

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 6	PAGE 1
	APPL NO 500148	DATE 06/02/2010
	PROCESSED BY AS08	CHECKED BY CDR

Permit to Construct/Operate (Alteration/Modification)

Applicant's Name Eastern Municipal Water District
Moreno Valley Regional Water Reclamation Facility

Mailing Address 2270 Trumble Road
Perris, CA 92572-8300

Equipment Location 17140 Kitching Street
Moreno Valley, CA 92582

APPLICATION 500148, FACILITY ID 013088

Equipment Description

MODIFICATION OF AIR POLLUTION CONTROL SYSTEM CONSISTING OF:

1. SCRUBBER, CUSTOM, VERTICAL FLOW WET PACKED TYPE, 10'-0" DIA. X 27'-0" H., PACKED, WITH A 500 GPM CIRCULATION PUMP.
2. STORAGE TANK, SODIUM HYDROXIDE, 2,500 GALLONS, WITH ASSOCIATED PUMPS.
3. STORAGE TANK, SODIUM HYPOCHLORITE, 2,500 GALLONS, WITH ASSOCIATED PUMPS.
4. EXHAUST SYSTEM WITH A 100 H.P. BLOWER VENTING THE HEADWORKS.

BY REPLACING ITEM 1 WITH:

1. SCRUBBER, CUSTOM, VERTICAL FLOW WET PACKED TYPE, 11'-0" DIA. X 27'-0" H., WITH A MINIMUM DEPTH OF 10 FEET OF LANTEC PRODUCTS-Q-PAC PACKING MEDIA OR EQUIVALENT AND MIST ELIMINATOR, WITH A 500 GPM CIRCULATION PUMP.

REPLACING ITEM 2 WITH:

2. STORAGE TANK, SODIUM HYDROXIDE, 1,000 GALLONS, WITH ASSOCIATED PUMPS.

REPLACING ITEM 3 WITH:

3. STORAGE TANK, SODIUM HYPOCHLORITE, 2,300 GALLONS, WITH ASSOCIATED PUMPS.

INCLUDING CAPACITY AND PLANT NO. 2 CONNECTIONS OF ITEM 4 TO READ AS:

4. EXHAUST SYSTEM WITH A 100 H.P. BLOWER, 30,000 CFM CAPACITY, VENTING THE HEADWORKS AND PLANT NO. 2 GRIT CHAMBERS.

Background/Process Description

Eastern Municipal Water District (EMWD) Moreno Valley Regional Water Reclamation Facility (MVRWRF) A/N 500149 was submitted for Title V permit revision (05) on June 30, 2009. The Title V permit revision includes a permit application (A/N 500148) for Proposed Alteration/Modification to Permitted Equipment. A/N 500148 is for the modification of an odor scrubber

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used at the MVRWRF. MVRWRF is comprised of two treatment plants, Plant 1 and Plant 2, which have a combined total capacity of 15.8 million gallons per day (MGD) annual average flow, which corresponds to a maximum 30-day average flow of 17.4 MGD. The facility operates 24 hours per day, 365 days per year.

Odorous emissions from the headworks are currently treated by a conventional chemical scrubbing system that has been in use for about 20 years. The existing scrubber is currently operating under Permit F58148, A/N 407839. EMWD proposed to retrofit the existing odor scrubber system to increase its treatment efficiency. The modification involves the following: replace the existing demisting section, replace the existing packing media with new packing media, replace the existing scrubbing solution distributor, replace the existing recirculation pump, replace the sodium hydroxide metering pump, and replace the existing fan.

The modification will not change the scrubber system location. The modified system will have the same air flow capacity of 30,000 cfm as the existing system. Emissions from the headworks and emissions from Plant 2 grit chambers will be routed to the modified scrubber system. This additional emission source shall be included in the equipment description of the proposed permit. Also the new storage tank capacities shall be updated from to 1,000 gallons for the sodium hydroxide tank and 2,300 gallons for the sodium hypochlorite tank.

Additionally, the applicant had requested to update Condition No. 3 of the existing permit. The applicant indicates that the facility conducts a test once a month where Southern California Edison interrupts the power to the plant for emergency system testing to ensure the generator system is tested for its ability to cover the facilities electrical demand. The applicant indicated that the current Condition No. 3 has an electrical power source change over limit of one changeover per month, which does not provide coverage in the event of an actual "Edison brown out" power failure due to electricity demand. Previous application A/N 407839 from 2002 was submitted to include this condition. The evaluation under A/N 407839 indicates that the applicant maintains that the short term shutdowns do not create releases of odors because the blower shuts down, thus keeping the "odorous" gases inside the structures. Therefore Condition No. 3 was updated to reflect shutdown due to the emergency testing and Edison power interruptions for high demand.

This modification was included in the CEQA document prepared in 2007 for the MVRWRF expansion project. The Notice of Determination is included in the application materials.

There is a school, El Potrero Elementary School, 16820 Via Pamplona, Moreno Valley, CA, within 1000 feet of the emission source. In the last three years two Notices to Comply were issued to the above facility. Notice to Comply D14829 was issued on April 8, 2008 to provide the following: 1) copies of source test (cover page & results page only) for ICE permits F68934, F63608, and F68132, 2) Ignition timing inspection report for ICE permits F36089, F36095, F66584, and F68933, 3) oxygen concentration at the outlet for ICE permits F63608 and F68933. Notice to Comply D116616 was issued on August 7, 2007 to provide the following information

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for Permit, G4189, A/N 446530: 1) date the mist eliminator was ordered, 2) final specifications submitted to AQMD, 3) dates operated, 4) duration of operations, 5) quantity of gas consumed, and 6) temperature of flare during operations. The above facility has received one complaint for odors in the last three years.

Title V revision 05, to include the modification of an odor scrubber is considered a minor permit revision, since the permit meets all of the criteria listed below:

- i. does not require or change a case-by-case evaluation of: reasonably available control technology (RACT) pursuant to Title I of the federal Clean Air Act; or maximum achievable control technology (MACT) pursuant to 40 CFR Part 63, Subpart B;
- ii. does not violate a regulatory requirement;
- iii. does not require any significant change in monitoring terms or conditions in the permit;
- iv. does not require relaxation of any recordkeeping, or reporting requirement, or term, or condition in the permit;
- v. does not result in an emission increase of RECLAIM pollutants over the facility starting Allocation plus nontradeable Allocations, or higher Allocation amount which has previously undergone a significant permit revision process;
- vi. does not result in an increase in emissions of a pollutant subject to Regulation XIII - New Source Review or a hazardous air pollutant;
- vii. does not establish or change a permit condition that the facility has assumed to avoid an applicable requirement;
- viii. is not an installation of a new permit unit subject to a New Source Performance Standard (NSPS) pursuant to 40 CFR Part 60, or a National Emission Standard for Hazardous Air Pollutants (NESHAP) pursuant to 40 CFR Part 61 or 40 CFR Part 63; and,
- ix. is not a modification or reconstruction of an existing permit unit, resulting in new or additional NSPS requirements pursuant to 40 CFR Part 60, or new or additional NESHAP requirements pursuant to 40 CFR Part 61 or 40 CFR Part 63.

Public notice is not required. Title V Revision 04 (A/N 499770) was issued January 1, 2010.

Calculations for A/Ns 500148

Square's Area = 48in x 32in = 1536 sq in

Converted Inner Diam. = $(1536 \text{ sq in} \times 4 / \pi)^{1/2} = 44.2 \text{ in} \sim 44 \text{ in}$

Converted Stack Inner Diam. = 44in x ft/12in x m/3.28ft = 1.12 m

ROG emissions (based on previous permit)

R1 = R2 = 0 lbs/hr = 0lbs/day

Please note all ROG emissions from the equipment this unit is venting (sewage treatment plant) are associated with the sewage treatment plant A/N 474814, instead of the control equipment, such as this permit unit for an odor scrubber.

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Hydrogen Sulfide (H2S) Calculations

OEHHA H2S concentration threshold

Outlet concentration is based on the maximum concentration to be in compliance. 8 ppb is inhalation reference exposure level and odor threshold according to Office of Environmental Health Hazard Assessment (OEHHA). 8ppb is the H2S concentration limit at the receptor distance with the maximum calculated concentration for worst case consideration.

Calculate the effluent concentration of H2S based on screen 3 modeling for nuisance calculations. Screen 3 provides an emission rate of 1 lb/hr associated with a maximum concentration of 30.01 ug/m³ at the receptor distance of 31m.

Concentration associated with 8ppbv:

$$\begin{aligned}
 8\text{ppbv} &= 0.008\text{ppmv} \\
 &= 0.008\text{ppmv} \times 34.08\text{lbsH}_2\text{S/lbmole} / 0.02404 \\
 &= 11.34 \text{ ug/m}^3
 \end{aligned}$$

Equivalent Screen 3 emission rate associated with 8ppbv at receptor (31m) is:

$$\begin{aligned}
 &= 11.34 \text{ ug/m}^3 \times 1\text{lb/hr} / 30.01\text{ug/m}^3 \\
 &= 0.38 \text{ lbs/hr}
 \end{aligned}$$

Concentration of H2S at exhaust is with 8ppbv at the nearest receptor (31m):

$$\begin{aligned}
 &= 0.38\text{lbs/hr} \times 1\text{E}6/1 / 30,000\text{cfm} / 60\text{min/hr} \times 379\text{cf/lbmole} / 34.08\text{lbsH}_2\text{S/lbmole} \\
 &= 2.35 \text{ ppmv H}_2\text{S}
 \end{aligned}$$

1.0 ppmv will continue to be used as the permit condition H2S limit for the application. 1.0 ppmv passes HIA & HIC threshold limit and will result in less than 8ppbv at receptor distance.

H2S Emissions

$$\begin{aligned}
 \text{R2} &= 1.0\text{ppmv} \times \text{ft}^3/10^6\text{ft}^3 \times 30,000\text{cfm} \times 60\text{min/hr} \times \text{lbmole}/379\text{ft}^3 \times 34.08\text{lbsH}_2\text{S/lbmole} \\
 &= 0.16 \text{ lb/hr} \qquad \qquad \qquad = 3.84 \text{ lbs/day}
 \end{aligned}$$

$$\begin{aligned}
 \text{R1} &= 1.0\text{ppmv} / (1 - 0.99) \\
 &= 100\text{ppmv} \times \text{ft}^3/10^6\text{ft}^3 \times 30,000\text{scfm} \times 60\text{min/hr} \times \text{lbmole}/379\text{ft}^3 \times 34.08\text{lbsH}_2\text{S/lbmole} \\
 &= 16.19 \text{ lbs/hr} \qquad \qquad \qquad = 388.56 \text{ lbs/day}
 \end{aligned}$$

Toxic Risk Analysis

Nearest Residential Receptor Distance: 596 ft. (182 m)
 Nearest Commercial Receptor Distance: 754 ft. (230 m)
 Stack height: 20 ft. (6.10 m)
 Stack inner diameter: 44 in. (1.12 m)

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Compound	Inlet Concentration (ppmv)	MW (lb/mole)	Control Efficiency	Outlet Concentration (ppmv)
H2S	100	34.08	0.99	1.0

Tier II analysis was used since the nearest receptor is greater than 25m from the exhaust stack and the exhaust stack has no rain cap. Tier II risk analysis was based on the outlet concentrations listed in the above table. H2S is not currently considered a carcinogen. HIA and HIC were 0.636 and 0.185 respectively and therefore less than 1. Cancer Burden was less than 0.5.

Emissions Summary

A/N 500148 (odor scrubber)

CO	= 0 lbs/hr	= 0 lbs/day	= 0 lbs/year	= 0 tons/year
NOx	= 0 lbs/hr	= 0 lbs/day	= 0 lbs/year	= 0 tons/year
PM10	= 0 lbs/hr	= 0 lbs/day	= 0 lbs/year	= 0 tons/year
ROG	= 0 lbs/hr	= 0 lbs/day	= 0 lbs/year	= 0 tons/year
SOx	= 0 lbs/hr	= 0 lbs/day	= 0 lbs/year	= 0 tons/year

Rules Evaluation

Rule 212: Rule 212 (c)(1)- There is a school within 1000 feet of the facility. Although this project does not require notification since the modification has no potential to affect emissions.

Rule 212 (c)(2)- On-site emission increases do not exceed the following:

Volatile Organic Compounds	30 lbs/day
Nitrogen Oxides	40 lbs/day
PM10	30 lbs/day
Sulfur Dioxide	60 lbs/day
Carbon Monoxide	220 lbs/day
Lead	3 lbs/day

Rule 212 (c)(3)(A)- There is no increase of emissions. The modification to the odor scrubber is exempt from Rule 1401(d) requirements as listed in Rule 1401(g)(1)(B), since the modification causes no increase of emissions, there is no increase in the cancer burden, MICR or acute or chronic HI at any receptor location.

Rule 212 (c)(3)(A)(i)- MICR is below 1 in a million for the modification to the odor scrubber.

Public Notice is not required.

Rule 401: Visible Emissions
No violations are expected, limits are listed under Rule 401(b)(1).

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Rule 402: Nuisance
Nuisance is not expected.

Reg. XIII: Rule 1303(a)(1) and Rule 1303(a)(2)- Equipment is considered BACT control equipment for sewage treatment plants. Additionally, the modification to the equipment will result in no emission increase.
Rule 1303(b)(1)- Modeling for VOC and SOx is not required (1303 Appendix A). NOx, CO and PM10 are less than the allowable emissions in Table A-1, no further analysis is required (1301 Appendix A).
Rule 1303(b)(2)- Offsets are not required; there is no increase of emissions due to equipment modification. Additionally, offsets are not required since the facility is an essential public service.
Compliance is expected.

Rule 1401: Toxic Air Contaminants
Rule 1401(d)- The modification to the odor scrubber is exempt from Rule 1401(d) requirements as listed in Rule 1401(g)(1)(B), since the modification causes no increase of emissions, there is no increase in the cancer burden, MICR or acute or chronic HI at any receptor location.
Rule 1401(d)(1)(A)- MICR less than 1.0×10^{-6} limit.
Rule 1401(d)(1)(C)- Cancer burden is less than 0.5.
Rule 1401(d)(2) and Rule 1401(d)(3)- HIC and HIA values are estimated to be less than 1 respectively.

Rule 1401.1: Rule 1401.1(b)- Equipment is exempt since it is located at an existing facility.

Reg. XXX: Modification to the odor scrubber is considered a Title V Minor permit revision under Rule 3000(b)(12) and will be subject to an EPA review (Rule 3003 (j)). A public notice is not required.
The modification is considered a Minor revision since the proposed equipment does not require relaxation of the permit, does not result in an emission increase, and is not subject to NSPS or NESHAP requirements.
An EPA 45 day review will be imposed.
Compliance is expected.

Conclusions and Recommendations

The equipment is in compliance with the Rules and Regulations of the AQMD. A Permit to Operate is recommended for application 500148. For Permit Conditions please see Sample Permit. A revised Title V permit is recommended after EPA review.