regulation #9.
16. Pursuant to 40 CFR 70.6(a)(8) and §26.701(H) of Regulation #26, no permit revision shall be required, under any approved economic incentives, marketable permits, emissions trading and other similar programs or processes for changes that are provided for elsewhere in this permit.
17. Pursuant to 40 CFR 70.6(a)(9)(i) and §26.701(I)(1) of Regulation #26, if the permittee is allowed to operate under different operating scenarios, the permittee shall, contemporaneously with making a change from one operating scenario to another, record in a log at the permitted facility a record of the scenario under which the facility or source is operating.
18. Pursuant to 40 CFR 70.6(b) and §26.702(A) and (B) of Regulation #26, all terms and conditions in this permit, including any provisions designed to limit a source's potential to emit, are enforceable by the Administrator and citizens under the Act unless the Department has specifically designated as not being federally enforceable under the Act any terms and conditions included in the permit that are not required under the Act or under any of its applicable requirements.

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19. Pursuant to 40 CFR 70.6(c)(1) and §26.703(A) of Regulation #26, any document (including reports) required by this permit shall contain a certification by a responsible official as defined in §26.2 of Regulation #26.
20. Pursuant to 40 CFR 70.6(c)(2) and §26.703(B) of Regulation #26, the permittee shall allow an authorized representative of the Department, upon presentation of credentials, to perform the following:
 - a. Enter upon the permittee's premises where the permitted source is located or emissions-related activity is conducted, or where records must be kept under the conditions of this permit;
 - b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
 - c. Inspect at reasonable times any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under this permit; and
 - d. As authorized by the Act, sample or monitor at reasonable times substances or parameters for the purpose of assuring compliance with this permit or applicable requirements.
21. Pursuant to 40 CFR 70.6(c)(5) and §26.703(E)(3) of Regulation #26, the permittee shall submit a compliance certification with terms and conditions contained in the permit, including emission limitations, standards, or work practices. This compliance certification shall be submitted annually and shall be submitted to the Administrator as well as to the Department. All compliance certifications required by this permit shall include the following:
 - a. The identification of each term or condition of the permit that is the basis of the certification;
 - b. The compliance status;
 - c. Whether compliance was continuous or intermittent;
 - d. The method(s) used for determining the compliance status of the source, currently and over the reporting period established by the monitoring requirements of this permit; and
 - e. Such other facts as the Department may require elsewhere in this permit or by §114(a)(3) and 504(b) of the Act.
22. Pursuant to §26.704(C) of Regulation #26, nothing in this permit shall alter or affect the following:

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- a. The provisions of Section 303 of the Act (emergency orders), including the authority of the Administrator under that section;
- b. The liability of the permittee for any violation of applicable requirements prior to or at the time of permit issuance;
- c. The applicable requirements of the acid rain program, consistent with §408(a) of the Act; or
- d. The ability of EPA to obtain information from a source pursuant to §114 of the Act.

23. Pursuant to A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311, this permit authorizes only those pollutant emitting activities addressed herein.

RESPONSE TO COMMENTS

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On or about February 9, 2002 the Director of the Arkansas Department of Environmental Quality gave notice of the draft permitting decision for the above referenced facility. The Department made changes to the permit for the purpose of clarification. These changes are stated below.

- Issue 1:** The permit summary on page 3 was modified to explain that permitted emission rates were changing. And a statement was added stating that the emissions from the boiler were below PSD significance levels.
- Issue 2:** The source number for the boiler being added was changed from SN-101 to SN-101A to avoid possible confusion at a later date.