

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 2	PAGE 1
	APPL NO 520795	DATE 8/18/2011
	PROCESSED BY GCR	CHECKED BY AD

TITLE V PERMIT REVISION EVALUATION
(SECTION D, REV 03 AND SECTION H, REV 03)

APPLICANT'S NAME: ORANGE COUNTY SANITATION DISTRICT (OCSD)

MAILING ADDRESS: 10844 ELLIS AVENUE
FOUNTAIN VALLEY, CA 92708
ATTN.: TERRY AHN, REGULATORY SPECIALIST

EQUIPMENT ADDRESS: WASTEWATER TREATMENT PLANT NO. 1
"SAME AS ABOVE"

FACILITY ID NO.: 017301

Background:

A/N 520795 for Title V revision was submitted 04/07/2011. This revision will include A/N 520793, for new construction of the odor control system, consisting of multi-stage chemical scrubbers followed by granular activated carbon (GAC) system, to treat 40,000 cfm of exhaust air from the new sludge thickening and dewatering building. Also, A/N 520794 is filed for modifications to the existing sewage treatment plant (PC453210) for installations of New Sludge Thickening and Dewatering Facility (155 MGD capacity), and all equipment to be located within a building.

Previously application 514193 was submitted for Title V permit revision on 09/08/2010. This revision was to include two (2) applications (512830 and 512831) for permit to operate existing acid storage tanks vented to the carbon drum (Under Rule 310- Amnesty for Unpermitted Equipment). Acid storage tanks' permits will be incorporated under this TV revision A/N 520795 under Section D.

Note: Evaluations for A/N 512830 and 512831 has been revised to accommodate OCSD's request for increased acid filling limit on a monthly basis (Condition No. 4) from 2000 gallons to 6000 gallons. This change has negligible impact on emissions.

Most recent Title V permit revisions were issued on May 5, 2010 (Section H, Rev #2) and August 27, 2010 (Section D, Rev #2).

Evaluation:

New construction and modifications applications described above (520793 and 520794) are considered a De-Minimis Significant Revision, as emission increase is below daily maximum threshold and would not result in new or additional requirements pursuant to NSPS (40 CFR Part 60) or NESHAP (40 CFR Part 61 or 63). Acid storage tanks (512830 and 512531) are also considered De-Minimis Significant revision.

Review of the actual toxic pollutants' emissions data for the year 2009 and 2010 indicated Formaldehyde emission of <10 TPY (19,126 lbs/yr for 2009 and 19,297 lbs/yr for 2010).

The proposed Title V revision consists of the following. Public notice is not required; however, it is subject to EPA 45-day review.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 2	PAGE 2
	APPL NO 520795	DATE 8/18/2011
	PROCESSED BY GCR	CHECKED BY

PERMIT TO OPERATE: Section D, Rev #3

<u>Application No.</u>	<u>Description</u>
512830	Acid Storage Tank (HCl), 8,000 gallons, with a passive carbon adsorber
512831	Acid Storage Tank (HCl), 2,000 gallons, with a passive carbon adsorber

PERMIT TO CONSTRUCT: Section H, Rev #3

<u>Application No.</u>	<u>Description</u>
520793	Odor Control equipment, 40, 000 cfm capacity
520794	Modifications to sewage treatment plant > 5 MGD, anaerobic (PC 453210)

Permit evaluations for above applications are included in folder.

RULES EVALUATION: TV Revision

REG XXX: Title V Permits

Compliance with this regulation is expected.

CONCLUSIONS/RECOMMENDATION:

The facility is expected to be in compliance with all applicable AQMD's Rules and Regulations. A De-minimis significant permit revision is recommended upon completion of EPA 45-day review/commenting period.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 5	PAGE 1
	APPL NO 512830rev 512831rev	DATE 05/02/2012
	PROCESSED BY GCR	CHECKED BY AD

PERMIT TO OPERATE EVALUATION

APPLICANT'S NAME: ORANGE COUNTY SANITATION DISTRICT (OCS D)

MAILING ADDRESS: 10844 ELLIS AVENUE
FOUNTAIN VALLEY, CA 92708-7018
ATTN.: TERRY AHN, REGULATORY SPECIALIST

EQUIPMENT ADDRESS: SAME AS ABOVE (PLANT NO. 1)

FACILITY ID.: 017301

APPLICATION NO. 512830:

EQUIPMENT DESCRIPTION:

STORAGE TANK, FIXED ROOF, ID NO. 10ITNK037 (P1 HEADWORKS), HYDROCHLORIC ACID, 12' - 0" DIA. X 10' - 0" H., 8,000-GALLON CAPACITY AND VENTING THROUGH A 55-GALLON DRUM CONTAINING (50% SULPHASORB XL AND 50% SAFETYSORB BLEND OR EQUAL) ACTIVATED CARBON.

APPLICATION NO. 512831:

EQUIPMENT DESCRIPTION:

STORAGE TANK, FIXED ROOF, ID NO. 11ITNK100 (P1 PRIMARY), HYDROCHLORIC ACID, 6' - 0" DIA. X 11' - 0" H., 2,000-GALLON CAPACITY AND VENTING THROUGH A 55-GALLON DRUM CONTAINING (50% SULPHASORB XL AND 50% SAFETYSORB BLEND OR EQUAL) ACTIVATED CARBON.

CONDITIONS: (512830 / 512831)

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN COMPLIANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL STORE HYDROCHLORIC ACID WITH CONCENTRATION OF 38 WEIGHT PERCENT OR LESS ONLY.
[RULE 204]
4. THE MAXIMUM AMOUNT OF HYDROCHLORIC ACID FILLED INTO THIS STORAGE TANK SHALL NOT EXCEED 6000 GALLONS PER MONTH.
[RULE 1303 (b) (1) - OFFSET]

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 5	PAGE 2
	APPL NO 512830rev 512831rev	DATE 05/02/2012
	PROCESSED BY GCR	CHECKED BY

5. THIS EQUIPMENT SHALL NOT BE FILLED UNLESS THE VENT GASES PASS THROUGH A 55-GALLON DRUM CONTAINING ACTIVATED CARBON.
[RULE 1303 (a) (1)-BACT]
6. THE OPERATOR SHALL REPLACE THE CARBON PER MANUFACTURER'S RECOMMENDATION.
[RULE 204]
7. RECORDS REQUIRED BY THIS PERMIT SHALL BE KEPT AND MAINTAINED FOR AT LEAST FIVE YEARS AND MADE AVAILABLE TO AQMD PERSONNEL UPON REQUEST.
[RULE 204]

BACKGROUND:

On 7/22/2010, Orange County Sanitation District (OCSD) submitted above applications for permits to operate the existing HCl-acid storage tanks, at their Plant 1, for the headworks (512830) and primary treatment process (512831). These applications were submitted under the provision of Rule 310 (Amnesty for unpermitted equipment) and, hence, not subject to higher fees for PO no PC.

This is a Title V facility. A/N 514393 is also filed for the TV Revision. Most recent administrative revision to the Title V facility permit was issued August 27, 2010 (Section D, Rev 02).

This is a revised evaluation (for both tanks) to accommodate OCSD's request for increased monthly maximum acid filling limit from initial 2000 gallons to 6000 gallons. Impact on emission is negligible. EPA will be re-noticed for this change (Permit Condition No. 4)

PROCESS DESCRIPTION:

The existing headworks and primary treatment processes consist of chemical scrubbers where recirculating scrubbing liquid trickles down through the packed bed and contacts the foul air which is passed up through the bed to remove odors. NaOH and NaOCl solutions used for the scrubber and HCl is used for periodic cleaning of the packed bed to remove hardwater deposits and chemical buildup.

Emission is revised based on 6000 gallon HCL/month tank filling limit.

EMISSIONS:

A/N 512830: (8000 gal. Tank)

Working loss:

Acid filling rate: 2000 gallon truck delivery, pumped at @ 50 gpm, 3 times a year (40 minutes/event)

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 5	PAGE 3
	APPL NO 512830rev 512831rev	DATE 05/02/2012
	PROCESSED BY GCR	CHECKED BY

Acid filling is revised to 6000 gallons/month, i.e. tank filling events at 3 times per month.

$$L_w = (F)(1 \text{ cft}/7.48 \text{ gal})(1 \text{ lb-mole}/380 \text{ cf})(M_v)(P/14.7 \text{ psia})$$

$$= 2.4 \times 10^{-5} \times F \times P \times M_v$$

$$= 2.4 \text{ E-05} \times 2000 \times 2.90 \times 36.5$$

$$L_w = \mathbf{5.08 \text{ lbs HCl /day}}$$
 (with no vapor return line to truck and vapor venting to passive C-drum)
$$= 5.08 \text{ lbs/mo.}$$

$$= 5.08 \text{ lbs/mo.} \times 3 \text{ fillings in a month} = \mathbf{15.24 \text{ lbs/month}}$$

L_w = working loss (lb/day)
 F = filling rate (gal/day), 2000 gal/day (40 min filling time)
 P = true vapor pressure (psia)
= 150 mm Hg @ 20 deg C, **max. 37.14% HCl (23^o Be)**
= 2.90 psia
 M_v = molecular weight of vapor (lb/lb-mole) = 36.5

Breathing loss:

$$L_B = (V_o)(\Delta T/T_{avg})(1/v)(P/14.7)(M_v)$$

L_B = breathing loss (lb/day)
 V_o = volume of vapor above liquid surface (cf)
= 50% of max tank vol of 1130 cf = **565 cf**

ΔT = average daily temperature change (deg R or F) = **25 deg R**

T_{avg} = average daily temperature (deg R) = 65 + 460 = **525 deg R**

$(V_o)(\Delta T/T_{avg})$ = Vol of vapor expelled from the tank due to avg. temp. change (cft)

P = true vapor pressure (Psia) = **2.90 psia @ 20 deg C**

$$V = 10.73(\text{FT}^3 \text{ Psia}/\text{lbmole } ^\circ\text{R}) T_{AV} (^{\circ}\text{R}) (1/14.7 \text{ psia})$$

$$= (10.73) (525)/14.7$$

$$= 383.21$$

$$(1/v) = 1/383.21 = \mathbf{0.0026}$$

M_v = molecular weight of vapor (lb/lb-mole) = **36.5**

$$L_B = (565) (25/525) (0.0026) (2.90/14.7) (36.5)$$

$$= \mathbf{0.50 \text{ lbs/day}}$$

$$= 0.50 \times 30 = 15 \text{ lbs/mo}$$

No change in tank breathing loss for increased acid filling limit.

Total uncontrolled HCl emission = 15.24 + 15.0 = 30.24 lbs/mo = 1.01 lbs/day or 1.0 lb/hr (based on 1 hr fill time) (R1)

At 99% control efficiency* for Carbon per OCSD E-mail information, Oct. 15, 2010),
= 30.24 x (1.0 - 0.99)

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 5	PAGE 4
	APPL NO 512830rev 512831rev	DATE 05/02/2012
	PROCESSED BY GCR	CHECKED BY

Controlled emission = 0.30 lb/mo = 0.01 lb/day = or 0.01 lb/hr (R2), based on 1 hr fill time.
No offset required.

A/N 512831: (2000 gal. Tank)

The emissions can be assessed using the following equations:

Working loss:

Acid filling rate: 2000 gallon truck delivery, pumped at @ 50 gpm, 3 times per month (40 minutes/event)

Annual throughput = 7,800 gal (permit condition) per OCSD 10/14/2010 E-mail.

Acid filling is revised to 6000 gallons/month, i.e. tank filling events at 3 times per month.

$$L_w = (F)(1 \text{ cft}/7.48 \text{ gal})(1 \text{ lb-mole}/380 \text{ cf})(M_v)(P/14.7 \text{ psia})$$

$$= 2.4 \times 10^{-5} \times F \times P \times M_v$$

$$= 2.4 \text{ E-05} \times 2000 \times 2.90 \times 36.5$$

$$L_w = \mathbf{5.08 \text{ lbs HCl/day}}$$
 (with no vapor return line to truck and vapor venting to passive C-drum)

$$= 5.08 \text{ lb/mo.}$$

$$= 5.08 \text{ lbs/mo.} \times 3 \text{ fillings in a month} = \mathbf{15.24 \text{ lbs/month}}$$

L_w = working loss (lb/day)

F = filling rate (gal/day), 2000 gal/day (40 min filling time, once every 4-month)

P = true vapor pressure (psia)

= 150 mm Hg @ 20 deg C, **max. 37.14% HCl** (23⁰ Be)

= 2.90 psia

M_v = molecular weight of vapor (lb/lb-mole) = 36.5

Breathing loss:

$$L_B = (V_o)(\Delta T/T_{avg})(1/v)(P/14.7)(M_v)$$

L_B = breathing loss (lb/day)

V_o = volume of vapor above liquid surface (cf)

= 50% of max tank vol of 311 cf = **155 cf**

ΔT = average daily temperature change (deg R or F) = **25 deg R**

T_{avg} = average daily temperature (deg R) = 65 + 460 = **525 deg R**

$(V_o)(\Delta T/T_{avg})$ = Vol of vapor expelled from the tank due to avg. temp. change (cft)

P = true vapor pressure (Psia) = **2.90 psia @ 20 deg C**

$$V = 10.73(\text{ FT}^3 \text{ Psia/ lbmole } ^\circ\text{R}) T_{AV} (^\circ\text{R}) (1/14.7 \text{ psia})$$

$$= (10.73) (525)/14.7$$

$$= 383.21$$

$$(1/v) = 1/383.21 = \mathbf{0.0026}$$

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 5	PAGE 5
	APPL NO 512830rev 512831rev	DATE 05/02/2012
	PROCESSED BY GCR	CHECKED BY

M_V = molecular weight of vapor (lb/lb-mole) = **36.5**

$L_B = (155) (25/525) (0.0026) (2.90/14.7) (36.5)$

= **0.14 lbs/day**

= $0.14 \times 30 = 4.2$ lbs/mo.

Total uncontrolled HCl emission = $15.24 + 4.2 = 19.44$ lbs/mo = 0.648 lb/day or 0.648 lb/hr (R1), based on 1 hr fill time.

At 99% control efficiency for Carbon (per OCSD E-mail information, Oct. 15, 2010),

= $19.44 \times (1.0 - 0.99)$

Controlled emission = 0.194 lb/mo = 0.0065 lb/day or 0.0065 lb/hr, based on 1 hour fill time, (R2)

No offset required.

RULES EVALUATION:

Rule 212:

There are no schools within 1/4 mile of the emission source.

HCl is non-carcinogenic- no risk. No public notice required. Compliance is expected.

Rule 401 (Visible Emissions):

With proper operation, maintenance and control of equipment compliance is expected.

Rule 402 (Nuisance):

With proper operation, maintenance and control of equipment compliance is expected.

Regulation XIII:

Whenever tank is filled and breathing, displaced vapors will be venting through the granular carbon media with assumed control efficiency of 99%.

No modeling or offsets is required. Compliance is expected.

Rule 1401:

HCl is not carcinogenic, no health risk.

Controlled HCl emission is less than chronic (298 lbs/yr) and acute (1.05 bs/hr), worst-case at 25 meters receptor, Screening Emission Levels listed under Table-1A. No further HIC/HIA evaluation is required. Compliance is expected.

Rule 1401.1:

Not applicable as this is an existing facility.

REG. XXX:

Compliance is expected. Title V revision A/N 514393 is filed to include these two permits (A/Ns 512830 & 512831).

Recommendations:

A permit to operate is recommended, for each of the above application, with proposed conditions listed on Pgs. 1-2.

Upon approval of these permits, it should be included under TV Revision (03), Section D.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT STATIONARY SOURCE COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 11	PAGE 1
	APPL NO 520793	DATE 05/01/2012
	PROCESSED BY GCR	CHECKED BY AD

PERMIT TO CONSTRUCT EVALUATION
(Revsd as necessary based on OCSD comments to Draft PC, Oct 4, 2011)

APPLICANT'S NAME: ORANGE COUNTY SANITATION DISTRICT (OCSD)

MAILING ADDRESS: 10844 ELLIS AVENUE
FOUNTAIN VALLEY, CA 92708
ATTN.: TERRY AHN, REGULATORY SPECIALIST

EQUIPMENT ADDRESS: WASTEWATER TREATMENT PLANT NO. 1
"SAME AS ABOVE"

FACILITY ID NO.: 017301

EQUIPMENT DESCRIPTION:

ODOR CONTROL SCRUBBER SYSTEM (SIEMENS, DUALL OR EQUIVALENT) FOR NEW SLUDGE THICKENING AND DEWATERING FACILITY (JOB NO. P1-101), CONSISTING OF:

1. FOUL AIR EXHAUST DUCT FROM NEW SLUDGE THICKENING AND DEWATERING BUILDING, TOTAL 40,000 CFM.
2. THREE (3) EXHAUST BLOWERS (ONE FOR STAND BY UNIT), EACH 100 H.P., 20,000 CFM.
3. THREE (3) CHEMICAL SCRUBBERS (ONE STANDBY UNIT), EACH 3-STAGE, SIEMENS MODEL LP-6500 OR DUALL MODEL PMTD OR EQUAL, VERTICAL, PACKED BED TYPE, EACH WITH JAEGER, APPROXIMATELY 15 FT. HIGH POLYPROPYLENE PACKING BED, FIRST AND FINAL STAGE MIST ELIMINATORS, AND EQUIPPED WITH PH AND OXIDATION REDUCTION POTENTIAL (ORP) PROBES AND CONTROLLERS, DIFFERENTIAL PRESSURE GAUGES, THREE (3) SUMPS, SCRUBBER SOLUTION RECIRCULATION PUMPS AND FLOW METERS, SPRAY NOZZLES, AUTOMATIC CHEMICAL FEED METERING PUMP AND MAKEUP WATER SYSTEM, AND ASSOCIATED SULFURIC ACID (97%), SODIUM HYDROXIDE (25% NaOH SOLUTION), AND SODIUM HYPOCHLORITE (12.5% NaOCl SOLUTION) STORAGE TANKS, EACH WITH EXHAUST STACK, 3' DIA. X 33' - 9" H., AND WITH NO RAIN CAP.
4. OPTIONAL TWO (2) DUAL-BED ADSORBERS, IN PARALLEL, EACH SIEMENS MODEL RJC-1300-D OR DUALL MODEL CA-132DB OR EQUIVALENT, GRANULAR ACTIVATED CARBON, 20, 000 SCFM, AND EQUIPPED WITH DIFFERENTIAL PRESSURE GAUGE, SAMPLING PORTS, INSTRUMENTATION, CONTROLS AND OTHER ACCESSORIES, EACH WITH A EXHAUST STACK, 3' DIA. X 22' - 6" H., AND WITH NO RAIN CAP.

CONDITIONS:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT STATIONARY SOURCE COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 11	PAGE 2
	APPL NO 520793	DATE 05/01/2012
	PROCESSED BY GCR	CHECKED BY

2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL BE OPERATED BY PERSONNEL PROPERLY TRAINED IN ITS OPERATION.
[RULE 204]
4. THIS PERMIT SHALL EXPIRE IF CONSTRUCTION OF THE EQUIPMENT IS NOT COMPLETED WITHIN ONE YEAR FROM THE DATE OF ISSUANCE OF THIS PERMIT UNLESS AN EXTENSION IS GRANTED BY THE EXECUTIVE OFFICER.
[RULE 205]
5. AT LEAST 30 DAYS PRIOR TO INSTALLATION OF THE EQUIPMENT, ORANGE COUNTY SANITATION DISTRICT (OCSD) SHALL PROVIDE TO SCAQMD FINAL DESIGN DRAWINGS, PROCESS AND FLOW DIAGRAM, CONTROLS, EQUIPMENT SPECIFICATIONS (MAKE, MODEL, SIZE AND MAXIMUM CAPACITY). DEVIATIONS FROM THE ABOVE DESCRIPTION AND PROPOSED DESIGN AFFECTING EQUIPMENT PERFORMANCE OR EMISSIONS SHALL BE APPROVED IN WRITING BY THE AQMD.
[RULE 204]
6. THE EXHAUST BLOWERS ASSOCIATED WITH THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS FOUL-AIR FROM THE SLUDGE THICKENING AND DEWATERING BUILDING IS VENTED THROUGH THE ODOR CONTROL SYSTEM DESCRIBED IN THIS PERMIT. AT NO TIME, THE OPERATOR SHALL ALLOW THE ESCAPE OF FOUL-AIR INTO THE ATMOSPHERE.
[RULE 401, 402]
7. WHEN IN OPERATION, NO MORE THAN TWO (2) MUTI-STAGE CHEMICAL SCRUBBERS SHALL BE IN OPERATION.
[RULE 204]
8. A FLOW METER SHALL BE INSTALLED AND MAINTAINED AT THE INLET STREAM TO EACH OF THE MULTI-STAGE CHEMICAL SCRUBBER TO INDICATE THE TOTAL AIR FLOW RATE IN CUBIC FEET PER MINUTE (CFM). THE MEASURED AIR FLOW RATE SOR EACH SCRUBBER SHALL NOT EXCEED 20,000 CFM. IN CASE A PRESSURE SENSOR DEVICE(S) IS USED IN PLACE OF THE FLOW METER(S), A CONVERSION CHART SHALL BE MAINTAINED TO INDICATE THE CORRESPONDENT FLOW RATE(S), IN CFM, TO THE PRESSURE READING.
[RULE 204]
9. A PRESSURE DIFFERENTIAL GAUGE INDICATING THE PRESSURE DROP ACROSS EACH SCRUBBER PACKING BED SHALL BE INSTALLED AND MAINTAINED. THE PRESSURE DROP ACROSS EACH PACKING BED SHALL BE MAINTAINED WHEN THE SCRUBBER IS IN OPERATION PER MANUFACTURER'S RECOMMENDATION.
[RULE 204]

*See
sample
permit*

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT STATIONARY SOURCE COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 11	PAGE 3
	APPL NO 520793	DATE 05/01/2012
	PROCESSED BY GCR	CHECKED BY

10. A PH METER SHALL BE INSTALLED AND MAINTAINED, FOR EACH SCRUBBER STAGE (SUMP SOLUTION), TO INDICATE PH OF THE SCRUBBING SOLUTION.

THE PH FOR THE FIRST STAGE SCRUBBER SOLUTION (H₂SO₄) SHALL BE MAINTAINED AT OR BELOW 7.0.

THE PH FOR THE 2ND AND 3RD STAGE SCRUBBER SOLUTION (NaOH AND NaOCl) SHALL BE MAINTAINED ABOVE 7.0.
[RULE 204]
11. OXIDATION REDUCTION POTENTIAL (ORP) METER SHALL BE INSTALLED AND MAINTAINED TO INDICATE ORP READING (mv) FOR THE SCRUBBING SOLUTION. THE ORP VALUES FOR EACH STAGE OF SCRUBBING SOLUTION SHALL BE MAINTAINED PER MANUFACTURER'S RECOMMENDATION.
[RULE 1303 (a)(1)- BACT]
12. A FLOW METER SHALL BE INSTALLED TO INDICATE SCRUBBING SOLUTION FLOW RATE FOR EACH SCRUBBER. THE SCRUBBING SOLUTION FLOW RATE (GPM) FOR EACH STAGE SHALL BE MAINTAINED AS PER MANUFACTURER'S RECOMMENDATION.
[RULE 204]
13. WHEN IN OPERATION, FOR EACH SCRUBBER THE FOUL-AIR FLOW RATE, SCRUBBING SOLUTION FLOW RATE, PH, ORP AND PRESSURE DIFFERENTIAL ACROSS THE SCRUBBER PACKING BED SHALL BE MONITORED AND RECORDED AT LEAST ONCE A DAY.
[RULE 204]
14. A FLOW METER SHALL BE INSTALLED AND MAINTAINED AT THE INLET STREAM TO EACH CARBON ADSORBER TO INDICATE THE EXHAUST AIR (FROM CHEMICAL SCRUBBER UNITS) TREATED, IN CUBIC FEET PER MINUTE (SCFM). IN CASE A PRESSURE SENSOR DEVICE IS USED IN PLACE OF THE FLOW METER, A CONVERSION CHART SHALL BE MAINTAINED TO INDICATE THE CORRESPONDING FLOW RATE, IN CFM, TO THE PRESSURE READING.
[RULE 204]
15. MAXIMUM EXHAUST AIR FLOW TO BE TREATED BY EACH OF THE CARBON ADSORBER SHALL NOT EXCEED 20,000 SCFM.
[RULE 204]
16. WITHIN 90 DAYS AFTER START UP OF THE NEW SLUDGE THICKENING AND DEWATERING EQUIPMENT (OCSJ JOB NO. P1-101), OPERATING AT A STEADY STATE, BUT NOT LATER THAN 180 DAYS AFTER INITIAL START-UP, ORANGE COUNTY SANITATION DISTRICT (OCSJ) SHALL CONDUCT SOURCE TESTS TO DETERMINE EMISSIONS FROM THE ODOR CONTROL SYSTEM DESCRIBED IN THIS PERMIT, IN ACCORDANCE WITH THE AQMD APPROVED SOURCE TESTS PROTOCOL. A TEST PROTOCOL INCLUDING ALL SOURCE TESTING AND ANALYTICAL METHODS SHALL BE SUBMITTED TO THE AQMD, WASTE MANAGEMENT & BULK TERMINALS PERMITTING TEAM, FOR APPROVAL AT LEAST 30 DAYS PRIOR TO START OF THE TESTS. NOTICE SHALL BE PROVIDED TO THE AQMD 10 DAYS PRIOR TO THE TESTING SO THAT AN OBSERVER MAY BE PRESENT. WRITTEN RESULTS OF SUCH PERFORMANCE TESTS

SEE
SAMPLE
PERMIT

SEE
SAMPLE
PERMIT

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT STATIONARY SOURCE COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 11	PAGE 4
	APPL NO 520793	DATE 05/01/2012
	PROCESSED BY GCR	CHECKED BY

SHALL BE SUBMITTED WITHIN 60 DAYS AFTER TESTING. THE TESTS SHALL DETERMINE THE EMISSIONS TO ATMOSPHERE FROM THE ODOR CONTROL SYSTEM FOR:

- A. TOTAL NON-METHANE HYDROCARBONS (TNMHC) AND TOXIC AIR CONTAMINANTS (TAC) PRESENT, (LBS/HR AND PPMV) – INLET AND EXHAUST.
 - B. AMMONIA AND HYDROGEN SULFIDE (H₂S), (LBS/HR AND PPMV) – INLET AND EXHAUST.
 - C. CARBON DIOXIDE, OXYGEN AND NITROGEN
 - D. MOISTURE CONTENT, TEMPERATURE AND EXHAUST FLOW RATE.
- [RULE 204, 1401]

- 17. ADEQUATE NUMBER OF SAMPLING PORTS WITH ITS SAFE ACCESS, SHALL BE INSTALLED AND MAINTAINED FOR THE ODOR CONTROL UNIT AND EXHAUST STACKS IN ACCORDANCE WITH SCAQMD'S RULE 217.
[RULE 217]
- 18. A PRESSURE DIFFERENTIAL GAUGE INDICATING THE PRESSURE DROP (INCHES OF WATER COLUMN) ACROSS EACH CARBON BED SHALL BE INSTALLED AND MAINTAINED. THE PRESSURE DROP ACROSS EACH CARBON BED SHALL BE MAINTAINED AS PER MANUFACTURER'S SPECIFICATION AND RECOMMENDATION. PRESSURE DROP READING SHALL BE RECORDED AT LEAST ONCE A DAY.
[RULE 204]
- 19. AMMONIA (NH₃) AND HYDROGEN SULFIDE (H₂S) CONCENTRATIONS (PPMV), AT THE EXHAUST STACKS, SHALL BE MONITORED USING HANDHELD DEVICES (USING LOW RANGE CONCENTRATION DETECTION LIMIT) OR OTHER APPROVED METHODS AT LEAST ONCE A DAY WHEN EQUIPMENT IS IN OPERATION.
[RULE 3000 (a) (4)]
- 20. EMISSIONS FROM THIS EQUIPMENT SHALL NOT EXCEED THE FOLLOWING.

H ₂ S	1 PPMV
NH ₃	5 PPMV

[RULE 402, 1303 (b)(2)-OFFSET]
- 21. ACTIVATED CARBON SHALL BE REPLACED WITH FRESH ONE AS PER MANUFACTURER'S RECOMMENDATION TO MAINTAIN DESIRED CONTROL EFFICIENCY, RECORDS FOR CARBON REPLACEMENT EVENTS, WITH DATE, TYPE AND QUANTITY SHALL BE MAINTAINED ON FILE.
[RULE 204]
- 22. SPENT CARBON REMOVED FROM THIS SYSTEM SHALL BE MAINTAINED OR STORED IN CLOSED CONTAINERS PRIOR TO REMOVAL FROM SITE.
[RULE 204]
- 23. RECORDS TO DEMONSTRATE COMPLIANCE WITH THE CONDITIONS OF THIS PERMIT SHALL BE KEPT AND MAINTAINED FOR AT LEAST FIVE YEARS AND MADE AVAILABLE TO THE SCAQMD PERSONNEL UPON REQUEST.
[RULE 204]

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT STATIONARY SOURCE COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 11	PAGE 5
	APPL NO 520793	DATE 05/01/2012
	PROCESSED BY GCR	CHECKED BY

BACKGROUND:

On April 7, 2011, Orange County sanitation District (OCSD) submitted this application #520793 for construction of odor control system to treat exhaust from the proposed new sludge Thickening and sludge Dewatering facility (A/N 520794). The existing Dewatering Facility Scrubbers permit (PO F40906, A/N 386679) will be inactivated at a later date as this new odor control system is a replacement system.

This is a Title V facility. Most recent TV revision was issued August 27, 2010. OCSDD has also filed A/N 520794 to modify existing POTW PC under 453210 for construction of the new sludge Thickening and sludge Dewatering facility. Also, A/N 520795 is filed for Title V revision to include equipment under A/Ns 520793 and 520794.

PROCESS DESCRIPTION:

Orange County Sanitation District (OCSD) has proposed to upgrade to secondary treatment for Fountain Valley wastewater Treatment facility (Plant No. 1). This includes replacing or rehabilitating the existing sludge dewatering facility. OCSD has proposed a new sludge thickening and dewatering facility which is referred to by OCSD as Job No. P1-101. The new facility will consist of;

- Three sludge blending tanks
- Three sludge thickening centrifuges
- Three thickened sludge wet wells
- Three dewatering centrifuges
- Two dewatered cake hoppers and other associated equipment.

This new facility will replace the existing belt press dewatering system (PC 453210) and upgrade or replace sludge conveyance and pumping station, cake storage and load-out system, chemical feed system, ventilation and other electrical and control systems. These equipment will be located in a building, called sludge thickening and dewatering facility, and all exhaust from the building (40, 000 cfm) that may contain VOCs, NH₃ and H₂S will be treated by the new odor control system (this A/N 527093) that will replace existing odor control system permitted under F40906, A/N 386679.

New odor control system consists of "once-through", three (3) multi-stage chemical scrubbers (2 on duty, one stand-by) that will treat 40,000 cfm of foul air containing TOCs, NH₃ and H₂S (20,000 cfm per scrubber, two units in service). Exhaust from the scrubbers will be further treated by two granular activated carbon adsorbers to remove residual TOCs and odors. Three stage operations are briefly explained here.

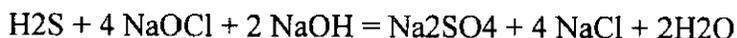
1st stage: (H₂SO₄ scrubbing solution)

H₂SO₄ scrubbing solution will remove ammonia and amines. Under acidic conditions and with the presence of H₂SO₄, ammonia reduced to ammonium sulfate (NH₄)₂SO₄. PH is maintained in the range of 3-7 with Oxidation Reduction Potential (ROP) of 700 mV to 800 mV. Chemical is added to the sump by automatic metering pump to maintain the desired PH and ORP. These parameters are continuously monitored and controlled.

2nd and 3rd stage⊗ NaOH + NaOCl scrubbing solution)

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT STATIONARY SOURCE COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 11	PAGE 6
	APPL NO 520793	DATE 05/01/2012
	PROCESSED BY GCR	CHECKED BY

Under alkaline conditions and with the presence of excess NaOCl, H₂S is oxidized to form sulfuric acid which is then neutralized by NaOH to form byproduct sodium sulfate. PH is maintained in the range of 9-11 with Oxidation Reduction Potential (ROP) of 600 mV to 650 mV. Chemicals are added to the sumps by automatic metering pumps to maintain the desired PH and ORP. These parameters are continuously monitored and controlled.



A polypropylene packing media is provided to allow for the necessary chemical reactions to occur in the system. The packing is designed to allow the maximum amount of surface area while minimizing the pressure drop. This configuration is critical to maximize the amount of liquid to gas contact in the system thereby maximizing the removal efficiency of the system and minimizing chemical consumption.

The slat byproducts, dissolved in the sump liquid overflows out of the sump and at the same rate fresh water is injected into the sump. A pressure differential gauge is provided to insure that the packing does not retain excess amount of the byproducts or "plug".

AFTER treatment by the LO/PRO chemical scrubber system, air containing trace amount of odorous compounds, are treated by a Granular Activated carbon (GAC) adsorber, a dual-bed adsorber. After entering the vessel, half of the air flows downward through a 3-ft deep lower bed of media and half of the air flows upwards through a 3-ft upper bed media. There are two adsorbers, in parallel, each treating 20,000 cfm air (total 40,000 cfm). Cleaned air is exhausted through the respective stacks.

Following are specifications for the packed –bed scrubber (single Unit) and GAC system,

Manufacturer: Siemens LP-6500 OR Duall PTMD OR Equivalent

Packing material type: Jeager, polypropylene

Packing Factor: 1.25

Packing Size: 3.5"

Height of Packing Material: 15.0 ft.

Number of Transfer Unit (NTU): 8

Height of Transfer Unit (HTU): 1.43 ft.

Pressure Drop: 0.45 in H₂O/ft or 6.75 in. H₂O across 15' packing material

Mist Eliminator: Internal, 1st and 3rd stage scrubbers

Overall pressure drop across the scrubber = 11 in. H₂O

Exhaust blower = 20,000 cfm, 100 HP (Total 40,000 cfm, 2 units).

Recirculation pump, 1 = 15 HP.

Recirculation water flow rate = 400 gpm

Make up water rate = 12 gpm.

PH operating Range = 3-7 1st stage (H₂SO₄), 9.0 – 11 2nd & 3rd stage (NaOH & NaOCl)

Oxidation Reduction Potential (ORP) = minimum 700 mV – 800 mV (1st stage)

= minimum 600 mV – 650 mV (2nd & 3rd stage)

Exhaust Stack: 3' Dia. X 33'-9" H., no rain cap.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT STATIONARY SOURCE COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 11	PAGE 7
	APPL NO 520793	DATE 05/01/2012
	PROCESSED BY GCR	CHECKED BY

Granular Activated Carbon (GAC) Adsorbers:

Manufacturer = Siemens or Duall or Equivalent

Number of vessels = 2, each one is a dual-bed

Media = Pelletized Anthracite

Media capacity = 12,670 lbs each adsorber, 3' x 2 = 6' depth for dual-bed.

Odor removal capacity = 0.30 g H₂S/ cc carbon (= 0.60 lbs H₂S/lb carbon)

Air flow per vessel = 20,000 cfm

Exhaust stack = 3' Dia. X 22'-6"H.(revised dimensions per E-mail, 10/4/12) above ground level, no rain cap

Exhaust temperature = Ambient.

Pressure drop across adsorber = 3" – 4" water column (Duall carbon system)*
= 4.5" water column (Siemens Water Technologies)*

*E-mail from Manufacturers, 8/04/2011.

EMISSION CALCULATIONS: (Revised)

Max. exhaust flow rate = total 40,000 scfm

Overall TOC control efficiency = 99% assumed (3 stage scrubbers + GAC)

Max. Inlet H₂S con. = 20 ppmv (per application)

H₂S odor control efficiency = 99%, for the packed -bed chemical scrubber

Max. Inlet NH₃ con. = 50 ppmv (per application)

NH₃ odor control efficiency = 99%, for the packed -bed chemical scrubber

Operating Schedule = 24 hrs/day, 7 days/wk, 52 wks/yr.

Assume TOC = VOC (as hourly emission for specific compound is in order of E-03 to E-06, and exempt VOC compounds (MeCl₂ and Perc) are in the range of E-04 to E-05).

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT STATIONARY SOURCE COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 11	PAGE 8
	APPL NO 520793	DATE 05/01/2012
	PROCESSED BY GCR	CHECKED BY

Estimated TOC (VOC) emissions from the dewatering building for 40,000 cfm exhaust air are listed below (as provided by Black & Veatch. See E-mail from OCSD, 8/03/2011)

	<u>Lb/hr, controlled</u> (40,000 cfm)	<u>Lb/hr, controlled</u> (20,000 cfm/exhaust stack)
Benzene	1.41E-06	7.05E-07
Chloroform	202 E-04	1.01E-04
1,4 (p)-dichlorobenzene	2.75E-04	1.375E-04
Methylene chloride*	1.83E-05	9.15E-06
Perchloroethylene*	1.28E-04	6.40E-05
Styrene	7.12E-06	3.56E-06
Toluene	1.95E-03	9.75E-04
Trichloroethylene	5.69E-06	2.845E-06
Xylene	2.32E-03	1.16E-03
Total	4.907E-03	2.453E-03
*Exempt VOC		

Total TOC (VOC) controlled emission (40,000 cfm) = **0.0049 lb/hr (R₂)** = 0.117 lbs/day
 Uncontrolled emission @ 95% efficiency = 0.0049 / 0.05 = **0.10 lb/hr (R₁)** = 2.4 lbs/day
 No VOC condition or limit will be proposed since the VOC from this process is part of the total VOC from the entire facility.

H₂S & NH₃ Emissions

Based on maximum outlet H₂S concentration in 40,000 cfm exhaust = 1ppmv (requested per application)
 and maximum outlet NH₃ concentration in 40,000 cfm exhaust = 5 ppmv (requested per application)
 Assumed control efficiency = 99%

H₂S (R₂) = (40000 scfm) (1 E-06) (1/379) (34) (60) = **0.21 lbs/hr** = 5.0 lbs/day.
 H₂S (R₁) = 0.21 lbs/hr / (1.0 - 0.99) = **21.0 lbs/hr** = 504 lbs/day

NH₃ (R₂) = (40000 scfm) (5 E-06) (1/379) (17) (60) = **0.54 lbs/hr** = 12.9 lbs/day.
 NH₃ (R₁) = 5.38 lbs/hr / (1.0 - 0.99) = **54 lbs/hr** = 1296 lbs/day

No PM₁₀ emission is expected from this odor control equipment (No PM10 measurement source tests is warranted and not included in source tests condition).

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT STATIONARY SOURCE COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 11	PAGE 9
	APPL NO 520793	DATE 05/01/2012
	PROCESSED BY GCR	CHECKED BY

Note: Estimate for dissolved salts solids' entrainment from the multi-stage chemical scrubbers (assumed 20% moisture in exhaust),

$$\begin{aligned}
 &= 3.88\text{E-}06 \text{ grains/cf exhaust (See spreadsheet calculations)} \\
 &= 3.88\text{E-}06 \text{ grains/cf} \times (40000 \text{ cfm} \times 0.80 \times 60) / 7,000 \text{ grains/lb} \\
 &= 0.001 \text{ lbs/hr} = \underline{0.024 \text{ lbs/day}}.
 \end{aligned}$$

No PM₁₀ monitoring condition proposed due to very low estimated emission.

Estimated Carbon Breakthrough – VOC

(Almost all of Ammonia and H₂S are expected to be removed by multi-stage chemical scrubbers with 95% or better expected control efficiency and GAC adsorbers are used for polishing any residual odorous compounds present in downstream of scrubbers)

$$\begin{aligned}
 \text{VOC loading per adsorber} &= 0.1 \text{ lb/hr} / 2 = 0.05 \text{ lbVOC/hr, in 20000 cfm air} \\
 &= 1.2 \text{ lb VOC/day (uncontrolled)}.
 \end{aligned}$$

$$\begin{aligned}
 \text{VOC adsorption capacity for GAC} &= 0.05 \text{ lb VOC/lb carbon} \times 12,670 \text{ lbs C} = 633 \text{ lbs VOC} \\
 \text{Breakthrough (single adsorber, 20,000 cfm),} \\
 &= 633 \text{ lbs VOC} / 1.2 \text{ lbs VOC loading /day} = 527 \text{ days} = 1.44 \text{ yrs.}
 \end{aligned}$$

AEIS/NSR:

VOC, ammonia and H₂S emissions are assigned to basic equipment A/N 520794, Sewage Treatment > 5 mgd. Therefore, emissions data entry under this A/N 520793 entered as zero (VOC, ammonia & H₂S).

ODOR CONTROL ANALYSIS:

H₂S in exhaust is conditioned for ~~0.2~~¹ ppmv. This limit will comply with odor threshold limits under CSAAQS and OEHHA (see below).

Screen 3 analysis indicated 1-hr maximum ground level con. @ nearest residential receptor (185 meters)
 = 22.66 mcg/m³ @ 1 lb/hr emission rate.

H₂S emission rate at 20,000 cfm = 0.21 lb/hr.

$$\begin{aligned}
 &0.21 \text{ lbs H}_2\text{S /hr} \times 22.66 \text{ mcg/m}^3 / 1 \text{ lb/hr} \times (0.02445 / 34) \\
 &= 0.0035 \text{ ppmv H}_2\text{S} \\
 &= 3.5 \text{ ppbv} < 30 \text{ ppbv H}_2\text{S limit under CSAAQS.} \\
 &\quad \text{and} < 8 \text{ ppbv H}_2\text{S odor threshold under OEHHA.}
 \end{aligned}$$

California State Ambient Air Quality Standard (CSAAQS)
 California Office of Environmental Health Hazard Assessment Office (OEHHA).

Note: Cumulative impact from emissions from two (2) stacks is expected to be below allowable odor thresholds.

Therefore, H₂S con. limit in exhaust = 1.0 ppmv for permit condition is okay.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT STATIONARY SOURCE COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES	PAGE
	11	10
	APPL NO 520793	DATE 05/01/2012
	PROCESSED BY GCR	CHECKED BY

NH₃ concentration in exhaust is conditioned to 5 ppmv since the concentration at the fenceline will be less than odor threshold limit for NH₃ (5 ppm).

$(20000) (10/10^6) (1/379) (17) (60) = 0.54 \text{ lbs/hr.}$
 $(0.54)(22.66) (0.02445/17) = 0.017 \text{ ppm} < 5 \text{ ppm odor threshold.}$

RULES EVALUATION:

- Rule 212:** This is not a significant project in terms of emissions. There are no schools within 1000' of emission source. Emissions are expected below daily emission threshold. MICR is expected to be below ten in a million with T-BACT. No public notice is required. Compliance is expected.
- Rule 219:** Sulfuric acid, ≤ 99% by wt., storage tank is exempt form permit per Rule 219 (m) (A). Sodium hydroxide storage tank is exempt form permit per Rule 219 (m) (C). Sodium hypochlorite solution storage tank is exempt form permit per Rule 219 (m) (19).
- Rule 401:** The equipment is not expected to emit visible emissions with proper operation and maintenance.
- Rule 402:** With proper operation, monitoring and maintenance of the equipment no odor complaints are anticipated. Permit condition for ammonia and H₂S conc. In exhaust shall comply with odor threshold limits. Compliance is expected.
- Rule 404:** No PM emissions expected from the proposed odor control system. Note: PM₁₀ emission (dissolved salts entrainment) from chemical scrubbers with demister is estimated at 3.88E-06 grains/scf which is below 0.0463 grains.dscf allowed for 42380 cfm under Table 404(a). compliance is expected.
- Reg. 13:** CEQA – Proposed OCSD Project (No. P1-101), in accordance with US EPA's procedures for implementing National Environmental Policy Act (40CFR Part 6), EPA has determined that this project is eligible for categorical exemption under 40CFR §6.107 and is exempt from the substantive environmental review requirements of the National Environmental Policy Act (42 U.S.C. 4321 et seq). Copy of this exemption is included in folder.

Ammonia, H₂S and VOC emissions from this proposed project is part of the facility emissions. There is no increase in emissions from this project and BACT is not triggered. This project is only for control of odors.

No Offset is required for VOC (0.117 lb/day). H₂S and ammonia are not required any offset (ammonia is subject to BACT but not offset). Compliance is expected.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT STATIONARY SOURCE COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 11	PAGE 11
	APPL NO 520793	DATE 05/01/2012
	PROCESSED BY GCR	CHECKED BY

Rule 1401: Pass Tier 1 screening with pollutant screening index (PSI) <1, each, for cancer/chronic ASI and acute ASI.

Tier 2 results: MICR = 2.38E-08 (Res.) < 10 in a million with T-BACT.

HIC and HIA are estimated to be < 1 for each applicable organ.
Compliance is expected.

Rule 1401.1: Exempt. This is an existing facility.

Reg. 30: Most recent TV revision was issued August 27, 2010.
OCSD has submitted A/N 520795 for Title V permit revision to include the proposed project, P1-101. Compliance is expected with completion of public notice and EPA 45-day review..

RECOMMENDATION:

A permit to construct is recommended subject to above listed conditions and, upon approval and issuance of the Title V permit revision.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT STATIONARY SOURCE COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 10	PAGE 1
	APPL NO 520794 Rev	DATE 01-02-2012
	PROCESSED BY GCR	CHECKED BY A.S.

PERMIT TO CONSTRUCT EVALUATION

(Revsd per OCSD comments to Draft, 10-04-11 email)

APPLICANT'S NAME: ORANGE COUNTY SANITATION DISTRICT (OCSD)

MAILING ADDRESS: 10844 ELLIS AVENUE
FOUNTAIN VALLEY, CA 92708
ATTN.: TERRY AHN, REGULATORY SPECIALIST

EQUIPMENT ADDRESS: WASTEWATER TREATMENT PLANT NO. 1
"SAME AS ABOVE"

FACILITY ID NO.: 017301

EQUIPMENT DESCRIPTION:

ALTERATION OF THE EXISTING SEWAGE TREATMENT PLANT (216 MGD), COVERED BY PERMIT TO CONSTRUCT APPLICATION NO. ~~432418~~ 453210 (AND EXISTING P/O F66565), CONSISTING OF:

1. HEADWORKS STATION NO. 1 WITH TWO GRIT CHAMBERS, 28'-0" L. X 20'-0" W. X 14'-0" D., TWO SPLITTER BOXES, 15'-0" L. X 4'-0" W. X 7'-6" D., TWO GRIT CLASSIFIERS, AND ASSOCIATED PUMPS AND BLOWER.
2. HEADWORKS STATION NO. 2 WITH FIVE GRIT CHAMBERS, 38'-0" L. X 20'-0" W. X 14'-0" D., THREE SPLITTER BOXES, 15'-0" L. X 8'-0" W. X 15'-0" D., FOUR BAR SCREENS WITH A RAKE ASSEMBLY, EIGHT GATE OPERATORS, FIVE SPLITTER BOX WEIR GATE OPERATORS, AND ASSOCIATED PUMPS, BLOWERS AND COMPRESSOR.
3. FIFTEEN PRIMARY BASINS CONSISTING OF TWO 188'-0" L. X 40'-0" W. X 9'-0" D. RECTANGULAR BASINS WITH CONCRETE AND ALUMINUM COVERS, THREE 140'-0" DIA. X 9'-0" D. CIRCULAR BASINS WITH ALUMINUM GEODESIC DOME COVERS, TEN 10'-0" L. X 195'-0" W. X 10'-0" D. RECTANGULAR BASINS WITH CONCRETE AND ALUMINUM COVERS AND ASSOCIATED PUMPS AND BLOWERS.
4. FOUR TRICKLING FILTERS, EACH 180' DIA. X 6'-0" D., WITH TWO GATE OPERATORS AND ASSOCIATED PUMPS.
5. SECONDARY CLARIFIERS CONSISTING OF ONE 140'-0" DIA. X 9'-0" D. AND TWENTY-FOUR 150'-0" L. X 40'-0" W. X 10'-0" D. WITH ASSOCIATED PUMPS.
6. ACTIVATED SLUDGE PLANT PRIMARY EFFLUENT PUMP STATION WITH ASSOCIATED PUMPS.
7. TEN AERATION BASINS, EACH 275'-0" L. X 45'-0" W. X 15'-0" D. WITH ASSOCIATED BLOWERS.
8. SIX SLUDGE THICKENERS, EACH 40'-0" DIA. X 8'-0" D., WITH ASSOCIATED SWEEP DRIVER AND CONVEYORS.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT STATIONARY SOURCE COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 10	PAGE 2
	APPL NO 520794 Rev	DATE 01-02-2012
	PROCESSED BY GCR	CHECKED BY

9. TWELVE DIGESTER TANK CONSISTING OF FOUR 90' -0" DIA. X 30' - 0" D, EACH 208,780 CUBIC FEET CAPACITY, EIGHT 110' -0" DIA. X 30' - 0" D, EACH APPROXIMATELY 330,430 CUBIC FEET CAPACITY WITH ASSOCIATED PUMPS AND COMMUTERS. EACH DIGESTER EQUIPPED WITH TWO PASSIVE VENTILATION CARBON ADSORBERS (55 GALLONS OR LESS VOLUME).
10. THIRTY-TWO DIGESTER CLEANING BEDS, 58'- 0" L. X 56'- 0" W. X 3' -2" D.
11. DIGESTER GAS STORAGE TANKS, 25,000 CUBIC FEET CAPACITY, 42' -0" DIA. X 33' - 6" H. WITH THREE COMPRESSORS.
12. SLUDGE PROCESSING STATION WITH TWO GRINDERS, EIGHT DEWATERING FILTER PRESSES, TRANSFER PUMP HOPPERS, AUGERS, STORAGE HOPPERS AND A TRUCK LOAD-OUT HOPPER.
- 13.* SIXTEEN PRIMARY BASINS, 195'- 0" L. X 40'- 0" W. X 10' -0" D., EACH WITH CONCRETE COVERS AND 6 MGD AVERAGE CAPACITY AND ASSOCIATED PUMPS AND BLOWERS.
- 14.* FOUR EXISTING TRICKLING FILTERS (ITEM NO. 4 ABOVE) REPLACED WITH TWO NEW TRICKLING FILTERS, EACH 166' DIA. X 20' - 0" MEDIA DEPTH, AND ASSOCIATED PUMPS. EACH NEW TRICKLING FILTER WITH TWO EXHAUST STACKS, EACH STACK 40' HIGH, AND WITH A TOTAL AIR FLOW RATE OF 25,000 CFM PER TRICKLING FILTER.
- 15.* ONE EXISTING SECONDARY CLARIFIER (ITEM NO. 5 ABOVE) REPLACED WITH TWO NEW SECONDARY CLARIFIERS CONSISTING OF 175' - 0" DIA. X 15' - 0" D. WITH ASSOCIATED PUMPS.

* Construction for the above items 13, 14, and 15 has been completed (under A/N 407071).

BY THE ADDITION OF: (OCSD JOB NO. P1-82 ACTIVATED SLUDGE PLANT REHABILITATION) UNDER A/N 432418.

16. TWO NEW SECONDARY CLARIFIERS, EACH 150'- 0" L. X 40'- 0" W. X 10' - 0" D.

BY THE REMOVAL OF:

10. THIRTY-TWO DIGESTER CLEANING BEDS, 58'- 0" L. X 56'- 0" W. X 3' -2" D.

AND BY THE ADDITION OF:

17. NEW SECONDARY ACTIVATED SLUDGE FACILITY 2 (OCSD JOB NO. P1-102), AND NEW SLUDGE DEWATERING BEDS (OCSD JOB NO. P1-106) UNDER A/N 453210,
 - I. SIX AERATION BASINS (NOS. 11 THROUGH 16), COVERED, EACH 227' - 2" L. X 45' - 0" W. X 26' - 0" D., WITH ASSOCIATED AERATION BLOWERS, DIFFUSERS, MIXERS, AND PUMPS, AND VENTING THROUGH SIX STACKS, EACH 7' - 11" H., AND 10,000 SCFM.
 - II. SIX SECONDARY CLARIFIERS (NOS. 27, 29, 31, 32, 33, AND 34), UNCOVERED, EACH 155' DIA. X 16' SIDE WATER D. , WITH ASSOCIATED RETURN ACTIVATED

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT STATIONARY SOURCE COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 10	PAGE 3
	APPL NO 520794 Rev	DATE 01-02-2012
	PROCESSED BY GCR	CHECKED BY

SLUDGE (RAS), WASTE ACTIVATED SLUDGE (WAS), AND SECONDARY SCUM PUMPS.

- III. SODIUM HYPOCHLORITE (NaOCl) SOLUTION SYSTEM ADDITION (TO THE EXISTING BLEACH SYSTEM) FOR CHLORINATION OF THE TREATED EFFLUENT, RETURN ACTIVATED SLUDGE (RAS), WASTE ACTIVATED SLUDGE (WAS), AND SURFACE WASTE.

18. SLUDGE MANAGEMENT SYSTEM CONSISTING OF:

- I. TRUCK WASH STATION
- II. SAWDUST STORAGE
- III. TWO (2) DEWATERING BEDS FOR PLANT CLEANING OPERATIONS, EACH 110' - 0" L. X 56' - 0" W., AND WITH APPROXIMATELY 580 CUBIC YARDS CAPACITY.
- IV. ONE DEWATERING BED FOR PLANT CLEANING OPERATIONS, 100' - 0" L. X 24' - 0" W., WITH APPROXIMATELY 44 CUBIC YARDS CAPACITY.

BY THE REPLACEMENT/UPGRADE OF: (OCSJ JOB NO. P1-101- NEW SLUDGE THICKENING AND DEWATERING FACILITY, NEW A/N 520794),

- 19. REPLACE TWO GRINDERS, EIGHT DEWATERING FILTER PRESSES (LISTED UNDER ITEM NO. 12)

20. UPGRADE, REPLACE OR MODIFY;

- I. SLUDGE CONVEYANCE AND PUMPING SYSTEM
- II. BIOSOLIDS STORAGE AND LOAD-OUT SYSTEM
- III. CHEMICAL FEED SYSTEM
- IV. VENTILATION SYSTEM AND VARIOUS OTHER ELECTRICAL AND CONTROL SYSTEMS.
- V. MODIFY EXISTING TRUCKLOADING FACILITY TO IMPROVE ODOR CONTROL AND TO ALLOW STORAGE AND CONVEYANCE OF A DRIER DEWATERED CAKE/BIOSOLIDS.

AND BY THE ADDITION OF: (OCSJ JOB NO. P1-101- NEW SLUDGE THICKENING AND DEWATERING FACILITY, NEW A/N 520794),

- 21. THREE (3) SLUDGE BLENDING TANKS
POLYMER SYSTEM CONSISTING OF POLYMER STORAGE, MIXING AND AGING TANKS.
THREE (3) SLUDGE THICKENING CENTRIFUGES
THREE (3) THICKENED SLUDGE WETWELLS
THREE (3) DEWATERING CENTRIFUGES
DEWATERED CAKE CONVEYANCE SYSTEM CONSISTING OF INCLINED SCREW CONVEYORS, HORIZONTAL/CROSS CONVEYERS, HORIZONTAL COLLECTOR CONVEYORS, CAKE HOPPERS AND TRUCK LOAD OUT HOPPER.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT STATIONARY SOURCE COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 10	PAGE 4
	APPL NO 520794 Rev	DATE 01-02-2012
	PROCESSED BY GCR	CHECKED BY

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN COMPLIANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL BE OPERATED BY PERSONNEL PROPERLY TRAINED IN ITS OPERATION.
[RULE 204]
4. ORANGE COUNTY SANITATION DISTRICT (OCS D) SHALL MAKE A WRITTEN REQUEST FOR AND OBTAIN AN EXTENSION OF TIME TO CONSTRUCT THIS EQUIPMENT ON AN ANNUAL BASIS UNTIL SUCH TIME CONSTRUCTION IS COMPLETED AND THE EQUIPMENT IS PUT INTO OPERATION. AT LEAST 30 DAYS PRIOR TO THE EXPIRATION DATE OF THE PERMIT TO CONSTRUCT, OCS D SHALL PROVIDE IN THE WRITTEN REQUEST, VERIFIABLE DATA TO AQMD IN ORDER TO SHOW COMPLIANCE WITH THE CONSTRUCTION SCHEDULE AS PROVIDED IN THE APPLICATION UNDER WHICH THIS PERMIT TO CONSTRUCT IS GRANTED. IF THERE ARE CHANGES TO THE INCREMENTS OF PROGRESS AND/OR CONSTRUCTION SCHEDULE, THEY WILL NOT BECOME EFFECTIVE UNTIL OCS D RECEIVES WRITTEN CONFIRMATION OF SUCH CHANGES FROM AQMD.
[RULE 204]
5. THE HEADWORKS FACILITIES, PRIMARY TREATMENT BASINS, AND NEW SLUDGE THICKENING AND DEWATERING AND SOLIDS PROCESSING AND HANDLING FACILITY (JOB P1-101) SHALL NOT BE OPERATED UNLESS THEY ARE FULLY ENCLOSED AND THEIR EXHAUST AIR VENTED TO AIR POLLUTION CONTROL SYSTEMS, WHICH ARE IN FULL OPERATION AND HAVE VALID PERMITS TO CONSTRUCT OR OPERATE ISSUED BY THE SCAQMD. IN THE EVENT AIR POLLUTION CONTROL SYSTEM(S) ARE SHUTDOWN FOR CONSTRUCTION OR MAINTENANCE WORK, THE H₂S EMISSIONS SHALL NOT EXCEED THE CONCENTRATION LIMITS AS SPECIFIED IN THEIR RESPECTIVE AIR POLLUTION CONTROL EQUIPMENT PERMIT.
[RULE 402]
6. THE DAILY TOTAL INFLUENT FLOW, IN MILLION GALLONS PER DAY (MGD), TO THE HEADWORKS, PRIMARY TREATMENT PROCESS, AND SECONDARY TREATMENT PROCESS SHALL BE RECORDED.
[RULE 204]
7. THE TOTAL INFLUENT FLOW OF WASTEWATER TO THE PRIMARY WASTEWATER TREATMENT PROCESS SHALL NOT EXCEED 216 MILLION GALLONS PER DAY (MGD), AVERAGED ON A CALENDAR MONTH, EXCEPT DURING WET WEATHER PERIODS AND EMERGENCY PERIODS INVOLVING PUBLIC HEALTH AND SAFETY.
[RULE 1304 (a) (4) - MODELING & OFFSETS EXEMPTION]

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT STATIONARY SOURCE COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES	PAGE
	10	5
	APPL NO 520794 Rev	DATE 01-02-2012
	PROCESSED BY GCR	CHECKED BY

8. THE TOTAL INFLUENT FLOW OF WASTEWATER TO THE SECONDARY WASTEWATER TREATMENT PROCESS SHALL NOT EXCEED 182 MILLION GALLONS PER DAY (MGD), AVERAGED ON A CALENDAR MONTH, EXCEPT DURING WET WEATHER PERIODS AND EMERGENCY PERIODS INVOLVING PUBLIC HEALTH AND SAFETY.
[RULE 1304 (a) (4) – MODELING & OFFSETS EXEMPTION]

9. THE AVERAGE DAILY PRIMARY EFFLUENT FLOW RATE, TREATED BY THE NEW ACTIVATED SLUDGE FACILITY 2 (JOB NO. P1-102 CONSISTING OF SIX AERATION BASINS AND SIX SECONDARY CLARIFIERS), SHALL NOT EXCEED 60 MILLION GALLONS PER DAY (MGD) , AVERAGED ON A CALENDAR MONTH, EXCEPT DURING WET WEATHER PERIODS AND EMERGENCY PERIODS INVOLVING PUBLIC HEALTH AND SAFETY.
[RULE 204]

10. WITHIN 60 DAYS AFTER ACHIEVING THE MAXIMUM INFLUENT FLOW RATE FOR THE ACTIVATED SLUDGE FACILITY 2 (JOB NO. P1-102), BUT NOT LATER THAN 180 DAYS AFTER INITIAL START-UP, ORANGE COUNTY SANITATION DISTRICT (OCS D) SHALL CONDUCT SOURCE TESTS TO DETERMINE EMISSIONS FROM AT LEAST TWO OF THE SIX NEW AERATION BASINS' EXHAUST STACKS, AND AT LEAST TWO OF THE SIX NEW SECONDARY CLARIFIERS' SURFACE EMISSIONS, IN ACCORDANCE WITH THE AQMD OR OTHER APPROVED TEST PROCEDURES. A TEST PROTOCOL INCLUDING ALL SOURCE TESTING AND ANALYTICAL METHODS SHALL BE SUBMITTED TO THE AQMD, REFINERY AND WASTE MANAGEMENT TEAM, FOR APPROVAL AT LEAST 30 DAYS PRIOR TO START OF THE TESTS. NOTICE SHALL BE PROVIDED TO THE AQMD 10 DAYS PRIOR TO THE TESTING SO THAT AN OBSERVER MAY BE PRESENT. WRITTEN RESULTS OF SUCH PERFORMANCE TESTS SHALL BE SUBMITTED WITHIN 60 DAYS AFTER TESTING. THE TESTS SHALL DETERMINE THE EMISSIONS TO ATMOSPHERE FROM TWO OF THE AERATION BASINS AND TWO OF THE SECONDARY CLARIFIERS FOR:
 - A. TOTAL NON-METHANE HYDROCARBONS (TNMHC) AND TOXIC AIR CONTAMINANTS (TAC) PRESENT, (LBS/HR AND PPMV).
 - B. AMMONIA AND HYDROGEN SULFIDE (H₂S), (LBS/HR AND PPMV).
 - C. CARBON DIOXIDE, OXYGEN AND NITROGEN
 - D. MOISTURE CONTENT, TEMPERATURE AND EXHAUST FLOW RATE.

11. ADEQUATE NUMBER OF SAMPLING PORTS WITH ITS SAFE ACCESS, SHALL BE INSTALLED AND MAINTAINED IN THE AERATION BASINS' EXHAUST STACK (JOB NO. P1-102) IN ACCORDANCE WITH SCAQMD'S RULE 217.
[RULE 217]

12. ORANGE COUNTY SANITATION DISTRICT (OCS D) SHALL CALCULATE THE MAXIMUM INDIVIDUAL CANCER RISK (MICR), ACUTE HAZARD INDEX (HIA) AND CHRONIC HAZARD INDEX (HIC), BASED ON THE SOURCE TESTS RESULTS, USING AQMD PUBLISHED "RISK ASSESSMENT PROCEDURES FOR RULES 1401 AND 212" (VERSION 7.0, JULY 1, 2005), TO DETERMINE THE COMPLIANCE WITH RULE 1401. RESULTS SHALL BE SUBMITTED TO AQMD.
[RULE 1401]

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT STATIONARY SOURCE COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 10	PAGE 6
	APPL NO 520794 Rev	DATE 01-02-2012
	PROCESSED BY GCR	CHECKED BY

13. IF SOURCE TESTS RESULTS INDICATE THAT THE TOTAL VOLATILE ORGANIC COMPOUNDS (VOC) EMISSIONS FROM THE AERATION BASINS EXCEED 13 LBS PER DAY OR AS DETERMINED BY AQMD, THEN OCSD SHALL CONDUCT IN DETAIL THE TECHNOLOGICAL FEASIBLE STUDY AND COST-EFFECTIVENESS ANALYSIS FOR A SUITABLE AIR POLLUTION CONTROL EQUIPMENT TO DETERMINE LOWEST ACHIEVABLE EMISSION RATE (LAER) FROM SUCH PROCESS.
[RULE 1303 (a) (1) – BACT]
14. THE HYDROGEN SULFIDE (H₂S) CONCENTRATION (PPMV) IN THE EXHAUST STACKS OF EACH TRICKLING FILTER SHALL BE MEASURED AND RECORDED ON A DAILY BASIS.
[RULE 402]
15. RAW DIGESTER GAS PRODUCED AT THIS FACILITY SHALL NOT BE RELEASED INTO THE ATMOSPHERE. ALL COLLECTED DIGESTER GAS SHALL BE EITHER COMBUSTED IN DIGESTER GAS FLARES, INTERNAL COMBUSTION ENGINES, OR BOILERS WITH VALID AQMD PERMIT, OR SHALL BE TREATED THROUGH A PERMITTED AIR POLLUTION CONTROL DEVICE(S).
[RULE 402]
16. THE SAWDUST USED IN THE SLUDGE MANAGEMENT SYSTEM SHALL BE STORED AND KEPT SUFFICIENTLY MOIST TO PREVENT ANY AIR BORNE PARTICULATE MATTER EMISSIONS.
[RULE 402]
17. OCSD SHALL KEEP THE FOLLOWING DAILY RECORDS WITH REGARDS TO THE SLUDGE MANAGEMENT SYSTEM,
 - I. THE AMOUNT OF SLUDGE DEWATERED IN EACH DRYING BED.
 - II. NUMBER OF TRUCKS WASHED.
 - III. NUMBER OF LEAKY OR OVERFILLED TRUCKS.
 [RULE 204]
18. RECORDS TO DEMONSTRATE COMPLIANCE WITH THE CONDITIONS OF THIS PERMIT SHALL BE KEPT AND MAINTAINED FOR AT LEAST FIVE YEARS AND MADE AVAILABLE TO THE SCAQMD PERSONNEL UPON REQUEST.
[RULE 204]

BACKGROUND:

On April 7, 2011, Orange County sanitation District (OCSD) submitted this application #520794 for alteration/modification of the existing Sewage Treatment Plant (PC 453210).

The proposed modifications include;

- Replacement of grinders and dewatering belt filter presses
- Upgrade, replace or modify chemical feed system, sludge pumping and conveyance system, solids processing, handling, storage and load-out system, ventilation system and other electrical and control systems and,
- Installations of;

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT STATIONARY SOURCE COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 10	PAGE 7
	APPL NO 520794 Rev	DATE 01-02-2012
	PROCESSED BY GCR	CHECKED BY

Sludge blending tanks, polymer storage, mixing and aging tanks, sludge thickening centrifuges, thickened sludge wetwells, dewatering centrifuges, dewatered cake conveyance (screw) system and truck load out hopper.

The proposed modifications is termed as "New sludge thickening and dewatering facility", OCSJ Job No. P1-101. All equipment are located in a building and collected foul air, 40,000 cfm, venting to the proposed new odor control system for which a new A/N 520793 is submitted. [The existing Dewatering Facility Scrubbers permit (PO F40906, A/N 386679) will be inactivated at a later date as this new odor control system is a replacement system.]

Project schedule consists of completion of final design, bid advertisement, notice to proceed, begin construction (April 2012) and with project completion target date of March 2015.

Also, A/N 520795 is filed for Title V revision to include equipment under A/Ns 520793 and 520794.

This is a Title V facility. Most recent TV revision was issued August 27, 2010.

PROCESS DESCRIPTION:

The new Sludge Thickening and Dewatering Facility (OCSJ Job No. P1-101) will have treatment capacity of 155 mgd and will include equipment described under Background and as listed under equipment description item Nos. 19, 20 and 21.

Total of 40,000 cfm of foul air (design basis) from the building will be vented to the new odor control system (A/N 520793). This consists of 17,000 cfm from the new process and 15,000 cfm from the existing processes - solids handling, storage and load out system, solids handling (total 32,000 cfm).

Proposed New Process	Air flow, cfm- Design
3-Dewatering Centrifuges	5525
4-Thickening Centrifuges	6000
3-Blend Tanks	3000
4-Thickened Wetwells	1000
Centrate Wells/Cake Hopper	1475

EMISSION CALCULATIONS: (from odor control system evaluation, A/N 520793)

Max. exhaust flow rate = total 40,000 scfm
 Overall TOC control efficiency = 99% assumed (3 stage scrubbers + GAC)

Max. Inlet H₂S con. = 20 ppmv (per application)
 H₂S odor control efficiency = 99%, for the packed -bed chemical scrubber

Max. Inlet NH₃ con. = 50 ppmv (per application)
 NH₃ odor control efficiency = 99%, for the packed -bed chemical scrubber

Operating Schedule = 24 hrs/day, 7 days/wk, 52 wks/yr.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT STATIONARY SOURCE COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 10	PAGE 8
	APPL NO 520794 Rev	DATE 01-02-2012
	PROCESSED BY GCR	CHECKED BY

Assume TOC = VOC (as hourly emission for specific compound is in order of E-03 to E-06, and exempt VOC compounds (MeCl2 and Perc) are in the range of E-04 to E-05).

Estimated TOC (VOC) emissions from the dewatering building for 40,000 cfm exhaust air are listed below (as provided by Black & Veatch. See E-mail from OCSD, 8/03/2011)

	<u>Lb/hr, controlled</u> (40,000 cfm)	<u>Lb/hr, controlled</u> (20,000 cfm/exhaust stack)
Benzene	1.41E-06	7.05E-07
Chloroform	202 E-04	1.01E-04
1,4 (p)-dichlorobenzene	2.75E-04	1.375E-04
Methylene chloride*	1.83E-05	9.15E-06
Perchloroethylene*	1.28E-04	6.40E-05
Styrene	7.12E-06	3.56E-06
Toluene	1.95E-03	9.75E-04
Trichloroethylene	5.69E-06	2.845E-06
Xylene	2.32E-03	1.16E-03
Total	4.907E-03	2.453E-03
*Exempt VOC		

Total TOC (VOC) controlled emission (40,000 cfm) = **0.0049 lb/hr (R₂)** = 0.117 lbs/day
 Uncontrolled emission @ 95% efficiency = 0.0049 / 0.05 = **0.10 lb/hr (R₁)** = 2.4 lbs/day
No VOC monitoring condition proposed due to very low estimated emission.

H₂S & NH₃ Emissions

Based on maximum inlet H₂S concentration in 40,000 cfm exhaust = 20 ppmv (Given per application)
 and maximum inlet NH₃ concentration in 40,000 cfm exhaust = 50 ppmv (Given per application)
 Assumed control efficiency = 99%

H₂S (R₁) = (40000 scfm) (20 E-06) (1/379) (34) (60) = **4.30 lbs/hr** = 103.2 lbs/day.

H₂S (R₂) = 4.30 lbs/hr (1.0 - 0.99) = **0.0431 lbs/hr** = 1.03 lbs/day

NH₃ (R₁) = (40000 scfm) (50 E-06) (1/379) (17) (60) = **5.38 lbs/hr** = 129.1 lbs/day.

NH₃ (R₂) = 5.38 lbs/hr (1.0 - 0.99) = **0.0538 lbs/hr** = 1.30 lbs/day

No PM₁₀ emission is expected from this odor control equipment.

Note: Estimate for dissolved salts solids' entrainment from the multi-stage chemical scrubbers (assumed 20% moisture in exhaust),

= 3.88E-06 grains/cf exhaust (See spreadsheet calculations)

= 3.88E-06 grains/cf x (40000 cfm x 0.80 x 60) / 7,000 grains/lb

= 0.001 lbs/hr = **0.024 lbs/day**.

No PM₁₀ monitoring condition proposed due to very low estimated emission.

Estimated Carbon Breakthrough – VOC

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT STATIONARY SOURCE COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 10	PAGE 9
	APPL NO 520794 Rev	DATE 01-02-2012
	PROCESSED BY GCR	CHECKED BY

(Almost all of Ammonia and H₂S are expected to be removed by multi-stage chemical scrubbers with 95% or better expected control efficiency and GAC adsorbers are used for polishing any residual odorous compounds present in downstream of scrubbers)

VOC loading per adsorber = 0.1 lb/hr /2 = 0.05 lbVOC/hr in 20,000 cfm air
= 1.2 lb VOC/day (uncontrolled).

VOC adsorption capacity for GAC = 0.05 lb VOC/lb carbon x 12,670 lbs C = 633 lbs VOC
Breakthrough (single adsorber, 20,000 cfm),
= 633 lbs VOC/ 1.2 lbs VOC loading /day = 527 days = 1.44 yrs.

AEIS/NSR:

VOC, ammonia and H₂S emissions are assigned to Sewage Treatment Plant, basic equipment A/N 520794, Sewage Treatment > 5 mgd. Therefore, emissions data entry under odor control equipment, A/N 520793 entered as zero (VOC, ammonia & H₂S).

A/N 520794, Modifications to Sewage Treatment Plant

Emissions due to modifications, Job No. P1-101,

Pollutant	Uncontrolled (R1)		Controlled (R2)	
	lbs/hr		lbs/hr	
VOC (TOC)	0.10		0.0049	
H ₂ S	4.30		0.043	
NH ₃	5.38		0.054	

TOTAL EMISSIONS: A/N 520794

Pollutant	Existing PC- 453210		From Modifications (P1-101)		Total	
	lbs/hr		lbs/hr		lbs/hr	
	R1	R2	R1	R2	R1	R2
VOC (TOC)	2.83	2.83	0.10	0.0049	2.93	2.83
H ₂ S	0.06	0.06	4.30	0.043	4.36	0.10
NH ₃	-	-	5.38	0.054	5.38	0.05

RULES EVALUATION:

Rule 212: This is not a significant project in terms of emissions.
There are no schools within 1000' of emission source.
Emissions are expected below daily emission threshold.
MICR is estimated 2.38E-08 (Res.) < ten in a million with T-BACT.
No public notice is required.
Compliance is expected.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT STATIONARY SOURCE COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 10	PAGE 10
	APPL NO 520794 Rev	DATE 01-02-2012
	PROCESSED BY GCR	CHECKED BY

Rule 401: The equipment is not expected to emit visible emissions with proper operation and maintenance.

Rule 402: With proper operation, monitoring and maintenance of the equipment no odor complaints are anticipated.

Rule 404: No PM emissions expected from the foul air treated by multi-stage chemical scrubbers followed by a GAC system.
 Note: PM10 emission (dissolved salts entrainment) from chemical scrubbers with internal mist eliminators is estimated at 3.88E-06 grains/scf (for total 40,000 cfm exhaust) which is below 0.0463 grains.dscf allowed for 42380 cfm under Table 404(a). compliance is expected.

Reg. 13: CEQA – Proposed OCS D Project (No. P1-101), in accordance with US EPA’s procedures for implementing National Environmental Policy Act (40CFR Part 6), EPA has determined that this project is eligible for categorical exemption under 40CFR §6.107 and is exempt from the substantive environmental review requirements of the National Environmental Policy Act (42 U.S.C. 4321 et seq). Copy of this exemption is included in folder.

For VOC, ammonia and H2S emissions control using multi-stage chemical scrubbers followed by GAC, and overall control efficiency of 99%, compliance with BACT/LAER is expected.

No Offset is required for VOC (0.117 lb/day).
 H2S and ammonia are not required any offset (ammonia is subject to BACT but not offset). Compliance is expected.

Rule 1401: Pass Tier 1 screening with pollutant screening index (PSI) <1, each for cancer/chronic ASI and acute ASI.
 Tier 2 results: MICR = 2.38E-08 (Res.) < 10 in a million with T-BACT.
 HIC and HIA are estimated to be < 1 for each applicable organ.
 Compliance is expected.

Rule 1401.1: Exempt. This is an existing facility.

Reg. 30: Most recent TV revision was issued August 27, 2010.
 OCS D has submitted A/N 520795 for Title V permit revision to include the proposed project, P1-101. Compliance can be expected with completion of public notice and EPA 45-day review.

RECOMMENDATION:

A permit to construct is recommended subject to above listed conditions and, upon approval and issuance of the Title V permit revision.