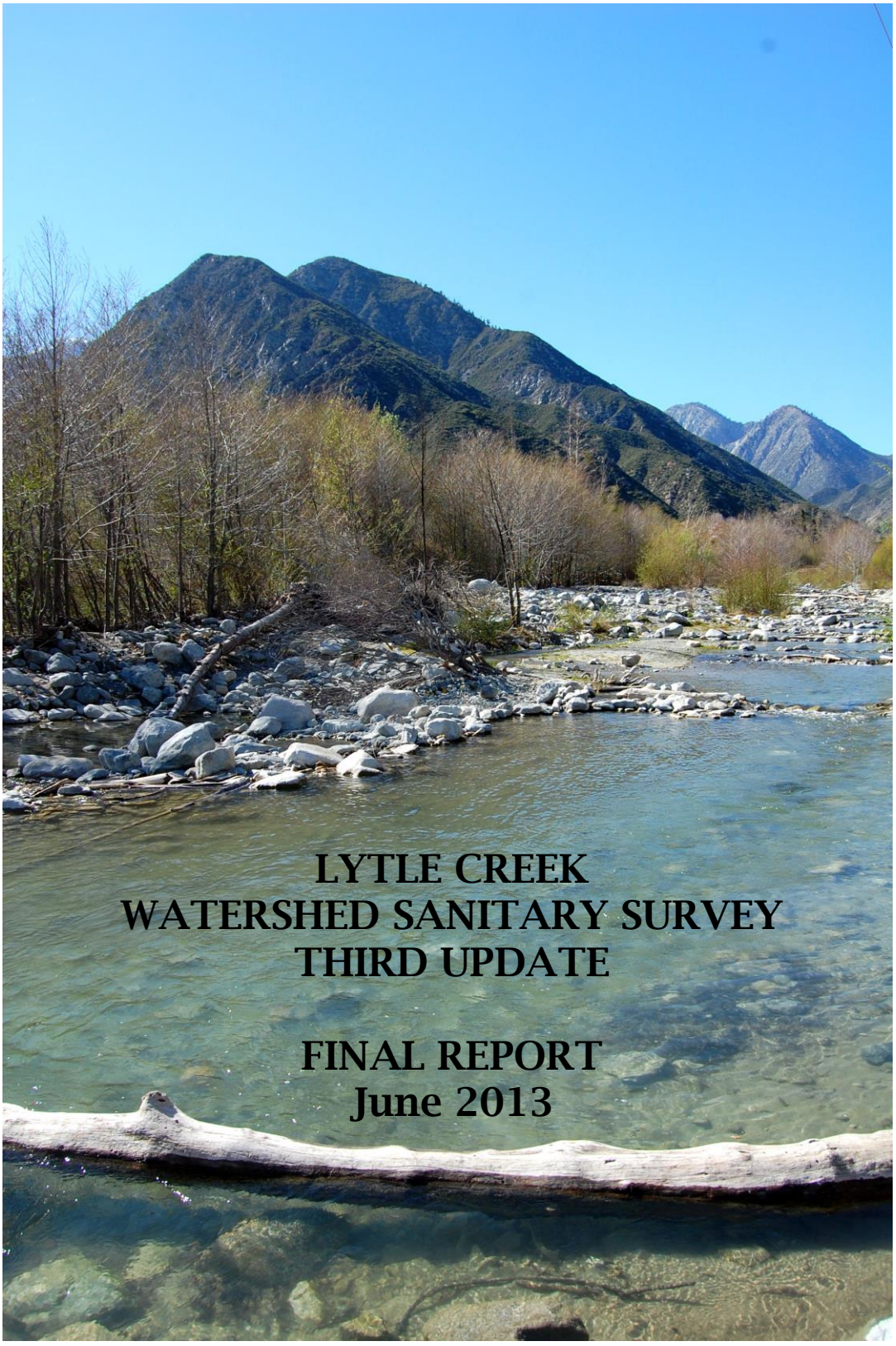

# LYTLE CREEK
# WATERSHED SANITARY SURVEY
# THIRD UPDATE

## FINAL REPORT
## June 2013

**Prepared By**

Palencia Consulting Engineers

Starr Consulting

# Lytle Creek Watershed Sanitary Survey
# Third Update
# FINAL REPORT
# June 2013

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# LIST OF ABBREVIATIONS

Alum - aluminum sulfate

BAER – Burned Area Emergency Response
BMP – Best Management Practice
BOD – Biological Oxygen Demand

CAP – *Cryptosporidium* Action Plan
CCTV – Closed circuit television
CDPH – California Department of Public Health
CEDEN – California Environmental Data Exchange
CEQA – California Environmental Quality Act
CFE – Combined Filter Effluent
cfs – cubic feet per second
CIWQS – California Integrated Water Quality System
CSBSDD – County of San Bernardino Special Districts Department
CT – Contact Time
CUPA – Certified Unified Program Agency

D/DBP – Disinfectants/Disinfection By-Products
DBP – disinfection by-product

*E. coli* – *Escherichia coli*

FUWC – Fontana Union Water Company
FWC – Fontana Water Company

GAC – granular activated carbon
gpd – gallons per day
gpm – gallons per minute

HAA5 – haloacetic acids

IDSE – Initial Distribution System Evaluation
IESWTR – Interim Enhanced Surface Water Treatment Rule
IFE – individual filter effluent

LRAA – locational running annual average
LT1ESWTR – Long Term 1 Enhanced Surface Water Treatment Rule
LT2ESWTR – Long Term 2 Enhanced Surface Water Treatment Rule

MCL – maximum contaminant level
µg/L - micrograms per liter
mgd – million gallons per day
mg/L – milligrams per liter

MPN/100 mL – most probable number per 100 milliliters

NOI – Notice of Intent
NPDES – National Pollution Discharge Elimination System
NTU – nephelometric turbidity unit

OES – California Office of Emergency Services
OWTS – Onsite Wastewater Treatment System

PCAs – Potential Contaminating Activities
PVC – Polyvinyl Chloride

RAA – running annual average
Regional Board – Santa Ana Regional Water Quality Control Board
RIMS – Response Information Management System
RV – Recreational Vehicle

SBCFCD – San Bernardino County Flood Control District
SCE – Southern California Edison
SDWA – Safe Drinking Water Act
SEMS – Standardized Emergency Management System
SOC – synthetic organic compound
SSMP – Sewer System Management Plan
SSO – Sanitary Sewer Overflow
SPW – State Project Water
SWAMP – Surface Water Ambient Monitoring Program
SWTR – Surface Water Treatment Rule

TMDL – Total Maximum Daily Load
TOC – total organic carbon
TTHM – total trihalomethanes

ug/L – micrograms per liter
USFS – United States Forest Service
USEPA – US Environmental Protection Agency
USGS – US Geological Survey
UV – Ultraviolet light

VOC – volatile organic compound

WDR – Waste Discharge Requirement
WFF – water filtration facility
WQMP – Water Quality Management Plan
WVWD – West Valley Water District
WWTP – Wastewater Treatment Plant

## INTRODUCTION

Drinking water utilities that use surface water are required to conduct a watershed sanitary survey for that source, under the California Surface Water Treatment Rule (SWTR). This survey must be updated every five years. This Third Update to the Lytle Creek Watershed Sanitary Survey covers the period January 1, 2008 through December 31, 2012.

## OBJECTIVES OF THE UPDATE

The overall objective of this Third Update is to assess the source water quality of Lytle Creek to ensure the ability of the Oliver P. Roemer Water Filtration Facility (WFF) to continue to provide their customers with drinking water that meets all current drinking water standards. This Third Update also accomplishes some other specific objectives including:

- Review and evaluation of selected constituents of interest to identify potential water quality or treatment issues at the water treatment plant. Assess the ability of the Roemer WFF to meet drinking water standards based on current regulatory framework, as well as comment on the appropriate level of treatment for pathogens, specifically for *Giardia*, viruses, and *Cryptosporidium*.

- Review and evaluation of selected potential contaminating activities to identify potential impacts on source water quality.

- Development of recommendations that are economically feasible and within the authority of the West Valley Water District (WVWD) to implement.

## SIGNIFICANT CHANGES AND SOURCE WATER PROTECTION ACTIVITIES SINCE 2008 UPDATE

The West Valley Water District (WVWD) has implemented source water protection efforts as recommended in the 2008 Update Report. It is important to note the following source water protection efforts:

- WVWD coordinated with the United States Forest Service (USFS) during and after the Sheep Fire in October 2009 to ensure that fire retardants were not used near the Lytle Creek streambed.

- In April 2013, WVWD sent a letter to the USFS to support the continued collection of Forest Adventure Pass fees in the Lytle Creek watershed.

- WVWD participated in a Lytle Creek Watershed Action Project which received grant funding in 2007 from the CALFED Bay-Delta Program. Other partners for the project were the San Bernardino Valley Municipal Water District, USFS, the Santa Ana Regional Water Quality Control Board (Regional Board), and the California State University at San Bernardino Water Resources Institute. Educational materials were developed; outreach to schools was conducted, as well as a watershed clean-up day and coliform monitoring for two years along Lytle Creek. Unfortunately, the watershed project was discontinued in 2010 due to a lack of funding. Additional information can be found in **Section 4**.

- WWVD initiated *E. coli* monitoring of the Grapeland tunnel water to assess any impact from the Lytle Creek wastewater treatment plant percolation ponds.

- WVWD continues to investigate the feasibility of installing a turbidimeter at Fish Wheel to detect illicit discharges.

- WVWD has continued to conduct monthly visual inspections of the watershed.

There have been no significant changes in the watershed since the 2008 Update. In general, the pace of development is slow in the Lytle Creek area. There are approximately 375 homes in the communities of Scotland, Happy Jack and Lytle Creek.

The Roemer WFF has not undergone any significant treatment upgrades since the 2008 Update.

## KEY FINDINGS AND CONCLUSIONS

The key findings and conclusions for this report are organized as they pertain to source water quality, treatment and regulatory compliance, and watershed contaminant sources. Highlights of these findings and conclusions are presented below.

### Source Water Quality

Overall, Lytle Creek provides excellent quality raw water. The raw water can be treated to meet all drinking water standards using conventional treatment processes. Key findings for the constituents of interest are presented below.

### *Turbidity*

The Roemer WFF has relatively low levels of raw water turbidity, with an average value less than 1 NTU. The peak daily raw water turbidity ranges from 0.1 to 6.6 nephelometric turbidity units (NTU), with an average value of 0.578 NTU. It should be kept in mind that the sampling location for plant influent turbidity is located after Lytle Creek is blended with State Project water. There are no clear trends in the data but turbidity peaks generally occur during the wet season, between October and April, but can also occur during the spring and summer months. There was an extended period of higher turbidity values during the late spring/summer of 2011, and there is no clear cause of the increase.

### *Coliform*

Total coliform, fecal coliform, and *Escherichia coli* (*E. coli)* data show generally low levels. Individual total coliform, fecal coliform, and *E. coli* samples had average values of 196 most probable number (MPN)/100 mL, 16 MPN/100 mL, and 12 MPN/100mL, respectively.

99 percent of monthly median total coliform values were less than 1,000 MPN/100 mL, and 100 percent of monthly median fecal coliform and *E. coli* values were less than 200 MPN/100mL. Only three monthly median calculations triggered additional log reduction of *Giardia*/viruses under current permit conditions for total coliforms. Coliform data support that 3/4-log treatment for *Giardia*/viruses is appropriate under most source water quality conditions during the study period.

Peak levels of coliform occurred in 2011. There is no clear cause, and it is suspected that this may be related to possible illicit discharges from Mountain Lakes Resort ponds.

Fecal coliform and *E. coli* data support 3/4-log treatment for *Giardia*/viruses is appropriate for all source water quality conditions during the study period.

### *Giardia/Cryptosporidium*

WVWD conducted monthly source water monitoring for *Cryptosporidium* under the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) from April 2007 through March 2009. Two years of monthly data show one sample with low-level detection of *Cryptosporidium* and no detect of *Giardia.* No detection of *Giardia* supports 3-log reduction is appropriate for the Roemer WFF. Maximum running annual average value for *Cryptosporidium* was 0.008 oocysts/L, well below the Bin 1 limit of 0.075 oocysts/L, resulting in Bin 1 classification with no additional action required under the LT2ESWTR.

### *Disinfection By-Product Precursors*

Limited TOC data as measured at the Southern California Edison (SCE) After Bay shows very low levels, with all samples less than 1 mg/L in Lytle Creek. Lytle Creek water can then be blended with SPW, which has higher TOC levels. Prior to blending with Lytle Creek water, SPW is sent through a pre-treatment facility. WVWD's strategy of blending and pre-treating SPW is effective at maintaining the plant influent TOC below the treatment trigger threshold of 2 mg/L. The influent and effluent of the GAC filters was sampled periodically through the study period. The influent location had an average TOC level of 1.14 mg/L and a median TOC level of 0.53 mg/L. The effluent location had an average TOC level of 0.63 mg/L and a median TOC level of 0.3 mg/L. There was an extended peak of TOC in the GAC influent and effluent samples during the late spring/summer of 2011 which is not clearly related to any activity in the watershed, and may be related to an illicit discharge.

## Intake Evaluation

### *Oliver P. Roemer Water Filtration Facility*

The Roemer WFF is currently in compliance with all existing drinking water regulations. The Roemer WFF implements conventional filtration processes and meets all current drinking water standards, including maximum contaminant levels (MCLs) and treatment technology requirements. Below is a summary of the selected treatment and regulatory compliance issues.

#### Turbidity

All combined filter effluent (CFE) turbidity measurements between January 2008 and December 2012 met the turbidity treatment technique limit and were less than 0.14 NTU. The peak daily settled water had an average value of 0.048 NTU and the average daily CFE had an average value of 0.041 NTU. This shows that a large amount of the solids removal is achieved during the pretreatment process of flocculation and sedimentation.

Solids removal through plant averages 90 percent, meeting the 80 percent goal for conventional treatment. Removal is most difficult under low raw water turbidity periods.

#### Microbiological Constituent Review

Distribution system monitoring for coliforms as part of the Total Coliform Rule resulted in a few detections of total coliform in distribution system during the study period. In each month with a detection, less than five percent of samples

were positive and there were no fecal coliform detected. Therefore, there were no violations of the coliform maximum contaminant level (MCL).

Disinfection Precursors and By-Products

The Roemer WFF CFE data (2011 through 2012) show an average TOC value of 0.434 mg/L with all samples less than 1.2 mg/L. The GAC facility effluent data (2008 through 2012) show an average TOC value of 0.63 mg/L with 88 percent of samples less than 2.0 mg/L. WVWD complies with the Stage 1 D/DBP Rule by meeting an alternative compliance criterion for the enhanced coagulation treatment technique, less than 2 mg/L in source or treated water.

Under the Stage 1 D/DBP Rule, WVWD sampled 24 sites in the distribution system on a quarterly basis for disinfection by-products. Since the Roemer WFF primarily services pressure zones 4 through 8, only the 15 sites in those zones were included in the data evaluation. When looking at the quarters when the Roemer WFF was in operation, the TTHM running annual average (RAA) of the 15 selected distribution sites ranged from 5 to 9.3 µg/L, well below the current MCL of 80 µg/L. The HAA5 RAA of the 15 selected distribution sites ranged from 2.2 to 4.1 µg/L, well below the current MCL of 60 µg/L.

WVWD converted to the Stage 2 D/DBP Rule monitoring sites in June 2012. Only eight distribution sites are required to be monitored, and six of those are located in the zones that represent water from the Roemer WFF. Locational running annual averages (LRAA) were calculated for the six sites, and THM LRAAs ranged from ND to 27.4 µg/L, with an average of 12.1 µg/L, all well below the MCL of 80 µg/L. HAA5 LRAAs ranged from ND to 11.6 µg/L, with an average of 5.2 µg/L, all well below the MCL of 60 µg/L. The highest levels of THMs and HAA5 continue to occur at Site 1.

There were no identifiable trends in the data due to variable plant operations and source water blending. IDSE monitoring results had data results similar to the Stage 1 sample sites.

*Giardia*/Virus/*Cryptosporidium* Reduction Requirements

Based on the total coliform, fecal coliform, and *E. coli* data presented in **Section 3**, 3/4/2-log reduction of *Giardia*/virus/*Cryptosporidium* appear to be appropriate reduction requirements for the Roemer WFF under most source water quality scenarios.

The Roemer WFF is classified as a conventional filtration WTP, and currently receives reduction credit for 2.5-log *Giardia,* 2.0-log viruses, and 2-log *Cryptosporidium* for physical removal. Disinfection with sodium hypochlorite provides 0.5-log credit for *Giardia* and 2.0-log credit for viruses. This meets all of

the current microbial removal/inactivation requirements of the SWTR and the Interim Enhanced SWTR.

## Watershed Contaminant Sources

There are numerous types of potential contaminating activities (PCAs) in the watershed. Six activities were selected for evaluation in this report based on constituents of interest and predominance in the watershed. Selected findings for each of these activities are provided below.

### *Spills*

There were four spills/incidents listed in the State Office of Emergency Services (OES) Hazardous Materials Release database from 2008 to 2012. Two of the spills involved sewage and two of the spills involved diesel fuel and carburetor cleaner.

The largest SSO involving raw sewage occurred on October 14, 2008 when 900 gallons of raw sewage was released from a manhole and 100 gallons impacted Lytle Creek. *E. coli* was sampled on the same day and results were 22 MPN/100mL, which is higher than the median *E. coli* value of 4 MPN/100mL, indicating that the source water was likely impacted by the spill.

### *Recreation*

Recreational uses in the Lytle Creek watershed are primarily for camping, picnicking, hiking, fishing, hunting, off-highway vehicle use, and swimming in the creek. The watershed currently receives approximately 70,000 day-use visitors on an annual basis, and can experience as much as 10,000 visitors on peak summer weekends. The USFS does not have resources to actively manage people swimming in Lytle Creek. However, the USFS have placed portable restrooms at key locations along Lytle Creek from May through October to provide sanitation facilities for visitors.

Similar to the findings of the 2008 Watershed Sanitary Survey, fecal coliform and *E. coli* levels at the SCE After Bay increase in the summertime, possibly as a result of body contact recreation in Lytle Creek.

In April 2013, WVWD sent a letter to the USFS to support the continued collection of Forest Adventure Pass fees in the Lytle Creek watershed.

WVWD continues to have unexplained spikes of turbidity, coliforms, and TOC in the Lytle Creek source water which is suspected to be from Mountain Lakes draining/flushing their fishing lakes.

### *Wastewater*

There are no wastewater treatment plants which discharge treated effluent directly to Lytle Creek. The Lytle Creek wastewater plant disposes their secondary effluent to percolation ponds located near the USFS Ranger Station upstream of the Grapeland Tunnel. The Regional Board performs inspections of the Lytle Creek wastewater treatment plant, and the facility has been in compliance during the reporting period. However, it is possible that the Lytle Creek wastewater treatment plant's percolation ponds may impact water received by WVWD through the Grapeland Tunnel. It is recommended that the WVWD continue to monitor the Grapeland tunnel water for *E. coli* to assess any impact from the Lytle Creek wastewater treatment plant percolation ponds.

About 90 percent of Lytle Creek residences receive centralized sewer services, while approximately 10 percent remains off-line. The locations of the remaining septic systems in the watershed are unknown. The total number of sewer service connections for the Lytle Creek service area was 392 in 2012.

### *Developments*

Overall, there has been little to no development in the watershed over the past five years. Land uses in the watershed are either open space or residential, with very little commercial and no industrial uses. There were only two large construction projects in the watershed, conducted by the San Bernardino County Department of Public Works at South Fork Road for bridge replacement and rock slope protection

### *Fires*

The Lytle Creek watershed is entirely a high to extremely high fire risk based on vegetation. The largest wildfire over the reporting period was the Sheep Fire which occurred from October 3 to October 10, 2009. WVWD staff contacted the Lytle Creek Ranger Station to ensure that retardant drops did not occur near the stream bed of Lytle Creek. WVWD is able to minimize fire-related impacts to the Roemer WFF by shutting the plant down during times of degraded source water quality. However, the Roemer WFF remained on-line after the Sheep Fire.

### *Floods/Erosion*

Flooding and debris flows occur in the Lytle Creek watershed as it is a natural canyon area with steep topography and can receive high amounts of rainfall in a short time period. Debris and flood flows are also uncontrolled in the upper reaches of Lytle Creek, since there are no flood control facilities upstream of the Lytle Creek communities.

Modeling was conducted by the BAER team to predict the increase in peak discharge (cfs/square mile) for the 2-year, 5-year, 10-year and 25-year storm event for the year following the Sheep Fire. Examination of Lytle Creek flow records after the Sheep Fire did not show any noticeable increase above normal winter flows in Lytle Creek.

WVWD typically avoids using Lytle Creek water during high storm events, in order to prevent high turbidity and china clay from entering the treatment plant.

### TOPICS TO CONSIDER FOR THE 2018 UPDATE

Based on the information collected and evaluated as part of this report, a list of potential topics to consider for discussion in the next update to the Lytle Creek Watershed Sanitary Survey includes:

- Source water quality for all regulated constituents
- Possible impact of wastewater percolation ponds to Grapeland Tunnel water quality
- Status of pathogen total maximum daily load (TMDL) for Lytle Creek
- Changes to County requirements for septic systems due to 2012 State Water Resources Control Board policy (Resolution No. 2012-0032)
- Changes to collection of Forest Adventure Pass fees in Lytle Creek.

### RECOMMENDATIONS

A number of recommendations covering water quality and watershed management were developed for this Third Update. Please refer to **Section 6** for further information on the recommendations.

## INTRODUCTION

This report presents the findings of the Third Update to the Lytle Creek Watershed Sanitary Survey. This study covers the period January 1, 2008 through December 31, 2012. The Second Update was completed in July 2008, the First Update was completed in August 2003, and the initial Watershed Sanitary Survey was completed in 1998 in accordance with the California Surface Water Treatment Rule (SWTR).

For assistance with abbreviations and acronyms, the reader is referred to the List of Abbreviations at the front of the report.

## OBJECTIVES OF THE UPDATE

A watershed sanitary survey focuses on the first barrier to contamination of the drinking water supply, namely source water protection. Evaluating source water quality and watershed contaminant sources provides key information to aid in understanding how to maintain and possibly improve the first barrier. In order to fully assess the ability of the West Valley Water District (WVWD) to treat Lytle Creek water, some evaluation of treatment plant capabilities and treated water quality is also necessary.

This Third Update is intended to accomplish the following objectives:

1) Fulfillment of the California SWTR and the Interim Enhanced Surface Water Treatment Rule (IESWTR) requirements that surface water agencies conduct a sanitary survey of the source watershed once every five years. Any significant changes within the last five years that affect source water quality are to be identified in each update. In addition, it is required to comment on the appropriate level of treatment for pathogens, specifically for *Giardia*, viruses, and *Cryptosporidium*.

2) Review and evaluation of selected constituents of interest to identify potential water quality or treatment issues at the Oliver P. Roemer Water Filtration Facility (Roemer WFF). Assess the ability of the treatment plant to meet standards based on current regulatory framework.

3) Review and evaluation of selected potential contaminating activities to identify impacts on source water quality. Determine whether it may be useful to conduct additional monitoring to further assess contaminant levels in the source water or contaminants from a particular watershed source.

4) Identification of appropriate watershed management actions to protect and possibly improve source water quality. Development of recommendations for watershed management actions that are economically feasible and within the authority of the WVWD to implement is critical.

## CONSTITUENTS AND POTENTIAL CONTAMINATING ACTIVITIES COVERED IN THE THIRD UPDATE

Several water quality constituents were selected for evaluation as part of the Third Update. **Table 1-1** presents a summary of the water quality constituents selected and the reason for selection.

**Table 1-1**
**Water Quality Constituents Selected for Evaluation as Part of the Third Update**

| Constituent | Reason for Inclusion in Third Update |
|---|---|
| Turbidity | Turbidity is a measurement of suspended solids in water. Treated water turbidity levels are regulated in the SWTR and the IESWTR. |
| Total Coliform | Monthly medians are recommended for evaluation under the SWTR to determine appropriate level of treatment for *Giardia* and viruses. |
| Fecal Coliform and *E. coli* | Fecal coliform and *E. coli* are more specific surrogates for fecal contamination. |
| *Giardia* | *Giardia lamblia* is infectious to humans. Source water levels of *Giardia* are used to determine treatment requirements under the SWTR. |
| *Cryptosporidium* | *Cryptosporidium parvum* is infectious to humans. Actual source water levels of *Cryptosporidium* were used to determine treatment requirements as part of the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR). |
| Total Organic Carbon | Total organic carbon (TOC) is a surrogate measure of disinfection by-products (DBP) precursor material in water. TOC levels in either source or treated water are used to determine treatment requirements in the Stage 1 Disinfectant/Disinfection By-Product Rule (D/DBP). |
| Total Trihalomethanes | Total Trihalomethanes (TTHMs) are disinfection by-products formed in disinfected treated water. Treated water levels are regulated by the Stage 1 D/DBP Rule and further regulated under the Stage 2 D/DBP Rule. |
| Haloacetic Acids | Haloacetic acids (HAA5) are disinfection by-products formed in disinfected treated water. Treated water levels are regulated by the Stage 1 D/DBP Rule and further regulated under the Stage 2 D/DBP Rule. |

Six potential contaminating activities were selected for review as part of the Third Update: spills, recreation, wastewater, development, fires, and floods/erosion. Each of these activities can contribute at least one of the constituents identified in **Table 1-1** to the source water. These activities were selected based on their presence in the watershed, and were identified by the WVWD as key contaminating activities.

### DESCRIPTION OF HOW THE THIRD UPDATE WAS CONDUCTED

The project team consisted of a Technical Committee comprised of representatives from the WVWD and the consultant team of Palencia Consulting Engineers and Starr Consulting. The Technical Committee participated in developing the scope of work and reviewed identification and development of key findings and recommendations.

The consultant team obtained information from the WVWD through a survey that addressed the Roemer WFF's process, including a discussion of treatment challenges and changes since the 2008 Watershed Sanitary Survey. Raw and treated water quality data was also provided by the WVWD.

The consultant team collected information on contaminant sources in the watershed through literature reviews, Internet searches, and discussions with various agencies' staff. A bibliography and list of contacts are provided in **Appendix A**.

## REPORT ORGANIZATION

### Section 1 – Introduction

This section describes the objectives of the Third Update, lists the main constituents and potentially contaminating activities covered in the Third Update, describes how the Third Update was conducted, and includes a description of the basic report organization.

### Section 2- The Watershed and Supply Systems

This section is largely descriptive and provides: (1) a brief overview of the physical, hydrologic, and land use characteristics of the watershed, (2) a description of the existing water supply system, and (3) contains watershed maps delineating the watershed and outlining land use and land ownership in the watershed. For more detailed descriptive information on watershed characteristics, the reader is referred to the 2003 Watershed Sanitary Survey.

### Section 3 – Lytle Creek Water Quality Review

This section provides a review of the constituents of interest, including an explanation for their selection and a summary of the data obtained for the period of study for each constituent.

### Section 4 – Watershed Contaminant Sources Review

This section describes pertinent characteristics of each of the six potential contaminating activities that were reviewed as part of this Third Update. If applicable, each potential contaminating activity will include a discussion on background and occurrence, seasonal patterns, water quality issues and data review, regulation and management, and source water protection activities.

### Section 5 - Intake Evaluation

This section contains an evaluation of the Roemer WFF's treated water quality, as well as an evaluation of the Roemer WFF's ability to meet the SWTR as well as other existing regulations.

### Section 6 – Recommendations

This section consists of a discussion of source water protection activities taken since the 2008 Watershed Sanitary Survey and a list of recommendations for future source water protection efforts.

## WATERSHED DESCRIPTION

This section provides an overall description of the watershed, which summarizes physical, hydrologic, and land use characteristics. Major watershed characteristics such as soils, geology, biology, and topography have changed little since the original 1998 and 2003 Survey. For a more detailed account of this information, the reader is referred to the 2003 Survey. This section provides a description of the West Valley Water District's (WVWD) existing water supply system, including a brief description of the Oliver P. Roemer Water Filtration Facility (Roemer WFF). There is also a discussion of how water is diverted off Lytle Creek and delivered to the Roemer WFF.

The Lytle Creek watershed is located in the Upper Santa Ana River basin at the easternmost extension of the San Gabriel Mountains and is approximately 60 square miles. Lytle Creek flows in a southeasterly direction where it joins Cajon Creek before finally reaching its confluence with the Santa Ana River near Colton. However, the entire watershed is not tributary to water treated by the WVWD as water is diverted from Lytle Creek at two diversion points which are well upstream of where Lytle and Cajon creeks intersect. The portion of the watershed which is tributary to the two diversion points is shown in **Figure 2-1**, and is approximately 47 square miles.

Lytle Creek is a perennial stream that begins at the top of Mt. San Antonio, at an elevation of approximately 10,000 feet and flows eastward in three forks (North Fork, Middle Fork, and South Fork). The area is highly dissected by deep canyons, steep slopes, cliffs, and narrow ridges (United States Forest Service [USFS] Land Management Plan, 2005).

A variety of habitats can be found from chaparral, to lush riparian to high elevation conifers. Vegetation consists of mature stands of mixed conifer with some black oak, scattered areas of scrub oak and chaparral, and some isolated pockets of bigcone Douglas fir (California Wilderness Coalition 2008).

The streams and wilderness areas in the canyon provide important habitats for mountain lion, bear, badger, bighorn sheep, great horned owls, red-tailed hawk, coyotes, kangaroo rats, bald eagles, golden eagles, and a variety of birds. Over the last two decades, the sheep population in the San Gabriel Mountains has declined by 85 to 95 percent for reasons that are poorly understood (USFS Land Management Plan 2005).

### Land Ownership

The USFS is the prime landowner in the Lytle Creek watershed, owning approximately 96 percent as shown in **Figure 2-2,** with the remaining 4 percent unclassified**.** The private lands in the watershed are associated with the communities of Scotland, Happy Jack, and Lytle Creek.

### Land use

Most of the land use in the Lytle Creek watershed is vacant, as the majority of the land is owned by the USFS. **Figure 2-3** shows that 97 percent of the watershed is vacant, 2.2 percent is for open space/recreation, 0.5 percent is residential, and 0.1 percent is public/institutional. There are minimal commercial and no industrial uses in the watershed.

There are no incorporated cities within the watershed. There are several small community clusters such as Scotland, Happy Jack, and Lytle Creek, which make up the approximately 1,200 residents and 375 homes in the watershed. The residents of Lytle Creek have a strong desire to maintain present mountain lifestyle, preferring development to be mainly residential. They are opposed to commercial development and would like to keep tourism to a minimum (Lytle Creek Community Plan, 2007).

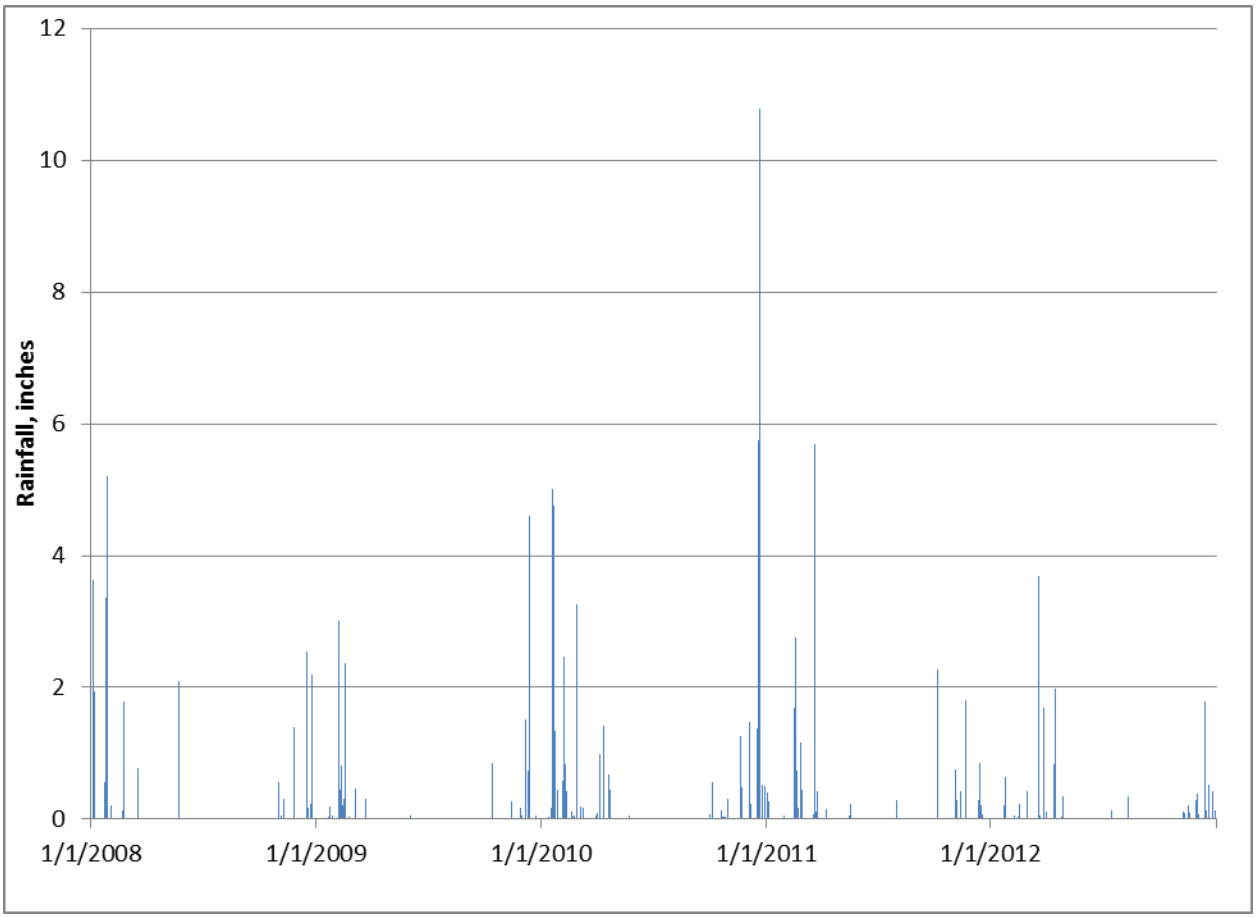
A field visit conducted in March 2013 found very few businesses along Lytle Creek Road, the main road leading into the Lytle Creek watershed. There was a post office, fire station, campgrounds, shooting range, grocery store, and one restaurant.

### Climate and Precipitation

The climate of the watershed ranges from Mediterranean to mountain, from temperate to hot, with cooler temperatures at the higher elevations. Precipitation ranges throughout the watershed, with snow in the winter on the tallest peaks (USFS Land Management Plan, 2005).

**Figure 2-4** shows daily precipitation totals from the United States Geological Survey (USGS) rain gauge at Middle Fork Lytle Creek from 2008 to 2012. The highest daily rainfall total was 10.8 inches on December 20, 2010. The highest annual rainfall from 2008 to 2012 was water year 2010-2011 at an annual total of 50.9 inches, and the lowest annual rainfall was water year 2011-2012 at an annual total of 19.6 inches.

**Figure 2-4**
**Monthly Rainfall Totals at Middle Fork Lytle Creek, 2008-2012**



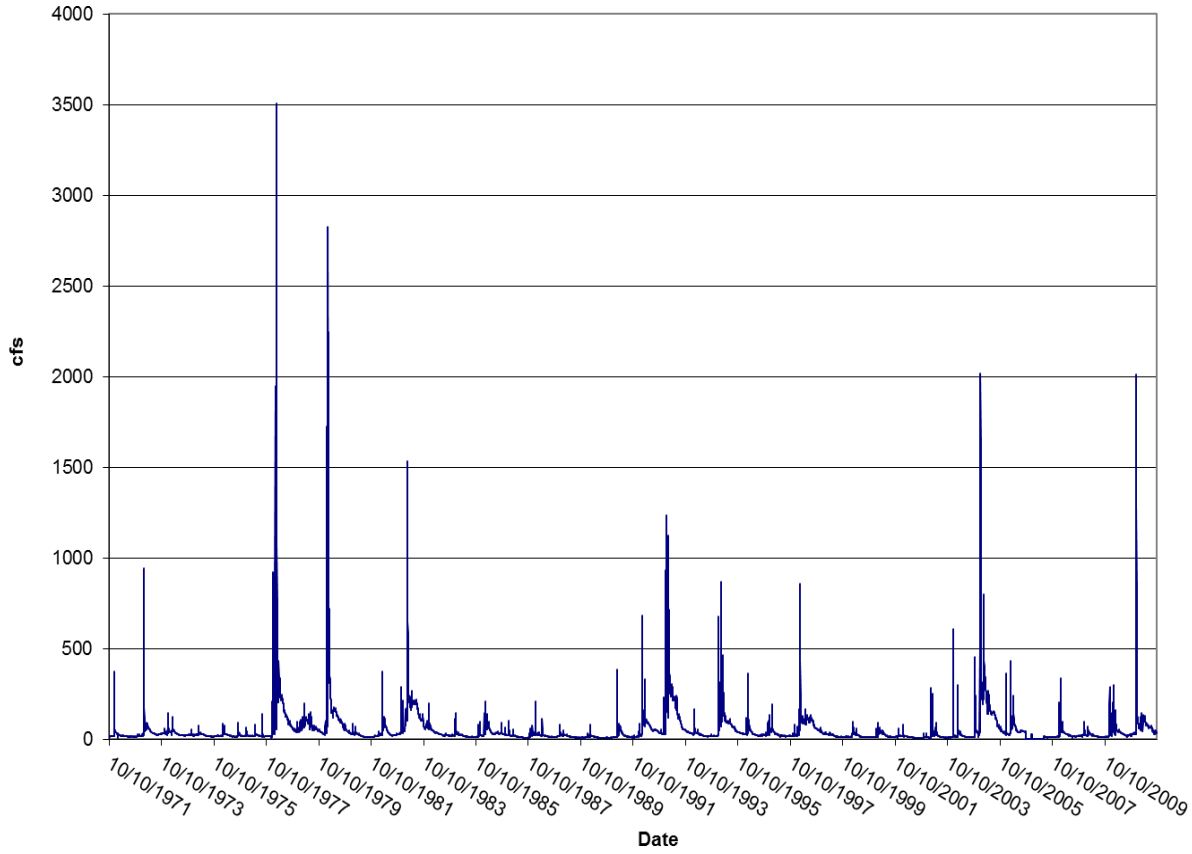

### STREAM FLOW

There is no stream flow gage upstream of the upper Southern California Edison (SCE) diversion. The USGS maintains a stream gauge in Lytle Creek which is located about 2.3 miles downstream from the upper SCE diversion and about a ¼ mile downstream from the end of infiltration gallery for the Grapeland Tunnel (site 11062000). Therefore, total flow is calculated by summing: 1) the upper diverted flows by SCE (site 11060900), 2) the infiltrated flow from the Grapeland Tunnel (site 11061000), and 3) site 11062000.

Flow records for the infiltration tunnel flows and the SCE diverted flows began in 1971, however records for site 1106200 date as far back as 1918. Over the entire period of record (1918-2011), the maximum mean daily discharge as measured at this site was 25,000 cubic feet per second (cfs) in March 1938, and the minimum mean daily discharge was 2.4 cfs in February 2003.

**Figure 2-5** shows the total flow in Lytle Creek from 1971 to 2011. For this 40-year period of record, the average mean daily discharge was 48.4 cfs, and the median mean daily discharge was 23.7 cfs.

**Figure 2-5**
**Mean Daily Discharge for Lytle Creek, 1971-2011**




Historically, the Lytle Creek area has experienced heavy floods. During the 1969 floods, private development near the confluence of the North, Middle and South forks of Lytle Creek sustained severe damage. Catastrophic floods also occurred in 1938 and 1980.

### DIVERSION FROM LYTLE CREEK TO WEST VALLEY WATER DISTRICT

The Lytle Creek source for WVWD is diverted from Lytle Creek at two facilities along the creek. There is an upper diversion that is owned and operated by SCE and a lower intake structure that is owned by Fontana Union Water Company (FUWC) and operated by Fontana Water Company (FWC). Infiltrated groundwater is also collected from the Grapeland Tunnel by FUWC and blended with the diverted surface water.

SCE diverts water through the Fish Wheel and Sand Box into the upper diversion, and the flow is then conveyed by a penstock pipeline to the SCE Fontana Powerhouse where it is used for power generation. The upper SCE diversion is located

approximately four miles north of the lower intake structure. Please see **Figure 2-6** for a diagram showing facility locations.

Creek flow remaining in Lytle Creek after the upper SCE diversion may either continue downstream or it can infiltrate into the ground and be captured in the Grapeland tunnel. According to the 2008 Watershed Sanitary Survey Update Report, the tunnel length was to be 2,850 feet and 4.5 feet wide and 6.5 feet high. Any surface flow in the creek remaining after the upper SCE diversion and infiltration into the Grapeland Tunnel is diverted into the lower intake structure through an earthen diversion dam (soft plug). This soft plug is constructed to blow out in times of high storm/runoff flows. During high storm/runoff flows all water flows are diverted back into the stream. The lower intake structure is located approximately three miles above the intersection of Riverside Avenue and Lytle Creek Road.

Water from the upper penstock pipeline and waters collected in the Grapeland Tunnel are joined at the FUWC weir 1 diversion structure intake, as well as additional surface flow. The blended water is then transported from the lower intake structure, via underground pipeline, approximately 25,000 feet to the Fontana Powerhouse Forebay owned by FUWC. Lytle Creek water is then transported from this Powerhouse Afterbay to an adjacent facility owned by WVWD. Raw water is delivered by gravity via a 30-inch diameter pipeline to the two 2.0 million gallon influent blending ponds at the Roemer WFF.

### WATER SUPPLY SYSTEM – WEST VALLEY WATER DISTRICT

#### Background

WVWD is a county water district and a public agency of the State of California. The District was formed in 1952 under the name Bloomington County Water Company, which was changed to Semi-tropic County Water District in 1959, then to West San Bernardino County Water District in 1961, and then to West Valley Water District in 2003.

The service area is 29.5 square miles, providing water service to portions of Rialto, Colton, Fontana, North Riverside County and the community of Bloomington. Currently, the WVWD has approximately 19,253 service connections, serving 60,985 water customers.

WVWD has four sources of water: local surface water from Lytle Creek, State Project Water, groundwater, and purchased water from the San Bernardino Valley Municipal Water District. WVWD currently utilizes water from five groundwater basins: Lytle Creek, Rialto, Bunker Hill, North Riverside, and Chino. **Table 2-1** provides the breakdown of water sources used for years 2009 through 2012.

**Table 2-1. Percent Breakdown of Water Sources Utilized by WVWD, 2009-2012**

| Year | Surface Water (local and SPW) | Groundwater | Purchased Well Water |
|---|---|---|---|
| 2009 | 21.5 | 66.6 | 11.9 |
| 2010 | 25 | 61 | 14 |
| 2011 | 27.5 | 58 | 14.4 |
| 2012 | 30.3 | 60.8 | 8.8 |

WVWD treats Lytle Creek flow based on the combined legal entitlements of the cities of Rialto and San Bernardino, and the WVWD. When Lytle Creek is not in proration, the maximum flows for each are as follows:

City of Rialto - 1,034 gallons per minute (gpm)
City of San Bernardino - 1,350 gpm
WVWD - 2,291 gpm
FUWC – receives remaining flow above three combined entitlements.

**Oliver P. Roemer Water Filtration Facility**

The Roemer WFF currently consists of a series of treatment processes. A significant expansion program was completed in 2007. This was focused on capacity expansion and upgrade of facilities to allow for increased use of State Project Water and Lytle Creek during periods of lower water quality.

The WFF currently operates under the 2012 permit which rates the plant capacity at 14.4 million gallons per day (mgd). The plant was classified as a conventional WTP by CDPH's Engineering Report and is therefore granted 2.5/2.0/2.0-log reduction credit for *Giardia*/viruses/*Cryptosporidium*.

The only major change to the Roemer WTP over the reporting period was in 2011, when the WVWD installed a six inch pipeline to convey backwash/decant water to the intake pre-treatment header. This decant flow cannot exceed ten percent of the plant flow. WVWD previously sent the backwash/decant water for non-potable irrigation at the El Rancho Verde Golf Course.

In order to provide additional solids removal for State Project Water, that water is sent to a pretreatment facility prior to blending with Lytle Creek water. The pretreatment facilities include a flow splitting structure with design capacity of 21.6 mgd and three high-rate conventional treatment trains with a capacity of 7.2 mgd for each train. Each train includes one flocculation basin (serpentine with three stages) and sedimentation basin (inclined plate settlers). Aluminum sulfate is used as the primary coagulant, with cationic polymer as a coagulant aid, and there is an option of using sodium hydroxide for pH control during pretreatment. The Lytle Creek source is typically sent directly to

the raw water blending reservoirs. The effluent from the raw water blending reservoirs is then sent to the filtration plant.

The filtration plant consists of six Microfloc Trident 840 package units which provide two-stage filtration. Chemical feed occurs at the influent to the plant and upstream of the Microfloc units. This includes pre-chlorination, coagulation with aluminum sulfate (alum), and cationic polymer as needed. Conventional filtration equivalent is provided by the package system consisting of contact absorption clarification and multi-media filtration. The filtered water is then sent through UV reactors for disinfection.

If TOC levels in the filter plant effluent water need to be further reduced prior to disinfection then a portion of the stream will be sent to the GAC filters and then blended back in the filter plant effluent. Finally, the water is post-chlorinated in a chlorine contact tank to provide a distribution system disinfectant residual.

WVWD has long-term plans to construct a 6.0 mgd microfiltration plant to treat State Project Water or Lytle Creek water, and increase the treatment capacity from 14.4 mgd to 20.4 mgd. This is called the Phase 4 Expansion, but this project is not anticipated to start within the next five years.

# SECTION 3 – LYTLE CREEK WATER QUALITY REVIEW

This section first provides an overall review of the water quality data available for Lytle Creek at the Southern California Edison (SCE) and Fontana Union Water Company (FUWC) diversion locations. There was one ambient water quality monitoring program in the study area with available drinking water constituent data for the study period; January 1, 2008 through December 31, 2012. This study was conducted by the California State University at San Bernardino Water Resources Institute. Other agencies contacted include: United States Geological Survey, San Bernardino County Stormwater Program, Santa Ana Regional Water Quality Control Board, Surface Water Ambient Monitoring Program (SWAMP), and California Environmental Data Exchange Network (CEDEN). Therefore the overall water quality review will be primarily based on the data collected by West Valley Water District (WVWD). **Appendix B** contains a summary of the Oliver P. Roemer Water Filtration Facility (WFF) intake data used for this review.

This section then provides a review of the constituents of interest, including an explanation for their selection and a summary of the data obtained during the study period.

For assistance with abbreviations and acronyms, the reader is referred to the List of Abbreviations at the front of the Report.

### AMBIENT WATER QUALITY MONITORING – WATER RESOURCES INSTITUTE

In 2007, the California State University at San Bernardino received grant funding from the CALFED Bay-Delta program for a Lytle Creek Watershed Action Project. Other partners for this project were the WVWD, the San Bernardino Valley Municipal Water District, the U.S. Forest Service, and the Santa Ana Regional Water Quality Control Board. As part of this watershed project, coliform monitoring was conducted for two years from May 2008 to April 2010. **Figure 3-1** shows the locations of the five monitoring locations. From downstream to upstream, the monitoring locations were: Station 1 at Long Bridge, Station 2 at Fish Wheel, Station 3 at Green Mountain Ranch, Station 4 at Applewhite Picnic Area, and Station 5 at Happy Jack. It is important to note that Station 5 is actually downstream of Station 4 as the sampling location was collected at a small foot bridge at the most southern end of the Happy Jack development. In addition, samples for Station 5 were not collected from the main creek, but from a small tributary running through the development, right before it ties into the main creek at the Applewhite picnic area.

Samples were collected for total coliform, *Escherichia coli* (*E. coli)* and Enterococcus. Although total coliform is of interest, many results were reported as greater than 200 most probable number per milliliter (MPN/mL), which does not provide useful information for evaluation. The data set for *E. coli* is presented in **Figure 3-2** and **Table 3-1.**

**Figure 3-1. Monitoring locations for the Lytle Creek Watershed Action Project, 2008-2010**


**Figure 3-2. *E. coli* Monitoring Results from Lytle is Vital Watershed Action Project, 2008-2010**

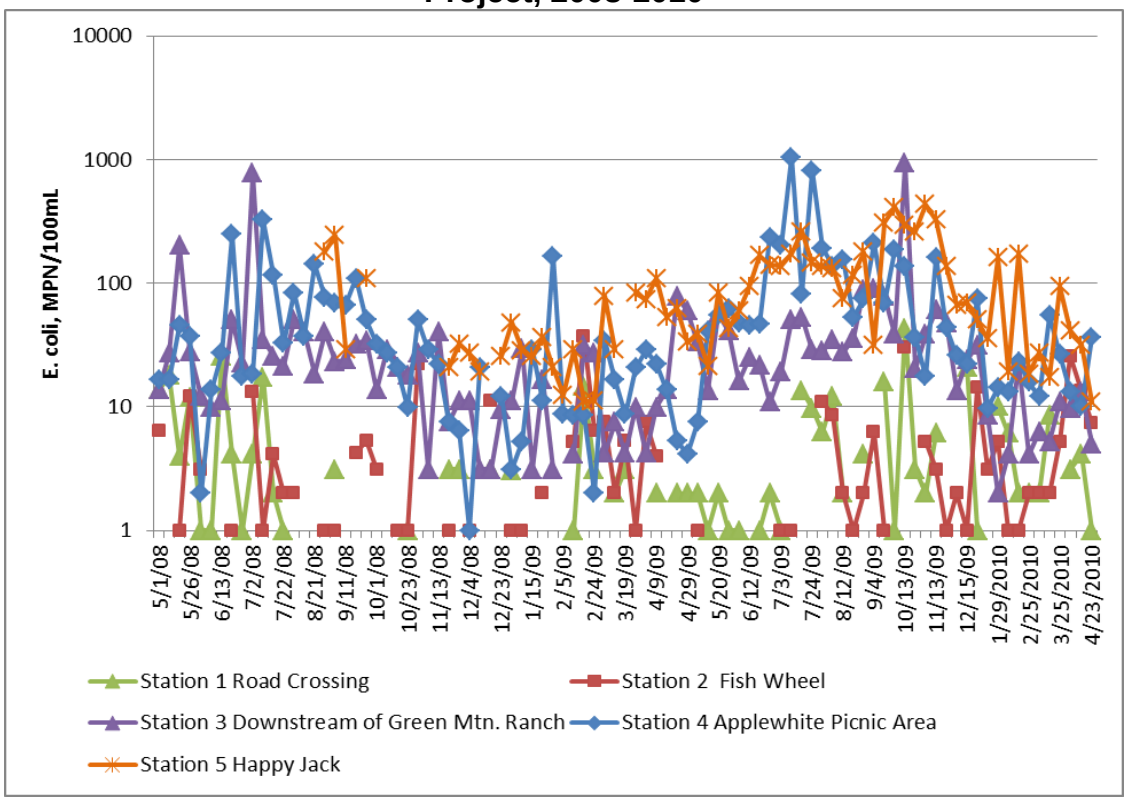


**Table 3-1. Data Summary for *E. coli* Monitoring Results from Lytle is Vital Watershed Action Project, 2008-2010**

| | Range, MPN/100mL | Average, MPN/100mL | Median, MPN/100mL |
|---|---|---|---|
| Station 1 | ND – 43 | 4 | 2 |
| Station 2 | ND – 37 | 3.8 | 1 |
| Station 3 | ND – 929 | 44.6 | 21.8 |
| Station 4 | 1 – 1046 | 74 | 28.8 |
| Station5 | 11 - 435 | 99 | 62.4 |

Interestingly, the *E. coli* levels appear to be the highest at the two most upstream locations; Applewhite picnic area and Happy Jack. The *E. coli* levels show a large decrease at Station 2, which is the Southern California Edison (SCE) upper diversion for the Lytle Creek source for WVWD. Additional information regarding potential contaminant source is discussed in **Section 4.**

### OVERALL WATER QUALITY REVIEW

The review of overall water quality is largely based on comparison of the Roemer WFF intake water (also called raw water) to drinking water standards for the constituents currently regulated. This includes all constituents with primary and secondary Maximum Contaminant Levels (MCLs) and unregulated constituents that have Notification Levels. In general, it is assumed that if the raw water is below these limits, then the treated water (also called finished water) will be also. There is an exception for aluminum because it is added to the water as the primary coagulant. MCLs and Notification Levels are typically based on treated water sample results.

Overall, Lytle Creek provides excellent quality water. The raw water is treated to meet drinking water standards using conventional filtration processes. There are no constituents present in the raw water that consistently require additional treatment processes. The individual intake evaluation for treated water and regulatory compliance is presented in **Section 5**.

Selected raw water data has been summarized and is included in the summary table below. **Table 3-2** shows the statistics for each selected constituent. It must be noted that the Roemer WFF periodically treats a blend of Lytle Creek and State Project Water (SPW). Some of the sample sites are representative of the Lytle Creek only source, but some of the data represents a blend of the two waters. This report will identify the sources represented in each data set evaluated. Also there were periods during the study where the plant was off-line, either due to raw water quality conditions, maintenance, or construction, and no data was collected during those periods.

**Table 3-2**
**Summary of Raw Water Quality Data for the Roemer WFF**

| Constituent | Units | Range | Average | Median | 95th Percentile |
|---|---|---|---|---|---|
| Turbidity[1] | NTU | 0.1 – 6.6 | 0.578 | 0.4 | 1.435 |
| Total Coliform[2,3] | MPN/ 100 mL | <2 - 3000 | 196 | 80 | 800 |
| Fecal Coliform[2,3] | MPN/ 100 mL | <2 - 170 | 16 | 8 | 50 |
| *E.coli*[2,3] | MPN/ 100 mL | <2 - 170 | 12 | 4 | 30 |
| *Giardia*[4,5] | cysts/L | 0 | 0 | 0 | 0 |
| *Cryptosporidium*[4,5] | oocysts/L | 0 – 0.095 | 0.004 | 0 | 0 |
| Total Organic Carbon[2,6] | mg/L | <0.3 – 0.63 | 0.39 | 0.4 | 0.63 |

[1]Based on peak daily value for raw water turbidity, representing a blend of Lytle Creek and SPW, from January 1, 2008 through December 31, 2012 during operational periods only
[2]Based on Lytle Creek Only at SCE Afterbay
[3]Total and fecal coliform based on data from January 1, 2008 through December 31, 2012 and *E.coli* based on data from January 1, 2008 through November 30, 2009
[4]Based on a Blend of Lytle Creek and SPW
[5]Based on data from April 2007 through March 2009
[6]Based on data from November 2011 through December 2012

### SELECTED CONSTITUENT REVIEW

This section contains a general discussion of selected water quality constituents and the reasons why they were selected for further evaluation. The constituents selected for further review in this section include turbidity, total coliform, fecal coliform, *E. coli*, *Giardia*, *Cryptosporidium*, and total organic carbon (TOC). The constituents' general characteristics, seasonal and historical trends, and significance with respect to existing and potential future regulations are presented, along with data analysis and review. Additional evaluation of these constituents, with respect to treated water quality and regulatory compliance, is presented in **Section 5**.

The constituents selected for further review were selected based on several criteria including; existing or upcoming regulatory standards, critical operational evaluation parameters, and relevance to significant potential contaminating activities. These items are discussed in the background section for each constituent. **Table 3-3** shows the relationship between potential contaminating activities and water quality constituents.

**Table 3-3**
**Relationship Between Potential Contaminating Activities and Water Quality**

| | Wastewater | Recreation | Floods/ Erosion | Spills | Fires | Developments |
|---|---|---|---|---|---|---|
| Turbidity | √ | √ | √ | | √ | √ |
| Microbial Constituents | √ | √ | √ | √ | | √ |
| TOC | √ | | √ | | √ | √ |

## Turbidity

### *General Characteristics and Background*

Turbidity is the measurement of light scatter in water and provides a measure of the degradation of clarity in water. Clarity is typically degraded by suspended colloids and fine suspended solids such as clay, organic particulates, and microorganisms such as *Giardia* and *Cryptosporidium*, if present. Turbidity is measured to evaluate the efficiency of the treatment process at removing these particles and also to comply with regulatory requirements.

Turbidity was selected for further evaluation since most utilities, including WVWD, optimize pretreatment processes to maximum turbidity removal in order to reduce the potential for pathogens, such as *Giardia* and *Cryptosporidium*, in treated drinking water. Turbidity is monitored throughout the water treatment plant to ensure that particles are removed. Turbidity has been assumed to be an indicator organism for the presence of *Giardia* and C*ryptosporidium*. However, turbidity alone may be a poor predictor of microbiological quality.

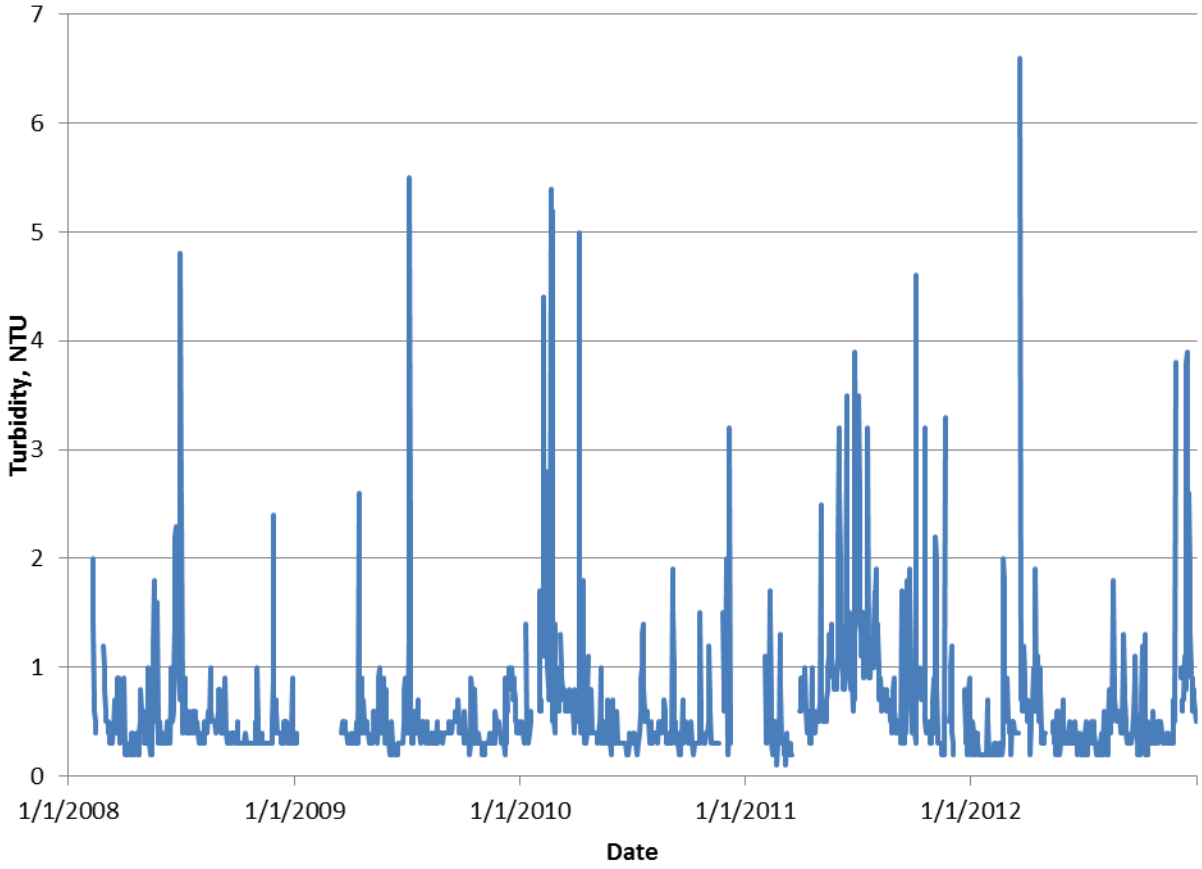
Current drinking water regulations require that the combined filtered effluent be less than 0.3 nephelometric turbidity units (NTU) in 95 percent of monthly measurements and the turbidity may never exceed 1 NTU. Continuous turbidity monitoring for individual filters is required. Turbidity has also been indirectly regulated in drinking water as part of the Filter Backwash Rule. This rule requires that recycled waste streams return to the plant headworks upstream of all chemical feed systems and recommends return at a controlled, small percentage of total flow (less than 10 percent) to ensure that chemical feed is adjusted for blended water quality, including potential increases in turbidity caused by recycle streams.

High turbidity levels in surface water sources, such as creeks and lakes, are typically the result of erosion and sediment transport during precipitation and high flow events, and are undesirable because high turbidity can mask the presence of harmful particulates. The principal source of turbidity is general watershed runoff, and can also be contributed by other potential contaminating activities such as fires, floods/erosion, and wastewater. It is common for turbidities to vary seasonally as a result of precipitation and flow. It has also been found that the presence of suspended matter can interfere with disinfection of microorganisms.

### *Evaluation*

Turbidity has been selected for evaluation not only because it is a regulated constituent, but also because it is commonly used as an indicator of general water quality and overall plant performance. The average, median, minimum, maximum, and 95$^{th}$ percentile has been summarized for the plant influent at the Roemer WFF in **Table 3-2,** keep in mind that this represents Lytle Creek blended with SPW. A timeseries plot has been developed for peak daily raw water turbidity from January 1, 2008 through December 31, 2012 for the Roemer WFF (**Figure 3-3)**.

**Figure 3-3**
**Peak Daily Raw Water Turbidity for the Roemer WFF**




Turbidity did not correlate well with either local precipitation or flow in Lytle Creek. This is likely due to the influence of the solids load associated with the SPW, which is blended in upstream of the plant influent turbidity reading location. Turbidity fluctuated through the study period, without consistent trends. However, there was an extended peaking period during the spring/summer of 2011. No specific activities in the watershed were able to be attributable to this increase.

### *Summary of Results for Turbidity*

- The raw water turbidity data reflects the plant influent water, after the Lytle Creek source is blended with SPW.
- The Roemer WFF has relatively low levels of raw water turbidity, with an average value less than 1 NTU.
- There are no clear trends in the data, turbidity peaks generally occur during the wet season, between October and April, but can also occur during the spring and summer months.
- There was an extended period of higher turbidity values during the late spring/summer of 2011; there is no clear cause of the increase.

## Microbiological Constituents

### *General Characteristics and Background*

The major microbiological constituents of concern include total coliform, fecal coliform, *E. coli*, *Giardia lamblia*, and *Cryptosporidium parvum*. Generally speaking, pathogenic organisms carried by mammalian species may be infectious to humans although this depends on the species of micrororganism. Pathogens infecting other types of animals, such as birds and reptiles, are usually not infectious to humans. However, some types of animals, such as birds, may be vectors for human pathogens. Each of these constituents was identified for further evaluation because they are currently regulated. The presence of the constituents in the raw water governs the overall treatment requirements for the water treatment plants.

Coliform and *E. coli* have been used to indicate the potential presence of pathogenic microorganisms in source waters. Although coliform levels have not been shown to correlate well with pathogenic microorganisms, they continue to be used as indicators due to the lack of affordable and reliable direct analytical methods for detecting pathogens. The USEPA has determined that the most practical surrogate for protozoa at this time is *E. coli*, as required under the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR). Potential sources of coliform bacteria include general watershed runoff, agricultural drainage, recreation, wastewater, urban runoff, and animal populations. Coliform levels in treated water are currently regulated directly through the Total Coliform Rule, to ensure the effectiveness of the disinfection process throughout the distribution system.

*Giardia lamblia* is a species of the protozoa genus *Giardia* that infects humans and can cause the gastrointestinal disease giardiasis. *Giardia* is found in the environment as a cyst from the feces of humans and animals; both wild and domestic animals may be hosts. Sources close to waterbodies have the most potential to introduce viable cysts to the source water. Cysts may be destroyed naturally in the environment by desiccation and/or heat. The cysts are effectively inactivated using chlorine disinfection. The detectability of *Giardia* has been greatly improved with USEPA Method 1623, which is better able to establish concentrations, but still does not determine viability. *Giardia* may

be carried in urban runoff and wastewater sources or may be contributed directly as a result of body-contact recreation or animal defecation.

*Giardia lamblia* is currently regulated by the Surface Water Treatment Rule (SWTR) and the Interim Enhanced Surface Water Treatment Rule (IESWTR). Surface water supplies must provide for 3-log reduction of *Giardia* through physical removal and chemical inactivation. Additional reduction may be required for impaired water supplies. The USEPA provided guidance with the SWTR that indicated additional reduction would be appropriate if measured *Giardia* levels in the source water were greater than 0.01 cysts per liter. However, in the 1980's there was no practical means to measure *Giardia*, therefore the California Department of Public Health (CDPH) prepared guidance under the SWTR that indicated that 3-log reduction would likely be appropriate when monthly median levels of total coliform in the raw water were less than 1,000 most probable number per 100 milliliter (MPN/100 mL). In recent years CDPH has allowed for the substitution of fecal coliform or *E. coli* levels in raw water since they are more specific indicators. The CDPH have set the guidance level for increased treatment at raw water monthly fecal or *E. coli* median levels greater than 200 MPN/100 mL, based on the historic ratio of five total coliform to one fecal coliform.

*Cryptosporidium parvum* is a species of the protozoa genus *Cryptosporidium* that infects humans and can cause the gastrointestinal disease cryptosporidiosis. *Cryptosporidium* is found in the environment as an oocyst principally from the feces of domestic animals, although both wild and domestic animals are known to be hosts. Like *Giardia*, *Cryptosporidium* oocysts may be destroyed naturally in the environment by desiccation and/or heat. Once in the source water, however, viable oocysts are very resistant to traditional chemical inactivation using chlorine. Stronger disinfectants such as ozone or ultraviolet (UV) light are required to inactivate these pathogens. The detectability of *Cryptosporidium* has been greatly improved with USEPA Methods 1622 and 1623, which are able to establish truer concentrations, but still do not determine viability. *Cryptosporidium* may be carried in urban runoff and wastewater sources or may be contributed directly as a result of body-contact recreation or animal defecation.

*Cryptosporidium* is currently regulated through the IESWTR and the Long Term 1 ESWTR (LT1ESWTR), which require 2-log reduction, and the LT2ESWTR which potentially requires additional log action based on source water monitoring results for *Cryptosporidium*. Under the IESWTR and LT1ESWTR well-operated conventional and direct treatment plants are granted a 2-log removal credit for *Cryptosporidium* if they meet all treated water turbidity standards. The LT2ESWTR further regulates *Cryptosporidium* and requires additional action (treatment or protection) if the source water quality is determined to be impaired based on direct *Cryptosporidium* monitoring of the source, with a running annual average level greater than 0.075 oocysts per liter.

The CDPH also developed the *Cryptosporidium* Action Plan (CAP) in the mid-1990's to address *Cryptosporidium* while federal regulations were being formed. The CAP identified recommended turbidity limits for settled water, treated water and recycled water in lieu of treated water *Cryptosporidium* levels. The CAP was developed to help

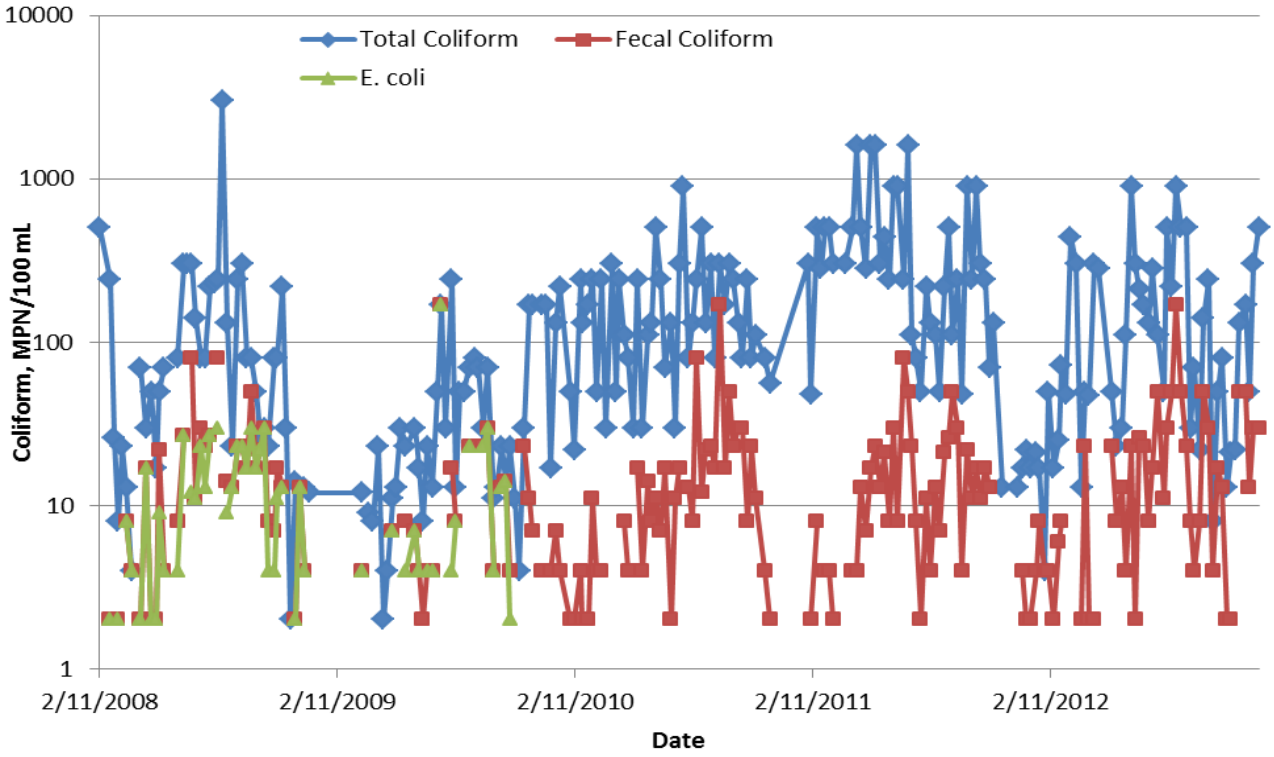
utilities optimize treatment processes to ensure maximum removal of *Cryptosporidium* oocysts and reduce the risk of waterborne illness. This plan was intended for utilities with over 1,000 service connections.

### *Evaluation for Total Coliform, Fecal Coliform, and E. coli*

WVWD monitored the raw water for total coliform and fecal coliform on a weekly basis for the Lytle Creek source, at the SCE Afterbay which is indicative of Lytle Creek water only. *E. coli* monitoring was also conducted between January 2008 and November 2009. WVWD currently has a CDPH water supply permit requirement that triggers additional log reduction for *Giardia* and viruses when the monthly median value for total coliform exceeds 1,000 MPN/100 mL. Alternatively, CDPH does allow other water utilities to use monthly median fecal coliform or *E. coli* levels as a guide for increased *Giardia*/virus treatment requirements, with 200 MPN/100mL as the designated level for increased log reduction. Many water utilities have opted to change their monitoring programs to focus on either fecal or *E. coli*, instead of total coliform, based on USEPA and CDPH regulatory direction.

WVWD has been monitoring total coliform weekly during the entire study period. **Figure 3-4** provides a timeseries plot of the coliform data during the study period.

**Figure 3-4**
**Lytle Creek at the SCE Afterbay Coliform, 2008 - 2012**



From the chart, a slight seasonal trend of increasing coliform levels can be seen from the late spring through the fall. This is evident for total coliform, fecal coliform, and *E. coli*. The highest levels of total coliform occurred during the late spring/summer of 2011. The potential contaminating activity (PCA) research conducted as part of this report did not show any clearly responsible cause for the increase in coliform. The Roemer WFF operator's log book noted a suspicion of an illicit discharge from the pond system at the Mountain Lakes Resort during this period.

Monthly median data for coliform is used to determine the appropriateness of the level of treatment for *Giardia* and viruses. A monthly median was calculated each week (based on the previous four samples) during the study period for total coliform and fecal coliform, that data is summarized in **Table 3-4**.

**Table 3-4**
**Calculated Monthly Medians for Coliform, MPN/100 mL**

| | Minimum | Maximum | Average |
|---|---|---|---|
| Total Coliform | 6 | 1050 | 157 |
| Fecal Coliform | 0 | 50 | 12 |
| *E. coli* | 0 | 26 | 9 |

The total coliform calculations shows that three, out of 223, calculated monthly medians were greater than 1,000 MPN/100 mL, thus triggering additional log reduction of *Giardia* and viruses as per the CDPH water supply permit. These occurred on May 10, 2011, May 17, 2011, and May 31, 2011. These calculations are provided in **Appendix A**. The calculations for fecal coliform and *E. coli* show that there were no monthly median values above 200 MPN/100 mL.

***Summary of Results for Total Coliform, Fecal Coliform, and E. coli***

- There is a seasonal trend for all coliforms, increasing between late spring and early fall.
- Total coliform data show generally low levels. Individual samples had an average value of 196 MPN/100 mL, a median value of 80 MPN/100 mL, and 98 percent of samples were less than 1,000 MPN/100 mL. Monthly medians had an average value of 157 MPN/100 mL, a median value of 100 MPN/100 mL and 99 percent of median values were less than 1,000 MPN/100 mL. Only three monthly median calculations, or 1.4 percent, triggered additional log reduction of *Giardia*/viruses under current permit conditions.
- Fecal coliform data show generally low levels. Individual samples had an average value of 16 MPN/100 mL, a median value of 8 MPN/100 mL, and 100 percent of samples were less than 200 MPN/100 mL. Monthly medians had an average value of 12 MPN/100 mL, a median value of 9 MPN/100 mL and 100 percent of median values were less than 200 MPN/100 mL.
- *E. coli* data show generally low levels. Individual samples had an average value of 12 MPN/100 mL, a median value of 4 MPN/100 mL, and 100 percent of samples were less than 200 MPN/100 mL. Monthly medians had an average

value of 9 MPN/100 mL, a median value of 6 MPN/100 mL, and 100 percent of median values were less than 200 MPN/100 mL.

- Peak levels of coliform occurred in 2011. There is no clear cause, and it is suspected that this may be related to possible illicit discharges from Mountain Lakes Resort ponds.
- Fecal coliform and *E. coli* data support 3/4-log treatment for *Giardia*/viruses is appropriate for all source water quality conditions during the study period.

### *Evaluation for Giardia and Cryptosporidium*

WVWD conducted the required monthly source water monitoring for *Cryptosporidium*, under the LT2ESWTR, from April 2007 through March 2009. The sample was also analyzed for *Giardia*. The sample was collected at the plant influent sample site, which represents a blend of Lytle Creek and SPW. These results are provided in **Table 3-5**.

**Table 3-5**
**Raw Water Protozoa Monitoring for the Roemer WFF**

| | *Giardia (cysts/L)* | | | *Cryptosporidium (oocysts/L)* | | |
|---|---|---|---|---|---|---|
| **Date** | **IFA[1]** | **DIC >2 structures[2]** | **DAPI+[3]** | **IFA[1]** | **DIC Structure[2]** | **DAPI +[3]** |
| 4/17/2007 | Not Reported[4] | | | 0 | 0 | 0 |
| 5/14/2007 | Not Reported[4] | | | **0.095** | Not Reported[4] | |
| 6/19/2007 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7/16/2007 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8/21/2007 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9/18/2007 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10/16/2007 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11/19/2007 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12/12/2007 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1/15/2008 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2/21/2008 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3/18/2008 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4/16/2008 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5/20/2008 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6/19/2008 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7/16/2008 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8/25/2008 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9/15/2008 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10/14/2008 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11/18/2008 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12/15/2008 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1/14/2009 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2/18/2009 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3/17/2009 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Average** | **0** | **0** | **0** | **0.004** | **0** | **0** |

[1] IFA – Immunofluorescence microscopy, all particles of correct size that fluorescent properly
[2] DIC – differential interference contrast microscopy, internal structures of protozoa identified and counted
[3] DAPI+ - 4',6-diamidino-2-phenylindole stain positive for protozoa

[4] Analytical laboratory did not report Gia*rdia* results for first two events and did not provide additional analysis information for 5/14/07 *Cryptosporidium* result

The data show that there have been no detects of *Giardia* during the 22 month sample period and only one sample with a detect of *Cryptosporidium* during the 24 month sample period. The maximum running annual average of the IFA results for *Cryptosporidium* is the regulatory compliance point under the LT2ESWTR. The maximum running annual average was 0.008 oocysts/L, well below the Bin 1 limit of 0.075 oocysts/L. The Roemer WFF received a Bin 1 classification of *Cryptosporidium* under the LT2ESWTR.

### *Summary of Results for Giardia and Cryptosporidium*

- Two years of monthly data show one sample with low-level detection of *Cryptosporidium* and no detect of *Giardia.*
- No detect of *Giardia* supports 3-log reduction is appropriate for the Roemer WFF.
- Maximum running annual average value for *Cryptosporidium* was 0.008 oocysts/L, well below the Bin 1 limit of 0.075 oocysts/L, resulting in Bin 1 classification with no additional action required under the LT2ESWTR.

## Disinfection By-Product Precursors (Total Organic Carbon)

### *General Characteristics and Background*

Disinfection By-Products (DBPs) are formed when disinfectants added to water react with naturally occurring organic matter or other constituents, such as bromide. Since Lytle Creek does not have detectable levels of bromide, total organic carbon is the key precursor for DBPs. The most common DBPs are total trihalomethanes (TTHMs), which are suspected carcinogens. Other DBPs, including haloacetic acids (HAA5), are suspected mutagens and teratogens. Potential sources of these organic precursors are plant matter, animal matter, and soil, which can be contributed by general watershed runoff, urban runoff, agricultural runoff, recreation, grazing, and wastewater sources.

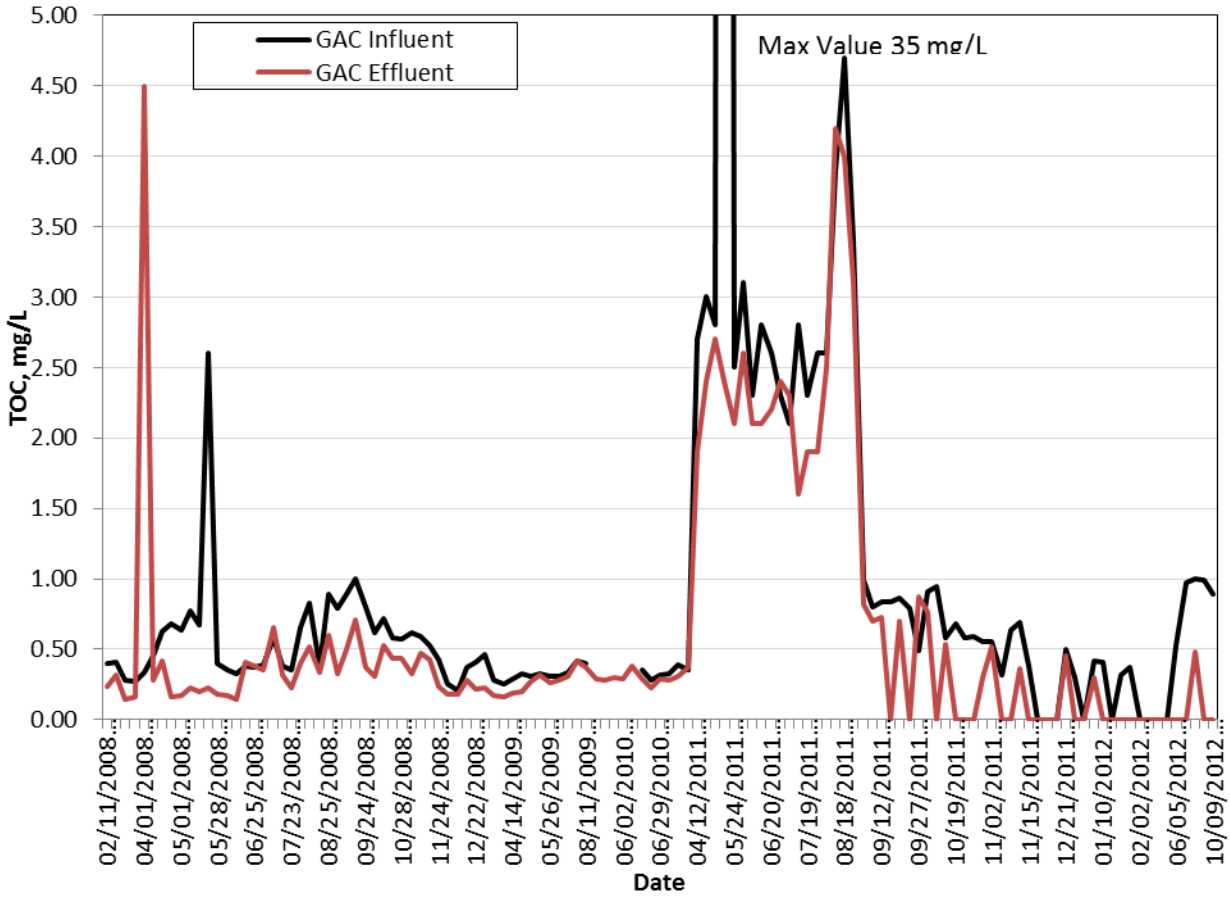
The Stage 1 Disinfectants/Disinfection Byproduct (D/DBP) Rule requires varying levels of TOC removal if the source water TOC concentrations exceed 2 mg/L and a utility uses conventional filtration. TOC was a selected constituent for further evaluation due to its importance in the formation of DBPs and also as a general indicator of organic contamination in water.

### *Evaluation*

The Lytle Creek source water was monitored at SCE Afterbay for TOC from November 2011 through December 2012. The data ranged from non-detectable to 0.63 mg/L, with an average of 0.39 mg/L and a median of 0.4 mg/L. There is insufficient data to identify seasonal trends or obvious impacts on the level of TOC.

The Lytle Creek source water enters the Roemer WFF and is frequently blended with SPW, which has higher TOC levels. The SPW is sent through the pre-treatment facility first, which provides TOC reduction prior to blending with the Lytle Creek source at the raw water blending reservoirs. The water moves through the plant to the Granular Activated Carbon (GAC) filters. The influent and effluent of the GAC filters was sampled periodically through the study period. The influent location had an average TOC level of 1.14 mg/L and a median TOC level of 0.53 mg/L. The effluent location had an average TOC level of 0.63 mg/L and a median TOC level of 0.3 mg/L. **Figure 3-5** shows the GAC influent and effluent TOC levels during the study period.

**Figure 3-5**
**Roemer WFF GAC Influent and Effluent TOC Levels, 2008 - 2012**




The data show that the TOC levels were generally below 1 mg/L in both the GAC influent and effluent. There was a small peak in May 2008, at 2.6 mg/L, when there was primarily the use of Lytle Creek water. This did not coincide with any spill event or rain event, and no other cause could be identified. There was a more significant, extended peak period during the late spring/summer of 2011. During this time there was a peak detect of 35 mg/L, and the source water for the Roemer WFF was 100 percent Lytle Creek water. This did not coincide with any spill or rain event either. In the operational

log for the Roemer WFF, it was noted that there was a suspected illicit discharge from the Mountain Lakes Resort pond to Lytle Creek.

***Summary of Results***

- The limited TOC data for the SCE Afterbay show very low levels, with all samples less than 1 mg/L in Lytle Creek.
- The larger data set at the GAC influent and effluent show that TOC levels at the Roemer WFF remain less than 1 mg/L.
- There was an extended peak of TOC in the GAC influent and effluent samples during the late spring/summer of 2011 which is not clearly related to any activity in the watershed, and may be related to an illicit discharge.

# SECTION 4 – WATERSHED CONTAMINANT SOURCES REVIEW

This section contains an evaluation of six potential contaminant activities (PCAs) which were selected for review for this Third Update of the Lytle Creek Watershed Sanitary Survey. The six potential contaminant activities are: (1) spills, (2) recreation, (3) wastewater, (4) development, (5) fires, and (6) floods/erosion. These PCAs were selected based on their presence in the watershed and their potential to impact Lytle Creek water quality.

## SPILLS

### Background

A hazardous material spill or leak into a surface water body could occur as the result of a vehicular traffic accident, pipeline leak or spill, wastewater treatment plant spill, or other incident. In the event of a leak or spill, timely notification is critical to ensure that the water treatment plant operators are provided with sufficient time and information to best respond to potential treatment concerns.

Spills of raw or partially treated wastewater occur from collection systems and from wastewater treatment plants. A sanitary sewer overflow (SSO) is any overflow, spill, release, discharge, or diversion of untreated or partially treated wastewater from a sanitary sewer system. Major causes of SSOs include grease, root and debris blockages; sewer line flood damage; manhole structure failures; vandalism; pump station mechanical failures; power outages; excessive storm or groundwater inflow/infiltration; improper construction; lack of proper operation and maintenance; insufficient capacity; and contractor-caused damage. Spills of raw or partially treated wastewater occur due to equipment malfunctions or operator errors at wastewater treatment plants. Spills also occur during storm events when stormwater infiltrates a wastewater collection system and the capacity of the wastewater treatment plant is exceeded.

### Seasonal Patterns

SSOs typically occur more frequently during the wet season, when stormwater can infiltrate a wastewater collection system or washout a pipeline carrying sewage.

### Related Constituents

The most common spills are related to oil and petroleum products or sewage. Therefore, typical constituents of concern range from volatile organic compounds (VOCs) and hydrocarbons to microbial constituents (i.e. viruses, pathogens, *Giardia, Cryptosporidium*). However, hazardous materials emergencies can involve a virtually infinite number of chemicals or chemical combinations.

### Occurrence in Watershed

There were four spills/incidents listed in the State Office of Emergency Services (OES) Hazardous Materials Release database from 2008 to 2012 within the watershed. Two of the spills involved sewage and two of the spills involved other substances and all are listed in **Table 4-1**.

The largest known SSO involving raw sewage occurred on October 14, 2008 when approximately 900 gallons of raw sewage was released from a manhole. It is estimated that approximately 100 gallons impacted Lytle Creek.

**Table 4-1**
**Summary of Spills/Incidents Occurring in Lytle Creek Watershed as reported to OES, 2008-2012**

| Discharger | Spill Date | Spill Location | Type of Spill | Cause of Spill | Volume (gallons) | Receiving Water |
|---|---|---|---|---|---|---|
| San Bernardino Co. Special District Water and Sanitation | 7/10/2008 | Lytle Creek Road and Middle Fork Road | Raw Sewage | Backup in sewer line causing manhole to over flow | 200, 25 gallons went into Lytle Creek | Lytle Creek |
| San Bernardino Co. Special District Water and Sanitation | 10/14/2008 | Eastside of Lytle Creek Road, 400 feet north of South Fork Road | Raw Sewage | County Road Dept. knocked over a manhole filled of debris causing release | 900, 100 gallons went into Lytle Creek | 800 gallons was contained by an earthen dam approx. 400 feet from manhole |
| Unknown | 4/4/2009 | LAT 34 17.159N, LONG 117 33.261W, in San Bernardino National Forest | Carburetor Cleaner | Illegal Dumping | 75 | Did not reach water |
| Unknown | 3/3/2012 | At South Fork Bridge Closest cross street is Lytle Creek Bridge | Diesel | Vandalism of construction equipment | Unknown | Did not reach water |

Source: State Office of Emergency Services

There were no chemical related spills due to traffic accidents. The main transportation route through the watershed is Lytle Creek Road.

The West Valley Water District (WVWD) is on the notification list to be contacted by the County of San Bernardino Special Districts County Service Area 70-S3 if a sewage overflow occurs. The time, location, and all known information concerning the overflow will be given. However, the WVWD did not receive notification for both SSOs in 2008.

### Related Water Quality Issues and Data Review

As discussed above, there were two sewage spills that impacted Lytle Creek. It cannot be determined if the source water to the Oliver P. Roemer Water Filtration Facility (WFF) was impacted for the July 10, 2008 SSO, since the closest *E. coli* samples were collected on July 8 and July 16, 2008. However *E. coli* levels were 23 MPN/100mL on July 16, 2008. *E. coli* levels were 22 MPN/100mL on October 14, 2008 when the second SSO occurred. Since the median *E. coli* level from January 1, 2008 through November 30, 2009 was 4 MPN/100mL these levels are an order of magnitude higher.

### Regulation and Management

When a hazardous materials spill or leak of a reportable quantity occurs, notification to an emergency response agency is required by state and federal law. A sewage spill is required to be reported if 1,000 gallons or more are released or if discharge goes to surface water or a drainage channel. An oil or petroleum product spill is required to be reported if 42 gallons or more are released. Any other hazardous materials spill is required to be reported if there is a reasonable belief that the release poses a significant present or potential hazard to human health and safety, property, or the environment. When a hazardous materials spill or leak occurs, it is the owner's or operator's responsibility to notify the local designated emergency response agency, which is called the Certified Unified Program Agency (CUPA), as well as the OES.

For the Lytle Creek watershed, the local CUPA is the San Bernardino Fire Department. The emergency response program is also under the jurisdiction of the San Bernardino Fire Department. As part of the emergency response program, the San Bernardino Fire Department would evaluate whether or not the material is hazardous, determine the extent of contamination, and would secure the site. Depending on the type of spill and where it occurred, other agencies such as California Department of Fish and Game, and the Santa Ana Regional Water Quality Control Board (Regional Board) may be involved. An incident report would then be sent to OES.

Historical hazardous hazmat spills were queried from the California Emergency Management Agency website:

http://www.calema.ca.gov/HazardousMaterials/Pages/Historical-HazMat-Spill-Notifications.aspx

The County of San Bernardino Special Districts Department (CSBSDD), County Service Area 70 S-3 is mandated to comply with the State Water Resources Control Board Order No. 2006-0003-DWQ. The State Water Board adopted Statewide General Waste Discharge Requirements (WDRs) for Sanitary Sewer Systems, Water Quality Order No. 2006-03 (Sanitary Sewer Order) on May 2, 2006 to have a consistent statewide approach to reducing SSOs. The Sanitary Sewer Order requires public agencies that own or operate sanitary sewer systems to develop and implement sewer system management plans (SSMPs) and report all SSOs to the State Water Board's online SSO database. Also, the State Board Sanitary Sewer Order was revised in 2008 (Order No. WQ 2008-0002) to require the discharger to notify the OES, local health agency and the appropriate Regional Board as soon as possible, but no later than two hours for sewage spills that discharge to a drainage channel or surface water. The Sanitary Sewer Order requires the owners and operators of sanitary sewer systems to take all feasible steps to eliminate SSOs and to develop and implement a system-specific SSMP. SSMPs must include provisions to provide proper operation and maintenance while considering risk management and cost. The SSMP must contain a spill response plan that establishes standard procedures for immediate response to an SSO in a manner designed to minimize water quality impacts and potential nuisance conditions. The SSMPs must be updated every five years. The CSBSDD completed their SSMP in February 2011.

The CSBSDD has an active wastewater spill response and reporting procedure for the Lytle Creek watershed. The SSMP states that all efforts will be made to contain, control and clean-up after all SSO occurrences. Also, corrective actions will be taken to prevent future occurrences.

Some of the major highlights for spill response procedures (as stated in the 2011 SSMP) are:

1) Assess spill and what is needed to contain or control spill and make work area safe;
2) Contain or control spill (i.e. direct spill with sandbags to a safe place or divert to a downstream manhole);
3) Sampling may be required;
4) Begin to relieve the stoppage using hydroflushing or mechanical rodding;
5) Provide rough estimate on spill volume;
6) Post area with proper warning signage;
7) Thoroughly clean the mainline sewer;
8) Conduct clean-up measures and ensure all liquids and solids are removed from the affected area, including washdown water;
9) Closed circuit television (CCTV) the sewer line following the cleaning;
10) Complete the spill report form to OES and local agencies.

The SSMP also states that when sewage enters receiving waters, the San Bernardino County Flood Control District must be notified and bacteriological sampling must be performed. Samples shall be collected for total coliform, fecal coliform and fecal

streptococci. The samples must be taken upstream of the entry point, just below the entry point, and distance downstream of entry point.

### Source Water Protection Activities

The WVWD is not currently engaged in specific source water activities regarding spills as a potential contaminant source.

In order to prevent sewage overflows, the CSBSDD has an annual goal of cleaning or televising ten percent of a service area's linear footage every year. Since the linear footage of Lytle Creek sewer lines is approximately 10.7 miles, at least one mile of sewer lines are cleaned or televised every year. There are known hot spots within the Lytle Creek area that are subject to infiltration during storm events, and the County targets these areas for more frequent cleaning.

In addition, the CSBSDD televises five percent of recently cleaned sewer lines as a quality assurance procedure to ensure the cleaning process was effective.

As the implementation of the SSMP is a relatively new program, the CSBSDD proposes to use the following monitoring and performance goals to gauge the effectiveness of the program:

- On an annual basis, compare the number of SSOs for each County Service Area.
- Compare the frequency and magnitude of sewer pump/lift station failures and SSOs in each County Service Area
- On an annual basis, monitor, document, and evaluate SSOs for any potential impacts to human health or the immediate environment
- Track miles of sewer pipeline cleaned, rehabilitated and replaced.

The CSBSDD indicated that the annual report was not currently available as of Spring 2013. The County also has on-going programs for manhole rehabilitation, smoke testing and slip lining the sewer lines.

There are no source water protection activities recommended at this time regarding spills.

### Summary of Findings for Spills

- There were four spills/incidents listed in the State OES Hazardous Materials Release database from 2008 to 2012.

- Two of the spills involved sewage and two of the spills involved diesel fuel and carburetor cleaner.

- The largest SSO involving raw sewage occurred on October 14, 2008 when 900 gallons of raw sewage was released from a manhole and 100 gallons impacted Lytle Creek. *E. coli* was sampled on the same day and results were 22 MPN/100mL, which is higher than the median *E. coli* value of 4 MPN/100mL, indicating that the source water was likely impacted by the spill.

- There were no chemical related spills due to traffic accidents. The main transportation route through the watershed is Lytle Creek Road.

- WVWD is on the notification list to be contacted by the CSBSDD County Service Area 70-S3 if a sewage overflow occurs.

## RECREATION

### Background

Recreational uses in the Lytle Creek watershed consist primarily of camping, picnicking, hiking, fishing, hunting, off-highway vehicle use, and swimming in the creek. The lack of open space in nearby urban areas, as well as hot temperatures in San Bernardino Valley, may explain why as many as 10,000 people visit Lytle Creek on summer weekend days.

As the population of San Bernardino County is projected to increase from 1.72 million to 2.56 million by 2025 (48.9 percent increase), the continued increase of visitors to Lytle Creek is expected. The watershed currently receives approximately 70,000 day-use visitors on an annual basis (Personal Communication, Melinda Lyon, U.S. Forest Service (USFS), February 2013).

### Seasonal Patterns

Although recreation occurs year-round, camping and swimming occur primarily from Memorial Day to Labor Day weekend.

### Related Constituents

Body contact recreation in general has long been known to be a source of pathogen contamination, resulting partly from personal sanitary conduct and partly from a natural shedding process. Pathogens shed by recreationalists include bacteria, viruses, and protozoa. Moreover, because their origin is human, microorganisms shed by recreationalists are transmittable to other humans.

### Occurrence in Watershed

#### *San Bernardino National Forest*

As stated above, Lytle Creek serves as year-round stream gathering place for urban families. The 2005 United States Forest Service (USFS) Land Management Plan states that water resources are affected by the large numbers of recreationalists that come into contact with the water. Access to the area is primarily gained through the County Road system with further dispersal of recreation via the national forest road system.

The USFS Land Management Plan states that unlawful activities, such as trash dumping, shooting, fire-building, unauthorized off-road vehicle use, graffiti, and property vandalism are reoccurring difficulties. Funding to mitigate these activities comes from the USFS recreation budget, but this funding is decreasing. Dispersed picnicking by large groups near the creek bed has resulted in large amounts of litter in the watershed. Heavy, continuous dispersed recreation impacts Lytle Creek, especially sanitation issues.

The San Bernardino National Forest has one developed campground located on the North Fork of Lytle Creek, the Applewhite Campground. The Applewhite Campground has 44 sites and no reservations are required. There are flush restrooms, but no showers or dump station. Across the road from the campground is a picnic area where visitors can find drinking water, tables, restrooms, and barbecues. There is easy access to Lytle Creek, where fishing and waterplay are popular. There have been no changes to these facilities over the past five years, and there are no new facilities planned for the Lytle Creek area in the near future (Personal communication, Melinda Lyon, USFS).

Lytle Creek is a popular location for swimming in the summertime. According to the USFS, people access the creek for swimming or waterplay at multiple locations along the creek, concentrated primarily along the canyon bottoms of the Middle and North Forks of Lytle Creek. The most popular sites are the Applewhite picnic area, the Middle Fork area, the Green Mountain area, and just upstream of where Southern California Edison (SCE) diverts water from the creek. In order to provide sanitation services for visitors to Lytle Creek, two portable restrooms were installed at the Lytle Creek Ranger Station year-round. Beginning in 1995, portable restrooms were installed at the Long Bridge (where road crosses creek), SCE intake, near Green Mountain Ranch, and the Applewhite campground to service the peak recreation season only (May through October). Permanent restrooms are located at the Lytle Creek ranger station, Applewhite campground, Applewhite picnic area, and Middle Fork.

There are also a number of undeveloped campsites located within the watershed, as shown in **Table 4-2.** The undeveloped campsites have no facilities or amenities, just a post and a fire ring.

**Table 4-2**
**Undeveloped Campgrounds Within Lytle Creek Watershed**

| Campground Name | Location |
|---|---|
| Paiute | North Fork Lytle Creek |
| Gobbler's Knob | North Fork Lytle Creek |
| Big Horn | North Fork Lytle Creek |
| Coldwater | North Fork Lytle Creek |
| Third Stream Crossing | Middle Fork Lytle Creek |
| Stone House | Middle Fork Lytle Creek |
| Commanche | Middle Fork Lytle Creek |
| Joe Elliot Tree Memorial | South Fork Lytle Creek |

Portions of the Pacific Crest Trail border the northern edge of the watershed, and the trailhead into the Cucamonga Wilderness area is the Middle Fork Trail Head**.** According to the USFS Land Management Plan, there is a lack of designated trails originating from the Applewhite campground and picnic area, as well as easy access loops for families hiking in the canyons.

The USFS also has a number of homes which are located on USFS land within the Lytle Creek watershed, primarily concentrated in the Happy Jack area. According to the

USFS, there are approximately 33 residences in the Lytle Creek area (Personal Communication, Jason Collier, USFS, December 2012). All of the current 33 residences are on a centralized sewer system. Please see **Appendix C** for a map of the residences.

The 20-year permits for the recreational residences located in the Lytle Creek area expired in 2008, but were renewed with no changes to the previous permit. There were no additional or new permits issued.

The Lytle Creek Firing Line is located on USFS land, but is operated by a private concessionaire.

### *Private Campgrounds*

The Bonita Ranch Recreational Vehicle (RV) Campground is located at 900 South Fork Road in Lytle Creek. There are 90 RV campsites, with 30 sites providing electrical, water and sewer hookups, and 60 sites providing electrical hookup only. There are two dump stations, showers, and public restrooms. Lytle Creek runs through the campground on the east end of the park. The creek is mostly for waterplay rather than swimming, as the stream bed is fairly rocky. There is also a waterfall within one mile of the campground.

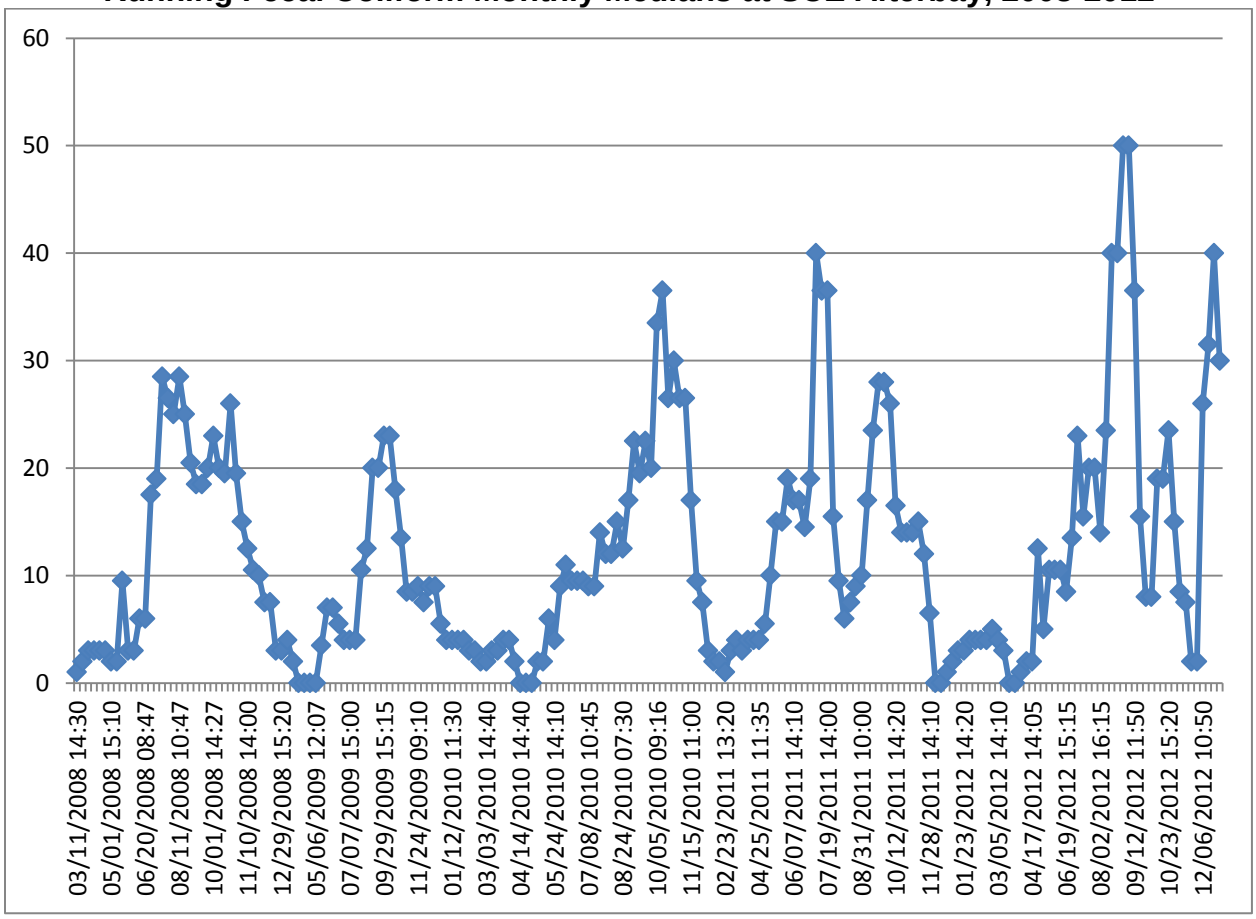
Mountain Lakes Resort is a members-only resort located at 277 Lytle Creek Road in Lytle Creek. There are 514 campsites with full hookups and six cabins available for overnight stay. The resort has two fishing lakes and Lytle Creek runs through the property. Other amenities are an on-site restaurant, three swimming pools, country store, paddle boats, and picnic areas.

### Related Water Quality Issues and Data Review

As shown in **Figure 4-1**, running monthly medians (calculated weekly) for fecal coliform sampled at the SCE Afterbay show increased concentrations during the summer months, when peak body-contact recreation occurs. Higher fecal coliform concentrations can start as early as May, and continue through October. However, the overall median for fecal coliform and *Escherichia coli* (*E. coli)* is low, at 8 most probable number per 100 milliliters (MPN/100mL) and 4 MPN/100mL, respectively. The fecal coliform median was derived from data beginning January 2008 through December 2012, and the *E. coli* median was derived from data beginning January 2008 through November 2009.

There were no detects of *Giardia* and only one detect of *Cryptosporidium* during the 24 months of monitoring data collected for the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) from April 2007 to March 2009.

**Figure 4-1**
**Running Fecal Coliform Monthly Medians at SCE Afterbay, 2008-2012**




## Regulation and Management

### *United States Forest Service*

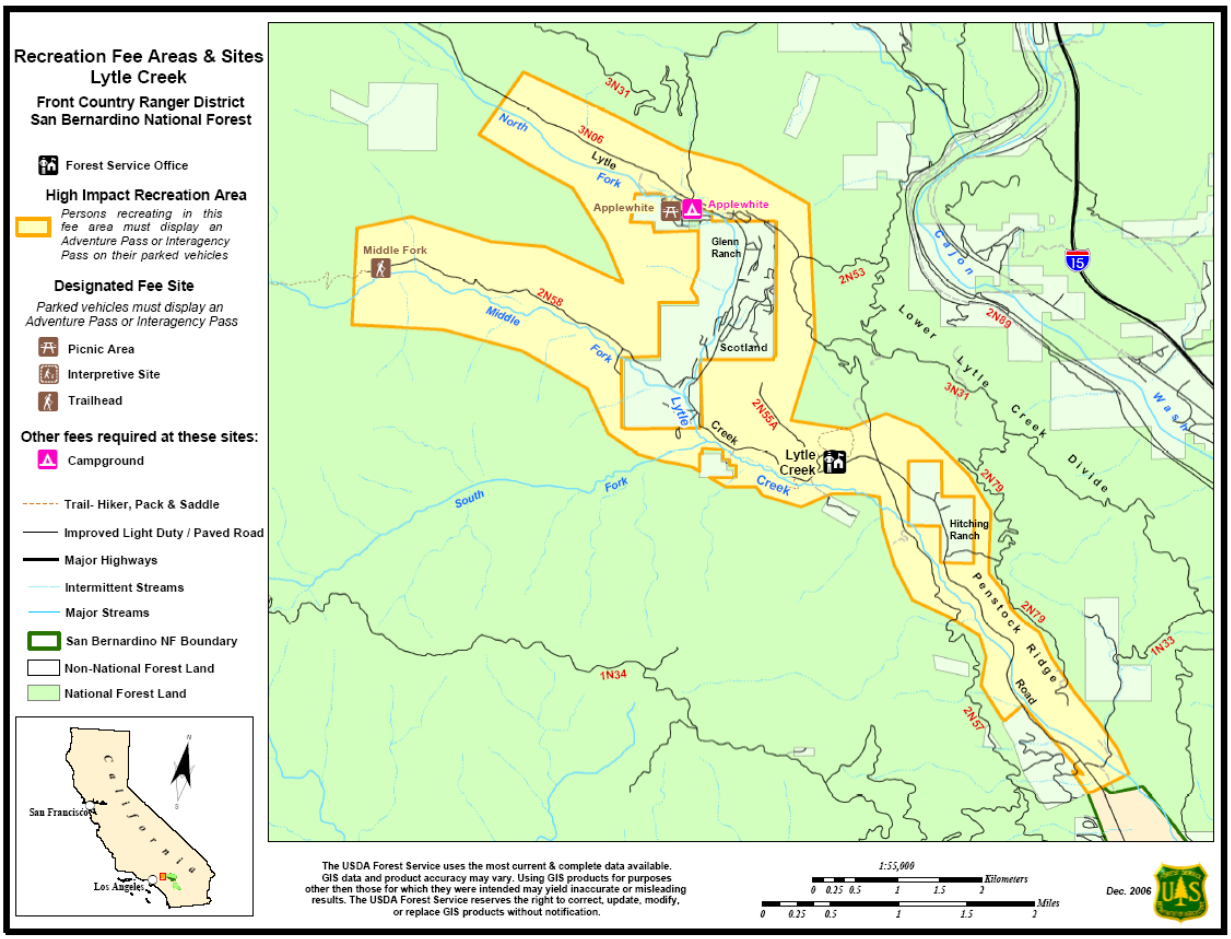
In 1996, the USFS began requiring an Adventure Pass for vehicles traveling to specific sites in the San Bernardino National Forest, and for heavily impacted recreation areas that have specific amenities including toilets, parking, trash receptacles, picnic tables, interpretation, and security. An adventure pass is required in high impact recreation areas, or at sites such as the Applewhite campground and picnic area, the Middle Fork Trail Head and the Lytle Creek Firing Line. **Figure 4-2** shows the designated fee sites and the high impact recreation area for the Lytle Creek watershed.

At the same time the Adventure Pass was implemented, the USFS began controlling the number of visitors by setting up a checkpoint at the mouth of the canyon on the five predicted busiest days of the year and closing the road when the vehicle capacity is reached. In 2012, the road was closed on the Sunday of the following weekends: Memorial Day, Fourth of July, and Labor Day.

The Adventure Pass has been challenged in Arizona and Colorado, and most recently for the Los Padres, Angeles, Cleveland and San Bernardino National Forest. The USFS is evaluating individual fee areas and may decide to no longer collect fees for certain areas. However, they indicated that that the Lytle Creek designated fee area is one of their top priority areas to retain for fee collection as it is a high-use area (Personal communication, John Miller, February 2013). All of the portable restrooms and trash cans are funded by the Adventure Pass.

The WVWD sent a letter to the USFS in April 2013 **(Appendix D)** to support the continued collection of Forest Adventure Pass fees in Lytle Creek. As stated in the letter "WVWD is concerned that without requiring a Forest Adventure Pass fee, the numbers of recreators will increase and levels of total coliforms and *E. coli* will increase, which will negatively impact our treatment requirements and is not in the best interest of our consumers."

**Figure 4-2**
**San Bernardino National Forest Recreation Fee Areas and Designated Fee Sites for the Lytle Creek Watershed**




Source: San Bernardino National Forest Website

The USFS is the site operator for the Applewhite Campground and picnic area. The USFS does not have resources to actively manage people swimming in Lytle Creek, but

have installed portable restrooms along the creek to minimize contamination of the creek.

### *Mountain Lakes Resort*

The Mountain Lakes Resort used to hold a National Pollutant Discharge Elimination System (NPDES) permit for lake overflow and lake drainage discharge for their two fishing lakes and recreational lagoon. According to the permit (Order 86-93), the waters in the lakes and lagoon were treated with chemicals containing copper for weed and algae control. The permit was rescinded by the Regional Board in 1992. WVWD staff has visited the Mountain Lakes Resort in the past and noted the use of aluminum sulfate for the fishing lakes.

According to the Regional Board, the Mountain Lakes Resort diverted Lytle Creek water into their recreational fishing ponds and continuously flowed the same amount of water back into the creek at the time the permit was rescinded. Occasionally, discharge would occur during heavy storms, but the facility was not allowed to drain their ponds. (Personal Communication, Gary Stewart, Regional Board, February 13, 2008).

The permit was rescinded in 1992 for a number of reasons: 1) chemical use at the Mountain Lakes Resort was minimal, 2) the facility had been monitored by the Regional Board for ten years without any issues, and 3) the discharge was considered not to be a waste discharge. The WVWD is concerned about the Mountain Lakes Resort, as it is suspected that the bottom waters and sediment of the fishing lakes are periodically drained into Lytle Creek. This concern was noted in the 2008 Watershed Sanitary Survey Update and WVWD continue to experience occasional spikes in turbidity, coliform, and total organic carbon (TOC) in their source water, which is believed to be associated with the flushing/draining of the fishing lakes. **Section 3** notes elevated coliforms and TOC in the Lytle Creek source water beginning in May 2011 and continuing through the summer. The Roemer WFF operator's log book noted a suspicion of an illicit discharge from the pond system at the Mountain Lakes Resort in May 2011.

As stated in the 2008 Update Watershed Sanitary Survey, the Regional Board encouraged the WVWD to contact them whenever they see a change in water quality (i.e. turbidity spike) for Lytle Creek during dry weather, and indicated that Regional Board staff could investigate further. However, it is difficult to provide a timely sample to the Regional Board to provide evidence of the flushing. WVWD is working on installing a turbidimeter at Fish Wheel to provide early warning.

### *Green Mountain Ranch*

Green Mountain Ranch is located at 955 Lytle Creek Road, and is currently used for weddings, special events and private parties. There is one pond on the property which is fed by diverted water from Lytle creek, and the pond outlet then returns water back to

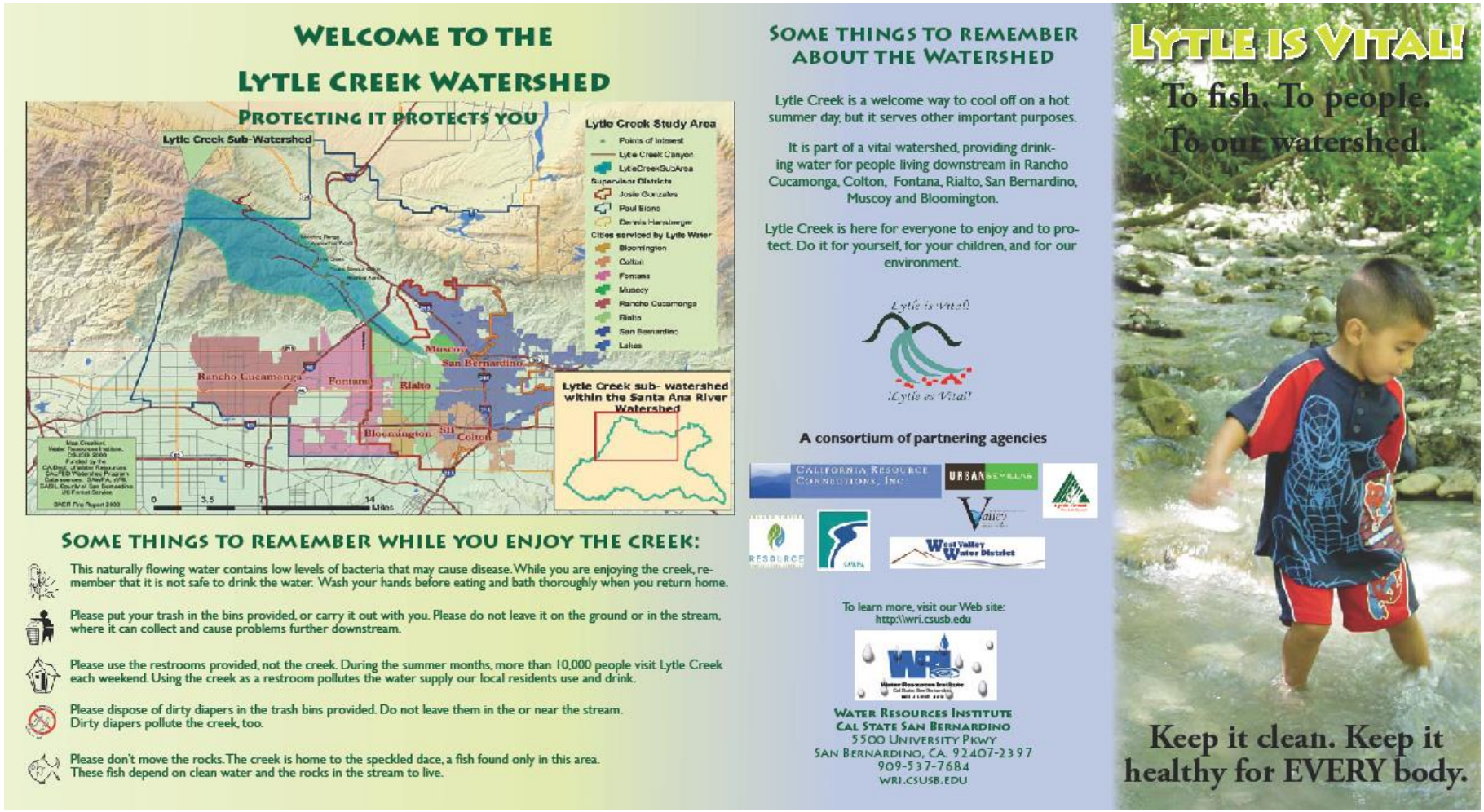
the main stem of Lytle Creek. There is no body contact or fishing conducted at the pond.

### Source Water Protection Activities

As stated in the 2008 Update Watershed Sanitary Survey, the California State University at San Bernardino Water Resources Institute was able to obtain $264,500 in CALFED funding for a "Lytle is Vital" watershed action project in 2007. The project was a series of smaller projects which primarily focused on public outreach to schools as well as on-site education at Lytle Creek. A flyer was developed (**Figure 4-3**) to educate visitors about keeping Lytle Creek clean and was distributed at the Ranger Station. The brochure is still currently distributed at the Ranger Station. A watershed restoration/ trash clean-up day occurred in September 2010. Additionally, water quality monitoring for coliforms was conducted at five locations along Lytle Creek from May 2008 to April 2010. The results of this study showed that the two most upstream locations (Happy Jack, Applewhite picnic area) had the highest median and average for *E. coli*, see **Section 3** for the data presentation.

The Southern California Mountains Foundation Urban Conservation Corps will collect trash from Lytle Creek once a week during the summer of 2013. According to USFS staff, this will provide much needed litter abatement as their own staff has been reduced. USFS staff also indicated that additional trash cans will be placed downstream of the ranger station, from the ranger station to Long Bridge in summer of 2013.

**Figure 4-3. Educational Pamphlet for Lytle is Vital Watershed Project**



### Summary of Findings for Recreation

- Recreational uses in the Lytle Creek watershed are primarily for camping, picnicking, hiking, fishing, hunting, off-highway vehicle use, and swimming in the creek. The watershed currently receives approximately 70,000 day-use visitors on an annual basis, and can experience as much as 10,000 visitors on peak summer weekends.

- The USFS does not have resources to actively manage people swimming in Lytle Creek. However, the USFS have placed portable restrooms at key locations along Lytle Creek from May through October to provide sanitation facilities for visitors.

- Water quality data collected to date indicate that fecal coliform levels at the SCE Afterbay increase in the summertime, likely as a result of body contact recreation in Lytle Creek.

- In April 2013, WVWD sent a letter to the USFS to support the continued collection of Forest Adventure Pass fees in the Lytle Creek watershed.

- WVWD continues to have unexplained spikes of turbidity, coliforms and TOC in the Lytle Creek source water which is suspected to be from Mountain Lakes draining/flushing their fishing lakes.

## WASTEWATER

### Background

Various types of wastewater facilities such as wastewater treatment plants and septic systems will be discussed in this section.

Wastewater is known to contain pathogenic microorganisms. Wastewater treatment plants remove and/or inactivate some, though not all, of these organisms through various treatment processes.

### Seasonal Patterns

There are no wastewater treatment plants which discharge treated effluent directly to Lytle Creek. There is one wastewater treatment plant in the watershed, the Lytle Creek wastewater treatment plant, which is operated year-round by the CSBSDD County Service Area 70-S3.

### Related Constituents

Wastewater is a blend of sewage, washwater from showers, kitchens, etc., and any effluent from industrial facilities within the sewer collection system. Potential contaminants of concern in wastewater include microbial pathogens (such as bacteria, viruses, and protozoa), TOC, nutrients, VOCs, and synthetic organic compounds (SOCs). Septic tank effluent typically contains high concentrations of total dissolved solids (TDS), chlorides, phosphates, nitrates, bacteria, and viruses.

### Occurrence in Watershed

#### *Lytle Creek Wastewater Treatment Plant*

About 90 percent of the residences within the Lytle Creek watershed area are provided centralized sewer service by the CSBSDD County Service Area 70-S3 (Lytle Creek Community Plan, 2007). The main communities within the watershed are Happy Jack, Scotland, Bonita, and the Applewhite Campground. As of June 2010, the population served by the County Service Area 70 S-3 was 1,290. **Figure 4-4** shows the 70-S3 County Service Area.

The sewer collection system is approximately eleven miles of gravity flow pipeline, ranging in size from 6-inches to 10-inches in diameter. The sewer collection system consists of approximately 52,800 linear feet of 8-inch polyvinyl chloride (PVC) gravity sewer mains, approximately 2,000 linear feet of 6-inch PVC gravity sewer mains and approximately 14,400 linear feet of 4-inch house laterals (County of San Bernardino Special Districts Department, 2011). Additionally there are approximately 1,300 linear feet of 6-inch PVC force main feeding the Lytle Creek wastewater treatment plant, and

approximately 2,600 linear feet of 4-inch force main and two lift stations. Lift Station #1 is located on the western portion of Lytle Creek Canyon near the Bonita RV Park. Lift Station #2 is located on the eastern most portion of Lytle Creek Canyon, 1,000 feet east of the Lytle Creek Ranger Station and approximately 1,300 feet downstream of the Lytle Creek Wastewater Treatment Plant. The collection system discharges to the Lytle Creek wastewater treatment plant which was designed for a maximum flow of 160,000 gallons per day (gpd). The wastewater treatment plant consists of preliminary treatment with bar screening, secondary treatment with an oxidation ditch and clarification, two percolation ponds, and six sludge drying beds.

**Figure 4-4. County of San Bernardino Special Districts**
**County Service Area 70-S3**


Source: County of San Bernardino Special Districts

According to the CSBSDD, there have been no changes to the treatment train since 1982, and the wastewater treatment plant does not use any chemicals, including chlorine (Personal communication, CSBSDD, Jay Baldwin, December 2012). There are also no downstream monitoring wells for the percolation ponds (Personal communication, Kathy Whalen, CSBSDD, February 14, 2008).

The total number of sewer service connections for the Lytle Creek service area was 392 in 2012. According to the CSBSDD, the number of sewer connections likely decreased slightly over the reporting period, and the plant flow rate has remained stable (Personal communication, San Bernardino County Special District, Jay Baldwin, November 27, 2012).

Although the wastewater treatment plant does not directly discharge treated wastewater effluent into Lytle Creek, there is a possibility that the percolation ponds may eventually impact water received by the WVWD through the Grapeland Tunnel, as the tunnel infiltrates groundwater. Based on a 1997 groundwater contour map developed for the Regional Board, the general direction of groundwater flow is to the southeast (Wildermuth Environmental, 2000) indicating a potential impact from the percolation ponds to the Grapeland Tunnel. Based on the Wildermuth report, predominant recharge to the groundwater reservoirs in the San Bernardino Valley is from infiltration of stream flow out of the San Gabriel and San Bernardino Mountains. In general, groundwater flow mimics surface drainage patterns (Wildermuth Environmental, 2000) for the San Bernardino Valley.

The WVWD indicated that the percolation ponds associated with the Lytle Creek wastewater treatment plant have also overflowed in the past during heavy rains, resulting in surface discharge to Lytle Creek. However, this did not occur over the current reporting period.

### *Septic Systems*

As stated above, about 90 percent of Lytle Creek residences receive centralized sewer services, while approximately 10 percent remains off-line. The off-line areas are isolated sites that have been developed with septic tanks and leach field systems (Lytle Creek Community Plan, 2007). The County of San Bernardino Department of Public Health was contacted to determine the parcel locations which have existing septic systems. The locations of the existing septic systems in the watershed are difficult to quantify as the County's database can only be queried with specific addresses or APN numbers. All of the APN numbers in the watershed would have to be queried one by one, in order to obtain the location of septic systems.

Due to a 1973 Discharge Prohibition issued by the Regional Board, it is prohibited to have a septic system installed above elevation 2600 feet in the Lytle Creek area, unless approved by the Regional Board. According to the County of San Bernardino Department of Public Health, there have been no septic systems installed above elevation 2600 feet in the last ten years.

### Related Water Quality Issues and Data Review

The Waste Discharge Requirement Order 95-32 for the Lytle Creek wastewater treatment plant specifies discharge limitations for biochemical oxygen demand, total suspended solids, total dissolved solids and pH, and requires monitoring for electrical conductivity, total hardness, chloride, sulfate, boron, fluoride, and sodium. As stated in the WDR, "these requirements are intended to meet the water quality objectives established to protect groundwater and to ensure that the discharge will not create conditions of pollution or nuisance."

As the Lytle Creek wastewater treatment plant discharges to percolation ponds, the monitored constituents in the effluent are focused on protecting groundwater quality. Therefore, this data has limited value in evaluating surface water quality of Lytle Creek.

According to the State Water Resources Control Board's California Integrated Water Quality System (CIWQS) database, there have been no violations with this WDR over the reporting period. Additionally, the Regional Board staff indicated that generally all of the CSBSDD plants are exceptionally good. (Personal Communication, Bill Norton, Regional Board). On December 24, 2010 Lift Station #1 experienced a failure. However, there was no SSO as the wet well had sufficient holding capacity.

### Regulation and Management

#### *Lytle Creek Wastewater Treatment Plant*

The discharge of treated wastewater to percolation ponds at the Lytle Creek wastewater plant is regulated under WDR Order No. 95-32, which was issued by the Regional Board on September 1, 1995.

The Regional Board performs inspections of the Lytle Creek wastewater treatment plant, and the facility has been in compliance during the reporting period. Under Order 95-32, the Regional Board requires that the effluent is sampled prior to discharge into the percolation ponds.

The discharge limits and sample frequency are shown in **Table 4-3**.

**Table 4-3**
**Lytle Creek Wastewater Treatment Plant Discharge Limits and Sample Frequency**

| Parameter | Effluent Limit | Sample Frequency |
|---|---|---|
| Biological Oxygen Demand | 30 mg/L (30 day average) | Weekly |
| Suspended Solids | 30 mg/L (30 day average) | Weekly |
| pH | 6.5 to 8.5 at all times | Weekly |
| Total Dissolved Solids | 490 mg/L (12 month average) | Bi-monthly |
| Electrical Conductivity | none | Bi-monthly |
| Total Hardness | none | Annually |
| Chloride | none | Annually |
| Sodium | none | Annually |
| Sulfate | none | Annually |
| Fluoride | none | Annually |
| Boron | none | Annually |

### *Septic Systems*

San Bernardino County Code of Enforcement is responsible for responding to reports of overflowing sewage and failed systems. However, they do not keep an electronic database of inspection results. Additional information may have been extracted by reviewing individual reports, but this level of review was not warranted for this report. Again, ninety percent of the Lytle Creek area receives centralized sewer service.

San Bernardino County does not have any specific ordinances for septic tanks in the Lytle Creek area. Construction requirements for septic systems must follow the Uniform Plumbing Code.

The State Water Resources Control Board developed a draft State Policy for Water Quality Control for Siting, Design, Operation, and Management of Onsite Wastewater Treatment Systems (OWTS) which was released in September 2011. The public review period closed on May 4, 2012. The State Board adopted Resolution No. 2012-0032, which adopted the policy. The OWTS policy will take effect on May 13, 2013.

A brief review of the policy indicates that each septic system will need to be placed into one of four tiers, which will indicate what action is needed. Refer to the OWTS policy for detailed information on the design requirements for each tier.

- **Tier 0** – These are existing septic systems that are properly functioning and do not require corrective action. No further action is needed.
- **Tier 1** – These are either new or replacement septic system that are considered low risk. These systems must meet Tier 1 design requirements.
- **Tier 2** – This tier is to be defined by local agency management programs, as California has an extreme range of geological and climatic conditions. In other words, local agencies may need to specify certain design requirement to address local conditions, in lieu of the Tier 1 design requirements.
- **Tier 3** – Septic systems within 600 feet of an impaired water body for either nitrogen or pathogens. If there is a total maximum daily load (TMDL), these septic systems will need to be addressed through the TMDL implementation program, or any special provisions by the local management agency. If there is no TMDL or special provisions, new or replacement septic systems must meet the requirements of Tier 3.
- **Tier 4**- Septic systems that require corrective action or are either presently failing or fail at any time, must meet Tier 4 requirements.

Since Lytle Creek was listed as an impaired water body in 2006 for pathogens, new or replacement systems within 600 feet of Lytle Creek will need to meet the Tier 3 design requirements. According to the San Bernardino County Environmental Health, they will likely revise their Local Area Management Plan to address the new requirements of the OWTS policy. They have not started this process yet. According to the Regional Board, it is uncertain if a pathogen TMDL will be developed for Lytle Creek in the future. If a TMDL is developed, septic systems may also be addressed through the TMDL implementation plan.

### Source Water Protection Activities

The WVWD is not currently engaged in specific source water activities regarding wastewater as a potential contaminant source.

### Summary of Findings for Wastewater

- There are no wastewater treatment plants which discharge treated effluent directly to Lytle Creek. However it is possible that the Lytle Creek wastewater treatment plant's percolation ponds may impact water received by WVWD through the Grapeland Tunnel.

- The Regional Board performs inspections of the Lytle Creek wastewater treatment plant, and the facility has been in compliance during the reporting period.

- The total number of sewer service connections for the Lytle Creek service area was 392 in 2012.

- About 90 percent of Lytle Creek residences receive centralized sewer services, while approximately 10 percent remains off-line. The locations of the remaining septic systems in the watershed are unknown.

## DEVELOPMENT

### Background

In general, conversion of natural lands to developed areas can affect surface and groundwater quality. Because of the high degree of imperviousness, urban areas typically generate higher per acre volumes of runoff than undeveloped or agricultural lands.

### Seasonal Patterns

Urban runoff occurs on a year-round basis and includes wet and dry weather discharges. Wet weather runoff results from seasonal storms. Wet weather runoff is of relatively short duration and can have highly variable pollutant concentrations. Dry weather runoff results from activities such as lawn irrigation and car washing.

### Related Constituents

Urban runoff can be a source of TOC, suspended solids, nutrients, metals, bacteria, and other constituents such as pesticides and other organic compounds. Generally, the impact is greater during the wet season, immediately following a first-flush event.

### Occurrence in Watershed

The San Bernardino County Land Use Service Department reviews all land development applications, such as subdivision and conditional use permits to assure conformance with adopted plans, regulations, and state law, including state and county environmental guidelines. In order to track the amount of potential development within the last five years, the County was contacted to review all applications accepted by the County from 2008 to 2012 within the Lytle Creek watershed. According to the County, there have been no private projects in the watershed from 2008 to 2012 except for single-family development (Personal Communication, Heidi Duron, County of San Bernardino Land Use Services Department, January 2013).

The San Bernardino County Department of Public Works constructed two projects in the watershed over the reporting period. The first project was the South Fork Road Bridge Replacement Project (Phase 1) which started in August 2011 and was completed in August 2012. The work consisted of constructing panel bridge and retaining walls, grading and placing asphalt over native soil, and placing rock and concreted rock slope protection. The second project was the South Fork Road (Phase II) Rock Slope Protection which started in February 2012 and was completed in February 2013. The work consisted of earthwork, dewatering, grouted cut-off walls, and placing grouted and non-grouted rock slope protection with filter fabric.

In addition to querying the San Bernardino County Land Use Department's database, the San Bernardino County Flood Control District (SBCFCD) was also contacted. As

required by the municipal storm water permit for San Bernardino County, (per the Regulation and Management section below), the SBCFCD is responsible for maintaining a database of commercial, industrial, and construction sites which could potentially impact water quality discharged through the storm drain system on a yearly basis. This database was also queried, as runoff from these sites could impact Lytle Creek. The 2011 County database was examined, and all of the sites listed were located in the Muscoy area, approximately near the intersection of Lytle and Cajon creeks, which is outside of the Lytle Creek watershed pertinent to WVWD.

### Related Water Quality Issues and Data Review

As there are limited urbanized areas within the Lytle Creek watershed, the area is not monitored for urban runoff by the SBCFCD. Examination of the Lytle Creek raw water does not show any levels of concern for metals or organics typically associated with urban runoff.

### Regulation and Management

Prior to any construction and/or land disturbing activity, the San Bernardino County Land Use Services Department requires a pre-construction inspection report permit or erosion control permit as well an on-site inspection. This is required in order to obtain approval or clearance for subsequent building permits. A grading permit is required for an excavation greater than two feet in depth, or a fill one foot or more in thickness, or if the grading is over 5,000 cubic yards.

Urban runoff from the unincorporated communities in the Lytle Creek watershed are regulated through a municipal storm water permit for San Bernardino County and all the incorporated cities within its jurisdiction. The San Bernardino County NPDES permit number is RB8-2002-0012. The permit named the SBCFCD the principal permittee and San Bernardino County and the incorporated cities as the co-permittees.

For construction projects within the unincorporated areas of San Bernardino County, such as the Lytle Creek watershed, urban runoff and stormwater issues are addressed through the California Environmental Quality Act (CEQA) process, through inspection of construction sites, and by requiring a project-specific Water Quality Management Plan (WQMP).

A project-specific WQMP is intended to identify potential post-project pollutants and hydrologic impacts associated with the development; identify proposed mitigation measures for identified impacts including site design, source control and treatment control post-development best management practices (BMPs); and identify sustainable funding and maintenance mechanisms for the BMPs.

Additionally, for projects that disturb at least one acre of land, a Notice of Intent (NOI) must be filed with the Regional Board to obtain coverage under the General Stormwater

Permit for Construction Activities. Proof of submittal of an NOI must be provided prior to issuance of a grading or building permit.

### Source Water Protection Activities

No specific source water protection activities have been conducted by WVWD during the study period.

### Summary of Findings for Development

- Overall, there has been little to no development within the watershed within the past five years.
- There are little to no commercial and industrial uses within the watershed, as it is primarily residential and open space.
- There were only two large construction projects in the watershed, conducted by the San Bernardino County Department of Public Works at South Fork Road for bridge replacement and rock slope protection.

## FIRES

### Background

The aftermath of a wildfire or prescribed burn can impact source water quality. In general, the load of dissolved substances to streams will increase following a wildfire, due to increased runoff. Increased runoff can occur following a fire because the formation of a hydrophobic organic layer in the soil increases the water repellency of soils (DeBano, 2000). A U.S. Geological Survey (USGS) study concluded that measurable effects of fires on streamwater quality are most likely to occur if the fire was severe enough to burn large amounts of organic matter, if windy conditions were present during the fire, if heavy rain occurred following the fire, and if the fire occurred in a watershed with steep slopes and soils with little cation-exchange capacity (USGS, 2004).

### Seasonal Patterns

In the literature reviewed, many of the highest nitrate concentrations in streams and rivers have been measured during storms in the weeks to months following a fire. In general, elevated concentrations of phosphorus decline one to two years post-fire, while the elevated concentrations of nitrogen, particularly nitrate, decline at a slower rate, three to five years post-fire.

### Related Constituents

The magnitude of the effects of fire on water quality is dependent on how fire characteristics (frequency, intensity, duration, and spatial extent of burning) interact with watershed characteristics (weather, slope, soil type, geology, land use, timing of regrowth of vegetation, and burn history). This interaction is complex and highly variable so that even fires in the same watershed can burn with different characteristics and produce variable effects on water quality. Typically, stormwater runoff from burned forested areas contains high concentrations of phosphorus, nitrogen, dissolved organic carbon, sediment, and metals such as mercury, lead, and arsenic.

### Occurrence in Watershed

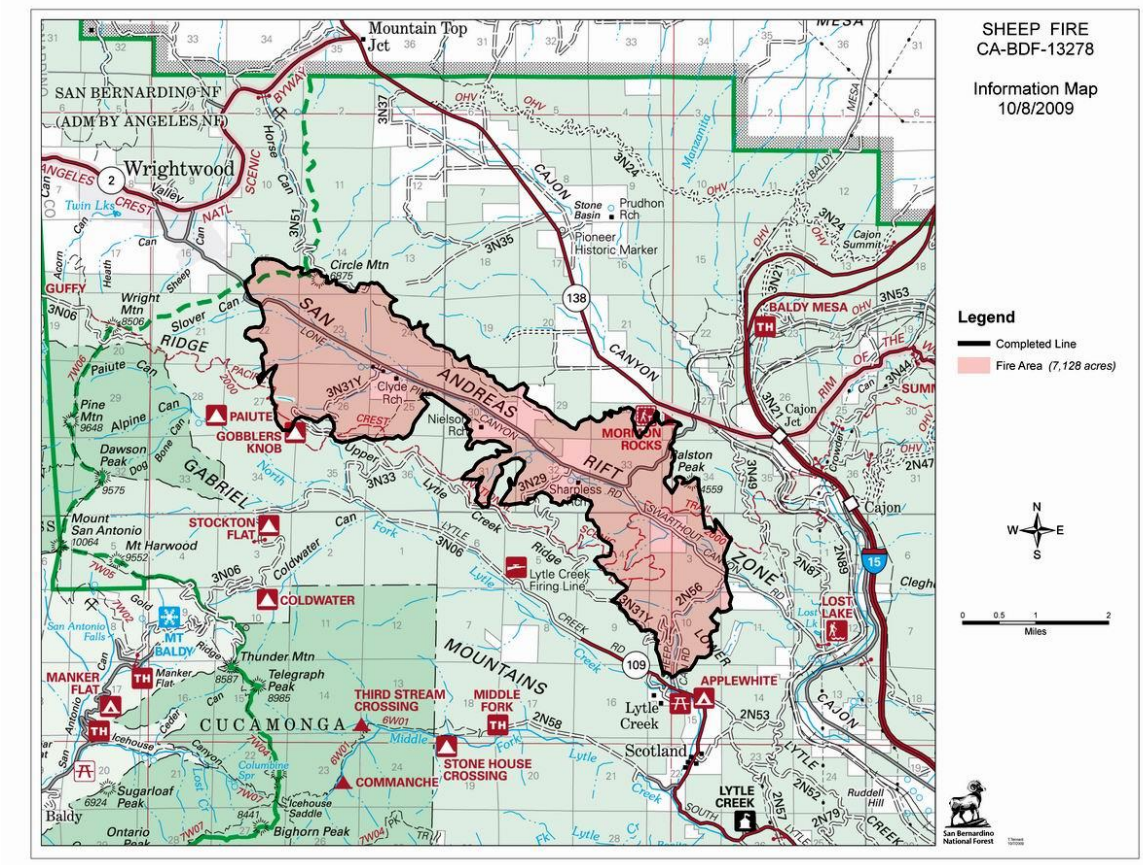
There were two wildfires which occurred over the study period; the Sheep Fire in October 2009 and the Lytle Fire in June 2012.

#### *Sheep Fire*

The Sheep Fire started on October 3, 2009 and was contained on October 10, 2009. A total of 7,128 acres were burned which was located within the watershed, as shown in **Figure 4-5.** The majority of the area burned in less than 24 hours in a fast moving fire. A Burned Area Emergency Response (BAER) assessment team developed a long-term recovery strategy for the watershed and also conducted modeling to determine the peak

flow and erosion rates before and after the fire. This will be discussed in further detail in the Floods/Erosion section. The BAER report identified increased sedimentation, ash, and turbidity as the main impacts to water quality. No hill slope treatments such as hydromulching, aerial seeding, and straw application were recommended as they were infeasible and would not reduce the probability of damage to assets.

**Figure 4-5 Sheep Fire Burn Perimeter**




The Sheep Fire started along Sheep Creek Road near Lytle Creek and burned north towards Mormon Rocks then northwest up Lone Pine Canyon Road. Five structures were destroyed in the Lone Pine and Swarthout Canyon areas including one residence. Five vehicles, four RVs, and two pieces of heavy equipment were also lost. Numerous helitankers and fixed wing air tankers dropped water and retardant on the fire.

The spillway of the Sheep Canyon Reservoir was rendered non-functional, as the spillway was armored with creosote treated timbers which burned in the fire. The Sheep Canyon Reservoir is an earthen dam built in 1941 to act as a debris dam. After the fire, the spillway could erode or fail rapidly through streamflow or raindrop impact. If the spillway were to fail, this would impact the community of Lytle Creek, Sheep Canyon Road, Lytle Creek Road, and the Applewhite Picnic Area.

Sediment basin reconstruction and channel debris cleaning at the Sheep Canyon Dam and drainage area were conducted after the fire to reduce erosion resulting from post-fire runoff events.

### *Lytle Fire*

The Lytle Fire started on June 24, 2012 and was quickly brought into containment by June 25, 2012. The fire burned in heavy chaparral in rocky, steep terrain and burnt into a USFS fuels reduction project, which helped to slow the spread of the fire. The total burn area was held to 12 acres. There was no BAER report completed for this wildfire.

### Related Water Quality Issues and Data Review

The first rain after the Sheep Fire occurred on October 14, 2009, just four days after the fire was contained, which had a daily precipitation total of 0.86 inches, followed by 1.52 inches on December 7, 2009. Examination of turbidity in the Lytle Creek source water does not show a measurable increase due to the Sheep Fire, with raw water turbidities staying well below 2 nephelometric turbidity units (NTU) from October 2009 to January 2010. There were no TOC source water samples collected during this time period to confirm any impact after the Sheep Fire. The Roemer Water Filtration Facility (WFF) remained on-line after the Sheep Fire.

### Regulation and Management

Fire protection services are mainly provided by the San Bernardino County Service Area 38. The San Bernardino County Fire Department provides services to Lytle Creek through the West Valley Division of their department, as the West Valley Division has a station located within the Lytle Creek community.

Other agencies providing fire protection services include the California Department of Forestry and Fire Protection, the USFS, and the Fire Safe Council.

The Land Management Plan for the San Bernardino National Forest identifies community protection from wildfire as the highest priority program emphasis for Lytle Creek. The USFS' planned protection measures included fire defense zones around the Lytle Creek community, eradication of the nonnative Tree of Heaven, and maintenance of firebreaks. Other possible tactics include application of fire retardant along roads and adjacent to areas of high recreation use where human-caused wildland fires are frequent, and restricting access to the National Forest when there is a lack of firefighting resources or extreme weather.

The use of approved long-term retardants in wildland fire suppression is standard in fire management and planning. The retardants are most often delivered in fixed or rotor-wing aircraft. A current list of qualified products and approved uses is listed on the U.S. Forest Service Wildland Fire Chemical Systems website (http://www.fs.fed.us/rm/fire). According to the USFS, the fire retardant commonly used is Phos-Check. The use of

fire retardants can impact water quality if chemicals are accidentally dropped into a water body, or if heavy rains occur before the product has had time to naturally degrade.

Post-fire water quality monitoring for streams near four wildfires showed that aerial application of fire retardant near but not into streams had minimal effect on surface water quality (Crouch et al, 2006). Ammonia and phosphorus from the burning of wood and other organics in burn area streams where fire retardant was not used were found in concentrations similar to those found in area where fire retardant was aerially applied.

The National Interagency Fire Center has developed *Interagency Standards for Fire and Fire Aviation Operations* which are annually revised. The *Interagency Standards for Fire and Fire Aviation Operations* states, references, or supplements policy for the U.S. Bureau of Land Management, the USFS, the U.S. Fish and Wildlife Service, and the National Park Service. Regarding the use of fire retardants, the Aerial Application Guidelines are to "avoid aerial or ground application of retardant or foam within 300 feet of waterways." (http://www.fire.blm.gov/Standards/redbook.htm). This policy was recently upheld in a December 2011 Record of Decision, Nationwide Aerial Application of Fire Retardant on National Forest System Land, USFS.

### Source Water Protection Activities

During the Sheep Fire, WVWD contacted the Lytle Creek Ranger Station to ensure that retardant drops would be not conducted near or in the stream bed of Lytle Creek. WVWD staff also visually checked in the field that there were no drops within the stream bed.

Source water protection from fire-related impacts is generally in place as the Roemer WFF can be shutdown when turbidity increases, or other changes in source water quality occur.

### Summary of Findings for Fires

- The Lytle Creek watershed is entirely a high to extremely high fire risk based on vegetation. The largest wildfire over the reporting period was the Sheep Fire which occurred from October 3 to October 10, 2009.

- For the Sheep Fire, WVWD staff contacted the Lytle Creek Ranger Station to ensure that retardant drops did not occur near the stream bed of Lytle Creek. WVWD is able to minimize fire-related impacts to the Roemer WFF by shutting the plant down during times of degraded source water quality. However, the Roemer WFF remained on-line after the Sheep Fire.

- It is recommended to obtain watershed information from the BAER team or the USFS Ranger Station whenever there is a fire within the Lytle Creek watershed.

## FLOODS/EROSION

### Background

Floods and erosion are naturally-occurring phenomenon for the Lytle Creek watershed. Erosion can be caused by either wind, gravity, or running water. Lytle Creek is an erosive watershed, particularly because the San Gabriel Mountains are considered a fast growing mountain range. Therefore, erosion occurs in both dry and wet conditions.

Although no major flood problems exist within the Lytle Creek study area as defined by the National Flood Insurance maps, the steepness of the terrain can cause flooding and flood related problems for properties adjacent to major drainage courses. The steep slopes in Lytle Creek create a high velocity of water flow in streambeds. This high velocity causes greater than normal erosion to occur in, and adjacent to, drainage courses. Residents want to prevent the conversion of natural watercourses to culverts, storm drains, or other underground structures except by special permit (2007 Lytle Creek Community Plan).

Additionally, Lytle Creek is a high to very high fire risk watershed. Rainfall on burned basins can transport and deposit large volumes of sediment, both within and down-channel from the burned area (Cannon et al 2003). Debris flows are among the most hazardous consequences of rainfall on burned hillslopes. Debris flows and landslides pose a distinct hazard because of their unique destructive power.

### Seasonal Patterns

On average, about 75 percent of California's average annual precipitation falls between November and March; half occurs between December and February. The Lytle Creek watershed is also subject to short-duration, high-intensity summer monsoon rains. Please refer to **Section 2** for rainfall records from 2008 to 2012 in the Lytle Creek watershed.

### Related Constituents

Debris flows may consist of mud, rocks, trees, and boulders. It is generally a muddy slurry, capable of transporting a mixture of materials**,** including very large boulders over gentle slopes.

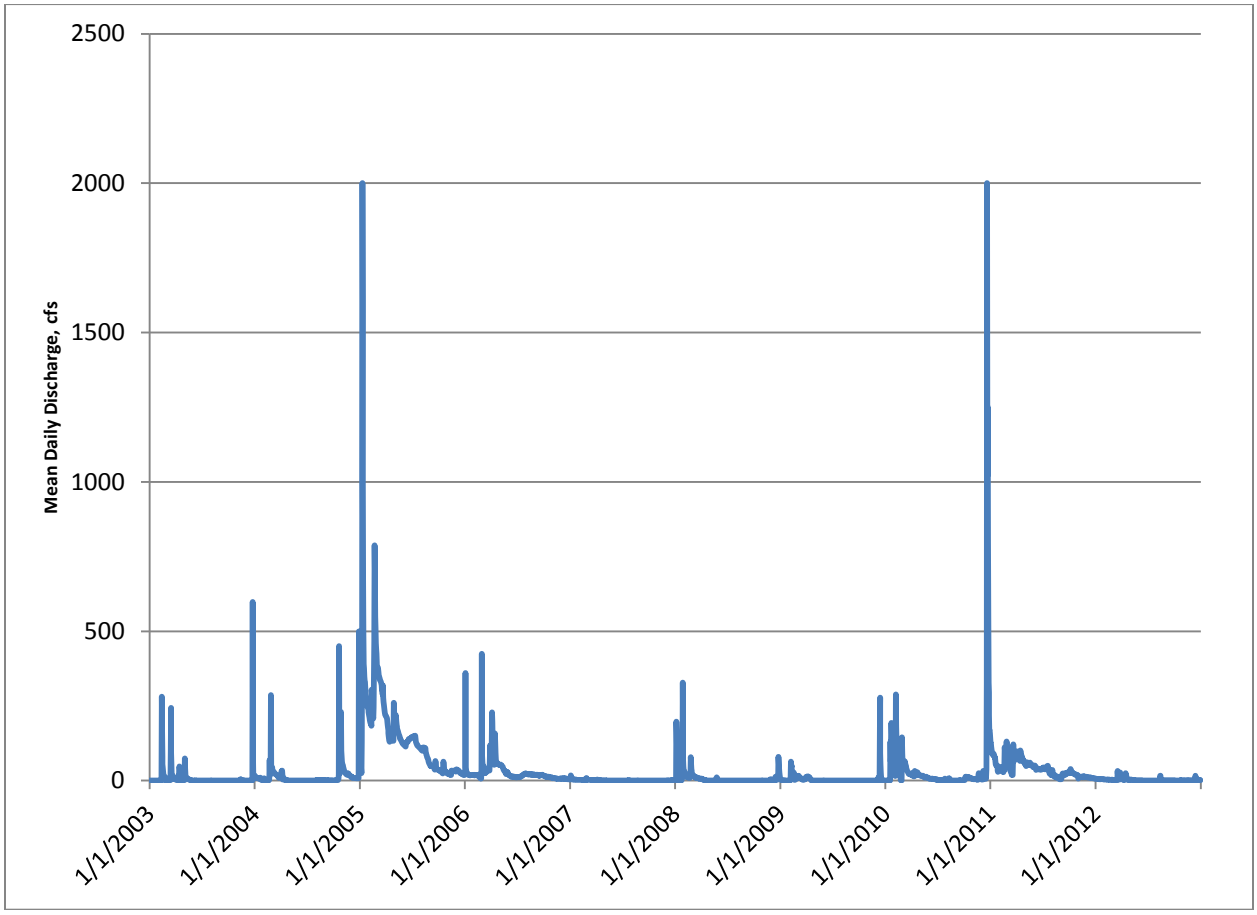
WVWD staff report that china clay, or kaolinite, is eroded and then transported from the stream bed during storms. Kaolinite is a clay mineral with the chemical composition $\underline{Al}_2\underline{Si}_2\underline{O}_5(\underline{OH})_4$. It is a soft, earthy, usually white mineral (dioctahedral phyllosilicate clay), produced by the chemical weathering of aluminum silicate minerals like feldspar.

### Occurrence in Watershed

Flooding and debris flows occur in the Lytle Creek watershed as it is a natural canyon area with steep topography and can receive high amounts of rainfall in a short time period. Debris and flood flows are also uncontrolled in the upper reaches of Lytle Creek, since there are no major flood-control facilities upstream of Lytle Creek's 375 homes and roughly 1,200 residents.

Stream flow data for Lytle Creek was obtained over the reporting time period to study the occurrence of high flows. **Figure 4-6** shows the total flow in Lytle Creek from 2003 to the present. For this 10-year period of record, the average mean daily discharge was 29.2 cubic feet per second (cfs), the median mean daily discharge was 3.7 cfs, and the maximum mean daily discharge was 2,000 cfs on January 9, 2005 and December 20, 2010.

**Figure 4-6**
**Mean Daily Discharge for Lytle Creek, Station 11062000, 2003-2012**




After the Sheep Fire in 2009, modeling was conducted by the BAER team to predict the increase in peak discharge (cfs/square mile) for the 2-year, 5-year, 10-year and 25-year storm event for the year following the Sheep Fire. **Table 4-4** summarizes the modeling

results for the Sheep Creek watershed, which shows that flows in the watershed will increase significantly for all storm scenarios, one year after the Sheep Fire.

**Table 4-4. Peak Discharge for Various Storm Events following the Sheep Fire (1-year post-fire)**

| | Normal Peak Discharge (cfs/sq. mile) | 1-year Post-Fire Peak Discharge | Percent Increase |
|---|---|---|---|
| 2-year storm | 0.31 | 0.49 | 58 |
| 5-year storm | 0.55 | 0.82 | 49 |
| 10-year storm | 0.81 | 1.2 | 48 |
| 25-year storm | 1.2 | 1.6 | 33 |

Sediment yields were also modeled for first and second years after the Sheep Fire for the Sheep Creek watershed. The normal sediment yield in the Sheep Creek watershed is 16 cubic yards/square mile. However, sediment yield 1-year following the Sheep Fire was modeled to be 200 cubic yards/square mile and sediment yield 2-years following was 79 cubic yards/square mile. This modeling indicates a 1,150 percent increase for one year following the fire, and a 393 percent increase for two years following the fire.

Overall, the Sheep Fire will likely cause higher flows in the watershed, with more sediment entrained by the flows, and more deposition of sediment as well.

### Related Water Quality Issues and Data Review

As discussed in the Fires section, the Roemer WFF remained on-line after the Sheep Fire. The first rain after the Sheep Fire occurred on October 14, 2009 which had a daily precipitation total of 0.86 inches, followed by 1.52 inches on December 7, 2009. Examination of turbidity in the Lytle Creek source water did not show a measurable turbidity increase post-Sheep Fire, with raw water turbidities staying below 2 NTU from October 2009 through January 2010. There were no TOC source water samples collected during this time period to confirm any impact after the Sheep Fire. Examination of flow in Lytle Creek after the Sheep Fire shows an increase in December 2009 to 278 cubic feet per second (cfs), but this is well within historical winter flows, as shown in **Figure 4-6.**

### Regulation and Management

The SBCFCD is responsible for providing flood control and related services throughout San Bernardino County, including the city incorporated areas. However, there are no major flood-control facilities upstream of Lytle Creek's 375 homes and roughly 1,200 residents.

## Source Water Protection Activities

### *West Valley Water District*

Similar to fires, source water protection from flooding and erosion is generally in place as the Roemer WFF can be shutdown when turbidity increases, or other changes in source water quality occur. For example, the WVWD typically avoids using Lytle Creek water during high storm events, in order to prevent china clay from entering the treatment plant. WVWD staff has reported difficulty in treating china clay, as it is difficult to coagulate.

### *United States Forest Service*

For over twenty years, the San Bernardino National Forest has conducted a self-evaluation of how effectively they have implemented best management practices to control water pollution from National Forest lands. Typically, the types of Forest Service administered projects (or facilities) that are evaluated fall into one of the following categories: timber harvest, recreation, roads, grazing, fuel reduction/fire, mining and vegetative activities. The San Bernardino National Forest produces an annual report which discusses their findings. According to the USFS staff, one of the primary water quality concerns is sediment transport from roads.

Both the 2011 and the 2010 reports were reviewed, and there was only one site of concern and monitored within the Lytle Creek watershed.: Road 3N31. Road 3N31 is in the Upper Lytle Creek area of Lone Pine Canyon, and it was used extensively during the Sheep Fire. USFS staff found evidence of sediment transport and scour. In 2011, the USFS took action to repair the road surface and identify the main channel for proper drainage.

Although there was only one project evaluated in the Lytle Creek watershed during the reporting period, it is helpful to know that the USFS does evaluate whether or not their facilities are impacting water sources. The USFS is aware that runoff from the parking lot and Applewhite picnic area is transported to Lytle Creek, however they indicated that a solution would likely require an engineered redesign of the site.

## Summary of Findings for Floods/Erosion

- Flooding and debris flows occur in the Lytle Creek watershed as it is a natural canyon area with steep topography and can receive high amounts of rainfall in a short time period.

- Debris and flood flows are also uncontrolled in the upper reaches of Lytle Creek, since there are no flood control facilities upstream of the Lytle Creek communities.

- Modeling was conducted by the BAER team to predict the increase in peak discharge (cfs/square mile) for the 2-year, 5-year, 10-year and 25-year storm event for the year following the Sheep Fire. Examination of Lytle Creek flow records after the Sheep Fire did not show any noticeable increase above normal winter flows in Lytle Creek.

- WVWD typically avoids using Lytle Creek water during high storm events, in order to prevent high turbidity and china clay from entering the treatment plant.

# SECTION 5 – INTAKE EVALUATION

The purpose of this section is to evaluate the Oliver P. Roemer Water Filtration Facility (WFF) for its compliance with existing drinking water regulations.

For assistance with abbreviations and acronyms, the reader is referred to the List of Abbreviations at the front of the report.

**Highlights of Selected Existing Drinking Water Regulations**

**NIPDWR and Phase I, II, and V Regulations.** Set MCLs for many inorganic chemicals, synthetic organic compounds (SOCs), and volatile organic compounds (VOCs).

**Surface Water Treatment Rule (SWTR).** Sets minimum 3/4-log reduction requirement for *Giardia* and viruses, respectively. Set turbidity requirements, which have since been tightened by the Interim Enhanced Surface Water Treatment Rule.

**Interim Enhanced SWTR (IESWTR) and Filter Backwash Rule.** Sets minimum 2-log reduction requirement for *Cryptosporidium*. Requires continuous monitoring of individual filter effluents (IFE) and combined filter effluent (CFE). Tightened treated water turbidity requirements: CFE < 0.3 NTU in 95 percent of monthly measurements, and not to exceed 1 NTU. Set IFE reporting and evaluation requirements. Requires recycling of all return flows to the headworks, upstream of chemical feed.

**Stage 1 Disinfection/Disinfection By-Product (D/DBP) Rule.** Sets a treatment technology for DBP precursor removal (enhanced coagulation) based on source water total organic carbon (TOC) levels. Varying levels of removal are required if the source water concentrations are > 2 mg/L. Sets maximum contaminant levels (MCLs) for TTHMs and HAA5 at 80/60 µg/L, respectively, in the distribution system as system-wide running annual average (RAA).

**Long Term 2 Enhanced SWTR.** Requires *Cryptosporidium*, or *Escherichia coli (E. coli)* source water monitoring depending on system size. Source water bin classification dependent on monitoring results. If average *Cryptosporidium* value is > 0.075 oocysts/L, bin classification will require additional action (which could be additional log reductions or other actions, including source water protection). Also requires disinfection profiling and benchmarking if monitoring for *Cryptosporidium*. A second round of source water monitoring will be conducted again, six years after initial bin classification.

**Stage 2 D/DBP Rule.** Requires compliance with distribution system MCLs for TTHM and HAA5 to be based on locational running annual average (LRAA). In Stage 2 compliance is based on LRAA of 80/60 µg/L. Initial Distribution System Evaluations were completed to identify long term routine monitoring locations. Compliance schedules will depend on system size and source type. For combined distributions systems, all systems will be on schedule of earliest system.

## OLIVER P. ROEMER WATER FILTRATION FACILITY

### *System Description*

The Roemer WFF receives Lytle Creek water from the Fontana Union Water Company (FUWC) Powerhouse Afterbay. This water consists of a blend of source waters from the Southern California Edison (SCE) upper diversion, the FUWC lower intake structure, and the Grapeland Tunnel groundwater infiltration. In addition to the Lytle Creek source, the Roemer WFF receives State Project Water. Typically, these waters are blended to achieve optimum raw water quality.

The West Valley Water District's (WVWD) California Department of Public Health (CDPH) Water Supply Permit was amended on August 31, 2012 to expand the plant from 9.6 to 14.4 million gallons per day (mgd). The amendment also added the pretreatment facilities, the ultraviolet (UV) light disinfection system, and upgraded the onsite chlorine generator system. The new UV system was provided operating criteria for disinfection credit.

The Roemer WFF currently consists of a series of treatment processes. The plant was expanded in 2007 to increase capacity and upgrade the facilities to allow for increased use of State Project Water and during periods of lower Lytle Creek quality. The plant was operated under the 1998 and 2012 permits during the study period. The filtration process has been permitted by the CDPH as a conventional filtration plant and is therefore granted 2.5-log reduction credit for *Giardia*, 2-log reduction credit for *Cryptosporidium*, and 2-log reduction credit for viruses.

The Roemer WFF has a pretreatment facility to provide additional solids removal primarily for the State Project Water, and possibly the Lytle Creek source during periods of lower water quality. This facility includes flocculation and sedimentation. The pretreatment effluent is sent to the two raw water blending reservoirs. The Lytle Creek source is typically sent directly to the raw water blending reservoirs. The effluent from the raw water blending reservoirs is then sent to the filtration plant.

The filtration plant consists of six Microfloc Trident 840E package units which provide two-stage filtration. Chemical feed occurs at the influent to the plant and includes pre-chlorination, coagulation with aluminum sulfate (alum), and cationic polymer as needed. Conventional filtration equivalent is provided by the package system consisting of contact absorption clarification and multi-media filtration. The filter loading rate is 6 gallons per minute per square foot (gpm/sf) and the filters are backwashed based on filter run time, effluent turbidity, and head loss. The filter backwash water is sent to the decant basins and is now recycled to the inlet header upstream of the pretreatment basins the plant. After backwashing, the filters are normally wasted for 10-15 minutes before returning to service.

The filtered water is then sent through three parallel ultraviolet (UV) light reactors for disinfection. This is a Trojan UVSwift TM Model 6L24. If total organic carbon (TOC)

levels in the plant effluent water need to be further reduced prior to disinfection then a portion of the stream will be sent to the granular activated carbon (GAC) units and then blended back in the plant effluent. Finally, the water is post-chlorinated in a chlorine contact tank to provide a distribution system disinfectant residual. The typical residual leaving the plant ranges from 1.0 – 1.5 milligrams per liter (mg/L).

WVWD has long-term plans to construct a 6.0 mgd membrane filtration plant to treat State Project water or Lytle Creek water and increase the treatment capacity from 14.4 mgd to 20.4 mgd.

### *Highlights of Changes Since the 2008 Update*

There have been very few significant changes at the Roemer WFF since the 2008 Watershed Sanitary Survey. In 2011 the District began recycling filter backwash, filter-to-waste, and sludge decant water in the plant. A six inch pipeline was constructed to return the flow to the pretreatment header. The flow is paced to not exceed 10 percent of the total plant flow.

### *Significant Potential Contaminating Activities*

The diverted water from Lytle Creek is subject to recreation, development, fires, floods/erosion, spills, and wastewater. The water from the Grapeland Tunnel is mixed in with the diverted Lytle Creek water and its vulnerability to potential contaminating activities (PCAs) is uncertain, but may include the wastewater treatment plant percolation ponds near the United States Forest Service Ranger Station. The most significant watershed activities which impact the water quality of Lytle Creek is body-contact and dispersed recreation in Lytle Creek, as well as suspected illegal discharges.

### *Water Quality Summary*

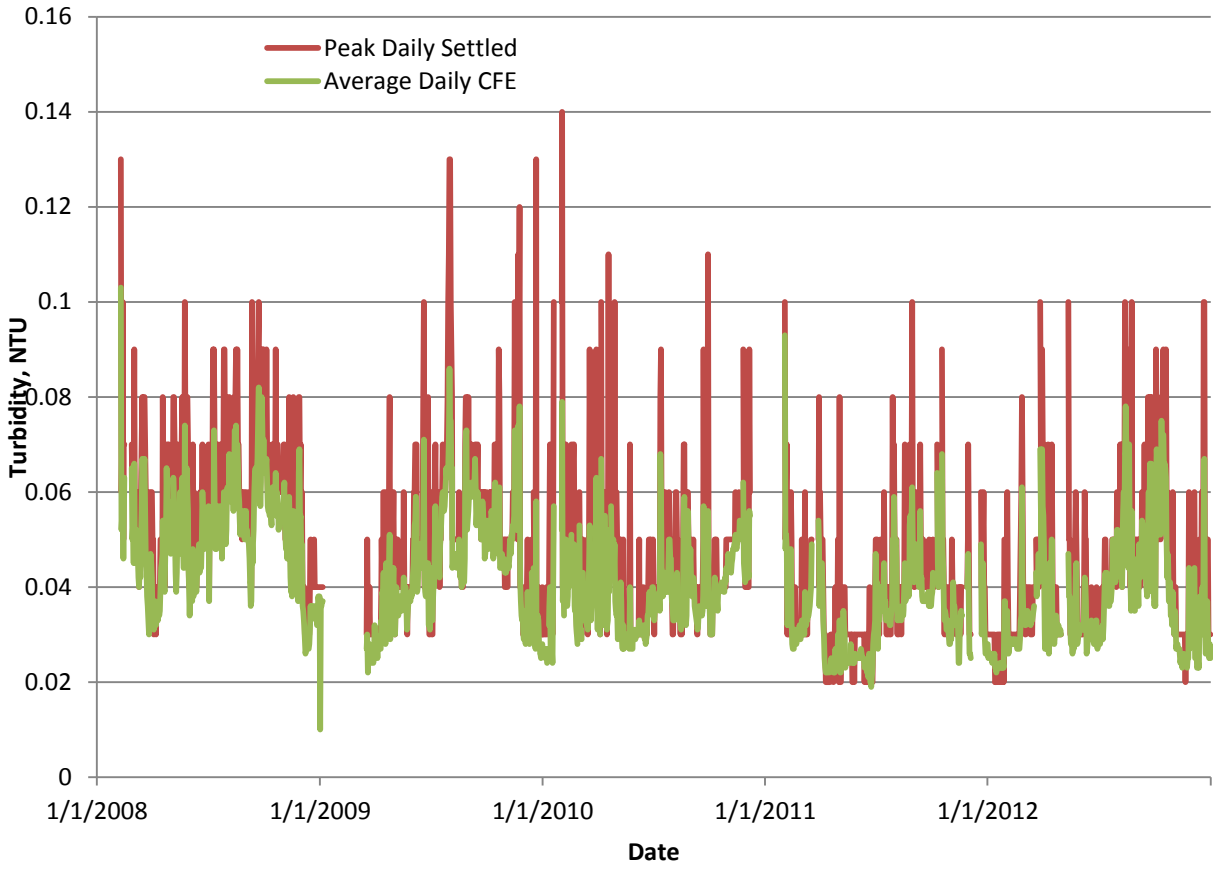
Below is a discussion of each of the constituents of interest and any notable compliance issues for each constituent during the period of study.

#### Turbidity

The hardcopy data for the 4-hour turbidity measurements of the combined filter effluent (CFE) from January 2008 through December 2012 were included in this evaluation. A review of the data shows that the CFE was well within regulatory limits, with all 4-hour measurements below 0.14 nephelometric turbidity units (NTU), well below the treatment technique requirement of 0.3 NTU.

A statistical assessment was conducted for the peak daily settled water and the average daily CFE. **Figure 5-1** shows a time series plot of settled and treated water turbidities. The Roemer WFF meets all current treated water turbidity standards.

**Figure 5-1**
**Peak Daily Settled and Average Daily CFE Turbidity at Roemer WFF, 2008 - 2012**




The peak daily settled water ranged from 0.02 to 0.14 NTU, with an average value of 0.048 NTU and a median value of 0.04 NTU. Ninety-five percent of daily samples were less than 0.08 NTU. This correlates to an average daily solids removal through sedimentation of 88.4 percent, exceeding the 80 percent requirement.

The average daily CFE ranged from 0.01 to 0.103 NTU, with an average value of 0.041 NTU and a median value of 0.039 NTU. Ninety-five percent of average daily values were less than 0.064 NTU. This correlates to an average daily solids removal through filtration of 90 percent, exceeding the 80 percent requirement.

- All CFE turbidity measurements between January 2008 and December 2012 met the turbidity treatment technique limit and were less than 0.14 NTU.
- The peak daily settled water had an average value of 0.048 NTU and the average daily CFE had an average value of 0.041 NTU. This shows that a large amount of the solids removal is achieved during the pretreatment process of flocculation and sedimentation.
- Solids removal through plant averages 90 percent, meeting the 80 percent goal for conventional treatment. Removal is most difficult under low raw water turbidity periods.

Microbiological Constituent Review

Distribution system monitoring for coliforms as part of the Total Coliform Rule resulted in a few detections of total coliform in distribution system during the study period. In each month with a detection, less than five percent of samples were positive and there were no fecal coliform detected. Therefore, there were no violations of the coliform maximum contaminant level (MCL).

Disinfection By-Products and Precursors

WVWD monitored TOC levels at several locations in the treatment process during the study period in order to determine compliance with the TOC removal requirement of the Stage 1 D/DBP Rule. Historically, the Lytle Creek and State Project Water sources were blended to provide a raw water TOC level less than 2.0 mg/L to comply with the alternative compliance criterion. With the implementation of the new treatment processes, the raw water blending is being balanced with the ability to provide advanced treatment of the raw water to achieve treated water TOC less than 2.0 mg/L, also an alternative compliance criterion. As presented in **Section 3** the Lytle Creek source is monitored at the Southern California Edison (SCE) Afterbay and has an average TOC of 0.39 mg/L. This water is typically blended with State Project Water (after pretreatment) for an average GAC influent TOC of 1.14 mg/L.

The GAC effluent was monitored most consistently during the study period, from February 2008 through October 2012, while the CFE was only monitored from November 2011 through December 2012.

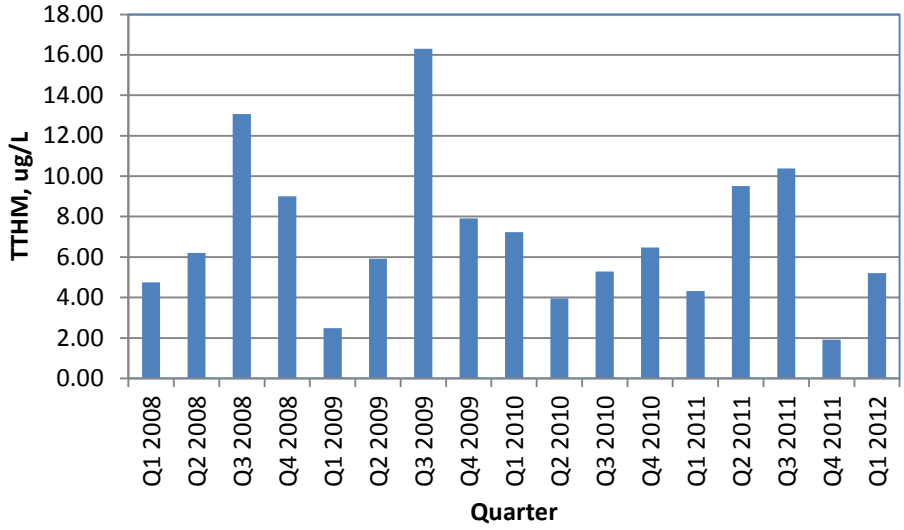
Based on the CFE samples, the average TOC level was 0.434 mg/L, with all samples less than 1.2 mg/L. Based on all the GAC effluent samples, the average TOC level was 0.63 mg/L, with 88 percent of samples less than 2.0 mg/L. The majority of GAC effluent TOC levels greater than 2.0 mg/L occurred during the late spring/summer of 2011. GAC effluent samples collected only during the same period as the CFE samples (November 2011 through October 2012) had an average TOC level of 0.08 mg/L, with all samples less than 0.52 mg/L. For source or treated waters with a running annual average TOC less than 2.0 mg/L, the alternative compliance criterion is met and no TOC removal ratio is required to be calculated.

- Roemer WFF CFE data (2011 through 2012) show an average TOC value of 0.434 mg/L with all samples less than 1.2 mg/L.
- GAC facility effluent data (2008 through 2012) show an average TOC value of 0.63 mg/L with 88 percent of samples less than 2.0 mg/L.
- WVWD complies with the Stage 1 D/DBP Rule by meeting an alternative compliance criterion for the enhanced coagulation treatment technique, less than 2 mg/L in source or treated water.

Under the Stage 1 D/DBP Rule, WVWD sampled 24 sites in the distribution system on a quarterly basis for disinfection by-products from March 2008 through March 2012. These sites represent the Roemer WFF as well as the five groundwater equivalent plants. Since the Roemer WFF primarily services pressure zones 4 through 8, only sites in those zones were included in the data evaluation. Fifteen sites were included: 1, 3, 4, 7, 8, 9, 10, 11, 13, 15, 31, 32, 34, 36, and 50. Some of these sites are still influenced by local groundwater.

**Figure 5-2** provides the quarterly average for the 15 distribution system sites for total trihalomethanes (TTHM) during the study period. Overall, the levels of TTHMs are very low in the distribution system with the highest individual sample at 40 micrograms per liter (ug/L), and the average of all samples at 7.1 ug/L.

**Figure 5-2**
**Quarterly Average TTHM for Distribution System**
**2008 - 2012**




The data are impacted by the blending of source waters at the Roemer WFF as well as the presence of groundwater in the distribution system. The quarterly averages ranged from 1.9 to 16.3 ug/L and generally speaking, the third quarter has the highest TTHM levels. These peaks could have been caused by warmer temperatures, higher chlorine demands, and source water contributions. The highest levels of TTHMs are seen at the sites located in pressure zones 6, 7, and 8, which receive the highest amounts of water from the Roemer WFF.

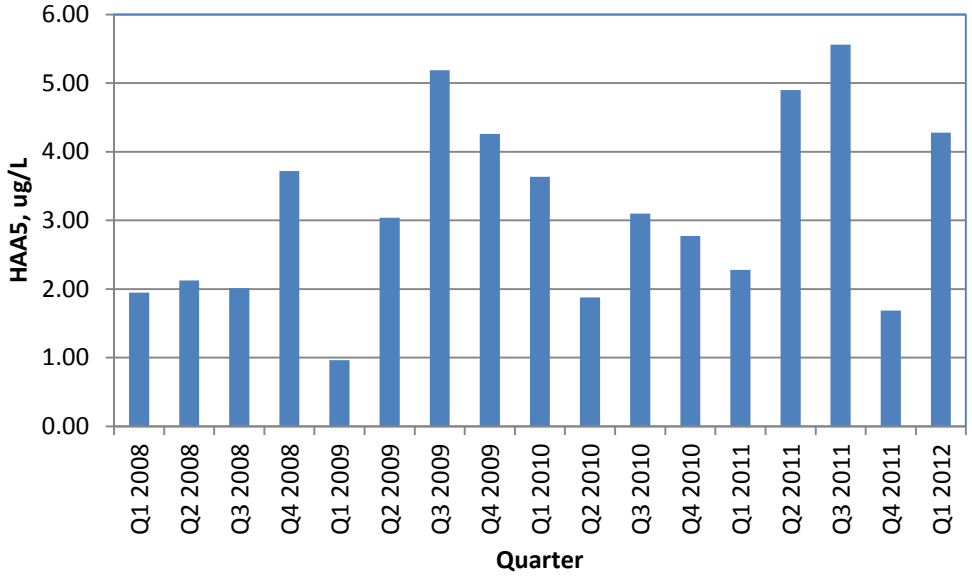
The running annual average (RAA) of the quarterly averages was the compliance point for the Stage 1 D/DBP Rule. The RAA of the 15 selected distribution sites for Roemer WFF water ranged from 5 to 9.3 µg/L, well below the current MCL of 80 µg/L.

WVWD converted to the Stage 2 D/DBP Rule monitoring sites in June 2012. Only eight distribution sites are required to be monitored under this Rule, and six of those are located in the zones that represent water from the Roemer WFF. This includes two

sites from the Stage 1 D/DBP Rule monitoring; 1 and 13. The other four sites were selected from the Initial Distribution System Evaluation (IDSE) conducted as part of the Stage 2 D/DBP Rule compliance, including; T2, T5, T6, and 3E. Locational running annual averages (LRAA) were calculated for the six selected distribution sites. The LRAAs ranged from non-detect to 27.4 µg/L, with an average value of 12.1 µg/L, all well below the MCL of 80 µg/L. The highest levels of TTHMs continue to occur at site 1, which is located in zone 8.

**Figure 5-3** provides the quarterly average for the 15 distribution system sites for haloacetic acids (HAA5) during the study period. Again, the levels of HAA5 are very low in the distribution system with the highest individual sample at 24.5 micrograms per liter (ug/L), and the average of all samples at 3.1 ug/L.

**Figure 5-3**
**Quarterly Average HAA5 for Distribution System**
**2008 - 2012**




Similar to TTHMs, the data are impacted by the blending of source waters at the Roemer WFF as well as the presence of groundwater in the distribution system. The quarterly averages ranged from 1.0 to 5.6 ug/L. There generally was an increase in HAA5 levels during the third quarter. These peaks could have been caused by warmer temperatures, higher chlorine demands, and source water contributions. The highest levels of HAA5 are seen at the sites located in pressure zones 6, 7, and 8, which receive the highest amounts of water from the Roemer WFF.

The RAA of the quarterly averages for the 15 selected distribution sites ranged from 2.2 to 4.1 µg/L, well below the current MCL of 60 µg/L.

LRAA were calculated for the six selected distribution sites under the Stage 2 D/DBP Rule monitoring. The LRAAs ranged from non-detect to 11.6 µg/L, with an average

value of 5.2 µg/L, all well below the MCL of 60 µg/L. The highest levels of HAA5s continue to occur at site 1, which is located in zone 8.

WVWD completed the Standard Monitoring Program as part of the Initial Distribution System Evaluation (IDSE) under the Stage 2 D/DBP Rule. An additional 24 distribution system sites were analyzed bimonthly for TTHM and HAA5 between November 2007 and September 2008. The final IDSE Report is included in **Appendix E**. The results from that monitoring program were similar to the standard monitoring under Stage 1 D/DBP Rule. TTHM LRAAs ranged from non-detect to 26 µg/L and HAA5 LRAAs ranged from non-detect to 7.6 µg/L.

- TTHM data is well within the primary MCL of 80 µg/L. All individual samples were less than 40 µg/L and all LRAA were less than 30 µg/L.
- HAA5 data is well within the primary MCL of 60 µg/L. All individual samples were less than 30 µg/L and all LRAA were less than 12 µg/L.
- There were no identifiable trends in the data due to variable plant operations and source water blending.
- IDSE monitoring results had data results similar to the Stage 1 sample sites.

### *Giardia/Virus/Cryptosporidium Reduction Requirements*

Based on the total coliform, fecal coliform, *Escherichia coli (E. coli), Giardia,* and *Cryptosporidium* data presented in **Section 3**, 3/4/2-log reduction of *Giardia*/virus/*Cryptosporidium* are appropriate reduction requirements for the Roemer WFF.

The Roemer WFF is classified as a conventional filtration water treatment plant, and is therefore granted reduction credit for 2.5-log *Giardia,* 2.0-log viruses, and 2-log *Cryptosporidium* for physical removal. Disinfection with sodium hypochlorite provides 0.5-log credit for *Giardia* and 2.0-log credit for viruses. This meets all of the current microbial removal/inactivation requirements of the SWTR, the Interim Enhanced SWTR, and the Long Term 2 ESWTR.

### *Regulatory Compliance Evaluation*

WVWD has been monitoring the raw and treated water for the Roemer WFF for all required Title 22 compliance constituents. **Table 5-1** lists the existing drinking water regulations and a compliance evaluation for these standards at the Roemer WFF. The Roemer WFF is currently in compliance with existing regulations.

**Table 5-1**
**Regulatory Compliance Evaluation**
**West Valley Water District – Roemer WFF**

| | Targeted Compounds | Key Issues Compliance Status |
|---|---|---|
| **Existing Regulations** | | |
| Phase I, II, and V | IOCs, VOCs, SOCs | Monitored as required. The Annual Consumer Confidence Reports from the study period indicate that all MCLs are met in the treated water. |
| SWTR | Microbial and Turbidity | Coliform and *Giardia* data support 3/4—log reduction requirement for *Giardia*/viruses. All operations, monitoring and reporting requirements are met and all treated water turbidity standards are met. |
| Interim Enhanced SWTR and Filter Backwash Rule | Microbial and Turbidity | All new turbidity standards met. 2-log reduction credit for *Cryptosporidium* applicable. |
| Stage 1 D/DBP Rule | Disinfectants and Disinfection By-Products | TOC <1.0 mg/L in Lytle Creek source. Blending of SPW and Lytle Creek is implemented, along with SPW pre-treatment to bring plant influent levels to <1 mg/L. Treated water levels are consistently <1 mg/L. Therefore, no TOC removal ratio is required to be calculated. TTHM/HAA5 RAAs at D/DBP Rule sites comply with drinking water standards (<80/60 µg/L, respectively). |
| Long Term 2 Enhanced SWTR | Microbial | *Cryptosporidium* monitoring resulted in a maximum running annual average concentration of 0.008 oocysts/L and a Bin 1 classification. No further action required. Second round of source water monitoring to be conducted six years after initial classification. |
| Stage 2 D/DBP Rule | Disinfectants and Disinfection By-Products | WVWD completed the IDSE and converted over to the new Stage 2 monitoring sites in June 2012. TTHM/HAA5 LRAAs for Stage 2 data are well below drinking water standards (<80/60 µg/L, respectively). |

# SECTION 6 – RECOMMENDATIONS

This section discusses source water protection activities taken since the 2008 Update Watershed Sanitary Survey and a list of recommendations for future source water protection efforts.

## SOURCE WATER PROTECTION ACTIVITIES SINCE THE 2008 UPDATE WATERSHED SANITARY SURVEY

The West Valley Water District (WVWD) has implemented source water protection efforts as recommended in the 2008 Update Report. It is important to note the following source water protection efforts:

- WVWD coordinated with the United States Forest Service (USFS) during and after the Sheep Fire in October 2009 to ensure that fire retardants were not used near the Lytle Creek streambed.

- In April 2013, WVWD sent a letter to the USFS to support the continued collection of Forest Adventure Pass fees in the Lytle Creek watershed.

- WVWD participated in a Lytle Creek Watershed Action Project which received grant funding in 2007 from the CALFED Bay-Delta Program. Other partners for the project were the San Bernardino Valley Municipal Water District, USFS, the Santa Ana Regional Water Quality Control Board (Regional Board), and the California State University at San Bernardino Water Resources Institute. Educational materials were developed; outreach to schools was conducted, as well as a watershed clean-up day and coliform monitoring for two years along Lytle Creek. Unfortunately, the watershed project was discontinued in 2010 due to a lack of funding. Additional information can be found in **Section 4**.

- WWVD initiated *E. coli* monitoring of the Grapeland tunnel water to assess any impact from the Lytle Creek wastewater treatment plant percolation ponds.

- WVWD continues to investigate the feasibility of installing a turbidimeter at Fish Wheel to provide early detection of illicit discharges to Lytle Creek.

- WVWD has continued to conduct monthly visual inspections of the watershed.

## RECOMMENDATIONS

The following recommendations have been developed for this Third Update, and are listed by subject area and not by priority. Development of recommendations for watershed management actions that are economically feasible and within the authority of the WVWD is critical. Recommendations will be implemented by the WVWD as resources are available.

### Water Quality

- Coordinate with California Department of Public Health (CDPH) to revise the current Water Supply Permit to clarify that the Oliver P. Roemer Water Filtration Facility (WFF) is a conventional water treatment plant which is awarded 2.5-log reduction of *Giardia* (99.7 percent), 2-log reduction of *Cryptosporidium* (99 percent), and 2-log reduction of viruses (99 percent), when all turbidity standards are met, as stated in the Engineering Report.

- Coordinate with CDPH to evaluate the opportunity to use source water fecal coliform or *Escherichia coli (E. coli)* concentrations to determine the appropriate level of treatment required for pathogen reduction under the Surface Water Treatment Rule (SWTR) and Guidances. Request CDPH to revise permit condition related to advanced level of treatment to be based on monthly median *E. coli* level, with a trigger level of 200 most probable number per 100 milliliters (MPN/100 mL). Clarify the source water monitoring requirements and the method for determination of the level of treatment required, which is believed to be monthly median calculated weekly.

- Consider permanently converting to source water monitoring for total coliform and *E. coli*, in lieu of fecal coliform.

- Formally request a meeting with the Santa Ana Regional Board to present the findings and potential causes for the Spring/Summer 2011 related to elevated levels of total coliform and total organic carbon.

- Continue to optimize treatment during times of potentially reduced source water quality – i.e. adjust coagulant dose, optimize polymers, implement alternative treatment processes (granular activated carbon [GAC]/ultraviolet light [UV]), reduce flow if possible to increase hydraulic detention times and reduce filtration loading rates, ensure adequate disinfection contact time (CT).

- Continue to use jar testing to optimize solids removal and document removal rates under low raw water turbidity scenarios. Consider application of a streaming current detector to assist with dosing strategy.

### Watershed Contaminant Sources

- Track if any changes will occur to the current USFS policy for requiring a Forest Adventure Pass fee within the Lytle Creek watershed.

- Obtain watershed information from the Burned Area Emergency Response team or Lytle Creek Ranger Station whenever there is a fire within the Lytle Creek watershed.

- Continue pursuing the installation of a turbidimeter at the Upper Southern California Edison (SCE) intake (Fish Wheel) in order to provide WVWD staff advance warning of changes in source water quality.

- Continue *E. coli* monitoring of Grapeland Tunnel water, weekly for one year.

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| Lauren Blake | USFS – Sheep Fire | (909) 382-2873 |

| Date | Peak Daily Raw | Peak Daily Settled | Average Daily CFE | Removal thru Sed | Removal thru Filt |
|---|---|---|---|---|---|
| 1/1/2008 | | | | | |
| 1/2/2008 | | | | | |
| 1/3/2008 | | | | | |
| 1/4/2008 | | | | | |
| 1/5/2008 | | | | | |
| 1/6/2008 | | | | | |
| 1/7/2008 | | | | | |
| 1/8/2008 | | | | | |
| 1/9/2008 | | | | | |
| 1/10/2008 | | | | | |
| 1/11/2008 | | | | | |
| 1/12/2008 | | | | | |
| 1/13/2008 | | | | | |
| 1/14/2008 | | | | | |
| 1/15/2008 | | | | | |
| 1/16/2008 | | | | | |
| 1/17/2008 | | | | | |
| 1/18/2008 | | | | | |
| 1/19/2008 | | | | | |
| 1/20/2008 | | | | | |
| 1/21/2008 | | | | | |
| 1/22/2008 | | | | | |
| 1/23/2008 | | | | | |
| 1/24/2008 | | | | | |
| 1/25/2008 | | | | | |
| 1/26/2008 | | | | | |
| 1/27/2008 | | | | | |
| 1/28/2008 | | | | | |
| 1/29/2008 | | | | | |
| 1/30/2008 | | | | | |
| 1/31/2008 | | | | | |
| 2/1/2008 | | | | | |
| 2/2/2008 | | | | | |
| 2/3/2008 | | | | | |
| 2/4/2008 | | | | | |
| 2/5/2008 | | | | | |
| 2/6/2008 | | | | | |
| 2/7/2008 | | | | | |
| 2/8/2008 | | | | | |
| 2/9/2008 | 2 | 0.13 | 0.103 | 94% | 95% |
| 2/10/2008 | 1.4 | 0.06 | 0.052 | 96% | 96% |
| 2/11/2008 | 0.7 | 0.07 | 0.055 | 90% | 92% |
| 2/12/2008 | 0.6 | 0.1 | 0.056 | 83% | 91% |
| 2/13/2008 | 0.5 | 0.05 | 0.046 | 90% | 91% |
| 2/14/2008 | 0.4 | 0.07 | 0.051 | 83% | 87% |
| 2/15/2008 | 0.4 | 0.07 | 0.063 | 83% | 84% |
| 2/16/2008 | | | | | |
| 2/17/2008 | | | | | |
| 2/18/2008 | | | | | |
| 2/19/2008 | | | | | |
| 2/20/2008 | | | | | |
| 2/21/2008 | | | | | |
| 2/22/2008 | | | | | |
| 2/23/2008 | | | | | |
| 2/24/2008 | | | | | |
| 2/25/2008 | 1.3 | 0.08 | 0.068 | 94% | 95% |
| 2/26/2008 | | | | | |
| 2/27/2008 | 1.2 | 0.07 | 0.065 | 94% | 95% |
| 2/28/2008 | 1 | 0.06 | 0.05 | 94% | 95% |
| 2/29/2008 | 0.8 | 0.07 | 0.053 | 91% | 93% |
| 3/1/2008 | 0.6 | 0.06 | 0.045 | 90% | 93% |
| 3/2/2008 | 0.5 | 0.09 | 0.066 | 82% | 87% |
| 3/3/2008 | 0.5 | 0.05 | 0.045 | 90% | 91% |
| 3/4/2008 | 0.5 | 0.06 | 0.049 | 88% | 90% |
| 3/5/2008 | 0.5 | 0.06 | 0.052 | 88% | 90% |

| Date | Peak Daily Raw | Peak Daily Settled | Average Daily CFE | Removal thru Sed | Removal thru Filt |
|---|---|---|---|---|---|
| 3/6/2008 | 0.4 | 0.06 | 0.046 | 85% | 89% |
| 3/7/2008 | 0.4 | 0.06 | 0.045 | 85% | 89% |
| 3/8/2008 | 0.3 | 0.06 | 0.047 | 80% | 84% |
| 3/9/2008 | 0.4 | 0.05 | 0.042 | 88% | 90% |
| 3/10/2008 | 0.3 | 0.04 | 0.04 | 87% | 87% |
| 3/11/2008 | 0.4 | 0.05 | 0.045 | 88% | 89% |
| 3/12/2008 | 0.3 | 0.05 | 0.042 | 83% | 86% |
| 3/13/2008 | 0.5 | 0.06 | 0.05 | 88% | 90% |
| 3/14/2008 | 0.4 | 0.07 | 0.056 | 83% | 86% |
| 3/15/2008 | 0.4 | 0.08 | 0.067 | 80% | 83% |
| 3/16/2008 | 0.7 | 0.07 | 0.064 | 90% | 91% |
| 3/17/2008 | 0.5 | 0.07 | 0.055 | 86% | 89% |
| 3/18/2008 | 0.4 | 0.08 | 0.065 | 80% | 84% |
| 3/19/2008 | 0.4 | 0.08 | 0.067 | 80% | 83% |
| 3/20/2008 | 0.4 | 0.07 | 0.056 | 83% | 86% |
| 3/21/2008 | 0.9 | 0.06 | 0.046 | 93% | 95% |
| 3/22/2008 | 0.9 | 0.06 | 0.044 | 93% | 95% |
| 3/23/2008 | 0.9 | 0.06 | 0.038 | 93% | 96% |
| 3/24/2008 | 0.3 | 0.04 | 0.036 | 87% | 88% |
| 3/25/2008 | 0.4 | 0.04 | 0.033 | 90% | 92% |
| 3/26/2008 | 0.4 | 0.04 | 0.03 | 90% | 93% |
| 3/27/2008 | 0.4 | 0.06 | 0.041 | 85% | 90% |
| 3/28/2008 | 0.4 | 0.06 | 0.045 | 85% | 89% |
| 3/29/2008 | 0.4 | 0.06 | 0.047 | 85% | 88% |
| 3/30/2008 | 0.4 | 0.06 | 0.045 | 85% | 89% |
| 3/31/2008 | 0.9 | 0.06 | 0.042 | 93% | 95% |
| 4/1/2008 | 0.3 | 0.05 | 0.034 | 83% | 89% |
| 4/2/2008 | 0.2 | 0.05 | 0.036 | 75% | 82% |
| 4/3/2008 | 0.2 | 0.03 | 0.031 | 85% | 85% |
| 4/4/2008 | 0.2 | 0.04 | 0.033 | 80% | 84% |
| 4/5/2008 | 0.2 | 0.04 | 0.037 | 80% | 82% |
| 4/6/2008 | 0.2 | 0.04 | 0.035 | 80% | 83% |
| 4/7/2008 | 0.3 | 0.03 | 0.032 | 90% | 89% |
| 4/8/2008 | 0.3 | 0.04 | 0.035 | 87% | 88% |
| 4/9/2008 | 0.3 | 0.04 | 0.035 | 87% | 88% |
| 4/10/2008 | 0.2 | 0.04 | 0.033 | 80% | 84% |
| 4/11/2008 | 0.2 | 0.04 | 0.036 | 80% | 82% |
| 4/12/2008 | 0.3 | 0.04 | 0.034 | 87% | 89% |
| 4/13/2008 | 0.4 | 0.04 | 0.035 | 90% | 91% |
| 4/14/2008 | 0.4 | 0.05 | 0.04 | 88% | 90% |
| 4/15/2008 | 0.3 | 0.05 | 0.044 | 83% | 85% |
| 4/16/2008 | 0.2 | 0.05 | 0.045 | 75% | 78% |
| 4/17/2008 | 0.2 | 0.05 | 0.047 | 75% | 77% |
| 4/18/2008 | 0.3 | 0.08 | 0.054 | 73% | 82% |
| 4/19/2008 | 0.3 | 0.05 | 0.045 | 83% | 85% |
| 4/20/2008 | 0.4 | 0.05 | 0.04 | 88% | 90% |
| 4/21/2008 | 0.3 | 0.04 | 0.039 | 87% | 87% |
| 4/22/2008 | 0.3 | 0.05 | 0.047 | 83% | 84% |
| 4/23/2008 | 0.2 | 0.06 | 0.051 | 70% | 75% |
| 4/24/2008 | 0.2 | 0.07 | 0.065 | 65% | 68% |
| 4/25/2008 | 0.4 | 0.07 | 0.057 | 83% | 86% |
| 4/26/2008 | 0.5 | 0.06 | 0.053 | 88% | 89% |
| 4/27/2008 | 0.8 | 0.06 | 0.053 | 93% | 93% |
| 4/28/2008 | 0.6 | 0.07 | 0.058 | 88% | 90% |
| 4/29/2008 | 0.6 | 0.06 | 0.055 | 90% | 91% |
| 4/30/2008 | 0.5 | 0.06 | 0.051 | 88% | 90% |
| 5/1/2008 | 0.5 | 0.05 | 0.047 | 90% | 91% |
| 5/2/2008 | 0.4 | 0.05 | 0.05 | 88% | 88% |
| 5/3/2008 | 0.3 | 0.06 | 0.051 | 80% | 83% |
| 5/4/2008 | 0.3 | 0.05 | 0.05 | 83% | 83% |
| 5/5/2008 | 0.6 | 0.08 | 0.063 | 87% | 90% |
| 5/6/2008 | 0.4 | 0.08 | 0.059 | 80% | 85% |
| 5/7/2008 | 0.3 | 0.07 | 0.055 | 77% | 82% |
| 5/8/2008 | 0.6 | 0.06 | 0.047 | 90% | 92% |

| Date | Peak Daily Raw | Peak Daily Settled | Average Daily CFE | Removal thru Sed | Removal thru Filt |
|---|---|---|---|---|---|
| 5/9/2008 | 1 | 0.05 | 0.043 | 95% | 96% |
| 5/10/2008 | 0.5 | 0.05 | 0.039 | 90% | 92% |
| 5/11/2008 | 0.4 | 0.05 | 0.043 | 88% | 89% |
| 5/12/2008 | 0.3 | 0.07 | 0.052 | 77% | 83% |
| 5/13/2008 | 0.2 | 0.06 | 0.051 | 70% | 75% |
| 5/14/2008 | 0.2 | 0.06 | 0.053 | 70% | 74% |
| 5/15/2008 | 0.2 | 0.05 | 0.047 | 75% | 77% |
| 5/16/2008 | 0.4 | 0.07 | 0.06 | 83% | 85% |
| 5/17/2008 | 0.6 | 0.07 | 0.055 | 88% | 91% |
| 5/18/2008 | 1.2 | 0.06 | 0.056 | 95% | 95% |
| 5/19/2008 | 1.8 | 0.07 | 0.057 | 96% | 97% |
| 5/20/2008 | 1 | 0.08 | 0.063 | 92% | 94% |
| 5/21/2008 | 0.5 | 0.06 | 0.05 | 88% | 90% |
| 5/22/2008 | 0.5 | 0.05 | 0.044 | 90% | 91% |
| 5/23/2008 | 0.5 | 0.05 | 0.044 | 90% | 91% |
| 5/24/2008 | 1.6 | 0.1 | 0.074 | 94% | 95% |
| 5/25/2008 | 0.5 | 0.07 | 0.06 | 86% | 88% |
| 5/26/2008 | 0.3 | 0.07 | 0.059 | 77% | 80% |
| 5/27/2008 | 0.5 | 0.08 | 0.065 | 84% | 87% |
| 5/28/2008 | 0.5 | 0.08 | 0.06 | 84% | 88% |
| 5/29/2008 | 0.3 | 0.07 | 0.056 | 77% | 81% |
| 5/30/2008 | 0.3 | 0.05 | 0.045 | 83% | 85% |
| 5/31/2008 | 0.4 | 0.04 | 0.04 | 90% | 90% |
| 6/1/2008 | 0.3 | 0.04 | 0.034 | 87% | 89% |
| 6/2/2008 | 0.3 | 0.04 | 0.04 | 87% | 87% |
| 6/3/2008 | 0.3 | 0.04 | 0.042 | 87% | 86% |
| 6/4/2008 | 0.4 | 0.04 | 0.039 | 90% | 90% |
| 6/5/2008 | 0.4 | 0.04 | 0.037 | 90% | 91% |
| 6/6/2008 | 0.3 | 0.07 | 0.048 | 77% | 84% |
| 6/7/2008 | 0.3 | 0.05 | 0.038 | 83% | 87% |
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| 6/12/2008 | 0.4 | 0.04 | 0.039 | 90% | 90% |
| 6/13/2008 | 0.4 | 0.05 | 0.042 | 88% | 90% |
| 6/14/2008 | 0.3 | 0.05 | 0.045 | 83% | 85% |
| 6/15/2008 | 0.7 | 0.05 | 0.047 | 93% | 93% |
| 6/16/2008 | 1 | 0.05 | 0.049 | 95% | 95% |
| 6/17/2008 | 0.6 | 0.05 | 0.043 | 92% | 93% |
| 6/18/2008 | 0.5 | 0.06 | 0.047 | 88% | 91% |
| 6/19/2008 | 0.6 | 0.05 | 0.044 | 92% | 93% |
| 6/20/2008 | 0.9 | 0.05 | 0.044 | 94% | 95% |
| 6/21/2008 | 1.4 | 0.06 | 0.05 | 96% | 96% |
| 6/22/2008 | 2.2 | 0.07 | 0.06 | 97% | 97% |
| 6/23/2008 | 2.3 | 0.06 | 0.056 | 97% | 98% |
| 6/24/2008 | 1.9 | 0.06 | 0.049 | 97% | 97% |
| 6/25/2008 | 1.5 | 0.06 | 0.048 | 96% | 97% |
| 6/26/2008 | 1.1 | 0.06 | 0.051 | 95% | 95% |
| 6/27/2008 | 1.2 | 0.06 | 0.05 | 95% | 96% |
| 6/28/2008 | 0.9 | 0.05 | 0.049 | 94% | 95% |
| 6/29/2008 | 0.7 | 0.06 | 0.051 | 91% | 93% |
| 6/30/2008 | 4.8 | 0.06 | 0.053 | 99% | 99% |
| 7/1/2008 | 2.3 | 0.06 | 0.053 | 97% | 98% |
| 7/2/2008 | 2.5 | 0.07 | 0.057 | 97% | 98% |
| 7/3/2008 | 0.6 | 0.04 | 0.037 | 93% | 94% |
| 7/4/2008 | 0.4 | 0.06 | 0.054 | 85% | 87% |
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| 7/8/2008 | 0.5 | 0.06 | 0.049 | 88% | 90% |
| 7/9/2008 | 0.5 | 0.09 | 0.056 | 82% | 89% |
| 7/10/2008 | 0.4 | 0.07 | 0.057 | 83% | 86% |
| 7/11/2008 | 0.5 | 0.09 | 0.073 | 82% | 85% |

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|---|---|---|---|---|---|
| 7/12/2008 | 0.4 | 0.07 | 0.059 | 83% | 85% |
| 7/13/2008 | 0.5 | 0.05 | 0.048 | 90% | 90% |
| 7/14/2008 | 0.6 | 0.06 | 0.05 | 90% | 92% |
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| 7/29/2008 | 0.4 | 0.06 | 0.052 | 85% | 87% |
| 7/30/2008 | 0.3 | 0.05 | 0.049 | 83% | 84% |
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| 8/1/2008 | 0.3 | 0.07 | 0.057 | 77% | 81% |
| 8/2/2008 | 0.3 | 0.07 | 0.061 | 77% | 80% |
| 8/3/2008 | 0.4 | 0.07 | 0.06 | 83% | 85% |
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| 8/10/2008 | 0.4 | 0.07 | 0.059 | 83% | 85% |
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| 8/13/2008 | 0.4 | 0.08 | 0.064 | 80% | 84% |
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| 8/27/2008 | 0.4 | 0.06 | 0.053 | 85% | 87% |
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| 8/29/2008 | 0.5 | 0.06 | 0.052 | 88% | 90% |
| 8/30/2008 | 0.6 | 0.06 | 0.05 | 90% | 92% |
| 8/31/2008 | 0.8 | 0.06 | 0.051 | 93% | 94% |
| 9/1/2008 | 0.8 | 0.06 | 0.056 | 93% | 93% |
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| 9/9/2008 | 0.4 | 0.04 | 0.036 | 90% | 91% |
| 9/10/2008 | 0.4 | 0.04 | 0.037 | 90% | 91% |
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| 9/21/2008 | 0.4 | 0.09 | 0.075 | 78% | 81% |
| 9/22/2008 | 0.4 | 0.1 | 0.082 | 75% | 80% |
| 9/23/2008 | 0.4 | 0.07 | 0.061 | 83% | 85% |
| 9/24/2008 | 0.4 | 0.07 | 0.063 | 83% | 84% |
| 9/25/2008 | 0.4 | 0.07 | 0.057 | 83% | 86% |
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| 9/29/2008 | 0.4 | 0.07 | 0.065 | 83% | 84% |
| 9/30/2008 | 0.4 | 0.09 | 0.071 | 78% | 82% |
| 10/1/2008 | 0.5 | 0.07 | 0.064 | 86% | 87% |
| 10/2/2008 | 0.3 | 0.07 | 0.065 | 77% | 78% |
| 10/3/2008 | 0.3 | 0.07 | 0.064 | 77% | 79% |
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| 10/5/2008 | 0.3 | 0.09 | 0.067 | 70% | 78% |
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| 10/8/2008 | 0.3 | 0.06 | 0.056 | 80% | 81% |
| 10/9/2008 | 0.3 | 0.06 | 0.056 | 80% | 81% |
| 10/10/2008 | 0.3 | 0.06 | 0.055 | 80% | 82% |
| 10/11/2008 | 0.3 | 0.06 | 0.055 | 80% | 82% |
| 10/12/2008 | 0.3 | 0.06 | 0.055 | 80% | 82% |
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| 10/25/2008 | 0.3 | 0.06 | 0.052 | 80% | 83% |
| 10/26/2008 | 0.3 | 0.06 | 0.054 | 80% | 82% |
| 10/27/2008 | 0.3 | 0.06 | 0.054 | 80% | 82% |
| 10/28/2008 | 0.3 | 0.06 | 0.056 | 80% | 81% |
| 10/29/2008 | 0.3 | 0.06 | 0.055 | 80% | 82% |
| 10/30/2008 | 0.5 | 0.06 | 0.056 | 88% | 89% |
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| 11/5/2008 | 0.3 | 0.05 | 0.051 | 83% | 83% |
| 11/6/2008 | 0.3 | 0.05 | 0.048 | 83% | 84% |
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| 11/19/2008 | 0.3 | 0.05 | 0.044 | 83% | 85% |
| 11/20/2008 | 0.3 | 0.04 | 0.04 | 87% | 87% |
| 11/21/2008 | 0.3 | 0.04 | 0.039 | 87% | 87% |
| 11/22/2008 | 0.3 | 0.04 | 0.04 | 87% | 87% |
| 11/23/2008 | 0.3 | 0.04 | 0.041 | 87% | 86% |
| 11/24/2008 | 0.3 | 0.04 | 0.04 | 87% | 87% |
| 11/25/2008 | 0.3 | 0.04 | 0.039 | 87% | 87% |
| 11/26/2008 | 0.5 | 0.05 | 0.037 | 90% | 93% |
| 11/27/2008 | 0.9 | 0.08 | 0.064 | 91% | 93% |
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| 11/30/2008 | 0.4 | 0.07 | 0.055 | 83% | 86% |
| 12/1/2008 | 0.6 | 0.05 | 0.048 | 92% | 92% |
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| 12/3/2008 | 0.6 | 0.04 | 0.036 | 93% | 94% |
| 12/4/2008 | 0.4 | 0.04 | 0.035 | 90% | 91% |
| 12/5/2008 | 0.4 | 0.04 | 0.033 | 90% | 92% |
| 12/6/2008 | 0.4 | 0.04 | 0.032 | 90% | 92% |
| 12/7/2008 | 0.4 | 0.03 | 0.029 | 93% | 93% |
| 12/8/2008 | 0.4 | 0.03 | 0.026 | 93% | 94% |
| 12/9/2008 | 0.4 | 0.03 | 0.027 | 93% | 93% |
| 12/10/2008 | 0.4 | 0.03 | 0.028 | 93% | 93% |
| 12/11/2008 | 0.3 | 0.03 | 0.027 | 90% | 91% |
| 12/12/2008 | 0.3 | 0.03 | 0.027 | 90% | 91% |
| 12/13/2008 | 0.3 | 0.03 | 0.027 | 90% | 91% |
| 12/14/2008 | 0.3 | 0.03 | 0.028 | 90% | 91% |
| 12/15/2008 | 0.5 | 0.04 | 0.031 | 92% | 94% |
| 12/16/2008 | 0.5 | 0.05 | 0.036 | 90% | 93% |
| 12/17/2008 | 0.5 | 0.04 | 0.033 | 92% | 93% |
| 12/18/2008 | 0.5 | 0.04 | 0.036 | 92% | 93% |
| 12/19/2008 | 0.5 | 0.04 | 0.035 | 92% | 93% |
| 12/20/2008 | 0.4 | 0.04 | 0.035 | 90% | 91% |
| 12/21/2008 | 0.3 | 0.04 | 0.035 | 87% | 88% |
| 12/22/2008 | 0.3 | 0.05 | 0.036 | 83% | 88% |
| 12/23/2008 | 0.4 | 0.04 | 0.034 | 90% | 92% |
| 12/24/2008 | 0.3 | 0.04 | 0.035 | 87% | 88% |
| 12/25/2008 | 0.4 | 0.04 | 0.034 | 90% | 92% |
| 12/26/2008 | 0.3 | 0.04 | 0.035 | 87% | 88% |
| 12/27/2008 | 0.3 | 0.04 | 0.032 | 87% | 89% |
| 12/28/2008 | 0.4 | 0.04 | 0.034 | 90% | 92% |
| 12/29/2008 | 0.9 | 0.04 | 0.038 | 96% | 96% |
| 12/30/2008 | 0.4 | 0.04 | 0.037 | 90% | 91% |
| 12/31/2008 | 0.3 | 0.04 | 0.038 | 87% | 87% |
| 1/1/2009 | 0.3 | 0.04 | 0.01 | 87% | 97% |
| 1/2/2009 | 0.3 | 0.04 | 0.036 | 87% | 88% |
| 1/3/2009 | 0.3 | 0.04 | 0.036 | 87% | 88% |
| 1/4/2009 | 0.4 | 0.04 | 0.037 | 90% | 91% |
| 1/5/2009 | 0.3 | 0.04 | 0.037 | 87% | 88% |
| 1/6/2009 | | | | | |
| 1/7/2009 | | | | | |
| 1/8/2009 | | | | | |
| 1/9/2009 | | | | | |
| 1/10/2009 | | | | | |
| 1/11/2009 | | | | | |
| 1/12/2009 | | | | | |
| 1/13/2009 | | | | | |
| 1/14/2009 | | | | | |
| 1/15/2009 | | | | | |
| 1/16/2009 | | | | | |
| 1/17/2009 | | | | | |
| 1/18/2009 | | | | | |
| 1/19/2009 | | | | | |

| Date | Peak Daily Raw | Peak Daily Settled | Average Daily CFE | Removal thru Sed | Removal thru Filt |
|---|---|---|---|---|---|
| 1/20/2009 | | | | | |
| 1/21/2009 | | | | | |
| 1/22/2009 | | | | | |
| 1/23/2009 | | | | | |
| 1/24/2009 | | | | | |
| 1/25/2009 | | | | | |
| 1/26/2009 | | | | | |
| 1/27/2009 | | | | | |
| 1/28/2009 | | | | | |
| 1/29/2009 | | | | | |
| 1/30/2009 | | | | | |
| 1/31/2009 | | | | | |
| 2/1/2009 | | | | | |
| 2/2/2009 | | | | | |
| 2/3/2009 | | | | | |
| 2/4/2009 | | | | | |
| 2/5/2009 | | | | | |
| 2/6/2009 | | | | | |
| 2/7/2009 | | | | | |
| 2/8/2009 | | | | | |
| 2/9/2009 | | | | | |
| 2/10/2009 | | | | | |
| 2/11/2009 | | | | | |
| 2/12/2009 | | | | | |
| 2/13/2009 | | | | | |
| 2/14/2009 | | | | | |
| 2/15/2009 | | | | | |
| 2/16/2009 | | | | | |
| 2/17/2009 | | | | | |
| 2/18/2009 | | | | | |
| 2/19/2009 | | | | | |
| 2/20/2009 | | | | | |
| 2/21/2009 | | | | | |
| 2/22/2009 | | | | | |
| 2/23/2009 | | | | | |
| 2/24/2009 | | | | | |
| 2/25/2009 | | | | | |
| 2/26/2009 | | | | | |
| 2/27/2009 | | | | | |
| 2/28/2009 | | | | | |
| 3/1/2009 | | | | | |
| 3/2/2009 | | | | | |
| 3/3/2009 | | | | | |
| 3/4/2009 | | | | | |
| 3/5/2009 | | | | | |
| 3/6/2009 | | | | | |
| 3/7/2009 | | | | | |
| 3/8/2009 | | | | | |
| 3/9/2009 | | | | | |
| 3/10/2009 | | | | | |
| 3/11/2009 | | | | | |
| 3/12/2009 | | | | | |
| 3/13/2009 | | | | | |
| 3/14/2009 | | | | | |
| 3/15/2009 | | | | | |
| 3/16/2009 | | | | | |
| 3/17/2009 | | | | | |
| 3/18/2009 | 0.4 | 0.03 | 0.027 | 93% | 93% |
| 3/19/2009 | 0.5 | 0.05 | 0.03 | 90% | 94% |
| 3/20/2009 | 0.5 | 0.03 | 0.022 | 94% | 96% |
| 3/21/2009 | 0.5 | 0.03 | 0.026 | 94% | 95% |
| 3/22/2009 | 0.4 | 0.03 | 0.027 | 93% | 93% |
| 3/23/2009 | 0.5 | 0.04 | 0.028 | 92% | 94% |
| 3/24/2009 | 0.4 | 0.03 | 0.026 | 93% | 94% |

| Date | Peak Daily Raw | Peak Daily Settled | Average Daily CFE | Removal thru Sed | Removal thru Filt |
|---|---|---|---|---|---|
| 3/25/2009 | 0.4 | 0.03 | 0.024 | 93% | 94% |
| 3/26/2009 | 0.4 | 0.03 | 0.025 | 93% | 94% |
| 3/27/2009 | 0.4 | 0.03 | 0.025 | 93% | 94% |
| 3/28/2009 | 0.3 | 0.03 | 0.025 | 90% | 92% |
| 3/29/2009 | | | 0.024 | | |
| 3/30/2009 | | | 0.025 | | |
| 3/31/2009 | | | 0.032 | | |
| 4/1/2009 | 0.3 | 0.03 | 0.03 | 90% | 90% |
| 4/2/2009 | 0.3 | 0.03 | 0.03 | 90% | 90% |
| 4/3/2009 | 0.4 | 0.03 | 0.027 | 93% | 93% |
| 4/4/2009 | 0.3 | 0.03 | 0.027 | 90% | 91% |
| 4/5/2009 | 0.3 | 0.03 | 0.025 | 90% | 92% |
| 4/6/2009 | 0.3 | 0.03 | 0.028 | 90% | 91% |
| 4/7/2009 | 0.3 | 0.03 | 0.027 | 90% | 91% |
| 4/8/2009 | 0.3 | 0.03 | 0.028 | 90% | 91% |
| 4/9/2009 | 0.3 | 0.03 | 0.027 | 90% | 91% |
| 4/10/2009 | 0.3 | 0.03 | 0.027 | 90% | 91% |
| 4/11/2009 | 0.5 | 0.04 | 0.033 | 92% | 93% |
| 4/12/2009 | 0.3 | 0.05 | 0.032 | 83% | 89% |
| 4/13/2009 | 0.3 | 0.04 | 0.039 | 87% | 87% |
| 4/14/2009 | 0.3 | 0.04 | 0.038 | 87% | 87% |
| 4/15/2009 | 2.6 | 0.06 | 0.043 | 98% | 98% |
| 4/16/2009 | 0.8 | 0.04 | 0.032 | 95% | 96% |
| 4/17/2009 | 0.4 | 0.03 | 0.03 | 93% | 93% |
| 4/18/2009 | 0.9 | 0.03 | 0.028 | 97% | 97% |
| 4/19/2009 | 0.9 | 0.06 | 0.045 | 93% | 95% |
| 4/20/2009 | 0.7 | 0.04 | 0.032 | 94% | 95% |
| 4/21/2009 | 0.6 | 0.04 | 0.034 | 93% | 94% |
| 4/22/2009 | 0.4 | 0.05 | 0.039 | 88% | 90% |
| 4/23/2009 | 0.7 | 0.05 | 0.039 | 93% | 94% |
| 4/24/2009 | 0.5 | 0.06 | 0.044 | 88% | 91% |
| 4/25/2009 | 0.5 | 0.08 | 0.051 | 84% | 90% |
| 4/26/2009 | 0.4 | 0.03 | 0.029 | 93% | 93% |
| 4/27/2009 | 0.4 | 0.04 | 0.036 | 90% | 91% |
| 4/28/2009 | 0.5 | 0.06 | 0.044 | 88% | 91% |
| 4/29/2009 | 0.4 | 0.04 | 0.037 | 90% | 91% |
| 4/30/2009 | 0.4 | 0.05 | 0.04 | 88% | 90% |
| 5/1/2009 | 0.4 | 0.06 | 0.044 | 85% | 89% |
| 5/2/2009 | 0.3 | 0.04 | 0.035 | 87% | 88% |
| 5/3/2009 | 0.3 | 0.03 | 0.031 | 90% | 90% |
| 5/4/2009 | 0.3 | 0.03 | 0.03 | 90% | 90% |
| 5/5/2009 | 0.3 | 0.04 | 0.036 | 87% | 88% |
| 5/6/2009 | 0.3 | 0.05 | 0.04 | 83% | 87% |
| 5/7/2009 | 0.3 | 0.04 | 0.036 | 87% | 88% |
| 5/8/2009 | 0.4 | 0.05 | 0.035 | 88% | 91% |
| 5/9/2009 | 0.6 | 0.04 | 0.034 | 93% | 94% |
| 5/10/2009 | 0.6 | 0.04 | 0.035 | 93% | 94% |
| 5/11/2009 | 0.6 | 0.04 | 0.038 | 93% | 94% |
| 5/12/2009 | 0.4 | 0.04 | 0.036 | 90% | 91% |
| 5/13/2009 | 0.4 | 0.04 | 0.036 | 90% | 91% |
| 5/14/2009 | 0.4 | 0.04 | 0.035 | 90% | 91% |
| 5/15/2009 | 0.3 | 0.04 | 0.035 | 87% | 88% |
| 5/16/2009 | 0.5 | 0.04 | 0.036 | 92% | 93% |
| 5/17/2009 | 0.9 | 0.04 | 0.038 | 96% | 96% |
| 5/18/2009 | 1 | 0.06 | 0.042 | 94% | 96% |
| 5/19/2009 | 0.5 | 0.04 | 0.04 | 92% | 92% |
| 5/20/2009 | 0.4 | 0.04 | 0.04 | 90% | 90% |
| 5/21/2009 | 0.5 | 0.04 | 0.04 | 92% | 92% |
| 5/22/2009 | 0.4 | 0.04 | 0.037 | 90% | 91% |
| 5/23/2009 | 0.5 | 0.04 | 0.031 | 92% | 94% |
| 5/24/2009 | 0.7 | 0.03 | 0.033 | 96% | 95% |
| 5/25/2009 | 0.9 | 0.04 | 0.035 | 96% | 96% |
| 5/26/2009 | 0.6 | 0.04 | 0.037 | 93% | 94% |
| 5/27/2009 | 0.4 | 0.04 | 0.038 | 90% | 91% |

| Date | Peak Daily Raw | Peak Daily Settled | Average Daily CFE | Removal thru Sed | Removal thru Filt |
|---|---|---|---|---|---|
| 5/28/2009 | 0.3 | 0.04 | 0.037 | 87% | 88% |
| 5/29/2009 | 0.8 | 0.04 | 0.037 | 95% | 95% |
| 5/30/2009 | 0.3 | 0.04 | 0.039 | 87% | 87% |
| 5/31/2009 | 0.3 | 0.04 | 0.038 | 87% | 87% |
| 6/1/2009 | 0.3 | 0.04 | 0.04 | 87% | 87% |
| 6/2/2009 | 0.3 | 0.05 | 0.043 | 83% | 86% |
| 6/3/2009 | 0.3 | 0.05 | 0.045 | 83% | 85% |
| 6/4/2009 | 0.2 | 0.06 | 0.048 | 70% | 76% |
| 6/5/2009 | 0.2 | 0.06 | 0.053 | 70% | 74% |
| 6/6/2009 | 0.2 | 0.07 | 0.054 | 65% | 73% |
| 6/7/2009 | 0.5 | 0.07 | 0.059 | 86% | 88% |
| 6/8/2009 | 0.3 | 0.07 | 0.056 | 77% | 81% |
| 6/9/2009 | 0.3 | 0.04 | 0.039 | 87% | 87% |
| 6/10/2009 | 0.2 | 0.05 | 0.04 | 75% | 80% |
| 6/11/2009 | 0.2 | 0.05 | 0.045 | 75% | 78% |
| 6/12/2009 | 0.2 | 0.05 | 0.045 | 75% | 78% |
| 6/13/2009 | 0.2 | 0.05 | 0.047 | 75% | 77% |
| 6/14/2009 | 0.2 | 0.05 | 0.049 | 75% | 76% |
| 6/15/2009 | 0.2 | 0.05 | 0.049 | 75% | 76% |
| 6/16/2009 | 0.2 | 0.05 | 0.044 | 75% | 78% |
| 6/17/2009 | 0.2 | 0.05 | 0.044 | 75% | 78% |
| 6/18/2009 | 0.3 | 0.05 | 0.045 | 83% | 85% |
| 6/19/2009 | 0.3 | 0.08 | 0.052 | 73% | 83% |
| 6/20/2009 | 0.3 | 0.1 | 0.071 | 67% | 76% |
| 6/21/2009 | 0.3 | 0.04 | 0.042 | 87% | 86% |
| 6/22/2009 | 0.3 | 0.04 | 0.039 | 87% | 87% |
| 6/23/2009 | 0.3 | 0.04 | 0.038 | 87% | 87% |
| 6/24/2009 | 0.3 | 0.06 | 0.043 | 80% | 86% |
| 6/25/2009 | 0.3 | 0.05 | 0.043 | 83% | 86% |
| 6/26/2009 | 0.3 | 0.05 | 0.044 | 83% | 85% |
| 6/27/2009 | 0.5 | 0.08 | 0.045 | 84% | 91% |
| 6/28/2009 | 0.8 | 0.04 | 0.032 | 95% | 96% |
| 6/29/2009 | 0.9 | 0.03 | 0.032 | 97% | 96% |
| 6/30/2009 | 0.4 | 0.03 | 0.031 | 93% | 92% |
| 7/1/2009 | 0.5 | 0.06 | 0.044 | 88% | 91% |
| 7/2/2009 | 0.4 | 0.05 | 0.039 | 88% | 90% |
| 7/3/2009 | 0.4 | 0.03 | 0.033 | 93% | 92% |
| 7/4/2009 | 0.5 | 0.03 | 0.033 | 94% | 93% |
| 7/5/2009 | 1.3 | 0.04 | 0.036 | 97% | 97% |
| 7/6/2009 | 5.5 | 0.05 | 0.04 | 99% | 99% |
| 7/7/2009 | 2.1 | 0.05 | 0.04 | 98% | 98% |
| 7/8/2009 | 0.4 | 0.06 | 0.05 | 85% | 88% |
| 7/9/2009 | 0.4 | 0.07 | 0.057 | 83% | 86% |
| 7/10/2009 | 0.3 | 0.05 | 0.044 | 83% | 85% |
| 7/11/2009 | 0.3 | 0.05 | 0.043 | 83% | 86% |
| 7/12/2009 | 0.4 | 0.05 | 0.044 | 88% | 89% |
| 7/13/2009 | 0.6 | 0.05 | 0.046 | 92% | 92% |
| 7/14/2009 | 0.4 | 0.06 | 0.046 | 85% | 89% |
| 7/15/2009 | 0.4 | 0.05 | 0.043 | 88% | 89% |
| 7/16/2009 | 0.4 | 0.04 | 0.042 | 90% | 90% |
| 7/17/2009 | 0.4 | 0.05 | 0.049 | 88% | 88% |
| 7/18/2009 | 0.4 | 0.05 | 0.051 | 88% | 87% |
| 7/19/2009 | 0.4 | 0.06 | 0.055 | 85% | 86% |
| 7/20/2009 | 0.7 | 0.06 | 0.059 | 91% | 92% |
| 7/21/2009 | 0.5 | 0.07 | 0.06 | 86% | 88% |
| 7/22/2009 | 0.4 | 0.06 | 0.057 | 85% | 86% |
| 7/23/2009 | 0.4 | 0.06 | 0.056 | 85% | 86% |
| 7/24/2009 | 0.3 | 0.06 | 0.057 | 80% | 81% |
| 7/25/2009 | 0.4 | 0.06 | 0.06 | 85% | 85% |
| 7/26/2009 | 0.5 | 0.07 | 0.063 | 86% | 87% |
| 7/27/2009 | 0.5 | 0.07 | 0.065 | 86% | 87% |
| 7/28/2009 | 0.5 | 0.07 | 0.063 | 86% | 87% |
| 7/29/2009 | 0.4 | 0.08 | 0.064 | 80% | 84% |
| 7/30/2009 | 0.4 | 0.1 | 0.065 | 75% | 84% |

| Date | Peak Daily Raw | Peak Daily Settled | Average Daily CFE | Removal thru Sed | Removal thru Filt |
|---|---|---|---|---|---|
| 7/31/2009 | 0.4 | 0.11 | 0.071 | 73% | 82% |
| 8/1/2009 | 0.4 | 0.13 | 0.086 | 68% | 79% |
| 8/2/2009 | 0.3 | 0.13 | 0.075 | 57% | 75% |
| 8/3/2009 | 0.5 | 0.1 | 0.075 | 80% | 85% |
| 8/4/2009 | 0.4 | 0.09 | 0.065 | 78% | 84% |
| 8/5/2009 | 0.3 | 0.08 | 0.065 | 73% | 78% |
| 8/6/2009 | 0.3 | 0.05 | 0.044 | 83% | 85% |
| 8/7/2009 | 0.3 | 0.05 | 0.045 | 83% | 85% |
| 8/8/2009 | 0.3 | 0.05 | 0.045 | 83% | 85% |
| 8/9/2009 | 0.3 | 0.05 | 0.047 | 83% | 84% |
| 8/10/2009 | 0.4 | 0.05 | 0.046 | 88% | 89% |
| 8/11/2009 | 0.4 | 0.05 | 0.046 | 88% | 89% |
| 8/12/2009 | 0.3 | 0.05 | 0.046 | 83% | 85% |
| 8/13/2009 | 0.3 | 0.05 | 0.044 | 83% | 85% |
| 8/14/2009 | 0.4 | 0.05 | 0.047 | 88% | 88% |
| 8/15/2009 | 0.3 | 0.05 | 0.046 | 83% | 85% |
| 8/16/2009 | 0.3 | 0.05 | 0.046 | 83% | 85% |
| 8/17/2009 | 0.4 | 0.06 | 0.05 | 85% | 88% |
| 8/18/2009 | 0.3 | 0.05 | 0.044 | 83% | 85% |
| 8/19/2009 | 0.3 | 0.05 | 0.042 | 83% | 86% |
| 8/20/2009 | 0.5 | 0.05 | 0.046 | 90% | 91% |
| 8/21/2009 | 0.3 | 0.04 | 0.04 | 87% | 87% |
| 8/22/2009 | 0.4 | 0.04 | 0.041 | 90% | 90% |
| 8/23/2009 | 0.4 | 0.04 | 0.041 | 90% | 90% |
| 8/24/2009 | 0.4 | 0.05 | 0.042 | 88% | 90% |
| 8/25/2009 | 0.4 | 0.05 | 0.041 | 88% | 90% |
| 8/26/2009 | 0.4 | 0.06 | 0.046 | 85% | 89% |
| 8/27/2009 | 0.4 | 0.07 | 0.064 | 83% | 84% |
| 8/28/2009 | 0.4 | 0.08 | 0.071 | 80% | 82% |
| 8/29/2009 | 0.3 | 0.08 | 0.073 | 73% | 76% |
| 8/30/2009 | 0.4 | 0.06 | 0.052 | 85% | 87% |
| 8/31/2009 | 0.4 | 0.06 | 0.054 | 85% | 87% |
| 9/1/2009 | 0.4 | 0.08 | 0.056 | 80% | 86% |
| 9/2/2009 | 0.4 | 0.06 | 0.059 | 85% | 85% |
| 9/3/2009 | 0.4 | 0.06 | 0.06 | 85% | 85% |
| 9/4/2009 | 0.4 | 0.06 | 0.059 | 85% | 85% |
| 9/5/2009 | 0.4 | 0.07 | 0.061 | 83% | 85% |
| 9/6/2009 | 0.4 | 0.07 | 0.062 | 83% | 85% |
| 9/7/2009 | 0.4 | 0.06 | 0.061 | 85% | 85% |
| 9/8/2009 | 0.5 | 0.06 | 0.061 | 88% | 88% |
| 9/9/2009 | 0.4 | 0.06 | 0.059 | 85% | 85% |
| 9/10/2009 | 0.4 | 0.06 | 0.062 | 85% | 85% |
| 9/11/2009 | 0.4 | 0.06 | 0.062 | 85% | 85% |
| 9/12/2009 | 0.4 | 0.07 | 0.067 | 83% | 83% |
| 9/13/2009 | 0.4 | 0.07 | 0.061 | 83% | 85% |
| 9/14/2009 | 0.5 | 0.06 | 0.053 | 88% | 89% |
| 9/15/2009 | 0.5 | 0.06 | 0.056 | 88% | 89% |
| 9/16/2009 | 0.5 | 0.07 | 0.06 | 86% | 88% |
| 9/17/2009 | 0.5 | 0.06 | 0.058 | 88% | 88% |
| 9/18/2009 | 0.5 | 0.06 | 0.053 | 88% | 89% |
| 9/19/2009 | 0.6 | 0.06 | 0.055 | 90% | 91% |
| 9/20/2009 | 0.5 | 0.06 | 0.054 | 88% | 89% |
| 9/21/2009 | 0.5 | 0.06 | 0.054 | 88% | 89% |
| 9/22/2009 | 0.5 | 0.05 | 0.05 | 90% | 90% |
| 9/23/2009 | 0.7 | 0.06 | 0.053 | 91% | 92% |
| 9/24/2009 | 0.5 | 0.06 | 0.058 | 88% | 88% |
| 9/25/2009 | 0.4 | 0.06 | 0.056 | 85% | 86% |
| 9/26/2009 | 0.4 | 0.05 | 0.05 | 88% | 88% |
| 9/27/2009 | 0.4 | 0.06 | 0.053 | 85% | 87% |
| 9/28/2009 | 0.4 | 0.05 | 0.046 | 88% | 89% |
| 9/29/2009 | 0.4 | 0.05 | 0.047 | 88% | 88% |
| 9/30/2009 | 0.4 | 0.05 | 0.049 | 88% | 88% |
| 10/1/2009 | 0.5 | 0.06 | 0.054 | 88% | 89% |
| 10/2/2009 | 0.3 | 0.05 | 0.048 | 83% | 84% |

| Date | Peak Daily Raw | Peak Daily Settled | Average Daily CFE | Removal thru Sed | Removal thru Filt |
|---|---|---|---|---|---|
| 10/3/2009 | 0.6 | 0.05 | 0.048 | 92% | 92% |
| 10/4/2009 | 0.4 | 0.05 | 0.048 | 88% | 88% |
| 10/5/2009 | 0.4 | 0.05 | 0.05 | 88% | 88% |
| 10/6/2009 | 0.4 | 0.06 | 0.054 | 85% | 87% |
| 10/7/2009 | 0.3 | 0.05 | 0.053 | 83% | 82% |
| 10/8/2009 | 0.3 | 0.06 | 0.054 | 80% | 82% |
| 10/9/2009 | 0.3 | 0.06 | 0.056 | 80% | 81% |
| 10/10/2009 | 0.3 | 0.06 | 0.055 | 80% | 82% |
| 10/11/2009 | 0.4 | 0.06 | 0.051 | 85% | 87% |
| 10/12/2009 | 0.2 | 0.05 | 0.046 | 75% | 77% |
| 10/13/2009 | 0.3 | 0.05 | 0.048 | 83% | 84% |
| 10/14/2009 | 0.9 | 0.07 | 0.06 | 92% | 93% |
| 10/15/2009 | 0.8 | 0.07 | 0.062 | 91% | 92% |
| 10/16/2009 | 0.4 | 0.05 | 0.049 | 88% | 88% |
| 10/17/2009 | 0.4 | 0.06 | 0.052 | 85% | 87% |
| 10/18/2009 | 0.3 | 0.06 | 0.049 | 80% | 84% |
| 10/19/2009 | 0.3 | 0.06 | 0.051 | 80% | 83% |
| 10/20/2009 | 0.8 | 0.06 | 0.047 | 93% | 94% |
| 10/21/2009 | 0.3 | 0.09 | 0.059 | 70% | 80% |
| 10/22/2009 | 0.3 | 0.08 | 0.061 | 73% | 80% |
| 10/23/2009 | 0.3 | 0.05 | 0.044 | 83% | 85% |
| 10/24/2009 | 0.3 | 0.05 | 0.044 | 83% | 85% |
| 10/25/2009 | 0.3 | 0.05 | 0.045 | 83% | 85% |
| 10/26/2009 | 0.4 | 0.05 | 0.047 | 88% | 88% |
| 10/27/2009 | 0.3 | 0.05 | 0.044 | 83% | 85% |
| 10/28/2009 | 0.3 | 0.05 | 0.045 | 83% | 85% |
| 10/29/2009 | 0.3 | 0.05 | 0.046 | 83% | 85% |
| 10/30/2009 | 0.3 | 0.05 | 0.044 | 83% | 85% |
| 10/31/2009 | 0.3 | 0.04 | 0.043 | 87% | 86% |
| 11/1/2009 | 0.2 | 0.05 | 0.044 | 75% | 78% |
| 11/2/2009 | 0.3 | 0.05 | 0.043 | 83% | 86% |
| 11/3/2009 | 0.3 | 0.05 | 0.044 | 83% | 85% |
| 11/4/2009 | 0.2 | 0.04 | 0.044 | 80% | 78% |
| 11/5/2009 | 0.3 | 0.05 | 0.045 | 83% | 85% |
| 11/6/2009 | 0.3 | 0.05 | 0.044 | 83% | 85% |
| 11/7/2009 | 0.3 | 0.05 | 0.046 | 83% | 85% |
| 11/8/2009 | 0.3 | 0.05 | 0.05 | 83% | 83% |
| 11/9/2009 | 0.3 | 0.05 | 0.05 | 83% | 83% |
| 11/10/2009 | 0.3 | 0.05 | 0.047 | 83% | 84% |
| 11/11/2009 | 0.3 | 0.05 | 0.051 | 83% | 83% |
| 11/12/2009 | 0.3 | 0.05 | 0.05 | 83% | 83% |
| 11/13/2009 | 0.4 | 0.06 | 0.053 | 85% | 87% |
| 11/14/2009 | 0.3 | 0.06 | 0.053 | 80% | 82% |
| 11/15/2009 | 0.4 | 0.06 | 0.055 | 85% | 86% |
| 11/16/2009 | 0.3 | 0.1 | 0.073 | 67% | 76% |
| 11/17/2009 | 0.3 | 0.06 | 0.058 | 80% | 81% |
| 11/18/2009 | 0.3 | 0.07 | 0.056 | 77% | 81% |
| 11/19/2009 | 0.3 | 0.06 | 0.052 | 80% | 83% |
| 11/20/2009 | 0.3 | 0.08 | 0.063 | 73% | 79% |
| 11/21/2009 | 0.3 | 0.05 | 0.052 | 83% | 83% |
| 11/22/2009 | 0.6 | 0.11 | 0.074 | 82% | 88% |
| 11/23/2009 | 0.5 | 0.09 | 0.068 | 82% | 86% |
| 11/24/2009 | 0.5 | 0.12 | 0.078 | 76% | 84% |
| 11/25/2009 | 0.4 | 0.04 | 0.041 | 90% | 90% |
| 11/26/2009 | 0.4 | 0.04 | 0.037 | 90% | 91% |
| 11/27/2009 | 0.4 | 0.04 | 0.034 | 90% | 92% |
| 11/28/2009 | 0.5 | 0.04 | 0.033 | 92% | 93% |
| 11/29/2009 | 0.4 | 0.04 | 0.035 | 90% | 91% |
| 11/30/2009 | 0.4 | 0.03 | 0.031 | 93% | 92% |
| 12/1/2009 | 0.3 | 0.03 | 0.029 | 90% | 90% |
| 12/2/2009 | 0.3 | 0.03 | 0.029 | 90% | 90% |
| 12/3/2009 | 0.3 | 0.03 | 0.029 | 90% | 90% |
| 12/4/2009 | 0.3 | 0.03 | 0.028 | 90% | 91% |
| 12/5/2009 | 0.3 | 0.04 | 0.03 | 87% | 90% |

| Date | Peak Daily Raw | Peak Daily Settled | Average Daily CFE | Removal thru Sed | Removal thru Filt |
|---|---|---|---|---|---|
| 12/6/2009 | 0.3 | 0.04 | 0.033 | 87% | 89% |
| 12/7/2009 | 0.2 | 0.05 | 0.039 | 75% | 81% |
| 12/8/2009 | 0.9 | 0.04 | 0.034 | 96% | 96% |
| 12/9/2009 | 0.3 | 0.04 | 0.037 | 87% | 88% |
| 12/10/2009 | 0.3 | 0.03 | 0.028 | 90% | 91% |
| 12/11/2009 | 0.9 | 0.04 | 0.032 | 96% | 96% |
| 12/12/2009 | 0.6 | 0.04 | 0.035 | 93% | 94% |
| 12/13/2009 | | | | | |
| 12/14/2009 | 1 | 0.05 | 0.043 | 95% | 96% |
| 12/15/2009 | 0.8 | 0.04 | 0.037 | 95% | 95% |
| 12/16/2009 | | | | | |
| 12/17/2009 | 0.9 | 0.06 | 0.044 | 93% | 95% |
| 12/18/2009 | 0.9 | 0.04 | 0.031 | 96% | 97% |
| 12/19/2009 | 1 | 0.03 | 0.028 | 97% | 97% |
| 12/20/2009 | 0.8 | 0.04 | 0.027 | 95% | 97% |
| 12/21/2009 | 0.7 | 0.13 | 0.058 | 81% | 92% |
| 12/22/2009 | 0.9 | 0.03 | 0.028 | 97% | 97% |
| 12/23/2009 | 0.8 | 0.04 | 0.033 | 95% | 96% |
| 12/24/2009 | 0.7 | 0.04 | 0.034 | 94% | 95% |
| 12/25/2009 | 0.5 | 0.04 | 0.033 | 92% | 93% |
| 12/26/2009 | 0.5 | 0.03 | 0.028 | 94% | 94% |
| 12/27/2009 | 0.4 | 0.03 | 0.027 | 93% | 93% |
| 12/28/2009 | 0.4 | 0.03 | 0.026 | 93% | 94% |
| 12/29/2009 | 0.4 | 0.03 | 0.025 | 93% | 94% |
| 12/30/2009 | 0.4 | 0.03 | 0.027 | 93% | 93% |
| 12/31/2009 | 0.5 | 0.04 | 0.028 | 92% | 94% |
| 1/1/2010 | 0.4 | 0.03 | 0.027 | 93% | 93% |
| 1/2/2010 | 0.4 | 0.03 | 0.026 | 93% | 94% |
| 1/3/2010 | 0.5 | 0.03 | 0.026 | 94% | 95% |
| 1/4/2010 | 0.5 | 0.03 | 0.026 | 94% | 95% |
| 1/5/2010 | 0.4 | 0.03 | 0.025 | 93% | 94% |
| 1/6/2010 | 0.4 | 0.03 | 0.027 | 93% | 93% |
| 1/7/2010 | 0.4 | 0.04 | 0.027 | 90% | 93% |
| 1/8/2010 | 0.3 | 0.03 | 0.024 | 90% | 92% |
| 1/9/2010 | | | | | |
| 1/10/2010 | | | | | |
| 1/11/2010 | 1.4 | 0.04 | 0.032 | 97% | 98% |
| 1/12/2010 | 0.4 | 0.05 | 0.036 | 88% | 91% |
| 1/13/2010 | 0.4 | 0.07 | 0.04 | 83% | 90% |
| 1/14/2010 | 0.4 | 0.03 | 0.027 | 93% | 93% |
| 1/15/2010 | 0.3 | 0.03 | 0.027 | 90% | 91% |
| 1/16/2010 | 0.4 | 0.04 | 0.027 | 90% | 93% |
| 1/17/2010 | 0.4 | 0.03 | 0.024 | 93% | 94% |
| 1/18/2010 | 0.5 | 0.05 | 0.039 | 90% | 92% |
| 1/19/2010 | 0.6 | 0.1 | 0.057 | 83% | 91% |
| 1/20/2010 | | | | | |
| 1/21/2010 | | | | | |
| 1/22/2010 | | | | | |
| 1/23/2010 | | | | | |
| 1/24/2010 | | | | | |
| 1/25/2010 | | | | | |
| 1/26/2010 | | | | | |
| 1/27/2010 | | | | | |
| 1/28/2010 | | | | | |
| 1/29/2010 | | | | | |
| 1/30/2010 | | | | | |
| 1/31/2010 | | | | | |
| 2/1/2010 | 1.7 | 0.1 | 0.052 | 94% | 97% |
| 2/2/2010 | 0.8 | 0.14 | 0.079 | 83% | 90% |
| 2/3/2010 | 0.6 | 0.04 | 0.037 | 93% | 94% |
| 2/4/2010 | 0.6 | 0.07 | 0.044 | 88% | 93% |
| 2/5/2010 | 0.7 | 0.05 | 0.034 | 93% | 95% |
| 2/6/2010 | | | | | |
| 2/7/2010 | | | | | |

| Date | Peak Daily Raw | Peak Daily Settled | Average Daily CFE | Removal thru Sed | Removal thru Filt |
|---|---|---|---|---|---|
| 2/8/2010 | 4.4 | 0.07 | 0.05 | 98% | 99% |
| 2/9/2010 | 1.1 | 0.04 | 0.038 | 96% | 97% |
| 2/10/2010 | 2.2 | 0.04 | 0.036 | 98% | 98% |
| 2/11/2010 | 2.5 | 0.05 | 0.038 | 98% | 98% |
| 2/12/2010 | 2.8 | 0.05 | 0.045 | 98% | 98% |
| 2/13/2010 | 1.8 | 0.05 | 0.04 | 97% | 98% |
| 2/14/2010 | 1.1 | 0.05 | 0.045 | 95% | 96% |
| 2/15/2010 | 1 | 0.06 | 0.049 | 94% | 95% |
| 2/16/2010 | 0.8 | 0.05 | 0.041 | 94% | 95% |
| 2/17/2010 | 0.7 | 0.07 | 0.051 | 90% | 93% |
| 2/18/2010 | | | | | |
| 2/19/2010 | 0.9 | 0.06 | 0.049 | 93% | 95% |
| 2/20/2010 | 5.4 | 0.07 | 0.049 | 99% | 99% |
| 2/21/2010 | 0.7 | 0.07 | 0.049 | 90% | 93% |
| 2/22/2010 | 5.2 | 0.04 | 0.036 | 99% | 99% |
| 2/23/2010 | 0.5 | 0.04 | 0.035 | 92% | 93% |
| 2/24/2010 | 0.5 | 0.04 | 0.036 | 92% | 93% |
| 2/25/2010 | 0.5 | 0.04 | 0.032 | 92% | 94% |
| 2/26/2010 | 0.4 | 0.03 | 0.03 | 93% | 93% |
| 2/27/2010 | 1.4 | 0.03 | 0.028 | 98% | 98% |
| 2/28/2010 | | | | | |
| 3/1/2010 | | | | | |
| 3/2/2010 | 0.8 | 0.06 | 0.053 | 93% | 93% |
| 3/3/2010 | 1 | 0.04 | 0.032 | 96% | 97% |
| 3/4/2010 | 0.7 | 0.03 | 0.031 | 96% | 96% |
| 3/5/2010 | 0.6 | 0.04 | 0.031 | 93% | 95% |
| 3/6/2010 | 0.8 | 0.03 | 0.029 | 96% | 96% |
| 3/7/2010 | | | | | |
| 3/8/2010 | 1.3 | 0.05 | 0.043 | 96% | 97% |
| 3/9/2010 | 1 | 0.04 | 0.033 | 96% | 97% |
| 3/10/2010 | 0.9 | 0.04 | 0.034 | 96% | 96% |
| 3/11/2010 | 0.8 | 0.04 | 0.037 | 95% | 95% |
| 3/12/2010 | 0.7 | 0.04 | 0.039 | 94% | 94% |
| 3/13/2010 | 0.7 | 0.04 | 0.033 | 94% | 95% |
| 3/14/2010 | 0.8 | 0.04 | 0.032 | 95% | 96% |
| 3/15/2010 | 0.7 | 0.05 | 0.037 | 93% | 95% |
| 3/16/2010 | 0.6 | 0.03 | 0.031 | 95% | 95% |
| 3/17/2010 | 0.6 | 0.05 | 0.035 | 92% | 94% |
| 3/18/2010 | 0.6 | 0.05 | 0.044 | 92% | 93% |
| 3/19/2010 | 0.7 | 0.09 | 0.053 | 87% | 92% |
| 3/20/2010 | 0.6 | 0.06 | 0.041 | 90% | 93% |
| 3/21/2010 | 0.7 | 0.04 | 0.033 | 94% | 95% |
| 3/22/2010 | 0.8 | 0.05 | 0.038 | 94% | 95% |
| 3/23/2010 | 0.7 | 0.06 | 0.044 | 91% | 94% |
| 3/24/2010 | 0.6 | 0.04 | 0.039 | 93% | 94% |
| 3/25/2010 | 0.6 | 0.05 | 0.04 | 92% | 93% |
| 3/26/2010 | 0.6 | 0.07 | 0.044 | 88% | 93% |
| 3/27/2010 | 0.6 | 0.06 | 0.049 | 90% | 92% |
| 3/28/2010 | 0.6 | 0.04 | 0.039 | 93% | 94% |
| 3/29/2010 | 0.4 | 0.04 | 0.039 | 90% | 90% |
| 3/30/2010 | 0.8 | 0.09 | 0.063 | 89% | 92% |
| 3/31/2010 | 0.7 | 0.04 | 0.036 | 94% | 95% |
| 4/1/2010 | 0.6 | 0.04 | 0.031 | 93% | 95% |
| 4/2/2010 | 0.6 | 0.04 | 0.038 | 93% | 94% |
| 4/3/2010 | 0.5 | 0.04 | 0.032 | 92% | 94% |
| 4/4/2010 | 0.5 | 0.04 | 0.032 | 92% | 94% |
| 4/5/2010 | 0.6 | 0.03 | 0.03 | 95% | 95% |
| 4/6/2010 | | | | | |
| 4/7/2010 | 5 | 0.1 | 0.067 | 98% | 99% |
| 4/8/2010 | 0.6 | 0.05 | 0.042 | 92% | 93% |
| 4/9/2010 | 0.4 | 0.05 | 0.042 | 88% | 90% |
| 4/10/2010 | 0.4 | 0.04 | 0.034 | 90% | 92% |
| 4/11/2010 | 0.4 | 0.04 | 0.032 | 90% | 92% |
| 4/12/2010 | | | | | |

| Date | Peak Daily Raw | Peak Daily Settled | Average Daily CFE | Removal thru Sed | Removal thru Filt |
|---|---|---|---|---|---|
| 4/13/2010 | 1.8 | 0.06 | 0.055 | 97% | 97% |
| 4/14/2010 | 0.6 | 0.05 | 0.037 | 92% | 94% |
| 4/15/2010 | 0.3 | 0.04 | 0.036 | 87% | 88% |
| 4/16/2010 | 0.3 | 0.03 | 0.031 | 90% | 90% |
| 4/17/2010 | 0.8 | 0.04 | 0.032 | 95% | 96% |
| 4/18/2010 | 0.3 | 0.04 | 0.033 | 87% | 89% |
| 4/19/2010 | 0.4 | 0.11 | 0.048 | 73% | 88% |
| 4/20/2010 | 0.7 | 0.04 | 0.039 | 94% | 94% |
| 4/21/2010 | 1.1 | 0.07 | 0.052 | 94% | 95% |
| 4/22/2010 | | | | | |
| 4/23/2010 | 0.7 | 0.07 | 0.057 | 90% | 92% |
| 4/24/2010 | 0.5 | 0.05 | 0.045 | 90% | 91% |
| 4/25/2010 | 0.4 | 0.05 | 0.045 | 88% | 89% |
| 4/26/2010 | 0.8 | 0.06 | 0.049 | 93% | 94% |
| 4/27/2010 | 0.4 | 0.08 | 0.05 | 80% | 88% |
| 4/28/2010 | 0.4 | 0.05 | 0.044 | 88% | 89% |
| 4/29/2010 | 0.4 | 0.1 | 0.049 | 75% | 88% |
| 4/30/2010 | 0.4 | 0.05 | 0.037 | 88% | 91% |
| 5/1/2010 | 0.4 | 0.06 | 0.035 | 85% | 91% |
| 5/2/2010 | 0.4 | 0.06 | 0.034 | 85% | 92% |
| 5/3/2010 | 0.4 | 0.05 | 0.035 | 88% | 91% |
| 5/4/2010 | 0.4 | 0.04 | 0.029 | 90% | 93% |
| 5/5/2010 | 0.4 | 0.03 | 0.031 | 93% | 92% |
| 5/6/2010 | 0.4 | 0.05 | 0.039 | 88% | 90% |
| 5/7/2010 | 0.3 | 0.05 | 0.04 | 83% | 87% |
| 5/8/2010 | 0.4 | 0.04 | 0.035 | 90% | 91% |
| 5/9/2010 | 0.4 | 0.05 | 0.041 | 88% | 90% |
| 5/10/2010 | 0.5 | 0.04 | 0.037 | 92% | 93% |
| 5/11/2010 | 0.4 | 0.03 | 0.029 | 93% | 93% |
| 5/12/2010 | 1 | 0.04 | 0.027 | 96% | 97% |
| 5/13/2010 | 0.3 | 0.05 | 0.032 | 83% | 89% |
| 5/14/2010 | 0.3 | 0.03 | 0.027 | 90% | 91% |
| 5/15/2010 | 0.3 | 0.03 | 0.028 | 90% | 91% |
| 5/16/2010 | 0.4 | 0.03 | 0.03 | 93% | 93% |
| 5/17/2010 | 0.5 | 0.03 | 0.03 | 94% | 94% |
| 5/18/2010 | 0.3 | 0.03 | 0.029 | 90% | 90% |
| 5/19/2010 | 0.3 | 0.03 | 0.029 | 90% | 90% |
| 5/20/2010 | 0.4 | 0.03 | 0.028 | 93% | 93% |
| 5/21/2010 | 0.4 | 0.03 | 0.029 | 93% | 93% |
| 5/22/2010 | 0.3 | 0.03 | 0.029 | 90% | 90% |
| 5/23/2010 | 0.7 | 0.03 | 0.027 | 96% | 96% |
| 5/24/2010 | 0.3 | 0.07 | 0.04 | 77% | 87% |
| 5/25/2010 | 0.3 | 0.03 | 0.03 | 90% | 90% |
| 5/26/2010 | 0.3 | 0.03 | 0.028 | 90% | 91% |
| 5/27/2010 | 0.3 | 0.03 | 0.027 | 90% | 91% |
| 5/28/2010 | 0.2 | 0.03 | 0.027 | 85% | 87% |
| 5/29/2010 | 0.3 | 0.03 | 0.03 | 90% | 90% |
| 5/30/2010 | 0.5 | 0.03 | 0.03 | 94% | 94% |
| 5/31/2010 | 0.7 | 0.03 | 0.03 | 96% | 96% |
| 6/1/2010 | 0.4 | 0.03 | 0.031 | 93% | 92% |
| 6/2/2010 | 0.3 | 0.03 | 0.029 | 90% | 90% |
| 6/3/2010 | 0.3 | 0.03 | 0.03 | 90% | 90% |
| 6/4/2010 | 0.3 | 0.03 | 0.031 | 90% | 90% |
| 6/5/2010 | 0.3 | 0.03 | 0.031 | 90% | 90% |
| 6/6/2010 | 0.4 | 0.03 | 0.03 | 93% | 93% |
| 6/7/2010 | 0.6 | 0.03 | 0.031 | 95% | 95% |
| 6/8/2010 | 0.3 | 0.05 | 0.033 | 83% | 89% |
| 6/9/2010 | 0.3 | 0.03 | 0.03 | 90% | 90% |
| 6/10/2010 | 0.3 | 0.03 | 0.032 | 90% | 89% |
| 6/11/2010 | 0.3 | 0.03 | 0.031 | 90% | 90% |
| 6/12/2010 | 0.3 | 0.03 | 0.03 | 90% | 90% |
| 6/13/2010 | 0.3 | 0.03 | 0.03 | 90% | 90% |
| 6/14/2010 | 0.3 | 0.03 | 0.03 | 90% | 90% |
| 6/15/2010 | 0.3 | 0.04 | 0.032 | 87% | 89% |

| Date | Peak Daily Raw | Peak Daily Settled | Average Daily CFE | Removal thru Sed | Removal thru Filt |
|---|---|---|---|---|---|
| 6/16/2010 | 0.3 | 0.03 | 0.03 | 90% | 90% |
| 6/17/2010 | 0.3 | 0.03 | 0.029 | 90% | 90% |
| 6/18/2010 | 0.3 | 0.03 | 0.03 | 90% | 90% |
| 6/19/2010 | 0.3 | 0.03 | 0.028 | 90% | 91% |
| 6/20/2010 | 0.3 | 0.03 | 0.029 | 90% | 90% |
| 6/21/2010 | 0.3 | 0.03 | 0.03 | 90% | 90% |
| 6/22/2010 | 0.2 | 0.04 | 0.034 | 80% | 83% |
| 6/23/2010 | 0.2 | 0.04 | 0.034 | 80% | 83% |
| 6/24/2010 | 0.2 | 0.05 | 0.037 | 75% | 82% |
| 6/25/2010 | 0.2 | 0.05 | 0.039 | 75% | 81% |
| 6/26/2010 | 0.3 | 0.04 | 0.035 | 87% | 88% |
| 6/27/2010 | 0.3 | 0.05 | 0.039 | 83% | 87% |
| 6/28/2010 | 0.4 | 0.04 | 0.037 | 90% | 91% |
| 6/29/2010 | 0.3 | 0.04 | 0.039 | 87% | 87% |
| 6/30/2010 | 0.3 | 0.04 | 0.04 | 87% | 87% |
| 7/1/2010 | 0.3 | 0.05 | 0.04 | 83% | 87% |
| 7/2/2010 | | 0.04 | 0.034 | | |
| 7/3/2010 | 0.3 | 0.03 | 0.033 | 90% | 89% |
| 7/4/2010 | 0.4 | 0.04 | 0.035 | 90% | 91% |
| 7/5/2010 | 0.4 | 0.04 | 0.037 | 90% | 91% |
| 7/6/2010 | 0.3 | 0.04 | 0.037 | 87% | 88% |
| 7/7/2010 | 0.3 | 0.04 | 0.037 | 87% | 88% |
| 7/8/2010 | 0.3 | 0.04 | 0.037 | 87% | 88% |
| 7/9/2010 | 0.2 | 0.04 | 0.038 | 80% | 81% |
| 7/10/2010 | 0.2 | 0.04 | 0.038 | 80% | 81% |
| 7/11/2010 | 0.3 | 0.04 | 0.039 | 87% | 87% |
| 7/12/2010 | 0.3 | 0.04 | 0.035 | 87% | 88% |
| 7/13/2010 | 0.4 | 0.08 | 0.068 | 80% | 83% |
| 7/14/2010 | 0.4 | 0.09 | 0.06 | 78% | 85% |
| 7/15/2010 | 0.6 | 0.05 | 0.044 | 92% | 93% |
| 7/16/2010 | 0.9 | 0.05 | 0.043 | 94% | 95% |
| 7/17/2010 | 1 | 0.04 | 0.038 | 96% | 96% |
| 7/18/2010 | 1.3 | 0.05 | 0.041 | 96% | 97% |
| 7/19/2010 | 1.4 | 0.04 | 0.04 | 97% | 97% |
| 7/20/2010 | 0.8 | 0.04 | 0.039 | 95% | 95% |
| 7/21/2010 | 0.6 | 0.06 | 0.043 | 90% | 93% |
| 7/22/2010 | 0.5 | 0.04 | 0.039 | 92% | 92% |
| 7/23/2010 | 0.5 | 0.04 | 0.04 | 92% | 92% |
| 7/24/2010 | 0.5 | 0.04 | 0.04 | 92% | 92% |
| 7/25/2010 | 0.6 | 0.04 | 0.039 | 93% | 94% |
| 7/26/2010 | 0.5 | 0.05 | 0.044 | 90% | 91% |
| 7/27/2010 | 0.5 | 0.06 | 0.05 | 88% | 90% |
| 7/28/2010 | 0.5 | 0.05 | 0.05 | 90% | 90% |
| 7/29/2010 | 0.5 | 0.05 | 0.046 | 90% | 91% |
| 7/30/2010 | 0.3 | 0.05 | 0.046 | 83% | 85% |
| 7/31/2010 | 0.4 | 0.04 | 0.04 | 90% | 90% |
| 8/1/2010 | 0.5 | 0.04 | 0.037 | 92% | 93% |
| 8/2/2010 | 0.3 | 0.03 | 0.036 | 90% | 88% |
| 8/3/2010 | 0.3 | 0.03 | 0.033 | 90% | 89% |
| 8/4/2010 | 0.3 | 0.04 | 0.033 | 87% | 89% |
| 8/5/2010 | 0.4 | 0.04 | 0.033 | 90% | 92% |
| 8/6/2010 | 0.4 | 0.04 | 0.036 | 90% | 91% |
| 8/7/2010 | 0.4 | 0.06 | 0.041 | 85% | 90% |
| 8/8/2010 | 0.4 | 0.06 | 0.041 | 85% | 90% |
| 8/9/2010 | 0.4 | 0.05 | 0.043 | 88% | 89% |
| 8/10/2010 | 0.4 | 0.05 | 0.041 | 88% | 90% |
| 8/11/2010 | 0.3 | 0.04 | 0.04 | 87% | 87% |
| 8/12/2010 | 0.3 | 0.04 | 0.036 | 87% | 88% |
| 8/13/2010 | 0.5 | 0.04 | 0.033 | 92% | 93% |
| 8/14/2010 | 0.4 | 0.04 | 0.038 | 90% | 91% |
| 8/15/2010 | 0.4 | 0.03 | 0.032 | 93% | 92% |
| 8/16/2010 | 0.5 | 0.04 | 0.031 | 92% | 94% |
| 8/17/2010 | 0.4 | 0.03 | 0.032 | 93% | 92% |
| 8/18/2010 | 0.5 | 0.04 | 0.033 | 92% | 93% |

| Date | Peak Daily Raw | Peak Daily Settled | Average Daily CFE | Removal thru Sed | Removal thru Filt |
|---|---|---|---|---|---|
| 8/19/2010 | 0.5 | 0.05 | 0.041 | 90% | 92% |
| 8/20/2010 | 0.5 | 0.07 | 0.055 | 86% | 89% |
| 8/21/2010 | 0.5 | 0.07 | 0.059 | 86% | 88% |
| 8/22/2010 | 0.7 | 0.05 | 0.048 | 93% | 93% |
| 8/23/2010 | 0.6 | 0.04 | 0.039 | 93% | 94% |
| 8/24/2010 | 0.4 | 0.04 | 0.032 | 90% | 92% |
| 8/25/2010 | 0.4 | 0.04 | 0.034 | 90% | 92% |
| 8/26/2010 | 0.4 | 0.06 | 0.047 | 85% | 88% |
| 8/27/2010 | 0.3 | 0.06 | 0.056 | 80% | 81% |
| 8/28/2010 | 0.3 | 0.05 | 0.049 | 83% | 84% |
| 8/29/2010 | 0.3 | 0.05 | 0.044 | 83% | 85% |
| 8/30/2010 | 0.4 | 0.05 | 0.044 | 88% | 89% |
| 8/31/2010 | 0.3 | 0.05 | 0.048 | 83% | 84% |
| 9/1/2010 | 0.3 | 0.05 | 0.045 | 83% | 85% |
| 9/2/2010 | 0.3 | 0.04 | 0.039 | 87% | 87% |
| 9/3/2010 | 0.3 | 0.04 | 0.038 | 87% | 87% |
| 9/4/2010 | 0.3 | 0.04 | 0.038 | 87% | 87% |
| 9/5/2010 | 1.9 | 0.05 | 0.042 | 97% | 98% |
| 9/6/2010 | 1.5 | 0.04 | 0.041 | 97% | 97% |
| 9/7/2010 | 1 | 0.04 | 0.036 | 96% | 96% |
| 9/8/2010 | 0.5 | 0.04 | 0.035 | 92% | 93% |
| 9/9/2010 | 0.5 | 0.04 | 0.034 | 92% | 93% |
| 9/10/2010 | 0.3 | 0.04 | 0.033 | 87% | 89% |
| 9/11/2010 | 0.3 | 0.03 | 0.032 | 90% | 89% |
| 9/12/2010 | 0.3 | 0.03 | 0.031 | 90% | 90% |
| 9/13/2010 | 0.4 | 0.04 | 0.032 | 90% | 92% |
| 9/14/2010 | 0.3 | 0.04 | 0.035 | 87% | 88% |
| 9/15/2010 | 0.2 | 0.04 | 0.036 | 80% | 82% |
| 9/16/2010 | 0.3 | 0.04 | 0.035 | 87% | 88% |
| 9/17/2010 | 0.2 | 0.04 | 0.035 | 80% | 83% |
| 9/18/2010 | 0.3 | 0.04 | 0.035 | 87% | 88% |
| 9/19/2010 | 0.4 | 0.04 | 0.034 | 90% | 92% |
| 9/20/2010 | 0.4 | 0.04 | 0.035 | 90% | 91% |
| 9/21/2010 | 0.7 | 0.05 | 0.038 | 93% | 95% |
| 9/22/2010 | 0.5 | 0.09 | 0.057 | 82% | 89% |
| 9/23/2010 | 0.3 | 0.04 | 0.037 | 87% | 88% |
| 9/24/2010 | 0.4 | 0.04 | 0.037 | 90% | 91% |
| 9/25/2010 | 0.5 | 0.04 | 0.036 | 92% | 93% |
| 9/26/2010 | 0.5 | 0.04 | 0.036 | 92% | 93% |
| 9/27/2010 | 0.5 | 0.04 | 0.036 | 92% | 93% |
| 9/28/2010 | 0.4 | 0.05 | 0.04 | 88% | 90% |
| 9/29/2010 | 0.4 | 0.11 | 0.056 | 73% | 86% |
| 9/30/2010 | 0.3 | 0.04 | 0.037 | 87% | 88% |
| 10/1/2010 | 0.4 | 0.04 | 0.038 | 90% | 91% |
| 10/2/2010 | 0.3 | 0.04 | 0.033 | 87% | 89% |
| 10/3/2010 | 0.3 | 0.03 | 0.03 | 90% | 90% |
| 10/4/2010 | 0.5 | 0.03 | 0.03 | 94% | 94% |
| 10/5/2010 | 0.5 | 0.03 | 0.03 | 94% | 94% |
| 10/6/2010 | 0.3 | 0.03 | 0.03 | 90% | 90% |
| 10/7/2010 | 0.3 | 0.04 | 0.036 | 87% | 88% |
| 10/8/2010 | 0.2 | 0.04 | 0.036 | 80% | 82% |
| 10/9/2010 | 0.2 | 0.04 | 0.037 | 80% | 82% |
| 10/10/2010 | 0.3 | 0.05 | 0.042 | 83% | 86% |
| 10/11/2010 | 0.3 | 0.04 | 0.036 | 87% | 88% |
| 10/12/2010 | 0.3 | 0.05 | 0.038 | 83% | 87% |
| 10/13/2010 | 0.3 | 0.05 | 0.039 | 83% | 87% |
| 10/14/2010 | 0.3 | 0.04 | 0.037 | 87% | 88% |
| 10/15/2010 | 0.3 | 0.04 | 0.035 | 87% | 88% |
| 10/16/2010 | 0.3 | 0.04 | 0.04 | 87% | 87% |
| 10/17/2010 | 0.3 | 0.04 | 0.04 | 87% | 87% |
| 10/18/2010 | 0.3 | 0.04 | 0.039 | 87% | 87% |
| 10/19/2010 | 0.3 | 0.04 | 0.04 | 87% | 87% |
| 10/20/2010 | 1.5 | 0.04 | 0.04 | 97% | 97% |
| 10/21/2010 | 0.6 | 0.04 | 0.041 | 93% | 93% |

| Date | Peak Daily Raw | Peak Daily Settled | Average Daily CFE | Removal thru Sed | Removal thru Filt |
|---|---|---|---|---|---|
| 10/22/2010 | 0.4 | 0.04 | 0.04 | 90% | 90% |
| 10/23/2010 | 0.4 | 0.04 | 0.04 | 90% | 90% |
| 10/24/2010 | 0.4 | 0.04 | 0.04 | 90% | 90% |
| 10/25/2010 | 0.3 | 0.04 | 0.039 | 87% | 87% |
| 10/26/2010 | 0.3 | 0.04 | 0.039 | 87% | 87% |
| 10/27/2010 | 0.3 | 0.04 | 0.042 | 87% | 86% |
| 10/28/2010 | 0.3 | 0.04 | 0.041 | 87% | 86% |
| 10/29/2010 | 0.4 | 0.05 | 0.044 | 88% | 89% |
| 10/30/2010 | 0.4 | 0.05 | 0.043 | 88% | 89% |
| 10/31/2010 | 0.4 | 0.05 | 0.044 | 88% | 89% |
| 11/1/2010 | 0.4 | 0.05 | 0.047 | 88% | 88% |
| 11/2/2010 | 0.5 | 0.05 | 0.046 | 90% | 91% |
| 11/3/2010 | 1.2 | 0.05 | 0.045 | 96% | 96% |
| 11/4/2010 | 0.7 | 0.05 | 0.046 | 93% | 93% |
| 11/5/2010 | 0.6 | 0.05 | 0.046 | 92% | 92% |
| 11/6/2010 | 0.3 | 0.05 | 0.043 | 83% | 86% |
| 11/7/2010 | 0.3 | 0.05 | 0.045 | 83% | 85% |
| 11/8/2010 | 0.3 | 0.05 | 0.046 | 83% | 85% |
| 11/9/2010 | 0.3 | 0.05 | 0.048 | 83% | 84% |
| 11/10/2010 | 0.3 | 0.05 | 0.048 | 83% | 84% |
| 11/11/2010 | 0.3 | 0.05 | 0.049 | 83% | 84% |
| 11/12/2010 | 0.3 | 0.05 | 0.049 | 83% | 84% |
| 11/13/2010 | 0.3 | 0.06 | 0.051 | 80% | 83% |
| 11/14/2010 | 0.3 | 0.05 | 0.049 | 83% | 84% |
| 11/15/2010 | 0.3 | 0.05 | 0.048 | 83% | 84% |
| 11/16/2010 | 0.3 | 0.05 | 0.049 | 83% | 84% |
| 11/17/2010 | 0.3 | 0.05 | 0.05 | 83% | 83% |
| 11/18/2010 | 0.3 | 0.05 | 0.05 | 83% | 83% |
| 11/19/2010 | 0.3 | 0.06 | 0.05 | 80% | 83% |
| 11/20/2010 | 0.3 | 0.05 | 0.054 | 83% | 82% |
| 11/21/2010 | | | | | |
| 11/22/2010 | | | | | |
| 11/23/2010 | | | | | |
| 11/24/2010 | | | | | |
| 11/25/2010 | | | | | |
| 11/26/2010 | 1.5 | 0.09 | 0.062 | 94% | 96% |
| 11/27/2010 | 0.8 | 0.05 | 0.045 | 94% | 94% |
| 11/28/2010 | 0.6 | 0.05 | 0.043 | 92% | 93% |
| 11/29/2010 | 0.6 | 0.04 | 0.041 | 93% | 93% |
| 11/30/2010 | 0.6 | 0.04 | 0.042 | 93% | 93% |
| 12/1/2010 | 2 | 0.04 | 0.043 | 98% | 98% |
| 12/2/2010 | 1.6 | 0.05 | 0.046 | 97% | 97% |
| 12/3/2010 | 0.2 | 0.04 | 0.042 | 80% | 79% |
| 12/4/2010 | 0.2 | 0.04 | 0.043 | 80% | 79% |
| 12/5/2010 | 0.5 | 0.04 | 0.042 | 92% | 92% |
| 12/6/2010 | 3.2 | 0.09 | 0.056 | 97% | 98% |
| 12/7/2010 | 0.3 | 0.06 | 0.055 | 80% | 82% |
| 12/8/2010 | | | | | |
| 12/9/2010 | | | | | |
| 12/10/2010 | | | | | |
| 12/11/2010 | | | | | |
| 12/12/2010 | | | | | |
| 12/13/2010 | | | | | |
| 12/14/2010 | | | | | |
| 12/15/2010 | | | | | |
| 12/16/2010 | | | | | |
| 12/17/2010 | | | | | |
| 12/18/2010 | | | | | |
| 12/19/2010 | | | | | |
| 12/20/2010 | | | | | |
| 12/21/2010 | | | | | |
| 12/22/2010 | | | | | |
| 12/23/2010 | | | | | |
| 12/24/2010 | | | | | |

| Date | Peak Daily Raw | Peak Daily Settled | Average Daily CFE | Removal thru Sed | Removal thru Filt |
|---|---|---|---|---|---|
| 12/25/2010 | | | | | |
| 12/26/2010 | | | | | |
| 12/27/2010 | | | | | |
| 12/28/2010 | | | | | |
| 12/29/2010 | | | | | |
| 12/30/2010 | | | | | |
| 12/31/2010 | | | | | |
| 1/1/2011 | | | | | |
| 1/2/2011 | | | | | |
| 1/3/2011 | | | | | |
| 1/4/2011 | | | | | |
| 1/5/2011 | | | | | |
| 1/6/2011 | | | | | |
| 1/7/2011 | | | | | |
| 1/8/2011 | | | | | |
| 1/9/2011 | | | | | |
| 1/10/2011 | | | | | |
| 1/11/2011 | | | | | |
| 1/12/2011 | | | | | |
| 1/13/2011 | | | | | |
| 1/14/2011 | | | | | |
| 1/15/2011 | | | | | |
| 1/16/2011 | | | | | |
| 1/17/2011 | | | | | |
| 1/18/2011 | | | | | |
| 1/19/2011 | | | | | |
| 1/20/2011 | | | | | |
| 1/21/2011 | | | | | |
| 1/22/2011 | | | | | |
| 1/23/2011 | | | | | |
| 1/24/2011 | | | | | |
| 1/25/2011 | | | | | |
| 1/26/2011 | | | | | |
| 1/27/2011 | | | | | |
| 1/28/2011 | | | | | |
| 1/29/2011 | | | | | |
| 1/30/2011 | | | | | |
| 1/31/2011 | | | | | |
| 2/1/2011 | | | | | |
| 2/2/2011 | 1.1 | 0.1 | 0.093 | 91% | 92% |
| 2/3/2011 | 0.4 | 0.05 | 0.048 | 88% | 88% |
| 2/4/2011 | 0.3 | 0.06 | 0.051 | 80% | 83% |
| 2/5/2011 | 0.9 | 0.07 | 0.048 | 92% | 95% |
| 2/6/2011 | 0.8 | 0.03 | 0.032 | 96% | 96% |
| 2/7/2011 | 0.4 | 0.04 | 0.033 | 90% | 92% |
| 2/8/2011 | 0.5 | 0.03 | 0.032 | 94% | 94% |
| 2/9/2011 | 1.7 | 0.03 | 0.032 | 98% | 98% |
| 2/10/2011 | 1.5 | 0.04 | 0.034 | 97% | 98% |
| 2/11/2011 | 0.7 | 0.03 | 0.033 | 96% | 95% |
| 2/12/2011 | 0.4 | 0.06 | 0.048 | 85% | 88% |
| 2/13/2011 | 0.3 | 0.05 | 0.033 | 83% | 89% |
| 2/14/2011 | 0.2 | 0.03 | 0.028 | 85% | 86% |
| 2/15/2011 | 0.2 | 0.03 | 0.027 | 85% | 87% |
| 2/16/2011 | 0.4 | 0.03 | 0.027 | 93% | 93% |
| 2/17/2011 | 0.5 | 0.03 | 0.027 | 94% | 95% |
| 2/18/2011 | 0.5 | 0.04 | 0.031 | 92% | 94% |
| 2/19/2011 | 0.3 | 0.04 | 0.031 | 87% | 90% |
| 2/20/2011 | 0.2 | 0.03 | 0.029 | 85% | 86% |
| 2/21/2011 | 0.1 | 0.03 | 0.028 | 70% | 72% |
| 2/22/2011 | 0.3 | 0.03 | 0.029 | 90% | 90% |
| 2/23/2011 | 0.5 | 0.03 | 0.03 | 94% | 94% |
| 2/24/2011 | 0.3 | 0.03 | 0.031 | 90% | 90% |
| 2/25/2011 | 0.3 | 0.03 | 0.03 | 90% | 90% |
| 2/26/2011 | 1.3 | 0.03 | 0.032 | 98% | 98% |

| Date | Peak Daily Raw | Peak Daily Settled | Average Daily CFE | Removal thru Sed | Removal thru Filt |
|---|---|---|---|---|---|
| 2/27/2011 | 0.8 | 0.03 | 0.029 | 96% | 96% |
| 2/28/2011 | 0.3 | 0.03 | 0.029 | 90% | 90% |
| 3/1/2011 | 0.3 | 0.03 | 0.03 | 90% | 90% |
| 3/2/2011 | 0.3 | 0.05 | 0.033 | 83% | 89% |
| 3/3/2011 | 0.3 | 0.03 | 0.03 | 90% | 90% |
| 3/4/2011 | 0.3 | 0.04 | 0.031 | 87% | 90% |
| 3/5/2011 | 0.2 | 0.04 | 0.031 | 80% | 85% |
| 3/6/2011 | 0.2 | 0.03 | 0.03 | 85% | 85% |
| 3/7/2011 | 0.1 | 0.06 | 0.039 | 40% | 61% |
| 3/8/2011 | 0.4 | 0.03 | 0.032 | 93% | 92% |
| 3/9/2011 | 0.3 | 0.03 | 0.032 | 90% | 89% |
| 3/10/2011 | 0.2 | 0.04 | 0.033 | 80% | 84% |
| 3/11/2011 | 0.2 | 0.03 | 0.033 | 85% | 84% |
| 3/12/2011 | 0.2 | 0.04 | 0.034 | 80% | 83% |
| 3/13/2011 | 0.2 | 0.04 | 0.034 | 80% | 83% |
| 3/14/2011 | 0.3 | 0.04 | 0.035 | 87% | 88% |
| 3/15/2011 | 0.3 | 0.04 | 0.036 | 87% | 88% |
| 3/16/2011 | 0.2 | 0.04 | 0.038 | 80% | 81% |
| 3/17/2011 | 0.2 | 0.05 | 0.04 | 75% | 80% |
| 3/18/2011 | 0.2 | 0.05 | 0.049 | 75% | 76% |
| 3/19/2011 | | | | | |
| 3/20/2011 | | | | | |
| 3/21/2011 | | | | | |
| 3/22/2011 | | | | | |
| 3/23/2011 | | | | | |
| 3/24/2011 | 0.7 | 0.1 | 0.095 | 86% | 86% |
| 3/25/2011 | | | | | |
| 3/26/2011 | | | | | |
| 3/27/2011 | | | | | |
| 3/28/2011 | | | | | |
| 3/29/2011 | 0.6 | 0.05 | 0.054 | 92% | 91% |
| 3/30/2011 | 0.6 | 0.08 | 0.049 | 87% | 92% |
| 3/31/2011 | 0.6 | 0.04 | 0.036 | 93% | 94% |
| 4/1/2011 | 0.9 | 0.06 | 0.042 | 93% | 95% |
| 4/2/2011 | 0.9 | 0.05 | 0.045 | 94% | 95% |
| 4/3/2011 | 0.9 | 0.05 | 0.045 | 94% | 95% |
| 4/4/2011 | 0.8 | 0.05 | 0.045 | 94% | 94% |
| 4/5/2011 | 0.7 | 0.05 | 0.04 | 93% | 94% |
| 4/6/2011 | 0.7 | 0.04 | 0.033 | 94% | 95% |
| 4/7/2011 | 1 | 0.03 | 0.03 | 97% | 97% |
| 4/8/2011 | 0.6 | 0.03 | 0.025 | 95% | 96% |
| 4/9/2011 | 0.6 | 0.03 | 0.023 | 95% | 96% |
| 4/10/2011 | 0.4 | 0.02 | 0.022 | 95% | 95% |
| 4/11/2011 | 0.5 | 0.02 | 0.022 | 96% | 96% |
| 4/12/2011 | 0.5 | 0.02 | 0.022 | 96% | 96% |
| 4/13/2011 | 0.6 | 0.02 | 0.022 | 97% | 96% |
| 4/14/2011 | 0.4 | 0.02 | 0.023 | 95% | 94% |
| 4/15/2011 | 0.4 | 0.02 | 0.023 | 95% | 94% |
| 4/16/2011 | 0.3 | 0.02 | 0.022 | 93% | 93% |
| 4/17/2011 | 0.3 | 0.02 | 0.023 | 93% | 92% |
| 4/18/2011 | 0.4 | 0.03 | 0.023 | 93% | 94% |
| 4/19/2011 | 1 | 0.03 | 0.025 | 97% | 98% |
| 4/20/2011 | 0.4 | 0.03 | 0.024 | 93% | 94% |
| 4/21/2011 | 0.4 | 0.03 | 0.024 | 93% | 94% |
| 4/22/2011 | 0.4 | 0.03 | 0.023 | 93% | 94% |
| 4/23/2011 | 0.4 | 0.02 | 0.022 | 95% | 95% |
| 4/24/2011 | 0.4 | 0.03 | 0.023 | 93% | 94% |
| 4/25/2011 | 0.6 | 0.03 | 0.022 | 95% | 96% |
| 4/26/2011 | 0.5 | 0.04 | 0.027 | 92% | 95% |
| 4/27/2011 | 0.5 | 0.03 | 0.023 | 94% | 95% |
| 4/28/2011 | 0.5 | 0.03 | 0.024 | 94% | 95% |
| 4/29/2011 | 0.5 | 0.03 | 0.024 | 94% | 95% |
| 4/30/2011 | 0.5 | 0.05 | 0.03 | 90% | 94% |
| 5/1/2011 | 0.7 | 0.03 | 0.023 | 96% | 97% |

| Date | Peak Daily Raw | Peak Daily Settled | Average Daily CFE | Removal thru Sed | Removal thru Filt |
|---|---|---|---|---|---|
| 5/2/2011 | 0.7 | 0.02 | 0.023 | 97% | 97% |
| 5/3/2011 | 2.5 | 0.08 | 0.033 | 97% | 99% |
| 5/4/2011 | 0.6 | 0.02 | 0.022 | 97% | 96% |
| 5/5/2011 | 0.6 | 0.02 | 0.022 | 97% | 96% |
| 5/6/2011 | 0.5 | 0.03 | 0.023 | 94% | 95% |
| 5/7/2011 | 0.5 | 0.03 | 0.026 | 94% | 95% |
| 5/8/2011 | 0.5 | 0.03 | 0.027 | 94% | 95% |
| 5/9/2011 | 0.6 | 0.04 | 0.035 | 93% | 94% |
| 5/10/2011 | 0.6 | 0.04 | 0.032 | 93% | 95% |
| 5/11/2011 | 0.5 | 0.04 | 0.03 | 92% | 94% |
| 5/12/2011 | 0.5 | 0.03 | 0.023 | 94% | 95% |
| 5/13/2011 | 0.7 | 0.03 | 0.024 | 96% | 97% |
| 5/14/2011 | 0.8 | 0.03 | 0.025 | 96% | 97% |
| 5/15/2011 | 1 | 0.03 | 0.025 | 97% | 98% |
| 5/16/2011 | 1.1 | 0.03 | 0.024 | 97% | 98% |
| 5/17/2011 | 1.3 | 0.03 | 0.025 | 98% | 98% |
| 5/18/2011 | 1.1 | 0.03 | 0.024 | 97% | 98% |
| 5/19/2011 | 1 | 0.03 | 0.025 | 97% | 98% |
| 5/20/2011 | 1.4 | 0.03 | 0.026 | 98% | 98% |
| 5/21/2011 | 1 | 0.03 | 0.028 | 97% | 97% |
| 5/22/2011 | 1 | 0.03 | 0.026 | 97% | 97% |
| 5/23/2011 | 0.9 | 0.03 | 0.024 | 97% | 97% |
| 5/24/2011 | 0.9 | 0.02 | 0.024 | 98% | 97% |
| 5/25/2011 | 0.8 | 0.02 | 0.024 | 98% | 97% |
| 5/26/2011 | 0.8 | 0.03 | 0.025 | 96% | 97% |
| 5/27/2011 | 0.9 | 0.02 | 0.024 | 98% | 97% |
| 5/28/2011 | 0.8 | 0.03 | 0.026 | 96% | 97% |
| 5/29/2011 | 1 | 0.03 | 0.025 | 97% | 98% |
| 5/30/2011 | 1.1 | 0.03 | 0.025 | 97% | 98% |
| 5/31/2011 | 2.1 | 0.03 | 0.025 | 99% | 99% |
| 6/1/2011 | 3.2 | 0.03 | 0.025 | 99% | 99% |
| 6/2/2011 | 2.6 | 0.03 | 0.025 | 99% | 99% |
| 6/3/2011 | 2 | 0.03 | 0.025 | 99% | 99% |
| 6/4/2011 | 1.4 | 0.03 | 0.026 | 98% | 98% |
| 6/5/2011 | 1.3 | 0.03 | 0.026 | 98% | 98% |
| 6/6/2011 | 1 | 0.03 | 0.025 | 97% | 98% |
| 6/7/2011 | 0.9 | 0.03 | 0.027 | 97% | 97% |
| 6/8/2011 | 0.8 | 0.03 | 0.026 | 96% | 97% |
| 6/9/2011 | 0.9 | 0.03 | 0.025 | 97% | 97% |
| 6/10/2011 | 0.9 | 0.03 | 0.025 | 97% | 97% |
| 6/11/2011 | 0.8 | 0.03 | 0.025 | 96% | 97% |
| 6/12/2011 | 0.9 | 0.03 | 0.024 | 97% | 97% |
| 6/13/2011 | 1.1 | 0.02 | 0.023 | 98% | 98% |
| 6/14/2011 | 3.5 | 0.03 | 0.024 | 99% | 99% |
| 6/15/2011 | 1.4 | 0.03 | 0.024 | 98% | 98% |
| 6/16/2011 | 1.3 | 0.02 | 0.024 | 98% | 98% |
| 6/17/2011 | 1.1 | 0.02 | 0.022 | 98% | 98% |
| 6/18/2011 | 1 | 0.02 | 0.023 | 98% | 98% |
| 6/19/2011 | 1.5 | 0.02 | 0.021 | 99% | 99% |
| 6/20/2011 | 1 | 0.03 | 0.026 | 97% | 97% |
| 6/21/2011 | 0.8 | 0.04 | 0.025 | 95% | 97% |
| 6/22/2011 | 1.1 | 0.02 | 0.02 | 98% | 98% |
| 6/23/2011 | 0.9 | 0.02 | 0.02 | 98% | 98% |
| 6/24/2011 | 0.6 | 0.02 | 0.019 | 97% | 97% |
| 6/25/2011 | 0.7 | 0.02 | 0.021 | 97% | 97% |
| 6/26/2011 | 0.7 | 0.02 | 0.023 | 97% | 97% |
| 6/27/2011 | 3.9 | 0.03 | 0.028 | 99% | 99% |
| 6/28/2011 | 1.9 | 0.03 | 0.03 | 98% | 98% |
| 6/29/2011 | 1.7 | 0.04 | 0.031 | 98% | 98% |
| 6/30/2011 | 1.9 | 0.04 | 0.033 | 98% | 98% |
| 7/1/2011 | 2.4 | 0.05 | 0.047 | 98% | 98% |
| 7/2/2011 | 1.6 | 0.05 | 0.039 | 97% | 98% |
| 7/3/2011 | 3.5 | 0.05 | 0.041 | 99% | 99% |
| 7/4/2011 | 2.6 | 0.04 | 0.032 | 98% | 99% |

| Date | Peak Daily Raw | Peak Daily Settled | Average Daily CFE | Removal thru Sed | Removal thru Filt |
|---|---|---|---|---|---|
| 7/5/2011 | 1.8 | 0.04 | 0.027 | 98% | 99% |
| 7/6/2011 | 1.4 | 0.04 | 0.035 | 97% | 98% |
| 7/7/2011 | 1.3 | 0.03 | 0.033 | 98% | 97% |
| 7/8/2011 | 1.1 | 0.04 | 0.035 | 96% | 97% |
| 7/9/2011 | 1.2 | 0.05 | 0.04 | 96% | 97% |
| 7/10/2011 | 1.5 | 0.04 | 0.037 | 97% | 98% |
| 7/11/2011 | 1.5 | 0.04 | 0.037 | 97% | 98% |
| 7/12/2011 | 0.9 | 0.04 | 0.035 | 96% | 96% |
| 7/13/2011 | 1.1 | 0.04 | 0.036 | 96% | 97% |
| 7/14/2011 | 1.1 | 0.05 | 0.042 | 95% | 96% |
| 7/15/2011 | 1 | 0.06 | 0.045 | 94% | 96% |
| 7/16/2011 | 1.3 | 0.04 | 0.036 | 97% | 97% |
| 7/17/2011 | 1.2 | 0.04 | 0.037 | 97% | 97% |
| 7/18/2011 | 3.2 | 0.04 | 0.033 | 99% | 99% |
| 7/19/2011 | 1 | 0.03 | 0.033 | 97% | 97% |
| 7/20/2011 | 0.9 | 0.04 | 0.035 | 96% | 96% |
| 7/21/2011 | 1.1 | 0.03 | 0.033 | 97% | 97% |
| 7/22/2011 | 0.9 | 0.04 | 0.035 | 96% | 96% |
| 7/23/2011 | 1.2 | 0.04 | 0.033 | 97% | 97% |
| 7/24/2011 | 1 | 0.03 | 0.032 | 97% | 97% |
| 7/25/2011 | 1 | 0.03 | 0.032 | 97% | 97% |
| 7/26/2011 | 1 | 0.03 | 0.033 | 97% | 97% |
| 7/27/2011 | 1 | 0.04 | 0.035 | 96% | 97% |
| 7/28/2011 | 1.4 | 0.04 | 0.036 | 97% | 97% |
| 7/29/2011 | 1.7 | 0.08 | 0.05 | 95% | 97% |
| 7/30/2011 | 1.6 | 0.05 | 0.045 | 97% | 97% |
| 7/31/2011 | 1.9 | 0.07 | 0.059 | 96% | 97% |
| 8/1/2011 | 1.4 | 0.05 | 0.049 | 96% | 97% |
| 8/2/2011 | 1.4 | 0.05 | 0.049 | 96% | 97% |
| 8/3/2011 | 1.3 | 0.05 | 0.05 | 96% | 96% |
| 8/4/2011 | 1.3 | 0.05 | 0.045 | 96% | 97% |
| 8/5/2011 | 1 | 0.04 | 0.037 | 96% | 96% |
| 8/6/2011 | 0.7 | 0.03 | 0.033 | 96% | 95% |
| 8/7/2011 | 0.8 | 0.04 | 0.034 | 95% | 96% |
| 8/8/2011 | 0.9 | 0.03 | 0.033 | 97% | 96% |
| 8/9/2011 | 0.7 | 0.04 | 0.034 | 94% | 95% |
| 8/10/2011 | 0.6 | 0.04 | 0.034 | 93% | 94% |
| 8/11/2011 | 0.7 | 0.04 | 0.034 | 94% | 95% |
| 8/12/2011 | 0.7 | 0.03 | 0.033 | 96% | 95% |
| 8/13/2011 | 0.8 | 0.04 | 0.036 | 95% | 96% |
| 8/14/2011 | 0.8 | 0.04 | 0.034 | 95% | 96% |
| 8/15/2011 | 0.7 | 0.04 | 0.034 | 94% | 95% |
| 8/16/2011 | 0.7 | 0.04 | 0.035 | 94% | 95% |
| 8/17/2011 | 0.8 | 0.04 | 0.04 | 95% | 95% |
| 8/18/2011 | 0.6 | 0.07 | 0.045 | 88% | 93% |
| 8/19/2011 | 0.6 | 0.04 | 0.037 | 93% | 94% |
| 8/20/2011 | 0.6 | 0.04 | 0.039 | 93% | 94% |
| 8/21/2011 | 0.6 | 0.05 | 0.041 | 92% | 93% |
| 8/22/2011 | 0.7 | 0.05 | 0.043 | 93% | 94% |
| 8/23/2011 | 0.5 | 0.05 | 0.041 | 90% | 92% |
| 8/24/2011 | 0.5 | 0.04 | 0.038 | 92% | 92% |
| 8/25/2011 | 0.5 | 0.04 | 0.04 | 92% | 92% |
| 8/26/2011 | 0.4 | 0.07 | 0.053 | 83% | 87% |
| 8/27/2011 | 0.7 | 0.07 | 0.055 | 90% | 92% |
| 8/28/2011 | 0.8 | 0.06 | 0.053 | 93% | 93% |
| 8/29/2011 | 0.9 | 0.06 | 0.055 | 93% | 94% |
| 8/30/2011 | 0.6 | 0.1 | 0.061 | 83% | 90% |
| 8/31/2011 | 0.5 | 0.05 | 0.049 | 90% | 90% |
| 9/1/2011 | 0.4 | 0.05 | 0.046 | 88% | 89% |
| 9/2/2011 | 0.4 | 0.04 | 0.041 | 90% | 90% |
| 9/3/2011 | 0.4 | 0.04 | 0.042 | 90% | 90% |
| 9/4/2011 | 0.5 | 0.05 | 0.047 | 90% | 91% |
| 9/5/2011 | 0.5 | 0.05 | 0.046 | 90% | 91% |
| 9/6/2011 | 0.5 | 0.06 | 0.049 | 88% | 90% |

| Date | Peak Daily Raw | Peak Daily Settled | Average Daily CFE | Removal thru Sed | Removal thru Filt |
|---|---|---|---|---|---|
| 9/7/2011 | 0.4 | 0.05 | 0.046 | 88% | 89% |
| 9/8/2011 | 0.4 | 0.05 | 0.046 | 88% | 89% |
| 9/9/2011 | 0.4 | 0.05 | 0.046 | 88% | 89% |
| 9/10/2011 | 0.3 | 0.05 | 0.04 | 83% | 87% |
| 9/11/2011 | 1.7 | 0.05 | 0.04 | 97% | 98% |
| 9/12/2011 | 0.4 | 0.07 | 0.056 | 83% | 86% |
| 9/13/2011 | 0.3 | 0.05 | 0.041 | 83% | 86% |
| 9/14/2011 | 0.4 | 0.04 | 0.042 | 90% | 90% |
| 9/15/2011 | 0.3 | 0.04 | 0.038 | 87% | 87% |
| 9/16/2011 | 0.4 | 0.04 | 0.037 | 90% | 91% |
| 9/17/2011 | 0.4 | 0.05 | 0.038 | 88% | 91% |
| 9/18/2011 | 0.4 | 0.04 | 0.037 | 90% | 91% |
| 9/19/2011 | 1.8 | 0.04 | 0.037 | 98% | 98% |
| 9/20/2011 | 1.5 | 0.04 | 0.037 | 97% | 98% |
| 9/21/2011 | 1 | 0.04 | 0.037 | 96% | 96% |
| 9/22/2011 | 0.8 | 0.04 | 0.037 | 95% | 95% |
| 9/23/2011 | 1.9 | 0.04 | 0.038 | 98% | 98% |
| 9/24/2011 | 1.7 | 0.04 | 0.037 | 98% | 98% |
| 9/25/2011 | 1 | 0.04 | 0.039 | 96% | 96% |
| 9/26/2011 | 0.7 | 0.04 | 0.036 | 94% | 95% |
| 9/27/2011 | 0.4 | 0.05 | 0.037 | 88% | 91% |
| 9/28/2011 | 0.4 | 0.04 | 0.036 | 90% | 91% |
| 9/29/2011 | 0.4 | 0.04 | 0.037 | 90% | 91% |
| 9/30/2011 | 0.4 | 0.04 | 0.036 | 90% | 91% |
| 10/1/2011 | 0.4 | 0.04 | 0.038 | 90% | 91% |
| 10/2/2011 | 0.4 | 0.04 | 0.039 | 90% | 90% |
| 10/3/2011 | 0.4 | 0.05 | 0.043 | 88% | 89% |
| 10/4/2011 | 0.3 | 0.04 | 0.041 | 87% | 86% |
| 10/5/2011 | 4.6 | 0.04 | 0.041 | 99% | 99% |
| 10/6/2011 | | | | | |
| 10/7/2011 | | | | | |
| 10/8/2011 | | | | | |
| 10/9/2011 | | | | | |
| 10/10/2011 | 1 | 0.07 | 0.064 | 93% | 94% |
| 10/11/2011 | 0.9 | 0.05 | 0.045 | 94% | 95% |
| 10/12/2011 | 0.7 | 0.04 | 0.04 | 94% | 94% |
| 10/13/2011 | | | | | |
| 10/14/2011 | | | | | |
| 10/15/2011 | | | | | |
| 10/16/2011 | | | | | |
| 10/17/2011 | | | | | |
| 10/18/2011 | 3.2 | 0.09 | 0.068 | 97% | 98% |
| 10/19/2011 | 0.5 | 0.05 | 0.048 | 90% | 90% |
| 10/20/2011 | 0.4 | 0.05 | 0.044 | 88% | 89% |
| 10/21/2011 | 0.4 | 0.04 | 0.036 | 90% | 91% |
| 10/22/2011 | 0.4 | 0.03 | 0.033 | 93% | 92% |
| 10/23/2011 | 0.4 | 0.04 | 0.035 | 90% | 91% |
| 10/24/2011 | 0.5 | 0.04 | 0.034 | 92% | 93% |
| 10/25/2011 | 0.4 | 0.03 | 0.031 | 93% | 92% |
| 10/26/2011 | 0.4 | 0.03 | 0.031 | 93% | 92% |
| 10/27/2011 | 0.3 | 0.04 | 0.033 | 87% | 89% |
| 10/28/2011 | 0.3 | 0.03 | 0.031 | 90% | 90% |
| 10/29/2011 | 0.3 | 0.03 | 0.03 | 90% | 90% |
| 10/30/2011 | 0.4 | 0.03 | 0.028 | 93% | 93% |
| 10/31/2011 | 0.4 | 0.03 | 0.028 | 93% | 93% |
| 11/1/2011 | 0.7 | 0.03 | 0.029 | 96% | 96% |
| 11/2/2011 | 0.9 | 0.03 | 0.029 | 97% | 97% |
| 11/3/2011 | 0.7 | 0.05 | 0.033 | 93% | 95% |
| 11/4/2011 | 0.4 | 0.04 | 0.032 | 90% | 92% |
| 11/5/2011 | 2.2 | 0.04 | 0.041 | 98% | 98% |
| 11/6/2011 | 2 | 0.04 | 0.036 | 98% | 98% |
| 11/7/2011 | 0.8 | 0.04 | 0.036 | 95% | 96% |
| 11/8/2011 | 0.4 | 0.04 | 0.035 | 90% | 91% |
| 11/9/2011 | 0.3 | 0.04 | 0.033 | 87% | 89% |

| Date | Peak Daily Raw | Peak Daily Settled | Average Daily CFE | Removal thru Sed | Removal thru Filt |
|---|---|---|---|---|---|
| 11/10/2011 | 0.3 | 0.03 | 0.032 | 90% | 89% |
| 11/11/2011 | 0.3 | 0.03 | 0.032 | 90% | 89% |
| 11/12/2011 | 0.3 | 0.03 | 0.032 | 90% | 89% |
| 11/13/2011 | 0.3 | 0.04 | 0.032 | 87% | 89% |
| 11/14/2011 | 0.3 | 0.03 | 0.024 | 90% | 92% |
| 11/15/2011 | 0.2 | 0.03 | 0.024 | 85% | 88% |
| 11/16/2011 | 0.2 | 0.04 | 0.031 | 80% | 85% |
| 11/17/2011 | 0.2 | 0.03 | 0.033 | 85% | 84% |
| 11/18/2011 | 0.2 | 0.04 | 0.035 | 80% | 83% |
| 11/19/2011 | 0.2 | 0.04 | 0.034 | 80% | 83% |
| 11/20/2011 | 3.3 | 0.04 | 0.034 | 99% | 99% |
| 11/21/2011 | | | | | |
| 11/22/2011 | | | | | |
| 11/23/2011 | | | | | |
| 11/24/2011 | | | | | |
| 11/25/2011 | | | | | |
| 11/26/2011 | | | | | |
| 11/27/2011 | | | | | |
| 11/28/2011 | 0.5 | 0.04 | 0.04 | 92% | 92% |
| 11/29/2011 | 0.6 | 0.05 | 0.043 | 92% | 93% |
| 11/30/2011 | 1 | 0.07 | 0.047 | 93% | 95% |
| 12/1/2011 | 1.2 | 0.05 | 0.036 | 96% | 97% |
| 12/2/2011 | 0.4 | 0.03 | 0.026 | 93% | 94% |
| 12/3/2011 | 0.3 | 0.03 | 0.026 | 90% | 91% |
| 12/4/2011 | 0.2 | 0.03 | 0.025 | 85% | 88% |
| 12/5/2011 | | | | | |
| 12/6/2011 | | | | | |
| 12/7/2011 | | | | | |
| 12/8/2011 | | | | | |
| 12/9/2011 | | | | | |
| 12/10/2011 | | | | | |
| 12/11/2011 | | | | | |
| 12/12/2011 | | | | | |
| 12/13/2011 | | | | | |
| 12/14/2011 | | | | | |
| 12/15/2011 | | | | | |
| 12/16/2011 | | | | | |
| 12/17/2011 | | | | | |
| 12/18/2011 | | | | | |
| 12/19/2011 | | | | | |
| 12/20/2011 | | | | | |
| 12/21/2011 | 0.8 | 0.06 | 0.049 | 93% | 94% |
| 12/22/2011 | 0.7 | 0.04 | 0.03 | 94% | 96% |
| 12/23/2011 | 0.4 | 0.05 | 0.032 | 88% | 92% |
| 12/24/2011 | 0.3 | 0.05 | 0.045 | 83% | 85% |
| 12/25/2011 | 0.3 | 0.06 | 0.04 | 80% | 87% |
| 12/26/2011 | 0.3 | 0.04 | 0.033 | 87% | 89% |
| 12/27/2011 | 0.2 | 0.04 | 0.029 | 80% | 86% |
| 12/28/2011 | 0.6 | 0.03 | 0.026 | 95% | 96% |
| 12/29/2011 | 0.8 | 0.03 | 0.026 | 96% | 97% |
| 12/30/2011 | 0.9 | 0.03 | 0.028 | 97% | 97% |
| 12/31/2011 | 0.5 | 0.03 | 0.028 | 94% | 94% |
| 1/1/2012 | 0.5 | 0.03 | 0.028 | 94% | 94% |
| 1/2/2012 | 0.2 | 0.03 | 0.025 | 85% | 88% |
| 1/3/2012 | 0.4 | 0.03 | 0.026 | 93% | 94% |
| 1/4/2012 | 0.5 | 0.03 | 0.026 | 94% | 95% |
| 1/5/2012 | 0.4 | 0.03 | 0.026 | 93% | 94% |
| 1/6/2012 | 0.2 | 0.03 | 0.026 | 85% | 87% |
| 1/7/2012 | 0.2 | 0.03 | 0.026 | 85% | 87% |
| 1/8/2012 | 0.2 | 0.03 | 0.024 | 85% | 88% |
| 1/9/2012 | 0.3 | 0.03 | 0.025 | 90% | 92% |
| 1/10/2012 | 0.4 | 0.03 | 0.024 | 93% | 94% |
| 1/11/2012 | 0.4 | 0.03 | 0.025 | 93% | 94% |
| 1/12/2012 | 0.3 | 0.03 | 0.026 | 90% | 91% |

| Date | Peak Daily Raw | Peak Daily Settled | Average Daily CFE | Removal thru Sed | Removal thru Filt |
|---|---|---|---|---|---|
| 1/13/2012 | 0.2 | 0.02 | 0.023 | 90% | 89% |
| 1/14/2012 | 0.2 | 0.02 | 0.023 | 90% | 89% |
| 1/15/2012 | 0.2 | 0.02 | 0.022 | 90% | 89% |
| 1/16/2012 | 0.2 | 0.03 | 0.023 | 85% | 89% |
| 1/17/2012 | 0.2 | 0.03 | 0.023 | 85% | 89% |
| 1/18/2012 | 0.2 | 0.03 | 0.023 | 85% | 89% |
| 1/19/2012 | 0.2 | 0.02 | 0.023 | 90% | 89% |
| 1/20/2012 | 0.2 | 0.03 | 0.023 | 85% | 89% |
| 1/21/2012 | 0.2 | 0.03 | 0.024 | 85% | 88% |
| 1/22/2012 | 0.2 | 0.03 | 0.024 | 85% | 88% |
| 1/23/2012 | 0.2 | 0.02 | 0.023 | 90% | 89% |
| 1/24/2012 | 0.2 | 0.03 | 0.024 | 85% | 88% |
| 1/25/2012 | 0.2 | 0.02 | 0.023 | 90% | 89% |
| 1/26/2012 | 0.2 | 0.03 | 0.024 | 85% | 88% |
| 1/27/2012 | 0.2 | 0.02 | 0.023 | 90% | 89% |
| 1/28/2012 | 0.7 | 0.05 | 0.037 | 93% | 95% |
| 1/29/2012 | 0.5 | 0.05 | 0.037 | 90% | 93% |
| 1/30/2012 | 0.2 | 0.03 | 0.026 | 85% | 87% |
| 1/31/2012 | 0.2 | 0.03 | 0.026 | 85% | 87% |
| 2/1/2012 | 0.2 | 0.03 | 0.027 | 85% | 87% |
| 2/2/2012 | 0.2 | 0.06 | 0.035 | 70% | 83% |
| 2/3/2012 | 0.2 | 0.04 | 0.029 | 80% | 86% |
| 2/4/2012 | 0.2 | 0.03 | 0.026 | 85% | 87% |
| 2/5/2012 | 0.2 | 0.03 | 0.027 | 85% | 87% |
| 2/6/2012 | 0.2 | 0.03 | 0.029 | 85% | 86% |
| 2/7/2012 | 0.3 | 0.03 | 0.029 | 90% | 90% |
| 2/8/2012 | 0.3 | 0.03 | 0.028 | 90% | 91% |
| 2/9/2012 | 0.3 | 0.03 | 0.029 | 90% | 90% |
| 2/10/2012 | 0.2 | 0.03 | 0.029 | 85% | 86% |
| 2/11/2012 | 0.3 | 0.03 | 0.029 | 90% | 90% |
| 2/12/2012 | 0.2 | 0.03 | 0.028 | 85% | 86% |
| 2/13/2012 | 0.2 | 0.03 | 0.028 | 85% | 86% |
| 2/14/2012 | 0.2 | 0.03 | 0.029 | 85% | 86% |
| 2/15/2012 | 0.2 | 0.03 | 0.029 | 85% | 86% |
| 2/16/2012 | 0.3 | 0.03 | 0.029 | 90% | 90% |
| 2/17/2012 | 0.3 | 0.03 | 0.028 | 90% | 91% |
| 2/18/2012 | 0.3 | 0.03 | 0.027 | 90% | 91% |
| 2/19/2012 | 0.2 | 0.03 | 0.027 | 85% | 87% |
| 2/20/2012 | 0.2 | 0.03 | 0.027 | 85% | 87% |
| 2/21/2012 | 0.3 | 0.03 | 0.027 | 90% | 91% |
| 2/22/2012 | 0.3 | 0.03 | 0.027 | 90% | 91% |
| 2/23/2012 | 2 | 0.04 | 0.029 | 98% | 99% |
| 2/24/2012 | 1.8 | 0.05 | 0.033 | 97% | 98% |
| 2/25/2012 | 0.8 | 0.06 | 0.034 | 93% | 96% |
| 2/26/2012 | 0.6 | 0.08 | 0.061 | 87% | 90% |
| 2/27/2012 | 0.5 | 0.06 | 0.042 | 88% | 92% |
| 2/28/2012 | 0.5 | 0.04 | 0.035 | 92% | 93% |
| 2/29/2012 | 0.9 | 0.04 | 0.035 | 96% | 96% |
| 3/1/2012 | 0.5 | 0.04 | 0.034 | 92% | 93% |
| 3/2/2012 | 0.5 | 0.03 | 0.032 | 94% | 94% |
| 3/3/2012 | 0.5 | 0.03 | 0.032 | 94% | 94% |
| 3/4/2012 | 0.4 | 0.04 | 0.034 | 90% | 92% |
| 3/5/2012 | 0.5 | 0.04 | 0.033 | 92% | 93% |
| 3/6/2012 | 0.2 | 0.04 | 0.035 | 80% | 83% |
| 3/7/2012 | 0.5 | 0.04 | 0.033 | 92% | 93% |
| 3/8/2012 | 0.5 | 0.04 | 0.034 | 92% | 93% |
| 3/9/2012 | 0.5 | 0.04 | 0.034 | 92% | 93% |
| 3/10/2012 | 0.5 | 0.04 | 0.034 | 92% | 93% |
| 3/11/2012 | 0.4 | 0.03 | 0.032 | 93% | 92% |
| 3/12/2012 | 0.4 | 0.03 | 0.033 | 93% | 92% |
| 3/13/2012 | 0.4 | 0.03 | 0.033 | 93% | 92% |
| 3/14/2012 | 0.4 | 0.03 | 0.033 | 93% | 92% |
| 3/15/2012 | 0.4 | 0.04 | 0.034 | 90% | 92% |
| 3/16/2012 | 0.4 | 0.04 | 0.035 | 90% | 91% |

| Date | Peak Daily Raw | Peak Daily Settled | Average Daily CFE | Removal thru Sed | Removal thru Filt |
|---|---|---|---|---|---|
| 3/17/2012 | 0.4 | 0.04 | 0.036 | 90% | 91% |
| 3/18/2012 | | | | | |
| 3/19/2012 | | | | | |
| 3/20/2012 | 6.6 | 0.05 | 0.043 | 99% | 99% |
| 3/21/2012 | 0.7 | 0.04 | 0.038 | 94% | 95% |
| 3/22/2012 | 0.9 | 0.05 | 0.042 | 94% | 95% |
| 3/23/2012 | 0.8 | 0.05 | 0.041 | 94% | 95% |
| 3/24/2012 | 0.8 | 0.05 | 0.047 | 94% | 94% |
| 3/25/2012 | 0.6 | 0.04 | 0.041 | 93% | 93% |
| 3/26/2012 | | | | | |
| 3/27/2012 | 1.2 | 0.1 | 0.069 | 92% | 94% |
| 3/28/2012 | 0.9 | 0.07 | 0.057 | 92% | 94% |
| 3/29/2012 | 0.6 | 0.05 | 0.047 | 92% | 92% |
| 3/30/2012 | 0.7 | 0.09 | 0.069 | 87% | 90% |
| 3/31/2012 | 0.6 | 0.07 | 0.057 | 88% | 91% |
| 4/1/2012 | 0.7 | 0.07 | 0.055 | 90% | 92% |
| 4/2/2012 | 0.5 | 0.07 | 0.048 | 86% | 90% |
| 4/3/2012 | 0.5 | 0.04 | 0.031 | 92% | 94% |
| 4/4/2012 | 0.5 | 0.03 | 0.027 | 94% | 95% |
| 4/5/2012 | 0.5 | 0.03 | 0.028 | 94% | 94% |
| 4/6/2012 | 0.2 | 0.03 | 0.029 | 85% | 86% |
| 4/7/2012 | 0.5 | 0.03 | 0.027 | 94% | 95% |
| 4/8/2012 | 0.6 | 0.04 | 0.031 | 93% | 95% |
| 4/9/2012 | 0.7 | 0.07 | 0.041 | 90% | 94% |
| 4/10/2012 | 0.7 | 0.03 | 0.026 | 96% | 96% |
| 4/11/2012 | 1 | 0.05 | 0.045 | 95% | 96% |
| 4/12/2012 | 0.6 | 0.06 | 0.037 | 90% | 94% |
| 4/13/2012 | 0.6 | 0.03 | 0.028 | 95% | 95% |
| 4/14/2012 | 1.9 | 0.05 | 0.046 | 97% | 98% |
| 4/15/2012 | 0.7 | 0.07 | 0.05 | 90% | 93% |
| 4/16/2012 | 0.8 | 0.05 | 0.034 | 94% | 96% |
| 4/17/2012 | 0.6 | 0.03 | 0.03 | 95% | 95% |
| 4/18/2012 | 1.1 | 0.03 | 0.03 | 97% | 97% |
| 4/19/2012 | 0.8 | 0.03 | 0.028 | 96% | 97% |
| 4/20/2012 | 0.5 | 0.03 | 0.03 | 94% | 94% |
| 4/21/2012 | 0.7 | 0.04 | 0.034 | 94% | 95% |
| 4/22/2012 | 1 | 0.04 | 0.034 | 96% | 97% |
| 4/23/2012 | 0.8 | 0.03 | 0.032 | 96% | 96% |
| 4/24/2012 | 0.4 | 0.03 | 0.03 | 93% | 93% |
| 4/25/2012 | 0.3 | 0.03 | 0.03 | 90% | 90% |
| 4/26/2012 | 0.4 | 0.03 | 0.032 | 93% | 92% |
| 4/27/2012 | 0.3 | 0.03 | 0.03 | 90% | 90% |
| 4/28/2012 | 0.3 | 0.03 | 0.03 | 90% | 90% |
| 4/29/2012 | 0.4 | 0.03 | 0.031 | 93% | 92% |
| 4/30/2012 | 0.4 | 0.03 | 0.03 | 93% | 93% |
| 5/1/2012 | | | | | |
| 5/2/2012 | | | | | |
| 5/3/2012 | | | | | |
| 5/4/2012 | | | | | |
| 5/5/2012 | | | | | |
| 5/6/2012 | | | | | |
| 5/7/2012 | | | | | |
| 5/8/2012 | | | | | |
| 5/9/2012 | | | | | |
| 5/10/2012 | | | | | |
| 5/11/2012 | | | | | |
| 5/12/2012 | 0.5 | 0.1 | 0.047 | 80% | 91% |
| 5/13/2012 | 0.4 | 0.05 | 0.038 | 88% | 91% |
| 5/14/2012 | 0.5 | 0.05 | 0.038 | 90% | 92% |
| 5/15/2012 | 0.3 | 0.03 | 0.031 | 90% | 90% |
| 5/16/2012 | 0.3 | 0.03 | 0.028 | 90% | 91% |
| 5/17/2012 | 0.2 | 0.03 | 0.029 | 85% | 86% |
| 5/18/2012 | 0.2 | 0.03 | 0.028 | 85% | 86% |
| 5/19/2012 | 0.2 | 0.03 | 0.026 | 85% | 87% |

| Date | Peak Daily Raw | Peak Daily Settled | Average Daily CFE | Removal thru Sed | Removal thru Filt |
|---|---|---|---|---|---|
| 5/20/2012 | 0.6 | 0.03 | 0.028 | 95% | 95% |
| 5/21/2012 | 0.6 | 0.03 | 0.027 | 95% | 96% |
| 5/22/2012 | 0.3 | 0.03 | 0.028 | 90% | 91% |
| 5/23/2012 | 0.2 | 0.05 | 0.034 | 75% | 83% |
| 5/24/2012 | 0.2 | 0.06 | 0.042 | 70% | 79% |
| 5/25/2012 | 0.3 | 0.05 | 0.045 | 83% | 85% |
| 5/26/2012 | 0.4 | 0.04 | 0.032 | 90% | 92% |
| 5/27/2012 | 0.3 | 0.03 | 0.028 | 90% | 91% |
| 5/28/2012 | 0.4 | 0.03 | 0.029 | 93% | 93% |
| 5/29/2012 | 0.7 | 0.03 | 0.03 | 96% | 96% |
| 5/30/2012 | 0.5 | 0.03 | 0.03 | 94% | 94% |
| 5/31/2012 | 0.3 | 0.03 | 0.032 | 90% | 89% |
| 6/1/2012 | 0.3 | 0.03 | 0.032 | 90% | 89% |
| 6/2/2012 | 0.3 | 0.03 | 0.032 | 90% | 89% |
| 6/3/2012 | 0.4 | 0.03 | 0.031 | 93% | 92% |
| 6/4/2012 | 0.4 | 0.03 | 0.031 | 93% | 92% |
| 6/5/2012 | 0.3 | 0.03 | 0.031 | 90% | 90% |
| 6/6/2012 | 0.3 | 0.04 | 0.032 | 87% | 89% |
| 6/7/2012 | 0.3 | 0.04 | 0.035 | 87% | 88% |
| 6/8/2012 | 0.5 | 0.06 | 0.042 | 88% | 92% |
| 6/9/2012 | 0.5 | 0.05 | 0.041 | 90% | 92% |
| 6/10/2012 | 0.4 | 0.05 | 0.037 | 88% | 91% |
| 6/11/2012 | 0.3 | 0.03 | 0.026 | 90% | 91% |
| 6/12/2012 | 0.3 | 0.03 | 0.027 | 90% | 91% |
| 6/13/2012 | 0.3 | 0.03 | 0.029 | 90% | 90% |
| 6/14/2012 | 0.3 | 0.03 | 0.03 | 90% | 90% |
| 6/15/2012 | 0.3 | 0.03 | 0.03 | 90% | 90% |
| 6/16/2012 | 0.3 | 0.03 | 0.03 | 90% | 90% |
| 6/17/2012 | 0.3 | 0.03 | 0.03 | 90% | 90% |
| 6/18/2012 | 0.5 | 0.03 | 0.029 | 94% | 94% |
| 6/19/2012 | 0.3 | 0.04 | 0.033 | 87% | 89% |
| 6/20/2012 | 0.3 | 0.03 | 0.029 | 90% | 90% |
| 6/21/2012 | 0.3 | 0.03 | 0.03 | 90% | 90% |
| 6/22/2012 | 0.2 | 0.03 | 0.029 | 85% | 86% |
| 6/23/2012 | 0.3 | 0.03 | 0.028 | 90% | 91% |
| 6/24/2012 | 0.3 | 0.03 | 0.028 | 90% | 91% |
| 6/25/2012 | 0.4 | 0.03 | 0.032 | 93% | 92% |
| 6/26/2012 | 0.3 | 0.03 | 0.033 | 90% | 89% |
| 6/27/2012 | 0.3 | 0.04 | 0.033 | 87% | 89% |
| 6/28/2012 | 0.2 | 0.03 | 0.028 | 85% | 86% |
| 6/29/2012 | 0.2 | 0.03 | 0.027 | 85% | 87% |
| 6/30/2012 | 0.3 | 0.03 | 0.028 | 90% | 91% |
| 7/1/2012 | 0.3 | 0.03 | 0.03 | 90% | 90% |
| 7/2/2012 | 0.3 | 0.03 | 0.028 | 90% | 91% |
| 7/3/2012 | 0.2 | 0.03 | 0.028 | 85% | 86% |
| 7/4/2012 | 0.4 | 0.03 | 0.029 | 93% | 93% |
| 7/5/2012 | 0.5 | 0.03 | 0.03 | 94% | 94% |
| 7/6/2012 | 0.3 | 0.03 | 0.031 | 90% | 90% |
| 7/7/2012 | 0.2 | 0.04 | 0.032 | 80% | 84% |
| 7/8/2012 | 0.3 | 0.03 | 0.029 | 90% | 90% |
| 7/9/2012 | 0.3 | 0.04 | 0.032 | 87% | 89% |
| 7/10/2012 | 0.3 | 0.04 | 0.037 | 87% | 88% |
| 7/11/2012 | 0.3 | 0.05 | 0.042 | 83% | 86% |
| 7/12/2012 | 0.3 | 0.05 | 0.043 | 83% | 86% |
| 7/13/2012 | 0.3 | 0.04 | 0.04 | 87% | 87% |
| 7/14/2012 | 0.5 | 0.04 | 0.043 | 92% | 91% |
| 7/15/2012 | 0.3 | 0.04 | 0.038 | 87% | 87% |
| 7/16/2012 | 0.5 | 0.04 | 0.038 | 92% | 92% |
| 7/17/2012 | 0.3 | 0.04 | 0.036 | 87% | 88% |
| 7/18/2012 | 0.5 | 0.04 | 0.036 | 92% | 93% |
| 7/19/2012 | 0.4 | 0.04 | 0.037 | 90% | 91% |
| 7/20/2012 | 0.3 | 0.04 | 0.037 | 87% | 88% |
| 7/21/2012 | 0.3 | 0.04 | 0.037 | 87% | 88% |
| 7/22/2012 | 0.2 | 0.04 | 0.039 | 80% | 81% |

| Date | Peak Daily Raw | Peak Daily Settled | Average Daily CFE | Removal thru Sed | Removal thru Filt |
|---|---|---|---|---|---|
| 7/23/2012 | 0.3 | 0.05 | 0.041 | 83% | 86% |
| 7/24/2012 | 0.2 | 0.05 | 0.05 | 75% | 75% |
| 7/25/2012 | 0.2 | 0.05 | 0.048 | 75% | 76% |
| 7/26/2012 | 0.2 | 0.05 | 0.045 | 75% | 78% |
| 7/27/2012 | 0.2 | 0.05 | 0.043 | 75% | 79% |
| 7/28/2012 | 0.2 | 0.05 | 0.041 | 75% | 80% |
| 7/29/2012 | 0.3 | 0.05 | 0.044 | 83% | 85% |
| 7/30/2012 | 0.4 | 0.04 | 0.042 | 90% | 90% |
| 7/31/2012 | 0.3 | 0.06 | 0.052 | 80% | 83% |
| 8/1/2012 | 0.3 | 0.06 | 0.052 | 80% | 83% |
| 8/2/2012 | 0.2 | 0.05 | 0.045 | 75% | 78% |
| 8/3/2012 | 0.6 | 0.05 | 0.048 | 92% | 92% |
| 8/4/2012 | 0.5 | 0.05 | 0.044 | 90% | 91% |
| 8/5/2012 | 0.3 | 0.07 | 0.051 | 77% | 83% |
| 8/6/2012 | 0.3 | 0.05 | 0.043 | 83% | 86% |
| 8/7/2012 | 0.2 | 0.07 | 0.046 | 65% | 77% |
| 8/8/2012 | 0.2 | 0.04 | 0.04 | 80% | 80% |
| 8/9/2012 | 0.2 | 0.06 | 0.048 | 70% | 76% |
| 8/10/2012 | 0.4 | 0.07 | 0.056 | 83% | 86% |
| 8/11/2012 | 0.8 | 0.07 | 0.06 | 91% | 93% |
| 8/12/2012 | 0.7 | 0.06 | 0.053 | 91% | 92% |
| 8/13/2012 | 0.4 | 0.1 | 0.068 | 75% | 83% |
| 8/14/2012 | 0.4 | 0.09 | 0.078 | 78% | 81% |
| 8/15/2012 | 0.5 | 0.08 | 0.071 | 84% | 86% |
| 8/16/2012 | 0.8 | 0.08 | 0.068 | 90% | 92% |
| 8/17/2012 | 0.5 | 0.06 | 0.05 | 88% | 90% |
| 8/18/2012 | 1.6 | 0.07 | 0.044 | 96% | 97% |
| 8/19/2012 | 1.8 | 0.06 | 0.057 | 97% | 97% |
| 8/20/2012 | 0.8 | 0.09 | 0.07 | 89% | 91% |
| 8/21/2012 | 0.7 | 0.06 | 0.048 | 91% | 93% |
| 8/22/2012 | 0.6 | 0.04 | 0.041 | 93% | 93% |
| 8/23/2012 | 0.6 | 0.05 | 0.035 | 92% | 94% |
| 8/24/2012 | 0.6 | 0.1 | 0.056 | 83% | 91% |
| 8/25/2012 | 0.5 | 0.04 | 0.039 | 92% | 92% |
| 8/26/2012 | 0.5 | 0.04 | 0.037 | 92% | 93% |
| 8/27/2012 | 0.6 | 0.04 | 0.036 | 93% | 94% |
| 8/28/2012 | 0.5 | 0.04 | 0.035 | 92% | 93% |
| 8/29/2012 | 0.6 | 0.04 | 0.035 | 93% | 94% |
| 8/30/2012 | 0.4 | 0.05 | 0.042 | 88% | 90% |
| 8/31/2012 | 0.4 | 0.05 | 0.038 | 88% | 91% |
| 9/1/2012 | 0.4 | 0.05 | 0.038 | 88% | 91% |
| 9/2/2012 | 0.5 | 0.05 | 0.046 | 90% | 91% |
| 9/3/2012 | 1.1 | 0.05 | 0.041 | 95% | 96% |
| 9/4/2012 | 1.3 | 0.04 | 0.036 | 97% | 97% |
| 9/5/2012 | 0.8 | 0.05 | 0.049 | 94% | 94% |
| 9/6/2012 | 0.7 | 0.04 | 0.043 | 94% | 94% |
| 9/7/2012 | 0.5 | 0.05 | 0.042 | 90% | 92% |
| 9/8/2012 | 0.4 | 0.05 | 0.047 | 88% | 88% |
| 9/9/2012 | 0.3 | 0.05 | 0.048 | 83% | 84% |
| 9/10/2012 | 0.4 | 0.06 | 0.054 | 85% | 87% |
| 9/11/2012 | 0.4 | 0.06 | 0.053 | 85% | 87% |
| 9/12/2012 | 0.3 | 0.05 | 0.043 | 83% | 86% |
| 9/13/2012 | 0.3 | 0.05 | 0.043 | 83% | 86% |
| 9/14/2012 | 0.3 | 0.07 | 0.047 | 77% | 84% |
| 9/15/2012 | 0.3 | 0.05 | 0.042 | 83% | 86% |
| 9/16/2012 | 0.3 | 0.05 | 0.042 | 83% | 86% |
| 9/17/2012 | 0.3 | 0.04 | 0.04 | 87% | 87% |
| 9/18/2012 | 0.4 | 0.04 | 0.038 | 90% | 91% |
| 9/19/2012 | 0.4 | 0.06 | 0.044 | 85% | 89% |
| 9/20/2012 | 0.6 | 0.08 | 0.052 | 87% | 91% |
| 9/21/2012 | 0.6 | 0.08 | 0.06 | 87% | 90% |
| 9/22/2012 | 0.9 | 0.05 | 0.05 | 94% | 94% |
| 9/23/2012 | 1.1 | 0.08 | 0.066 | 93% | 94% |
| 9/24/2012 | 0.4 | 0.07 | 0.063 | 83% | 84% |

| Date | Peak Daily Raw | Peak Daily Settled | Average Daily CFE | Removal thru Sed | Removal thru Filt |
|---|---|---|---|---|---|
| 9/25/2012 | 0.5 | 0.08 | 0.066 | 84% | 87% |
| 9/26/2012 | 0.3 | 0.08 | 0.06 | 73% | 80% |
| 9/27/2012 | 0.2 | 0.05 | 0.039 | 75% | 81% |
| 9/28/2012 | 0.3 | 0.05 | 0.041 | 83% | 86% |
| 9/29/2012 | 0.2 | 0.04 | 0.038 | 80% | 81% |
| 9/30/2012 | 0.2 | 0.04 | 0.036 | 80% | 82% |
| 10/1/2012 | 0.5 | 0.04 | 0.037 | 92% | 93% |
| 10/2/2012 | 0.6 | 0.04 | 0.036 | 93% | 94% |
| 10/3/2012 | 0.7 | 0.09 | 0.062 | 87% | 91% |
| 10/4/2012 | 1.2 | 0.07 | 0.069 | 94% | 94% |
| 10/5/2012 | 0.6 | 0.08 | 0.065 | 87% | 89% |
| 10/6/2012 | 0.4 | 0.06 | 0.059 | 85% | 85% |
| 10/7/2012 | 0.4 | 0.05 | 0.051 | 88% | 87% |
| 10/8/2012 | 1.3 | 0.06 | 0.054 | 95% | 96% |
| 10/9/2012 | 0.2 | 0.06 | 0.057 | 70% | 72% |
| 10/10/2012 | 0.2 | 0.05 | 0.051 | 75% | 75% |
| 10/11/2012 | 0.2 | 0.08 | 0.063 | 60% | 69% |
| 10/12/2012 | 0.2 | 0.08 | 0.075 | 60% | 63% |
| 10/13/2012 | 0.2 | 0.07 | 0.064 | 65% | 68% |
| 10/14/2012 | 0.5 | 0.08 | 0.072 | 84% | 86% |
| 10/15/2012 | 0.4 | 0.09 | 0.072 | 78% | 82% |
| 10/16/2012 | 0.3 | 0.07 | 0.064 | 77% | 79% |
| 10/17/2012 | 0.3 | 0.07 | 0.066 | 77% | 78% |
| 10/18/2012 | 0.3 | 0.07 | 0.065 | 77% | 78% |
| 10/19/2012 | 0.3 | 0.09 | 0.063 | 70% | 79% |
| 10/20/2012 | 0.3 | 0.06 | 0.049 | 80% | 84% |
| 10/21/2012 | 0.3 | 0.05 | 0.042 | 83% | 86% |
| 10/22/2012 | 0.6 | 0.06 | 0.047 | 90% | 92% |
| 10/23/2012 | 0.3 | 0.05 | 0.045 | 83% | 85% |
| 10/24/2012 | 0.3 | 0.04 | 0.037 | 87% | 88% |
| 10/25/2012 | 0.3 | 0.05 | 0.037 | 83% | 88% |
| 10/26/2012 | 0.3 | 0.04 | 0.041 | 87% | 86% |
| 10/27/2012 | 0.4 | 0.04 | 0.034 | 90% | 92% |
| 10/28/2012 | 0.4 | 0.04 | 0.035 | 90% | 91% |
| 10/29/2012 | 0.3 | 0.04 | 0.032 | 87% | 89% |
| 10/30/2012 | 0.5 | 0.06 | 0.039 | 88% | 92% |
| 10/31/2012 | 0.5 | 0.04 | 0.032 | 92% | 94% |
| 11/1/2012 | 0.5 | 0.04 | 0.032 | 92% | 94% |
| 11/2/2012 | 0.4 | 0.03 | 0.03 | 93% | 93% |
| 11/3/2012 | 0.5 | 0.04 | 0.035 | 92% | 93% |
| 11/4/2012 | 0.4 | 0.04 | 0.034 | 90% | 92% |
| 11/5/2012 | 0.4 | 0.03 | 0.027 | 93% | 93% |
| 11/6/2012 | 0.3 | 0.03 | 0.028 | 90% | 91% |
| 11/7/2012 | 0.3 | 0.03 | 0.028 | 90% | 91% |
| 11/8/2012 | 0.3 | 0.03 | 0.027 | 90% | 91% |
| 11/9/2012 | 0.3 | 0.03 | 0.027 | 90% | 91% |
| 11/10/2012 | 0.3 | 0.03 | 0.027 | 90% | 91% |
| 11/11/2012 | 0.3 | 0.03 | 0.025 | 90% | 92% |
| 11/12/2012 | 0.3 | 0.03 | 0.024 | 90% | 92% |
| 11/13/2012 | 0.4 | 0.03 | 0.025 | 93% | 94% |
| 11/14/2012 | 0.4 | 0.03 | 0.025 | 93% | 94% |
| 11/15/2012 | 0.3 | 0.03 | 0.023 | 90% | 92% |
| 11/16/2012 | 0.4 | 0.03 | 0.025 | 93% | 94% |
| 11/17/2012 | 0.3 | 0.03 | 0.026 | 90% | 91% |
| 11/18/2012 | 0.3 | 0.03 | 0.025 | 90% | 92% |
| 11/19/2012 | 0.3 | 0.03 | 0.025 | 90% | 92% |
| 11/20/2012 | 0.3 | 0.02 | 0.024 | 93% | 92% |
| 11/21/2012 | 0.3 | 0.03 | 0.024 | 90% | 92% |
| 11/22/2012 | 0.3 | 0.03 | 0.024 | 90% | 92% |
| 11/23/2012 | 0.3 | 0.03 | 0.023 | 90% | 92% |
| 11/24/2012 | 0.7 | 0.03 | 0.025 | 96% | 96% |
| 11/25/2012 | 0.5 | 0.03 | 0.025 | 94% | 95% |
| 11/26/2012 | 0.5 | 0.06 | 0.044 | 88% | 91% |
| 11/27/2012 | 3.8 | 0.03 | 0.027 | 99% | 99% |

| Date | Peak Daily Raw | Peak Daily Settled | Average Daily CFE | Removal thru Sed | Removal thru Filt |
|---|---|---|---|---|---|
| 11/28/2012 | | | | | |
| 11/29/2012 | | | | | |
| 11/30/2012 | | | | | |
| 12/1/2012 | | | | | |
| 12/2/2012 | | | | | |
| 12/3/2012 | | | | | |
| 12/4/2012 | | | | | |
| 12/5/2012 | 1 | 0.06 | 0.044 | 94% | 96% |
| 12/6/2012 | 0.9 | 0.03 | 0.025 | 97% | 97% |
| 12/7/2012 | | | | | |
| 12/8/2012 | 0.6 | 0.03 | 0.029 | 95% | 95% |
| 12/9/2012 | 0.7 | 0.03 | 0.023 | 96% | 97% |
| 12/10/2012 | 0.7 | 0.03 | 0.023 | 96% | 97% |
| 12/11/2012 | 0.7 | 0.03 | 0.024 | 96% | 97% |
| 12/12/2012 | 1.1 | 0.03 | 0.023 | 97% | 98% |
| 12/13/2012 | 0.9 | 0.05 | 0.037 | 94% | 96% |
| 12/14/2012 | 0.8 | 0.05 | 0.038 | 94% | 95% |
| 12/15/2012 | 3.8 | 0.04 | 0.032 | 99% | 99% |
| 12/16/2012 | 3.9 | 0.04 | 0.033 | 99% | 99% |
| 12/17/2012 | 2.3 | 0.06 | 0.035 | 97% | 98% |
| 12/18/2012 | 1.8 | 0.06 | 0.04 | 97% | 98% |
| 12/19/2012 | 2.6 | 0.04 | 0.03 | 98% | 99% |
| 12/20/2012 | 1.9 | 0.1 | 0.055 | 95% | 97% |
| 12/21/2012 | 1.3 | 0.1 | 0.067 | 92% | 95% |
| 12/22/2012 | 1 | 0.04 | 0.032 | 96% | 97% |
| 12/23/2012 | 0.9 | 0.03 | 0.026 | 97% | 97% |
| 12/24/2012 | 0.9 | 0.03 | 0.026 | 97% | 97% |
| 12/25/2012 | 0.6 | 0.03 | 0.027 | 95% | 96% |
| 12/26/2012 | 0.8 | 0.05 | 0.037 | 94% | 95% |
| 12/27/2012 | 0.7 | 0.05 | 0.031 | 93% | 96% |
| 12/28/2012 | 0.6 | 0.03 | 0.026 | 95% | 96% |
| 12/29/2012 | 0.6 | 0.03 | 0.025 | 95% | 96% |
| 12/30/2012 | 0.5 | 0.03 | 0.028 | 94% | 94% |
| 12/31/2012 | 0.6 | 0.03 | 0.025 | 95% | 96% |
| | | | | | |
| Min | 0.100 | 0.020 | 0.010 | 40.0% | 61.0% |
| Max | 6.600 | 0.140 | 0.103 | 99.2% | 99.3% |
| Average | 0.578 | 0.048 | 0.041 | 88.4% | 90.0% |
| Median | 0.400 | 0.040 | 0.039 | 90.0% | 90.5% |
| 95th Perc | 1.435 | 0.080 | 0.064 | 97.2% | 97.5% |
| | | | | 80.0% | 80.0% |
| | | | | 8th percentile | 4.7th percentile |

| Date | SCE Afterbay | Unit |
|---|---|---|
| 11/15/2011 | 0.35 | mg/L |
| 11/28/2011 | 0.45 | mg/L |
| 1/4/2012 | 0.31 | mg/L |
| 2/1/2012 | 0.36 | mg/L |
| 3/5/2012 | 0 | mg/L |
| 4/3/2012 | 0.51 | mg/L |
| 5/14/2012 | 0.63 | mg/L |
| 6/4/2012 | 0.44 | mg/L |
| 7/10/2012 | 0.63 | mg/L |
| 8/2/2012 | 0.50 | mg/L |
| 9/12/2012 | 0.32 | mg/L |
| 10/9/2012 | 0.63 | mg/L |
| 11/7/2012 | 0 | mg/L |
| 12/6/2012 | 0.31 | mg/L |

| | |
|---|---|
| min | 0.00 |
| max | 0.63 |
| average | 0.39 |
| median | 0.40 |
| 95th percentile | 0.63 |

| Date | CFE | Unit |
|---|---|---|
| 11/02/2011 15:10 | 0 | mg/L |
| 11/09/2011 09:02 | 0.61 | mg/L |
| 11/15/2011 11:10 | 0.38 | mg/L |
| 11/28/2011 14:40 | 0.32 | mg/L |
| 01/04/2012 10:49 | 0 | mg/L |
| 02/01/2012 13:50 | 0 | mg/L |
| 02/01/2012 14:11 | 0 | mg/L |
| 02/06/2012 12:50 | 0.50 | mg/L |
| 02/14/2012 11:05 | 0 | mg/L |
| 02/22/2012 09:40 | 0 | mg/L |
| 02/27/2012 11:00 | 0 | mg/L |
| 03/05/2012 13:40 | 0 | mg/L |
| 03/05/2012 13:48 | 0 | mg/L |
| 03/12/2012 15:06 | 0 | mg/L |
| 03/21/2012 14:01 | 0.67 | mg/L |
| 03/29/2012 15:00 | 0.47 | mg/L |
| 04/03/2012 07:10 | 0.37 | mg/L |
| 04/09/2012 11:00 | 0 | mg/L |
| 04/17/2012 13:55 | 0.38 | mg/L |
| 04/24/2012 12:15 | 0.59 | mg/L |
| 05/14/2012 10:20 | 0.43 | mg/L |
| 05/14/2012 10:30 | 0.60 | mg/L |
| 05/21/2012 13:42 | 0 | mg/L |
| 05/29/2012 15:30 | 0.39 | mg/L |
| 06/04/2012 14:35 | 0.30 | mg/L |
| 06/04/2012 14:45 | 0.38 | mg/L |
| 06/13/2012 12:00 | 0.52 | mg/L |
| 06/19/2012 15:00 | 0.73 | mg/L |
| 06/25/2012 10:55 | 0 | mg/L |
| 07/03/2012 14:10 | 0 | mg/L |
| 07/10/2012 09:35 | 0.66 | mg/L |
| 07/10/2012 09:39 | 0.65 | mg/L |
| 07/16/2012 11:05 | 0.81 | mg/L |
| 07/24/2012 15:28 | 0.94 | mg/L |
| 08/02/2012 16:20 | 1.1 | mg/L |
| 08/07/2012 11:22 | 0.89 | mg/L |
| 08/14/2012 10:56 | 1.1 | mg/L |
| 08/21/2012 14:10 | 0.87 | mg/L |
| 08/28/2012 09:00 | 0.67 | mg/L |
| 09/06/2012 14:30 | 0.66 | mg/L |
| 09/12/2012 11:40 | 1.0 | mg/L |
| 09/12/2012 11:50 | 0.94 | mg/L |
| 09/17/2012 14:18 | 0.91 | mg/L |
| 09/26/2012 11:10 | 0.97 | mg/L |
| 10/01/2012 13:00 | 0.91 | mg/L |
| 10/09/2012 13:40 | 0.87 | mg/L |

| Date | CFE | Unit |
|---|---|---|
| 10/09/2012 13:45 | 0.72 | mg/L |
| 10/16/2012 11:25 | 1.2 | mg/L |
| 10/23/2012 15:18 | 0.94 | mg/L |
| 10/31/2012 10:00 | 0.31 | mg/L |
| 11/07/2012 14:00 | 0 | mg/L |
| 11/07/2012 14:10 | 0 | mg/L |
| 11/13/2012 14:30 | 0 | mg/L |
| 11/20/2012 10:35 | 0 | mg/L |
| 11/26/2012 10:45 | 0 | mg/L |
| 12/06/2012 10:40 | 0.31 | mg/L |
| 12/06/2012 10:55 | 0.32 | mg/L |
| 12/11/2012 14:40 | 0 | mg/L |
| 12/17/2012 13:30 | 0.35 | mg/L |
| 12/26/2012 14:28 | 0.30 | mg/L |

| | |
|---|---|
| min | 0 |
| max | 1.20 |
| average | 0.434 |
| median | 0.38 |

| Date | GAC Influent | GAC Effluent |
|---|---|---|
| 02/11/2008 13:10 | 0.40 | 0.24 |
| 03/11/2008 14:00 | 0.41 | 0.32 |
| 03/17/2008 15:05 | 0.28 | 0.14 |
| 03/24/2008 15:10 | 0.27 | 0.16 |
| 04/01/2008 15:03 | 0.34 | 4.5 |
| 04/10/2008 14:30 | 0.45 | 0.28 |
| 04/14/2008 15:30 | 0.63 | 0.42 |
| 04/23/2008 11:20 | 0.68 | 0.16 |
| 05/01/2008 12:00 | 0.64 | 0.17 |
| 05/08/2008 10:30 | 0.77 | 0.23 |
| 05/13/2008 13:45 | 0.67 | 0.20 |
| 05/20/2008 14:55 | 2.6 | 0.23 |
| 05/28/2008 14:15 | 0.40 | 0.18 |
| 06/03/2008 14:30 | 0.35 | 0.17 |
| 06/10/2008 14:17 | 0.33 | 0.14 |
| 06/20/2008 10:32 | 0.38 | 0.41 |
| 06/25/2008 14:49 | 0.37 | 0.38 |
| 07/02/2008 09:41 | 0.39 | 0.35 |
| 07/08/2008 15:00 | 0.58 | 0.65 |
| 07/16/2008 09:20 | 0.38 | 0.32 |
| 07/23/2008 10:10 | 0.35 | 0.23 |
| 07/30/2008 14:04 | 0.65 | 0.40 |
| 08/07/2008 14:15 | 0.83 | 0.52 |
| 08/18/2008 15:12 | 0.38 | 0.34 |
| 08/25/2008 14:00 | 0.89 | 0.60 |
| 09/02/2008 10:30 | 0.79 | 0.33 |
| 09/10/2008 14:47 | 0.89 | 0.50 |
| 09/17/2008 13:20 | 1.0 | 0.71 |
| 09/24/2008 15:52 | 0.80 | 0.37 |
| 10/08/2008 15:45 | 0.62 | 0.31 |
| 10/14/2008 13:50 | 0.72 | 0.53 |
| 10/22/2008 14:02 | 0.58 | 0.44 |
| 10/28/2008 13:30 | 0.57 | 0.44 |
| 11/06/2008 12:50 | 0.62 | 0.33 |
| 11/10/2008 11:30 | 0.59 | 0.47 |
| 11/18/2008 15:29 | 0.53 | 0.43 |
| 11/24/2008 10:40 | 0.43 | 0.24 |
| 12/01/2008 14:05 | 0.25 | 0.18 |
| 12/08/2008 15:05 | 0.21 | 0.18 |
| 12/15/2008 13:30 | 0.37 | 0.28 |
| 12/22/2008 11:50 | 0.41 | 0.22 |
| 12/29/2008 15:07 | 0.46 | 0.23 |
| 03/30/2009 10:52 | 0.28 | 0.17 |
| 04/06/2009 13:14 | 0.25 | 0.16 |
| 04/14/2009 13:32 | 0.29 | 0.19 |
| 04/22/2009 15:36 | 0.33 | 0.20 |

| Date | GAC Influent | GAC Effluent |
|---|---|---|
| 04/28/2009 15:02 | 0.31 | 0.27 |
| 05/18/2009 15:17 | 0.33 | 0.32 |
| 05/26/2009 10:53 | 0.31 | 0.26 |
| 06/03/2009 15:14 | 0.31 | 0.28 |
| 06/22/2009 13:29 | 0.34 | 0.31 |
| 07/14/2009 14:47 | 0.42 | 0.42 |
| 08/11/2009 14:02 | 0.40 | 0.37 |
| 05/11/2010 09:55 | | 0.29 |
| 05/17/2010 11:30 | | 0.28 |
| 05/24/2010 13:45 | | 0.30 |
| 06/02/2010 15:10 | 0.30 | 0.29 |
| 06/07/2010 16:00 | | 0.38 |
| 06/14/2010 14:30 | 0.35 | 0.29 |
| 06/22/2010 15:47 | 0.28 | 0.23 |
| 06/29/2010 10:07 | 0.32 | 0.29 |
| 07/08/2010 10:40 | 0.33 | 0.28 |
| 07/14/2010 14:05 | 0.39 | 0.31 |
| 07/21/2010 15:02 | 0.35 | 0.37 |
| 04/12/2011 14:05 | 2.7 | 1.9 |
| 05/03/2011 09:13 | 3.0 | 2.4 |
| 05/10/2011 11:12 | 2.8 | 2.7 |
| 05/17/2011 15:30 | 35 | 2.4 |
| 05/24/2011 11:30 | 2.5 | 2.1 |
| 05/31/2011 09:51 | 3.1 | 2.6 |
| 06/07/2011 14:17 | 2.3 | 2.1 |
| 06/14/2011 09:58 | 2.8 | 2.1 |
| 06/20/2011 12:11 | 2.6 | 2.2 |
| 06/30/2011 09:20 | 2.3 | 2.4 |
| 07/07/2011 10:31 | 2.1 | 2.3 |
| 07/12/2011 12:15 | 2.8 | 1.6 |
| 07/19/2011 14:10 | 2.3 | 1.9 |
| 07/26/2011 14:40 | 2.6 | 1.9 |
| 08/04/2011 14:00 | 2.6 | 2.5 |
| 08/10/2011 14:21 | 3.9 | 4.2 |
| 08/18/2011 15:40 | 4.7 | 4.0 |
| 08/24/2011 14:10 | 3.4 | 3.1 |
| 08/31/2011 00:00 | 0.99 | 0.82 |
| 09/07/2011 12:30 | 0.80 | 0.70 |
| 09/12/2011 12:55 | 0.84 | 0.73 |
| 09/20/2011 08:30 | 0.84 | 0 |
| 09/20/2011 14:04 | 0.86 | 0.70 |
| 09/27/2011 09:00 | 0.79 | 0 |
| 09/27/2011 14:00 | 0.49 | 0.87 |
| 10/05/2011 10:30 | 0.91 | 0.76 |
| 10/06/2011 09:00 | 0.95 | 0 |
| 10/12/2011 13:55 | 0.58 | 0.54 |

| Date | GAC Influent | GAC Effluent | |
|---|---|---|---|
| 10/19/2011 09:30 | 0.68 | 0 | |
| 10/19/2011 15:05 | 0.58 | 0 | |
| 10/26/2011 09:30 | 0.59 | 0 | |
| 10/26/2011 14:40 | 0.55 | 0.30 | |
| 11/02/2011 14:58 | 0.55 | 0.52 | |
| 11/03/2011 10:30 | 0.32 | 0 | |
| 11/08/2011 10:00 | 0.64 | 0 | |
| 11/09/2011 09:22 | 0.69 | 0.36 | |
| 11/15/2011 11:11 | 0.38 | 0 | |
| 11/16/2011 08:45 | 0 | 0 | |
| 11/23/2011 07:30 | 0 | 0 | |
| 11/28/2011 14:36 | 0 | 0 | |
| 12/21/2011 16:02 | 0.50 | 0.45 | |
| 12/29/2011 10:25 | 0.30 | 0 | |
| 01/04/2012 10:42 | 0 | 0 | |
| 01/06/2012 09:15 | 0.42 | 0.30 | |
| 01/10/2012 14:23 | 0.41 | 0 | |
| 01/19/2012 10:08 | 0 | 0 | |
| 01/23/2012 14:32 | 0.32 | 0 | |
| 01/24/2012 09:30 | 0.37 | 0 | |
| 02/02/2012 13:40 | 0 | 0 | |
| 03/07/2012 15:00 | 0 | 0 | |
| 04/03/2012 07:45 | 0 | 0 | |
| 05/14/2012 14:20 | 0 | 0 | |
| 06/05/2012 11:10 | 0.53 | 0 | |
| 07/10/2012 09:30 | 0.97 | 0 | |
| 08/02/2012 16:00 | 1.0 | 0.48 | |
| 09/12/2012 10:30 | 0.99 | 0 | |
| 10/09/2012 14:20 | 0.89 | 0 | |
| | | | |
| min | 0.00 | 0.00 | 0.00 |
| max | 35.00 | 4.50 | 0.52 |
| average | 1.14 | 0.63 | 0.08 |
| median | 0.53 | 0.30 | 0.00 |

| Date | Fecal Coliform | Mo. Median | *E. Coli* | Mo. Median |
|---|---|---|---|---|
| 02/11/2008 14:27 | 0 | | 0 | |
| 02/28/2008 10:33 | 2.0 | | 2 | |
| 03/05/2008 15:45 | 0 | | 0 | |
| 03/11/2008 14:30 | 2.0 | 1.0 | 2 | 1.0 |
| 03/24/2008 15:20 | 8.0 | 2.0 | 8 | 2.0 |
| 04/01/2008 15:05 | 4.0 | 3.0 | 4 | 3.0 |
| 04/10/2008 15:45 | 0 | 3.0 | 0 | 3.0 |
| 04/14/2008 15:30 | 2.0 | 3.0 | 2 | 3.0 |
| 04/23/2008 11:45 | 17 | 3.0 | 17 | 3.0 |
| 05/01/2008 15:10 | 2.0 | 2.0 | 2 | 2.0 |
| 05/08/2008 11:15 | 2.0 | 2.0 | 2 | 2.0 |
| 05/13/2008 14:30 | 22 | 9.5 | 9 | 5.5 |
| 05/20/2008 14:30 | 4.0 | 3.0 | 4 | 3.0 |
| 06/03/2008 15:00 | 0 | 3.0 | 0 | 3.0 |
| 06/10/2008 14:30 | 8.0 | 6.0 | 4 | 4.0 |
| 06/20/2008 08:47 | 27 | 6.0 | 27 | 4.0 |
| 07/02/2008 09:37 | 80 | 17.5 | 12 | 8.0 |
| 07/08/2008 15:30 | 11 | 19.0 | 11 | 11.5 |
| 07/16/2008 09:30 | 30 | 28.5 | 23 | 17.5 |
| 07/23/2008 10:10 | 23 | 26.5 | 13 | 12.5 |
| 07/30/2008 14:30 | 27 | 25.0 | 27 | 18.0 |
| 08/11/2008 10:47 | 80 | 28.5 | 30 | 25.0 |
| 08/25/2008 14:45 | 14 | 25.0 | 9 | 20.0 |
| 09/02/2008 10:45 | 13 | 20.5 | 13 | 20.0 |
| 09/10/2008 15:45 | 23 | 18.5 | 23 | 18.0 |
| 09/17/2008 15:45 | 23 | 18.5 | 23 | 18.0 |
| 09/24/2008 14:35 | 17 | 20.0 | 17 | 20.0 |
| 10/01/2008 14:27 | 50 | 23.0 | 30 | 23.0 |
| 10/08/2008 14:37 | 17 | 20.0 | 17 | 20.0 |
| 10/14/2008 14:20 | 22 | 19.5 | 22 | 19.5 |
| 10/22/2008 14:25 | 30 | 26.0 | 30 | 26.0 |
| 10/28/2008 14:40 | 8.0 | 19.5 | 4 | 19.5 |
| 11/06/2008 13:25 | 7.0 | 15.0 | 4 | 13.0 |
| 11/10/2008 14:00 | 17 | 12.5 | 11 | 7.5 |
| 11/18/2008 15:45 | 13 | 10.5 | 13 | 7.5 |
| 12/01/2008 15:17 | 0 | 10.0 | 0 | 7.5 |
| 12/08/2008 14:30 | 2.0 | 7.5 | 2 | 6.5 |
| 12/15/2008 13:32 | 13 | 7.5 | 13 | 7.5 |
| 12/22/2008 11:30 | 4.0 | 3.0 | 4 | 3.0 |
| 12/29/2008 15:20 | 0 | 3.0 | 0 | 3.0 |
| 03/20/2009 14:40 | 4.0 | 4.0 | 4 | 4.0 |
| 03/25/2009 10:32 | 0 | 2.0 | 0 | 2.0 |
| 03/30/2009 10:47 | 0 | 0.0 | 0 | 0.0 |
| 04/06/2009 13:28 | 0 | 0.0 | 0 | 0.0 |
| 04/22/2009 15:47 | 0 | 0.0 | 0 | 0.0 |
| 05/06/2009 12:07 | 7.0 | 0.0 | 7 | 0.0 |
| 05/26/2009 10:47 | 8.0 | 3.5 | 4 | 2.0 |
| 06/09/2009 15:17 | 7.0 | 7.0 | 7 | 5.5 |
| 06/15/2009 15:47 | 4.0 | 7.0 | 4 | 5.5 |
| 06/22/2009 14:27 | 2.0 | 5.5 | 0 | 4.0 |
| 06/29/2009 16:00 | 4.0 | 4.0 | 4 | 4.0 |
| 07/07/2009 15:00 | 4.0 | 4.0 | 4 | 4.0 |
| 07/20/2009 10:30 | 170 | 4.0 | 170 | 4.0 |
| 08/05/2009 15:02 | 17 | 10.5 | 4 | 4.0 |
| 08/11/2009 14:00 | 8.0 | 12.5 | 8 | 6.0 |
| 09/01/2009 14:37 | 23 | 20.0 | 23 | 15.5 |

| Date | Fecal Coliform | Mo. Median | *E. Coli* | Mo. Median |
|---|---|---|---|---|
| 09/22/2009 11:00 | 23 | 20.0 | 23 | 15.5 |
| 09/29/2009 15:15 | 30 | 23.0 | 30 | 23.0 |
| 10/08/2009 10:45 | 4.0 | 23.0 | 4 | 23.0 |
| 10/21/2009 13:45 | 13 | 18.0 | 13 | 18.0 |
| 10/27/2009 10:05 | 14 | 13.5 | 14 | 13.5 |
| 11/03/2009 14:15 | 4.0 | 8.5 | 2 | 8.5 |
| 11/17/2009 15:30 | 0 | 8.5 | 0 | 7.5 |
| 11/24/2009 09:10 | 23 | 9.0 | | |
| 12/02/2009 08:55 | 11 | 7.5 | | |
| 12/07/2009 12:48 | 7.0 | 9.0 | | |
| 12/15/2009 10:40 | 0 | 9.0 | | |
| 12/21/2009 14:46 | 4.0 | 5.5 | | |
| 01/04/2010 13:50 | 4.0 | 4.0 | | |
| 01/12/2010 11:30 | 7.0 | 4.0 | | |
| 01/18/2010 11:00 | 4.0 | 4.0 | | |
| 02/03/2010 15:20 | 2.0 | 4.0 | | |
| 02/09/2010 12:10 | 2.0 | 3.0 | | |
| 02/20/2010 08:30 | 4.0 | 3.0 | | |
| 02/22/2010 11:30 | 2.0 | 2.0 | | |
| 03/03/2010 14:40 | 2.0 | 2.0 | | |
| 03/09/2010 11:20 | 11 | 3.0 | | |
| 03/16/2010 13:45 | 4.0 | 3.0 | | |
| 03/23/2010 10:40 | 4.0 | 4.0 | | |
| 03/30/2010 14:00 | 0 | 4.0 | | |
| 04/08/2010 11:16 | 0 | 2.0 | | |
| 04/14/2010 14:40 | 0 | 0.0 | | |
| 04/19/2010 14:00 | 0 | 0.0 | | |
| 04/27/2010 09:00 | 8 | 0.0 | | |
| 05/03/2010 13:45 | 4 | 2.0 | | |
| 05/11/2010 09:45 | 0 | 2.0 | | |
| 05/17/2010 11:35 | 17 | 6.0 | | |
| 05/24/2010 14:10 | 4 | 4.0 | | |
| 06/02/2010 15:00 | 14 | 9.0 | | |
| 06/07/2010 13:30 | 8 | 11.0 | | |
| 06/14/2010 11:45 | 11 | 9.5 | | |
| 06/22/2010 12:45 | 7 | 9.5 | | |
| 06/29/2010 10:06 | 17 | 9.5 | | |
| 07/08/2010 10:45 | 2 | 9.0 | | |
| 07/14/2010 14:40 | 11 | 9.0 | | |
| 07/21/2010 14:45 | 17 | 14.0 | | |
| 08/03/2010 10:40 | 13 | 12.0 | | |
| 08/10/2010 08:20 | 8 | 12.0 | | |
| 08/16/2010 10:03 | 80 | 15.0 | | |
| 08/24/2010 07:30 | 12 | 12.5 | | |
| 08/30/2010 12:05 | 22 | 17.0 | | |
| 09/07/2010 14:15 | 23 | 22.5 | | |
| 09/13/2010 15:06 | 17 | 19.5 | | |
| 09/20/2010 09:14 | 170 | 22.5 | | |
| 09/28/2010 14:00 | 17 | 20.0 | | |
| 10/05/2010 09:16 | 50 | 33.5 | | |
| 10/11/2010 09:40 | 23 | 36.5 | | |
| 10/19/2010 12:00 | 30 | 26.5 | | |
| 10/25/2010 14:00 | 30 | 30.0 | | |
| 11/02/2010 14:55 | 8 | 26.5 | | |
| 11/08/2010 14:40 | 23 | 26.5 | | |

| Date | Fecal Coliform | Mo. Median | *E. Coli* | Mo. Median |
|---|---|---|---|---|
| 11/15/2010 11:00 | 11 | 17.0 | | |
| 11/29/2010 14:40 | 4 | 9.5 | | |
| 12/07/2010 11:30 | 2 | 7.5 | | |
| 02/03/2011 14:11 | 0 | 3.0 | | |
| 02/07/2011 14:30 | 2 | 2.0 | | |
| 02/16/2011 07:45 | 8 | 2.0 | | |
| 02/23/2011 13:20 | 0 | 1.0 | | |
| 03/01/2011 11:15 | 4 | 3.0 | | |
| 03/08/2011 11:30 | 4 | 4.0 | | |
| 03/14/2011 13:30 | 2 | 3.0 | | |
| 04/12/2011 14:30 | 4 | 4.0 | | |
| 04/19/2011 11:00 | 4 | 4.0 | | |
| 04/25/2011 11:35 | 13 | 4.0 | | |
| 05/03/2011 09:10 | 7 | 5.5 | | |
| 05/10/2011 11:00 | 17 | 10.0 | | |
| 05/17/2011 15:40 | 23 | 15.0 | | |
| 05/24/2011 11:45 | 13 | 15.0 | | |
| 05/31/2011 11:10 | 21 | 19.0 | | |
| 06/07/2011 14:10 | 8 | 17.0 | | |
| 06/14/2011 10:10 | 30 | 17.0 | | |
| 06/20/2011 12:10 | 8 | 14.5 | | |
| 06/30/2011 09:45 | 80 | 19.0 | | |
| 07/07/2011 10:36 | 50 | 40.0 | | |
| 07/12/2011 12:10 | 23 | 36.5 | | |
| 07/19/2011 14:00 | 8 | 36.5 | | |
| 07/26/2011 14:30 | 2 | 15.5 | | |
| 08/04/2011 14:05 | 11 | 9.5 | | |
| 08/10/2011 14:55 | 4 | 6.0 | | |
| 08/18/2011 15:30 | 13 | 7.5 | | |
| 08/24/2011 14:10 | 7 | 9.0 | | |
| 08/31/2011 10:00 | 21 | 10.0 | | |
| 09/07/2011 12:41 | 26 | 17.0 | | |
| 09/12/2011 12:45 | 50 | 23.5 | | |
| 09/20/2011 09:35 | 30 | 28.0 | | |
| 09/27/2011 14:00 | 4 | 28.0 | | |
| 10/05/2011 10:30 | 22 | 26.0 | | |
| 10/12/2011 14:20 | 11 | 16.5 | | |
| 10/19/2011 14:50 | 17 | 14.0 | | |
| 10/26/2011 14:40 | 11 | 14.0 | | |
| 11/02/2011 15:15 | 17 | 14.0 | | |
| 11/09/2011 09:10 | 13 | 15.0 | | |
| 11/15/2011 11:10 | 0 | 12.0 | | |
| 11/28/2011 14:10 | 0 | 6.5 | | |
| 12/21/2011 16:05 | 0 | 0.0 | | |
| 12/29/2011 10:25 | 4 | 0.0 | | |
| 01/04/2012 11:05 | 2 | 1.0 | | |
| 01/10/2012 14:45 | 2 | 2.0 | | |
| 01/19/2012 10:12 | 4 | 3.0 | | |
| 01/23/2012 14:20 | 8 | 3.0 | | |
| 02/01/2012 14:40 | 4 | 4.0 | | |
| 02/06/2012 12:45 | 4 | 4.0 | | |
| 02/14/2012 11:10 | 2 | 4.0 | | |
| 02/22/2012 09:45 | 6 | 4.0 | | |
| 02/27/2012 11:00 | 8 | 5.0 | | |
| 03/05/2012 14:10 | 0 | 4.0 | | |

| Date | Fecal Coliform | Mo. Median | *E. Coli* | Mo. Median |
|---|---|---|---|---|
| 03/12/2012 14:50 | 0 | 3.0 | | |
| 03/21/2012 14:05 | 0 | 0.0 | | |
| 03/29/2012 15:10 | 2 | 0.0 | | |
| 04/03/2012 07:30 | 23 | 1.0 | | |
| 04/09/2012 11:00 | 2 | 2.0 | | |
| 04/17/2012 14:05 | 2 | 2.0 | | |
| 05/14/2012 09:35 | 23 | 12.5 | | |
| 05/21/2012 13:35 | 8 | 5.0 | | |
| 05/29/2012 15:40 | 13 | 10.5 | | |
| 06/04/2012 15:10 | 4 | 10.5 | | |
| 06/13/2012 12:30 | 23 | 10.5 | | |
| 06/19/2012 15:15 | 2 | 8.5 | | |
| 06/25/2012 11:00 | 26 | 13.5 | | |
| 07/03/2012 14:20 | 23 | 23.0 | | |
| 07/10/2012 09:40 | 8 | 15.5 | | |
| 07/16/2012 11:30 | 17 | 20.0 | | |
| 07/24/2012 15:20 | 50 | 20.0 | | |
| 08/02/2012 16:15 | 11 | 14.0 | | |
| 08/07/2012 11:05 | 30 | 23.5 | | |
| 08/14/2012 10:55 | 50 | 40.0 | | |
| 08/21/2012 14:18 | 170 | 40.0 | | |
| 08/28/2012 09:10 | 50 | 50.0 | | |
| 09/06/2012 14:45 | 23 | 50.0 | | |
| 09/12/2012 11:50 | 8 | 36.5 | | |
| 09/17/2012 14:00 | 4 | 15.5 | | |
| 09/26/2012 09:58 | 8 | 8.0 | | |
| 10/01/2012 14:50 | 50 | 8.0 | | |
| 10/09/2012 14:00 | 30 | 19.0 | | |
| 10/16/2012 12:50 | 4 | 19.0 | | |
| 10/23/2012 15:20 | 17 | 23.5 | | |
| 10/31/2012 09:40 | 13 | 15.0 | | |
| 11/07/2012 14:00 | 2 | 8.5 | | |
| 11/13/2012 14:30 | 2 | 7.5 | | |
| 11/20/2012 10:42 | 0 | 2.0 | | |
| 11/26/2012 10:46 | 50 | 2.0 | | |
| 12/06/2012 10:50 | 50 | 26.0 | | |
| 12/11/2012 14:35 | 13 | 31.5 | | |
| 12/17/2012 13:22 | 30 | 40.0 | | |
| 12/26/2012 14:38 | 30 | 30.0 | | |
| | | | | |
| Min | 0 | 0 | 0 | 0 |
| Max | 170 | 50 | 170 | 26 |
| Average | 16 | 12 | 12 | 9 |
| Median | 8 | 9 | 4 | 6 |
| 95th Percentile | 50 | 33.4 | 30 | 23 |

| Date | Total Coliform | Fecal Coliform | *E. coli* |
|---|---|---|---|
| 02/11/08 | 500 | 0 | 0 |
| 02/28/08 | 240 | 2.0 | 2 |
| 03/05/08 | 26 | 0 | 0 |
| 03/11/08 | 8.0 | 2.0 | 2 |
| 03/17/08 | 23.0 | | |
| 03/24/08 | 13 | 8.0 | 8 |
| 04/01/08 | 4.0 | 4.0 | 4 |
| 04/10/08 | 0 | 0 | 0 |
| 04/14/08 | 70 | 2.0 | 2 |
| 04/23/08 | 30 | 17 | 17 |
| 05/01/08 | 50 | 2.0 | 2 |
| 05/08/08 | 17 | 2.0 | 2 |
| 05/13/08 | 50 | 22 | 9 |
| 05/20/08 | 70 | 4.0 | 4 |
| 06/03/08 | 0 | 0 | 0 |
| 06/10/08 | 80 | 8.0 | 4 |
| 06/20/08 | 300 | 27 | 27 |
| 06/25/08 | 300 | | |
| 07/02/08 | 300 | 80 | 12 |
| 07/08/08 | 140 | 11 | 11 |
| 07/16/08 | 80 | 30 | 23 |
| 07/23/08 | 80 | 23 | 13 |
| 07/30/08 | 220 | 27 | 27 |
| 08/07/08 | 230 | | |
| 08/11/08 | 240 | 80 | 30 |
| 08/18/08 | 3000 | | |
| 08/25/08 | 130 | 14 | 9 |
| 09/02/08 | 23 | 13 | 13 |
| 09/10/08 | 240 | 23 | 23 |
| 09/17/08 | 300 | 23 | 23 |
| 09/24/08 | 80 | 17 | 17 |
| 10/01/08 | 80 | 50 | 30 |
| 10/08/08 | 50 | 17 | 17 |
| 10/14/08 | 27 | 22 | 22 |
| 10/22/08 | 30 | 30 | 30 |
| 10/28/08 | 23 | 8.0 | 4 |
| 11/06/08 | 80 | 7.0 | 4 |
| 11/10/08 | 80 | 17 | 11 |
| 11/18/08 | 220 | 13 | 13 |
| 11/24/08 | 030 | | |
| 12/01/08 | 2.0 | 0 | 0 |
| 12/08/08 | 14 | 2.0 | 2 |
| 12/15/08 | 13 | 13 | 13 |
| 12/22/08 | 13 | 4.0 | 4 |
| 12/29/08 | 12 | 0 | 0 |
| 03/20/09 | 12 | 4.0 | 4 |
| 03/25/09 | 0 | 0 | 0 |
| 03/30/09 | 9.0 | 0 | 0 |
| 04/06/09 | 8.0 | 0 | 0 |
| 04/14/09 | 23.0 | | |
| 04/22/09 | 2.0 | 0 | 0 |
| 04/28/09 | 4.0 | | |
| 05/06/09 | 11 | 7.0 | 7 |

| Date | Total Coliform | Fecal Coliform | *E. coli* |
|---|---|---|---|
| 05/11/09 | 13 | | |
| 05/18/09 | 30 | | |
| 05/26/09 | 23 | 8.0 | 4 |
| 06/09/09 | 30 | 7.0 | 7 |
| 06/15/09 | 17 | 4.0 | 4 |
| 06/22/09 | 8.0 | 2.0 | 0 |
| 06/29/09 | 23 | 4.0 | 4 |
| 07/07/09 | 13 | 4.0 | 4 |
| 07/14/09 | 50 | | |
| 07/20/09 | 170 | 170 | 170 |
| 07/27/09 | 030 | | |
| 08/05/09 | 240 | 17 | 4 |
| 08/11/09 | 13 | 8.0 | 8 |
| 08/17/09 | 50 | | |
| 08/24/09 | 50 | | |
| 09/01/09 | 70 | 23 | 23 |
| 09/09/09 | 80 | | |
| 09/14/09 | 70 | | |
| 09/22/09 | 30 | 23 | 23 |
| 09/29/09 | 70 | 30 | 30 |
| 10/08/09 | 11 | 4.0 | 4 |
| 10/12/09 | 13 | | |
| 10/21/09 | 23 | 13 | 13 |
| 10/27/09 | 14 | 14 | 14 |
| 11/03/09 | 23 | 4.0 | 2 |
| 11/10/09 | 11 | | |
| 11/17/09 | 4.0 | 0 | 0 |
| 11/24/09 | 30 | 23 | |
| 12/02/09 | 170 | 11 | |
| 12/07/09 | 170 | 7.0 | |
| 12/15/09 | 0 | 0 | |
| 12/21/09 | 170 | 4.0 | |
| 12/28/09 | 170 | | |
| 01/04/10 | 17 | 4.0 | |
| 01/12/10 | 130 | 7.0 | |
| 01/18/10 | 220 | 4.0 | |
| 02/03/10 | 50 | 2.0 | |
| 02/09/10 | 22 | 2.0 | |
| 02/20/10 | 240 | 4.0 | |
| 02/22/10 | 130 | 2.0 | |
| 03/03/10 | 170 | 2.0 | |
| 03/09/10 | 240 | 11 | |
| 03/16/10 | 50 | 4.0 | |
| 03/23/10 | 240 | 4.0 | |
| 03/30/10 | 30 | 0 | |
| 04/08/10 | 300 | 0 | |
| 04/14/10 | 50 | 0 | |
| 04/19/10 | 240 | 0 | |
| 04/27/10 | 110 | 8 | |
| 05/03/10 | 80 | 4 | |
| 05/11/10 | 30 | 0 | |
| 05/17/10 | 240 | 17 | |

| Date | Total Coliform | Fecal Coliform | *E. coli* |
|---|---|---|---|
| 05/24/10 | 30 | 4 | |
| 06/02/10 | 110 | 14 | |
| 06/07/10 | 130 | 8 | |
| 06/14/10 | 500 | 11 | |
| 06/22/10 | 240 | 7 | |
| 06/29/10 | 70 | 17 | |
| 07/08/10 | 130 | 2 | |
| 07/14/10 | 30 | 11 | |
| 07/21/10 | 300 | 17 | |
| 07/26/10 | 900 | | |
| 08/03/10 | 80 | 13 | |
| 08/10/10 | 130 | 8 | |
| 08/16/10 | 240 | 80 | |
| 08/24/10 | 500 | 12 | |
| 08/30/10 | 130 | 22 | |
| 09/07/10 | 300 | 23 | |
| 09/13/10 | 80 | 17 | |
| 09/20/10 | 300 | 170 | |
| 09/28/10 | 170 | 17 | |
| 10/05/10 | 300 | 50 | |
| 10/11/10 | 240 | 23 | |
| 10/19/10 | 130 | 30 | |
| 10/25/10 | 80 | 30 | |
| 11/02/10 | 240 | 8 | |
| 11/08/10 | 80 | 23 | |
| 11/15/10 | 110 | 11 | |
| 11/29/10 | 80 | 4 | |
| 12/07/10 | 56 | 2 | |
| 02/03/11 | 300 | 0 | |
| 02/07/11 | 48 | 2 | |
| 02/16/11 | 500 | 8 | |
| 02/23/11 | 280 | 0 | |
| 03/01/11 | 500 | 4 | |
| 03/08/11 | 500 | 4 | |
| 03/14/11 | 300 | 2 | |
| 04/01/11 | 300 | | |
| 04/12/11 | 500 | 4 | |
| 04/19/11 | **1,600** | 4 | |
| 04/25/11 | 500 | 13 | |
| 05/03/11 | 280 | 7 | |
| 05/10/11 | **1,600** | 17 | |
| 05/17/11 | **1,600** | 23 | |
| 05/24/11 | 300 | 13 | |
| 05/31/11 | 440 | 21 | |
| 06/07/11 | 240 | 8 | |
| 06/14/11 | 900 | 30 | |
| 06/20/11 | 900 | 8 | |
| 06/30/11 | 240 | 80 | |
| 07/07/11 | **1,600** | 50 | |
| 07/12/11 | 110 | 23 | |
| 07/19/11 | 80 | 8 | |
| 07/26/11 | 50 | 2 | |

| Date | Total Coliform | Fecal Coliform | *E. coli* |
|---|---|---|---|
| 08/04/11 | 220 | 11 | |
| 08/10/11 | 130 | 4 | |
| 08/18/11 | 110 | 13 | |
| 08/24/11 | 50 | 7 | |
| 08/31/11 | 220 | 21 | |
| 09/07/11 | 500 | 26 | |
| 09/12/11 | 110 | 50 | |
| 09/20/11 | 240 | 30 | |
| 09/27/11 | 48 | 4 | |
| 10/05/11 | 900 | 22 | |
| 10/12/11 | 240 | 11 | |
| 10/19/11 | 900 | 17 | |
| 10/26/11 | 300 | 11 | |
| 11/02/11 | 240 | 17 | |
| 11/09/11 | 70 | 13 | |
| 11/15/11 | 130 | 0 | |
| 11/28/11 | 13 | 0 | |
| 12/21/11 | 13 | 0 | |
| 12/29/11 | 17 | 4 | |
| 01/04/12 | 22 | 2 | |
| 01/10/12 | 17 | 2 | |
| 01/19/12 | 21 | 4 | |
| 01/23/12 | 17 | 8 | |
| 02/01/12 | 4 | 4 | |
| 02/06/12 | 50 | 4 | |
| 02/14/12 | 17 | 2 | |
| 02/22/12 | 25 | 6 | |
| 02/27/12 | 72 | 8 | |
| 03/05/12 | 48 | 0 | |
| 03/12/12 | 440 | 0 | |
| 03/21/12 | 300 | 0 | |
| 03/29/12 | 13 | 2 | |
| 04/03/12 | 50 | 23 | |
| 04/09/12 | 47 | 2 | |
| 04/17/12 | 300 | 2 | |
| 04/24/12 | 280 | | |
| 05/14/12 | 50 | 23 | |
| 05/21/12 | 23 | 8 | |
| 05/29/12 | 30 | 13 | |
| 06/04/12 | 110 | 4 | |
| 06/13/12 | 900 | 23 | |
| 06/19/12 | 300 | 2 | |
| 06/25/12 | 210 | 26 | |
| 07/03/12 | 170 | 23 | |
| 07/10/12 | 130 | 8 | |
| 07/16/12 | 280 | 17 | |
| 07/24/12 | 110 | 50 | |
| 08/02/12 | 50 | 11 | |
| 08/07/12 | 500 | 30 | |
| 08/14/12 | 220 | 50 | |
| 08/21/12 | 900 | 170 | |
| 08/28/12 | 500 | 50 | |

| Date | Total Coliform | Fecal Coliform | *E. coli* |
|---|---|---|---|
| 09/06/12 | 500 | 23 | |
| 09/12/12 | 30 | 8 | |
| 09/17/12 | 70 | 4 | |
| 09/26/12 | 22 | 8 | |
| 10/01/12 | 140 | 50 | |
| 10/09/12 | 240 | 30 | |
| 10/16/12 | 8 | 4 | |
| 10/23/12 | 50 | 17 | |
| 10/31/12 | 80 | 13 | |
| 11/07/12 | 13 | 2 | |
| 11/13/12 | 21 | 2 | |
| 11/20/12 | 22 | 0 | |
| 11/26/12 | 130 | 50 | |
| 12/06/12 | 170 | 50 | |
| 12/11/12 | 50 | 13 | |
| 12/17/12 | 300 | 30 | |
| 12/26/12 | 500 | 30 | |
| | | | |
| Min | 0 | 0 | 0 |
| Max | **3000** | 170 | 170 |
| Average | 196.6 | 16 | 12 |
| Median | 80 | 8 | 4 |
| 95th Percentile | 800 | 50 | 30 |
| | 998 | 80 | |

| Date | Total Colifiorm | Monthly Median |
|---|---|---|
| 02/11/2008 14:27 | 500 | |
| 02/28/2008 10:33 | 240 | |
| 03/05/2008 15:45 | 26 | |
| 03/11/2008 14:30 | 8 | 133 |
| 03/17/08 | 23 | 25 |
| 03/24/2008 15:20 | 13 | 18 |
| 04/01/2008 15:05 | 4 | 11 |
| 04/10/2008 15:45 | 0 | 9 |
| 04/14/2008 15:30 | 70 | 9 |
| 04/23/2008 11:45 | 30 | 17 |
| 05/01/2008 15:10 | 50 | 40 |
| 05/08/2008 11:15 | 17 | 40 |
| 05/13/2008 14:30 | 50 | 40 |
| 05/20/2008 14:30 | 70 | 50 |
| 06/03/2008 15:00 | 0 | 34 |
| 06/10/2008 14:30 | 80 | 60 |
| 06/20/2008 08:47 | 300 | 75 |
| 06/25/08 | 300 | 190 |
| 07/02/2008 09:37 | 300 | 300 |
| 07/08/2008 15:30 | 140 | 300 |
| 07/16/2008 09:30 | 80 | 220 |
| 07/23/2008 10:10 | 80 | 110 |
| 07/30/2008 14:30 | 220 | 110 |
| 08/07/08 | 230 | 150 |
| 08/11/2008 10:47 | 240 | 225 |
| 08/18/08 | 3000 | 235 |
| 08/25/2008 14:45 | 130 | 235 |
| 09/02/2008 10:45 | 23 | 185 |
| 09/10/2008 15:45 | 240 | 185 |
| 09/17/2008 15:45 | 300 | 185 |
| 09/24/2008 14:35 | 80 | 160 |
| 10/01/2008 14:27 | 80 | 160 |
| 10/08/2008 14:37 | 50 | 80 |
| 10/14/2008 14:20 | 27 | 65 |
| 10/22/2008 14:25 | 30 | 40 |
| 10/28/2008 14:40 | 23 | 29 |
| 11/06/2008 13:25 | 80 | 29 |
| 11/10/2008 14:00 | 80 | 55 |
| 11/18/2008 15:45 | 220 | 80 |
| 11/24/08 | 30 | 80 |
| 12/01/2008 15:17 | 2 | 55 |
| 12/08/2008 14:30 | 14 | 22 |
| 12/15/2008 13:32 | 13 | 14 |
| 12/22/2008 11:30 | 13 | 13 |
| 12/29/2008 15:20 | 12 | 13 |
| 03/20/2009 14:40 | 12 | 13 |
| 03/25/2009 10:32 | 0 | 12 |
| 03/30/2009 10:47 | 9 | 11 |
| 04/06/2009 13:28 | 8 | 9 |
| 04/14/09 | 23 | 9 |
| 04/22/2009 15:47 | 2 | 9 |
| 04/28/09 | 4 | 6 |
| 05/06/2009 12:07 | 11 | 8 |

| Date | Total Colifiorm | Monthly Median |
|---|---|---|
| 05/11/09 | 13 | 8 |
| 05/18/09 | 30 | 12 |
| 05/26/2009 10:47 | 23 | 18 |
| 06/09/2009 15:17 | 30 | 27 |
| 06/15/2009 15:47 | 17 | 27 |
| 06/22/2009 14:27 | 8 | 20 |
| 06/29/2009 16:00 | 23 | 20 |
| 07/07/2009 15:00 | 13 | 15 |
| 07/14/09 | 50 | 18 |
| 07/20/2009 10:30 | 170 | 37 |
| 07/27/09 | 30 | 40 |
| 08/05/2009 15:02 | 240 | 110 |
| 08/11/2009 14:00 | 13 | 100 |
| 08/17/09 | 50 | 40 |
| 08/24/09 | 50 | 50 |
| 09/01/2009 14:37 | 23 | 37 |
| 09/09/09 | 80 | 50 |
| 09/14/09 | 70 | 60 |
| 09/22/2009 11:00 | 30 | 50 |
| 09/29/2009 15:15 | 70 | 70 |
| 10/08/2009 10:45 | 11 | 50 |
| 10/12/09 | 13 | 22 |
| 10/21/2009 13:45 | 23 | 18 |
| 10/27/2009 10:05 | 14 | 14 |
| 11/03/2009 14:15 | 23 | 19 |
| 11/10/09 | 11 | 19 |
| 11/17/2009 15:30 | 4 | 13 |
| 11/24/2009 09:10 | 30 | 17 |
| 12/02/2009 08:55 | 170 | 21 |
| 12/07/2009 12:48 | 170 | 100 |
| 12/15/2009 10:40 | 0 | 100 |
| 12/21/2009 14:46 | 170 | 170 |
| 12/28/09 | 170 | 170 |
| 01/04/2010 13:50 | 17 | 94 |
| 01/12/2010 11:30 | 130 | 150 |
| 01/18/2010 11:00 | 220 | 150 |
| 02/03/2010 15:20 | 50 | 90 |
| 02/09/2010 12:10 | 22 | 90 |
| 02/20/2010 08:30 | 240 | 135 |
| 02/22/2010 11:30 | 130 | 90 |
| 03/03/2010 14:40 | 170 | 150 |
| 03/09/2010 11:20 | 240 | 205 |
| 03/16/2010 13:45 | 30 | 150 |
| 03/23/2010 10:40 | 240 | 205 |
| 03/30/2010 14:00 | 30 | 135 |
| 04/08/2010 11:16 | 300 | 135 |
| 04/14/2010 14:40 | 50 | 145 |
| 04/19/2010 14:00 | 240 | 145 |
| 04/27/2010 09:00 | 110 | 175 |
| 05/03/2010 13:45 | 80 | 95 |
| 05/11/2010 09:45 | 30 | 95 |
| 05/17/2010 11:35 | 240 | 95 |

| Date | Total Colifiorm | Monthly Median |
|---|---|---|
| 05/24/2010 14:10 | 30 | 55 |
| 06/02/2010 15:00 | 110 | 70 |
| 06/07/2010 13:30 | 130 | 120 |
| 06/14/2010 11:45 | 500 | 120 |
| 06/22/2010 12:45 | 240 | 185 |
| 06/29/2010 10:06 | 70 | 185 |
| 07/08/2010 10:45 | 130 | 185 |
| 07/14/2010 14:40 | 30 | 100 |
| 07/21/2010 14:45 | 300 | 100 |
| 07/26/10 | 900 | 215 |
| 08/03/2010 10:40 | 80 | 190 |
| 08/10/2010 08:20 | 130 | 215 |
| 08/16/2010 10:03 | 240 | 185 |
| 08/24/2010 07:30 | 500 | 185 |
| 08/30/2010 12:05 | 130 | 185 |
| 09/07/2010 14:15 | 300 | 270 |
| 09/13/2010 15:06 | 80 | 215 |
| 09/20/2010 09:14 | 300 | 215 |
| 09/28/2010 14:00 | 170 | 235 |
| 10/05/2010 09:16 | 300 | 235 |
| 10/11/2010 09:40 | 240 | 270 |
| 10/19/2010 12:00 | 130 | 205 |
| 10/25/2010 14:00 | 30 | 185 |
| 11/02/2010 14:55 | 240 | 185 |
| 11/08/2010 14:40 | 80 | 105 |
| 11/15/2010 11:00 | 110 | 95 |
| 11/29/2010 14:40 | 80 | 95 |
| 12/07/2010 11:30 | 56 | 80 |
| 02/03/2011 14:11 | 300 | 95 |
| 02/07/2011 14:30 | 48 | 68 |
| 02/16/2011 07:45 | 500 | 178 |
| 02/23/2011 13:20 | 280 | 290 |
| 03/01/2011 11:15 | 500 | 390 |
| 03/08/2011 11:30 | 500 | 500 |
| 03/14/2011 13:30 | 300 | 400 |
| 04/01/11 | 300 | 400 |
| 04/12/2011 14:30 | 500 | 400 |
| 04/19/2011 11:00 | **1600** | 400 |
| 04/25/2011 11:35 | 500 | 500 |
| 05/03/2011 09:10 | 280 | 500 |
| 05/10/2011 11:00 | **1600** | **1050** |
| 05/17/2011 15:40 | **1600** | **1050** |
| 05/24/2011 11:45 | 300 | 950 |
| 05/31/2011 11:10 | 440 | **1020** |
| 06/07/2011 14:10 | 240 | 370 |
| 06/14/2011 10:10 | 900 | 370 |
| 06/20/2011 12:10 | 900 | 670 |
| 06/30/2011 09:45 | 240 | 570 |
| 07/07/2011 10:36 | **1600** | 900 |
| 07/12/2011 12:10 | 110 | 570 |
| 07/19/2011 14:00 | 80 | 175 |
| 07/26/2011 14:30 | 50 | 95 |

| Date | Total Colifiorm | Monthly Median |
|---|---|---|
| 08/04/2011 14:05 | 220 | 95 |
| 08/10/2011 14:55 | 130 | 105 |
| 08/18/2011 15:30 | 110 | 120 |
| 08/24/2011 14:10 | 50 | 120 |
| 08/31/2011 10:00 | 220 | 120 |
| 09/07/2011 12:41 | 500 | 165 |
| 09/12/2011 12:45 | 110 | 165 |
| 09/20/2011 09:35 | 240 | 230 |
| 09/27/2011 14:00 | 48 | 175 |
| 10/05/2011 10:30 | 900 | 175 |
| 10/12/2011 14:20 | 240 | 240 |
| 10/19/2011 14:50 | 900 | 570 |
| 10/26/2011 14:40 | 300 | 600 |
| 11/02/2011 15:15 | 240 | 270 |
| 11/09/2011 09:10 | 70 | 270 |
| 11/15/2011 11:10 | 130 | 185 |
| 11/28/2011 14:10 | 13 | 100 |
| 12/21/2011 16:05 | 13 | 42 |
| 12/29/2011 10:25 | 17 | 15 |
| 01/04/2012 11:05 | 22 | 15 |
| 01/10/2012 14:45 | 17 | 17 |
| 01/19/2012 10:12 | 21 | 19 |
| 01/23/2012 14:20 | 17 | 19 |
| 02/01/2012 14:40 | 4 | 17 |
| 02/06/2012 12:45 | 50 | 19 |
| 02/14/2012 11:10 | 17 | 17 |
| 02/22/2012 09:45 | 25 | 21 |
| 02/27/2012 11:00 | 72 | 38 |
| 03/05/2012 14:10 | 48 | 37 |
| 03/12/2012 14:50 | 440 | 60 |
| 03/21/2012 14:05 | 300 | 186 |
| 03/29/2012 15:10 | 13 | 174 |
| 04/03/2012 07:30 | 50 | 175 |
| 04/09/2012 11:00 | 47 | 49 |
| 04/17/2012 14:05 | 300 | 49 |
| 04/24/12 | 280 | 165 |
| 05/14/2012 09:35 | 50 | 165 |
| 05/21/2012 13:35 | 23 | 165 |
| 05/29/2012 15:40 | 30 | 40 |
| 06/04/2012 15:10 | 110 | 40 |
| 06/13/2012 12:30 | 900 | 70 |
| 06/19/2012 15:15 | 300 | 205 |
| 06/25/2012 11:00 | 210 | 255 |
| 07/03/2012 14:20 | 170 | 255 |
| 07/10/2012 09:40 | 130 | 190 |
| 07/16/2012 11:30 | 280 | 190 |
| 07/24/2012 15:20 | 110 | 150 |
| 08/02/2012 16:15 | 50 | 120 |
| 08/07/2012 11:05 | 500 | 195 |
| 08/14/2012 10:55 | 220 | 165 |
| 08/21/2012 14:18 | 900 | 360 |
| 08/28/2012 09:10 | 500 | 500 |

| Date | Total Colifiorm | Monthly Median |
|---|---|---|
| 09/06/2012 14:45 | 500 | 500 |
| 09/12/2012 11:50 | 30 | 500 |
| 09/17/2012 14:00 | 70 | 285 |
| 09/26/2012 09:58 | 22 | 50 |
| 10/01/2012 14:50 | 140 | 50 |
| 10/09/2012 14:00 | 240 | 105 |
| 10/16/2012 12:50 | 8 | 81 |
| 10/23/2012 15:20 | 50 | 95 |
| 10/31/2012 09:40 | 80 | 65 |
| 11/07/2012 14:00 | 13 | 32 |
| 11/13/2012 14:30 | 21 | 36 |
| 11/20/2012 10:42 | 22 | 22 |
| 11/26/2012 10:46 | 130 | 22 |
| 12/06/2012 10:50 | 170 | 76 |
| 12/11/2012 14:35 | 50 | 90 |
| 12/17/2012 13:22 | 300 | 150 |
| 12/26/2012 14:38 | 500 | 235 |
| | | |
| min | 0 | 6 |
| max | 3000 | 1050 |
| average | 196 | 157 |
| median | 80 | 100 |
| 95th percentile | 800 | 500 |

| Date | Crypto | RAA | Giardia | RAA |
|---|---|---|---|---|
| 4/17/2007 | 0 | | - | |
| 5/14/2007 | 0.095 | | - | |
| 6/19/2007 | 0 | | 0 | |
| 7/16/2007 | 0 | | 0 | |
| 8/21/2007 | 0 | | 0 | |
| 9/18/2007 | 0 | | 0 | |
| 10/16/2007 | 0 | | 0 | |
| 11/19/2007 | 0 | | 0 | |
| 12/12/2007 | 0 | | 0 | |
| 1/15/2008 | 0 | | 0 | |
| 2/21/2008 | 0 | | 0 | |
| 3/18/2008 | 0 | 0.008 | 0 | 0.000 |
| 4/16/2008 | 0 | 0.008 | 0 | 0.000 |
| 5/20/2008 | 0 | 0.000 | 0 | 0.000 |
| 6/19/2008 | 0 | 0.000 | 0 | 0.000 |
| 7/16/2008 | 0 | 0.000 | 0 | 0.000 |
| 8/25/2008 | 0 | 0.000 | 0 | 0.000 |
| 9/15/2008 | 0 | 0.000 | 0 | 0.000 |
| 10/14/2008 | 0 | 0.000 | 0 | 0.000 |
| 11/18/2008 | 0 | 0.000 | 0 | 0.000 |
| 12/15/2008 | 0 | 0.000 | 0 | 0.000 |
| 1/14/2009 | 0 | 0.000 | 0 | 0.000 |
| 2/18/2009 | 0 | 0.000 | 0 | 0.000 |
| 3/17/2009 | 0 | 0.000 | 0 | 0.000 |
| | | | | |
| Overall Avg | 0.004 | | 0 | |
| Overall Med | 0 | | 0 | |

Distribution System TTHM

| Sample date | 3/7/2008 | 6/12/2008 | 9/18/2008 | 12/10/2008 | 3/13/2009 | 6/19/2009 | 9/15/2009 | 12/17/2009 | 3/30/2010 | 6/30/2010 | 9/30/2010 | 12/23/2010 | 3/23/2011 | 6/30/2011 | 9/29/2011 | 12/20/2011 | 3/15/2012 | 6/11/2012 | 9/27/2012 | 12/20/2012 | 3/22/2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Pressure Zone 8** | | | | | | | | | | | | | | | | | | | | | |
| 3750 Lytle Creek Road (St2 Site 2) | 14.00 | 27.00 | 26.00 | 35.00 | 14.00 | 4.90 | 34.00 | 22.00 | 14.00 | 15.80 | 15.10 | 30.80 | 11.40 | 17.80 | 21.90 | 15.20 | 12.30 | 16.00 | 47.00 | 25.00 | 21.60 |
| 3192 Lytle Creek Road | 7.60 | 31.00 | 25.00 | 33.00 | 15.00 | 21.00 | 40.00 | 19.00 | 11.00 | 20.60 | 14.80 | 30.20 | 13.50 | 18.30 | 31.70 | 12.40 | 12.30 | | | | |
| | | | | | | | | | | | | | | | | | LRAA | **16.35** | **22.63** | **25.1** | **27.4** |
| **Pressure Zone 7** | | | | | | | | | | | | | | | | | | | | | |
| 4152 Tangerine | 5.10 | 11.00 | 14.00 | 7.50 | 1.10 | 4.60 | 29.00 | 15.00 | 8.50 | 5.10 | 9.00 | 8.10 | 5.40 | 11.00 | 15.90 | 1.20 | 6.10 | | | | |
| 3726 Live Oak | 4.20 | 10.00 | 14.00 | 6.80 | 0.00 | 5.60 | 26.00 | 9.90 | 12.00 | 2.70 | 7.80 | 3.90 | 7.00 | 14.20 | 9.90 | 0.00 | 6.30 | | | | |
| White Ash Rd (St2 Site 4) | | | | | | | | | | | | | | | | | | 9 | 40 | 22 | 12.3 |
| | | | | | | | | | | | | | | | | | LRAA | | | | **20.8** |
| **Pressure Zone 6** | | | | | | | | | | | | | | | | | | | | | |
| 3288 Alder | 5.90 | 3.20 | 22.00 | 5.10 | 0.00 | 22.00 | 24.00 | 8.90 | 11.00 | 3.20 | 6.50 | 4.90 | 6.80 | 10.60 | 16.40 | 0.00 | 5.80 | | | | |
| 1993 Fairview Dr. | 5.7 | 3.20 | 11.00 | 7.40 | 0.00 | 6.00 | 20.00 | 4.80 | 4.70 | 2.50 | 3.50 | 1.60 | 0.00 | 10.30 | 10.10 | 0.00 | 4.20 | | | | |
| 6075 Sierra Ave | 5.70 | 2.80 | 11.00 | 5.60 | 0.00 | 10.00 | 22.00 | 0.00 | 13.00 | 3.60 | 6.30 | 0.00 | 9.70 | 12.70 | 14.00 | 0.00 | 4.30 | | | | |
| Maple & Summit | 6.40 | 3.00 | 22.00 | 7.50 | 2.10 | 6.50 | 22.00 | 1.20 | 4.30 | 2.50 | 3.70 | 1.00 | 6.30 | 9.60 | 9.30 | 0.00 | 4.30 | | | | |
| 5556 Sycamore | 6.00 | 1.80 | 25.00 | 7.20 | 0.00 | 7.10 | 24.00 | 13.00 | 10.00 | 3.30 | 6.60 | 1.00 | 3.20 | 12.20 | 14.50 | 0.00 | 4.60 | | | | **0** |
| 15182 Crane (St2 Site 3) | | | | | | | | | | | | | | | | | | 0 | 0 | 0 | 0 |
| Re 6-3 Disch Line (St2 Site 5) | | | | | | | | | | | | | | | | | | 4 | 27 | 12 | 6 |
| | | | | | | | | | | | | | | | | | LRAA | | | | **12.3** |
| **Pressure Zone 5** | | | | | | | | | | | | | | | | | | | | | |
| 2478 Fillmore | 0.00 | 0.00 | 26.00 | 5.40 | 0.00 | 0.00 | 0.00 | 2.10 | 0.00 | 0.00 | 0.00 | 3.90 | 0.00 | 2.90 | 0.00 | 0.00 | 4.20 | | | | |
| 6064 Geremander | 4.50 | 0.00 | 0.00 | 5.80 | 2.40 | 0.00 | 0.00 | 3.60 | 4.10 | 0.00 | 2.30 | 1.10 | 0.00 | 10.20 | 0.00 | 0.00 | 4.30 | | | | |
| 6288 Apple | 5.20 | 0.00 | 0.00 | 6.20 | 2.60 | 0.00 | 0.00 | 3.90 | 9.20 | 0.00 | 2.40 | 6.00 | 0.00 | 3.10 | 0.00 | 0.00 | 4.50 | | | | |
| 872 W. Schallert | 1.00 | 0.00 | 0.00 | 2.60 | 0.00 | 1.00 | 3.40 | 9.80 | 1.30 | 0.00 | 1.20 | 2.30 | 1.40 | 9.70 | 12.00 | 0.00 | 4.80 | | | | |
| 18433 Bohnert (St2 Site 6) | | | | | | | | | | | | | | | | | | 6 | 29 | 12 | 10.4 |
| | | | | | | | | | | | | | | | | | LRAA | | | | **14.4** |
| **Pressure Zone 4** | | | | | | | | | | | | | | | | | | | | | |
| 213 E. Walnut (St2 Site 1) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.90 | 0.00 | 0.00 | 0.00 | 2.20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 12.00 | 0.00 |
| 871 E. Winchester | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.70 | 5.40 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | | |
| | | | | | | | | | | | | | | | | | LRAA | **0.00** | **0.00** | **3.00** | **3.00** |
| Quarterly Average | 4.75 | 6.20 | 13.07 | 9.01 | 2.48 | 5.91 | 16.29 | 7.92 | 7.23 | 3.95 | 5.28 | 6.47 | 4.31 | 9.51 | 10.38 | 1.92 | 5.20 | | | | |
| Running Annual Average | | | | 8.26 | 7.69 | 7.62 | 8.42 | 8.15 | 9.34 | 8.85 | 6.10 | 5.73 | 5.00 | 6.39 | 7.67 | 6.53 | 6.75 | | | **LRAA AVG** | **12.1** |

| | |
|---|---|
| overall min | 0.00 |
| overall max | 40.00 |
| overall avg | 7.05 |
| overall median | 4.30 |
| | |
| QA min | 1.92 |
| QA max | 16.29 |
| QA avg | 7.05 |
| QA median | 6.20 |
| | |
| RAA min | 5.00 |
| RAA max | 9.34 |
| RAA avg | 7.32 |
| RAA median | 7.64 |

| Sample date | 3/7/2008 | 6/12/2008 | 9/18/2008 | 12/10/2008 | 3/13/2009 | 6/19/2009 | 9/15/2009 | 12/17/2009 | 3/30/2010 | 6/30/2010 | 9/30/2010 | 12/23/2010 | 3/23/2011 | 6/30/2011 | 9/29/2011 | 12/20/2011 | 3/15/2012 | 6/11/2012 | 9/27/2012 | 12/20/2012 | 3/22/2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Pressure Zone 8** | | | | | | | | | | | | | | | | | | | | | |
| 3750 Lytle Creek Road (St2 Site 2) | 4.50 | 11.00 | 4.10 | 12.00 | 7.50 | 3.20 | 15.00 | 8.50 | 7.90 | 10.30 | 8.60 | 15.20 | 6.80 | 10.70 | 10.70 | 13.70 | 11.90 | 10.00 | 10.00 | 5.00 | 9.70 |
| 3192 Lytle Creek Road | 1.60 | 10.00 | 4.40 | 13.00 | 7.00 | 8.60 | 11.00 | 11.00 | 6.80 | 13.90 | 9.40 | 14.40 | 8.40 | 11.30 | 24.50 | 10.60 | 10.80 | | | | |
| | | | | | | | | | | | | | | | | | LRAA | **11.58** | **11.40** | **9.23** | **8.68** |
| **Pressure Zone 7** | | | | | | | | | | | | | | | | | | | | | |
| 4152 Tangerine | 1.3 | 2.00 | 1.50 | 2.70 | 0.00 | 2.80 | 8.30 | 9.20 | 3.80 | 3.00 | 5.70 | 3.90 | 3.40 | 6.10 | 8.40 | 1.00 | 4.90 | | | | |
| 3726 Live Oak | 1.20 | 2.00 | 1.60 | 2.80 | 0.00 | 4.00 | 9.10 | 5.90 | 6.10 | 0.00 | 4.90 | 3.90 | 4.00 | 7.10 | 4.20 | 0.00 | 4.80 | | | | |
| White Ash Rd (St2 Site 4) | | | | | | | | | | | | | | | | | | 5 | 10 | 6 | 4.8 |
| | | | | | | | | | | | | | | | | | | | | | **6.45** |
| **Pressure Zone 6** | | | | | | | | | | | | | | | | | | | | | |
| 3288 Alder | 2.90 | 1.20 | 2.10 | 3.40 | 0.00 | 9.90 | 7.50 | 4.00 | 5.50 | 0.00 | 4.60 | 4.20 | 3.50 | 6.10 | 7.70 | 0.00 | 4.70 | | | | |
| 1993 Fairview Dr. | 3.30 | 1.10 | 1.40 | 3.00 | 0.00 | 3.70 | 4.60 | 6.00 | 1.70 | 0.00 | 2.10 | 0.00 | 0.00 | 5.90 | 4.10 | 0.00 | 3.30 | | | | |
| 6075 Sierra Ave | 2.80 | 3.40 | 3.10 | 2.60 | 0.00 | 4.80 | 8.30 | 0.00 | 7.00 | 1.00 | 4.40 | 0.00 | 5.00 | 6.30 | 8.30 | 0.00 | 3.20 | | | | |
| Maple & Summit | 2.90 | 0.00 | 3.80 | 3.00 | 0.00 | 3.90 | 6.40 | 0.00 | 2.70 | 0.00 | 2.10 | 0.00 | 3.10 | 5.50 | 4.00 | 0.00 | 3.30 | | | | |
| 5556 Sycamore | 2.90 | 1.20 | 4.10 | 3.20 | 0.00 | 4.70 | 7.60 | 5.30 | 4.70 | 0.00 | 4.70 | 0.00 | 0.00 | 6.30 | 5.90 | 0.00 | 3.60 | | | | **0** |
| 15182 Crane (St2 Site 3) | | | | | | | | | | | | | | | | | | 0 | 0 | 0 | 0 |
| Re 6-3 Disch Line (St2 Site 5) | | | | | | | | | | | | | | | | | | 3 | 8 | 5 | 3 |
| | | | | | | | | | | | | | | | | | | | | | **4.75** |
| **Pressure Zone 5** | | | | | | | | | | | | | | | | | | | | | |
| 2478 Fillmore | 0.00 | 0.00 | 4.10 | 3.10 | 0.00 | 0.00 | 0.00 | 4.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.30 | | | | |
| 6064 Geremander | 3.10 | 0.00 | 0.00 | 3.60 | 0.00 | 0.00 | 0.00 | 1.50 | 1.80 | 0.00 | 0.00 | 0.00 | 0.00 | 4.20 | 0.00 | 0.00 | 3.30 | | | | |
| 6288 Apple | 2.70 | 0.00 | 0.00 | 3.40 | 0.00 | 0.00 | 0.00 | 1.30 | 5.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.40 | | | | |
| 872 W. Schallert | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 5.80 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 4.00 | 5.60 | 0.00 | 3.70 | | | | |
| 18433 Bohnert (St2 Site 6) | | | | | | | | | | | | | | | | | | 4 | 7 | 11 | 4.6 |
| | | | | | | | | | | | | | | | | | | | | | **6.65** |
| **Pressure Zone 4** | | | | | | | | | | | | | | | | | | | | | |
| 213 E. Walnut (St2 Site 1) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.30 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 7.00 | 0.00 |
| 871 E. Winchester | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.40 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | | |
| | | | | | | | | | | | | | | | | | LRAA | **0.00** | **0.00** | **1.75** | **1.75** |
| Quarterly Average | 1.95 | 2.13 | 2.01 | 3.72 | 0.97 | 3.04 | 5.19 | 4.26 | 3.63 | 1.88 | 3.10 | 2.77 | 2.28 | 4.90 | 5.56 | 1.69 | 4.28 | | | | |
| Running Annual Average | | | | 2.45 | 2.21 | 2.44 | 3.23 | 3.36 | 4.03 | 3.74 | 3.22 | 2.85 | 2.51 | 3.26 | 3.88 | 3.61 | 4.11 | | **LRAA AVG** | | **5.2** |

| | |
|---|---|
| overall min | 0.00 |
| overall max | 24.50 |
| overall avg | 3.14 |
| overall median | 2.10 |
| | |
| QA min | 0.97 |
| QA max | 5.56 |
| QA avg | 3.14 |
| QA median | 3.04 |
| | |
| RAA min | 2.21 |
| RAA max | 4.11 |
| RAA avg | 3.21 |
| RAA median | 3.25 |

# IDSE Report for Standard Monitoring

## I. General Information

### A. PWS Information:

PWSID: 3610004
PWS Name: West Valley Water District
PWS Address: Ken Sikorski, P.O. Box 920
City: Rialto
State: CA
Zip: 92377
Population Served: 62,400

System Type: CWS
Source Type: Subpart H
Buying/Selling Relationships: Consecutive System

### B: Date Submitted:

April 10, 2009

### C. PWS Operations:

Residual Disinfectant Type: Chlorine
Number of Disinfected Sources: 2 Surface, 20 Ground, 1 Purchased

### D. Contact Person:

Contact Name: Ken Sikorski
Title: Superintendent/Chief Operator
Phone Number: (909)875-1322
Fax Number: (909)875-1361
E-mail Address: ksikorski@wvwd.org

## II. Stage 2 DBPR Requirements

### A. Number of Compliance Monitoring Sites:

| | |
|---|---|
| Highest TTHM: | 3 |
| Highest HAA5: | 3 |
| Existing Stage 1: | 2 |
| TOTAL: | 8 |

**B. Schedule:** Schedule 2

**C. Compliance Monitoring Frequency:** Every 90 days (4 monitoring periods)

## III. Monitoring Results

**A. Did you deviate in any way from your approved standard monitoring plan?**
No.

**B. Where were your TTHM and HAA5 samples analyzed?**

Certified Laboratory: Test America

**C. What method(s) was used to analyze your TTHM and HAA5 samples?**

TTHM: EPA 524.2
HAA5: EPA 552.2

**D. IDSE Standard Monitoring Results - TTHM**

See Attached Table

**E. IDSE Standard Monitoring Results – HAA5**

See Attached Table

**F. Stage 1 DBPR Compliance Monitoring Results - TTHM**

See Attached Table

**G. Stage 1 DBPR Compliance Monitoring Results – HAA5**

See Attached Table

## IV. Justification of Stage 2 DBPR Compliance Monitoring Sites

See Attached Table

## V. Peak Historical Month and Proposed Stage 2 DBPR Compliance Monitoring Schedule

**A. Peak Historical Month:** September

**B. Is your Peak Historical Month the same as in your IDSE Standard Monitoring Plan?**

Yes. The Peak Historical Month in the IDSE Plan was identified as September based on historical TTHM data. Data collected during the one year study for the IDSE and

Stage 1 DBPR resulted in peak TTHM levels occurring in September and peak HAA5 levels occurring in September as well. It is recommended that the sample schedule include March, June. September, and December.

### C. Proposed Stage 2 DBPR Compliance Monitoring Schedule

See Attached Table

## VI. Distribution System Schematic

Attach a schematic of your distribution system if it has changed since you submitted your Standard Monitoring Plan: Not Required.

## VII. Attachments

IDSE Monitoring Results
Stage 1 DBPR Compliance Monitoring Results
Justification of Stage 2 DBPR Compliance Monitoring Sites
Proposed Stage 2 Compliance Monitoring Schedule

Total Number of Pages: 8

## III. D. IDSE Standard Monitoring Results - TTHM

| Site ID | 11/14/2007 | 1/7/2008 | 3/12/2008 | 5/14/2008 | 7/9/2008 | 9/9/2008 | Site LRAA | Site Max | Site Description |
|---|---|---|---|---|---|---|---|---|---|
| A1 | 0 | 0 | 6.1 | 12 | 0 | 0 | 3.0 | 12 | Average residence point |
| A12 | 0 | 0 | 0 | 1.2 | 0 | 0 | 0.2 | 1.2 | Average residence point |
| A18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Average residence point |
| A33 | 5.2 | 0 | 5.4 | 10 | 0 | 17 | 6.3 | 17 | Average residence point |
| A44 | 1.3 | 1.0 | 0 | 3.1 | 1.2 | 0 | 1.1 | 3.1 | Average residence point |
| A49 | 0 | 2.3 | 0 | 1.2 | 0 | 0 | 0.6 | 2.3 | Average residence point |
| 1E | 4.7 | 0 | 2.8 | 7.5 | 13 | 27 | 9.2 | 27 | Near Entry Point |
| 2E | 5.0 | 3.2 | 0 | 1.0 | 1.0 | 0 | 1.7 | 5 | Near Entry Point |
| 3E | 15 | 2.7 | 9.3 | 15 | 22 | 26 | 15.0 | 26 | Near Entry Point |
| 4E | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Near Entry Point |
| H1 | 0 | 0 | 6.7 | 13 | 0 | 0 | 3.3 | 13 | High HAA5 |
| H2 | 0 | 0 | 6.7 | 11 | 0 | 1.2 | 3.2 | 11 | High HAA5 |
| H3 | 4.9 | 0 | 6.4 | 12 | 8.9 | 22 | 9.0 | 22 | High HAA5 |
| H4 | 7.4 | 0 | 7.5 | 2.6 | 0 | 17 | 5.8 | 17 | High HAA5 |
| H6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | High HAA5 |
| H7 | 0 | 0 | 7.7 | 12 | 0 | 0 | 3.3 | 12 | High HAA5 |
| T1 | 0 | 0 | 8.5 | 8.4 | 0 | 0 | 2.8 | 8.5 | High TTHM |
| T2 | 0 | 0 | 7.8 | 11 | 0 | 0 | 3.1 | 11 | High TTHM |
| T3 | 33 | 17 | 17 | 23 | 13 | 53 | 26.0 | 53 | High TTHM |
| T4 | 4.9 | 0 | 7.0 | 11 | 13 | 17 | 8.8 | 17 | High TTHM |
| T5 | 23 | 12 | 8.4 | 16 | 17 | 14 | 15.1 | 23 | High TTHM |
| T6 | 11.0 | 1.0 | 5.3 | 9.8 | 16 | 19 | 10.4 | 19 | High TTHM |
| T14 | 0 | 0 | 0 | 1.0 | 0 | 0 | 0.2 | 1 | High TTHM |
| T35 | 1.0 | 2.2 | 4.6 | 1.6 | 1.2 | 16 | 4.4 | 16 | High TTHM |
| Qtr. Average | 4.9 | 1.7 | 4.9 | 7.6 | 4.4 | 9.6 | | | |

| Site ID | Description |
|---|---|
| A1 | Dearwood Lane @ Road Runner |
| A12 | 6774 Lilac |
| A18 | Randall & Aspen |
| A33 | 2642 N. Maple |
| A44 | 11094 Locust |
| A49 | Baywood, between Larch & Meadow Lark |
| 1E | Reservoir 5-3 Discharge Line |
| 2E | Reservoir 3A-2 Discharge Line |
| 3E | Reservoir 6-3 Discharge Line |
| 4E | Reservoir 4-1 Discharge Line |
| H1 | Brookside Avenue |
| H2 | Laguna Lane |
| H3 | Alder & County Landfill |
| H4 | 1395 Summit |
| H6 | 6633 Fillmore |
| H7 | Sandstone Lane |
| T1 | Mavenwood E. of Coyote Canyon |
| T2 | 15182 Crane |
| T3 | U.S. Forestry Station on Glen Helen Pkwy |
| T4 | Casmalia 600' E of Sierra Avenue Pkwy |
| T5 | White Ash Road |
| T6 | 18433 Bohnert |
| T14 | 477 E. Home |
| T35 | Cedar & La Gloria |

## III. E. IDSE Standard Monitoring Results - HAA5

| Site ID | 11/14/2007 | 1/7/2008 | 3/12/2008 | 5/14/2008 | 7/9/2008 | 9/9/2008 | Site LRAA | Site Max | Site Description |
|---|---|---|---|---|---|---|---|---|---|
| A1 | 0 | 0 | 2.4 | 3.1 | 0 | 0 | 0.9 | 3.1 | Average residence point |
| A12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Average residence point |
| A18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Average residence point |
| A33 | 0 | 0 | 1.6 | 2.1 | 0 | 6.9 | 1.8 | 6.9 | Average residence point |
| A44 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Average residence point |
| A49 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Average residence point |
| 1E | 0 | 0 | 0 | 1.0 | 7.3 | 7.5 | 2.6 | 7.5 | Near Entry Point |
| 2E | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Near Entry Point |
| 3E | 2.5 | 0 | 1.3 | 5.3 | 8.7 | 9 | 4.5 | 9 | Near Entry Point |
| 4E | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Near Entry Point |
| H1 | 0 | 0 | 0 | 3.3 | 0 | 0 | 0.6 | 3.3 | High HAA5 |
| H2 | 0 | 0 | 1.6 | 2.7 | 0 | 0 | 0.7 | 2.7 | High HAA5 |
| H3 | 0 | 0 | 1.3 | 3.6 | 10 | 3.9 | 3.1 | 10 | High HAA5 |
| H4 | 0 | 0 | 1.4 | 0 | 0 | 6 | 1.2 | 6 | High HAA5 |
| H6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | High HAA5 |
| H7 | 0 | 0 | 1.0 | 2.5 | 0 | 0 | 0.6 | 2.5 | High HAA5 |
| T1 | 0 | 0 | 1.8 | 1.7 | 0 | 0 | 0.6 | 1.8 | High TTHM |
| T2 | 0 | 0 | 3.3 | 2.9 | 0 | 0 | 1.0 | 3.3 | High TTHM |
| T3 | 5.6 | 2.6 | 4.5 | 8.8 | 12 | 12 | 7.6 | 12 | High TTHM |
| T4 | 0 | 0 | 3.0 | 2.6 | 10 | 5.6 | 3.5 | 10 | High TTHM |
| T5 | 2.1 | 0 | 1.4 | 7.6 | 8.5 | 7.4 | 4.5 | 8.5 | High TTHM |
| T6 | 1.0 | 0 | 3.1 | 0 | 8.3 | 6.1 | 3.1 | 8.3 | High TTHM |
| T14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | High TTHM |
| T35 | 0 | 0 | 0 | 1.0 | 0 | 5.4 | 1.1 | 5.4 | High TTHM |
| Qtr. Average | 0.5 | 0.1 | 1.2 | 2.0 | 2.7 | 2.9 | | | |

| Site ID | Description |
|---|---|
| A1 | Dearwood Lane @ Road Runner |
| A12 | 6774 Lilac |
| A18 | Randall & Aspen |
| A33 | 2642 N. Maple |
| A44 | 11094 Locust |
| A49 | Baywood, between Larch & Meadow Lark |
| 1E | Reservoir 5-3 Discharge Line |
| 2E | Reservoir 3A-2 Discharge Line |
| 3E | Reservoir 6-3 Discharge Line |
| 4E | Reservoir 4-1 Discharge Line |
| H1 | Brookside Avenue |
| H2 | Laguna Lane |
| H3 | Alder & County Landfill |
| H4 | 1395 Summit |
| H6 | 6633 Fillmore |
| H7 | Sandstone Lane |
| T1 | Mavenwood E. of Coyote Canyon |
| T2 | 15182 Crane |
| T3 | U.S. Forestry Station on Glen Helen Pkwy |
| T4 | Casmalia 600' E of Sierra Avenue Pkwy |
| T5 | White Ash Road |
| T6 | 18433 Bohnert |
| T14 | 477 E. Home |
| T35 | Cedar & La Gloria |

## III. F. Stage 1 DBPR Compliance Monitoring Results - TTHM

| Site ID | 12/11/2007 | 3/7/2008 | 6/12/2008 | 9/18/2008 | Site LRAA | Site Max |
|---|---|---|---|---|---|---|
| 1 | 16 | 14 | 27 | 26 | 20.8 | 27 |
| 50 | 14 | 7.6 | 31 | 25 | 19.4 | 31 |
| 31 | 8.9 | 5.1 | 11 | 14 | 9.8 | 14 |
| 3 | 4.7 | 4.2 | 10 | 14 | 8.2 | 14 |
| 4 | 5.5 | 5.9 | 3.2 | 22 | 9.2 | 22 |
| 34 | 0 | 5.7 | 3.2 | 11 | 5.0 | 11 |
| 7 | 0 | 6.4 | 3 | 22 | 7.9 | 22 |
| 8 | 2.3 | 6.0 | 1.8 | 25 | 8.8 | 25 |
| 9 | 2.4 | 0 | 0 | 26 | 7.1 | 26 |
| 11 | 0 | 5.2 | 0 | 0 | 1.3 | 5.2 |
| 15 | 0 | 0 | 0 | 0 | 0 | 0 |
| 36 | 0 | 1 | 0 | 0 | 0.3 | 1 |
| 13 | 0 | 0 | 0 | 0 | 0.0 | 0 |
| 2 | 0 | 5.7 | 2.8 | 11 | 4.9 | 11 |
| 10 | 0 | 4.5 | 0 | 0 | 1.1 | 4.5 |
| 23 | 5.8 | 1 | 0 | 2.7 | 2.4 | 5.8 |
| 51 | 2.3 | 0 | 0 | 0 | 0.6 | 2.3 |
| 39 | 2.4 | 0 | 0 | 1.3 | 0.9 | 2.4 |
| 30 | 0 | 0 | 0 | 1.3 | 0.3 | 1.3 |
| 27 | 0 | 4.1 | 0 | 1 | 1.3 | 4.1 |
| 47 | 0 | 0 | 0 | 1 | 0.3 | 1 |
| 46 | 0 | 4.1 | 0 | 1.3 | 1.4 | 4.1 |
| 17 | 2.0 | 0 | 0 | 0 | 0.5 | 2 |
| 37 | 5.6 | 2.3 | 4.6 | 2.7 | 3.8 | 5.6 |
| Quarter Average | 3.0 | 3.5 | 4.1 | 8.6 | | |

| Site | Description |
|---|---|
| 1 | 3750 Lytle Creek Road |
| 50 | 3192 Lytle Creek Road |
| 31 | 4152 Tangerine |
| 3 | 3726 Live Oak |
| 4 | 3288 Alder |
| 34 | 1993 Fairview Drive |
| 7 | Maple & Summit |
| 8 | 5556 Sycamore |
| 9 | 2478 Fillmore |
| 11 | 6288 Apple |
| 15 | 871 E. Winchester |
| 36 | 872 W. Schallert |
| 13 | 213 E. Walnut |
| 2 | 6075 Sierra Avenue |
| 10 | 6064 Geremander |
| 23 | 17673 Santa Ana |
| 51 | 10010 Olive Street |
| 39 | 900 N. Pepper |
| 30 | 11868 Pepper |
| 27 | Hall & Kinningham |
| 47 | Riverside & Resource Drive |
| 46 | 1305 Castellano |
| 17 | Randall & Cactus |
| 37 | Via Montana & Via Bonita |

## III. G. Stage 1 DBPR Compliance Monitoring Results - HAA

| Site ID | 12/11/2007 | 3/7/2008 | 6/12/2008 | 9/18/2008 | Site LRAA | Site Max |
|---|---|---|---|---|---|---|
| 1 | 3.9 | 4.5 | 11 | 4.1 | 5.9 | 11 |
| 50 | 3.2 | 1.6 | 10 | 4.4 | 4.8 | 10 |
| 31 | 0 | 1.3 | 2 | 1.5 | 1.2 | 2 |
| 3 | 0 | 1.2 | 2 | 1.6 | 1.2 | 2 |
| 4 | 0 | 2.9 | 1.2 | 2.1 | 1.6 | 2.9 |
| 34 | 0 | 3.3 | 1.1 | 1.4 | 1.5 | 3.3 |
| 7 | 0.0 | 2.9 | 0 | 3.8 | 1.7 | 3.8 |
| 8 | 0 | 2.9 | 1.2 | 4.1 | 2.1 | 4.1 |
| 9 | 0 | 0 | 0 | 4.1 | 1.0 | 4.1 |
| 11 | 0 | 2.7 | 0 | 0 | 0.7 | 2.7 |
| 15 | ND | 0 | 0 | 0 | 0 | 0 |
| 36 | 0 | 0 | 0 | 0 | 0 | 0 |
| 13 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | 0 | 2.8 | 3.4 | 3.1 | 2.3 | 3.4 |
| 10 | 0 | 3.1 | 0 | 0 | 0.8 | 3.1 |
| 23 | 0 | 0 | 0 | 0 | 0 | 0 |
| 51 | 0 | 0 | 0 | 0 | 0 | 0 |
| 39 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 | 0 | 0 | 0 | 0 | 0 | 0 |
| 27 | 0 | 0 | 0 | 0 | 0 | 0 |
| 47 | 0 | 0 | 0 | 0 | 0 | 0 |
| 46 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17 | 0 | 0 | 0 | 0 | 0 | 0 |
| 37 | 0 | 0 | ND | 0 | 0 | 0 |
| Quarter Average | 0.3 | 1.2 | 1.4 | 1.3 | | |

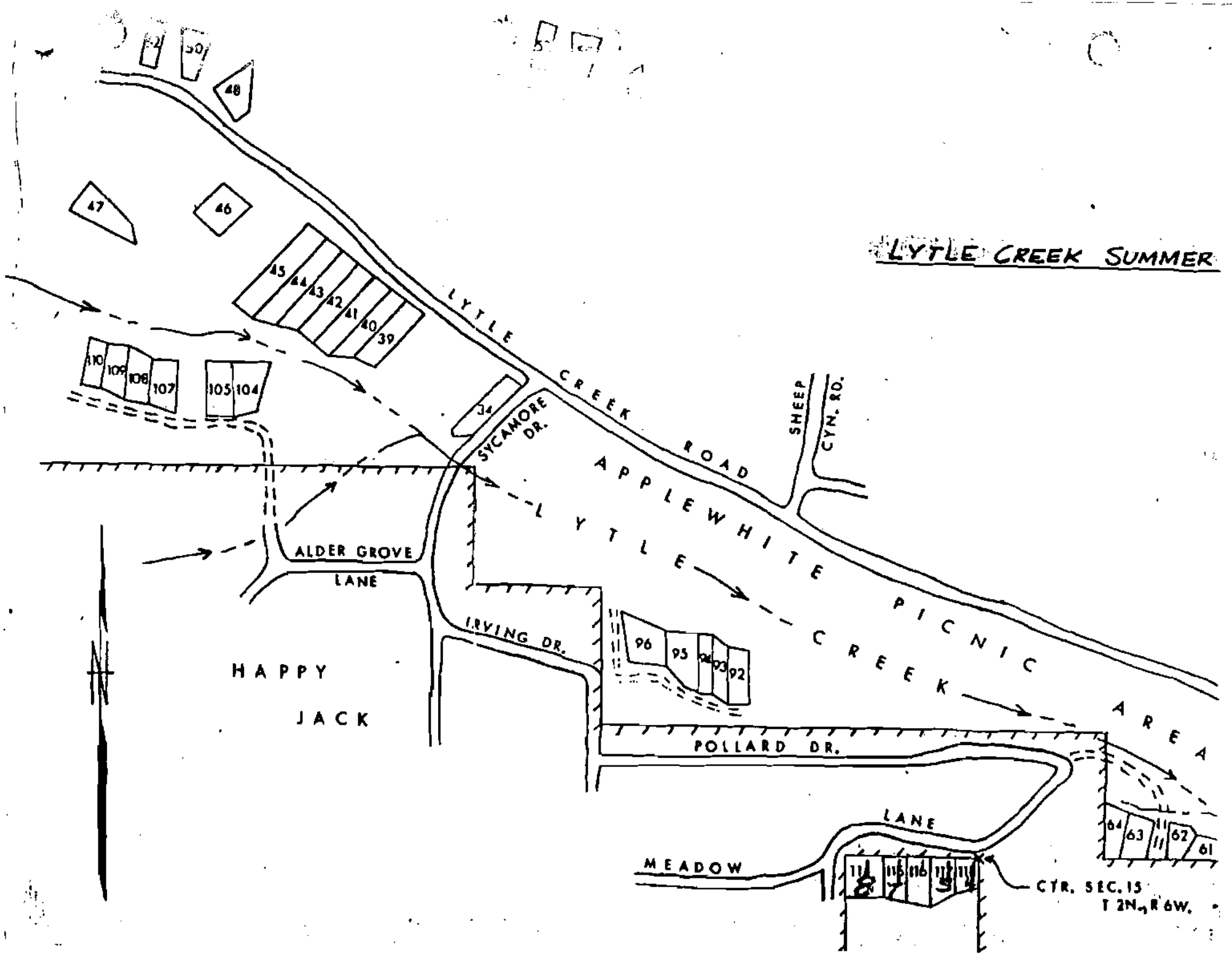
| Site | Description |
|---|---|
| 1 | 3750 Lytle Creek Road |
| 50 | 3192 Lytle Creek Road |
| 31 | 4152 Tangerine |
| 3 | 3726 Live Oak |
| 4 | 3288 Alder |
| 34 | 1993 Fairview Drive |
| 7 | Maple & Summit |
| 8 | 5556 Sycamore |
| 9 | 2478 Fillmore |
| 11 | 6288 Apple |
| 15 | 871 E. Winchester |
| 36 | 872 W. Schallert |
| 13 | 213 E. Walnut |
| 2 | 6075 Sierra Avenue |
| 10 | 6064 Geremander |
| 23 | 17673 Santa Ana |
| 51 | 10010 Olive Street |
| 39 | 900 N. Pepper |
| 30 | 11868 Pepper |
| 27 | Hall & Kinningham |
| 47 | Riverside & Resource Drive |
| 46 | 1305 Castellano |
| 17 | Randall & Cactus |
| 37 | Via Montana & Via Bonita |

**IV. Justification of Stage 2 DBPR Compliance Monitoring Sites**

| Stage 2 Compliance Monitoring Site ID | Site Type | Justification |
|---|---|---|
| Site 13 - 213 E. Walnut | High TTHM | This was the first site selected. This is an alternative site to site T3 which has the highest locational running annual average (LRAA) for TTHM and HAA5. Per DPH, site T3 was not selected due to a possible dead end. DPH requested site 13 to provide better geographical coverage. Site 13 is located in pressure zone 4. |
| Site 1 - 3750 Lytle Creek Road | High HAA5 | This was the second site selected and it has the second highest LRAA for TTHM and HAA5. It is located in pressure zone 8. |
| Site T2 - 15182 Crane | Stage 1 DBPR | This was the third site selected. This is an alternative site to the third highest LRAA for HAA5 (site 50). Site 50 was not selected as it is in close proximity to site 1 which was previously selected. In order to provide greater geographic coverage, DPH requested site T2 which is located in pressure zone 6. |
| Site T5 - White Ash Road | High TTHM | This was the fourth site selected and it has the fourth highest LRAA for TTHM and HAA5. It is located in pressure zone 7. |
| Site 3E - Reservoir 6-3 Discharge Line | High TTHM | This was the fifth site selected and it has the fifth highest LRAA for TTHM and HAA5. This is the entry point site for surface water treated at the Roemer WTP prior to the first service connection in pressure zone 6. |
| Site T6 - 18433 Bohnert | High HAA5 | This was the sixth site selected. This is an alternative site to the sixth highest LRAA for HAA5 (site T4) in order to provide greater representation of the pressure zones, as site T4 is in pressure zone 6 which is already covered by site 3E . Site T6 is the seventh highest LRAA for HAA5 and the sixth highest LRAA for TTHM and is located in pressure zone 5. |
| Site 37 - Via Montana and Via Bonita | Stage 1 DBPR | This was the seventh site selected. This is an alternative site to the seventh highest LRAA for TTHM (site 31) in order to provide greater geographic coverage and greater representation of the pressure zones. Site 37 has the highest LRAA for TTHM in pressure zone 3. |
| Site 27 - Hall & Kinningham | High HAA5 | This was the eighth site selected. This is an alternative site to the eighth highest LRAA for HAA5 (site 1E) in order to provide greater geographic coverage and greater representation of the pressure zones. Site 27 has the highest LRAA for TTHM in pressure zone 2. |

**VI. Proposed Stage 2 DBPR Compliance Monitoring Schedule**

| | Projected Sampling Date (Day or Week) | | | |
|---|---|---|---|---|
| Stage 2 Compliance Monitoring Site ID | Period 1 | Period 2 | Period 3 | Period 4 |
| Site 13 - 213 E. Walnut | Second Week of September, 2012 | Second Week of December, 2012 | Second Week of March, 2013 | Second Week of June, 2013 |
| Site 1 - 3750 Lytle Creek Road | Second Week of September, 2012 | Second Week of December, 2012 | Second Week of March, 2013 | Second Week of June, 2013 |
| Site T2 - 15182 Crane | Second Week of September, 2012 | Second Week of December, 2012 | Second Week of March, 2013 | Second Week of June, 2013 |
| Site T5 - White Ash Road | Second Week of September, 2012 | Second Week of December, 2012 | Second Week of March, 2013 | Second Week of June, 2013 |
| Site 3E - Reservoir 6-3 Discharge Line | Second Week of September, 2012 | Second Week of December, 2012 | Second Week of March, 2013 | Second Week of June, 2013 |
| Site T6 - 18433 Bohnert | Second Week of September, 2012 | Second Week of December, 2012 | Second Week of March, 2013 | Second Week of June, 2013 |
| Site 37 - Via Montana and Via Bonita | Second Week of September, 2012 | Second Week of December, 2012 | Second Week of March, 2013 | Second Week of June, 2013 |
| Site 27 - Hall & Kinningham | Second Week of September, 2012 | Second Week of December, 2012 | Second Week of March, 2013 | Second Week of June, 2013 |


LYTLE CREEK SUMMER
LYTLE CREEK ROAD
SHEEP CYN. RD.
SYCAMORE DR.
APPLEWHITE PICNIC AREA
LYTLE CREEK
ALDER GROVE LANE
IRVING DR.
POLLARD DR.
LANE
MEADOW
HAPPY JACK
CTR. SEC. 15
T 2N., R 6W.
48
47
46
45
44
43
42
41
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39
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107
105
104
34
96
95
94
93
92
64
63
62
61

West Valley Water District

855 West Base Line, P.O. Box 920
Rialto, California 92377-0920
Phone (909) 875-1804



Fax (909) 875-7284 Administration
Fax (909) 875-1361 Engineering
Fax (909) 875-1849 Customer Service

April 11, 2013

Jody Noiron
United States Forest Service
Forest Supervisor, San Bernardino National Forest
602 South Tippecanoe Avenue
San Bernardino, CA 92408

**Re: Support of Adventure Pass Fees for Lytle Creek Watershed**

Dear Ms. Noiron:

This letter is written to support the continued collection of Forest Adventure Pass fees for recreators within the Lytle Creek watershed. The Forest Adventure Pass has resulted in increased management of the recreation activities and recreationalist behavior in our watershed, which West Valley Water District (WVWD) believes has resulted in a direct improvement in the seasonal microbiological quality of Lytle Creek. WVWD understands that the US Forest Service is proposing to eliminate fee area designations for 23 locations within the National Forest System lands in California and reduce the boundaries for the rest. These proposed actions will result in the elimination of recreation fees from many recreation sites and areas. WVWD anticipates that this change in the Lytle Creek watershed could result in reduced management efforts and associated deterioration of source water quality, caused by recreation.

WVWD is a county water district and a public agency of the State of California. The WVWD provides water service to approximately 65,000 people located in portions of Rialto, Colton, Fontana, North Riverside County and the community of Bloomington. The WVWD uses water from Lytle Creek and subsequently treats it for domestic use. As a domestic water purveyor, the WVWD is required to comply with drinking water quality standards as outlined in Title 22 of the California Code of Regulations.

WVWD is particularly concerned with the microbiological quality of Lytle Creek, specifically the levels of total coliform, fecal coliform and Escherichia coli (E. coli). Currently, the Title 22 regulation for the Surface Water Treatment Rule requires an additional level of treatment for total coliforms and E. coli by the WVWD when levels in the raw, or untreated, water exceed designated levels. Therefore, higher levels of total coliform or E. coli in Lytle Creek potentially result in additional treatment and associated costs for additional chemicals and treatment. If more chlorine addition is required to address the microbial contamination, there is concern that this will increase the amount of disinfection byproducts in the treated water delivered to

WVWD's consumers. Certain disinfection byproducts, such as trihalomethanes and haloacetic acids, are known carcinogens and are also regulated under Title 22 regulations.

It has been well documented that body-contact recreation in a water body will contribute pathogenic organisms, as these organisms are washed off a recreator's body. An increase in the number of recreators will have a direct increase on the contribution of pathogenic organisms. Recreators in Lytle Creek have also historically littered the creek with diapers and other trash items. Management of recreationalist behavior, by limiting access, providing restroom and trash facilities, and education is key to improving source water quality. WVWD is concerned that without requiring a Forest Adventure Pass fee, the numbers of recreators will increase and levels of total coliforms and E. coli will increase, which will negatively impact our treatment requirements and is not in the best interest of our consumers.

WVWD has been tracking the levels of total coliforms since the Forest Adventure Pass fees were implemented in 1996. **Figures 1 to 3** show that the levels of total coliform frequently exceeded 1,000 most probably number per milliliter (MPN/mL) in years 1996 through 1998. The trigger level for additional drinking water treatment is currently based on source water total coliform levels greater than 1,000 MPN/100 mL. **Figure 4** show more recent total coliform data, from 2003 to 2012, and the levels of total coliform exceeding 1,000 MPN/mL occur much less frequently. This improvement in water quality has been significantly beneficial to the WVWD and its consumers, and therefore we support the US Forest Service in their efforts to continue to require a Forest Adventure Pass fee for the Lytle Creek watershed.

If you have any questions, please feel free to contact my office at (909) 820-3701.

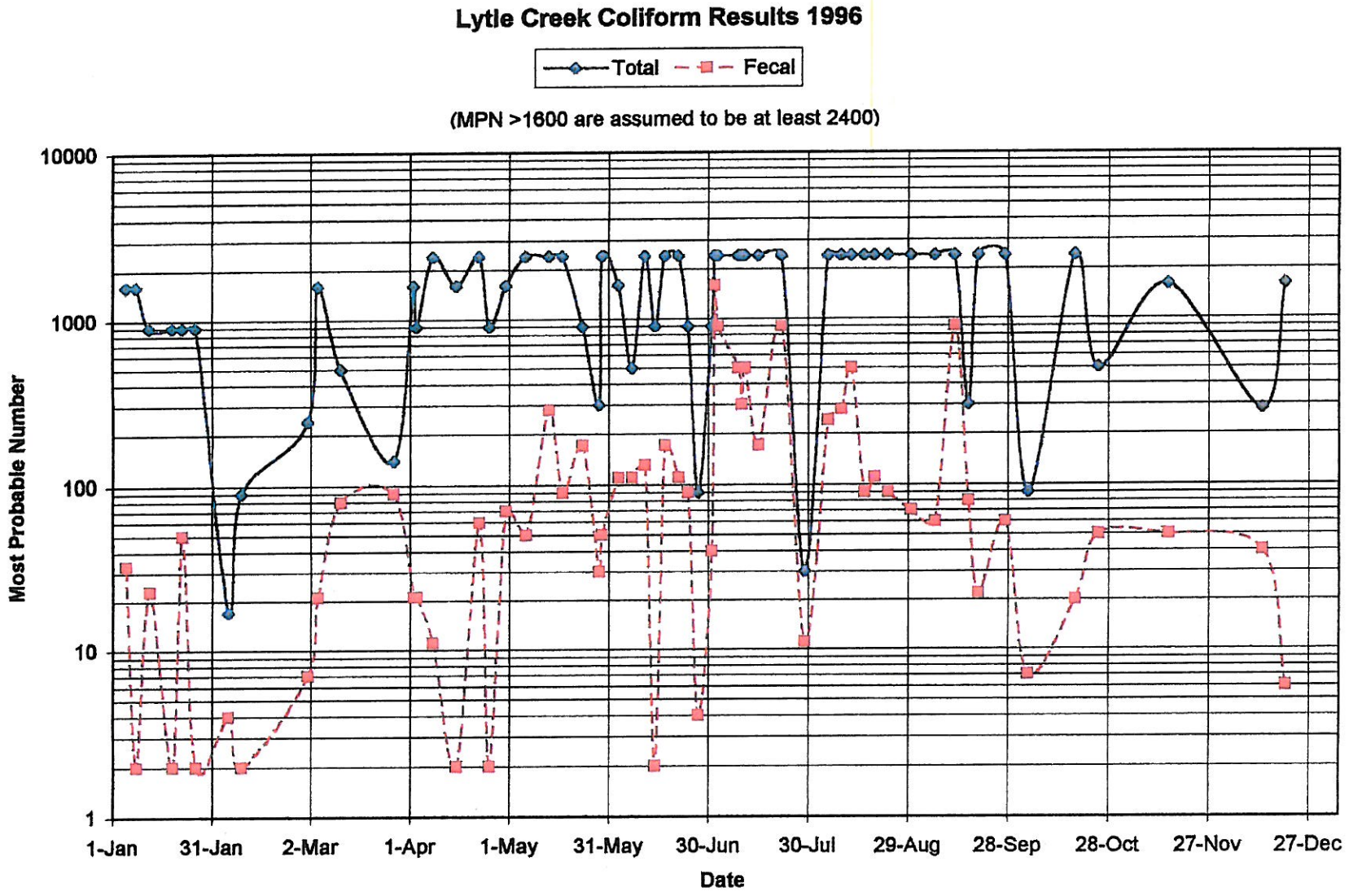
Respectfully,

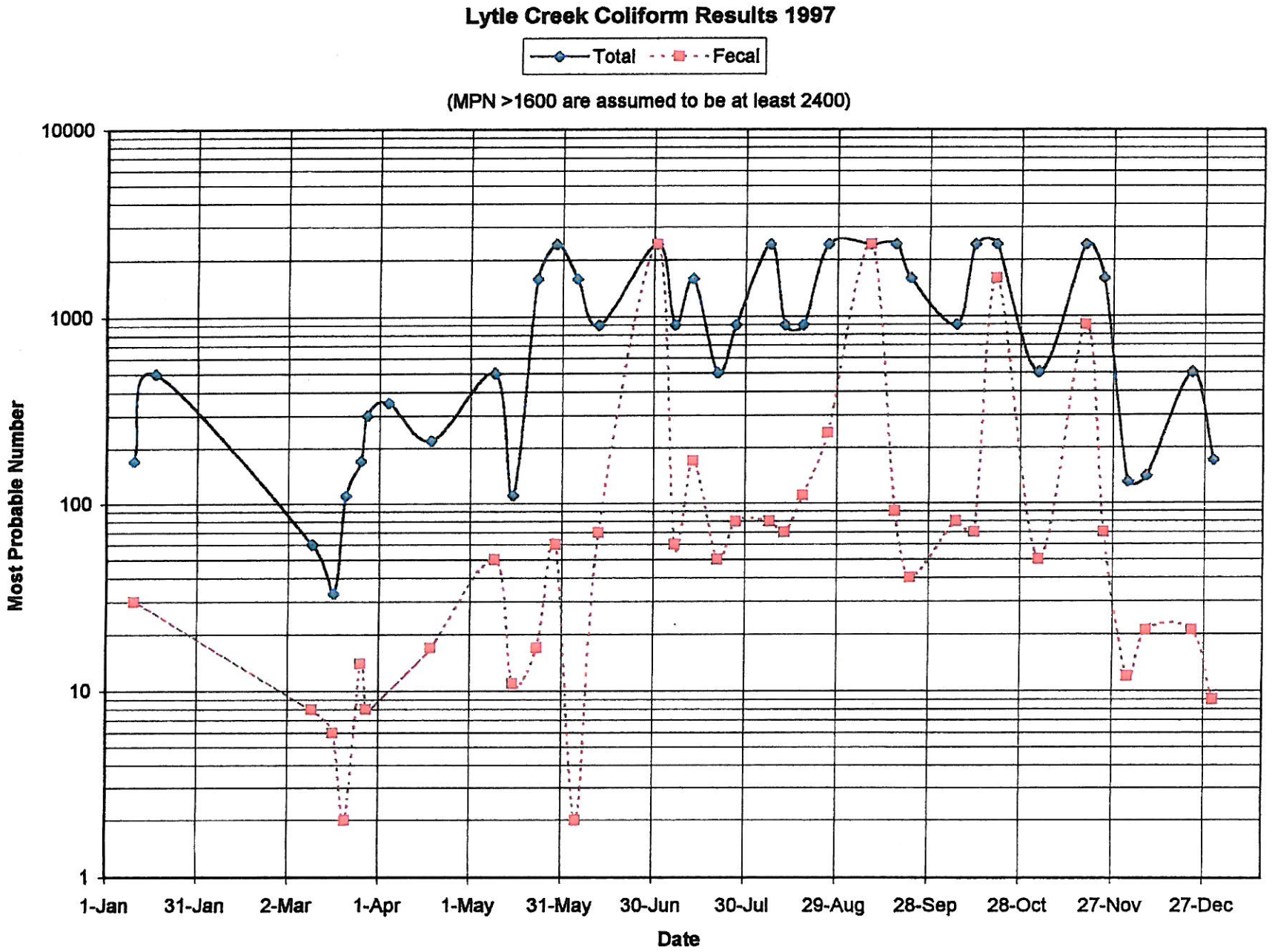
**WEST VALLEY WATER DISTRICT**

Anthony W. Araiza
General Manager

AWA:pa

Figures Attached


Lytle Creek Coliform Results 1996
Total
Fecal
(MPN >1600 are assumed to be at least 2400)
Most Probable Number
10000
1000
100
10
1
1-Jan
31-Jan
2-Mar
1-Apr
1-May
31-May
30-Jun
30-Jul
29-Aug
28-Sep
28-Oct
27-Nov
27-Dec
Date


Lytle Creek Coliform Results 1997
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Fecal
(MPN >1600 are assumed to be at least 2400)
Most Probable Number
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1000
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1
1-Jan
31-Jan
2-Mar
1-Apr
1-May
31-May
30-Jun
30-Jul
29-Aug
28-Sep
28-Oct
27-Nov
27-Dec
Date

## Lytle Creek Coliform Results 1998

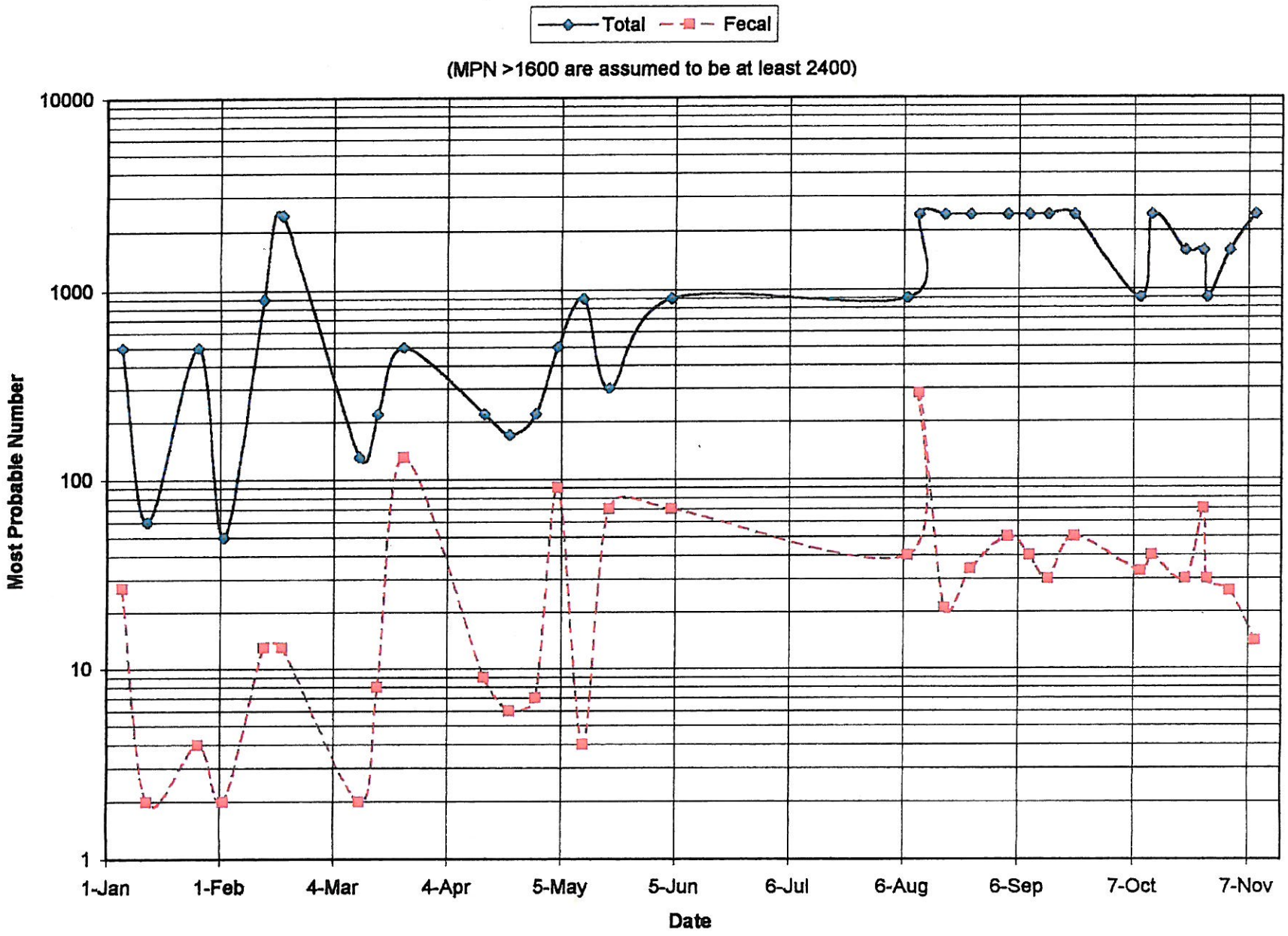
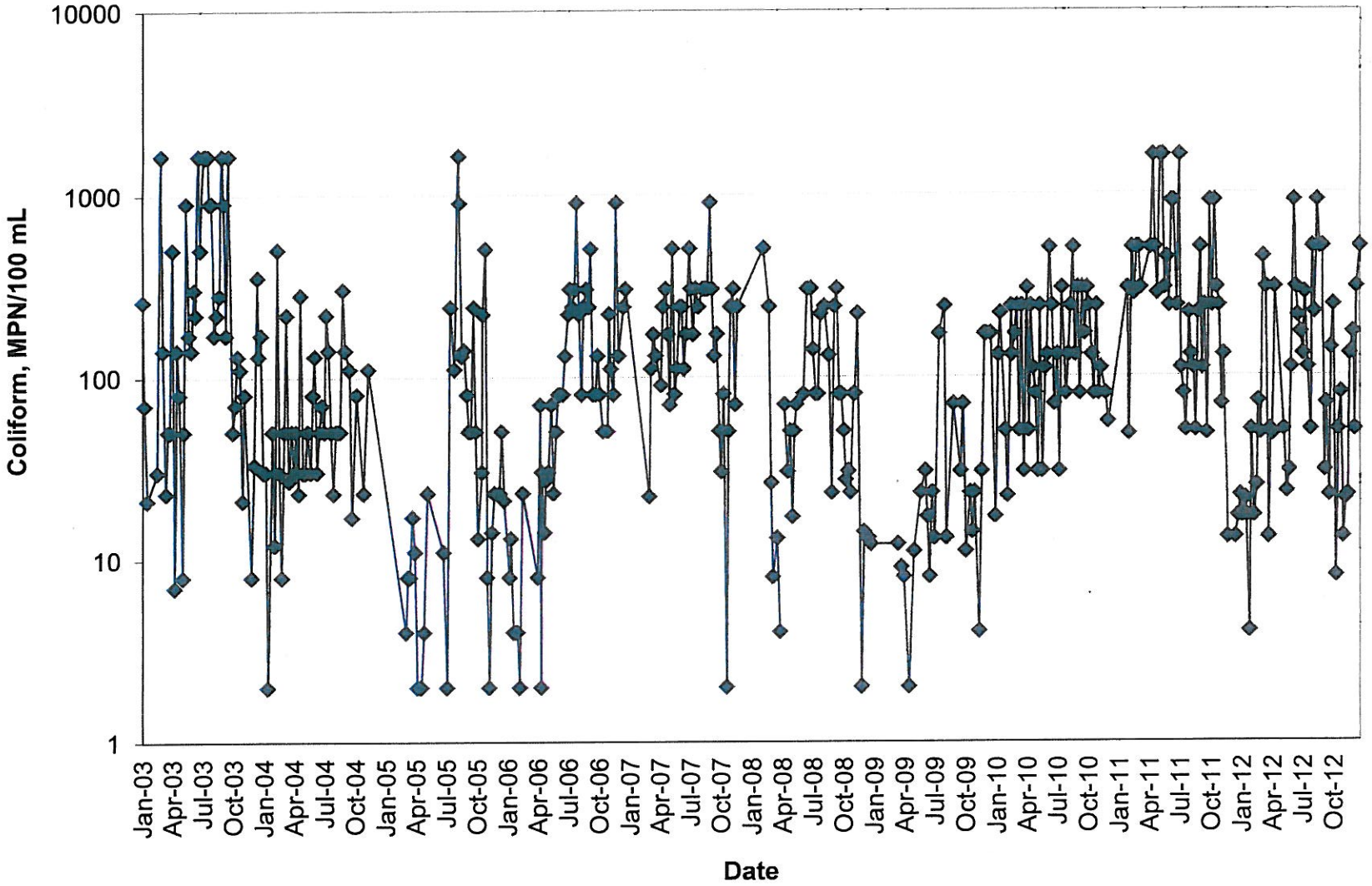


**Figure 4: Total Coliform Levels in Lytle Creek, 2003-2012**



# IDSE Report for Standard Monitoring

## I. General Information

### A. PWS Information:

PWSID: 3610004
PWS Name: West Valley Water District
PWS Address: Ken Sikorski, P.O. Box 920
City: Rialto
State: CA
Zip: 92377
Population Served: 62,400

System Type: CWS
Source Type: Subpart H
Buying/Selling Relationships: Consecutive System

### B: Date Submitted:

April 10, 2009

### C. PWS Operations:

Residual Disinfectant Type: Chlorine
Number of Disinfected Sources: 2 Surface, 20 Ground, 1 Purchased

### D. Contact Person:

Contact Name: Ken Sikorski
Title: Superintendent/Chief Operator
Phone Number: (909)875-1322
Fax Number: (909)875-1361
E-mail Address: ksikorski@wvwd.org

## II. Stage 2 DBPR Requirements

### A. Number of Compliance Monitoring Sites:

| | |
|---|---|
| Highest TTHM: | 3 |
| Highest HAA5: | 3 |
| Existing Stage 1: | 2 |
| TOTAL: | 8 |

**B. Schedule:** Schedule 2

**C. Compliance Monitoring Frequency:** Every 90 days (4 monitoring periods)

## III. Monitoring Results

**A. Did you deviate in any way from your approved standard monitoring plan?**
No.

**B. Where were your TTHM and HAA5 samples analyzed?**

Certified Laboratory: Test America

**C. What method(s) was used to analyze your TTHM and HAA5 samples?**

TTHM: EPA 524.2
HAA5: EPA 552.2

**D. IDSE Standard Monitoring Results - TTHM**

See Attached Table

**E. IDSE Standard Monitoring Results – HAA5**

See Attached Table

**F. Stage 1 DBPR Compliance Monitoring Results - TTHM**

See Attached Table

**G. Stage 1 DBPR Compliance Monitoring Results – HAA5**

See Attached Table

## IV. Justification of Stage 2 DBPR Compliance Monitoring Sites

See Attached Table

## V. Peak Historical Month and Proposed Stage 2 DBPR Compliance Monitoring Schedule

**A. Peak Historical Month:** September

**B. Is your Peak Historical Month the same as in your IDSE Standard Monitoring Plan?**

Yes. The Peak Historical Month in the IDSE Plan was identified as September based on historical TTHM data. Data collected during the one year study for the IDSE and

Stage 1 DBPR resulted in peak TTHM levels occurring in September and peak HAA5 levels occurring in September as well. It is recommended that the sample schedule include March, June. September, and December.

### C. Proposed Stage 2 DBPR Compliance Monitoring Schedule

See Attached Table

## VI. Distribution System Schematic

Attach a schematic of your distribution system if it has changed since you submitted your Standard Monitoring Plan: Not Required.

## VII. Attachments

IDSE Monitoring Results
Stage 1 DBPR Compliance Monitoring Results
Justification of Stage 2 DBPR Compliance Monitoring Sites
Proposed Stage 2 Compliance Monitoring Schedule

Total Number of Pages: 8

## III. D. IDSE Standard Monitoring Results - TTHM

| Site ID | 11/14/2007 | 1/7/2008 | 3/12/2008 | 5/14/2008 | 7/9/2008 | 9/9/2008 | Site LRAA | Site Max | Site Description |
|---|---|---|---|---|---|---|---|---|---|
| A1 | 0 | 0 | 6.1 | 12 | 0 | 0 | 3.0 | 12 | Average residence point |
| A12 | 0 | 0 | 0 | 1.2 | 0 | 0 | 0.2 | 1.2 | Average residence point |
| A18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Average residence point |
| A33 | 5.2 | 0 | 5.4 | 10 | 0 | 17 | 6.3 | 17 | Average residence point |
| A44 | 1.3 | 1.0 | 0 | 3.1 | 1.2 | 0 | 1.1 | 3.1 | Average residence point |
| A49 | 0 | 2.3 | 0 | 1.2 | 0 | 0 | 0.6 | 2.3 | Average residence point |
| 1E | 4.7 | 0 | 2.8 | 7.5 | 13 | 27 | 9.2 | 27 | Near Entry Point |
| 2E | 5.0 | 3.2 | 0 | 1.0 | 1.0 | 0 | 1.7 | 5 | Near Entry Point |
| 3E | 15 | 2.7 | 9.3 | 15 | 22 | 26 | 15.0 | 26 | Near Entry Point |
| 4E | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Near Entry Point |
| H1 | 0 | 0 | 6.7 | 13 | 0 | 0 | 3.3 | 13 | High HAA5 |
| H2 | 0 | 0 | 6.7 | 11 | 0 | 1.2 | 3.2 | 11 | High HAA5 |
| H3 | 4.9 | 0 | 6.4 | 12 | 8.9 | 22 | 9.0 | 22 | High HAA5 |
| H4 | 7.4 | 0 | 7.5 | 2.6 | 0 | 17 | 5.8 | 17 | High HAA5 |
| H6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | High HAA5 |
| H7 | 0 | 0 | 7.7 | 12 | 0 | 0 | 3.3 | 12 | High HAA5 |
| T1 | 0 | 0 | 8.5 | 8.4 | 0 | 0 | 2.8 | 8.5 | High TTHM |
| T2 | 0 | 0 | 7.8 | 11 | 0 | 0 | 3.1 | 11 | High TTHM |
| T3 | 33 | 17 | 17 | 23 | 13 | 53 | 26.0 | 53 | High TTHM |
| T4 | 4.9 | 0 | 7.0 | 11 | 13 | 17 | 8.8 | 17 | High TTHM |
| T5 | 23 | 12 | 8.4 | 16 | 17 | 14 | 15.1 | 23 | High TTHM |
| T6 | 11.0 | 1.0 | 5.3 | 9.8 | 16 | 19 | 10.4 | 19 | High TTHM |
| T14 | 0 | 0 | 0 | 1.0 | 0 | 0 | 0.2 | 1 | High TTHM |
| T35 | 1.0 | 2.2 | 4.6 | 1.6 | 1.2 | 16 | 4.4 | 16 | High TTHM |
| Qtr. Average | 4.9 | 1.7 | 4.9 | 7.6 | 4.4 | 9.6 | | | |

| Site ID | Description |
|---|---|
| A1 | Dearwood Lane @ Road Runner |
| A12 | 6774 Lilac |
| A18 | Randall & Aspen |
| A33 | 2642 N. Maple |
| A44 | 11094 Locust |
| A49 | Baywood, between Larch & Meadow Lark |
| 1E | Reservoir 5-3 Discharge Line |
| 2E | Reservoir 3A-2 Discharge Line |
| 3E | Reservoir 6-3 Discharge Line |
| 4E | Reservoir 4-1 Discharge Line |
| H1 | Brookside Avenue |
| H2 | Laguna Lane |
| H3 | Alder & County Landfill |
| H4 | 1395 Summit |
| H6 | 6633 Fillmore |
| H7 | Sandstone Lane |
| T1 | Mavenwood E. of Coyote Canyon |
| T2 | 15182 Crane |
| T3 | U.S. Forestry Station on Glen Helen Pkwy |
| T4 | Casmalia 600' E of Sierra Avenue Pkwy |
| T5 | White Ash Road |
| T6 | 18433 Bohnert |
| T14 | 477 E. Home |
| T35 | Cedar & La Gloria |

## III. E. IDSE Standard Monitoring Results - HAA5

| Site ID | 11/14/2007 | 1/7/2008 | 3/12/2008 | 5/14/2008 | 7/9/2008 | 9/9/2008 | Site LRAA | Site Max | Site Description |
|---|---|---|---|---|---|---|---|---|---|
| A1 | 0 | 0 | 2.4 | 3.1 | 0 | 0 | 0.9 | 3.1 | Average residence point |
| A12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Average residence point |
| A18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Average residence point |
| A33 | 0 | 0 | 1.6 | 2.1 | 0 | 6.9 | 1.8 | 6.9 | Average residence point |
| A44 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Average residence point |
| A49 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Average residence point |
| 1E | 0 | 0 | 0 | 1.0 | 7.3 | 7.5 | 2.6 | 7.5 | Near Entry Point |
| 2E | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Near Entry Point |
| 3E | 2.5 | 0 | 1.3 | 5.3 | 8.7 | 9 | 4.5 | 9 | Near Entry Point |
| 4E | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Near Entry Point |
| H1 | 0 | 0 | 0 | 3.3 | 0 | 0 | 0.6 | 3.3 | High HAA5 |
| H2 | 0 | 0 | 1.6 | 2.7 | 0 | 0 | 0.7 | 2.7 | High HAA5 |
| H3 | 0 | 0 | 1.3 | 3.6 | 10 | 3.9 | 3.1 | 10 | High HAA5 |
| H4 | 0 | 0 | 1.4 | 0 | 0 | 6 | 1.2 | 6 | High HAA5 |
| H6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | High HAA5 |
| H7 | 0 | 0 | 1.0 | 2.5 | 0 | 0 | 0.6 | 2.5 | High HAA5 |
| T1 | 0 | 0 | 1.8 | 1.7 | 0 | 0 | 0.6 | 1.8 | High TTHM |
| T2 | 0 | 0 | 3.3 | 2.9 | 0 | 0 | 1.0 | 3.3 | High TTHM |
| T3 | 5.6 | 2.6 | 4.5 | 8.8 | 12 | 12 | 7.6 | 12 | High TTHM |
| T4 | 0 | 0 | 3.0 | 2.6 | 10 | 5.6 | 3.5 | 10 | High TTHM |
| T5 | 2.1 | 0 | 1.4 | 7.6 | 8.5 | 7.4 | 4.5 | 8.5 | High TTHM |
| T6 | 1.0 | 0 | 3.1 | 0 | 8.3 | 6.1 | 3.1 | 8.3 | High TTHM |
| T14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | High TTHM |
| T35 | 0 | 0 | 0 | 1.0 | 0 | 5.4 | 1.1 | 5.4 | High TTHM |
| Qtr. Average | 0.5 | 0.1 | 1.2 | 2.0 | 2.7 | 2.9 | | | |

| Site ID | Description |
|---|---|
| A1 | Dearwood Lane @ Road Runner |
| A12 | 6774 Lilac |
| A18 | Randall & Aspen |
| A33 | 2642 N. Maple |
| A44 | 11094 Locust |
| A49 | Baywood, between Larch & Meadow Lark |
| 1E | Reservoir 5-3 Discharge Line |
| 2E | Reservoir 3A-2 Discharge Line |
| 3E | Reservoir 6-3 Discharge Line |
| 4E | Reservoir 4-1 Discharge Line |
| H1 | Brookside Avenue |
| H2 | Laguna Lane |
| H3 | Alder & County Landfill |
| H4 | 1395 Summit |
| H6 | 6633 Fillmore |
| H7 | Sandstone Lane |
| T1 | Mavenwood E. of Coyote Canyon |
| T2 | 15182 Crane |
| T3 | U.S. Forestry Station on Glen Helen Pkwy |
| T4 | Casmalia 600' E of Sierra Avenue Pkwy |
| T5 | White Ash Road |
| T6 | 18433 Bohnert |
| T14 | 477 E. Home |
| T35 | Cedar & La Gloria |

## III. F. Stage 1 DBPR Compliance Monitoring Results - TTHM

| Site ID | 12/11/2007 | 3/7/2008 | 6/12/2008 | 9/18/2008 | Site LRAA | Site Max |
|---|---|---|---|---|---|---|
| 1 | 16 | 14 | 27 | 26 | 20.8 | 27 |
| 50 | 14 | 7.6 | 31 | 25 | 19.4 | 31 |
| 31 | 8.9 | 5.1 | 11 | 14 | 9.8 | 14 |
| 3 | 4.7 | 4.2 | 10 | 14 | 8.2 | 14 |
| 4 | 5.5 | 5.9 | 3.2 | 22 | 9.2 | 22 |
| 34 | 0 | 5.7 | 3.2 | 11 | 5.0 | 11 |
| 7 | 0 | 6.4 | 3 | 22 | 7.9 | 22 |
| 8 | 2.3 | 6.0 | 1.8 | 25 | 8.8 | 25 |
| 9 | 2.4 | 0 | 0 | 26 | 7.1 | 26 |
| 11 | 0 | 5.2 | 0 | 0 | 1.3 | 5.2 |
| 15 | 0 | 0 | 0 | 0 | 0 | 0 |
| 36 | 0 | 1 | 0 | 0 | 0.3 | 1 |
| 13 | 0 | 0 | 0 | 0 | 0.0 | 0 |
| 2 | 0 | 5.7 | 2.8 | 11 | 4.9 | 11 |
| 10 | 0 | 4.5 | 0 | 0 | 1.1 | 4.5 |
| 23 | 5.8 | 1 | 0 | 2.7 | 2.4 | 5.8 |
| 51 | 2.3 | 0 | 0 | 0 | 0.6 | 2.3 |
| 39 | 2.4 | 0 | 0 | 1.3 | 0.9 | 2.4 |
| 30 | 0 | 0 | 0 | 1.3 | 0.3 | 1.3 |
| 27 | 0 | 4.1 | 0 | 1 | 1.3 | 4.1 |
| 47 | 0 | 0 | 0 | 1 | 0.3 | 1 |
| 46 | 0 | 4.1 | 0 | 1.3 | 1.4 | 4.1 |
| 17 | 2.0 | 0 | 0 | 0 | 0.5 | 2 |
| 37 | 5.6 | 2.3 | 4.6 | 2.7 | 3.8 | 5.6 |
| Quarter Average | 3.0 | 3.5 | 4.1 | 8.6 | | |

| Site | Description |
|---|---|
| 1 | 3750 Lytle Creek Road |
| 50 | 3192 Lytle Creek Road |
| 31 | 4152 Tangerine |
| 3 | 3726 Live Oak |
| 4 | 3288 Alder |
| 34 | 1993 Fairview Drive |
| 7 | Maple & Summit |
| 8 | 5556 Sycamore |
| 9 | 2478 Fillmore |
| 11 | 6288 Apple |
| 15 | 871 E. Winchester |
| 36 | 872 W. Schallert |
| 13 | 213 E. Walnut |
| 2 | 6075 Sierra Avenue |
| 10 | 6064 Geremander |
| 23 | 17673 Santa Ana |
| 51 | 10010 Olive Street |
| 39 | 900 N. Pepper |
| 30 | 11868 Pepper |
| 27 | Hall & Kinningham |
| 47 | Riverside & Resource Drive |
| 46 | 1305 Castellano |
| 17 | Randall & Cactus |
| 37 | Via Montana & Via Bonita |

## III. G. Stage 1 DBPR Compliance Monitoring Results - HAA

| Site ID | 12/11/2007 | 3/7/2008 | 6/12/2008 | 9/18/2008 | Site LRAA | Site Max |
|---|---|---|---|---|---|---|
| 1 | 3.9 | 4.5 | 11 | 4.1 | 5.9 | 11 |
| 50 | 3.2 | 1.6 | 10 | 4.4 | 4.8 | 10 |
| 31 | 0 | 1.3 | 2 | 1.5 | 1.2 | 2 |
| 3 | 0 | 1.2 | 2 | 1.6 | 1.2 | 2 |
| 4 | 0 | 2.9 | 1.2 | 2.1 | 1.6 | 2.9 |
| 34 | 0 | 3.3 | 1.1 | 1.4 | 1.5 | 3.3 |
| 7 | 0.0 | 2.9 | 0 | 3.8 | 1.7 | 3.8 |
| 8 | 0 | 2.9 | 1.2 | 4.1 | 2.1 | 4.1 |
| 9 | 0 | 0 | 0 | 4.1 | 1.0 | 4.1 |
| 11 | 0 | 2.7 | 0 | 0 | 0.7 | 2.7 |
| 15 | ND | 0 | 0 | 0 | 0 | 0 |
| 36 | 0 | 0 | 0 | 0 | 0 | 0 |
| 13 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | 0 | 2.8 | 3.4 | 3.1 | 2.3 | 3.4 |
| 10 | 0 | 3.1 | 0 | 0 | 0.8 | 3.1 |
| 23 | 0 | 0 | 0 | 0 | 0 | 0 |
| 51 | 0 | 0 | 0 | 0 | 0 | 0 |
| 39 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 | 0 | 0 | 0 | 0 | 0 | 0 |
| 27 | 0 | 0 | 0 | 0 | 0 | 0 |
| 47 | 0 | 0 | 0 | 0 | 0 | 0 |
| 46 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17 | 0 | 0 | 0 | 0 | 0 | 0 |
| 37 | 0 | 0 | ND | 0 | 0 | 0 |
| Quarter Average | 0.3 | 1.2 | 1.4 | 1.3 | | |

| Site | Description |
|---|---|
| 1 | 3750 Lytle Creek Road |
| 50 | 3192 Lytle Creek Road |
| 31 | 4152 Tangerine |
| 3 | 3726 Live Oak |
| 4 | 3288 Alder |
| 34 | 1993 Fairview Drive |
| 7 | Maple & Summit |
| 8 | 5556 Sycamore |
| 9 | 2478 Fillmore |
| 11 | 6288 Apple |
| 15 | 871 E. Winchester |
| 36 | 872 W. Schallert |
| 13 | 213 E. Walnut |
| 2 | 6075 Sierra Avenue |
| 10 | 6064 Geremander |
| 23 | 17673 Santa Ana |
| 51 | 10010 Olive Street |
| 39 | 900 N. Pepper |
| 30 | 11868 Pepper |
| 27 | Hall & Kinningham |
| 47 | Riverside & Resource Drive |
| 46 | 1305 Castellano |
| 17 | Randall & Cactus |
| 37 | Via Montana & Via Bonita |

**IV. Justification of Stage 2 DBPR Compliance Monitoring Sites**

| Stage 2 Compliance Monitoring Site ID | Site Type | Justification |
|---|---|---|
| Site 13 - 213 E. Walnut | High TTHM | This was the first site selected. This is an alternative site to site T3 which has the highest locational running annual average (LRAA) for TTHM and HAA5. Per DPH, site T3 was not selected due to a possible dead end. DPH requested site 13 to provide better geographical coverage. Site 13 is located in pressure zone 4. |
| Site 1 - 3750 Lytle Creek Road | High HAA5 | This was the second site selected and it has the second highest LRAA for TTHM and HAA5. It is located in pressure zone 8. |
| Site T2 - 15182 Crane | Stage 1 DBPR | This was the third site selected. This is an alternative site to the third highest LRAA for HAA5 (site 50). Site 50 was not selected as it is in close proximity to site 1 which was previously selected. In order to provide greater geographic coverage, DPH requested site T2 which is located in pressure zone 6. |
| Site T5 - White Ash Road | High TTHM | This was the fourth site selected and it has the fourth highest LRAA for TTHM and HAA5. It is located in pressure zone 7. |
| Site 3E - Reservoir 6-3 Discharge Line | High TTHM | This was the fifth site selected and it has the fifth highest LRAA for TTHM and HAA5. This is the entry point site for surface water treated at the Roemer WTP prior to the first service connection in pressure zone 6. |
| Site T6 - 18433 Bohnert | High HAA5 | This was the sixth site selected. This is an alternative site to the sixth highest LRAA for HAA5 (site T4) in order to provide greater representation of the pressure zones, as site T4 is in pressure zone 6 which is already covered by site 3E . Site T6 is the seventh highest LRAA for HAA5 and the sixth highest LRAA for TTHM and is located in pressure zone 5. |
| Site 37 - Via Montana and Via Bonita | Stage 1 DBPR | This was the seventh site selected. This is an alternative site to the seventh highest LRAA for TTHM (site 31) in order to provide greater geographic coverage and greater representation of the pressure zones. Site 37 has the highest LRAA for TTHM in pressure zone 3. |
| Site 27 - Hall & Kinningham | High HAA5 | This was the eighth site selected. This is an alternative site to the eighth highest LRAA for HAA5 (site 1E) in order to provide greater geographic coverage and greater representation of the pressure zones. Site 27 has the highest LRAA for TTHM in pressure zone 2. |

**VI. Proposed Stage 2 DBPR Compliance Monitoring Schedule**

| | Projected Sampling Date (Day or Week) | | | |
|---|---|---|---|---|
| Stage 2 Compliance Monitoring Site ID | Period 1 | Period 2 | Period 3 | Period 4 |
| Site 13 - 213 E. Walnut | Second Week of September, 2012 | Second Week of December, 2012 | Second Week of March, 2013 | Second Week of June, 2013 |
| Site 1 - 3750 Lytle Creek Road | Second Week of September, 2012 | Second Week of December, 2012 | Second Week of March, 2013 | Second Week of June, 2013 |
| Site T2 - 15182 Crane | Second Week of September, 2012 | Second Week of December, 2012 | Second Week of March, 2013 | Second Week of June, 2013 |
| Site T5 - White Ash Road | Second Week of September, 2012 | Second Week of December, 2012 | Second Week of March, 2013 | Second Week of June, 2013 |
| Site 3E - Reservoir 6-3 Discharge Line | Second Week of September, 2012 | Second Week of December, 2012 | Second Week of March, 2013 | Second Week of June, 2013 |
| Site T6 - 18433 Bohnert | Second Week of September, 2012 | Second Week of December, 2012 | Second Week of March, 2013 | Second Week of June, 2013 |
| Site 37 - Via Montana and Via Bonita | Second Week of September, 2012 | Second Week of December, 2012 | Second Week of March, 2013 | Second Week of June, 2013 |
| Site 27 - Hall & Kinningham | Second Week of September, 2012 | Second Week of December, 2012 | Second Week of March, 2013 | Second Week of June, 2013 |