Permit to Construct (Alteration/Modification)

Applicant Inland Empire Utilities Agency (IEUA)

Mailing Address 6075 Kimball Avenue
Chino, CA 91710

Equipment Location 2450 Philadelphia Avenue
Ontario, CA 91761

APPLICATION 501289, FACILITY ID 009163
Equipment Description

MODIFICATIONS OF THE EXISTING WASTEWATER TREATMENT PLANT (REGIONAL PLANT NO. 1), 44 MGD CAPACITY, CONSISTING OF:

A. PRIMARY TREATMENT:

1. HEADWORKS WITH FOUR CLIMBER SCREENS, A CONVEYOR, AN AERATED GRIT CHAMBER, 50'- 0" L. X 20' - 0" W. X 15'- 0" D, WITH TWO BLOWERS, A PISTA GRIT CHAMBER, TWO GRIT SEPARATORS, AND A RAG COMPACTOR.

2. FERRIC CHLORIDE STORAGE AND INJECTION FACILITY, 6000 GALLON CAPACITY.

3. TEN PRIMARY CLARIFIERS, RECTANGULAR, EACH 100' L. X 20' - 0" W. X 9' - 0" D., WITH FIVE SLUDGE COLLECTORS, FIVE SCUM REMOVERS AND ASSOCIATED SLUDGE PUMP AND CENTRIFUGAL PUMPS.

4. THREE EQUALIZATION LAGOONS, PRIMARY EFFLUENT, EACH 12,200,000 GALLON CAPACITY WITH TWO SURFACE AERATORS.

5. TWO PRIMARY CLARIFIERS, 100' DIA. X 9' - 0" D.

B. SECONDARY TREATMENT:

6. TWELVE AERATION BASINS, EACH 60'- 0" L. X 120' - 0" W. X 17'- 10" D., WITH DIFFUSED AIR PANEL AERATORS, AND A BLOWER BUILDING WITH THREE BLOWERS.

7. SIX SECONDARY CLARIFIERS, FOUR 120' DIA. X 14' - 0" D., AND TWO 130' DIA. X 14' - 0" D., EACH WITH SLUDGE COLLECTOR.

8. SODIUM HYPOCHLORITE STORAGE AND INJECTION FACILITY FOR ALTERNATE USE WITH HYDROGEN PEROXIDE.

9. THREE ANOXIC BASINS (SIX ANOXIC ZONES), EACH 236'- 2" L. X 21' - 0" W. X 20'- 0" D, WITH ASSOCIATED MIXERS AND RECYCLE PUMPS.

C. SOLIDS HANDLING:

10. THREE DISSOLVED AIR FLOTATION (DAF) THICKENERS, EACH WITH SURFACE SCUM COLLECTOR AND BOTTOM SLUDGE COLLECTOR.

11. SLUDGE GRAVITY THICKENER, 70' DIA. X 14' - 0" D.

12. SLUDGE BLENDING TANK (ALSO KNOWN AS ACID MANURE DIGESTER- AMD), 14'- 3" L. X 20' - 0" W. X 31'- 0" H.

13. TWO DIGESTERS, ANAEROBIC, FLOATING ROOF, EACH 65' DIA. X 30' - 0" D.

14. FIVE DIGESTERS, ANAEROBIC, FIXED ROOF, TWO 65' DIA. X 30' - 0" D., AND ONE 80' DIA. X 30' - 0" D., AND TWO 90' DIA. X 33' - 6" D.

15. SLUDGE DEWATERING FACILITY WITH FOUR FILTER BELT PRESSES, A SLUDGE BELT CONVEYOR, AND A SLUDGE STORAGE HOPPER.

16. ONE FERRIC CHLORIDE STORAGE TANK, 13,000 GALLON CAPACITY, WITH THREE INJECTION PUMPS.

17. TWO BELT PRESS FILTRATE TREATMENT PROCESS TANKS ("DODA" PROCESS), EACH 40' - 6" DIA. X 33' - 10" D.

D. TERTIARY TREATMENT:

18. TWO FLOCCULATION BASINS, EACH WITH FOUR FLOCCULATORS.

19. TWO SETTLING BASINS, EACH WITH TWO SLUDGE COLLECTORS.

20. TWENTY-SIX DUAL MEDIA FILTERS, ANTHRACITE COAL AND SAND, EACH 300 FT2 SURFACE AREA.

21. THREE CHLORINE CONTACT BASINS, SERPENTINE TYPE.

22. THREE SODIUM HYPOCHLORITE (SHC) STORAGE TANKS, EACH 10,000-GALLON CAPACITY.

23. DECHLORINATION FACILITY WITH TWO 12,500 GALLON SODIUM BISULFATE SOLUTION STORAGE TANKS, FOUR ABS METERING PUMPS, AND TWO SUBMERGED DIFFUSERS LOCATED IN THE CHLORINE CONTACT BASINS.

ALTERATION OF ITEMS 15, 17 &23:

15. BELT PRESS SLUDGE DEWATERING FACILITY WITH FOUR FILTER BELT PRESSES, A SLUDGE BELT CONVEYOR, AND A SLUDGE STORAGE HOPPER.

17. TWO BELT PRESS FILTRATE/CENTRATE TREATMENT PROCESS TANKS ("DODA" PROCESS), EACH 40' - 6" DIA. X 33' - 10" D.

23. DECHLORINATION FACILITY WITH TWO 12,500 GALLON SODIUM BISULFATE SOLUTION STORAGE TANKS, FOUR SBS METERING PUMPS, AND TWO SUBMERGED DIFFUSERS LOCATED IN THE CHLORINE CONTACT BASINS.

AND ADDITION OF:

16. CENTRIFUGE SLUDGE DEWATERING FACILITY WITH FOUR CENTRIFUGES, EIGHT SLUDGE SCREW CONVEYORS, CENTRIFUGE DISCHARGE CHUTES, CENTRATE WET WELL, PLANT DRAIN WET WELL, TWO SLUDGE STORAGE SILOS.

APPLICATION 501290, FACILITY ID 009163

Equipment Description

MODIFICATION OF THE EXISTING AIR POLLUTION CONTROL SYSTEM CONSISTING OF:

1. BIOFILTER (PHASE IA), CUSTOM MADE, 76' – 0" W. X 86' – 0" L. X 5' – 6" H., OVERALL DIMENSIONS, APPROXIMATELY 6,536 SQUARE FEET SURFACE AREA, CONTAINING 0.5 FT. WOOD CHIP BASE LAYER, 4' DEEP BIOFILTER MEDIA LAYER AND 0.5 FT. WOOD CHIP COVER LAYER, PLENUM LATER CONTAINING WASHED GRAVEL WITH INCOMING FOUL AIR DISTRIBUTION DUCTS, AND SURFACE IRRIGATION SYSTEM WITH TEN (10) WATER SPRINKLERS.

2. EXHAUST SYSTEM WITH TOTAL OF 22,570 CUBIC FEET PER MINUTE FOUL AIR (PHASE IA) FROM THE FOLLOWING PROCESS AREAS,

   A. SLUDGE DEWATERING BUILDING
   B. EXISTING GRAVITY THICKENER
   C. SIDE STREAM TREATMENT PROCESS ("DODA" TANK NO. 1, NO. 2, AND DIVERSION STRUCTURE).

BY ADDITION OF:

D: THE CENTRIFUGE SLUDGE DEWATERING BUILDING AND SILOS EXHAUST TO THE BIOFILTER.

APPLICATION 501594 TITLE V REVISION APPLICATION

Background

The above applications were filed on August 11, 2009 for a Proposed Alteration/Modification to Permitted Equipment, a wastewater treatment plant Permit F78934, A/N 442162, ID 9163 and a biofilter (> 100 cfm) (PC stage) A/N 428126. The site is Inland Empire Utilities Agency Regional Plant 1, wastewater treatment plant. The applicant had requested expedited permit processing for this application due to deadlines for their funding source through the American Recovery and Reinvestment Act through the State Water Resources Control Board, under the Clean Water State Revolving Fund. The stringent funding conditions require the project start construction by November 23, 2009.

The proposed alteration/modification to the wastewater treatment plant will include expanding the dewatering facility for redundancy, by constructing a new dewatering building (centrifuges) for primary use. The current dewatering building (belt presses) will be used for secondary use

(such as when the digesters are being cleaned). Both dewatering buildings will not be used simultaneously. The new dewatering building will require installation of centrifuges (instead of the current belt filter presses), design of an automated centrifuge and sludge conveyance system, new solids dewatering building, new dewatered cake storage with a capacity of two calendar days of dewatering production (16 hours), and installation of associated sludge and polymer pumps, piping, electrical, and control equipment.

The odor control system used in conjunction with the wastewater treatment plant is A/N 428126, ID 9163 biofilter (>100 cfm). The new dewatering building (centrifuges) does not exceed the existing biofilter capacity. The existing biofilter was designed by Tetra Tech in 2004 for a foul air loading rate of 3 cfm per square foot of filter surface. With the dimensions of its treatment area of 86 feet by 76 feet, totaling 18,370 cfm capacity, it has sufficient capacity to accommodate the foul air from the existing and modified odor sources.

In addition, provisions have been made to allow space to expand the biofilter westward in future projects to accommodate the air flows from the future gravity thickeners, the future replacement of the Do Da Tanks by the side stream treatment process and the future manure digestion area facilities, as well as Phase II air flow from the DAF Thickeners.

There are four different operating scenarios for the dewatering process: Scenario 1- old dewatering building fully online, Scenario 2- New dewatering building fully online, Scenario 3- new dewatering building offline/three belt filter presses in use, and Scenario 4- new dewatering building and DoDa process offline. All four operating scenarios do not exceed the biofilter capacity. Therefore there is no expected emissions increase due to the modification to the wastewater treatment plant.

	Maximum Air Flow Requirement (cfm)			
Odor Source	**Scenario 1**	**Scenario 2**	**Scenario 3**	**Scenario 4**
Four (4) Centrifuges (w/discharge chutes)	2,000	Offline	Offline	Offline
Screw conveyors	1,560	Offline	Offline	Offline
Centrate wet well	500	Offline	Offline	Offline
Plant drain wet well	400	Offline	Offline	Offline
Two (2) Sludge storage silos	1,200	Offline	1,200	1,200
Total air flow for new dewatering building	5,660	0	1,200	1,200
Four (4) Belt filter presses hoods in use	Offline	5,200	3,900	5,200
Three (3) Dewatering room (2nd floor)- west wall	Offline	2,910	2,910	2,910
Four (4) Dewatering room (2nd floor)- east wall	Offline	3,880	3,880	3,880
Exterior conveyor enclosure	Offline	1,000	1,000	1,000

Filtrate sump	Offline	700	700	700
Total air flow for old dewatering building	0	13,690	12,390	13,690
Gravity thickener	3,200	3,200	3,200	3,200
Total air flow for gravity thickener	3,200	3,200	3,200	3,200
"DoDa" Process Tank No. 1	970	970	970	Offline
"DoDa" Process Tank No. 2	400	400	400	Offline
"DoDa" Diversion Structure	100	100	100	Offline
Total air flow for "DoDa" process	1,470	1,470	1,470	0
Total air flow into biofilter, phase 1A	10,330	18,360	18,260	18.090

In addition, provisions have been made to allow space to expand the biofilter westward in future projects to accommodate the air flows from the future gravity thickeners, the future replacement of the Do Da Tanks by the side stream treatment process and the future manure digestion area facilities, as well as Phase II air flow from the DAF Thickeners.

There is no school within 1000 feet of the emission source. There is no increase of emissions. No public notice is required. There are no violations issued against the above facility within the last three years. The last notice of violation was issued 5/13/05 for failure to emit less than 5 lbs/day total sulfur compounds calculated as H2S per permit condition #9 on Permits to Operate F53212 and F53220. There has been one complaint in the last two years. The complaint was for sewage odor. An inspector followed up the complaint and observed no violation of District Rules.

IEUA is a lead agency for California Environmental Quality Act (CEQA) documentation. For the proposed dewatering facility expansion project at IEUA RP-1, a "Notice of Exemption" was approved March 4, 2009. This project falls into a categorical exemption (Sections 21084, 15301(b)(d)). Categorical Exemption Class I exempts "operation, repair, maintenance,… or minor alteration of existing public or private structures, facilities and mechanical equipment… involving negligible or no expansion of use beyond that existing at the time of the lead agency's determination." The proposed installation and operation of the new centrifugal dewatering system with support facilities has been determined not to have a potential to cause signification adverse environmental effects as a result of any of the exceptions. For further details please refer to the Notice of Exemption (signed 3/4/09) and memorandum from Tom Dodson & Associates, dated February 14, 2009, showing analysis for Categorical exemption – included in the application folder.

Process Description

Sewage Treatment Plant

This sewage treatment plant serves the surrounding area including the Cities of Ontario, Rancho Cucamonga, Upland, Montclair, Fontana and an unincorporated area of San Bernardino County. The treatment processes include preliminary and primary treatment, primary effluent flow equalization and diversion, secondary treatment, tertiary treatment, biosolids treatment with sludge thickening, anaerobic digestion, and dewatering.

Preliminary and primary treatment are physical processes. Preliminary treatment includes measuring the quantity of wastewater that flows into the facility, removing large objects and materials with mechanically operated course screens and removing sand and gritty material. These materials are stored in large bins and subsequently disposed of at a landfill. Following preliminary treatment, the wastewater is distributed equally to primary treatment settling tanks that allow the wastewater flow to slow down enough to settle out the heavy solids by gravity. The settled solids are continuously removed from the primary settling tanks and transferred to a process where they are concentrated and subsequently pumped to the anaerobic digesters.

After removing the heavy organic solids, the primary treated wastewater (primary effluent) enters a pumping facility and is pumped to secondary treatment. When the amount of primary effluent exceeds the RP-1 secondary treatment capacity, some of the primary effluent can be routed and temporarily stored in basins to help equalize the flow to secondary treatment. During the off-peak flow periods, the stored primary effluent is returned to the pumping facility and pumped to secondary treatment.

Secondary treatment is a biological process using millions of microorganisms that thrive in an environment containing food source and dissolved oxygen in the water. This method for treating wastewater is referred to as the activated sludge process. The mixture of microorganisms, primary effluent and dissolved oxygen is referred to as Mixed Liquor Suspended Solids (MLSS). After the aeration period, the MLSS is transferred to tanks where it is allowed to settle by gravity leaving a clear liquid referred to as secondary effluent. The secondary effluent is then transferred to tertiary treatment while the settled MLSS is returned to the aeration tanks to maintain the appropriate population and cultures of microorganisms. A portion of the MLSS is wasted from the activated sludge process in order to maintain a balance between the food source and microorganisms that will produce the highest quality of treatment. This wasting is referred to as Waste Activated Sludge (WAS). The WAS is transferred to a process where it is concentrated and subsequently pumped to the anaerobic digesters. Secondary treatment also removes nutrients (ammonia, nitrate and phosphate) from the wastewater in a process called Bio-Nutrient Removal (BNR).

The secondary effluent flow is equally distributed to a number of filters containing sand and anthracite coal media to remove very fine suspended particles in the tertiary treatment process. Before the filtered wastewater can be used for irrigation and ground water recharge purposes and/or discharged to any other body of surface water, it must be disinfected to comply with water quality regulations. Disinfection takes place in chlorine contact tanks where sodium hypochlorite (liquid chlorine bleach) is added to and instantaneously mixed with the tertiary filter effluent water as it enters the tanks. Upon being disinfected, the recycled water flows by gravity from the chlorine contact tanks to the recycled water pumping stations, where it is pumped into distribution and storage and utilized for reuse and ground water recharge. Excess recycled water is dechlorinated by adding sodium bisulfite and discharged to the Cucamonga Creek, a tributary to the Santa Ana River.

The sludge removed from primary treatment and secondary treatment WAS contains a significant amount of water. Gravity Thickening (GT) and Dissolved Air Floatation (DAF) thickening are respectively used to further separate the water from the sludge. The thickened sludge from the GT and DAF units are co-mixed and pumped to the anaerobic digesters. The digesters are treatment units that reduce the volume of organic matter by decomposition of the biosolids into relatively stable organic and inorganic compounds, from which water will separate more readily. Digestion occurs in the absence of oxygen by anaerobic microorganisms. The digester gas that is generated during digestion is used as a fuel source for boilers to heat the digesters and for operating engine generators to produce electrical power.

The digester sludge is removed from the digesters and transferred to the sludge dewatering facility, which will undergo expansion for redundancy (this permit application). Currently, this facility uses Belt Filter Presses (BFPs) and in the future dewatering centrifuges will be used to remove water from the digested sludge. The biosolids are loaded into trucks and subsequently are hauled to the Inland Empire Regional Composting Facility (IERCF) to be made into compost.

Biofilter

Foul air from bar screen, grit chamber, primary clarification, and intermediate pump stations is extracted and conveyed to the Phase 1B biofilter. Foul air from the gravity thickener, DoDa process and dewatering building is captured and conveyed to the Phase 1A biofilter. The biofilter is a treatment process where the odorous compounds are removed from the foul air by the biological action of microorganisms. The filter media will serve as the substrate material to support biological activity and to promote contact between the foul air and the microorganisms. The biofilter media is typically made of wood chip, or a blend of wood chip and a small percentage of other materials (compost, bark mulch). The medium is kept moist by spray nozzles at the top of the biofilter surface.

Basically the biofilter is a large vat of odor and pollutant eating bacteria. The biofilter is designed to treat the contaminated air. The foul air contain odor causing pollutants, mainly hydrogen sulfide (H2S). these pollutants, instead of being released to the atmosphere, are piped into the biofilter where the resident bacteria absorbs and biooxidize the contaminated air, allowing the air to exist at the other side of the biofilter significantly cleaner. Biofilters work continuously with minimal upkeep. It is the most commonly used method of odor treatment at composting facilities, since typically they are low in cost and daily maintenance.

The biofilter system is constructed of 3 main layers: plenum layer, media layer, and cover layer. The plenum layer distributes the foul air going into the biofilter and collects the leachate from the biofilter. The plenum layer is generally constructed of washed gravel with air distribution pipes running through it. The pipes carry the air to be treated to the biofilter. These pipes are perforated with a progressive hole pattern that ensures even air distribution throughout the plenum. Biofilters generally cover relatively large areas. Therefore, it is vital to ensure that the air to be treated is distributed evenly through the entire biofilter. The bottom layer of the biofilter is a minimum 6-inch later of ground wood or wood chips.

Biofilters also require irrigation to function properly. This irrigation leads to leachate that may contain some mineral salts. This leachate must be treated through a wastewater treatment plant. The plenum serves both of these functions. A liner at the bottom of the plenum traps the leachate and drains return it to the headworks of the wastewater treatment plant.

The media layer (4 ft) is the site of the actual treatment of the exhaust stream. The media can consist of compost, sand, shredded bark, peat, and other materials. As odorous or contaminated air is passed through the media, two basic removal mechanisms occur simultaneously: absorption/adsorption and biooxidation. The pollutants are adsorbed onto the surfaces of the biofilter media particles and/or absorbed into the moist surface layer (water film) surrounding the media particles. Microorganisms, mainly bacteria, actinomycetes and fungi are attached to the filtering medium. The media's organic material will supplement those nutrients that may or may not be present in the air stream to be treated. These microbes oxidize the organic and inorganic compounds, which make up the odorous gases. When a biofilter system performs properly, carbon dioxide, water and mineral salts are formed.

The cover layer serves two purposes, to retain moisture and to prevent weed growth. The cover layer is a minimum 6-inch layer of ground wood or wood chips. Since biofiltration relies on the adsorption of compounds into a moisture film on the surface of particles, it is vital that the proper moisture level be maintained in the biofilter. This layer shields the media from direct sunlight, thus helping to prevent drying. A humidification system and surface irrigation system have also been included to help give the biofilter proper moisture content. The cover layer also inhibits weed growth, but will not completely prevent it.

Biofilters function best with a minimum of 40 to 45 seconds of retention time. The proposed biofilter system will have a retention time of approximately 87 seconds. However, depending on the load conditions, the retention time could be reduced to 45 seconds.

Experience has shown that biofilter media has a service life of three to five years. Thus, routine media replacement is to be expected. The air distribution layer of the plenum will be designed with dividers so that a section of the biofilter can be taken out of service for maintenance.

Biofilters function best at temperatures at or below 104°F. In duct cooling will be added to reduce the inlet temperature to the biofilter if necessary.

Calculations for Sewage Treatment Plant

Existing VOC emissions calculated based on SCAQMD Rule 1179 Emissions Inventory Report, JEIP, "Estimation of VOC Emissions Chino Basin MWD Regional Plant Number One, Table 9-3," October 8, 1993.

	Mass Emission Rate		
Liquid Process	**(based on 33 mdg) lb/year**	**lb/yr/mgd**	**(based on 44 mdg) lb/year**
L1 Headworks	1.54	0.05	2.05
L2 Inlet Open Channel flow Meter	3.81	0.12	5.08
L3 Frit Removal - Aerated	39.83	1.21	53.11
L4 Grit Removal - Nonaerated (not operational)			
L5 Primary Sedimentation Tanks - Closed	787.84	23.87	1050.45
L6 Primary Sludge Thickening - Gravity	4.56	0.14	6.08
L7 Flow Equalization Tanks	1858.72	56.32	2478.29
L8 Activated Sludge - Mechanical	587.82	17.81	783.76
L9 Secondary Treatment - Trickling Filters	915.44	27.74	1220.59
L10 Secondary Clarifiers	521.18	15.79	694.91
L11 Tertiary Treatment - Gravity Filtration (open)	33.48	1.01	44.64
L12 Chlorination - Uncovered Tanks	88.15	2.67	117.53

L14 Final Effluent Discharge Weir - Uncovered	0.79	0.02	1.05
Liquid Process Total Emissions	**4843.16**	**146.76**	**6457.55**
Solids Processes			
S1 Dissolved Air Floatation	437.04	13.24	582.72
S2 Sludge Digestion - Anaerobic - Fixed Covers	0.41	0.01	0.55
S3 Sludge Digestion - Anaerobic - Floating Covers (out of service)			
S4 Sludge Dewatering - Belt Presses	688.41	20.86	917.88
S5 Sludge Cake Handling - Conveyor Belts	0.08	0.002	0.11
S6 Sludge Cake Storage	111.76	3.39	149.01
S7 Sludge Cake Truck Loading Operations	20.75	0.63	27.67
Solid Process Total Emissions	**1258.45**	**38.13**	**1677.93**
Combustion Processes			
C1 Digester Gas Combustion - Boilers	7.6	0.23	10.13
C2 Digester Gas Combustion - Flares	198.1	6.00	264.13
C3 Digester Gas Combustion - I.C. Engines	2777.1	84.15	3702.80
Combustion Processes Total Emissions	**2982.8**	**90.39**	**3977.07**
Other Processes			
Other Processes Total Emissions			
Plant Total VOC Emissions (calculated)	**9084.41**	**275.29**	**12112.55**
Plant Total VOC Emissions (reported)	**12000**		
Plant Total VOC Emissions Excluding Combustion Processes (calculated)	**6101.61**	**184.90**	**8135.48**

The table above shows the VOC emissions determined during the SCAQMD Rule 1179 JEIP Emissions Inventory Report (October 1993) for Inland Empire Utilities Agency's RP-1 facility (the Chino Basin Municipal Water District). In the emission table above, the only variation in emissions for the four operating scenarios is with regards to the sludge dewatering activities. Since there are two different types of sludge dewatering activities, there will be two different emissions scenarios to be calculated. The first emission scenario is the operation of the existing belt press sludge dewatering building. The associated emissions for the sewage treatment plant operating the existing belt press sludge dewatering building are shown in the above table in the last column using a 44 mgd plant capacity. Total plant VOC emission excluding combustion processes for this scenario is calculated to be 8135.48 lbs/year (0.93 lbs/hr and 22.23 lbs/day) of VOC at a 44 MGD capacity. The second emission scenario is the operation of the new centrifuge sludge dewatering building. The associated emissions for the sewage treatment plant operating the new centrifuge sludge dewatering building are shown in the calculation below.

VOC emissions from centrifuge sludge dewatering are based from the Joint Emissions Inventory Program, Executive Summary, "Basinwide Emissions Summary by JEIP Unit Process, Table 1-7."

In order to scale the centrifuge sludge dewatering emissions appropriately for this specific sewage treatment plant the JEIP Basinwide emission factor is scaled to Estimation of VOC Emissions RP-1.

Process	JEIP Basinwide Emissions Summary by JEIP Unit Process (lb/yr/MDG)	Estimation of VOC Emissions, Chino Basin MWD Regional Plant Number 1* (lb/yr/MDG)
Centrifuge sludge dewatering	6.65	X
Belt press sludge dewatering	58.81	20.86

*The values in this column are the values listed in Table 9-3 Estimation of VOC Emissions Chino Basin MWD Regional Plant Number One divided by the MGD of the facility at the time that the emission determination was made (33 MGD).

X = 6.65 lbs/yr/MGD x 20.86 lb/yr/MGD / 58.81 lb/yr/MGD
= 2.36 lbs/yr/MGD

Centrifuge VOC Emissions
R1=R2
R1 = 2.36 lbs/yr/MGD x 44 MGD
= 103.84 lbs/yr

The emissions for the existing belt press sludge dewatering building are 917.88 lbs/yr. The emissions for the new centrifuge sludge dewatering building are 103.84 lbs/yr. Therefore there is no increase in emissions due to the installation of the new sludge dewatering building and the maximum potential to emit of the facility will not change.

VOC Emissions

R1=R2
R1 = 8135.48 lbs/year
= 0.93 lbs/hr = 22.23 lbs/day = 4.07 tons/year

Emission Check

For comparison purposes only, the VOC emissions of the sewage treatment plant are also calculated using JEIP Basinwide Emissions Summary, Flow-Related Non Combustion VOC Emissions for JEIP POTWs (lb/yr/MGD).

R1 = R2
R1 = 200 (lbs/yr/MGD) x 44.0 MGD
= 8800 lbs/yr
= 1.00 lbs/hr = 24 lbs/day
The emissions are consistent and comparable with the facility wide emission factor from JEIP (200 lbs/yr/MGD).

Calculations for Biofilter

Maximum foul air flow rate = 18,370 cfm
Biofilter Ammonia control efficiency = 99%
Biofilter H2S control efficiency = 99.8%
(reference S/T for biofilter located at RP-5 Facility A/N 388295, ID 147371)

(vs/Ts) x Ta = va
18,370scfm x (460 + 80)°R/(460 + 60) °R = 19,077 acfm

Mainly H2S emissions are expected from the foul air. Currently, all emissions from the processing areas are discharged into the atmosphere and no VOCs are anticipated. However, during the source tests VOC emissions will be determined. Based on source test results, VOC will be included at the Permit to Operate state, if required.

Residence Time = volume of biofilter, cubic feet / foul air volume flow rate, cfm x 60 sec/min
= 76 ft. W. x 86 ft L. x 5 ft H. x 60 sec/min / 19,077 cfm
= 102 seconds (minimum retention time 40-45 seconds)

Ammonia emissions (facility wide)

Assuming 99% efficiency
R2 = (0.12 lbs NH3/10^6 gallons)* x 44mgd design capacity = 5.28 lbs/day (worst-case entire facility)
= 5.28 lbs/day NH3 = 0.22 lbs/hr
= 0.22 lbs/hr x 1E6/1 / 18,370scfm / 60min/hr x 379cft/lbmole / 17.03lbsNH3/lbmole
= 4.44 ppmv

R1 = 0.22 lbs/hr / (1 – 0.99)
= 22 lbs/hr x 1E6/1 / 18,370scfm / 60min/hr x 379cft/lbmole / 17.03lbsNH3/lbmole
= 444 ppmv

* Sonoma Technology, Inc., Recommended Improvements to the CME Ammonia Emission Inventory Model for Use by LADCO, page 2-6, March 26, 2003.

Hydrogen Sulfide (H2S) Calculations

CAAQS H2S concentration threshold

Outlet concentration is based on the maximum concentration to be in compliance. 30 ppb is the California Ambient Air Quality Standard at the facility property boundary. This standard was adopted to protect against nuisance odor for the general public. 30ppb is the H2S concentration limit at the facility boundary.

Calculate the effluent concentration of H2S based on screen 3 modeling. Screen 3 provides an emission rate of 1 lb/hr results in a concentration of 1536 ug/m^3 at the nearest facility property boundary of 30m.

Concentration associated with 30ppbv at nearest receptor (30m**) is:
30ppbv = 0.030ppmv
= 0.030ppmv x 34.08lbsH2S/lbmole / 0.02404
= 42.53 ug/m^3

Equivalent Screen 3 emission rate associated with 30ppbv at nearest receptor (30m) is:
= 42.53 ug/m^3 x 1lb/hr / 1536ug/m^3
= 0.03 lbs/hr

Concentration of H2S at exhaust is with 30ppbv at the nearest receptor (25m):
= 0.03lbs/hr x 1E6/1 / 18,370scfm / 60min/hr x 379cft/lbmole / 34.08lbsH2S/lbmole
= 0.30 ppmv H2S

0.30 ppmv H2S effluent concentration does not meet HIA threshold limit.
0.25 ppmv H2S effluent concentration is below HIA & HIC threshold limits and will result in less than 30ppbv at receptor distance.

H2S Emissions

Assuming 99.8% efficiency

R2 = 0.25ppmv x $ft^3/10^6ft^3$ x 18,370scfm x 60min/hr x lbmole/$379ft^3$ x 34.08lbsH2S/lbmole
= 0.02 lbs/hr = 0.48 lbs/day = 175.20 lbs/year

R1 = 0.25ppmv / (1 – 0.998)
= 125ppmv x $ft^3/10^6ft^3$ x 18,370scfm x 60min/hr x lbmole/$379ft^3$ x 34.08lbsH2S/lbmole
= 123.89 lbs/hr = 2973.36 lbs/day

Toxic Risk Analysis for Sewage Treatment Plant

Nearest Residential Receptor Distance: 185 ft. (56 m)
Nearest Commercial Receptor Distance: 99 ft. (30 m)
There is no emission increase due to the facility modification from the previous permit. No increase in MICR, cancer burden, HIC or HIA expected. Compliance is expected.

Toxic Risk Analysis for Biofilter

Nearest Residential Receptor Distance: 1015 ft. (309 m)
Nearest Commercial Receptor Distance: 99 ft. (30 m)
Stack height: 5.5 ft. (1.7 m)
Dimensions of area source: 76 ft. x 86 ft. (23m x 26m)
Volume of area source: 6536 ft^2 (608 m^2)

Compound	Inlet concentration (ppmv)	Control Efficiency	MW (lbs/lbmole)	Outlet concentration (ppmv)
Ammonia	444	99%	17.03	4.44
Hydrogen Sulfide (H2S)	125	99.8%	34.08	0.25

Tier III analysis was used since the source is an area source and requires screen3 modeling. Tier III risk analysis was based on the outlet concentrations listed in the above table. Ammonia and H2S are not currently considered carcinogens. HIA and HIC were 9.07E-1 and 4.39E-1 respectively and therefore less than 1. Cancer Burden was less than 0.5.

Evaluation

Rule 212: Rule 212 (c)(1)- There is no school within 1000 feet of the facility.
Rule 212 (c)(2)- Not exceeding the following:

Volatile Organic Compounds	30 lbs/day
Nitrogen Oxides	40 lbs/day
PM_{10}	30 lbs/day
Sulfur Dioxide	60 lbs/day
Carbon Monoxide	220 lbs/day
Lead	3 lbs/day

Rule 212 (c)(3)(A)(i)- MICR is below 1 in a million.
Public Notice is not required.

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

Rule 402: Nuisance
Nuisance is not expected with proper operation, monitoring and maintenance. The headworks and screens are vented through an odor scrubber for odor control. The primary fed tanks are covered. H2S emissions are controlled with a ferric chloride injection system to limit the generation of H2S. Based on previous operation of the facility for the last two years, compliance is expected.

Rule 1179: Publicly Owned Treatment Works Operations
Compliance has been demonstrated during SCAQMD Rule 1179 Emissions Inventory Report development.

Reg. XIII: Rule1303(a)(2)- The proposed equipment is expected to comply with BACT. The headworks and screens will vent through an odor scrubber for odor control. The primary fed tanks are covered. H2S emissions are controlled with a ferric chloride injection system to limit the generation of H2S.
Rule 1303(b)(1)- There is no emission increase for criteria pollutants for these applications. 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)- There is no emission increase for criteria pollutants due to the facility modification from the previous permit. No offsets are required due to these applications' emissions.

Rule 1401: Toxic Air Contaminants
H2S is currently not a carcinogen; there is no increase in MICR,
Rule 1401(d)(1)(B)- MICR less than 1.0×10^{-6} limit for BACT.

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 calculated to be less than 1 respectively.
Compliance is expected.

Reg. XXX: Installation of the centrifuge dewatering building is considered a Title V minor permit revision under Rule 3000(b)(12) and will be subject to a 45 days EPA review (Rule 3000 (j)). A public notice is not required.
The installation of the centrifuge dewatering building was considered a minor revision since the proposed equipment will not:

- Require or change a case by case evaluation of reasonable available control technology (RACT) or maximum achievable control technology (MACT)
- Violate a regulatory requirements
- Require any significant change in monitoring terms or conditions in the permit
- Require the relaxation of any record keeping, reporting requirement
- Result in an emission increase of RECLAIM pollutants
- Result in an increase in emissions of pollutant subject to Reg. XIII (NSR) or a hazardous air pollutant
- Establish or change a permit condition that the facility has assumed to avoid an applicable requirement
- Require compliance with NSPS or NESHAP
- Result in new or additional NSPS or NESHAP requirements

Compliance is expected.

Conclusions and Recommendations

The equipment is in compliance with the Rules and Regulations of the AQMD. A Permit to Construct is recommended for both applications (A/Ns 501289 & 501290). For Permit Conditions please see Sample Permit. A revised Title V permit is recommended after EPA review.