SCS TRACER ENVIRONMENTAL







Construction Sampling Report: Event #1
Silver Lake Reservoir Conduit Bypass Project

Particulate/Dust Monitoring Program

Presented to:

ESA

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626 Wilshire Boulevard, Suite 1100
Los Angeles, CA 90017

Presented by:

SCS Tracer Environmental
5963 La Place Court, Suite 207
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(760) 744-9611

April 22nd, 2015

Offices Nationwide
www.scsengineers.com

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1.0 PROJECT SUMMARY

1.1 INTRODUCTION

The SLRC Bypass Project is part of the SLRC Storage Replacement Project. This project is intended to replace the water storage provided by the Ivanhoe and Silver Lake Reservoirs and makes possible the preservation of these two bodies of water. The SLRC Bypass Project consists of approximately 4,600 linear feet of 66-inch diameter welded steel pipe, a regulator station, and a pressure relief station. The project, as originally proposed in the Environmental Impact Report for the SLRC Storage Replacement Project, was to have consisted of a large underground tunnel beneath West Silver Lake Drive. In an effort to minimize the construction impacts on the Silver Lake community, the LADWP is pursuing an in-reservoir approach which consists of open trench construction along a portion of West Silver Lake Drive and along the bottom of Silver Lake Reservoir.

This air monitoring project was designed to measure the concentrations of particulate matter with a mean aerodynamic diameter of 10 microns or less (PM_{10}) in the vicinity of the Silver Lake Reservoir at two locations downwind from construction activities and one location generally upwind from construction activities for comparison purposes.

Sampling occurred at all three sampling locations April 8th, 2015. The following sections provide the details of the sampling that took place and provides the results attained from this monitoring event.

1.2 PARAMETERS

Particulate concentration data has been obtained through the use of three semi-portable, programmable, mass-flow controlled PM_{10} samplers. The sampler of choice for this project is the BGI PQ167 (U.S. EPA Reference Method: RFPS-1298-124). The PQ167 sampler is highly reliable and easy to calibrate. The PQ167 sampler continuously monitors flow rate and adjusts the pump speed to maintain a consistent flow rate of 16.7 liters per minute (lpm). This flow rate is critical for the separation of PM_{10} from particulates of greater size. The PQ167 stores all of the valid sampling run parameters and calculates the total volume for each sampling event.

1.3 SITE LOCATIONS

The following are actual sampling locations for the above mentioned monitors during this construction sampling project (See Figure 1-1):

Upwind Monitoring Site:
Latitude: 34° 06.237’
Longitude: 118° 15.970’

Downwind Monitoring Site #1:
Latitude: 34° 06.053’
Longitude: 118° 15.794’

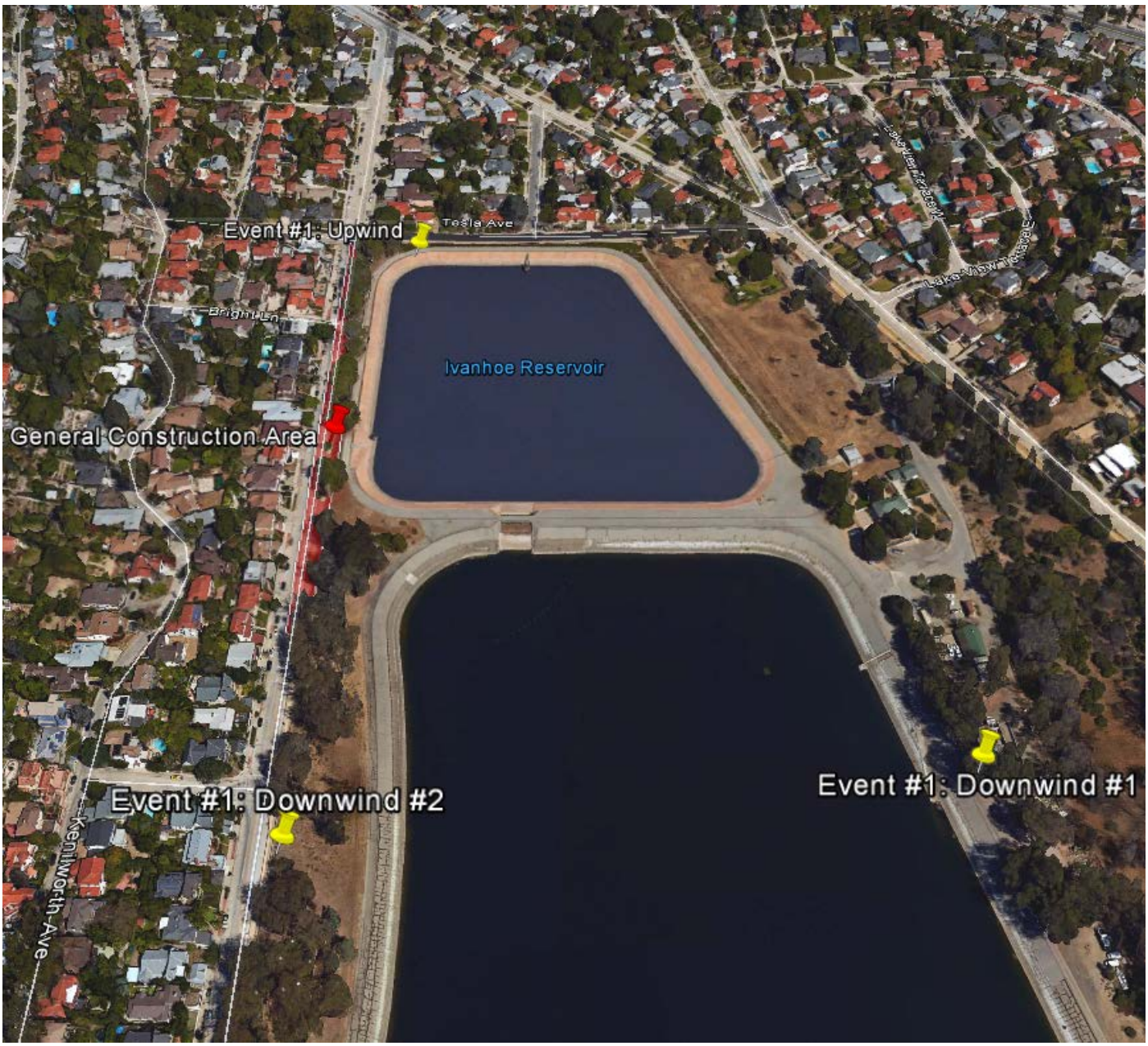
Downwind Monitoring Site #2:
Latitude: 34° 06.032'
Longitude: 118° 15.987'

These locations were chosen based on the following priorities:

- Attainment of data representative of upwind/downwind concentrations given the complex terrain and location of sources;
- Predominant wind direction during sampling period;
- Accessibility, given the site's construction activities; and
- Security.

Winds were fairly light in magnitude throughout the day and were persistently from the North-West to North-North West. Given this wind pattern, our monitors were appropriately set up for upwind and downwind monitoring of construction activities.

FIGURE 1-1: FIELD SAMPLING LOCATIONS



1.4 ORGANIZATION

The project is organized as described in the following paragraphs. The description provides individual personnel assigned to the project as well as their responsibilities.

Paul Schafer serves as the overall Project Manager and is responsible for all aspects of the program. This includes oversight of operation, maintenance and data reporting activities as well as correspondence with ESA and the Los Angeles Department of Water and Power (LADWP) personnel. In this capacity he is responsible for direct oversight of the field and data technicians. He is also responsible for facilitating repairs of instruments as well as QA/QC compliance on the program.

Tyler Thomason provided field technician support to the program. Tyler was responsible for onsite operations to include site visits, QA/QC checks and collection of sample media.

Tyler Thomason provides lab and database support to the program. He is responsible for analytical procedures as well as updating the database.

2.0 APPLICABLE DATA CAPTURE SUMMARIES

2.1 INTRODUCTION

This section contains various applicable data capture summary tables.

2.2 PM_{10} DATA

This section contains the table of sampling parameters (Table 2-1) as well as the table of time averaged PM_{10} concentrations (Table 2-2). Concentration data is reported in micrograms per cubic meter ($\mu g/m^3$).

TABLE 2-1: SAMPLE PARAMETERS

Date	Sample ID	Sampling Site	Start Time	Stop Time	Total Time (min)	Sample Volume (m^3)
04/08/15	009	U-1	09:00	17:00	480	8.02
04/08/15	010	D-1	09:00	17:00	480	8.02
04/08/15	011	D-2	09:00	17:00	480	8.02

TABLE 2-2: MEASURED TIME AVERAGED PM-10 CONCENTRATIONS

Date	Sample ID	Sampling Site	Sample Volume (m^3)	Sample Mass (mg)	Sample Concentration (µg/m^3)
04/08/15	009	U-1	8.02	0.14	17.5
04/08/15	010	D-1	8.02	0.14	17.5
04/08/15	011	D-2	8.02	0.13	16.2

3.0 QUALITY ASSURANCE AND QUALITY CONTROL DATA SUMMARIES

3.1 CALIBRATION FORMS AND SITE LOGS

Site Logs and calibration forms relative to the operations performed during this monitoring period are included in Appendix A and B respectively. The information these records contain include:

- Results of Calibrations;
- Adherence to all applicable protocols; and
- Diligence of operators to assure the quality of the data generated.

4.0 RESULTS AND CONCLUSIONS

4.1 INTERPRETATION OF RESULTS

When interpreting the results of the upwind and downwind monitoring data the following relationships are investigated:

1. Relative difference to established benchmarks (the California State Standard for 24-hr PM_{10} concentration if 50 µg/m^3),

2. Spatial Differences: What are the differences in concentration relative to sampling locations and especially in regards to the upwind versus downwind sampling locations, and

3. Temporal Differences: What are the differences in concentration relative to the time of the sampling? To assess this, the measured concentrations are compared to the baseline sampling data attained in the same general area at previous dates.

The following section will provide some commentary on the data collected relative to these relationships.

4.2 CONCLUSIONS

1. None of the samples taken for this sampling event exceeded the CA State 24-hr PM_{10} benchmark of 50 µg/m^3. In fact, the highest measured concentration was only 35 % of this benchmark. However, it should be noted that the samples taken where 8-hr time averaged samples and concentrations would likely change with a 24-hr sampling period. The project was designed to measure concentrations during the period of the day that construction activities are likely to occur for comparison purposes to monitoring during construction activities. Background concentrations in the area were likely reduced by the rain that occurred the day prior to this event.

2. Spatial differences in concentration were not significant. All measured concentrations were very similar and there were not significant differences in concentration relative to the upwind versus downwind monitoring sites. The construction project was not a significant source of PM_{10} downwind from the project site.

3. Relative to the baseline monitoring event, the measured concentrations from this event were significantly lower. This is likely due to the lower background concentration and the rain from the previous day reducing fugitive PM_{10} emissions in the vicinity of the project site.

4.3 DATA LIMITATIONS

There are several limitations associated with this sampling project. The major limitations are as follows:

- The results correspond to one particular period of time. These results would not necessarily be reproducible at another given period of time.
- Meteorological parameters significantly influence pollutant concentrations. These variables need to be considered.
- The data obtained in this sampling project are time averaged concentrations. Different averaging periods may lead to varying results.
- The project area is urban and multiple sources exist at varying times which are significant distances apart. The proximity of a sampler to a specific source greatly influences the impacts of that source on the sample. The individual impacts of each source cannot be defined.
- Some sources of particulate generation may be directly upwind from a given sampling site while other sources may not be given a prevailing wind direction. Also, although we are able to determine prevailing wind direction, wind direction is variable throughout a day.

Appendix A

Sample Logs

SCS Tracer Environmental

ESA-DWP Air Sampling Log

Sampling Date | Site # | Operator

Sample #:	7	Filter #:	7
Start Time	0610	Start Flow	16.7
Stop Time	1410	Stop Flow	16.7
Elapsed Time	480 min	Avg. Flow	16.7
		Tot. Vol.	8.016 L

Location: Background site #3
N 34° 05.559'
W 118° 15.854'

Notes: 3/12/2015

Sample #:	8	Filter #:	8
Start Time	0615	Start Flow	16.7
Stop Time	1415	Stop Flow	16.7
Elapsed Time	480 min	Avg. Flow	16.7
		Tot. Vol.	8.016 L

Location: Background site #4
N 34° 05.932'
W 118° 15.894'

Notes: 3/12/2015

Sample #:	9	Filter #:	220157233
Start Time	0900	Start Flow	16.7
Stop Time	1700	Stop Flow	16.7
Elapsed Time	480 min	Avg. Flow	16.7
		Tot. Vol.	8.016 L

Location: UPWIND
N 34° 06.237
W 118° 15.970

Notes: 4/8/2015
Work band done in (N 34° 06.243, W 118° 15.993) (N 34° 06.240, W 118° 15.987)
(N 34° 06.086, W 118° 15.992) (N 34° 06.084, W 118° 15.997)

SCS Tracer Environmental

ESA-DWP Air Sampling Log

Sampling Date: | Site #: | Operator:

Sample #:	10	Filter #:	220157234	Location:	Downwind #1
Start Time	0900	Start Flow	16.7		
Stop Time	1700	Stop Flow	16.7		
Elapsed Time	480 min	Avg. Flow	16.7		N 34° 06.053
		Tot. Vol.	8.016 L		W 118° 15.794

Notes: 4/8/2015 Rained Previous day of sampling
Work with Bobcat excavator, Crane Operations, (Drilling operations)
(N 34° 06.123 W 118° 15.990)

Sample #:	11	Filter #:	220157209	Location:	Down Wind #2
Start Time	0900	Start Flow	16.7		N 34° 06.032
Stop Time	1700	Stop Flow	16.7		W 118° 15.987
Elapsed Time	480 min	Avg. Flow	16.7		
		Tot. Vol.	8.016 L		

Notes: 4/8/2015

Sample #:		Filter #:		Location:	
Start Time		Start Flow			
Stop Time		Stop Flow			
Elapsed Time		Avg. Flow			
		Tot. Vol.			

Notes:

Appendix B

Calibration Forms

BGI INCORPORATED 58 GUINAN STREET WALTHAM, MA 02451
NIST Traceable Calibration Facility, ISO 9001:2008 Registered

deltaCal

CERTIFICATE OF CALIBRATION - NIST TRACEABILITY

(Refer to instruction manual for further details of calibration)

deltaCal Serial Number: **510** DATE: 18-Sep-14

Calibration Operator: Brian DeVoe

Critical Venturi Flow Meter: Max Uncertainity = 0.346%
Serial Number: 1 *CEESI NVLAP NIST Data File 04BGI151*
Serial Number: 2 *CEESI NVLAP NIST Data File 04BGI152*
Serial Number: 3 *CEESI NVLAP NIST Data File 04BGI153*
Serial Number: 4 *CEESI NVLAP NIST Data File 02BGI004*

Room Temperature: Uncertainity=0.071% Room Temperature: 21.1 C
Brand: Ever-Safe Serial Number: 016076
NIST Traceability No. 516837
deltaCal:
Ambient Temperature (set): 21.1 C
Aux (filter) Temperature (set): 21.1 C

Barometric Pressure and Absolute Pressure
Vaisala Model PTB330(50-1100) Digital Accuracy: 0.03371%
S/N D4310002
NIST Traceable (Princo Primary Standard Model 453 S/N W12537) Certificate No. P-7485
deltaCal:
Barometric pressure (set): 758.5 mm of Hg

Results of Venturi Calibration
Flow Rate (Q) vs. Pressure Drop (ΔP). Where: Q=Lpm, ΔP= Cm of H2O

Q= 4.16203 ΔP ^ 0.52082 Overall Uncertainty: 0.35%

Date Placed In Service Sep 2014
(To be filled in by operator upon receipt)

Recommended Recalibration Date 19 Sep 2015
(12 months from date placed in service)

Revised: July 2012

To Check a deltaCal 18-Sep-14 Brian DeVoe

2-20 Lpm VER 3.41P

BP= 758.5 mm of Hg

Maximum allowable error at any flow rate is .75%.

Serial No. 510

	Reading Abs. P Crit. Vent. mm of Hg	Room Temp	Crit. Vent. Temp	CV Qa Flow Lpm	Qa deltaCal Indicated	**% Error**
# 2	201.08	21.1	21.00	2.23	2.22	**-0.28**
	492.22	21.1	21.00	5.52	5.48	**-0.69**
# 1	252.22	21.1	21.00	9.80	9.75	**-0.55**
	398.09	21.1	21.00	15.59	15.53	**-0.37**
	487.48	21.1	21.00	19.13	19.12	**-0.06**
					Average %	**-0.39**

Certificate No.: 073040-091-123014

Mettler Toledo
Service Business Unit Laboratory
1900 Polaris Parkway
Columbus, OH 43240
1-800-METTLER

METTLER TOLEDO

ISO 9001: 2008 Registered

Calibration Certificate

Customer

Company:	SCS Tracer Environmental		
Address:	970 Los Vallecitos Blvd		
	Ste 100		
City:	San Marcos	*State/Province:*	California
Zip/Postal:	92069		

Device

Manufacturer:	Mettler Toledo	*Asset No.:*	
Serial No.:	B222975626	*Dept./Room:*	
Max Capacity:	22 g	*Readability:*	0.000001 g
Model:	XP26	*Work Order No:*	330596013
Procedure Statement:	The device referenced in this document has been metrologically tested in accordance with METTLER TOLEDO Work Instruction VW0152A. All translations into other languages are based on the referenced work instruction, which is in English. This certificate refers to: As Found and As Left		
Test Date:	30-Dec-2014	*Next Cal. Due Date:*	31-Jan-2016
Service Technician:	Denise Gogola	*Signature:*	ELECTRONIC SIGNATURE

Reference Weights

Traceability of Test Equipment:	All weights used for metrological testing are traceable to national or international standards. The weights were calibrated and certified by an accredited calibration laboratory.

Weight Set 1

Weight Set No.:	358	*Date of Issue:*	26-Sep-2014
Calibration Due Date:	30-Sep-2015	*NIST Traceability No.*	MT5061/MT001086
Class:	E2		

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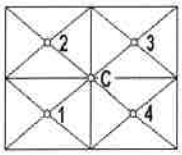
Measuring Results

Eccentricity



		As Found		As Left	
Test Weight	*Position*	*Displayed Value*	*Deviation*	*Displayed Value*	*Deviation*
C: 10 g	*Center*	0.000000 g	N/A	0.000000 g	N/A
1: 10 g	*Left Front*	-0.000011 g	-0.000011 g	-0.000007 g	-0.000007 g
2: 10 g	*Left Rear*	0.000000 g	0.000000 g	0.000000 g	0.000000 g
3: 10 g	*Right Rear*	0.000000 g	0.000000 g	0.000000 g	0.000000 g
4: 10 g	*Right Front*	-0.000011 g	-0.000011 g	-0.000007 g	-0.000007 g
Eccentric Load Deviation:		0.000011 g		0.000007 g	
Manufacturer Specifications:		0.00002 g		0.00002 g	
Manufacturer Specifications Rounded to Resolution of Eccentric Load Deviation:		0.000020		0.000020	
Specifications Met:		YES		YES	

Sensitivity

	As Found			As Left		
	Displayed Value			*Displayed Value*		
Reference Weight	*Without Reference Weight*	*With Reference Weight*	*Deviation*	*Without Reference Weight*	*With Reference Weight*	*Deviation*
20.000028 g	0.000000 g	20.000093 g	0.000065 g	0.000000 g	20.000044 g	0.000016 g
	Sensitivity Offset:		0.000065 g	*Sensitivity Offset:*		0.000016 g
	Manufacturer Specifications:		N/A	*Manufacturer Specifications*		0.00008 g
	Manufacturer Specifications Rounded to Resolution of Sensitivity Offset:		N/A	*Manufacturer Specifications Rounded to Resolution of Sensitivity Offset:*		0.000080 g
	Specifications Met:		N/A	*Specifications Met:*		YES

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Linearity - Differential Method

Test Weight: 5.000000 g

		As Found			As Left		
		Displayed Value		Deviation *	Displayed Value		Deviation *
	Preload Weight	Preload	Test Weight		Preload	Test Weight	
1	0 g	0.000000 g	5.000032 g	0.0000057 g	0.000000 g	5.000029 g	0.0000025 g
2	5 g	4.999990 g	10.000016 g	0.0000054 g	4.999987 g	10.000015 g	0.0000040 g
3	10 g	9.999959 g	14.999981 g	0.0000011 g	9.999955 g	14.999981 g	0.0000035 g
4	15 g	14.999939 g	19.999964 g	-0.0000002 g	14.999966 g	19.999989 g	0.0000000 g
		Linearity Deviation:		0.0000057 g	*Linearity Deviation:*		0.0000040 g
		Manufacturer Specifications:		0.000006 g	*Manufacturer Specifications:*		0.000006 g
		Manufacturer Specifications Rounded to Resolution of Linearity Deviation:		0.0000060 g	*Manufacturer Specifications Rounded to Resolution of Linearity Deviation:*		0.0000060 g
		Specifications Met:		YES	*Specifications Met:*		YES

* This Linearity Deviation is zero point offset and sensitivity error compensated.

Remarks

Calibrated unit for optimum performance.

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