VICTOR VALLEY WASTEWATER RECLAMATION AUTHORITY
Calendar Year 2005

ANNUAL SUMMARY OF
OPERATIONS AND MAINTENANCE

OVERALL TREATMENT

Effluent removal efficiencies averaged 99.4% for BOD, 99.5% for TSS, and 97.2% for ammonia nitrogen. The effluent to the Mojave River averaged 3.2 mg/l BOD, 3.2 mg/l TSS, and 2.2 mg/l ammonia nitrogen. The influent to the treatment facility averaged 368 mg/l BOD (37,397 lbs/day), 475 mg/l TSS (48,262 lbs/day), and 45.9 mg/l ammonia nitrogen (4,663 lbs/day). The influent flow to the facility averaged 12.19 MGD, the effluent flow to the Mojave River averaged 7.54 MGD, and the secondary effluent flow to the percolation ponds averaged 4.48 MGD. The influent flow was measured using a magmeter that was installed in 1999 as part of the 9.5 MGD Facility Improvements.

CONSTRUCTION ACTIVITY

The 11 MGD Regional Treatment Plant Expansion Project was completed in 2002. In May 2005 construction work began to expand the Regional Treatment Facility's capacity to 14.5 MGD. SSC Construction was selected to build the $22.5 million project, and the work is expected to be completed in October 2007. In December 2005 bids were opened for the construction of a project to expand the capacity of the Regional Treatment Facility to 18 MGD, and the $23.5 million project was awarded to SSC Construction in February 2006. Construction is expected to be completed in about 24 months. In December 2005 design work began to expand the capacity of the interceptor sewer system. The interceptor expansion work is expected to be done in phases, in order to ultimately convey 18 MGD to the Regional Treatment Plant. In 2002 Boyle Engineering began planning, engineering, and environmental studies to develop subregional reclamation facilities for the Regional Authority. The development of subregional reclamation facilities will allow VVWRA to accommodate growth in the population and provide high quality reclaimed water close to potential users, while minimizing the necessary expansions of the interceptor sewer system.

PRELIMINARY TREATMENT

Both bar screens and both grit tanks were in service and operated satisfactorily during the year. The screenings were compacted to remove excess water. Screenings and grit were hauled off-site for landfill disposal. Preventative maintenance was performed during the year on scheduled equipment.

PRIMARY TREATMENT

All four primary sedimentation basins were in service during the year. Solids removed by the primary treatment system were pumped to the anaerobic digesters for treatment. During the year thickened scum was removed periodically for off-site disposal. All other pumps, tanks and equipment related to the primary treatment process operated satisfactorily. Preventative maintenance was performed during the year on scheduled equipment.

SECONDARY TREATMENT

Aeration basins No.'s 1-8 were in service in an extended aeration mode of treatment, operating with four paired basins. Each pair of basins was operated with an anoxic selector for complete nitrification, partial denitrification, and alkalinity recovery.

During the year the aeration system was supplied air from the Facility's three dual-fuel gas-fired internal combustion, six-cylinder engine blowers. The installation of a backup 500 HP electric blower was completed in 2004, and the electric blower began service as a standby for the gas-engine blowers.

At various times during the year cationic and/or anionic polymer was used to improve solids retention in the secondary clarifiers. Chlorine gas in solution was added to the RAS at times for filamentous bacteria control. Nocardia bacteria (foaming) was controlled at various times during the year using polymer added directly to the aeration system MLSS, or by broadcasting HTH granular chlorine over the surface of the foam. All eight (8) secondary clarifiers and all six (6) of the return activated sludge (RAS) pumps were in service and operated satisfactorily during the year.

Waste activated sludge was removed from the secondary treatment system and pumped to the dissolved air floatation thickeners (DAFT's) for dewatering. All pumps, tanks, and equipment related to the secondary treatment process operated satisfactorily. Preventative maintenance was performed during the year on scheduled equipment.

PERCOLATION PONDS

A total of 1,636 million gallons of undisinfected secondary effluent (4.48 MGD, or 37% of the treatment flow) was discharged to the percolation ponds during the year.

In April 2005 the containment levee on the No. 10 percolation pond failed, and 8.72 million gallons of secondary effluent escaped into the Mojave River. The spill is described in greater detail later in this report.

During May and July a total of 1,411.29 wet tons of dried pond skimmings, including sand, accumulated wastewater solids, dead algae, and weeds were mechanically removed from the percolation ponds and hauled directly to the California Bio Mass compost facility for disposal.

TERTIARY TREATMENT

A total of 2,753.20 million gallons of secondary effluent (7.54 MGD, or 63% of the treatment flow) received tertiary filtration and disinfection and was discharged to the Mojave River. The two traveling bridge gravity sand filters and the six Dyna-sand moving bed filters were used to reduce solids in the final effluent prior to chlorination. Aluminum sulfate (alum) was added to the filter influent to coagulate the solids and improve filter efficiency. All pumps, tanks and equipment related to the tertiary process operated satisfactorily. Preventative maintenance was performed during the year on scheduled equipment.

The disinfection system operated satisfactorily during the year and gaseous chlorine in one-ton containers was used to disinfect the tertiary effluent, and aqueous ammonia was added to the wastewater stream immediately prior to chlorination to improve disinfection. For the latter the ammonia feed system used 30% aqueous ammonia to react with chlorine and form monochloroamines, which was found to be necessary due to the degree of nitrification achieved by the secondary treatment system. The dechlorination system operated satisfactorily during the year, and liquid sodium bisulfite in a 38% solution was used to remove chlorine from the effluent prior to discharge to the Mojave River.

TOTAL EFFLUENT FLOW

When the percolation pond flow and the tertiary treatment flow are added together, a total of 4,389.21 million gallons were discharged by the Facility in 2005 at an average daily flow of 12.03 MGD (13,470.90 total acre-feet, or 36.91 acre-feet per day). This represents a 14.69% increase from the daily average flow recorded during calendar year 2004.

BIOSOLIDS TREATMENT

Both dissolved air floatation thickeners (DAFT's) were in service during the year and operated satisfactorily for waste activated sludge dewatering. After thickening using the DAFT's, thickened WAS was pumped to the No. 3 fixed-cover anaerobic digester. Primary sludge was pumped to the No. 1 and No. 2 floating cover anaerobic digesters. All three anaerobic digesters were in service for complete mix mesothermic digestion. Anaerobically digested sludge was drained by gravity or pumped to the No. 1 and No. 2 liquid sludge storage lagoons. Digested sludge from the No. 1 and No. 2 sludge storage lagoons was pumped to one of four (4) sludge drying beds for solar dewatering. The gravity belt thickener was also used for sludge dewatering to provide additional capacity for solids handling. Dried biosolids were mechanically removed from the drying beds and placed on the sludge storage pad. A total of approximately 4,177.95 dry tons (4,814.47 wet tons) of Class A EQ dried biosolids were removed from the Facility for disposal using agricultural land application during 2005. At the end of the year 2,025.44 dry tons (90% TS, or 2,242.18 wet tons) of biosolids were in storage on the pad awaiting disposal.

All pumps, tanks, and equipment related to the sludge facility operated satisfactorily. Preventative maintenance was performed during the year on scheduled equipment.

METER CALIBRATION

VVWRA staff and/or an outside contractor calibrated the meters listed below various times during the year:

- Influent Flow
- No. 1 through No. 8 RAS Flows
- Final Effluent Turbidity
- Aeration Basin 1-4 and 5-8 Influent Flow
- Primary Effluent to Equalization Flow
- Final Effluent to the Mojave River Flow
- Equalization Basin Effluent Flow
- South Percolation Pond Flow Meters

ALARM MONITORING

All critical process alarms were checked daily from their source to the main control system. The Facility's SCADA computer alarm dialer system and backup internet messaging system was in service and was functional during the entire year. Most of the Facility's alarm points were routed through the SCADA system. Several alarm points were routed from the main control panel to a private alarm company, and these were checked once per week during the year. Eventually all of the Facility's alarm points will be routed through the SCADA system, and the need for a private alarm company will be eliminated except for redundant fire alarm communication.

SEPTAGE WASTE ACCEPTED

During 2005 a total of 5,999,519 gallons of septage and chemical toilet waste were received at the interim septage receiving facility for treatment and disposal. The interim septage receiving facility was first opened in October 2001.

GROUNDWATER MONITORING WELLS

The direction of groundwater movement in the four monitoring wells located at the treatment facility was approximately as follows:

Well No.	**Direction**
OW-4	NE
OW-6	NE
NW-2	NE
NW-3	NE
SP-1	NE
SP-2	NE
SP-3	E
SP-4	WNW

Maps of the facility and a graphical depiction of groundwater flow are attached to this report.

EFFLUENT TOXICITY ANALYSIS

Four acute toxicity samples were collected during the year from VVWRA's post-chlorination and dechlorination final effluent. Acute toxicity analyses was performed using fathead minnows, as required by the Facility's recently renewed NPDES permit. Although one of the four samples exhibited a very slight degree of reduced survival, the samples did not exhibit significant acute toxicity as defined by the NPDES Permit. The results were as follows:

Sample Date:	Fathead Survival:	Fathead TUa:
January 25, 2005	100%	0.00
April 12, 2005	95%	0.41
August 30, 2005	100%	0.00
October 4, 2005	100%	0.00

Chronic toxicity samples were collected on January 25, 2005 from VVWRA's post-chlorination and dechlorination final effluent and from the Mojave River, both upstream and downstream of the discharge. Tests were conducted using both Ceriodaphnia and fathead larvae. None of the samples exhibited any degree of chronic toxicity using Ceriodaphnia. However, the samples exhibited some toxicity using fathead minnows, particularly both the upstream and downstream river samples. Because the background toxicity present in the upstream river sample was higher than the measured toxicity of the treatment plant's effluent, the plant's effluent did not cause or increase the toxicity present in the receiving stream. The results were as follows:

Sample Location:	Organism:	Survival:	TUc:
Effluent	Ceriodaphnia	100%	1.00
Effluent	Fathead larvae	37.5%	2.67
Upstream	Ceriodaphnia	100%	1.00
Upstream	Fathead larvae	30.0%	3.33
Downstream	Ceriodaphnia	100%	1.00
Downstream	Fathead larvae	40.0%	2.50

ADDITIONAL INFORMATION

During the year the City of Hesperia used a contractor to haul an estimated 160,000 gallons of wastewater generated by two (2) Hesperia schools each month to a manhole on the City's collection system. The manhole is located inside the City limits and tributary to VVWRA's regional treatment facility. The wastewater is collected and stored in large buried steel tanks near the two schools, and the contents are hauled weekly or more often to a sewer manhole inside the City. The characteristics of the wastewater are representative of typical domestic sewage, and not septage. In the near future the City plans to install a new sewage pump station and force main that will provide sewer service for the respective schools.

ADDITIONAL INFORMATION (CONT.)

The Facility's influent and effluent samplers utilized flow-proportional sampling during 2005. Influent samples are collected once every 87,500 gallons of flow, and effluent samples are collected once every 75,782 gallons of flow.

On May 19, 2004, VVWRA submitted an application to renew the Facility's NPDES permit. The existing NPDES permit expired on November 17, 2004. As requested by the Regional Board staff, copies of the Basis of Design for the 14.5 MGD Expansion Project and a full set of the construction drawings were submitted to Lahontan. On August 30, 2005, Lahontan issued a tentative revised NPDES permit for comment. Lahontan later agreed to extend the comment period until December 2005, to allow more time to prepare comments due to the complexity of the permit (copy attached). Board adoption of the permit is now scheduled for consideration in June 2006.

In August 2004 VVWRA submitted an application to the Lahontan RWQCB requesting that the Regional Board approve re-rating the capacity of the existing Treatment Facility from 11 MGD to 12.5 MGD. The letter included documentation to support the proposed re-rating based on the actual measured performance of the south percolation ponds, which were placed in service in April 2002. Although Lahontan did not respond to the application for re-rating, the draft NPDES permit issued in August 2005 acknowledged that the capacity of the plant had been increased to 12.5 MGD.

RECYCLED WATER AND REUSE

During the year VVWRA provided a total of 1.466 million gallons of fully treated reclaimed water to California Bio-Mass, Inc. (CBM), for construction, processing, fire suppression, and dust control at the Victor Valley Regional Compost Facility. A total of 27.239 million gallons of fully treated reclaimed water were pumped to SCLA for irrigation of the Westwinds Golf Course. The construction contractor building the 14.5 MGD Expansion project used 13.263 million gallons of fully treated reclaimed water for grading and dust control. The VVWRA Treatment Facility also used 2.318 million gallons of fully treated reclaimed water to irrigate in-plant landscaping.

SPILL AND EXCURSION REPORT

There were two (2) excursions of the effluent permits limits, and four (4) reportable spill that occurred during 2005, as described below:

1. At approximately 9:30 AM on Tuesday January 4, 2005, VVWRA staff discovered untreated sewage overflowing from VVWRA interceptor sewer manhole No. 9 between Ridgecrest Drive and the BNSF railroad tracks in Victorville, close to the entrance to the Mojave Narrows Regional Park. The overflow was discovered during a routine inspection of VVWRA's interceptor sewers.

VVWRA staff contacted the City of Victorville, and the City immediately dispatched a sewer jet rodder to the scene of the spill. VVWRA and City staff found that the VVWRA interceptor sewer was overflowing apparently due to a partial plug that resulted from debris in the sewer. A grab sample of the sewage that was escaping from the manhole was collected and analyzed for common pollutant concentrations, and the results are attached. Although the weather was clear on January 4, the area had recently experiencing a significant period of rainy weather. The City of Victorville cleaned the sewer between manholes No. 8 and No. 9 and removed a 12-inch by 12-inch by 4-inch thick piece of asphalt from the sewer, and the overflow of sewage stopped by approximately 11:30 AM on Tuesday January 4. Pictures of the spill are attached, including a picture of the chunk of asphalt that caused the blockage. The chunk of asphalt apparently entered the sewer due to vandalism or construction activity.

It is estimated that approximately 10,000 gallons of untreated sewage and stormwater escaped from the interceptor on Tuesday, which flowed across the ground, into a wash, and then into a sediment basin at the Mojave Narrows Regional Park. VVWRA applied approximately 500 pounds of HTH granular chlorine to disinfect the contaminated ground surface on Tuesday after the overflow stopped. The wash was not flowing at the time of the spill. Although most of the sewage soaked into the ground, it is estimated that approximately 300 gallons of sewage entered the sediment basin at the Mojave Narrows Regional Park.

The spill was reported by Dan Gallagher in a telephone call to Joe Koutsky of the Lahontan RWQCB on January 4. Lahontan staff inspected the site of the spill with Dan Sentman, VVWRA Operations Manager, at approximately 3:00 PM on January 4. The spill was also reported on January 4 to Phil Krause of the San Bernardino County Parks Department. Mr. Krause requested that VVWRA disinfect the Park's sediment basin so that the water would not contaminate the fishing lake, if further rainfall caused the sediment basin to overflow into the lake. Mr. Krause also arranged for a Park Ranger to meet and coordinate with VVWRA staff. VVWRA staff was not able to disinfect the sediment basin on Tuesday due to darkness. The following morning on January 5 VVWRA applied approximately 300 pounds of HTH granular chlorine to disinfect the sediment basin and remaining areas of the wash.

The chunk of asphalt that caused the blockage may have also been the cause for the blockage and sewer spill that occurred on December 28-29, 2004. Although the prior blockage was cleared on December 29, whatever caused the blockage could not be found, and the material may have washed further down the sewer and contributed to the blockage on January 4, 2005.

To avoid a reoccurrence of the spill, the City and VVWRA will continue to inspect the collection system to look for problems in construction areas, and/or other unpermitted connections allowing surface waters and/or debris to enter the sewer system.

2. On Sunday January 9, 2005, VVWRA's Operator discovered a spill of approximately 3,000 gallons of anaerobically digested sludge that escaped from the No. 3 digester at the Regional Treatment Facility on Shay Road. The spill was reported by Dan Sentman, VVWRA Operations Manager, in a telephone message to Jay Cass of the Lahontan RWQCB on Sunday January 9.

Approximately 3,000 gallons of anaerobically digested sludge spilled from the No. 3 anaerobic digester sometime before dawn on Sunday January 9, 2005. Joe Del Monte, VVWRA's Operator of the Day, discovered the spill when he arrived for work at the Facility. Dan Sentman took several pictures of the spill after he arrived, copies of which were provided to the Regional Board.

Staff normally controls the sludge level in the digester by monitoring the continuous level meter that transmits the liquid level reading to the SCADA control system. When the liquid level reaches a predetermined point, normally staff transfers a measured quantity of sludge to the sludge storage lagoons. For unknown reasons the level transmitter on the No. 3 digester began sending an incorrect signal sometime before January 9, which indicated to the operations staff that the level in the digester was fairly constant, and therefore the operator did not need to transfer sludge to the storage lagoons. As a result, normal sludge processing and pumping during the night overfilled the digester, and liquid sludge overflowed into the digester's gravity drain structure. However, because the sludge was too thick to drain properly to the sludge storage lagoons by gravity, the gravity drain structure overflowed onto the ground surface.

Because it was raining at the time, some of the spilled sludge mixed with rainwater and flowed into the plant's storm drainage system. Although liquids that enter the storm drainage system are normally pumped by the Facility's stormwater pumping system to the influent headworks for full treatment, the staff found that on the morning of January 9 a tumbleweed had fallen into the storm drainpipe and plugged the drainage system. When staff dislodged the tumbleweed, the rush of accumulated stormwater mixed with sludge overwhelmed the stormwater pumping system. As a result, approximately 200-300 gallons of sludge escaped to the Mojave River via the facility's south stormwater discharge pipe.

Immediately after the discovery of the spill, Operator Joe Del Monte began transferring sludge from the No. 3 digester to the sludge storage lagoons to reduce the liquid level in the digester, which stopped the spill of sludge. Additional employees were called to duty and arrived to assist with the cleanup effort. The sludge that spilled on the ground around the digester was contained in place with a soil berm that the staff constructed. On Monday morning January 10 a contractor was secured to vacuum up all of the spilled sludge, which was then placed in the liquid sludge storage lagoons. The contaminated ground surface was later disinfected using 100 pounds of HTH granular chlorine.

The spill was the direct result of an instrument failure, for which there was no redundant system. To prevent a reoccurrence of the spill, staff installed a high level alarm float in the gravity drain structure on the No. 3 digester, to provide a redundant means of monitoring the liquid level in the digester. If a high level of sludge is detected in the digester, the SCADA system will immediately notify the Operations staff.

3. At approximately 9:00 AM on Saturday February 19, 2005, the City of Hesperia Public Works staff discovered untreated sewage overflowing from three VVWRA interceptor sewer manholes along "I" Avenue in the City of Hesperia. The sewer overflow was observed to be occurring at the following VVWRA manholes: (1) a manhole at the intersection of "I" and Lemon, (2) the first manhole on "I" south of "E" and (3) the second manhole on "I" south of "E".

City staff contacted VVWRA regarding the spill, and reported that the spill was not the result of a blockage and instead appeared to be the result of excessive stormwater entering the collection system from an unknown location upstream. The area was experiencing a significant rain event at the time. City staff eventually traced the source of the infiltration to Forecast Tract #16565 at Honeysuckle Avenue and Mayapple Street, which is east of Escondido Avenue and south of Sultana Street. Storm runoff was entering manholes in a section of the development that was under construction, and the water had displaced a plug installed after the previous storm event by the developer's contractor. The contractor didn't respond until later in the afternoon, and the infiltration wasn't diverted until about 5:00 PM. Immediately after the source of the infiltration was diverted the sewer overflow on "I" Avenue ceased. Due to the heavy rainfall, HTH granular chlorine was not applied to disinfect the street or gutter, because no trace of the overflow could be found once the overflow stopped. Likewise, no pictures were taken of the spill.

It is estimated that approximately 96,000-100,000 gallons of untreated sewage and stormwater escaped from the interceptor on February 19, which flowed in the street to nearby storm drains. The storm drains directed the rain mixed with sewage into a wash, which was flowing heavily at the time due to the rain event.

The spill was reported by Dan Gallagher in a telephone call to Kai Dunn of the Lahontan RWQCB on Tuesday morning February 22 (Monday February 21 was a holiday). The spill was reported in writing to the Lahontan RWQCB in a letter dated February 26, 2005 (copy attached).

To avoid a reoccurrence of the spill, the City of Hesperia and VVWRA will continue to inspect the collection system to look for problems in construction areas, and/or other unpermitted connections allowing surface waters to enter the sewer system.

4. Laboratory results for sample day Monday April 4, 2005, indicated that on that day the 24-hour composite sample of secondary effluent to the percolation ponds was analyzed with a biochemical oxygen demand (BOD) of 60.3 mg/l. The Facility's NPDES Permit limits the BOD discharged to the percolation ponds to a daily maximum of 45 mg/l. The elevated percolation pond BOD on April 4, therefore, represents an excursion of the daily maximum permit limit.

VVWRA's Treatment Plant Operator responded to a high effluent turbidity alarm at 2:00 AM on the morning of April 5 (the April 4 sample day extends from 8:00 AM on April 4 to 8:00 AM on April 5). The Operator determined that the high effluent turbidity alarm was the result of excessive quantities of Nocardia foam carryover from the secondary clarifiers to the tertiary filters, which in turn overloaded the tertiary filters with solids. The Operator immediately diverted all secondary effluent to the percolation ponds and stopped the flow to tertiary treatment, in order to avoid any excursion of the permit limits for the river discharge. The Operator also diverted a portion of the influent flow to the stormwater equalization basin to reduce the plant flow to 8 MGD, in order to reduce the foam carryover, and at 6:30 AM began adding polymer to the aeration system to help contain the foam. The tertiary filters were backwashed to remove the accumulation of solids, and the flow to tertiary treatment was resumed at about 10:00 AM. The discharge to the river began again at about 10:40 AM, and the diversion of influent flow to the stormwater equalization basin was stopped.

The carryover of foam and solids to the percolation ponds increased the BOD of the secondary effluent, which resulted in the excursion. Nocardia foam is typically present in activated sludge systems, but at the time VVWRA's treatment system was experiencing persistent and excessive populations of Nocardia, which can be difficult to control and remove. Therefore, the elevated percolation pond BOD was the direct result of a process upset.

For corrective action, the staff tried a number of known Nocardia foam control strategies, including polymers, defoamers, water sprays, recirculating mixed liquor to the anoxic selectors, and chlorination, each with limited success. Finally staff obtained a copy of research conducted by the City of Los Angeles at the Terminal Island Treatment Plant, which struggled for many years to control and manage the growth of Nocardia. The research suggested that increasing the mean cell residence time (MCRT) would force the activated sludge biomass into endogenous respiration, which has been found to reduce Nocardia. A few weeks later Staff began increasing the MCRT of VVWRA's activated sludge system, and to date has experienced promising success in controlling Nocardia growth.

5. At approximately 5:45 AM on Tuesday April 12, 2005, the No. 10 South Percolation Pond overflowed its containment levee, which eroded the levee and ultimately caused the failure of the levee and the release of the contents of the percolation pond. The secondary effluent contained in the No. 10 pond flowed across the ground, over Shay Road, and eventually into the Mojave River. The No. 10 percolation pond released approximately 8.72 million gallons of secondary effluent.

The overflow was detected at approximately 5:50 AM, and staff immediately closed the valve directing secondary effluent into the No. 10 percolation pond. In addition, the high water level in the No. 10 pond prior to the levee failure caused water to flow through overflow piping into the abandoned No. 9 percolation pond, which then filled with secondary effluent. When the No. 10 pond levee failed, water began running back into the No. 10 pond from the No. 9 pond via the overflow piping, which staff immediately stopped using inflatable sewer plugs. Staff collected a grab sample of the secondary effluent in No. 10 Percolation Pond at the time of the spill.

After closing the valve directing flow into the No. 10 percolation pond, staff temporarily reduced the flow to secondary treatment while options for responding to the levee failure were evaluated. To return the flow to secondary treatment to normal levels, staff increased the discharge flow to the Mojave River, and also increased the discharge flow to the North Percolation Ponds. Once the situation at the south ponds was stabilized, staff also resumed discharging secondary effluent into South Percolation Ponds No. 7 and No. 8.

The spill was reported by Dan Sentman, VVWRA's Operations Manager, in a telephone call to Joe Koutsky of the Lahontan RWQCB at approximately 9:00 AM on April 12. Mr. Koutsky inspected the site shortly thereafter. Mr. Koutsky checked VVWRA's permit requirements and informed Dan Sentman that a written report detailing the spill would be due to Lahontan by Friday April 22.

On the afternoon of April 12 Hisam Baqai called Dan Gallagher, VVWRA's General Manager, to inquire about what other agencies had been contacted regarding the spill, and Mr. Gallagher reported that only Lahontan had been contacted because the staff had been extremely busy cleaning up the spill and adjusting the plant's process flows. Mr. Baqai offered to contract the State and County Environmental Health Departments, and Mr. Gallagher agreed to contact all of the water purveyors located downstream from the treatment plant. On April 13 Manager Gallagher faxed a list of the agencies contacted to the Lahontan RWQCB.

On the evening of April 12 VVWRA staff posted signs at points of access along the river as a warning that the river could be contaminated, and staff talked to at least one resident that night about the spill. Additional signs were placed on April 13 and 14 at all points of access to the river between the treatment plant and Helendale Road, a distance of approximately 8 miles, as requested by the San Bernardino County Environmental Health Department. In all a total of 50 signs were placed along the Mojave River, which were spaced approximately every 500 feet in open areas. Mike Farrell from San Bernardino County Environmental Health told Mr. Gallagher that it would not be necessary to contact individual residential well owners located along the river. A number of residents subsequently called VVWRA to inquire about the signs, and what they needed to do in response to the contamination. Manager Gallagher addressed the calls and explained that the signs are intended to alert the public that coliform may be present in the river flow, and the river should not be used for swimming or wading. The coliform does not pose a danger to drinking water wells, which are constructed with sanitary seals that isolate the well from surface contamination.

Samples of the river upstream and downstream of the treatment plant were collected on April 12, 13, & 15 and analyzed for coliform, although there is always some coliform present in the river based on historical sampling. Due to the January storms, the Mojave River was still flowing continuously from Victorville north to the Lenwood area during early April. On April 22 Mike Farrell of the San Bernardino County Environmental Health Department told VVWRA that the threat of contamination had passed, especially due to the continuous flow in the river, and he said that the signs could be removed from the river.

A soils consultant was retained to evaluate the soils and to recommend specifications for the repair of the levee. Once the damaged levee dried sufficiently, repairs to the levee began. On May 11, 2005, the repairs were completed and the No. 10 percolation pond was returned to service. The secondary effluent that overflowed from the No. 10 percolation pond into the abandoned No. 9 percolation pond eventually evaporated and/or percolated into the ground.

An investigation of the incident revealed that the overflow occurred because the level sensors on the South Percolation Ponds did not provide sufficient information to the Operations staff that could have been used to prevent the overflow. The level sensors were originally installed and configured for a range of 0-3 feet of water depth, which was sufficient when the ponds were first placed in service in 2002. However, the level on April 12 exceeded 3 feet of water depth. To avoid a reoccurrence of the spill, the liquid level meters on all of the South Percolation Ponds were raised and recalibrated in order to transmit a signal throughout the full 0-5 foot operating range of the percolation ponds. Previously the liquid level meters did not provide information regarding the water depth once the depth exceeded 3 feet. Likewise the SCADA alarm system was revised to indicate the full range of water depth, and additional alarms and controls were programmed to prevent a reoccurrence. The plant was staffed continuously until all of the changes were completed and tested.

6. Laboratory results for Monday October 24, 2005, indicated that on that day the effluent flow to the Mojave River was analyzed with a total coliform of 50 colonies per 100 ml of sample. Previously on October 22, 2005, the effluent flow to the Mojave River was measured with a total coliform of 30 colonies per 100 ml of sample. The Facility's NPDES Permit limits the effluent coliform to no more than one (1) sample in excess of 23 colonies per 100 ml of sample during any 30-day period. The elevated coliform on October 24, 2005, therefore, represents an excursion of the daily maximum permit limit.

On Saturday October 22, 2005, the tertiary effluent flow to the chlorine zones was 5.71 MGD, and the effluent turbidity averaged 0.71 NTU's. On that day the ammonia feed system, which is used augment disinfection, was not functioning properly because the tubing used to direct ammonia into the tertiary filter effluent inadvertently moved and was not adding ammonia to the main flow stream. The chlorine residual in the chlorine contact basin effluent was measured at 5.75 mg/l, which provided a contact time (CT value) of 1,439 mg/l/min, well in excess of the required minimum 450 mg/l/min. In spite of the problem with the ammonia feed system, the chlorine dosage and detention time should have been more than adequate to obtain complete coliform destruction.

On Monday October 24 the tertiary effluent flow to the chlorine zones was 7.07 MGD, and the effluent turbidity averaged 0.82 NTU's. The ammonia feed tubing was found and repaired late in the day on Saturday October 22, so on October 24 the ammonia feed system was operating properly to augment disinfection. The chlorine residual in the chlorine contact basin effluent was measured at 5.35 mg/l, which provided a contact time (CT value) of 612 mg/l/min, well in excess of the required minimum 450 mg/l/min. The chlorine dosage and detention time should have been more than adequate to obtain complete coliform destruction.

SPILL AND EXCURSION REPORT (CONT.)

An investigation was performed to determine the cause of the elevated coliform samples. The three existing chlorine contact zones have a combined volume of 774,000 gallons, and were designed to provide 120 minutes of detention time at a rated flow of 8.3 MGD. On both days the secondary effluent flow to the chlorine contact basins was well below the rated capacity, and the disinfection system was operating normally. However, the secondary effluent nitrite was measured to be 1.0 mg/l in a routine sample collected on October 24, which was slightly elevated and could have contributed to a higher-than-normal chlorine demand. The secondary effluent nitrite concentration is usually much lower than 1 mg/l, and it is unknown why the nitrite concentration was elevated during the week of October 22.

On several occasions during 2005 the sludge blankets in one or more secondary clarifiers inverted, releasing a cloud of solids to the tertiary filters. During these events the release of solids to the tertiary filters in turn resulted in elevated effluent turbidity, which undoubtedly resulted in small accumulations of solids in the chlorine contact zones. Staff was aware of the possible accumulation of solids in the chlorine zones, and was planning to remove the chlorine zones from service for cleaning, although this work had not yet begun during the week of October 22.

For corrective action, on October 29 the staff reduced the flow to the chlorine zones, and correspondingly increased the discharge of secondary effluent to the percolation ponds. Staff also worked quickly to schedule the cleaning of the three chlorine contact zones, to remove any accumulations of solids. All three (3) chlorine zones were removed from service, drained, and cleaned one at a time to remove the accumulated solids and inspect the baffles and equipment. Solids that accumulate in the chlorine contact basins can release particles that can in turn increase the chlorine demand. In addition, staff further increased the MCRT, to improve nitrification and provide a greater buffer to protect the aeration system from the effects of shock loadings.

The coliform violation was the result of problems directly related to the treatment plant process and/or a process upset. A written report of the spill was submitted to the Regional Board on November 1, 2005.

CERTIFIED WASTEWATER OPERATORS

The following is a list of certified operators that were employed at the treatment facility during 2005:

NAME	GRADE	POSITION
Daniel P. Gallagher	V-9153	General Manager
Daniel J. Sentman	V-10138	Operations Manager
Roy Dagnino	V-7820	Operator V
Jose Gomez	V-7519	Operator V
Joseph Del Monte	V-7870	Operator V
Olin Keniston	III-6071	Pretreatment Technician/Interceptor Inspector
Dave Cuomo	III-8333	Operator III
Gabriel E. Chico	III-9209	Operator III
James Bryant	III-9750	Operator III
Carl Carlson	II-5356	Operator II
Bruce Correia	I-8784	Management Information Systems Coordinator

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