



Los Angeles Regional Water Quality Control Board

December 11, 2015

Mr. Peter Zorba
NASA-SSFL Project Manager
5800 Woolsey Canyon Road
Canoga Park, CA 91304

REVISED MONITORING AND REPORTING PROGRAM – HYDRAULIC TESTING USING POTABLE WATER AT THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA) AREA OF SANTA SUSANA FIELD LABORATORY PROPERTY, 5800 WOOLSEY CANYON ROAD, CANOGA PARK, CALIFORNIA 93063 (FILE NO. 15-050, ORDER NO. 2012-0010, SERIES NO. 002, CI-10158, GLOBAL ID WDR100023597)

Dear Mr. Zorba:

On July 31, 2015, The National Aeronautics and Space Administration (NASA) (hereinafter Discharger) was enrolled under the "State Water Resources Control Board Water Quality Order 2012-0010, General Waste Discharge Requirements for Aquifer Storage and Recovery Projects that Inject Drinking Water into Groundwater" adopted by the State Water Resources Control Board on September 19, 2012 for hydraulic testing using potable water at the subject site. Upon enrollment of the Waste Discharge Requirements (WDRs), the Discharger was required to implement Monitoring and Reporting Program (MRP) No. CI-10158.

On October 26, 2015, the Discharger submitted a letter to the Los Angeles Regional Water Quality Control Board (Regional Board) requesting the following modifications to the MRP:

1. Change the Expandable Launch Vehicle (ELV) Injection Well from RD-51A to RD-51B
The Discharger requested to change one of the injection wells in the ELV Area from well RD-51A to well RD-51B. RD-51A is currently dry and not suitable for use as an injection well. Both wells are part of the same well cluster at the same spatial location. The California Department of Toxic Substances Control (DTSC) approved this change in an email dated August 11, 2015.
2. Change the Coca/Delta Injection Well from ND-114 to ND113
The Discharger requested to replace well ND-113 with well ND-114 during the hydraulic testing at Santa Susana Field Laboratory. Well ND-114 is no longer viable for the testing because it has a low yield and extracting or injecting at this location will not provide appropriate aquifer stress to meet the intended objective of the test. Well ND-113 is the same in depth and construction as well ND-114 and has significantly higher yield and hydraulic conductivity. The higher permeability at ND-113 will allow a greater stress on the aquifer and increase the chances of a successful test. DTSC approved this change in an email dated October 26, 2015.

After review of the hydrogeological conditions at the proposed well locations and their structure, Regional Board staff concurs with the modifications approved by DTSC, and MRP No. CI-10158 is therefore modified as follows:

1. ELV Injection Well RD-51A is replaced by RD-51B.
2. Coca/Delta Injection Well ND-114 is replaced by ND-113.
3. Addition of Footnote "d" to Table 1 on Page T-11 of the MRP.

The Discharger shall comply with the Electronic Submittal of information (ESI) requirements by submitting all reports required under the MRP, including groundwater monitoring data, discharge location data, and pdf monitoring reports to the State Water Resources Control Board GeoTracker database under Global ID WDR100023597.

Please see Electronic Submittal for GeoTracker Users, dated December 12, 2011 at:
<http://www.waterboards.ca.gov/losangeles/resources/Paperless/Paperless%20Office%20for%20OGT%20Users.pdf>

If you have any additional questions, please contact the Project Manager, Mr. David Koo, at (213) 620-6155 (David.Koo@waterboards.ca.gov) or the Groundwater Permitting Unit Chief, Dr. Eric Wu, at (213) 576-6683 (Eric.Wu@waterboards.ca.gov).

Sincerely,



Samuel Unger, P.E.
Executive Officer

Enclosures: Monitoring and Reporting Program No. CI-10158 revised on December 11, 2015

cc: Mr. Paul Carpenter, Department of Toxic Substances Control
Ms. Jeremy Hilliard, CH2M HILL

**STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION**

**REVISED MONITORING AND REPORTING PROGRAM NO. CI-10158
FOR
NATIONAL AERONAUTICS SPACE ADMINISTRATION
SANTA SUSANA FIELD LABORATORY
CANOGA PARK, CA 93063**

**ENROLLMENT UNDER
STATE WATER RESOURCES CONTROL BOARD
WATER QUALITY ORDER NO. 2012-0010 (SERIES NO. 002)
FILE NO. 15-050**

I. REPORTING REQUIREMENTS

- A. The National Aeronautics and Space Administration (NASA) (hereinafter Discharger) shall implement this revised Monitoring and Reporting Program (MRP) at the Santa Susana Field Laboratory (SSFL), located at 5800 Woolsey Canyon Road, Canoga Park, California, the location of which is shown on Figure 1, on the effective date of this enrollment (December 11, 2015) under State Water Resources Control Board Water Quality Order No. 2012-0010.

Monitoring reports shall be received by the dates in the following schedule:

<u>Reporting Period</u>	<u>Report Due</u>
April – September	October 30
October – March	April 30

- B. If there is no injection of potable water during any reporting period, the report shall so state.
- C. By January 31st of each year, beginning January 31, 2016, the Discharger shall submit an annual summary report to the Regional Board. The report shall contain both tabular and graphical summaries of the monitoring data obtained during the previous calendar year. In addition, the Discharger shall discuss the compliance record and the corrective actions taken, or planned, which may be needed to bring the discharge into full compliance with the waste discharge requirements.
- D. Laboratory analyses – all chemical, bacteriological, and/or toxicity analyses shall be conducted at a laboratory certified for such analyses by the State Water Resources Control Board, Division of Drinking Water (SWRCB-DDW) Environmental Laboratory Accreditation Program (ELAP). A copy of the laboratory certifications shall be provided each time a new analysis is used and/or renewal is obtained from ELAP.

- E. The method limits (MLs) employed for analyses shall be lower than the permit limits established for a given parameter, unless the Discharger can demonstrate that a particular ML is not attainable and obtains approval for a higher ML from the Executive Officer. At least once a year, the Discharger shall submit a list of the analytical methods employed for each test and the associated laboratory quality assurance/quality control (QA/QC) procedures.
- F. All QA/QC samples must be run on the same dates when samples were actually analyzed. The Discharger shall make available for inspection and/or submit the QA/QC documentation upon request by Regional Board staff. Proper chain of custody procedures must be followed and a copy of the chain of custody documentation shall be submitted with the report.
- G. Each monitoring report must affirm in writing that "All analyses were conducted at a laboratory certified for such analyses by the SWRCB-DDW ELAP, and in accordance with current United States Environmental Protection Agency (USEPA) guideline procedures or as specified in this Monitoring Program." Proper chain of custody procedures must be followed and a copy of the completed chain of custody form shall be submitted with the report.
- H. For every item where the requirements are not met, the Discharger shall submit a statement of the cause(s), and actions undertaken or proposed which will bring the discharge into full compliance with waste discharge requirements at the earliest possible time, including a timetable for implementation of those actions.
- I. The Discharger shall maintain all sampling and analytical results, including strip charts, date, exact place, and time of sampling, dates analyses were performed, analyst's name, analytical techniques used, and results of all analyses. Such records shall be retained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge, or when requested by the Regional Board.
- J. In reporting the monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized to demonstrate compliance with the requirements and, where applicable, shall include results of receiving water observations.
- K. Any mitigation/remedial activity including any pre- or post-treatment conducted at the Site must be reported in the semi-annual monitoring report.
- L. Each monitoring report shall contain a separate section titled "Summary of Non-Compliance" which discusses the compliance record and the corrective actions taken or planned that may be needed to bring the discharge into full compliance with Waste Discharge Requirements (WDRs). This section shall be located at

the front of the report and shall clearly list all non-compliance with discharge requirements, as well as all excursions of effluent limitations.

II. POTABLE WATER INJECTION AQUIFER TESTING MONITORING REQUIREMENTS

Potable water injection well and monitoring well networks are presented on Figures 2 through 6.

The quarterly reports shall contain the following information regarding the potable water injection activities:

1. Location map showing potable water injection well and observation wells.
2. Written summary defining:
 - Total volume of potable water injected; and
 - Potable water injection flow rates

III. GROUNDWATER MONITORING PROGRAM FOR THE POTABLE WATER INJECTION AQUIFER TESTING PROGRAM

A groundwater level and groundwater quality monitoring program shall be implemented for each of the potable water injection aquifer tests. The groundwater level monitoring program shall consist of up to 20 wells, including the injection wells, with temporary pressure transducers. The pressure transducer in each well shall be programmed to monitoring groundwater levels at a regular interval. The transducers shall be deployed 1 week prior to set up for each test to collect baseline data and shall remain deployed for 1 week following the 72-hour constant rate injection test to monitor recovery.

Manual measurements of groundwater levels will be periodically collected from the monitoring network to verify the accuracy of the transducer data. Table 1 provides the list of groundwater level observation wells for each aquifer injection test.

The groundwater monitoring wells scheduled for sampling are presented on Figures 3 through 6. Table 1 also provides the list of groundwater quality sampling locations for each areas of impacted groundwater (AIGs). The first groundwater sampling event will be conducted at each AIG prior to injection aquifer testing. The second groundwater sampling event will be completed within 6 months of completing the aquifer testing at all AIGs.

Table 2 below identifies the constituents that shall be analyzed during the baseline sampling event prior to the first phase of injection aquifer test and 6 months after the second phase of injection aquifer test.

TABLE 1 Groundwater Monitoring Locations

AIG	Well Name	Aquifer Test Water Level Observation Well	Groundwater Quality Sampling Location Baseline Event	Groundwater Quality Sampling Location 6-month Post-Aquifer Test Event
LOX Plant AIG	ND-111	X	X	X
LOX Plant AIG	ND-112	X	X	X
LOX Plant AIG	PZ-062	X	X	X
LOX Plant AIG	PZ-095	X	X	X
LOX Plant AIG	PZ-128	X	X	X
LOX Plant AIG	PZ-129	X	X	X
LOX Plant AIG	PZ-130	X	X	X
LOX Plant AIG	PZ-131	X	X	X
LOX Plant AIG	PZ-132	X	X	X
LOX Plant AIG	PZ-133		X	X
LOX Plant AIG	PZ-134		X	X
LOX Plant AIG	PZ-135		X	X
LOX Plant AIG	PZ-136		X	X
LOX Plant AIG	PZ-137		X	X
LOX Plant AIG	RD-47	X	X	X
LOX Plant AIG	RD-52A	X	X	X
LOX Plant AIG	RD-52B	X	X	X
LOX Plant AIG	RD-52C	X	X	X
LOX Plant AIG	RD-69	X	X	X
LOX Plant AIG	RD-80	Injection Well	X	X
LOX Plant AIG	RD-81	X	X	X
LOX Plant AIG	RD-82	X	X	X
LOX Plant AIG	RD-83	X	X	X
LOX Plant AIG	WS-04A	X	X	X
LOX Plant AIG	WS-09B	X	X	X
LOX Plant AIG	WS-12	X	X	X
LOX Plant AIG	WS-13	X	X	X
B204/ELV AIG	ND-122	RD-51B Aquifer Test = X ND-123 Aquifer Test = X	X	X
B204/ELV AIG	ND-123	RD-51B Aquifer Test = X ND-123 Injection Well	X	X
B204/ELV AIG	ND-124	RD-51B Aquifer Test = X ND-123 Aquifer Test = X	X	X
B204/ELV AIG	ND-125	RD-51B Aquifer Test = X ND-123 Aquifer Test = X	X	X
B204/ELV AIG	ND-126	RD-51B Aquifer Test = X ND-123 Aquifer Test = X	X	X

TABLE 1 Groundwater Monitoring Locations

AIG	Well Name	Aquifer Test Water Level Observation Well	Groundwater Quality Sampling Location Baseline Event	Groundwater Quality Sampling Location 6-month Post-Aquifer Test Event
B204/ELV AIG	ND-127	RD-51B Aquifer Test = X ND-123 Aquifer Test = X	X	X
B204/ELV AIG	ND-128	RD-51B Aquifer Test = X ND-123 Aquifer Test = X	X	X
B204/ELV AIG	C-7	RD-51B Aquifer Test = X ND-123 Aquifer Test = X	X	X
B204/ELV AIG	ES-22	RD-51B Aquifer Test = X		
B204/ELV AIG	HAR-22		X	X
B204/ELV AIG	PZ-001A		X	X
B204/ELV AIG	PZ-001B		X	X
B204/ELV AIG	PZ-001C		X	X
B204/ELV AIG	PZ-001D		X	X
B204/ELV AIG	PZ-001E		X	X
B204/ELV AIG	PZ-001F		X	X
B204/ELV AIG	PZ-007A		X	X
B204/ELV AIG	PZ-007B		X	X
B204/ELV AIG	PZ-007C		X	X
B204/ELV AIG	PZ-007D		X	X
B204/ELV AIG	PZ-007E		X	X
B204/ELV AIG	PZ-007F		X	X
B204/ELV AIG	PZ-007G		X	X
B204/ELV AIG	PZ-009A		X	X
B204/ELV AIG	PZ-009B		X	X
B204/ELV AIG	PZ-009C		X	X
B204/ELV AIG	PZ-009D		X	X
B204/ELV AIG	PZ-009E		X	X
B204/ELV AIG	PZ-009F		X	X
B204/ELV AIG	PZ-010A		X	X
B204/ELV AIG	PZ-010B		X	X
B204/ELV AIG	PZ-010C		X	X
B204/ELV AIG	PZ-010D		X	X
B204/ELV AIG	PZ-010E		X	X
B204/ELV AIG	PZ-010F		X	X
B204/ELV AIG	PZ-010G		X	X
B204/ELV AIG	PZ-019		X	X
B204/ELV AIG	PZ-020		X	X

TABLE 1 Groundwater Monitoring Locations

AIG	Well Name	Aquifer Test Water Level Observation Well	Groundwater Quality Sampling Location Baseline Event	Groundwater Quality Sampling Location 6-month Post-Aquifer Test Event
B204/ELV AIG	PZ-021	RD-51B Aquifer Test = X	X	X
B204/ELV AIG	PZ-022		X	X
B204/ELV AIG	PZ-056		X	X
B204/ELV AIG	PZ-073	ND-123 Aquifer Test = X	X	X
B204/ELV AIG	PZ-114		X	X
B204/ELV AIG	PZ-115		X	X
B204/ELV AIG	PZ-125		X	X
B204/ELV AIG	PZ-138	RD-51B Aquifer Test = X		
B204/ELV AIG	PZ-139	RD-51B Aquifer Test = X	X	X
B204/ELV AIG	PZ-140	RD-51B Aquifer Test = X ND-123 Aquifer Test = X	X	X
B204/ELV AIG	PZ-141	RD-51B Aquifer Test = X ND-123 Aquifer Test = X	X	X
B204/ELV AIG	PZ-142		X	X
B204/ELV AIG	PZ-143	ND-123 Aquifer Test = X	X	X
B204/ELV AIG	PZ-144	RD-51B Aquifer Test = X ND-123 Aquifer Test = X	X	X
B204/ELV AIG	PZ-145		X	X
B204/ELV AIG	PZ-146		X	X
B204/ELV AIG	PZ-147		X	X
B204/ELV AIG	PZ-148		X	X
B204/ELV AIG	PZ-151		X	X
B204/ELV AIG	PZ-152		X	X
B204/ELV AIG	PZ-157		X	X
B204/ELV AIG	RD-09	RD-51B Aquifer Test = X ND-123 Aquifer Test = X	X	X
B204/ELV AIG	RD-14	ND-123 Aquifer Test = X	X	X
B204/ELV AIG	RD-15		X	X
B204/ELV AIG	RD-26	ND-123 Aquifer Test = X	X	X
B204/ELV AIG	RD-51A	RD-51B Aquifer Test = X ND-123 Aquifer Test = X	X	X
B204/ELV AIG	RD-51B	RD-51B Injection Well ND-123 Aquifer Test = X	X	X
B204/ELV AIG	RD-51C	RD-51B Aquifer Test = X ND-123 Aquifer Test = X	X	X
B204/ELV AIG	RD-56A	RD-51B Aquifer Test = X ND-123 Aquifer Test = X	X	X

TABLE 1 Groundwater Monitoring Locations

AIG	Well Name	Aquifer Test Water Level Observation Well	Groundwater Quality Sampling Location Baseline Event	Groundwater Quality Sampling Location 6-month Post-Aquifer Test Event
B204/ELV AIG	RD-56B	RD-51B Aquifer Test = X ND-123 Aquifer Test = X	X	X
B204/ELV AIG	RD-60	RD-51B Aquifer Test = X ND-123 Aquifer Test = X	X	X
B204/ELV AIG	RD-68A		X	X
B204/ELV AIG	RD-68B		X	X
B204/ELV AIG	RD-70	RD-51B Aquifer Test = X ND-123 Aquifer Test = X	X	X
B204/ELV AIG	RD-83	RD-51B Aquifer Test = X		
B204/ELV AIG	RS-21		X	X
B204/ELV AIG	RS-22		X	X
B204/ELV AIG	RS-29		X	X
B204/ELV AIG	WS-07	ND-123 Aquifer Test = X	X	X
B204/ELV AIG	WS-13	RD-51B Aquifer Test = X		
B204/ELV AIG	WS-SP	RD-51B Aquifer Test = X ND-123 Aquifer Test = X	X	X
Coca/Delta AIG	ND-113	Injection Well	X	X
Coca/Delta AIG	ND-114	X	X	X
Coca/Delta AIG	ND-115	X	X	X
Coca/Delta AIG	ND-116	X	X	X
Coca/Delta AIG	ND-117	X	X	X
Coca/Delta AIG	C-6	X	X	X
Coca/Delta AIG	HAR-07	X	X	X
Coca/Delta AIG	HAR-08	X	X	X
Coca/Delta AIG	HAR-17		X	X
Coca/Delta AIG	HAR-27		X	X
Coca/Delta AIG	HAR-29		X	X
Coca/Delta AIG	PZ-004A		X	X
Coca/Delta AIG	PZ-004B		X	X
Coca/Delta AIG	PZ-017A	X		
Coca/Delta AIG	PZ-017B	X		
Coca/Delta AIG	PZ-035		X	X
Coca/Delta AIG	PZ-045	X		
Coca/Delta AIG	PZ-046	X	X	X
Coca/Delta AIG	PZ-047	X	X	X
Coca/Delta AIG	PZ-053		X	X

TABLE 1 Groundwater Monitoring Locations

AIG	Well Name	Aquifer Test Water Level Observation Well	Groundwater Quality Sampling Location Baseline Event	Groundwater Quality Sampling Location 6-month Post-Aquifer Test Event
Coca/Delta AIG	PZ-054		X	X
Coca/Delta AIG	PZ-126		X	X
Coca/Delta AIG	RD-05A	X		
Coca/Delta AIG	RD-05B	X	X	X
Coca/Delta AIG	RD-05C	X		
Coca/Delta AIG	RD-40	X	X	X
Coca/Delta AIG	RD-41A	X	X	X
Coca/Delta AIG	RD-41B	X	X	X
Coca/Delta AIG	RD-41C	X	X	X
Coca/Delta AIG	RD-42	X	X	X
Coca/Delta AIG	RD-79	X	X	X
Coca/Delta AIG	RD-101	X	X	X
Coca/Delta AIG	RS-10		X	X
Coca/Delta AIG	SP-881C		X	X
Coca/Delta AIG	SP-881G		X	X
Coca/Delta AIG	SP-882A		X	X
Coca/Delta AIG	SP-882G		X	X
Coca/Delta AIG	SP-890C		X	X
Coca/Delta AIG	SP-890G		X	X
Coca/Delta AIG	WS-09A	X	X	X
Alfa/Bravo AIG	ND-132	X	X	X
Alfa/Bravo AIG	ND-133	X	X	X
Alfa/Bravo AIG	ND-134	X	X	X
Alfa/Bravo AIG	ND-135	X	X	X
Alfa/Bravo AIG	ND-136	X	X	X
Alfa/Bravo AIG	ND-137	X	X	X
Alfa/Bravo AIG	C-5	X	X	X
Alfa/Bravo AIG	HAR-05	X	X	X
Alfa/Bravo AIG	HAR-06	X	X	X
Alfa/Bravo AIG	HAR-09	X	X	X
Alfa/Bravo AIG	HAR-11	X	X	X
Alfa/Bravo AIG	HAR-12		X	X
Alfa/Bravo AIG	HAR-13		X	X
Alfa/Bravo AIG	HAR-14		X	X
Alfa/Bravo AIG	HAR-15		X	X

TABLE 1 Groundwater Monitoring Locations

AIG	Well Name	Aquifer Test Water Level Observation Well	Groundwater Quality Sampling Location Baseline Event	Groundwater Quality Sampling Location 6-month Post-Aquifer Test Event
Alfa/Bravo AIG	HAR-19	Injection Well	X	X
Alfa/Bravo AIG	HAR-20	X	X	X
Alfa/Bravo AIG	HAR-21	X	X	X
Alfa/Bravo AIG	HAR-23		X	X
Alfa/Bravo AIG	HAR-30		X	X
Alfa/Bravo AIG	HAR-31		X	X
Alfa/Bravo AIG	PZ-049		X	X
Alfa/Bravo AIG	PZ-057		X	X
Alfa/Bravo AIG	PZ-059	X	X	X
Alfa/Bravo AIG	PZ-060		X	X
Alfa/Bravo AIG	PZ-061		X	X
Alfa/Bravo AIG	PZ-070	X	X	X
Alfa/Bravo AIG	PZ-071		X	X
Alfa/Bravo AIG	PZ-153		X	X
Alfa/Bravo AIG	PZ-154		X	X
Alfa/Bravo AIG	PZ-155	X	X	X
Alfa/Bravo AIG	PZ-156	X		
Alfa/Bravo AIG	PZ-159		X	X
Alfa/Bravo AIG	PZ-203A	X		
Alfa/Bravo AIG	RD-04	X	X	X
Alfa/Bravo AIG	RD-104	X	X	X
Alfa/Bravo AIG	RD-47		X	X
Alfa/Bravo AIG	RD-49A	X	X	X
Alfa/Bravo AIG	RD-49B	X	X	X
Alfa/Bravo AIG	RD-49C	X	X	X
Alfa/Bravo AIG	RS-08		X	X
Alfa/Bravo AIG	RS-34		X	X
Alfa/Bravo AIG	WS-06	X	X	X
Alfa/Bravo AIG	WS-08	X	X	X
Alfa/Bravo AIG	WS-09	X	X	X

TABLE 2 – Groundwater Monitoring Constituents

<u>Constituent</u>	<u>Method</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Minimum Frequency of Analysis</u>
Water Temperature	Field probe	°C	Low-flow sample	Baseline: Prior to injection Aquifer Test Post-Test: Within 6-months of Aquifer Test
Dissolved Oxygen	Field probe	mg/L	Low-flow sample	Baseline: Prior to injection Aquifer Test Post-Test: Within 6-months of Aquifer Test
pH	Field probe	pH units	Low-flow sample	Baseline: Prior to injection Aquifer Test Post-Test: Within 6-months of Aquifer Test
Oxidation-Reduction Potential	Field probe	mV	Low-flow sample	Baseline: Prior to injection Aquifer Test Post-Test: Within 6-months of Aquifer Test
VOCs	SW-846 8260B	µg/L	Low-flow sample	Baseline: Prior to injection Aquifer Test Post-Test: Within 6-months of Aquifer Test
1,4-Dioxane	SW-846 8260B SIM	µg/L	Low-flow sample	Baseline: Prior to injection Aquifer Test Post-Test: Within 6-months of Aquifer Test
Anions (SO ₄ , Cl, NO ₃ , F)	EPA Method 300.0	µg/L	Low-flow sample	Baseline: Prior to injection Aquifer Test Post-Test: Within 6-months of Aquifer Test
Dissolved Metals (Mg, K, Na, Ca, Ba, B, Sr) ^a	SW-846 6010B	µg/L	Low-flow sample	Baseline: Prior to injection Aquifer Test Post-Test: Within 6-months of Aquifer Test
Total Metals (Mg, K, Na, Ca, Ba, B, Sr) ^a	SW-846 6010B	µg/L	Low-flow sample	Baseline: Prior to injection Aquifer Test Post-Test: Within 6-months of Aquifer Test
Alkalinity	SW-846 2320B	µg/L	Low-flow sample	Baseline: Prior to injection Aquifer Test Post-Test: Within 6-months of Aquifer Test
Manganese (dissolved)	SW-846 6010B, 6020	µg/L	Low-flow sample	Baseline: Prior to injection Aquifer Test Post-Test: Within 6-months of Aquifer Test
Ferrous Iron ^b	SM3500Fe-D	µg/L	Low-flow sample	Baseline: Prior to injection Aquifer Test Post-Test: Within 6-months of Aquifer Test
Sulfide	EPA Method 376.2	µg/L	Low-flow sample	Baseline: Prior to injection Aquifer Test Post-Test: Within 6-months of Aquifer Test
Total Organic Carbon	SW-846 9060	µg/L	Low-flow sample	Baseline: Prior to injection Aquifer Test Post-Test: Within 6-months of Aquifer Test
TDS	SM2540C	µg/L	Low-flow sample	Baseline: Prior to injection Aquifer Test Post-Test: Within 6-months of Aquifer Test
Methane, Ethane, Ethene	RSK-175	µg/L	Low-flow sample	Baseline: Prior to injection Aquifer Test Post-Test: Within 6-months of Aquifer Test
Conductivity ^c	E120.2/SW- 846 9050	µS/cm	Low-flow sample	Baseline: Prior to injection Aquifer Test Post-Test: Within 6-months of Aquifer Test
NDMA ^d	1625C	µg/L	Low-flow sample	Baseline: Prior to injection Aquifer Test Post-Test: Within 6-months of Aquifer Test
EFH – Gasoline ^{d,e}	SW8015B	µg/L	Low-flow sample	Baseline: Prior to injection Aquifer Test Post-Test: Within 6-months of Aquifer Test
EFH - Diesel ^{d,f}	SW8015B	µg/L	Low-flow sample	Baseline: Prior to injection Aquifer Test Post-Test: Within 6-months of Aquifer Test

Notes:

^a Groundwater sample at B204/ELV will also be analyzed for antimony, barium, boron, cadmium, lead, mercury, molybdenum, selenium, silver, and strontium.

^b Ferrous Iron will be analyzed using both an analytical method (SM3500Fe-D) and field method (Hach Test Kit).

^c Conductivity will be analyzed with an analytical method (E120.2/SW-846 9050) and as a field parameter using a field probe with direct reading meter and flow-through cell.

^d Constituents will be analyzed in groundwater samples at the Coca/Delta and Alfa/Bravo AIGs only.

^e Carbon range for TPH GRO: C6–C12

^f Carbon ranges for TPH DRO: C8-C11, C12-C14, C15-C20, C21-C30

°C = degrees Celsius

mV = millivolts

B = boron

NDMA = N-nitrosodimethylamine

Ba = barium

NO₃ = nitrate

Ca = calcium

SO₄ = sulfate

Cl = chloride

Sr = Strontium

EPA = U.S. Environmental Protection Agency

TCP = trichloropropane

EFH = extractable fuel hydrocarbons

TDS = total dissolved solids

F = fluoride

µS/cm = microSiemens per centimeter

K = potassium

µg/L = micrograms per liter

mg = magnesium

VOA = volatile organic analysis

mg/L = milligrams per liter

VOC = volatile organic compound

Groundwater monitoring reports must include, at minimum, the following:

- a. Well identification, date and time of sampling;
- b. Sampler identification, and laboratory identification;
- c. Groundwater levels measured during the baseline groundwater sampling event, measured during the potable water injection aquifer tests, and measured during the 6-month post-test groundwater sampling event. Groundwater level measurements will be recorded to 0.01 feet mean sea level.

IV. MONITORING FREQUENCIES

Specifications in this monitoring program are subject to periodic revisions. Monitoring requirements may be modified or revised by the Executive Officer based on review of monitoring data submitted pursuant to this Order. Monitoring frequencies may be adjusted to a less frequent basis or parameters and locations dropped by the Executive Officer if the Discharger makes a request and the request is backed by statistical trends of monitoring data submitted.

V. CERTIFICATION STATEMENT

Each report shall contain the following completed declaration:

"I certify under penalty of law that this document, including all attachments and supplemental information, was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the

person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment.

Executed on the ____ day of _____ at _____.

_____ (Signature)

_____ (Title)"

VI. ELECTRONIC SUBMITTAL OF INFORMATION (ESI) TO GEOTRACKER

The Discharger shall comply with the Electronic Submittal of Information (ESI) requirements by submitting all reports required under the MRP, including groundwater monitoring data, discharge location data, and pdf monitoring reports to the State Water Resources Control Board GeoTracker database under Global ID WDR100023597.

All records and reports submitted in compliance with this Order are public documents and will be made available for inspection during business hours at the office of the California Regional Water Quality Control Board, Los Angeles Region, upon request by interested parties. Only proprietary information, and only at the request of the Discharger, will be treated as confidential.

Ordered by: Samuel Unger
Samuel Unger, P.E.
Executive Officer

Date: December 11, 2015

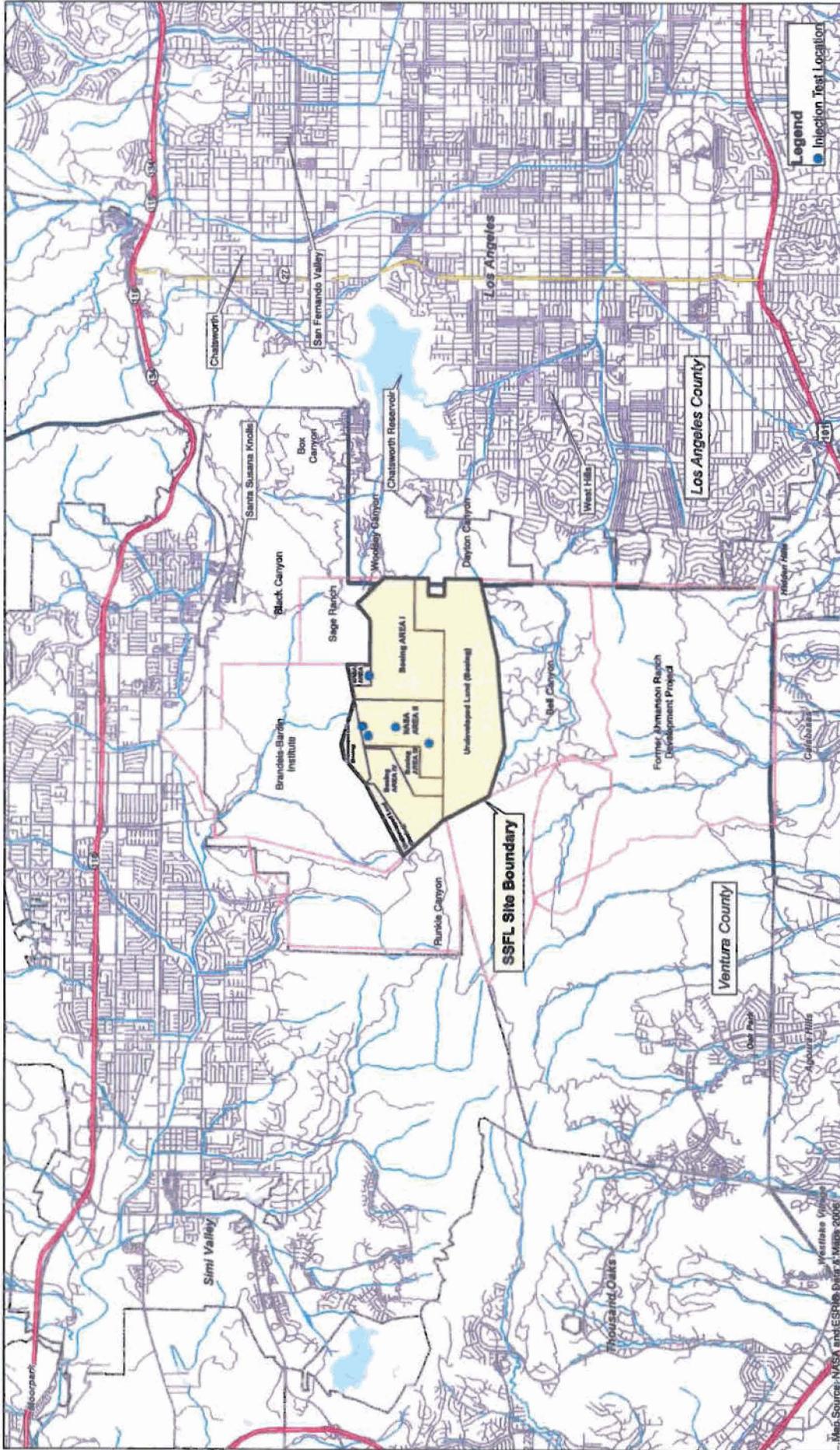
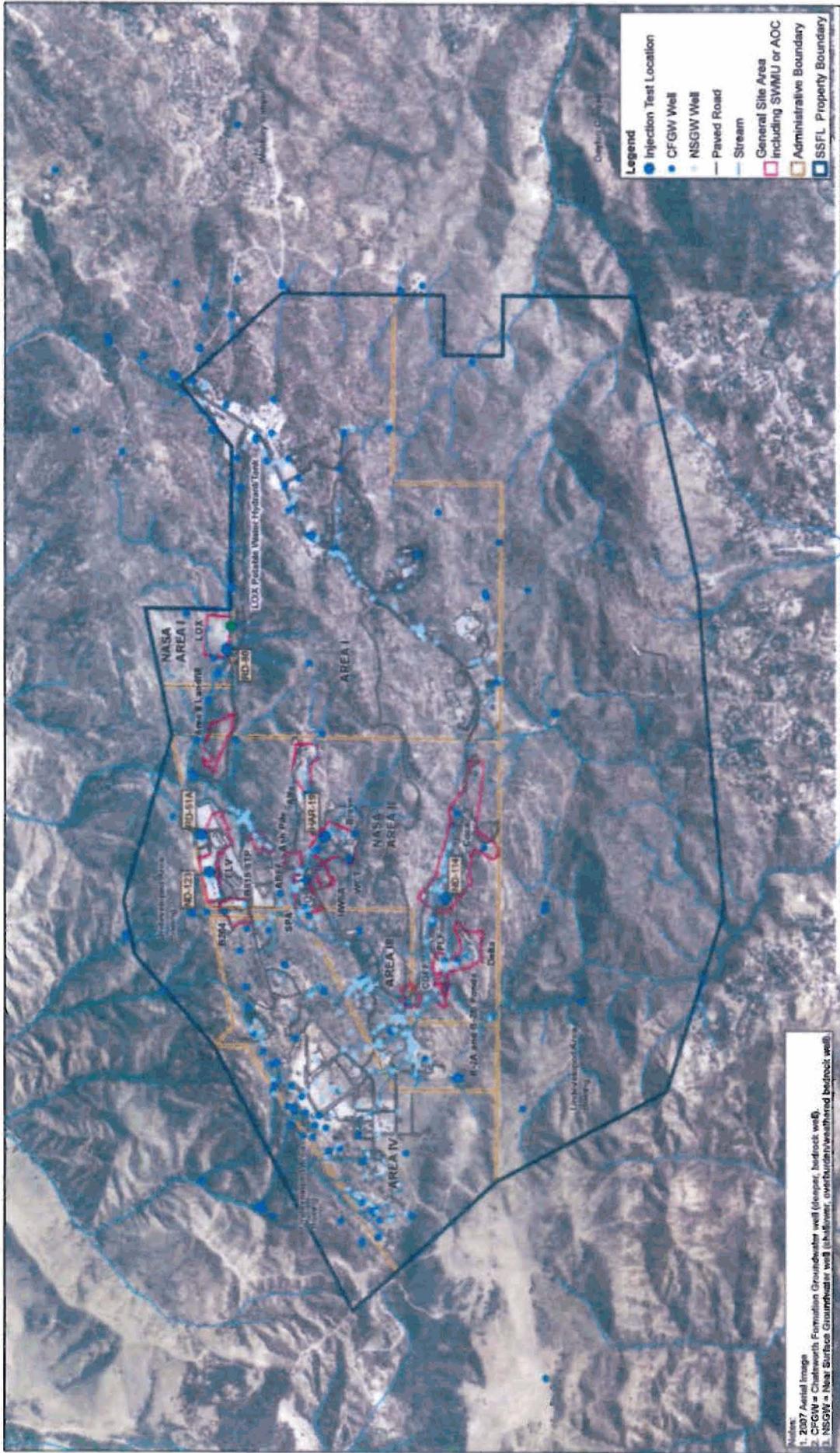


Figure 1
 Facility Location Map
 Santa Susana Field Laboratory
 Ventura County, California

Map Source: NASA and ESRI's Data & Maps 2006
 0 0.5 1 2 Miles
 0 0.75 1.5 3 Kilometers



04 March 2011
 Bruce R.
 A. Gandy



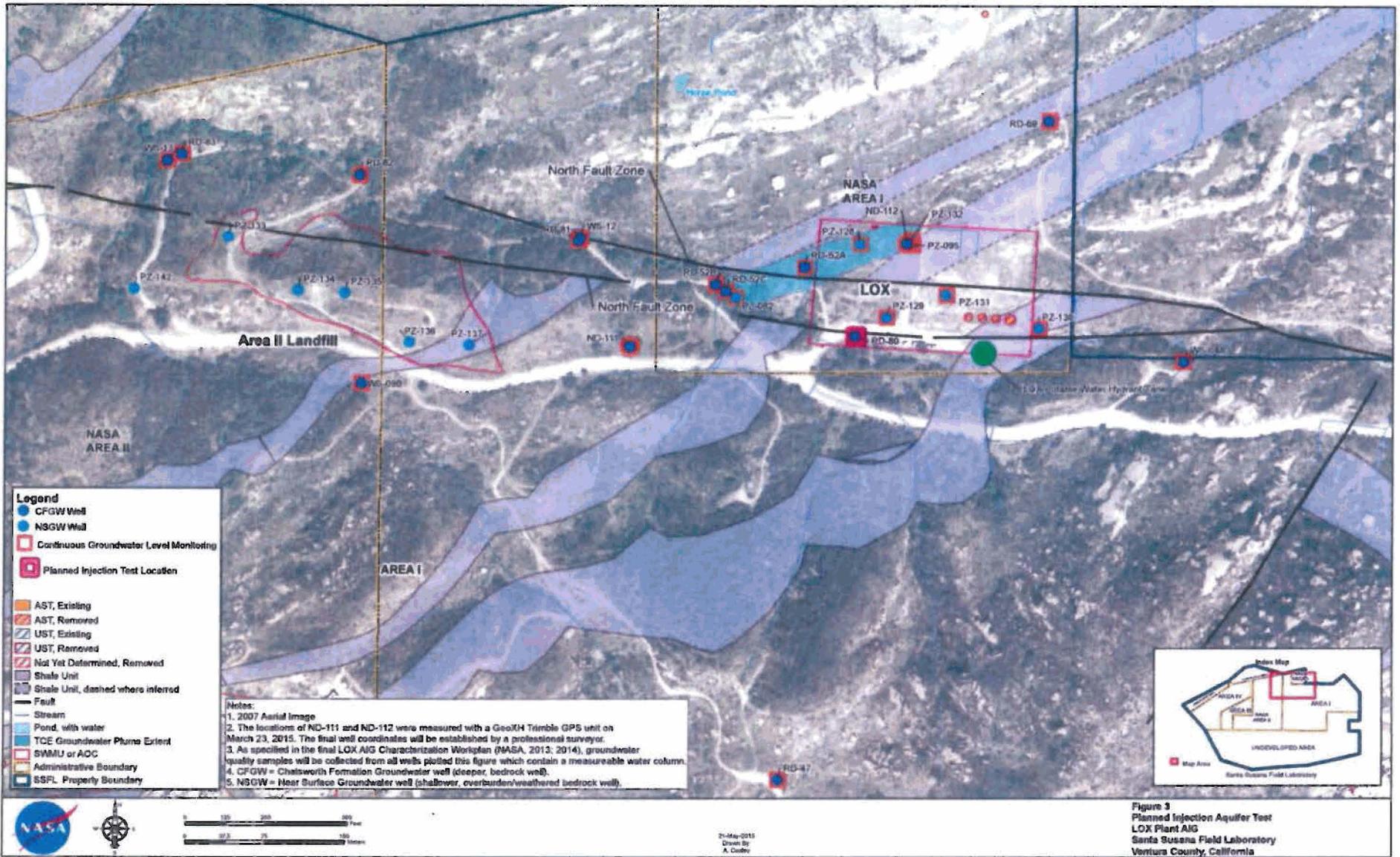
1. 2007 Aerial Image
 2. CFGW = Chalkworth Formation Groundwater well (deeper, bedrock well)
 3. NSGW = Near Surface Groundwater well (shallow, overburden/weathered bedrock well)

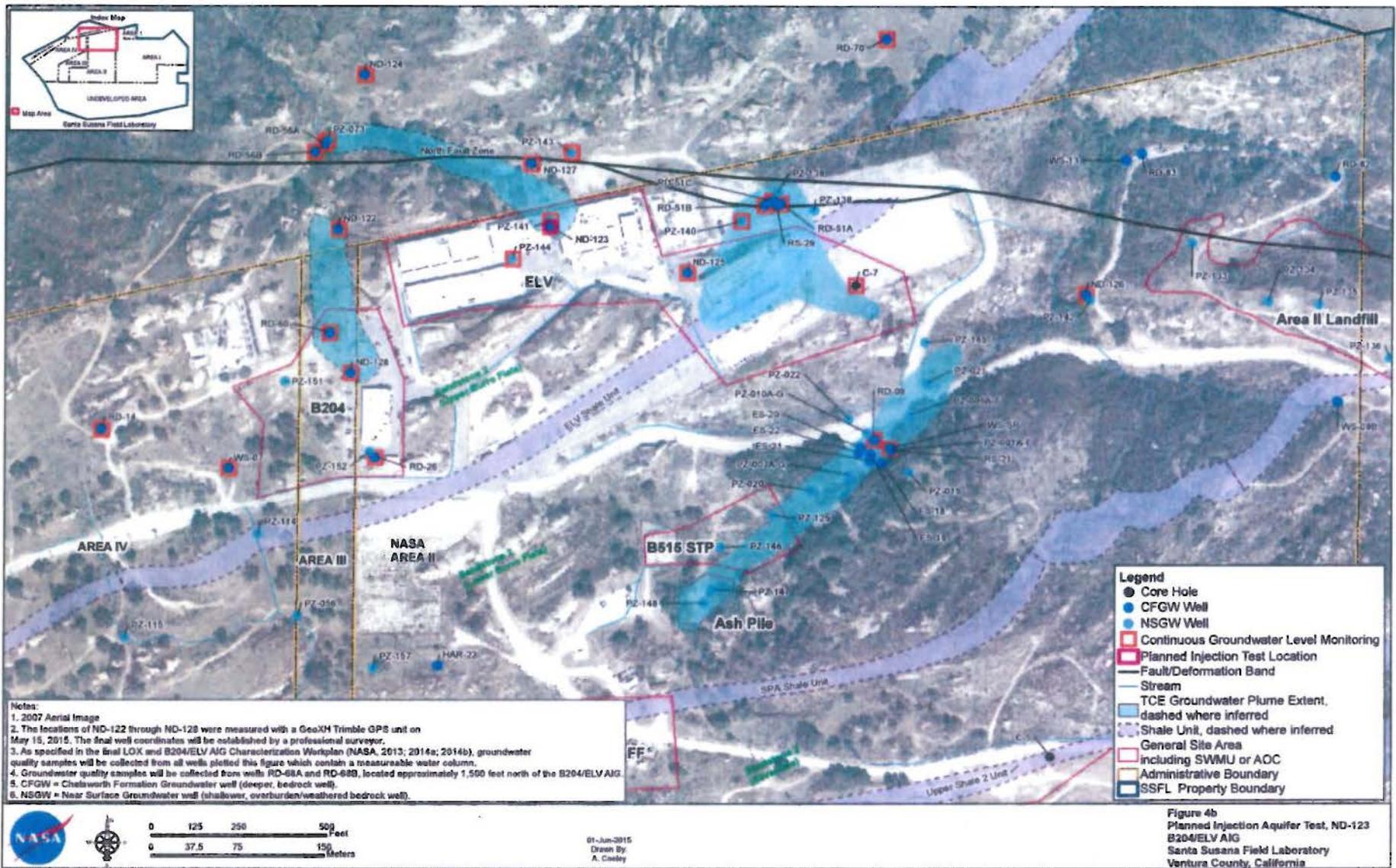


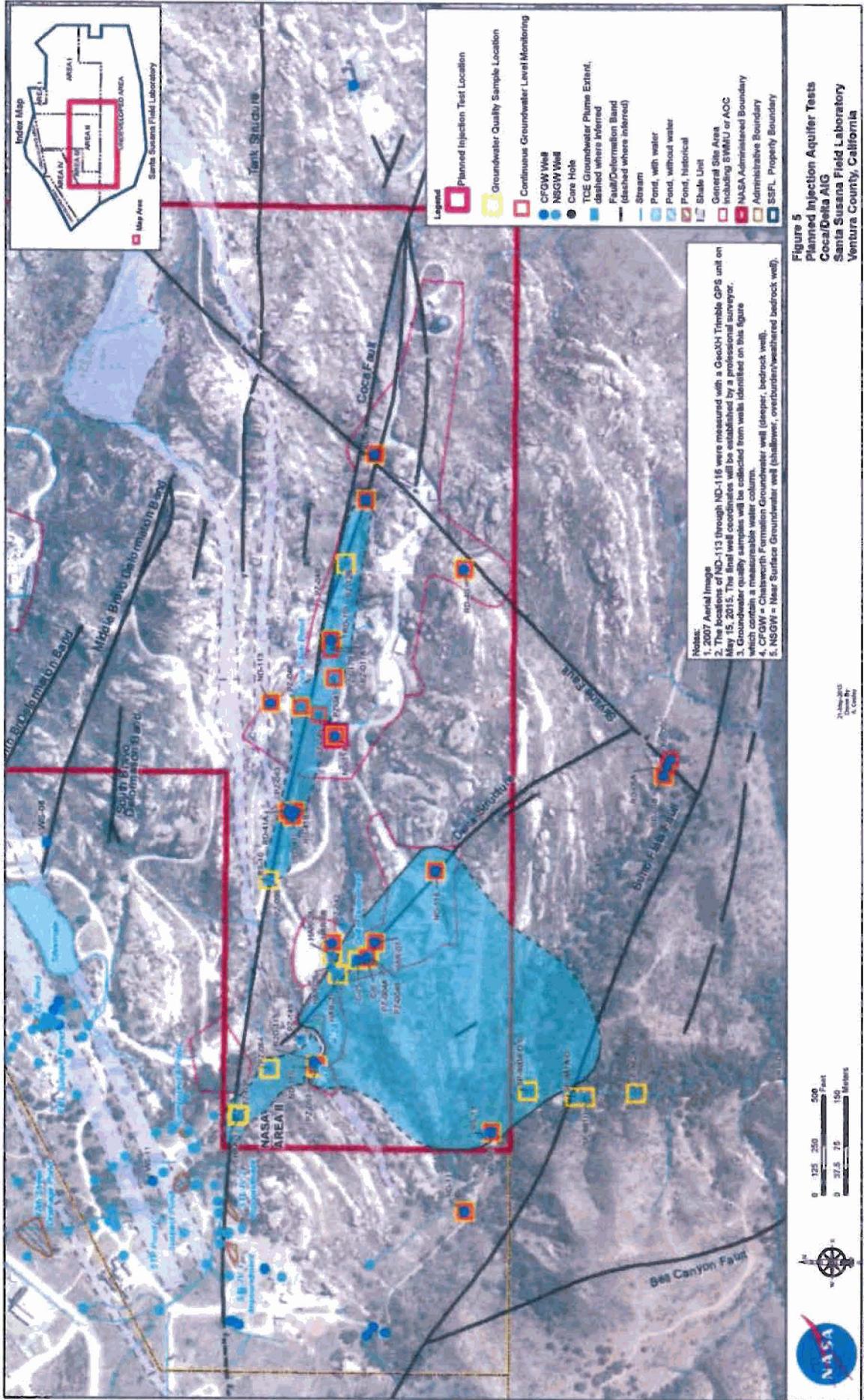
2/14/2011
 Santa Susana Field Laboratory
 A. C.

Figure 2
 SSFL Injection Aquifer Test Locations
 Santa Susana Field Laboratory
 Ventura County, CA

- Legend**
- Injection Test Location
 - CFGW Well
 - NSGW Well
 - Paved Road
 - Stream
 - General Site Area Including SWMU or AOC
 - Administrative Boundary
 - SSFL Property Boundary







Notes:
 1. 2007 Aerial Image
 2. The location of NSF-113 through NSF-115 were measured with a GeoVH Trimble GPS unit on May 15, 2015. The final well coordinates will be established by a professional surveyor.
 3. Groundwater quality samples will be collected from wells identified on this figure which contain a measurable water column.
 4. CFWW = Chainworth Formation Groundwater well (deeper, bedrock well).
 5. NSGW = Near Surface Groundwater well (shallower, overburden/weathered bedrock well).

Figure 5
 Planned Injection Aquifer Tests
 Coca/Delta AIG
 Santa Susana Field Laboratory
 Ventura County, California

Published
 Date: 07/15/15
 A. Cooley

0 125 250 500 Feet
 0 37.5 75 150 Meters



