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Lawrence Livermore National Laboratory
Livermore Site

Annual Storm Water Monitoring Report for Waste Discharge Requirements 95-174

Annual Report
2006 – 2007

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Lawrence Livermore National Laboratory Livermore Site Annual Storm Water Monitoring Report for WDR 95-174

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Acronyms and Definitions

Ag	agricultural use
ALPE	Arroyo Las Positas East (storm water influent sampling location)
ALPO	Arroyo Las Positas Outfall (storm water influent sampling location)
ASS2	Arroyo Seco South (storm water influent sampling location)
ASSE	Arroyo Seco Southeast (storm water influent sampling location in East Avenue drainage ditch)
ASW	Arroyo Seco West (storm water effluent sampling location)
AWQC	ambient water quality criteria
B	Building
BMP	best management practice
Bq/L	becquerel/liter
CA	California
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980
Directorates	LLNL's highest level organizational unit reporting to the Lab Director
DI	deionized water
DOE	Department of Energy
DRB	Drainage Retention Basin
EPD	Environmental Protection Department
ERD	Environmental Restoration Division
FY	fiscal year (October through September)
GRNE	Greenville Road East (storm water influent sampling location)
RHWM	Radiological Hazardous Waste Management
IH	Industrial hygienist
LCW	Low conductivity water
LLNL	Lawrence Livermore National Laboratory
LOEC	lowest observed effects concentration
MCL	maximum contaminant level
mg/L	milligrams per liter
M&O	Maintenance and Operation
MSDS	Material Safety Data Sheet
na	not analyzed
NIF	National Ignition Facility
NOEC	no observed effects concentration
NPDES	National Pollutant Discharge Elimination System
O & G	oil and grease
pCi	picocurie
PMCL	primary maximum contaminant level
QA/QC	quality assurance/quality control
RQ	reportable quantity
SC	specific conductance
SFBRWQCB	San Francisco Bay Regional Water Quality Control Board
SI	systèm internationale
SM	standard method
SWAR	Storm Water Annual Report
SWPPP	Storm Water Pollution Prevention Plan
T	trailer
TDS	total dissolved solids
TOC	Total organic carbon
TSS	total suspended solids
U.S. EPA	United States Environmental Protection Agency
WDR	Waste Discharge Requirements
WGMG	Water Guidance and Monitoring Group
WPDC	West Perimeter Drainage Channel (storm water effluent sampling location)

EXECUTIVE SUMMARY

Results of the storm water quality monitoring program at Lawrence Livermore National Laboratory (LLNL) in Livermore, California are reported as required in the Waste Discharge Requirements (WDR) 95-174, National Pollutant Discharge Elimination System (NPDES) Permit No. CA0030023. This report presents results for the 2006–2007 water year including: the Storm Water Pollution Prevention Plan (SWPPP) facility inspection results, wet and dry season observations, storm water discharge analytical data, and a summary interpretation of the data. The storm water monitoring program at LLNL goes beyond the requirements of the Permit by sampling at more locations and for more parameters than the Permit requires. This additional monitoring is called for under the environmental monitoring requirements of various DOE Orders. Furthermore, LLNL investigates water quality parameters that are found to be above historic levels as demonstrated by the site-specific threshold comparison criteria.

The facility inspection results indicated a few minor instances at the Livermore site in which best management practices (BMPs) listed in the SWPPP were not properly implemented, but that corrective actions have either been made or are in progress. Other than minor changes in water color (increased turbidity) observed at upstream sampling locations, storm water observations did not identify any issues. Although there are no numeric effluent limits placed on storm water discharges, data are compared with various criteria to determine if water quality remains similar to natural or upstream conditions. Acute and chronic fish toxicity testing indicated no toxicity in effluent storm water samples. Some chemical constituents of storm water samples, mostly inorganics and pesticides, were above LLNL site-specific threshold comparison criteria. All of the data that exceeded LLNL site-specific thresholds during 2006–2007 are attributed to off-site activities upstream of the Laboratory. All tritium results were less than comparison criteria and the drinking water maximum contaminant level (MCL). These monitoring results suggest that operations at the LLNL Livermore site during 2006–2007 did not impact storm water quality.

1.0 Introduction

Storm water monitoring quality results for the LLNL Livermore site are summarized, fulfilling the annual reporting requirements of WDR 95-174, issued by the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) on August 23, 1995, (hereafter referred to as "the Permit"). The Permit expired on August 23, 2000. LLNL submitted a Report of Waste Discharge (and an NPDES permit application) to renew the Permit on February 18, 2000, meeting the requirement to submit a renewal application 180 days in advance of permit expiration. SFBRWQCB staff confirmed the administrative continuance in November 2000 (Morse 2000).

LLNL consists of two sites: the Livermore site located along the eastern border of the City of Livermore and the Experimental Test Site (Site 300) located in the Altamont Hills southwest of Tracy. This report discusses the results of the 2006–2007 Livermore site storm water monitoring program.

The Livermore site is a 3.28-km^2 facility that is crossed by two intermittent streams, Arroyo Las Positas and Arroyo Seco. The average annual rainfall at the Livermore site is 35.6 cm; whereas the rainfall this season was 23.1 cm. Monthly rainfall totals are presented in **Table 1**. LLNL monitors influent and effluent water quality as required by the Permit. The six perimeter storm water sampling locations are shown in **Figure 1**, along with three internal monitoring locations around the Drainage Retention Basin, now renamed Lake Haussmann on site.

Table 1. Monthly rainfall totals (in cm) collected at the LLNL site meteorological station

Date	**Monthly Total** (cm)
May 2005	0.08
June 2005	0.00
July 2005	0.00
August 2005	0.00
September 2005	0.00
October 2005	0.46
November 2005	4.37
December 2005	5.62
January 2006	0.86
February 2006	9.3
March 2006	1.00
April 2006	1.41
Water Year TOTAL	**23.10**

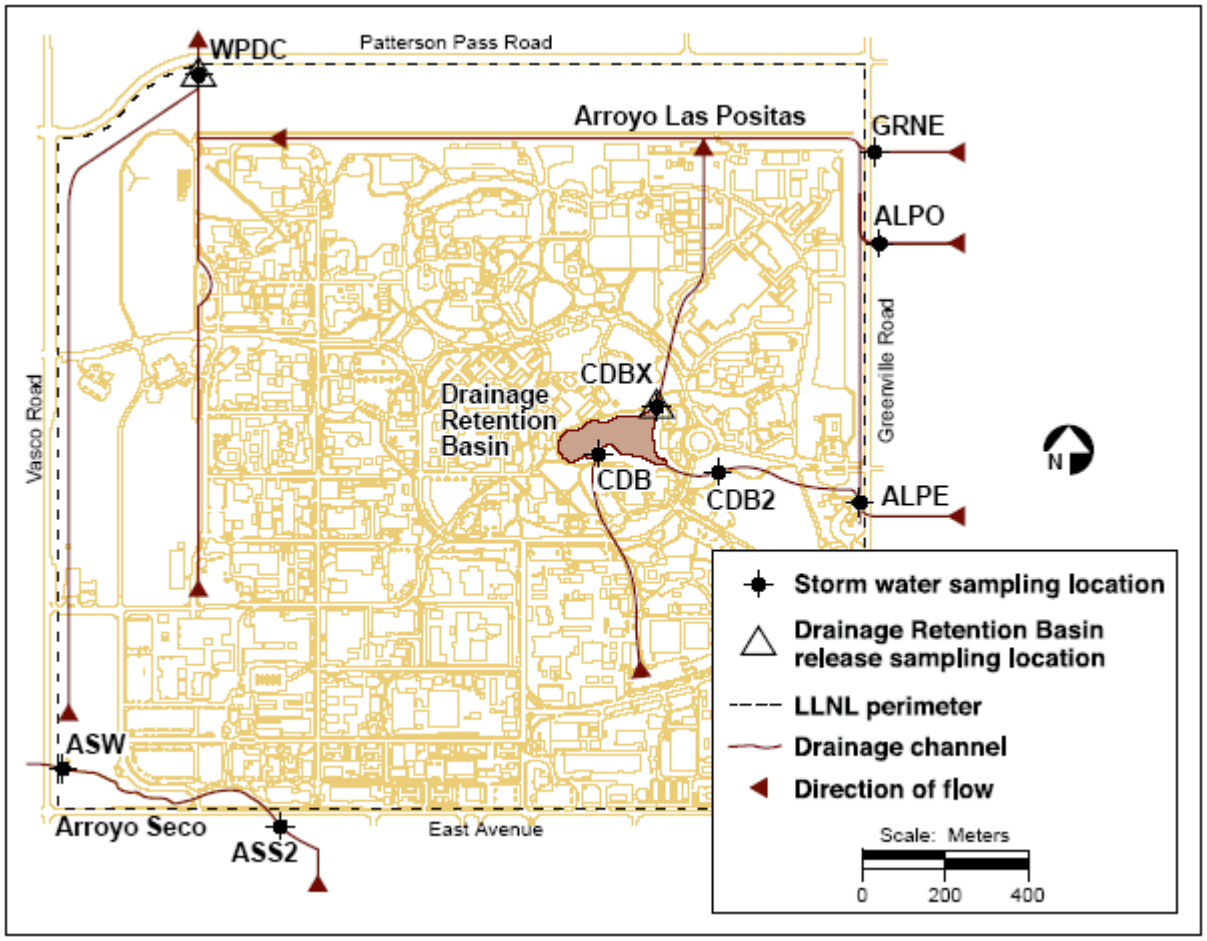

Figure 1. Routine storm water sampling and observation locations

2.0 Nonstorm Water Discharges

The SFBRWQCB issued the Permit to LLNL, allowing storm water discharges associated with industrial activities and four categories of nonstorm water discharges, including mechanical equipment sources (e.g., air conditioners), building and grounds maintenance (e.g., landscape irrigation), fire suppression and safety systems (e.g., hydrant testing), and water systems (e.g., backflow preventors). In addition, the Permit allows LLNL to administratively control several building conduits that remain open because they are impractical to seal.

LLNL tracks authorized nonstorm water discharge sources through the Building Drain Management database and key plans, and an internal drain connection permitting process. As required by the Permit, Provision C.8, LLNL evaluates all new construction, remodeling, and equipment upgrades to determine if it is practical to eliminate permitted discharge sources. If it is practical to do so, the discharge is eliminated. Modifications that result in new connections to building conduits are added to the Building Drain Management database.

Authorized nonstorm water discharge sources and open building conduits are included in LLNL's Dry Season Observation Program. These observations help LLNL

verify that the BMPs applied to these discharge sources continue to be properly implemented. Areas in the Dry Season Observation Program include secondary containment areas, loading and receiving areas, floor drains open to the storm drainage system, and automatic sump pumps. These locations and observation results are discussed in detail in this report in **Section 4.0**, Visual Observations. Nonroutine releases are summarized in **Appendix A**, **Table A-1**. This table includes unplanned releases reportable under the Permit, Provision C.1, and nonroutine releases allowed under the Permit but requiring prior notification under Provision C.7.

3.0 Annual Site Inspections

Each of the Directorates (LLNL's high level organizational unit) at LLNL conducts an annual inspection of its facilities to verify implementation of the SWPPP and ensure that measures to reduce pollutant loading to storm water runoff are adequately and properly implemented. The Associate Directors for each of the Directorates certify that their facilities comply with the provisions of the Permit and the SWPPP. Each Directorate documents and keeps on file the annual inspection results (as required by the Permit). These records include the dates, places, and times of the site inspections and the names of individuals performing the inspections. Because of the large number of facilities inspected (more than 500 buildings and trailers), the detailed inspection results are not included in this report, but the individual inspection records are available for submittal or review upon request. All inspections were completed; findings and deficiencies are summarized in **Appendix A**, **Table A-2**.

A few minor issues were identified in the annual SWPPP inspections. All of these issues have either been corrected or are in progress of being corrected as described in **Table A-2.** All other inspections indicated that the applicable BMPs were implemented correctly and adequately.

4.0 Visual Observations

Dry season observations were performed and are provided in **Appendix A**, **Table A-3**. The Permit requires that observations be conducted at least twice during the dry season (May through September). These observations occurred on June 27 and September 21, 2006, at storm water effluent sampling locations (**Figure 1**, ASW and WPDC), at storm water influent sampling locations (**Figure 1**, ASS2, ALPE, ALPO, and GRNE), at areas with a "high potential" of storm water pollution, and at nonstorm water discharge locations, to determine the presence of stains, sludges, odors, and other anomalous conditions. "High potential" areas include areas with automatic (e.g., sump pumps) or direct connections to the surface and areas where activities may result in accidental releases to the surface (e.g., loading/receiving areas and open rinse areas).

To determine the "high potential" areas, LLNL compiled and categorized potential storm water pollution areas, using information from the following sources:

- *LLNL Livermore Site Annual Storm Water Monitoring Report* (Brandstetter 1994).
- LLNL's Building Drain Management Database.
- LLNL's *Report of Waste Discharges*, March 1995 (Mathews and Welsh 1995).
- LLNL's Observation Records.

LLNL then conducted inspections, visual observations, and assessments of these potential areas for storm water pollution. Areas determined as "high potential" are included in the dry season observation program as follows:

- Arroyo Seco and Arroyo Las Positas (observations conducted at influent and effluent locations).
- Avenue K storm drain.
- Automatic sump pump area at Building 191.
- Loading/receiving areas in Buildings 194 and 341.
- Concrete wash area near Parking Lot F-2.
- Floor drain areas open to the environment in Buildings 111, 194, 391, and 551.

During this reporting period, the dry season observations did not identify any unusual discharges. Observed evidence of flow at some locations was from discharges of treated groundwater allowed under the *Comprehensive Environmental Response, Compensation and Liability Act* (*CERCLA) Record of Decision* (US Department of Energy 1992). All indications of nonstorm water flows were attributable to permitted discharges or natural sources.

Wet season observations are summarized in **Appendix A**, **Table A-4.** The Permit requires that wet season observations be conducted monthly during the wet season (October 2006 through April 2007) when significant storm events occur (a significant storm is defined as runoff lasting more than one hour). These observations are conducted at storm water influent and effluent sampling locations. Observations often indicated turbidity at both influent and effluent locations, but no unusual conditions or anomalies were observed. Because of lower-than-normal rainfall during this wet season, these observations occurred in December 2006 and February 2007. Observations were also conducted for the months of October and November 2006 and January, March, and April 2007. However, due to storm events not occurring or occurring during non-work hours, these observations did not coincide with a significant storm event.

5.0 Storm Water Sampling and Analysis

The Permit requires collection of two samples each wet season at effluent locations ASW and WPDC, and at influent locations ALPE, ALPO, ASS2, and GRNE. Permit-driven storm water samples were collected on December 12, 2006 and February 22, 2007. Samples were collected as soon as possible after runoff began (most within the first hour). Water quality data from these 2006–2007 storm water samples are presented in **Appendix A**, **Tables A-5** and **A-6**. Quality assurance and quality control (QA/QC) checks are performed on all sampling and analysis from LLNL. All data analysis included standard QA/QC practices. LLNL reports on QA annually in the Site Annual Environmental Report (e.g., Peterson et al. 2006); this information is available upon request.

There are currently no numeric limits for storm water effluent. Therefore, site-specific comparison criteria were developed from historical data to identify out-of-the ordinary data values (**Table 2**). These criteria are used to identify data values that require further investigation and explanation. In addition to the Livermore site-specific comparison criteria, storm water results are compared to other published values, including: United States Environmental Protection Agency (U.S. EPA) benchmarks; *The Water Quality Control Plan, San Francisco Bay Basin (Region 2)* (Basin Plan) (SFBRWQCB 1995); US EPA and State MCLs and Ambient Water Quality Criteria (AWQC). Although these latter criteria were established for other regulatory programs, use of a broad range of criteria can help LLNL evaluate the quality of Livermore site

storm water effluent. If a measured concentration is found to be higher than the comparison criteria, but the value is the same or higher at the influent location, the source is assumed to be unrelated to Livermore site operations; therefore, further analysis is not warranted.

Table 2. Livermore site-specific threshold comparison criteria for storm water constituents of concern

Parameter	Comparison criteria
Total suspended solids (TSS)	750 mg/L [a]
Chemical oxygen demand (COD)	200 mg/L [a]
pH	<6.0, >8.5 [a]
Nitrate (as NO_3)	10 mg/L [a]
Ortho-phosphate	2.5 mg/L [a]
Beryllium	1.6 μg/L [a]
Chromium(VI)	15 μg/L [a]
Copper	36 μg/L [a]
Lead	15 μg/L [b]
Mercury	Above RL [c]
Zinc	350 μg/L [a]
Diuron	14 μg/L [a]
Oil and grease	9 mg/L [a]
Tritium	36 Bq/L [a]
Gross alpha	0.34 Bq/L [a]
Gross beta	0.48 Bq/L [a]

Note: The sources of values above these are examined to determine if any action is necessary.

a Site-specific value calculated from historical data and studies. These values are lower than the MCLs and EPA benchmarks except for zinc, TSS, and COD

b California and EPA drinking water action level

c RL = reporting limit = 0.0002 mg/L for mercury

5.1 Toxicity monitoring

As required by the Permit, grab samples were collected from the site storm water effluent location, WPDC, and analyzed for acute and chronic toxicity using fathead minnows (*Pimephales promelas*) as the test species. In the acute test, 96-hour survival is observed in undiluted storm water collected from location WPDC. The Permit states that an acceptable survival rate is 20 percent lower than a control sample. If the acute toxicity test is failed, the Permit requires LLNL to conduct toxicity testing during the next significant storm event. After failing two consecutive tests, LLNL must perform a toxicity reduction evaluation to identify the source of the toxicity.

The December 12, 2006 96-hr acute toxicity test results showed no toxicity (100 percent survival, compared to 100 percent survival in the lab control sample) in fathead minnow at the effluent location WPDC (**Table 3a**). In the 7-day chronic fish toxicity test, storm water dilutions at 0 (Lab Control), 12.5, 25, 50, 75, and 100 percent (undiluted storm water at WPDC) were used to determine a dose-response relationship, if any, for both survival and growth of the fathead minnow (**Table 3b**). These tests are required

only at effluent location WPDC and are not conducted with water from corresponding influent locations. The testing laboratory provides water for the control sample, which consists of EPA synthetic moderately-hard water. From these data, no observed effect concentrations (NOECs) and lowest observed effect concentrations (LOECs) were calculated. The NOECs and LOECs for survival and growth were both 100 percent. The results demonstrate that no observed toxicity in storm water was related to operations at LLNL.

Table 3a. Single point acute fish toxicity test results for December 12, 2006

Location	Influent or Effluent	% Survival
		Replicate A
Lab Control	EPA synthetic "moderately hard" water	100
WPDC	Site Effluent	100

Table 3b. Chronic fish toxicity test results for December 12, 2006, at WPDC

Sample	7-day survival	7-day weight[a]
Concentration (%)	**Avg. (%)**	**Avg. (mg)**
Lab Control	100	0.33
12.5	87.5	0.35
25	95	0.33
50	85	0.37
75	100	0.42
100	95	0.37

[a] Weight of the fathead minnows at the end of the 7-day toxicity test.

5.2 Nonradioactive parameters

Table 4 contains the nonradioactive constituents that exceeded the threshold comparison criteria in **Table 2** during storms sampled in 2006–07 (full results are in **Tables A-5** and **A-6**). There were instances during 2006–07 when a nonradioactive parameter in a storm water sample exceeded LLNL specific comparison criteria listed in **Table 4**. Upstream activities near the Livermore site on the Arroyo Seco and Arroyo Las Positas include another scientific research institution, grape vineyards, an electrical transfer station, and cattle ranching that are potential sources for copper, diuron, and nitrate concentrations listed in **Table 4**.

Table 4. Constituents in storm water greater than the LLNL-specific threshold comparison criteria

Constituent	Date (2006/2007)	Location	Influent or Effluent	Result	LLNL threshold Criteria
Nonradioactive Parameters					
Chromium(VI)	12/12	GRNE	Influent	32 μg/L	15 μg/L
Copper	2/22	ALPO	Influent	73 μg/L	36 μg/L
Diuron	12/12	WPDC	Effluent	18 μg/L	14 μg/L
Diuron	12/12	ALPO	Influent	620 μg/L	14 μg/L
Diuron	2/22	ALPO	Influent	70 μg/L	14 μg/L
Diuron	2/22	GRNE	Influent	97 μg/L	14 μg/L
Diuron	2/22	ALPE	Influent	400 μg/L	14 μg/L
Diuron	2/22	CBD2	Internal	25 μg/L	14 μg/L
Nitrate (as NO3)	12/12	GRNE	Influent	16.0 mg/L	10 mg/L
Nitrate (as NO3)	2/22	GRNE	Influent	22.0 mg/L	10 mg/L
Total Suspended Solids (TSS)	2/22	ALPO	Influent	1300 mg/L	750 mg/L
Radioactive Parameters					
Gross Beta	2/22	ALPO	Influent	0.903±0.196 Bq/L	0.48 Bq/L
Gross Alpha	2/22	ALPO	Influent	0.396±0.211 Bq/L	0.34 Bq/L

Most of the diuron concentrations found to exceed LLNL-specific comparison criteria of 14 $\mu g/L$ occur at influent locations and thus originate off-site. One result for storm water samples collected on December 12th exceeded the LLNL-specific diuron threshold at an effluent location WPDC. Diuron concentration in a sample collected from the influent ALPO on that day was 620 $\mu g/L$, explaining the elevated value at the effluent sampling location, WPDC. An elevated diuron value (25 $\mu g/L$) was also observed at the internal CDB2 on February 22nd. Sampling location CDB2 is just downstream from the influent sampling location ALPE (**Figure 1**), where the diuron concentration in a sample collected on the same date was more than an order of magnitude greater (400 $\mu g/L$). Diuron is used on site as a pre-emergent herbicide and is commonly applied at off-site locations upstream of the Livermore Site. Elevated diuron concentrations from upstream sampling locations have been observed every year for the last seven wet seasons and were first observed in 2001 (Campbell et al. 2004). A source investigation identified an upstream source which was notified by LLNL staff. All of the occurrences of elevated diuron in storm water samples during this water year appear to originate from upstream, off-site sources and are unrelated to LLNL operations.

Last year (2005-06) an unusual pesticide (chloropropham) was detected in storm water samples from five sampling locations (Campbell and Brunckhorst, 2006). LLNL does not use this herbicide, nor is it currently allowed for common use (limited to "Special Local Needs") by the Federal Insecticide Fungicide and Rodenticide Act (FIFRA) Section 24(c) (US EPA 1996). LLNL continued to monitor for this pesticide during 2006–07 and it was not detected in any samples. It is possible that the original data resulted from handling or analytical errors at the contract laboratory.

Nitrate and chromium concentrations above our comparison criteria were found in samples collected from GRNE on January 12th and February 22nd (**Table 4**). GRNE is

an influent location and therefore the elevated nitrate chromium values are not related to LLNL activities.

An elevated TSS value in water samples from influent location ALPO on February 22nd was also observed to be the result of off-site upstream activities performed by groups unrelated to LLNL (**Table 4**). The elevated TSS on this date at ALPO is the likely explanation for the elevated copper concentration in this water sample. Copper may exist in both the dissolved and particulate portions of the storm water runoff and the analytical results are reported for total metals in the water sample. Again, given that this is an influent sampling location the copper appears to be unrelated to LLNL operations.

5.3 Radioactive parameters

Environmental measurements are reported in *Système Internationale* (SI) units. The SI unit for radioactivity is the becquerel (Bq), equal to 1 nuclear disintegration per second. The more commonly used unit, picocurie (pCi), is equal to 1 nuclear disintegration per 27 seconds. Results for gross alpha, gross beta, and tritium activities from storm water samples collected during 2006-07 are included in **Appendix A**, **Tables A-5** and **A-6**.

The elevated TSS value, discussed above, likely caused the elevated gross alpha and gross beta results on February 22nd in samples collected from ALPO (**Table 4**). Many radioactive particles are more likely to be associated with sediments and storm water samples are unfiltered, and analyzed for total activity.

LLNL began analyzing storm water for plutonium in runoff in 1998. Samples were analyzed from the Arroyo Seco and Arroyo Las Positas effluent locations (ASW and WPDC). The plutonium activities measured in samples from WPDC and ASW on December 12, 2006 and February 22, 2007 were below detection limit (0.0037 Bq/L, or 0.100 pCi/L).

6.0 Summary and Conclusions

The storm water monitoring program at LLNL goes beyond the requirements of the Permit by sampling at more locations and for more parameters than the Permit requires. This additional monitoring is called for under the environmental monitoring requirements of various DOE Orders. Furthermore, LLNL investigates water quality parameters that are found to be above historic levels as demonstrated by the site-specific comparison criteria in **Table 2**.

Storm water observations were performed monthly during the wet season and quarterly during the dry season, with no major deficiencies noted. Inspections of best management practices (BMPs) listed in the SWPPP revealed some areas for improvement, for which corrective actions have either been made or are in progress.

A few nonradioactive parameters were above the LLNL site-specific threshold comparison criteria (**Table 4**). Most of these elevated results were at influent locations. The analytical results exceeding LLNL's site-specific comparison criteria in a water sample from an effluent and one from an internal sampling location clearly originated upstream and are unrelated to activities on the Livermore Site. The acute and the chronic fish toxicity tests showed no toxicity in LLNL storm water effluent. These monitoring results suggest that operations at the LLNL Livermore site during 2006–2007 did not impact storm water quality.

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APPENDIX A TABLES

A-1. Summary of nonroutine releases May 2006–April 2007

Date of incident	Location	Type of incident
5/12/06	South side of B241 parking lot	An aerosol can of LPS-brand petroleum distillates rolled off of a table in the receiving bay into the parking lot, where it leaked a couple of ounces onto the parking lot asphalt. Technicians cleaned up the spill and none of the product entered the storm drain.
6/26/06	291 Cooling Tower Yard	About 1 gallon of diesel fuel was released to asphalt while a diesel generator was being moved. The fuel was immediately covered with dry sorb and cleaned up; the used dry sorb was managed as hazardous waste. No diesel fuel was released to the storm drain system.
6/28/06	B682 (NIF)	At approximately 8:15 a.m. a water leak from boiler lines leading from the NIF Central Plant, B-682 was reported. The leak rate was estimated at 2.5 GPH and may have started as early as 6:00 p.m. on 6/27/06 when moisture was observed on insulation surrounding the leaking pipe flanges. As much as 35 gallons of treated boiler water may have been released to gravel and soil in the small cut-out area (approximately 4 square feet) in the asphalt approach to B-682. The water leaking from the piping was diverted to the sanitary sewer drain in the B-682 utility pad and absorbent materials were placed on the exposed gravel and soil to absorb the released water and any water which may not have been directed to the sanitary sewer. Additionally, the affected area was cordoned off to prevent exposure of personnel and to prevent the spread of the released material by pedestrian or vehicular traffic. The boiler water is treated with an anti-corrosion agent (Chemtreat BL-1821) consisting of less than 25% sodium nitrite and less than 5% sodium tetraborate. The pH of the released water was determined to be between 9 and 10 using pH paper. The concentration of the anti-corrosion agent in the boiler water was 900 ppm, or less than 0.1%. The affected gravel and soil was removed and along with the affected insulation and absorbent materials managed appropriately as waste. None of the released water entered the on-site storm drain system or surface waters.
6/29/06	TSF Cooling Towers	Cooling tower overflow waters were released at 10:50 p.m. caused by a make up valve stuck in the open position. Water over filled the sump because leaves and debris had prevented proper flow to sanitary sewer. LLNL maintenance personnel responded and repaired the valve. The overflow lasted 20-60 min and resulted in 400 gal or less being discharged to ground and storm drain. Water traveled around the north side of the cooling tower following a drainage path to an area south of B361. The discharge soaked into the soil areas and evaporated from the asphalt areas before it could be cleaned up or sampled. The cooling tower water contains chlorine, a corrosion inhibitor, and a biocide. Maintenance data taken on Wednesday indicate the following concentrations: chlorine - 0.05 ppm, corrosion inhibitor - 0.65 ppm, biocide - <0.05 ppm. The water did not reach the arroyo or leave the LLNL site.
7/2/06	B693 (DWTF)	The foam fire suppression system activated in B693 due to a malfunction. The foam spread across the asphalt area between B693 and B695. Some foam reached the parking area. About 20 gal reached the storm drain before it was plugged, approximately 1/2 cup of foam made it to the arroyo

A-1. Summary of nonroutine releases May 2006–April 2007

Date of incident	Location	Type of incident
		but did not go off-site. The foam is 3% Ansul Jet-X foam concentrate and 97% water. Therefore, the <20 gal foam release contains approx 0.003 gal of foam concentrate (3% of 20 gal = 0.6 gal, 0.6 gal/200 = 0.003 gal). Per the MSDS the Jet-X concentrate is non-hazardous. The majority of the foam remained inside B693. The foam that remained on the asphalt after the storm drain was plugged was vacuumed it into portable tanker. About 500 gals was collected from the asphalt area. Permission was obtained to discharge the remaining foam into the sanitary sewer.
7/3/06	B551E	A potable water leak occurred into a construction trench which over flowed into the storm drains leading to the Drainage Retention Basin. The waer line was repaired within an hour of discovery and was thought to have been leaking for about 10 hours. Approximately 204,000 gallons of water were estimated to have been released.
7/21/06	T6575 (Visitor's Center)	An LLNL vehicle had a hose come loose, which resulted in the release of approximately 1 gallon of coolant to the asphalt near the Visitors Center. The release was immediately cleaned up using dry sorb and was managed as hazardous waste. No coolant was released to the to the storm drain system.
7/24/06	ERD Treatment Facility C	A small amount of water was released from ground water Treatment Facility C – Southeast when a pump failed and released an estimated 300-400 gallons of treated (clean) water. The water was released onto asphalt and made its way to a storm drain inlet approximately 75 feet away. It is likely that some of the treated water made its way to the surface drainage ditch that runs north along Avenue A (west of the 1800 Trailer Complex). Under applicable regulations, treated water from TFC-SE is routinely discharged into this storm drain.
7/24/06	SW of B162	Potassium dihydrogen phosphate (KDP) was released to the concrete pad immediately southwest of B-162. Crystals were formed from the evaporation of approximately 5 gallons of KDP solutions, which leaked from a portable storage tank staged on the concrete pad. An additional one gallon of KDP solution may have leaked from a portable storage tank staged south of the B-165 Annex. KDP is not a hazardous material and cleanup began immediately upon discovery. The dry crystals were scraped up and managed appropriately as waste, and mop solutions used to dissolve and pick up the remaining salt were discharged to the sanitary sewer after measuring the pH at 5 to 6. The affected area included approximately 60 square feet of concrete pad southwest of B-162 and approximately 25 square feet of asphalt south of B-165 Annex. None of the released solution entered the storm drain system or surface waters.
7/27/06	Avenue D, between South Mall Drive and East Ave	A private vehicle scraped the bottom of their car while exiting the C-2 Parking Lot along Avenue D. South Mall Drive was being worked on as part of a repaving project, and the asphalt surface in the area was uneven. Transmission fluid was released along the asphalt roadway when the transmission pan was damaged. Approximately 3 gallons of transmission fluid was released to the asphalt. A small trail of transmission fluid extended from the area where the initial damage occurred, to the stop sign

A-1. Summary of nonroutine releases May 2006–April 2007

Date of incident	Location	Type of incident
		at the intersection of Avenue D and East Avenue. A small puddle of transmission fluid was present in this location. The fluid was covered with dry sorb and cleaned up. They used dry sorb was collected and managed as hazardous waste. The transmission fluid did not enter the storm drain system.
8/3/06	B132N	A water line break occurred near B132N in a “trunk” line that connects to the main sewer line. The trunk line only serves the machine room and the water that discharged was condensate from AC units. Calculated flow values of 10 gallons per hour and estimated a total of 7 days of release, would produce a release of 1,680 gallons of water. The line was repaired and it is does not appear that the water flowed to the arroyo.
8/19/06	T-2425 and T-2428	Dust suppression water from the demolition of T-2425 and T-2428 flowed west down Fourth Street and into the storm drain on the corner of Fourth Street and Avenue B. A white residue was left on the asphalt when the water dried. The residue was found to be gypsum from drywall in the trailers. The demolition contractor, cleaned the residue from the street and gutter on August 23, 2006. The amount of water that left the demolition area is thought to be less than 250 gallons. Visual observations indicated that the gypsum did not enter the storm drain at Avenue B and no evidence was found that the water reached the arroyo.
9/5/06	DUS	A pump fell on the ground and broke, releasing approximately 25mL of mercury to asphalt just north of the receiving overhang area. The area was cordoned off to prevent traffic from disturbing the release, there were no storm drains in the vicinity. The spilled mercury and broken glass were cleaned up using a HEPA vacuum. The broken pump was placed into a 20 gallon drum for management as hazardous waste. The ground was monitored after cleanup and showed no elevated mercury readings.
9/11/06	ERD portable tank	Purge ground water from CERCLA sampling well W-315 was pumped into a holding tank which leaked 100-gallons of untreated ground water to the ground. No water reached ground water, storm drain system, or the arroyo. The latest analytical from W-315 (June 14, 2006) was 31.7 ppb total VOCs (17 ppb Freon 11, 10 ppb TCE, 3.7 ppb chloroform and 1 ppb carbon tetrachloride). This is 12 mg of total VOCs.
9/14/06	East of B274	A private vehicle leaked about 1 quart of oil onto the roadway. Dry sorb was placed on the oil, collected, and disposed of properly. None of the released oil reached a storm drain.
10/3/06	B334	Potable water from B-334 was released to the nearby storm drain on the north side of the building. The affected storm drain was plugged and released water recovered. Approximately 3000 gallons of water were recovered from B-334 and the affected asphalt area north of building. The pH of the released water was measured at pH=7 using pH paper at the storm drain location. Water samples were collected from the asphalt, the Room 1007 trench, and Room 1008 pit and analyzed for gross alpha, gross beta, and tritium by liquid scintillation counting. No radioactivity above the limit of detection was reported in any of the samples. A visual inspection of the water collected from the asphalt, the pit, the trenches, and the elevator

A-1. Summary of nonroutine releases May 2006–April 2007

Date of incident	Location	Type of incident
		shaft did not detect the presence of oil or oil sheen. The collected water was released to the sanitary sewer. The affected asphalt area north of B-334 is not identified as a known or suspected contaminated area. Inspection of storm drain catch basins downstream of the release did not identify any running water, indicating that probably no more than 100 gallons of water had entered the storm drain at B-334. None of the water entering the storm drain was available for recovery. It does not appear that any water reached the arroyo.
10/16/06	Near B-494	A greenish liquid dripped from a pipe that was exposed during the Overhead to Underground Conversion construction project, accumulating about 1 gallon in a trench near B-494. There was no odor or sheen, and the liquid had a pH of 7. The pipe that was exposed during the excavation was thought to be an old sanitary sewer pipe that was connected to Building 494. Building 494 is a warehouse and has not been used for any radioactive or hazardous operations. Analytical results indicated that the liquid was not hazardous or radioactive and based on the hazard categorization done, behaved like water. The soil that was impacted by the liquid in the trench was removed and placed into drums and disposed of properly. It does not appear that there was a release of hazardous or radioactive material from this pipe and the liquid did not reach the storm drain system.
11/2/06	West side of B611	A passenger van was backing out of one of the B-611 high-bays when the transmission fluid line broke, releasing about 3 quarts of transmission fluid to the asphalt in front of the high-bay. In addition, a small amount of fluid was leaked onto Avenue J. The van was parked and a drip tray placed underneath the leak. Dry sorb was placed along the trail of transmission fluid and cleaned up for appropriate disposal as hazardous waste. The fluid was limited to the asphalt and did not impact the storm drainage system.
11/6/06	T6203	A line became clogged and sewage was released to the asphalt area in front of T-6203. Approximately 20 gallons of sewage were released. It flowed down the asphalt area toward a vegetated strip between T-6203 and the drainage swale on the northwest side of the trailer. No sewage reached the nearby drainage swale. The clogged line was repaired and a bleach solution was sprayed to the visibly wet areas, including a small dirt area which was near a pedestrian pathway. The area was cordoned off and allowed to evaporate. No material was released to storm drains.
12/16/06	Avenue K & Outer Loop Road	A diesel spill of less than 3 gallons was spotted on asphalt, with the source unknown. The fuel was covered in dry sorb, collected and disposed of appropriately. No fuel was released to the storm drain system.
12/27/06	NW of T5475	A broken irrigation line was discovered northwest of Building 5475. Water was visible coming up out of the ground in the large grassy area between B-5475 and B-543. Water flowed north along the pathway/grass into a drainage swale, which eventually flows into Lake Haussmann. Water released from Lake Haussmann is considered part of LLNL's storm drainage system, and eventually is released into the Arroyo Las Positas.

A-1. Summary of nonroutine releases May 2006–April 2007

Date of incident	Location	Type of incident
		The leak started on December 26 at approximately 9:40 am and was shut off on December 27 at approximately 8:30 am. The estimated flow rate from the broken line is 250 gallons per minute. This adds up to a total release of 345,000 gallons of potable city water (15,000 gallons per hour x 23 hours). The line has since been repaired.
1/6/07	West end of E-2W parking lot	During truck refilling from a portable tank/pump approximately 0.5 gallons of diesel fuel spilled on the ground. The spill was approximately 6 ft in diameter. The fuel was covered in dry sorb, collected and disposed of appropriately. No fuel was released to the storm drain system.
1/13/07	B212, B411, B667, B512, B435, T4475, T4299, B693	After a particularly cold night, a number of irrigation water lines and an eyewash froze and breaks occurred. Each break released approximately 50 gallons of potable water. All water was released to soil/landscaped areas. While some water entered the storm drain system, no water appeared to flow to the arroyos.
1/22/07	North Outer Loop Road	A hydraulic fluid trail was discovered that started at the 11th Street project, turned onto North Outer Loop Road and continued to the D-9 parking lot. The trail then continued west to a walking path between buildings 491 and 381, eventually ending at a small parking area between the buildings. With the exception of a small strip of hard packed gravel and dirt shoulder area along North Outer Loop Road, the trail was confined to asphalt. It was estimated that the hydraulic fluid released from a "roller" was approximately 5 gallons of fluid. Dry sorb was applied to the trail to pick up any residual hydraulic fluid. In addition, the trail along the shoulder of North Outer Loop Rd. was also scraped down to remove the stained soil/gravel. The dry sorb and small amount of soil/gravel was collected and managed by an off-site contractor. The hydraulic fluid release did not impact the storm drainage system.
2/7/07	B583	Approximately 3 gallons of sanitary sewage was released from a sanitary sewer line serving B-583. The sewage was released to a shallow construction excavation, including approximately 3 feet of exposed PVC sanitary sewer line and approximately 10 square feet of soil in the bottom of the excavation. All of the affected materials (pipe and soil) were disinfected with a bleach solution. None of the released sewage entered the storm drain and none of the sewage was available for transport with storm water run-off to the storm drain system. The sanitary sewer line was isolated and repaired and service restored to B-583.
2/12/07	B531 parking area	Oil was released in the parking area to the south of B-531. A truck leaked about 0.5 gallon of oil directly into a rain puddle that had formed underneath the vehicle. The rainwater was discolored and had a visible sheen. The puddle was approximately 3 feet by 3 feet and had formed on hard packed gravel, which serves as a parking area for B-531. Dry sorb was applied to the puddle and the oily water was picked up. The area that had formed the puddle was scraped down to remove any excess oily water and sheen. The dirt that was visible after the dry sorb and top layer of dirt was picked up did not have any sheen or discoloration. The dirt area

A-1. Summary of nonroutine releases May 2006–April 2007

Date of incident	Location	Type of incident
		adjacent to the puddle looked clean and it did not appear that the oily water had run-off in any direction. A mix of gravel, mud and dry sorb was generated as a result of the clean up. This material was bagged up to be managed as non-hazardous waste. None of the materials were released to the storm drain system.
2/21/07	South of B583	Heavy equipment working south of B-583 severed an irrigation line releasing approximately 2,000 gallons of potable water to uncontaminated soil and two protected storm drains. Approximately 1,000 square feet of soil and two storm drain catch basins were affected by the release. None of the released water was recovered and all of it percolated into the soil or entered the storm drain system. The affected storm drain catch basins were previously protected with straw wattles to prevent silt from entering the storm drain. The storm drain protection was augmented with additional straw wattles and sandbags to prevent silt from entering the storm drain from the approaching storms.
3/10/07	North of B272	A water main break released approximately 3,000 gallons of potable city water to ground in the area of B272. The water did not encroach upon the contaminated 292 area. The uncontaminated drinking water did reach the storm drain system.
3/15/07	Multiple roadways	Diesel fuel was cleaned up at the following four intersections: 1) South Outerloop Rd and Ave. K 2) Southgate Drive and South Outerloop Rd 3) East Ave and Southgate Drive 4) East Ave. and entrance to Sandia (across from B-411). Additional spills occurred in the afternoon, diesel fuel was cleaned up at the following five locations: 1) South Outerloop Rd and Ave. K (repeat location from the morning response) 2) West Innerloop Rd. and 5th Street 3) Southgate Drive and South Outerloop Rd (repeat location from the morning response) 4) East Ave and Southgate Drive (repeat location from the morning response) 5) Sandia entrance semi-circle (east of Sandia Building 907). At each location, it is estimated that roughly 1-2 quarts of diesel fuel was released. The spilled diesel fuel was limited to the asphalt roadway. No diesel fuel entered a storm drain or came in contact with soil. Dry sorb was applied to all spill locations and worked into the fuel stain with brooms. The absorbent was swept up and containerized for proper disposal.
3/16/07	B415	A fire sprinkler head broke inside a building. A majority of the water was collected using a wet-vac and some remaining water leaked outside the building. Approximately 50-100 gallons of uncontaminated potable water was released, but none reached the storm drains.
3/16//07	B335	A small (2 - 3 ounces) oil spill leaked form a diffusion pump. The oil was tested fro radioactivity and none was found. The oil was cleaned up and disposed of properly.

A-1. Summary of nonroutine releases May 2006–April 2007

Date of incident	Location	Type of incident
3/28/07	B332	Wooden crates containing tritium contaminated fans sitting on the asphalt in the B332 yard were packed for disposal. They were covered by plastic to protect from the weather. When riggers came to move the fans, the plastic was pulled off and approx. 5 gallons of rainwater, which had pooled on the top of the crates, went to the asphalt. It was decided that the water was external to the packaging and they continued to move the fans. Once at the 612 yard they realized that there was water leaking from inside the wooden crates. A sample of the water was taken and run on the liquid scintillation counter, a result slightly elevated tritium activity was reported. As much of the water was collected as possible and disposed of properly. It appeared that none of the water flowed to the storm drain system.
3/29/07	West Gate Drive security post	A private vehicle released transmission fluid while waiting in line for badge check. The lane was blocked off with cones and the vehicle moved to the other side of the road and parked so repairs could be made. Approximately 3 quarts of transmission fluid were cleaned up with dry sorb. The used dry sorb was disposed of properly.
3/30/07	North of B682	An ethylene glycol coolant leak was discovered immediately north of B-682. Approximately 10 gallons of a 50% ethylene glycol/water solution was discharged from a "Trane" auxiliary power generator trailer to the asphalt surface below the trailer. The area was cordoned off the release contained with drip pans filled with dry sorb. Oil that continued to be released was collected in 85-gallon drums until the leak could be repaired. Additionally, the nearby storm drain was protected with plastic sheeting and absorbent "pigs." The affected area included approximately 800 square feet of asphalt surface below the trailer and approximately 100 square feet of metal trailer floor surface. The affected absorbent materials were collected in a 55-gallons poly-lined waste drum and disposed of properly. None of the released oil entered the storm drain system.
4/5/07	T3726	A water leak occurred between T3726 and the east side of T3775 and may have existed for half an hour or so before it was discovered. It was estimated that the water flow was approximately 30 gallons per minute. Some of the water was ponding in the area where it rose to the surface, but much of it was flowing into a storm drain southwest of T3726. The source of the leak was found to be an irrigation system, and the water was shut off. Approximately 2,000 gallons of potable water was released, of which perhaps 1,500 gallons entered the storm drain system.
4/5/07	T5627	A sewage occurred spill at T-5627 and residents of the trailer noticed an odor and called the plumbers. The problem was found to be a broken sewer pipe under Room 1017. About 100 gallons of sewage was pumped from a soil trench under the trailer and the pipe was repaired. The impacted area under the trailer was sprayed with bleach. Approximately 100 gallons of sewage was collected and disposed of properly.

Table A-2. Summary of best management practice inspections in potential pollutant source/industrial activity areas

Directorate Responsible for Potential Pollutant Source/Industrial Activity	Deficiencies in BMPs or BMP Implementation and Additional/Revised BMPs or Corrective Actions.
Laboratory Services Directorate	DUS: Open drums collected rainwater. Drums will be moved or covered to avoid water collection. Gas Yard: Paint in flaking from some structures, which will be repainted to avoid paint flakes reaching storm drains. Various Locations: Four separate drain pipes were identified for which a source needed to be determined. If the source is not a discharge called out in our SWPPP, it will be removed or plumbed to sewer. Shipping and Receiving: Ducting should have insulation replaced. B433, B522, B523, B525, T5105, T5125, T5224, T5299, T6297, T6298(A), T6299A Yards: Outside storage of liquid containers, rusty equipment and raw materials could be improved with disposal, covers, or secondary containment. Avenue L: Straw waddles should be replaced to minimize erosion. B622 Yard: Storage of transformers in this yard could be improved by avoiding contact with rain or providing secondary containment. Also, used absorbent material should be removed from the ground and when possible, machinery and equipment covered, to avoid contact with rain (continuing to improve).
Energy and Environment	No deficiencies were found.
National Ignition Facility	No deficiencies were found.
Computation Directorate	T1889: Excess debris accumulated around the trailer will be removed as good housekeeping. T3724, T3726, B451, T4525: Storm drains blocked in multiples locations and need to be cleared.
Nonproliferation, Homeland, and International Security	No deficiencies were found.
Physics and Advanced Technologies	B197: A french drain receiving condensate from a heat exchanger continues to exceed the drain capacity. Attempts are underway to reduce flow from the heat exchanger. B161, B341, B431, B435: Various pieces of equipment should be disposed of or covered to avoid contact with rain. B423: Some staining was observed around a chiller pad and will be observed to ensure that no leaks are occurring. B431: Absorbent “pigs” should be disposed of properly. T2801: Cigarette butts were observed on the ground, a receptacle should be provided.
Engineering	No deficiencies were found.
Safety and Environmental Protection	B324 east side: A drain pipe was identified for which a source needed to be determined. If the source is not a discharge called out in our SWPPP, it will be removed or plumbed to sewer. B323, B324, B328, B255: Outside storage of rusty equipment and raw materials could be improved with disposal, covers, or secondary containment. B64: Granular material from roof is visible on the ground and will be cleaned up.
Safeguards and Security	No deficiencies were found.

Table A-2. Summary of best management practice inspections in potential pollutant source/industrial activity areas (continued)

Directorate Responsible for Potential Pollutant Source/Industrial Activity	Deficiencies in BMPs or BMP Implementation and Additional/Revised BMPs or Corrective Actions.
Administration and Human Resources	No deficiencies were found.
Chemistry, Materials and Life Sciences	B361: Four drain pipes were identified for which a source needed to be determined. If the source is not a discharge called out in our SWPPP, it will be removed or plumbed to sewer. B362, B363, B364, B373, B376: A series of good housecleaning observations need to be addressed including storage of fluid bath and other equipment outside on the ground, shipping materials, electronic equipment, and other materials, and lead bricks.
Chief Financial Officer	No deficiencies were found.
Defense and Nuclear Technologies Directorate	No deficiencies were found.
Director's Office	No deficiencies were found.

Table A-3. Record of Dry Season Visual Obersvations

Location	Date	Time	Floating Material, Debris, Odor, Discolorations, or Oil and Gease?	Observations	Description
ALPE	27-Jun-06	11:13 AM	Leaves, sticks, paper, plastic		
ALPO	27-Jun-06	11:10 AM	Leaves, sticks, bottles, plastic		
ASS2	27-Jun-06	3:18 PM	Leaves, sticks		
ASW	27-Jun-06	3:23 PM	Leaves, sticks, paper		Water backing up the arroyo approx. 75 feet from the discharge of ERD's Treatment Facility "A"
AVE. K	27-Jun-06	3:40 PM	Leaves, sticks, paper, plastic		
B111	27-Jun-06	3:10 PM	Leaves, sticks		
B341	27-Jun-06	11:22 AM	Leaves, sticks, plastic		
B391	27-Jun-06	3:34 PM	Leaves, sticks		
B194	27-Jun-06	3:30 AM		Very Clean	
B551W	27-Jun-06	11:21 AM	Leaves, sticks		

Table A-3. Record of Dry Season Visual Obersvations

Location	Date	Time	Floating Material, Debris, Odor, Discolorations, or Oil and Gease?	Observations	Description
GRNE	27-Jun-06	11:09 AM	Leaves, sticks, paper, bottles, plastic		
HEAF	27-Jun-06	10:58 AM		Clean	
LABOR ONLY	27-Jun-06	3:05 PM			Evidence of wash water inside containment area, no release to stormdrains, no corrective action necessary
WPDC	27-Jun-06	11:04 AM	Leaves, sticks		DRB & ERD Treatment Facility B discharging, permitted discharge
ALPE	21-Sep-06	10:50 AM	Leaves, sticks, paper		
ALPO	21-Sep-06	10:53 AM	Leaves, sticks, plastic	Tire, old lumber	
ASS2	21-Sep-06	11:00 AM	Leaves, sticks		
ASW	21-Sep-06	11:06 AM	Leaves, sticks, paper		Discharge from ERD's Treatment Facility "A", permitted discharge
AVE. K	21-Sep-06	4:24 PM	Leaves, sticks, paper, plastic		General landscape irrigation
B111	21-Sep-06	11:12 AM	Leaves, sticks		

Table A-3. Record of Dry Season Visual Obersvations

Location	Date	Time	Floating Material, Debris, Odor, Discolorations, or Oil and Gease?	Observations	Description
B191	21-Sep-06	3:55 PM			
B194	21-Sep-06	3:50 PM			
B341	21-Sep-06	11:28 AM	Leaves		
B391	21-Sep-06	3:31 PM	Leaves, sticks		
B551W	21-Sep-06	11:24 AM	Leaves, sticks		
GRNE	21-Sep-06	10:55 AM	Leaves, sticks, paper, plastic		
LABOR ONLY	21-Sep-06	3:42 PM	Leaves, sticks		Evidence of wash water inside containment area, no release to stormdrains, no corrective action necessary
WPDC	21-Sep-06	11:16 AM	Leaves, sticks		DRB & ERD Treatment Facility B discharging, permitted discharge

Table A-4. Record of Wet Season Visual Observations

Location	Date	Time	Floating Material, Debris, Odor, Discolorations, or Oil and Gease?	Turbidity	Runoff	Additional Observations
ALPE	31-Oct-06	11:04 AM	Leaves, sticks, paper	No	No Runoff	
ALPO	31-Oct-06	2:51 PM	Leaves, sticks, bottle	No	No Runoff	Tire
ASS2	31-Oct-06	3:00 PM	Leaves, sticks	No	No Runoff	
ASW	31-Oct-06	3:07 PM	Leaves, sticks, plastic	No	No Runoff	ERD's Treatment Facility "A" discharging
GRNE	31-Oct-06	2:49 PM	Leaves, sticks	No	No Runoff	
WPDC	31-Oct-06	2:44 PM	Leaves, sticks	No	No Runoff	ERD Treatment Facility B discharging
ALPE	27-Nov-06	10:06 AM	Leaves, sticks, paper	No	No Runoff	
ALPO	27-Nov-06	10:09 AM	Leaves, sticks, paper, plastic	No	No Runoff	Tire
ASS2	27-Nov-06	10:19 AM	Leaves, sticks	No	No Runoff	
ASW	27-Nov-06	10:24 AM	Leaves, sticks	No	No Runoff	ERD's Treatment Facility "A" discharging
GRNE	27-Nov-06	10:13 AM	Leaves, sticks	No	No Runoff	
WPDC	27-Nov-06	10:31 AM	Leaves, sticks, plastic	No	No Runoff	DRB & ERD Treatment Facility B discharging

Table A-4. Record of Wet Season Visual Observations

Location	Date	Time	Floating Material, Debris, Odor, Discolorations, or Oil and Gease?	Turbidity	Runoff	Additional Observations
ALPE	12-Dec-06	9:12 AM	Leaves, sticks	Moderate	Significant	
ALPO	12-Dec-06	9:00 AM	Leaves, sticks	Moderate	Significant	
ASS2	12-Dec-06	8:40 AM	Leaves, sticks	Moderate	Significant	
ASW	12-Dec-06	9:10 AM	Leaves, sticks	Moderate	Significant	ERD's Treatment Facility "A" discharging
GRNE	12-Dec-06	8:43 AM	Leaves, sticks, plastic	Moderate	Significant	
WPDC	12-Dec-06	9:50 AM	Leaves, sticks	Moderate	Significant	DRB & ERD Treatment Facility B discharging
ALPE	29-Jan-07	2:45 PM	Leaves, sticks, plastic	No	No Runoff	
ALPO	29-Jan-07	2:52 PM	Leaves, sticks, paper, plastic	No	No Runoff	
ASS2	29-Jan-07	3:00 PM	Leaves, sticks	No	No Runoff	
ASW	29-Jan-07	3:03 PM	Leaves, sticks, paper, plastic	No	No Runoff	ERD's Treatment Facility "A" discharging
GRNE	29-Jan-07	2:55 PM	Leaves, sticks, plastic	No	No Runoff	
WPDC	29-Jan-07	3:08 PM	Leaves, sticks	No	No Runoff	DRB & ERD Treatment Facility B discharging

Table A-4. Record of Wet Season Visual Observations

Location	Date	Time	Floating Material, Debris, Odor, Discolorations, or Oil and Gease?	Turbidity	Runoff	Additional Observations
ALPE	22-Feb-07	8:30 AM	Leaves, sticks	Moderate	Significant	
ALPO	22-Feb-07	9:22 AM	Leaves, sticks, paper, plastic	High	Significant	Foaming on surface
ASW	22-Feb-07	9:25 AM		Moderate	Significant	ERD's Treatment Facility "A" discharging
ASS2	22-Feb-07	9:00 AM	Leaves, sticks	Moderate	Significant	
GRNE	22-Feb-07	8:57 AM	Leaves, sticks	Moderate	Significant	Foam from North side of culvert
WPDC	22-Feb-07	9:50 AM		Moderate-high	Significant	DRB & ERD Treatment Facility B discharging
ALPE	29-Mar-07	11:31 AM	Leaves, sticks, paper	No	No Runoff	
ALPO	29-Mar-07	11:23 AM	Leaves, sticks, paper, plastic	Moderate	Insignificant	
ASS2	29-Mar-07	10:58 AM	Leaves, sticks	No	No Runoff	
ASW	29-Mar-07	11:06 AM	Leaves, sticks, paper	No	No Runoff	ERD's Treatment Facility "A" discharging
GRNE	29-Mar-07	11:20 AM	Leaves, sticks, paper, plastic	No	No Runoff	
WPDC	29-Mar-07	11:15 AM	Leaves, sticks	No	No Runoff	DRB & ERD Treatment Facility B discharging

Table A-4. Record of Wet Season Visual Observations

Location	Date	Time	Floating Material, Debris, Odor, Discolorations, or Oil and Gease?	Turbidity	Runoff	Additional Observations
ALPE	30-Apr-07	10:42 AM	Leaves, sticks, paper, plastic	No	No Runoff	
ALPO	30-Apr-07	10:46 AM	Leaves, sticks, paper, plastic	Moderate	Insignificant	
ASS2	30-Apr-07	11:01 AM	Leaves, sticks	No	No Runoff	
ASW	30-Apr-07	11:10 AM	Leaves, sticks	No	No Runoff	
GRNE	30-Apr-07	10:50 AM	Leaves, sticks, plastic	No	No Runoff	
WPDC	30-Apr-07	11:14 AM	Leaves, sticks	No	No Runoff	DRB & ERD Treatment Facility B discharging

Table A-5. Storm water quality data for December 12, 2006.

DESCRIBE DISCHARGE LOCATION	DATE/TIME OF SAMPLE COLLECTION	TIME DISCHARGE STARTED	ANALYTICAL RESULTS For First Storm Event						
			BASIC PARAMETERS					OTHER PARAMETERS	
			pH	TSS	SC	O&G	TOC	Aluminum	Arsenic
WPDC (ALP Effluent)	12/12/06 9:50 AM [X] PM [ ]	Ongoing AM [X] PM [ ]	7.69	81	200	<5	6.6	2.2	<0.002
GRNE (ALP Influent)	12/12/06 8:43 AM [X] PM [ ]	Ongoing AM [X] PM [ ]	7.33	250	100	<5	2.8	4.8	0.0032
ALPO (ALP Influent)	12/12/06 9:00 AM [X] PM [ ]	Ongoing AM [X] PM [ ]	7.97	340	630	<5	7.5	14.0	0.0068
ALPE (ALP Influent)	12/12/06 9:12 AM [X] PM [ ]	Ongoing AM [X] PM [ ]	8.1	150	930	<5	17	4.8	0.0023
TEST REPORTING UNITS:			**pH Units**	**mg/L**	**µmhos/cm**	**mg/L**	**mg/L**	**mg/L**	**mg/L**
TEST METHOD USED:			E150.1	E160.2	E120.1	E1664	E415.1	E200.7	E200.8
ANALYZED BY (SELF/LAB):			BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs

ALP - Arroyo Las Positas
TSS - Total Suspended Solids
SC - Specific Conductance
O&G - Oil & Grease
TOC - Total Organic Carbon
Test Method Used: E is EPA Method and SM is Standard Methods for the examination of water and wastewater

Table A-5. Storm water quality data for December 12, 2006.

DESCRIBE DISCHARGE LOCATION	ANALYTICAL RESULTS For First Storm Event						
	OTHER PARAMETERS						
	Barium	Beryllium	Boron	Bromacil	Cadmium	Calcium	Chemical Oxygen Demand
WPDC (ALP Effluent)	0.067	<0.0002	0.29	1.1	<0.0005	13	42
GRNE (ALP Influent)	0.096	<0.0002	0.10	9.3	<0.0005	8.8	25
ALPO (ALP Influent)	0.280	0.00056	2.00	37.0	<0.0005	30	71
ALPE (Influent)	0.100	<0.0002	3.60	0.7	<0.0005	23	87
TEST REPORTING UNITS:	**mg/L**	**mg/L**	**mg/L**	**µg/L**	**mg/L**	**mg/L**	**mg O/ L**
TEST METHOD USED:	E200.7	E210.2	E200.7	E525.2	E200.8	E200.7	E410.4
ANALYZED BY (SELF/LAB):	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs

TSS - Total Suspended Solids
SC - Specific Conductance
O&G - Oil & Grease
TOC - Total Organic Carbon
Test Method Used: E is EPA Method and SM is Standard Methods for the examination of water and wastewater

Table A-5. Storm water quality data for December 12, 2006.

DESCRIBE DISCHARGE LOCATION	ANALYTICAL RESULTS For First Storm Event							
	OTHER PARAMETERS							
	Chromium	Copper	Diazinon	Diuron	Glyphosate	Hexavalent Chromium	Lead	Mercury
WPDC (ALP Effluent)	0.0120	0.0096	<0.2	18	<25	<0.002	<0.005	<0.0002
GRNE (ALP Influent)	0.0092	0.0065	<0.2	5	<25	0.033	<0.005	<0.0002
ALPO (ALP Influent)	0.0330	0.0280	<0.2	620	<25	<0.002	0.0098	<0.0002
ALPE (ALP Influent)	0.0069	0.0088	<0.2	3	<25	<0.002	<0.005	<0.0002
TEST REPORTING UNITS:	**mg/L**	**mg/L**	**µg/L**	**µg/L**	**µg/L**	**mg/L**	**mg/L**	**mg/L**
TEST METHOD USED:	E200.8	E200.8	E525.2	E632	E547	E7196	E200.8	E245.1
ANALYZED BY (SELF/LAB):	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs

TSS - Total Suspended Solids
SC - Specific Conductance
O&G - Oil & Grease
TOC - Total Organic Carbon
Test Method Used: E is EPA Method and SM is Standard Methods for the examination of water and wastewater

Table A-5. Storm water quality data for December 12, 2006.

DESCRIBE DISCHARGE LOCATION	ANALYTICAL RESULTS For First Storm Event							
	OTHER PARAMETERS							
	Nickel	Nitrate (asNO3)	Ortho-Phosphate	Potassium	Total Hardness	Total Dissolved Solids	Total PCBs	Zinc
WPDC (ALP Effluent)	0.0099	2.6	0.27	2.0	59	150	<0.2	0.110
GRNE (ALP Influent)	0.0097	16.0	0.46	2.0	37	91	NM	0.078
ALPO (ALP Influent)	0.0270	7.7	0.36	3.4	130	440	NM	0.090
ALPE (Influent)	0.0130	2.9	1.10	3.6	110	560	NM	0.051
TEST REPORTING UNITS:	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**µg/L**	**mg/L**
TEST METHOD USED:	E200.8	E300.0	E365.1	E200.7	SM2340B	E160.1	E8082A	E200.7
ANALYZED BY (SELF/LAB):	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs

TSS - Total Suspended Solids
SC - Specific Conductance
O&G - Oil & Grease
TOC - Total Organic Carbon
NM - Not Monitored
Test Method Used: E is EPA Method and SM is Standard Methods for the examination of water and wastewater

Table A-5. Storm water quality data for December 12, 2006.

DESCRIBE DISCHARGE LOCATION	ANALYTICAL RESULTS For First Storm Event			
	OTHER PARAMETERS			
	Gross alpha	Gross beta	Tritium	Plutonium 239+240
WPDC (ALP Effluent)	0.0300±0.0274	0.1380±0.0481	1.602±1.961	0.00019±0.00019
GRNE (ALP Influent)	0.0236±0.0307	0.2061±0.0518	0.164±1.887	NM
ALPO (ALP Influent)	0.1162±0.0851	0.3130±0.0703	0.000±1.961	NM
ALPE (Influent)	0.1240±0.1036	0.3559±0.0814	0.000±1.924	NM
TEST REPORTING UNITS:	**Bq/L**	**Bq/L**	**Bq/L**	**Bq/L**
TEST METHOD USED:	E900	E900	E906	AS:PUISO
ANALYZED BY (SELF/LAB):	Eberline	Eberline	Eberline	Eberline

Radioactivities are reported as the measured concentration and an uncertainty (s +/-2 counting error). If the concentration is less than or equal to the uncertainty, the result is considered to be a nondetection.

TSS - Total Suspended Solids

SC - Specific Conductance

O&G - Oil & Grease
TOC - Total Organic Carbon
NM - Not Monitored

Test Method Used: E is EPA Method and SM is Standard Methods for the examination of water and wastewater

Table A-5. Storm water quality data for December 12, 2006.

DESCRIBE DISCHARGE LOCATION	DATE/TIME OF SAMPLE COLLECTION	TIME DISCHARGE STARTED	ANALYTICAL RESULTS For First Storm Event						
			BASIC PARAMETERS					OTHER PARAMETERS	
			pH	TSS	SC	O&G	TOC	Aluminum	Arsenic
ASW (Arroyo Seco Effluent)	12/12/06 9:10 AM [X] PM [ ]	Ongoing AM [X] PM [ ]	7.42	87	84	<5	7.4	2.10	<0.002
ASS2 (Arroyo Seco Influent)	12/12/06 8:40 AM [X] PM [ ]	Ongoing AM [X] PM [ ]	7.05	16	29	<5	4.9	0.82	<0.002
TEST REPORTING UNITS:			**pH Units**	**mg/L**	**µmhos/cm**	**mg/L**	**mg/L**	**mg/L**	**mg/L**
TEST METHOD USED:			E150.1	E160.2	E120.1	E1664	E415.1	E200.7	E200.8
ANALYZED BY (SELF/LAB):			BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs

TSS - Total Suspended Solids
SC - Specific Conductance
O&G - Oil & Grease
TOC - Total Organic Carbon
Test Method Used: E is EPA Method and SM is Standard Methods for the examination of water and wastewater

Table A-5. Storm water quality data for December 12, 2006.

DESCRIBE DISCHARGE LOCATION	ANALYTICAL RESULTS For First Storm Event						
	OTHER PARAMETERS						
	Barium	Beryllium	Boron	Bromacil	Cadmium	Calcium	Chemical Oxygen Demand
ASW (Arroyo Seco Effluent)	0.058	<0.0002	0.077	<0.5	<0.0005	9.6	40
ASS2 (Arroyo Seco Influent)	0.021	<0.0002	<0.05	<0.5	<0.0005	2.8	35
TEST REPORTING UNITS:	**mg/L**	**mg/L**	**mg/L**	**µg/L**	**mg/L**	**mg/L**	**mg O/ L**
TEST METHOD USED:	E200.7	E210.2	E200.7	E525.2	E200.8	E200.7	E410.4
ANALYZED BY (SELF/LAB):	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs

TSS - Total Suspended Solids
SC - Specific Conductance
O&G - Oil & Grease
TOC - Total Organic Carbon
Test Method Used: E is EPA Method and SM is Standard Methods for the examination of water and wastewater

Table A-5. Storm water quality data for December 12, 2006.

DESCRIBE DISCHARGE LOCATION	ANALYTICAL RESULTS For First Storm Event							
	OTHER PARAMETERS							
	Chromium	Copper	Diazinon	Diuron	Glyphosate	Hexavalent Chromium	Lead	Mercury
ASW (Arroyo Seco Effluent)	0.0091	0.0077	<0.2	3	<25	<0.002	<0.005	<0.0002
ASS2 (Arroyo Seco Influent)	0.0041	0.0050	<0.2	<1	<25	<0.002	<0.005	<0.0002
TEST REPORTING UNITS:	**mg/L**	**mg/L**	**µg/L**	**µg/L**	**µg/L**	**mg/L**	**mg/L**	**mg/L**
TEST METHOD USED:	E200.8	E200.8	E525.2	E632	E547	E7196	E200.8	E245.1
ANALYZED BY (SELF/LAB):	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs

TSS - Total Suspended Solids
SC - Specific Conductance
O&G - Oil & Grease
TOC - Total Organic Carbon
Test Method Used: E is EPA Method and SM is Standard Methods for the examination of water and wastewater

Table A-5. Storm water quality data for December 12, 2006.

DESCRIBE DISCHARGE LOCATION	ANALYTICAL RESULTS For First Storm Event							
	OTHER PARAMETERS							
	Nickel	Nitrate (asNO3)	Ortho-Phosphate	Potassium	Total Hardness	Total Dissolved Solids	TOTAL PCB	Zinc
ASW (Arroyo Seco Effluent)	0.0092	3.1	0.39	2.1	41	73	<0.2	0.086
ASS2 (Arroyo Seco Influent)	0.0038	1.6	0.33	1.2	11	41	NM	0.110
TEST REPORTING UNITS:	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**µg/L**	**mg/L**
TEST METHOD USED:	E200.8	E300.0	E365.1	E200.7	SM2340B	E160.1	E8082A	E200.7
ANALYZED BY (SELF/LAB):	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs

TSS - Total Suspended Solids
SC - Specific Conductance
O&G - Oil & Grease
TOC - Total Organic Carbon
NM - Not Monitored at this location
Test Method Used: E is EPA Method and SM is Standard Methods for the examination of water and wastewater

Table A-5. Storm water quality data for December 12, 2006.

DESCRIBE DISCHARGE LOCATION	ANALYTICAL RESULTS For First Storm Event			
	OTHER PARAMETERS			
	Gross alpha	Gross beta	Tritium	Plutonium 239+240
ASW (Arroyo Seco Effluent)	0.0358±0.0244	0.1443±0.0481	0.6734±1.9610	- 0.0004±0.0007
ASS2 (Arroyo Seco Influent)	- 0.0085±0.0174	0.0829±0.0296	- 0.7104±1.8870	NM
TEST REPORTING UNITS:	**Bq/L**	**Bq/L**	**Bq/L**	**Bq/L**
TEST METHOD USED:	E900	E900	E906	AS:PUISO
ANALYZED BY (SELF/LAB):	Eberline	Eberline	Eberline	Eberline

Radioactivities are reported as the measured concentration and an uncertainty (s +/-2 counting error). If the concentration is less than or equal to the uncertainty, the result is considered to be a nondetection.

TSS - Total Suspended Solids

SC - Specific Conductance

O&G - Oil & Grease

TOC - Total Organic Carbon

NM - Not Monitored at this location

Test Method Used: E is EPA Method and SM is Standard Methods for the examination of water and wastewater

Table A-6. Storm water quality data for February 22, 2007.

DESCRIBE DISCHARGE LOCATION	DATE/TIME OF SAMPLE COLLECTION	TIME DISCHARGE STARTED	ANALYTICAL RESULTS For Second Storm Event						
			BASIC PARAMETERS					OTHER PARAMETERS	
			pH	TSS	SC	O&G	TOC	Aluminum	Arsenic
WPDC (ALP Effluent)	2/22/07 9:50 AM [X] PM [ ]	Ongoing AM [X] PM [ ]	7.77	46	168	<5	5.5	2.3	<0.002
GRNE (ALP Influent)	2/22/07 8:57 AM [X] PM [ ]	Ongoing AM [X] PM [ ]	7.56	62	118	<5	3.8	3.9	<0.002
ALPO (ALP Influent)	2/22/07 9:22 AM [X] PM [ ]	Ongoing AM [X] PM [ ]	8.12	1300	683	<5	7.0	37.0	0.013
ALPE (ALP Influent)	2/22/07 8:30 AM [X] PM [ ]	Ongoing AM [X] PM [ ]	7.56	68	116	<5	12.0	5.6	0.002
TEST REPORTING UNITS:			**pH Units**	**mg/L**	**µmhos/cm**	**mg/L**	**mg/L**	**mg/L**	**mg/L**
TEST METHOD USED:			E150.1	E160.2	E120.1	E1664	E415.1	E200.7	E200.8
ANALYZED BY (SELF/LAB):			BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs

ALP - Arroyo Las Positas
TSS - Total Suspended Solids
SC - Specific Conductance
O&G - Oil & Grease
TOC - Total Organic Carbon
Test Method Used: E is EPA Method and SM is Standard Methods for the examination of water and wastewater

Table A-6. Storm water quality data for February 22, 2007.

DESCRIBE DISCHARGE LOCATION	ANALYTICAL RESULTS For Second Storm Event						
	OTHER PARAMETERS						
	Barium	Beryllium	Boron	Bromacil	Cadmium	Calcium	Chemical Oxygen Demand
WPDC (ALP Effluent)	0.062	<0.0002	0.22	0.9	<0.0005	13.0	<25
GRNE (ALP Influent)	0.097	<0.0002	0.09	9.7	<0.0005	13.0	<25
ALPO (ALP Influent)	0.840	0.0013	2.00	8.3	0.00086	46.0	160
ALPE (Influent)	0.098	<0.0002	0.52	NR	<0.0005	6.8	77
TEST REPORTING UNITS:	**mg/L**	**mg/L**	**mg/L**	**µg/L**	**mg/L**	**mg/L**	**mg O/ L**
TEST METHOD USED:	E200.7	E210.2	E200.7	E525.2	E200.8	E200.7	E410.4
ANALYZED BY (SELF/LAB):	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs

TSS - Total Suspended Solids
SC - Specific Conductance
O&G - Oil & Grease
TOC - Total Organic Carbon
NR - Not Reported
Test Method Used: E is EPA Method and SM is Standard Methods for the examination of water and wastewater

Table A-6. Storm water quality data for February 22, 2007.

DESCRIBE DISCHARGE LOCATION	ANALYTICAL RESULTS For Second Storm Event							
	OTHER PARAMETERS							
	Chromium	Copper	Diazinon	Diuron	Glyphosate	Hexavalent Chromium	Lead	Mercury
WPDC (ALP Effluent)	0.0082	0.0068	<0.2	9	15	<0.002	<0.005	<0.0002
GRNE (ALP Influent)	0.0087	0.0073	<0.2	97	45	<0.002	<0.005	<0.0002
ALPO (ALP Influent)	0.0590	0.0730	<0.2	70	<5	<0.002	0.032	<0.0002
ALPE (ALP Influent)	0.0160	0.0120	NR	400	50	<0.002	<0.005	<0.0002
TEST REPORTING UNITS:	**mg/L**	**mg/L**	**µg/L**	**µg/L**	**µg/L**	**mg/L**	**mg/L**	**mg/L**
TEST METHOD USED:	E200.8	E200.8	E525.2	E632	E547	E7196	E200.8	E245.1
ANALYZED BY (SELF/LAB):	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs

TSS - Total Suspended Solids
SC - Specific Conductance
O&G - Oil & Grease
TOC - Total Organic Carbon
NR - Not Reported
Test Method Used: E is EPA Method and SM is Standard Methods for the examination of water and wastewater

Table A-6. Storm water quality data for February 22, 2007.

DESCRIBE DISCHARGE LOCATION	ANALYTICAL RESULTS For Second Storm Event							
	OTHER PARAMETERS							
	Nickel	Nitrate (asNO3)	Ortho-Phosphate	Potassium	Total Hardness	Total Dissolved Solids	Total PCBs	Zinc
WPDC (ALP Effluent)	0.0057	4.5	0.25	1.9	55	59	<0.2	0.087
GRNE (ALP Influent)	0.0085	22.0	0.60	2.2	49	62	NM	0.053
ALPO (ALP Influent)	0.0550	8.0	0.24	6.4	210	300	NM	0.220
ALPE (Influent)	0.0180	10.0	1.40	3.6	35	78	NM	0.031
TEST REPORTING UNITS:	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**µg/L**	**mg/L**
TEST METHOD USED:	E200.8	E300.0	E365.1	E200.7	SM2340B	E160.1	E8082A	E200.7
ANALYZED BY (SELF/LAB):	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs

TSS - Total Suspended Solids
SC - Specific Conductance
O&G - Oil & Grease
TOC - Total Organic Carbon
NM - Not Monitored at this location
Test Method Used: E is EPA Method and SM is Standard Methods for the examination of water and wastewater

Table A-6. Storm water quality data for February 22, 2007.

DESCRIBE DISCHARGE LOCATION	ANALYTICAL RESULTS For Second Storm Event			
	OTHER PARAMETERS			
	Gross alpha	Gross beta	Tritium	Plutonium 239+240
WPDC (ALP Effluent)	0.0291±0.0192	0.1018±0.0329	4.292±1.924	0.00019±0.00022
GRNE (ALP Influent)	0.0353±0.0222	0.1203±0.0481	0.707±1.924	NM
ALPO (ALP Influent)	0.3959±0.2109	0.9028±0.1961	0.361±1.961	NM
ALPE (Influent)	0.0444±0.0233	0.1787±0.0444	0.788±1.924	NM
TEST REPORTING UNITS:	**Bq/L**	**Bq/L**	**Bq/L**	**Bq/L**
TEST METHOD USED:	E900	E900	E906	AS:PUISO
ANALYZED BY (SELF/LAB):	Eberline	Eberline	Eberline	Eberline

Radioactivities are reported as the measured concentration and an uncertainty (s +/-2 counting error). If the concentration is less than or equal to the uncertainty, the result is considered to be a nondetection.

TSS - Total Suspended Solids

SC - Specific Conductance

O&G - Oil & Grease

TOC - Total Organic Carbon

NM - Not Monitored at this location

Test Method Used: E is EPA Method and SM is Standard Methods for the examination of water and wastewater

Table A-6. Storm water quality data for February 22, 2007.

DESCRIBE DISCHARGE LOCATION	DATE/TIME OF SAMPLE COLLECTION	TIME DISCHARGE STARTED	ANALYTICAL RESULTS For Second Storm Event						
			BASIC PARAMETERS					OTHER PARAMETERS	
			pH	TSS	SC	O&G	TOC	Aluminum	Arsenic
ASW (Arroyo Seco Effluent)	2/22/07 9:25 AM [X] PM [ ]	Ongoing AM [X] PM [ ]	7.24	21	40	<5	4.8	1.2	<0.002
ASS2 (Arroyo Seco Influent)	2/22/07 9:00 AM [X] PM [ ]	Ongoing AM [X] PM [ ]	7.33	12	37	<5	4.8	1.0	<0.002
TEST REPORTING UNITS:			**pH Units**	**mg/L**	**µmhos/cm**	**mg/L**	**mg/L**	**mg/L**	**mg/L**
TEST METHOD USED:			E150.1	E160.2	E120.1	E1664	E415.1	E200.7	E200.8
ANALYZED BY (SELF/LAB):			BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs

TSS - Total Suspended Solids
SC - Specific Conductance
O&G - Oil & Grease
TOC - Total Organic Carbon
Test Method Used: E is EPA Method and SM is Standard Methods for the examination of water and wastewater

Table A-6. Storm water quality data for February 22, 2007.

DESCRIBE DISCHARGE LOCATION	ANALYTICAL RESULTS For Second Storm Event						
	OTHER PARAMETERS						
	Barium	Beryllium	Boron	Bromacil	Cadmium	Calcium	Chemical Oxygen Demand
ASW (Arroyo Seco Effluent)	0.030	<0.0002	<0.05	<0.5	0.0009	3.8	25
ASS2 (Arroyo Seco Influent)	0.024	<0.0002	<0.05	<0.5	<0.0005	3.6	<25
TEST REPORTING UNITS:	**mg/L**	**mg/L**	**mg/L**	**µg/L**	**mg/L**	**mg/L**	**mg O/ L**
TEST METHOD USED:	E200.7	E210.2	E200.7	E525.2	<0.0005	E200.7	E410.4
ANALYZED BY (SELF/LAB):	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs

TSS - Total Suspended Solids
SC - Specific Conductance
O&G - Oil & Grease
TOC - Total Organic Carbon
Test Method Used: E is EPA Method and SM is Standard Methods for the examination of water and wastewater

Table A-6. Storm water quality data for February 22, 2007.

DESCRIBE DISCHARGE LOCATION	ANALYTICAL RESULTS For Second Storm Event							
	OTHER PARAMETERS							
	Chromium	Copper	Diazinon	Diuron	Glyphosate	Hexavalent Chromium	Lead	Mercury
ASW (Arroyo Seco Effluent)	0.003	0.0057	<0.2	1	33	<0.002	<0.005	<0.0002
ASS2 (Arroyo Seco Influent)	<0.003	0.0049	<0.2	<1	28	<.0002	<0.005	<0.0002
TEST REPORTING UNITS:	**mg/L**	**mg/L**	**µg/L**	**µg/L**	**µg/L**	**mg/L**	**mg/L**	**mg/L**
TEST METHOD USED:	E200.8	E200.8	E525	E632	E547	E7196	E200.7	E245.1
ANALYZED BY (SELF/LAB):	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs

TSS - Total Suspended Solids
SC - Specific Conductance
O&G - Oil & Grease
TOC - Total Organic Carbon
Test Method Used: E is EPA Method and SM is Standard Methods for the examination of water and wastewater

Table A-6. Storm water quality data for February 22, 2007.

DESCRIBE DISCHARGE LOCATION	ANALYTICAL RESULTS For Second Storm Event							
	OTHER PARAMETERS							
	Nickel	Nitrate (asNO3)	Ortho-Phosphate	Potassium	Total Hardness	Total Dissolved Solids	TOTAL PCB	Zinc
ASW (Arroyo Seco Effluent)	0.0043	2.0	0.42	2.0	16	21	<0.2	0.052
ASS2 (Arroyo Seco Influent)	0.0038	2.3	0.47	1.4	14	24	NM	0.079
TEST REPORTING UNITS:	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**µg/L**	**mg/L**
TEST METHOD USED:	E200.7	E300.0	E365.1	E200.7	SM2340B	E160.1	E8082A	E200.7
ANALYZED BY (SELF/LAB):	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs	BC Labs

TSS - Total Suspended Solids
SC - Specific Conductance
O&G - Oil & Grease
TOC - Total Organic Carbon
NM - Not Monitored at this location
Test Method Used: E is EPA Method and SM is Standard Methods for the examination of water and wastewater

Table A-6. Storm water quality data for February 22, 2007.

DESCRIBE DISCHARGE LOCATION	ANALYTICAL RESULTS For Second Storm Event			
	OTHER PARAMETERS			
	Gross alpha	Gross beta	Tritium	Plutonium 239+240
ASW (Arroyo Seco Effluent)	0.0045±0.0155	0.0781±0.0407	- 0.788±1.887	0.00011±0.00037
ASS2 (Arroyo Seco Influent)	- 0.0085±0.0174	0.0829±0.0296	- 0.710±1.887	NM
TEST REPORTING UNITS:	**Bq/L**	**Bq/L**	**Bq/L**	**Bq/L**
TEST METHOD USED:	E900	E900	E906	AS:PUISO
ANALYZED BY (SELF/LAB):	Eberline	Eberline	Eberline	Eberline

Radioactivities are reported as the measured concentration and an uncertainty (s +/-2 counting error). If the concentration is less than or equal to the uncertainty, the result is considered to be a nondetection.

TSS - Total Suspended Solids

SC - Specific Conductance

O&G - Oil & Grease

TOC - Total Organic Carbon

NM - Not Monitored at this location

Test Method Used: E is EPA Method and SM is Standard Methods for the examination of water and wastewater

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