

# Outfall 008 BMP and Performance Monitoring Locations

**Base Map Legend**

- Administrative Area Boundary
- RFI Site Boundary
- Drainage
- Non Jurisdictional Surface Water Pathway
- Surface Water Divide

**Figure Legend**

- Discontinued Performance Monitoring Location
- Potential BMP Subarea Monitoring Location
- Discontinued Potential BMP Subarea Monitoring Location
- Actual ISRA Excavation Boundary

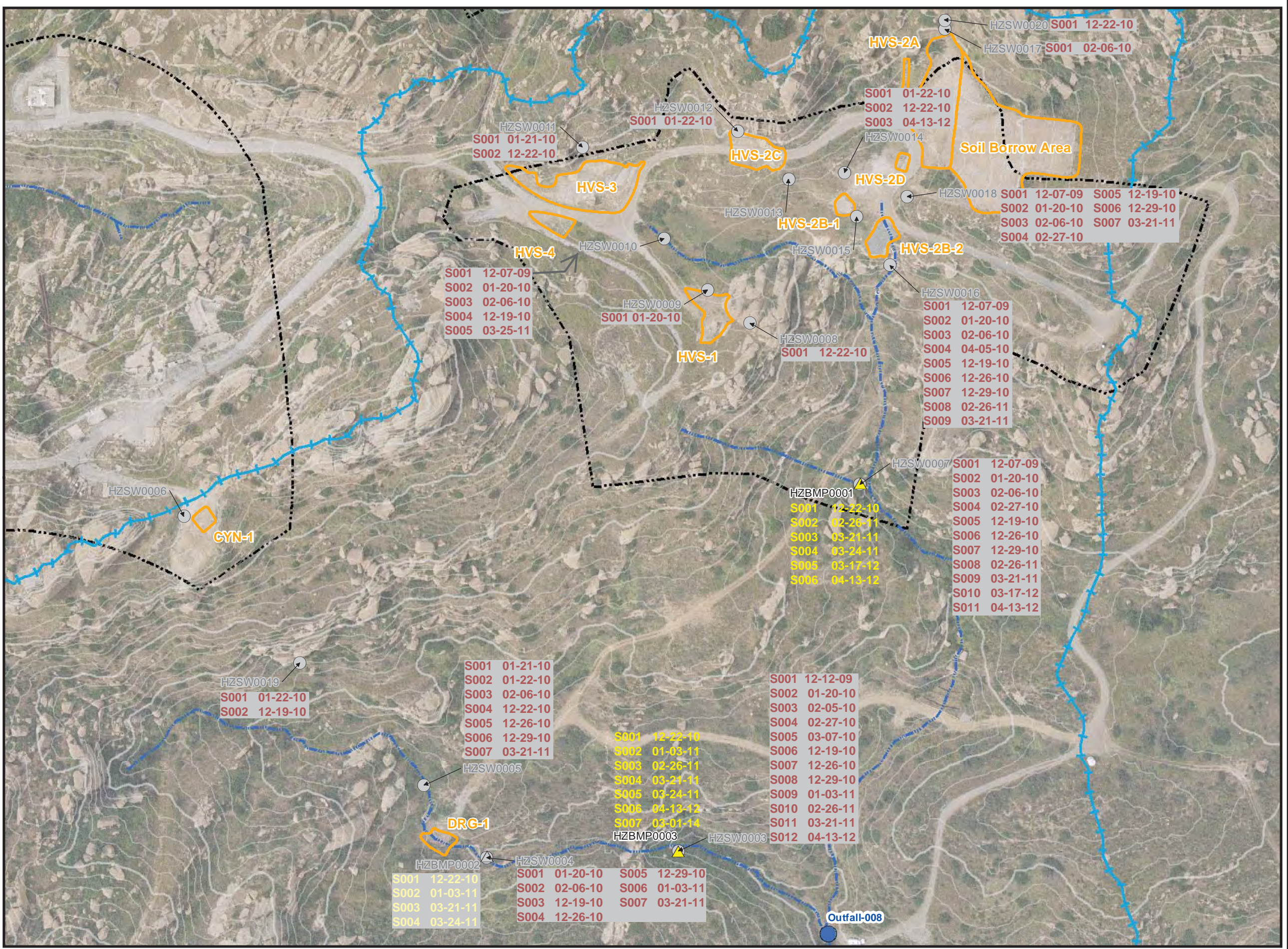
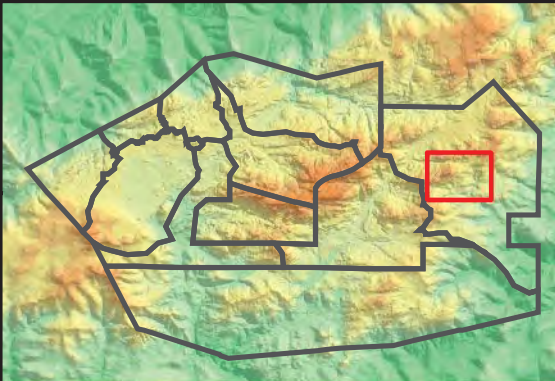
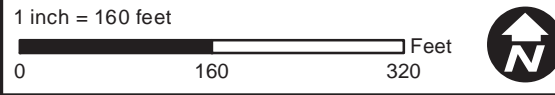
**S001 12-7-09** Performance Monitoring sample ID suffix and collection date

**S001 12-22-10** BMP Monitoring sample ID suffix and collection date

**Note:**  
Performance monitoring and BMP monitoring inspections were performed at locations shown on this figure during daylight hours as soon as possible after the rain event began, and at 24 hour intervals during extended rain events. During inspections, if sufficient storm water runoff was observed at a sample location, a sample was collected. The dates on which samples were collected are shown on the Figure; locations with no dates have never been sampled.

- Note:**
- Aerial imagery from 2010 Sage Consulting.
  - Topographic contours from 2010 Sage Consulting.
  - Rationale for discontinuing monitoring at previous sample locations can be found in the text and/or tables of the 2010/2011, 2011/2012, 2012/2013, and 2013/2014 Rainy Season Sampling and Analysis Plan.
  - Inspection/sampling at offsite monitoring locations subject to property owner approval.

Path: T:\projects\rock3\ISRA\Figures\PerfMon\2012-2013 Rainy Season\HVS\_Fig2-1.mxd  
Date: 8/27/2014





# Outfall 009 BMP and Performance Monitoring Locations AILF and IEL Areas

## Base Map Legend

- Administrative Area Boundary
- Non Jurisdictional Surface Water Pathway
- RFI Site Boundary
- Surface Water Divide
- Drainage

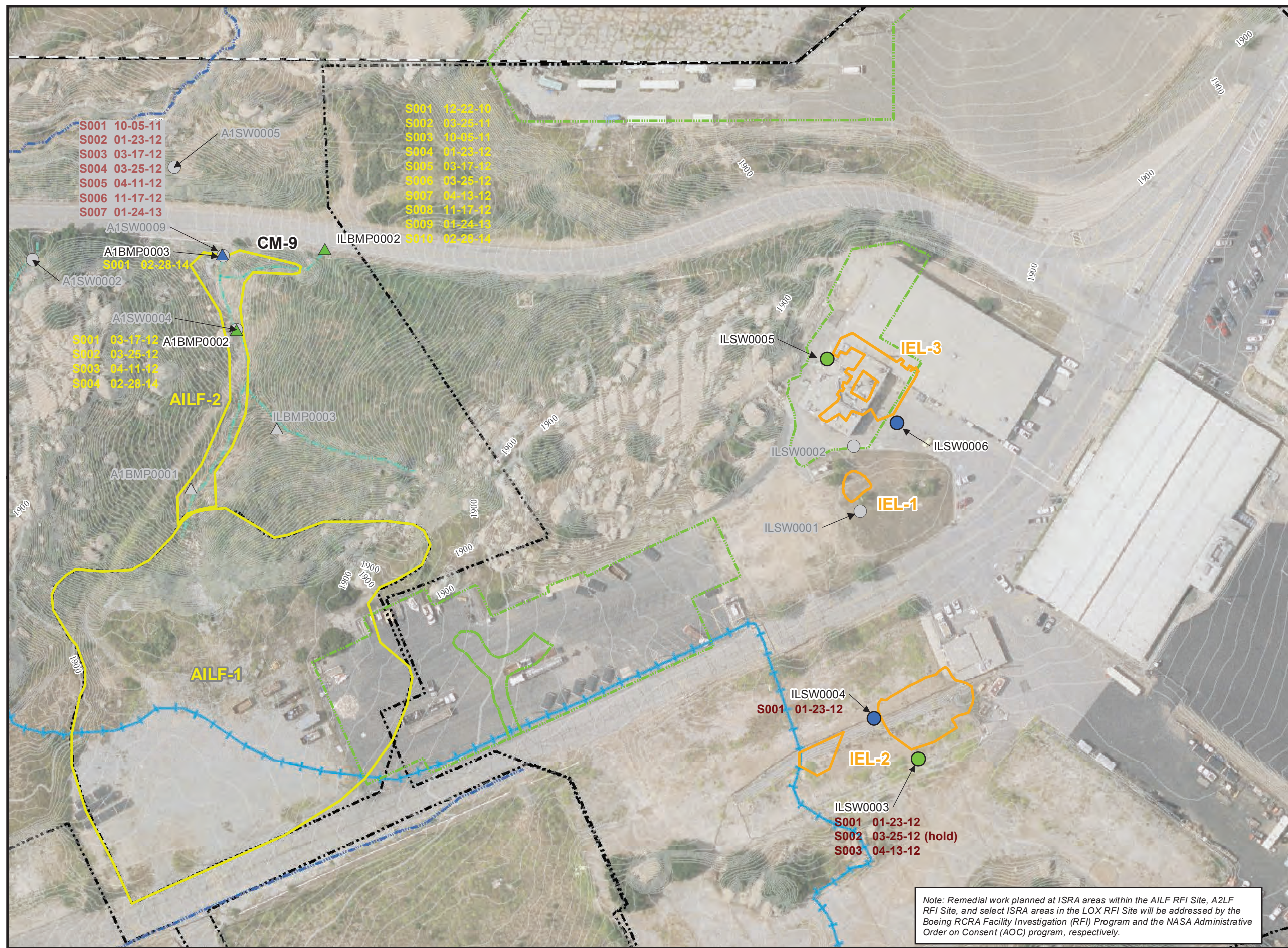
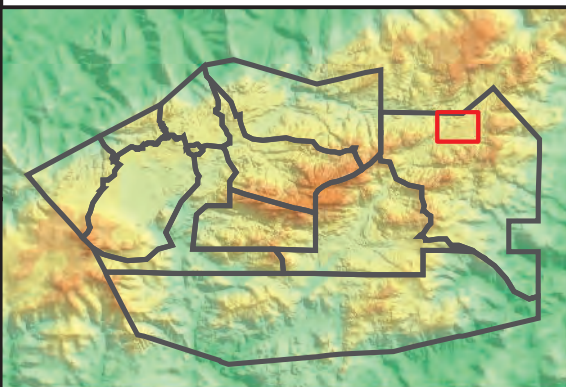
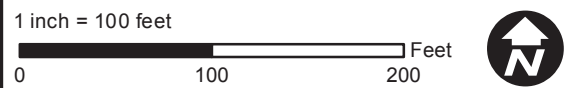
## Figure Legend

- Primary Downstream Performance Monitoring Location
- Upstream Performance Monitoring Location
- Discontinued Performance Monitoring Location
- Potential BMP Subarea Monitoring Location
- Downstream Treatment BMP Monitoring Location
- Upstream Treatment BMP Monitoring Location
- Discontinued Potential BMP Subarea Monitoring Location
- Actual ISRA Excavation Boundary
- Former Planned ISRA Area Boundary
- Asphalt/Concrete Removal Area

### Note:

1. Aerial imagery from 2010 Sage Consulting.
2. Topographic contours from 2010 Sage Consulting.
3. Rationale for discontinuing monitoring at previous sample locations can be found in the text and/or tables of the 2010/2011, 2011/2012, 2012/2013, and 2013/2014 Rainy Season Sampling and Analysis Plan.
4. Inspection/sampling at offsite monitoring locations subject to property owner approval.

Path: T:\projects\rock3\ISRA\Figures\PerfMon\2012-2013 Rainy Season\AILF\_IEL1\_Fig2-3.mxd  
Date: 8/27/2014



Note: Remedial work planned at ISRA areas within the AILF RFI Site, A2LF RFI Site, and select ISRA areas in the LOX RFI Site will be addressed by the Boeing RCRA Facility Investigation (RFI) Program and the NASA Administrative Order on Consent (AOC) program, respectively.

# Outfall 009 BMP and Performance Monitoring Locations LOX Area

## Base Map Legend

- Administrative Area Boundary
- RFI Site Boundary
- Drainage
- Non Jurisdictional Surface Water Pathway
- Surface Water Divide

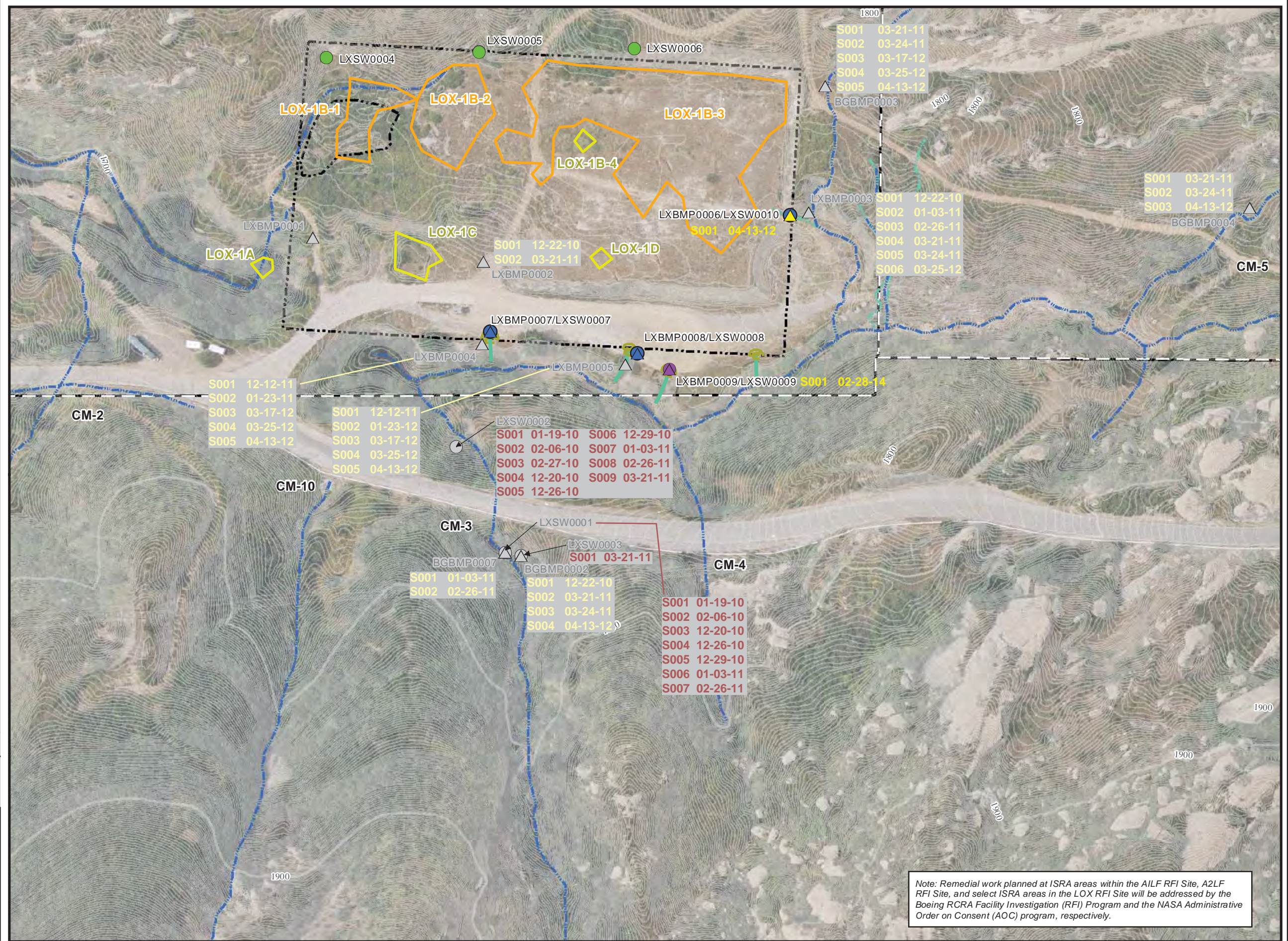
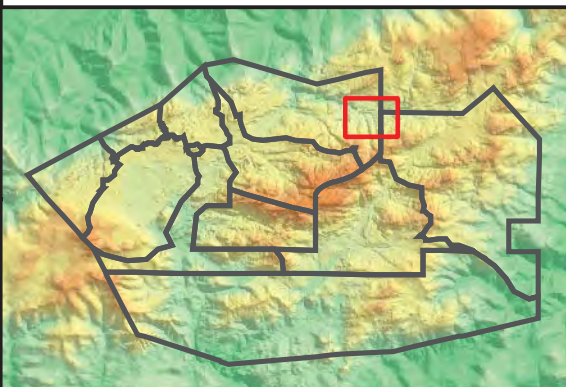
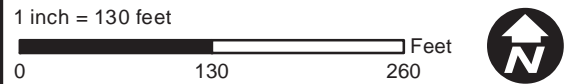
## Figure Legend

- Primary Downstream Performance Monitoring Location
- Upstream Performance Monitoring Location
- Discontinued Performance Monitoring Location
- Alternate Downstream Performance Monitoring Location
- Potential BMP Subarea Monitoring Location
- Downstream Treatment BMP Monitoring Location
- Discontinued Potential BMP Subarea Monitoring Location
- Alternate BMP Performance Monitoring Location
- Actual ISRA Excavation Boundary
- Former Planned ISRA Area Boundary
- Gravel Bag Berm
- Slope Drain

### Note:

1. Aerial imagery from 2010 Sage Consulting.
2. Topographic contours from 2010 Sage Consulting.
3. Rationale for discontinuing monitoring at previous sample locations can be found in the text and/or tables of the 2010/2011, 2011/2012, 2012/2013, and 2013/2014 Rainy Season Sampling and Analysis Plan.
4. Inspection/sampling at offsite monitoring locations subject to property owner approval.

Path: T:\projects\vock3\ISRA\Figures\PerfMon\2012-2013 Rainy Season\LOX\_Fig2-4.mxd  
Date: 8/27/2014



Note: Remedial work planned at ISRA areas within the AILF RFI Site, A2LF RFI Site, and select ISRA areas in the LOX RFI Site will be addressed by the Boeing RCRA Facility Investigation (RFI) Program and the NASA Administrative Order on Consent (AOC) program, respectively.

# Outfall 009 BMP and Performance Monitoring Locations A2LF and ELV Areas

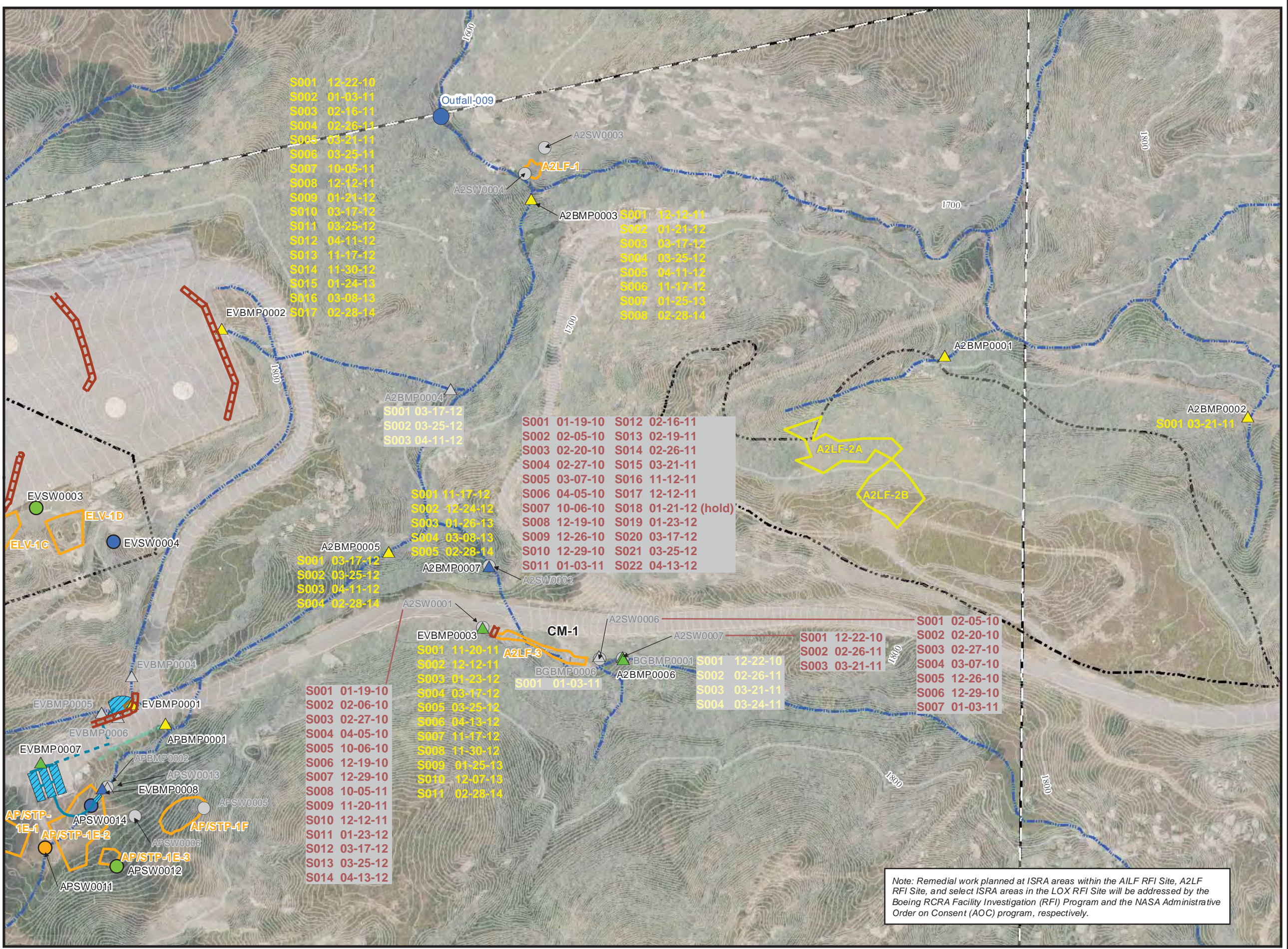
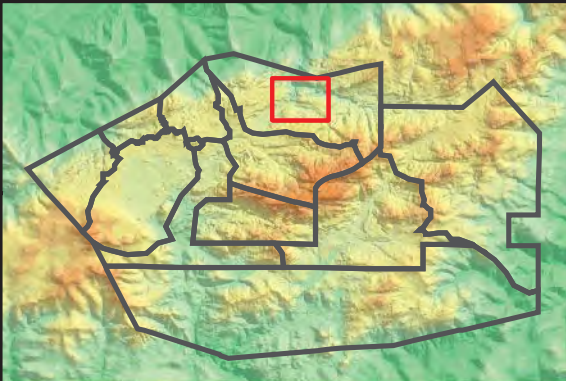
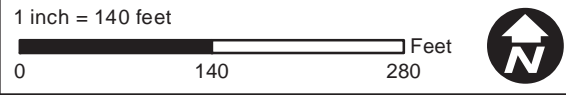
- Base Map Legend**
- Administrative Area Boundary
  - RFI Site Boundary
  - Drainage
  - Non Jurisdictional Surface Water Pathway
  - Surface Water Divide

- Figure Legend**
- Primary Downgradient Performance Monitoring Sample Location
  - Upgradient Performance Monitoring Sample Location
  - Secondary Performance Monitoring Sample Location
  - Previous Performance Monitoring
  - Potential BMP Subarea Monitoring Location
  - Downstream Treatment BMP Monitoring Location
  - Upstream Treatment BMP Monitoring Location
  - Discontinued Potential BMP Subarea Monitoring Location
  - Actual ISRA Excavation Boundary
  - Former Planned ISRA Area Boundary
  - Sandbags
  - Engineered Treatment System
  - Engineered Treatment System-Headwall
  - Engineered Treatment System-Pipeline (Aboveground)
  - Engineered Treatment System-Pipeline (Belowground)

**Note:**

- Aerial imagery from 2010 Sage Consulting.
- Topographic contours from 2010 Sage Consulting.
- Rationale for discontinuing monitoring at previous sample locations can be found in the text and/or tables of the 2010/2011, 2011/2012, 2012/2013, and 2013/2014 Rainy Season Sampling and Analysis Plan.
- Inspection/sampling at offsite monitoring locations subject to property owner approval.

Path: T:\projects\vo\3\ISRA\Figures\PerfMon\2012-2013 Rainy Season\A2LF\_Fig2-5.mxd  
Date: 8/27/2014



Note: Remedial work planned at ISRA areas within the AILF RFI Site, A2LF RFI Site, and select ISRA areas in the LOX RFI Site will be addressed by the Boeing RCRA Facility Investigation (RFI) Program and the NASA Administrative Order on Consent (AOC) program, respectively.

# Outfall 009 BMP and Performance Monitoring Locations AP/STP Area

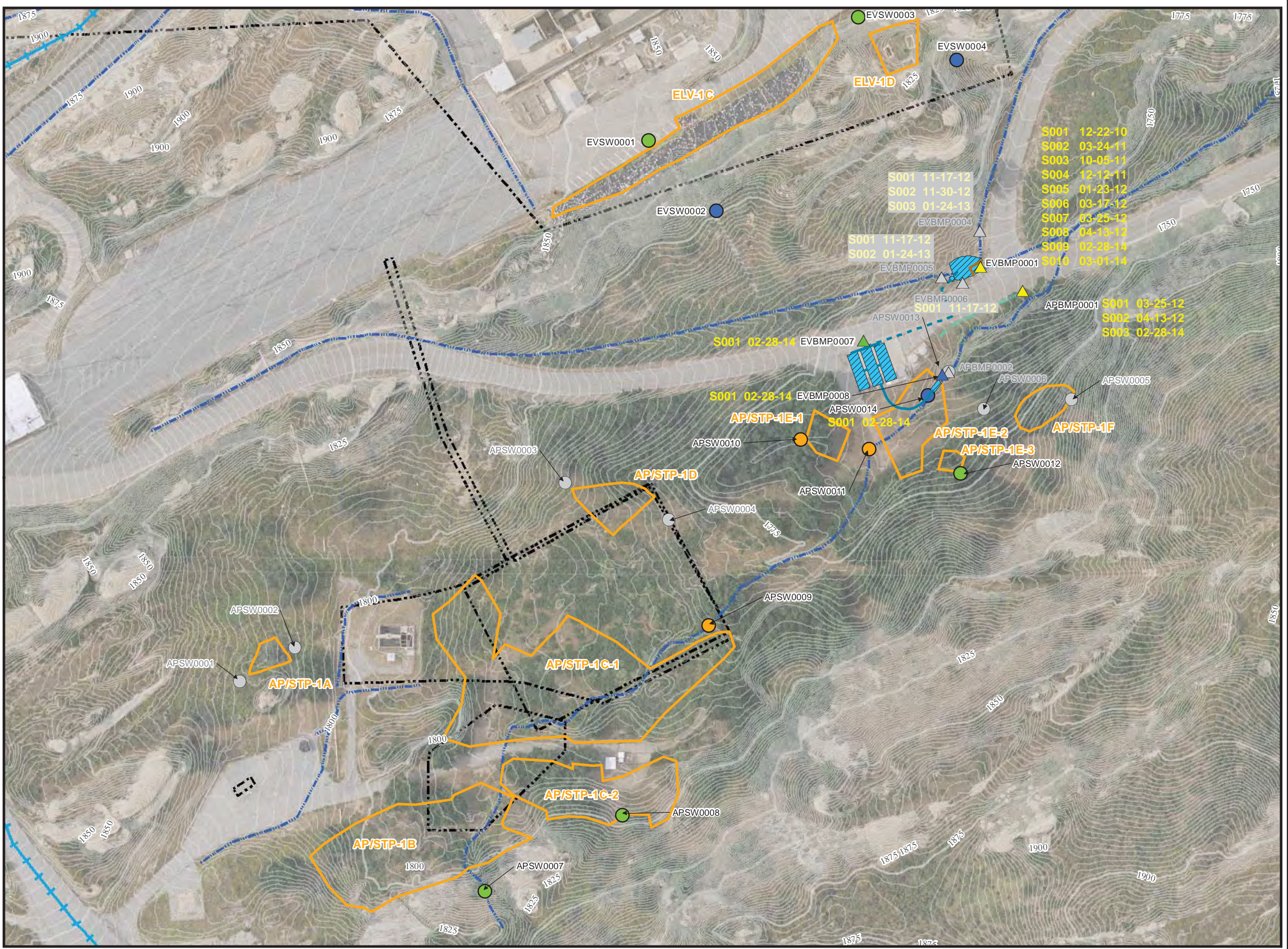
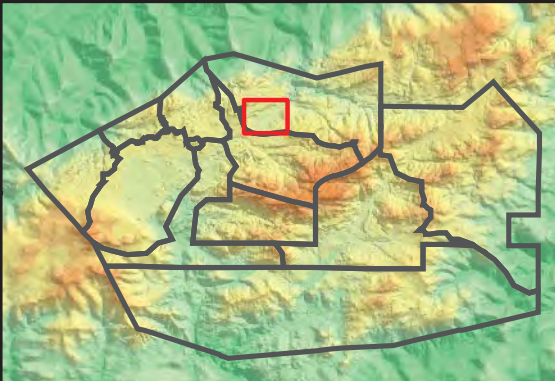
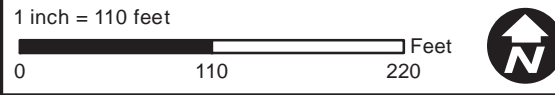
- Base Map Legend**
- Administrative Area Boundary
  - Non Jurisdictional Surface Water Pathway
  - RFI Site Boundary
  - Surface Water Divide
  - Drainage

- Figure Legend**
- Primary Downstream Performance Monitoring Location
  - Upstream Performance Monitoring Location
  - Secondary Performance Monitoring Location
  - Discontinued Performance Monitoring Location
  - Potential BMP Subarea Monitoring Location
  - Downstream Treatment BMP Monitoring Location
  - Upstream Treatment BMP Monitoring Location
  - Intermediate Treatment BMP Monitoring Location
  - Discontinued Potential BMP Subarea Monitoring Location
  - Actual ISRA Excavation Boundary
  - Engineered Treatment System
  - Engineered Treatment System-Headwall
  - Engineered Treatment System-Pipeline (Aboveground)
  - Engineered Treatment System-Pipeline (Belowground)

**Note:**

1. Aerial imagery from 2010 Sage Consulting.
2. Topographic contours from 2010 Sage Consulting.
3. Rationale for discontinuing monitoring at previous sample locations can be found in the text and/or tables of the 2010/2011, 2011/2012, 2012/2013, and 2013/2014 Rainy Season Sampling and Analysis Plan.
4. Inspection/sampling at offsite monitoring locations subject to property owner approval.

Path: T:\projects\vo\ck3\ISRA\Figures\PerfMon\2012-2013 Rainy Season\APSTP\_Fig-2-6.mxd  
Date: 8/27/2014



S001	12-22-10
S002	03-24-11
S003	10-05-11
S004	12-12-11
S005	01-23-12
S006	03-17-12
S007	03-25-12
S008	04-13-12
S009	02-28-14
S010	03-01-14

S001	11-17-12
S002	11-30-12
S003	01-24-13

S001	11-17-12
S002	01-24-13

S001	02-28-14
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S001	02-28-14
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S001	02-28-14
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S001	02-28-14
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S001	02-28-14
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S001	02-28-14
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S001	02-28-14
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S001	02-28-14
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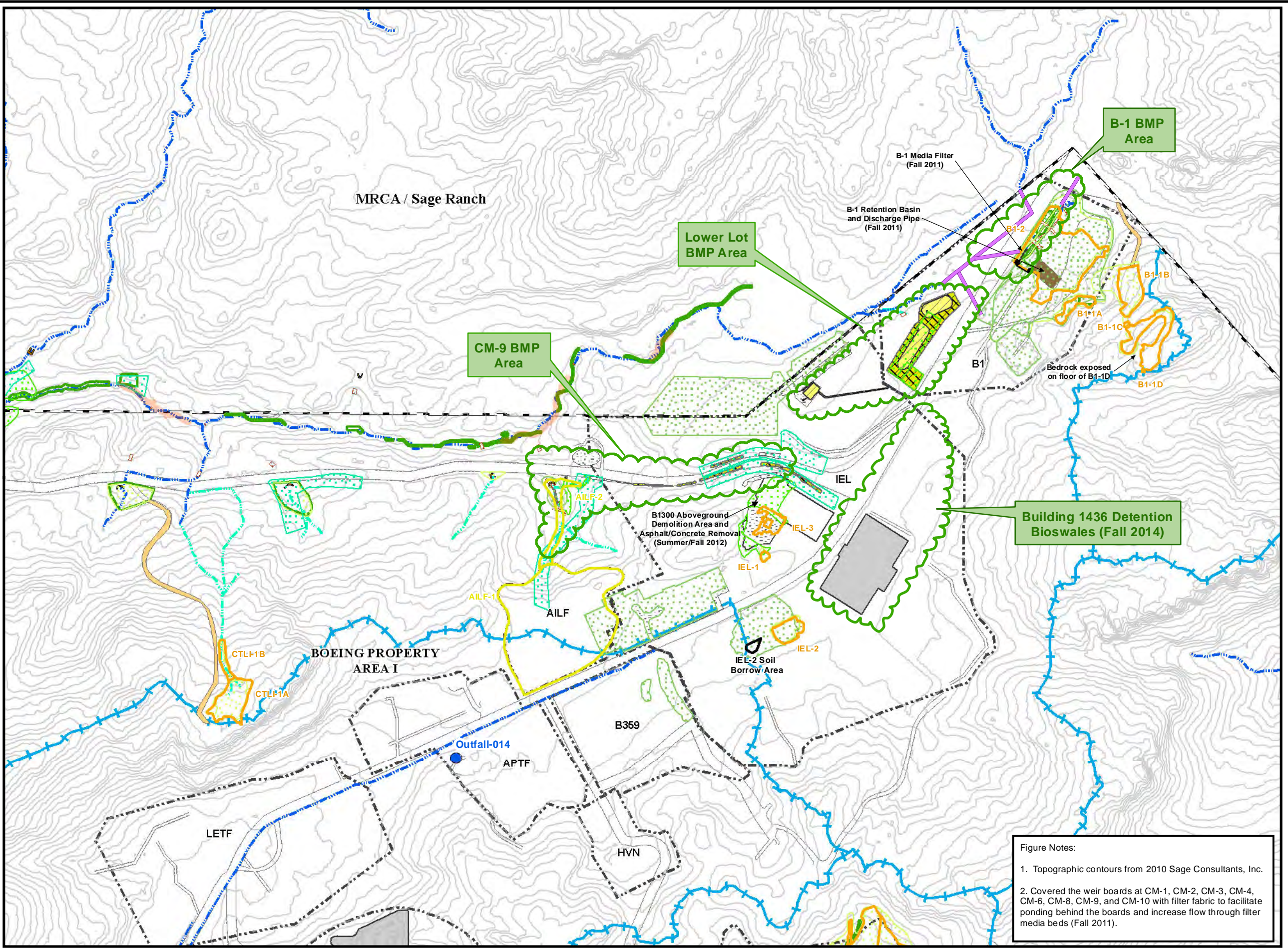
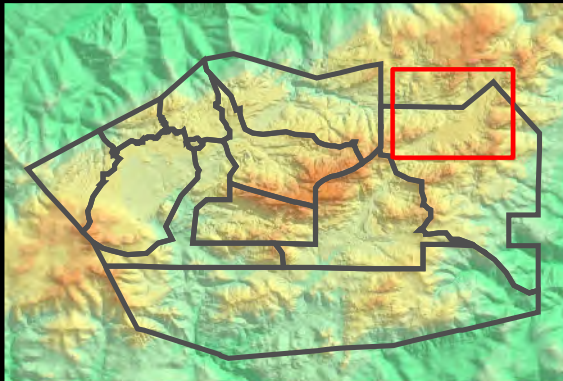
# BMP Areas Based on BMP Ranking Results Eastern Outfall 009 Watershed

- Base Map Legend**
- Administrative Area Boundary
  - RFI Site Boundary
  - NPDES Outfall
  - Non Jurisdictional Surface Water Pathway
  - Drainage
  - Surface Water Divide
  - A/C Paving
  - Dirt Road
  - Elevation Contour

- Data Legend**
- Actual ISRA Excavation Boundary
  - ISRA Area with Remediation in Progress
  - Former Planned ISRA Area Boundary
  - Culvert Maintenance (CM)
  - Media Filters
  - Retention Basin
  - Engineered Natural Treatment System
  - Abandoned Road
  - Demolition Area
  - Erosion Control Fabric
  - Jute Straw Mat
  - Rip Rap
  - Gravel
  - Planting Area
  - Hydroseed, 2013/2014
  - Hydroseed 2012/2013
  - Hydroseed 2011/2012
  - Hydroseed 2010/2011
  - Concrete Curb
  - Conveyance Pipeline
  - Curb Cut
  - Check Dam
  - Gabion
  - Fiber Rolls
  - Hay Straw Bales
  - Silt Fencing
  - Sandbags
  - Soil Berm
  - Water Gravel Bars
  - Wooden Retaining Wall
  - Culvert Maintenance Headwall
  - Planned BMP Activities
  - Northern Drainage RMMP Areas (Summer/Fall 2012)
  - B-1 Area Stormwater Conveyance Pipelines (estimated subsurface trace)
  - Trench Drain/Cistern
  - BMP Area

Path: T:\projects\rock3\ISRA\Figures\Outfall-009\BMP 009 2014\Figure 3-1.mxd Date: 8/27/2014

1 inch = 300 feet  
 0 300 600 Feet



- Figure Notes:**
1. Topographic contours from 2010 Sage Consultants, Inc.
  2. Covered the weir boards at CM-1, CM-2, CM-3, CM-4, CM-6, CM-8, CM-9, and CM-10 with filter fabric to facilitate ponding behind the boards and increase flow through filter media beds (Fall 2011).



SANTA SUSANA FIELD LABORATORY

FIGURE 3-1

# BMP Areas Based on BMP Ranking Results Western Outfall 009 Watershed

**Base Map Legend**

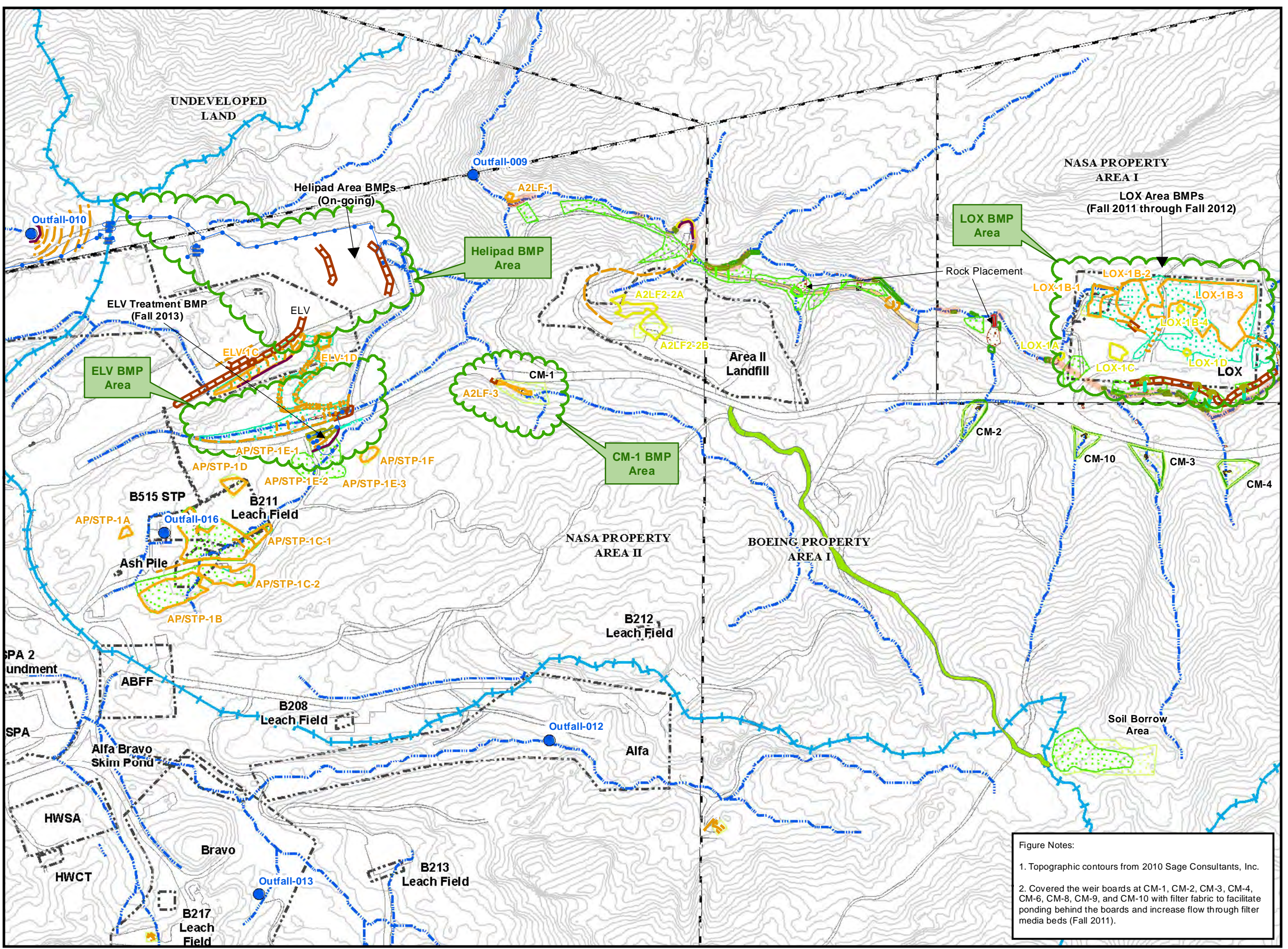
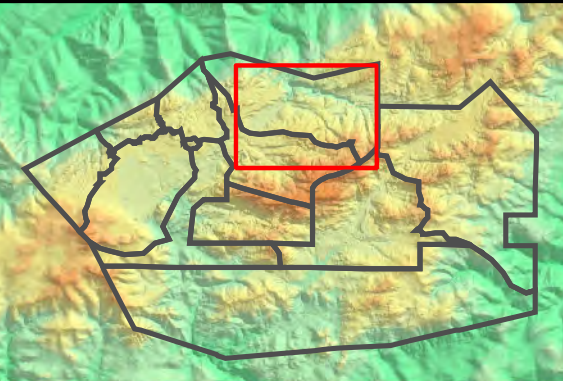
- Administrative Area Boundary
- RFI Site Boundary
- NPDES Outfall
- Drainage
- Non Jurisdictional Surface Water Pathway
- Surface Water Divide
- A/C Paving
- Dirt Road
- Elevation Contour

**Data Legend**

- Actual ISRA Excavation Boundary
- Former Planned ISRA Area Boundary
- Culvert Maintenance (CM)
- Media Filters
- Retention Basin
- Abandoned Road
- Erosion Control Fabric
- Rip Rap
- Geo Cell
- Planting Area
- Pump
- Storage Tank
- Road Erosion Control Measures
- Runoff Low Spot
- Hydroseed, 2013/2014
- Hydroseed 2012/2013
- Hydroseed 2011/2012
- Hydroseed 2010/2011
- Conveyance Pipeline
- Fiber Rolls
- Hay Straw Bales
- Silt Fencing
- Gravel Bag Berm
- Sandbags
- Rolling Dips
- Slope Drain
- Water Gravel Bars
- Pipeline
- Storm Drain Headwall
- Northern Drainage RMMP (Summer 2012)
- BMP Area

Path: T:\projects\rock3\ISRA\Figures\Outfall-009\BMP 009 2014\Figure 3-2.mxd  
Date: 8/27/2014

1 inch = 350 feet



**Figure Notes:**

- Topographic contours from 2010 Sage Consultants, Inc.
- Covered the weir boards at CM-1, CM-2, CM-3, CM-4, CM-6, CM-8, CM-9, and CM-10 with filter fabric to facilitate ponding behind the boards and increase flow through filter media beds (Fall 2011).

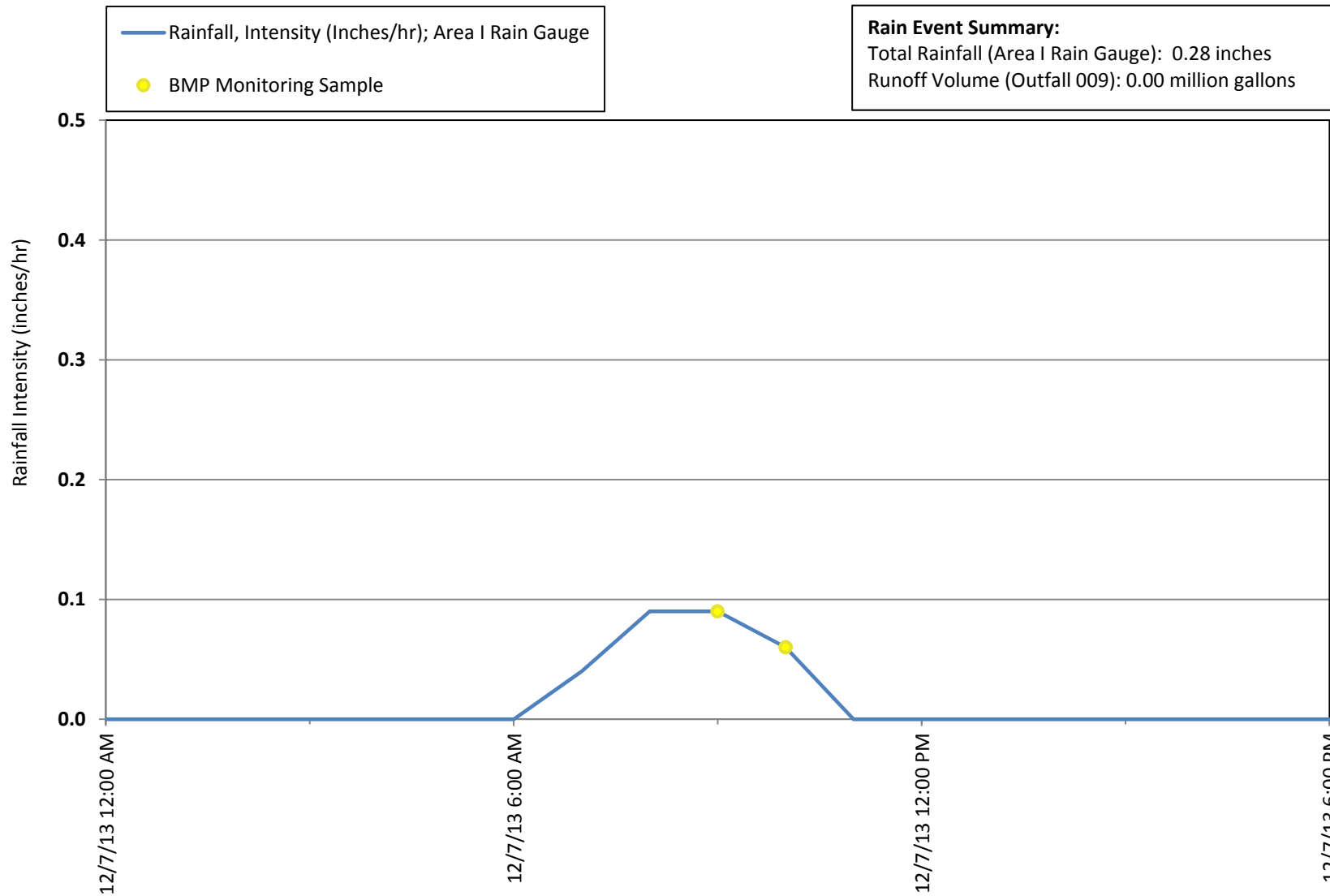




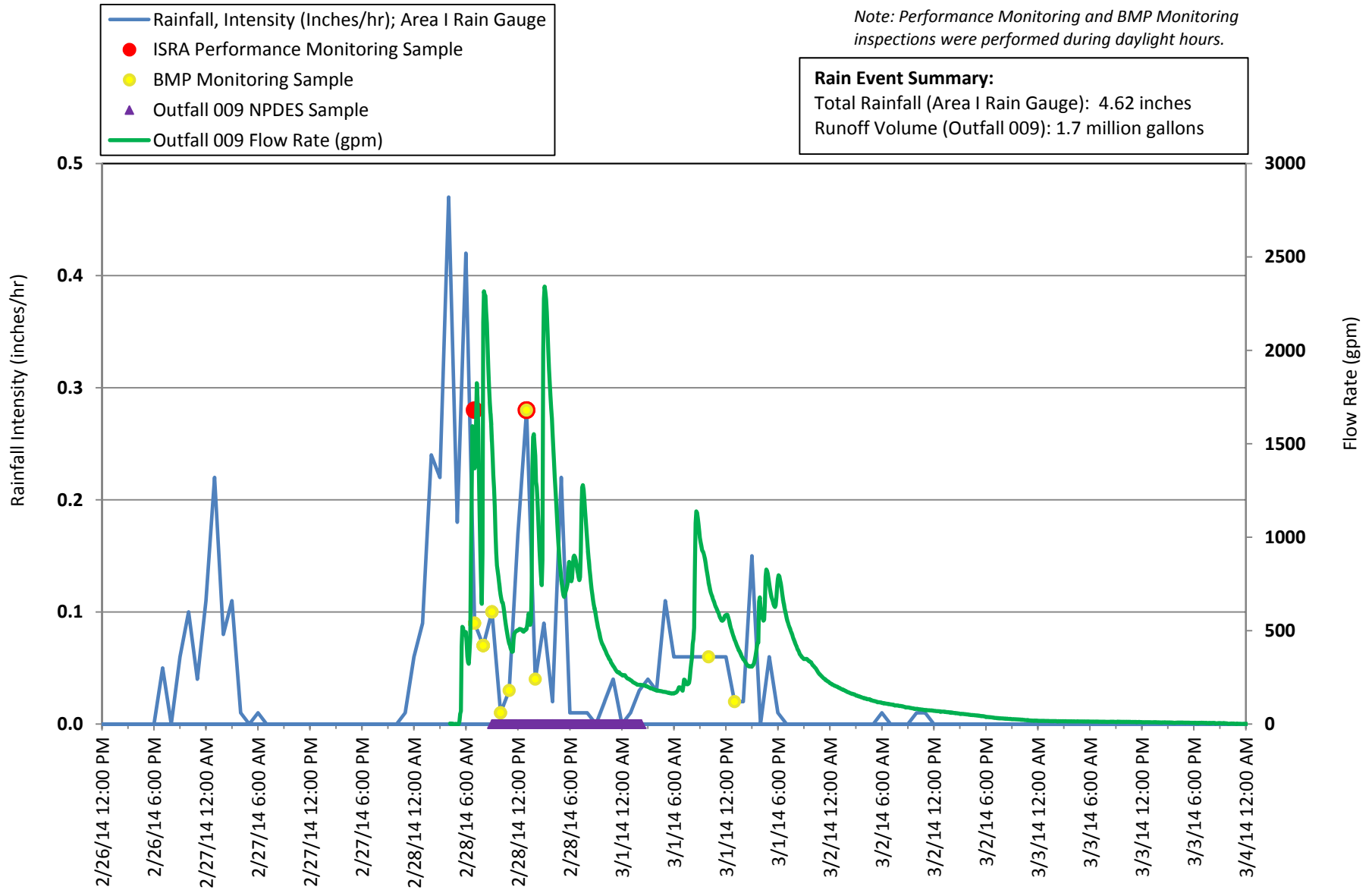
**APPENDIX A**  
**RAIN EVENT AND SAMPLING CHARTS**  
**2013/2014 RAINY SEASON**

### Rain Event December 7, 2013

*Note: Performance Monitoring and BMP Monitoring inspections were performed during daylight hours.*



### Rain Event February 26 - March 2, 2014



**APPENDIX B**

**LABORATORY AND DATA VALIDATION REPORTS  
PERFORMANCE MONITORING AND BMP MONITORING SAMPLES  
2013/2014 RAINY SEASON**

**Table B-1**  
**Laboratory Reports and Data Validation Reports**  
**2013/2014 Rainy Season**  
**Page 1 of 1**

*Table B-1*

Sample Delivery Group	Sample Collection Date	Sample Type	Laboratory Name	Laboratory Report	Validation Report
<b>ISRA Performance Monitoring</b>					
440-71609-1	2/28/2014	Primary	TA-Irvine/TA-Knoxville	Y	N
J60051	2/28/2014	RWQCB Split	ASL/CAS/Weck	Y	N
<b>BMP Monitoring</b>					
440-64503-1	12/7/2013	Primary	TA-Irvine/TA-Sacramento/PTS	Y	Y
440-71662-1	2/28/2014	Primary	TA-Irvine/TA-Knoxville/PTS	Y	Y
440-71673-1	3/1/2014	Primary	TA-Irvine/TA-Knoxville/PTS	Y	Y

**Notes**

ASL - American Scientific Laboratories, LLC  
CAS - Columbia Analytical Laboratory  
PTS - PTS Laboratories, Inc., Santa Fe Springs, California  
TA-Irvine - Test America Laboratories, Irvine, California  
TA-Knoxville - Test America Laboratories, Knoxville, Tennessee  
TA-Sacramento - Test America Laboratories, West Sacramento, California  
WECK - Weck Laboratories, Inc.

**Please contact Debbie Taege at 818-466-8849 if you would like to receive a CD containing the Laboratory and Data Validation Reports listed in Table B-1. The reports are not posted to the Boeing External Website due to the large file size.**

**APPENDIX C**  
**PERFORMANCE MONITORING CHARTS**  
**2013/2014 RAINY SEASON**

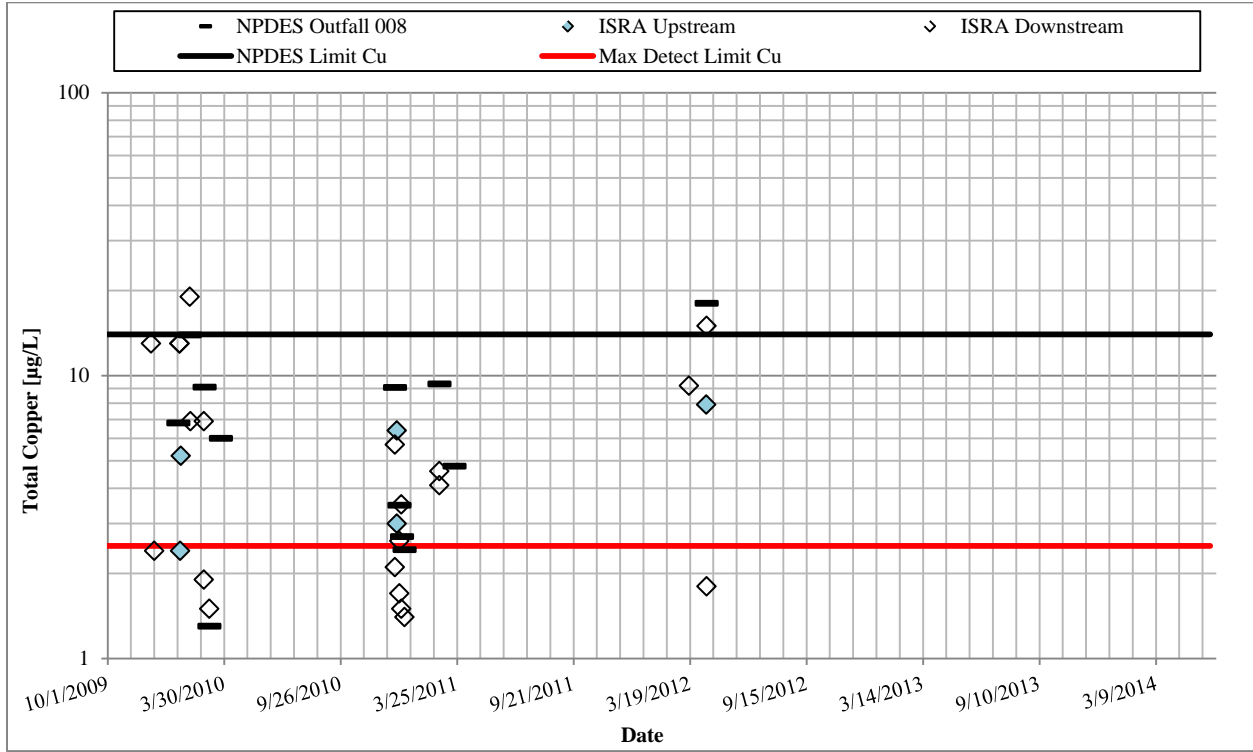
**APPENDIX C-1**

**PERFORMANCE MONITORING DATA GRAPHS VS. TIME –  
BY OUTFALL**

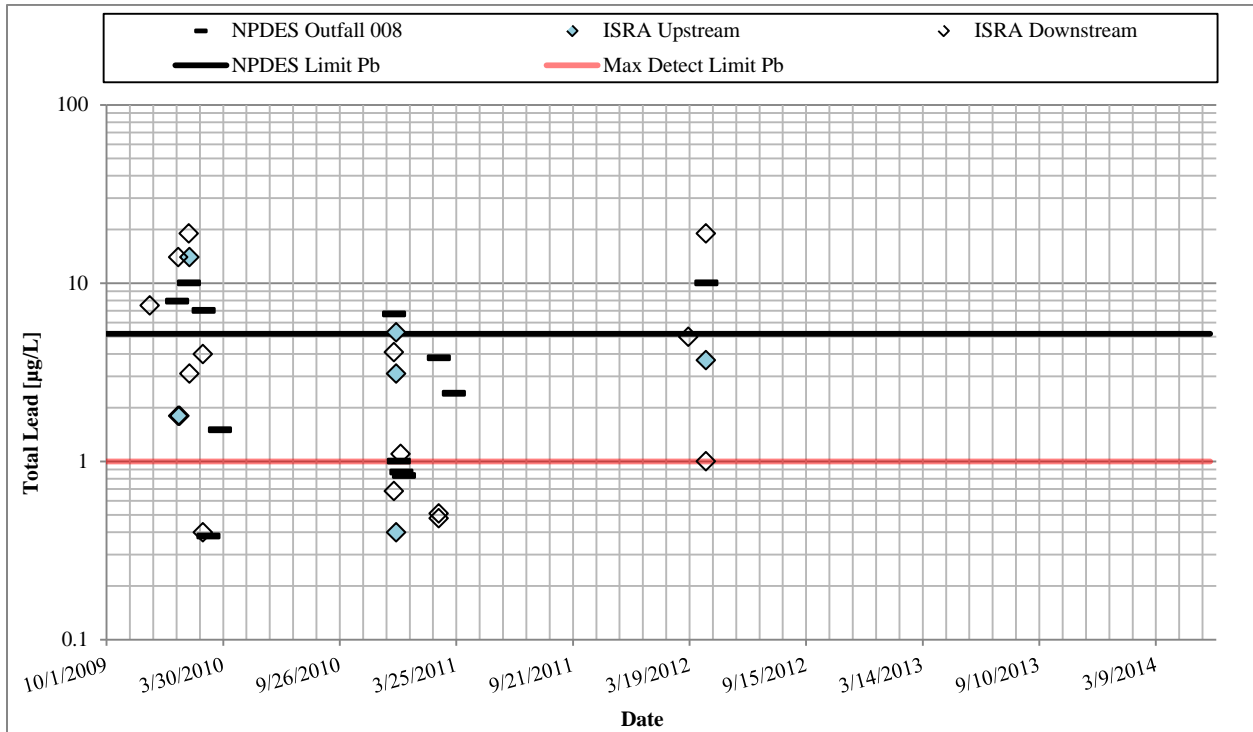


**OUTFALL 008 TIMESERIES CHARTS  
ISRA PERFORMANCE MONITORING PROGRAM**

**COPPER**



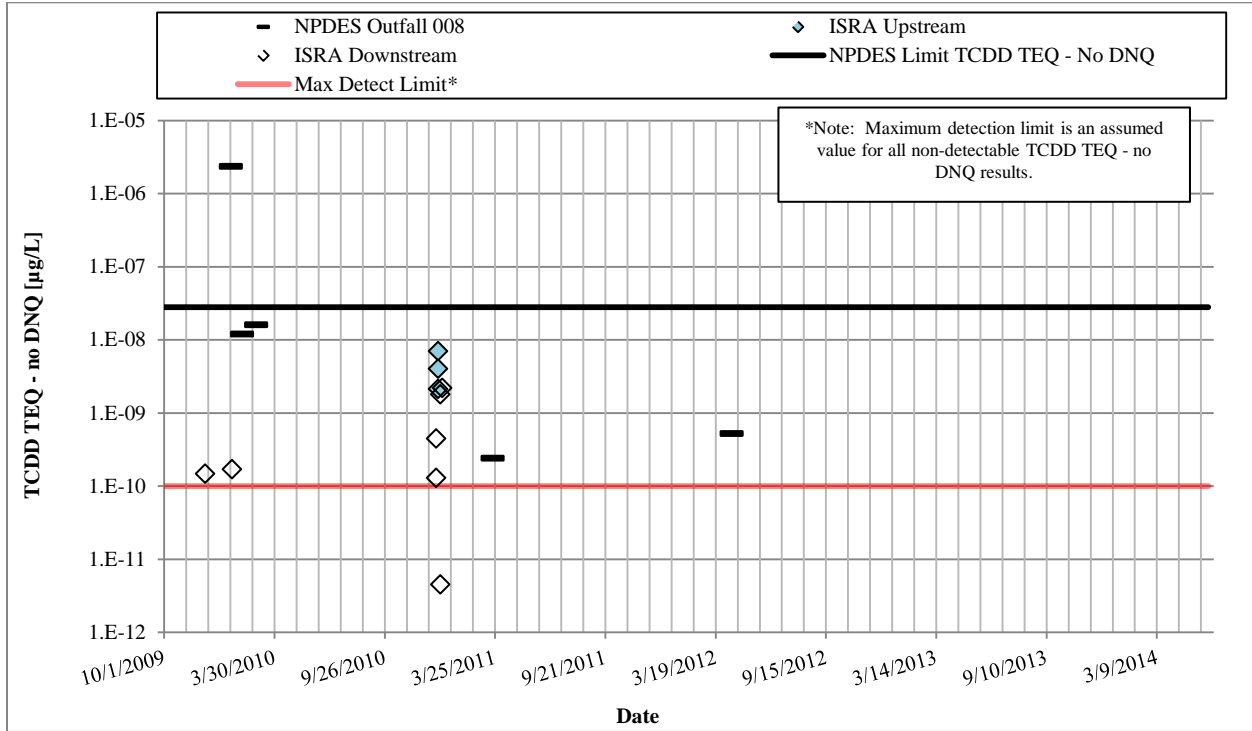
**LEAD**



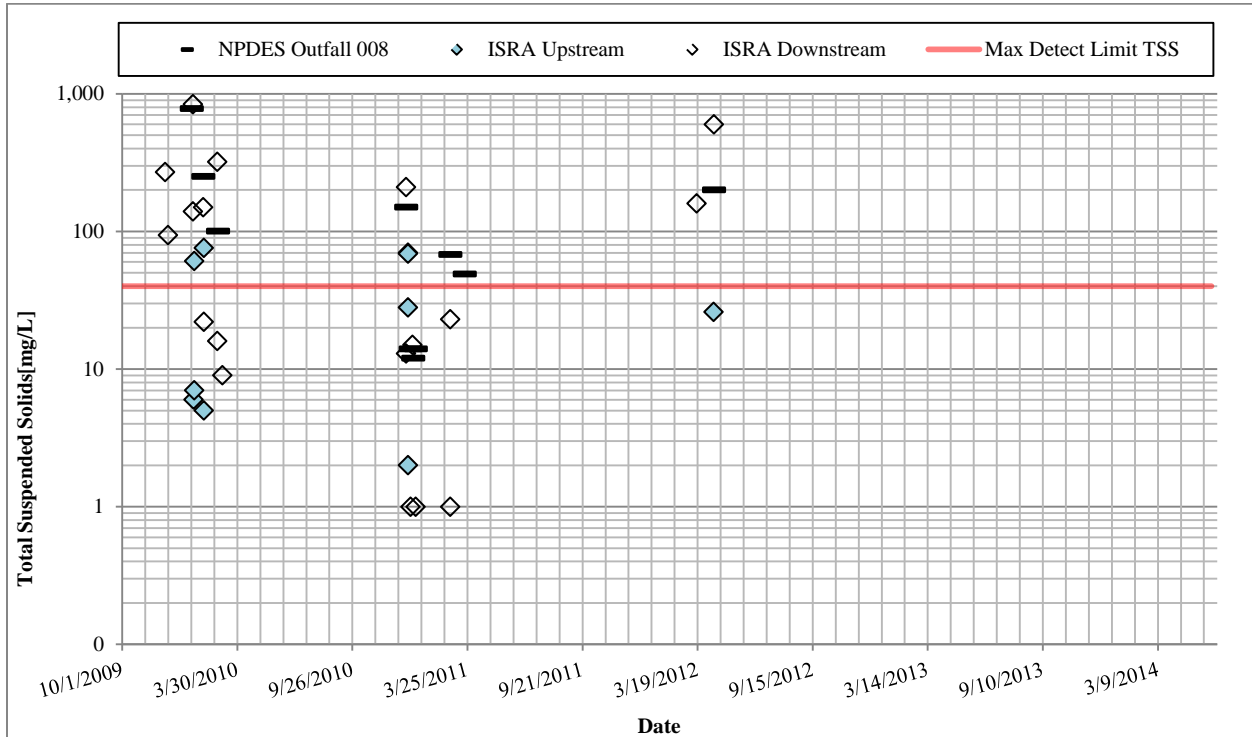
Sample results measured below the detection limit have been excluded. Results shown below the maximum detection limit line correspond to samples with a detection limit less than the maximum detection limit.

# OUTFALL 008 TIMESERIES CHARTS ISRA PERFORMANCE MONITORING PROGRAM

## DIOXINS (TCDD-TEQ - no DNQ)



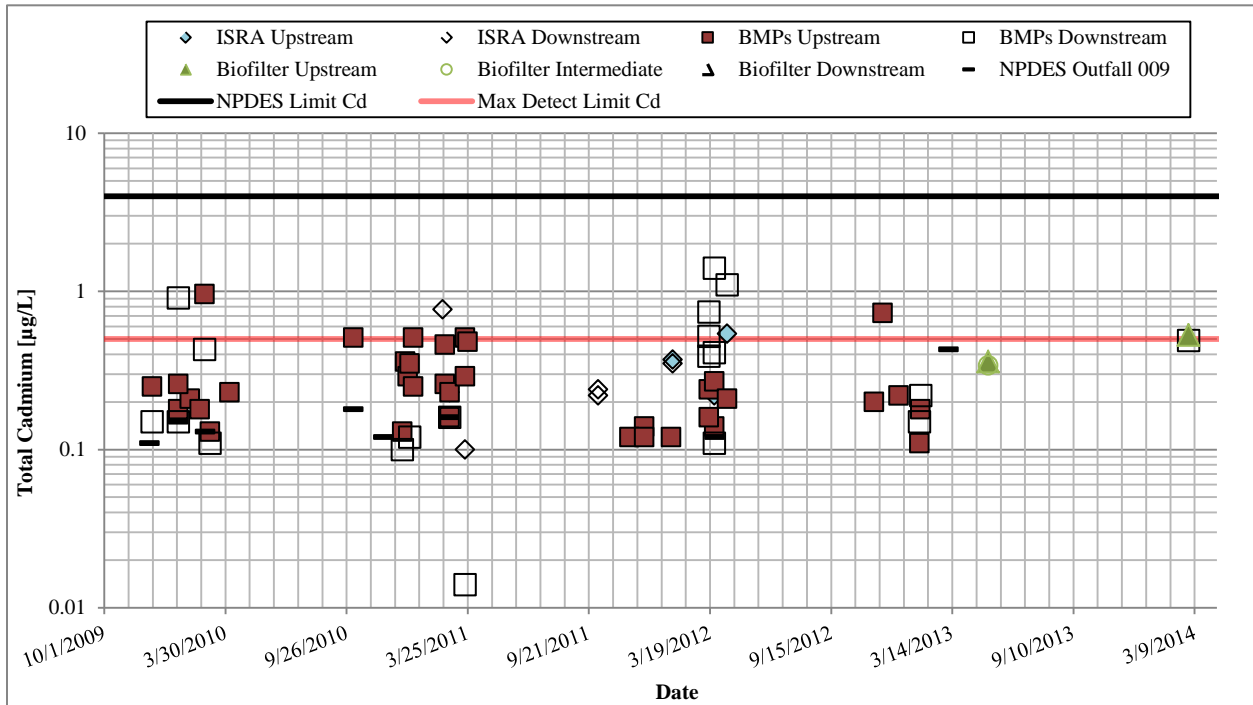
## TSS



Sample results measured below the detection limit have been excluded. Results shown below the maximum detection limit line correspond to samples with a detection limit less than the maximum detection limit.

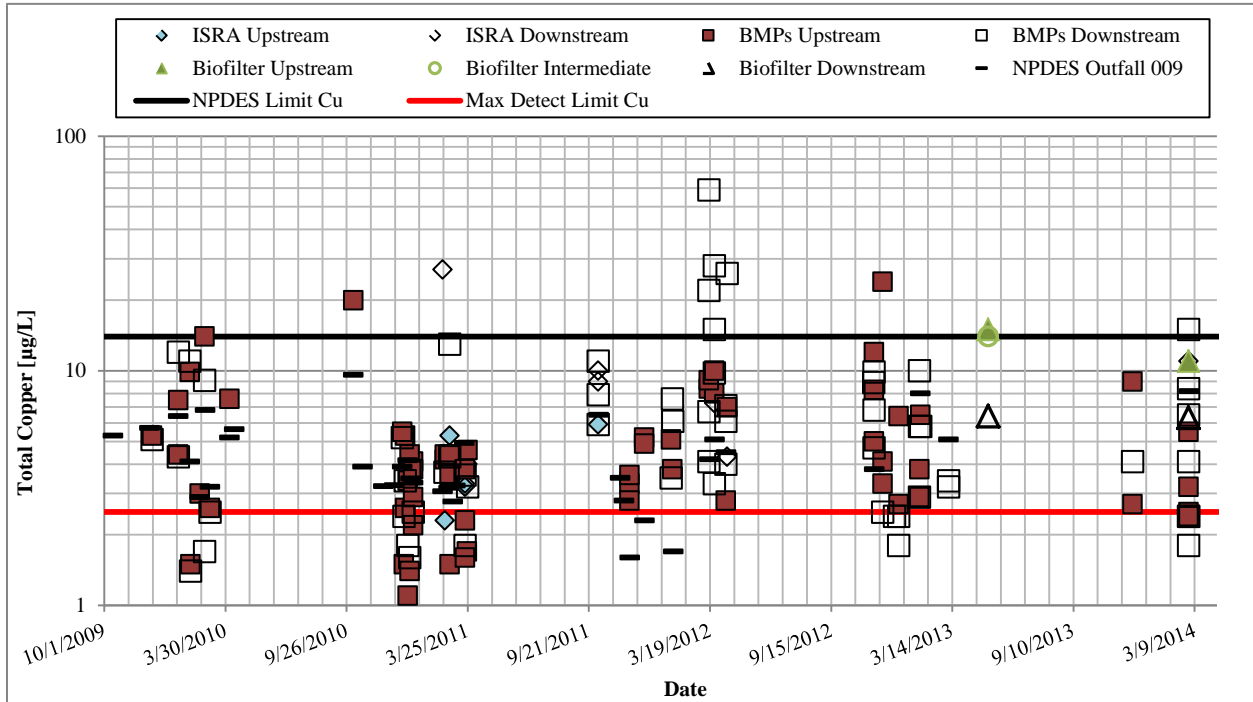
# OUTFALL 009 TIMESERIES CHARTS ISRA PERFORMANCE MONITORING PROGRAM

## CADMIUM



Background CM Upstream monitoring locations 8 and 11 were discontinued for the 2011-2012 monitoring season

## COPPER

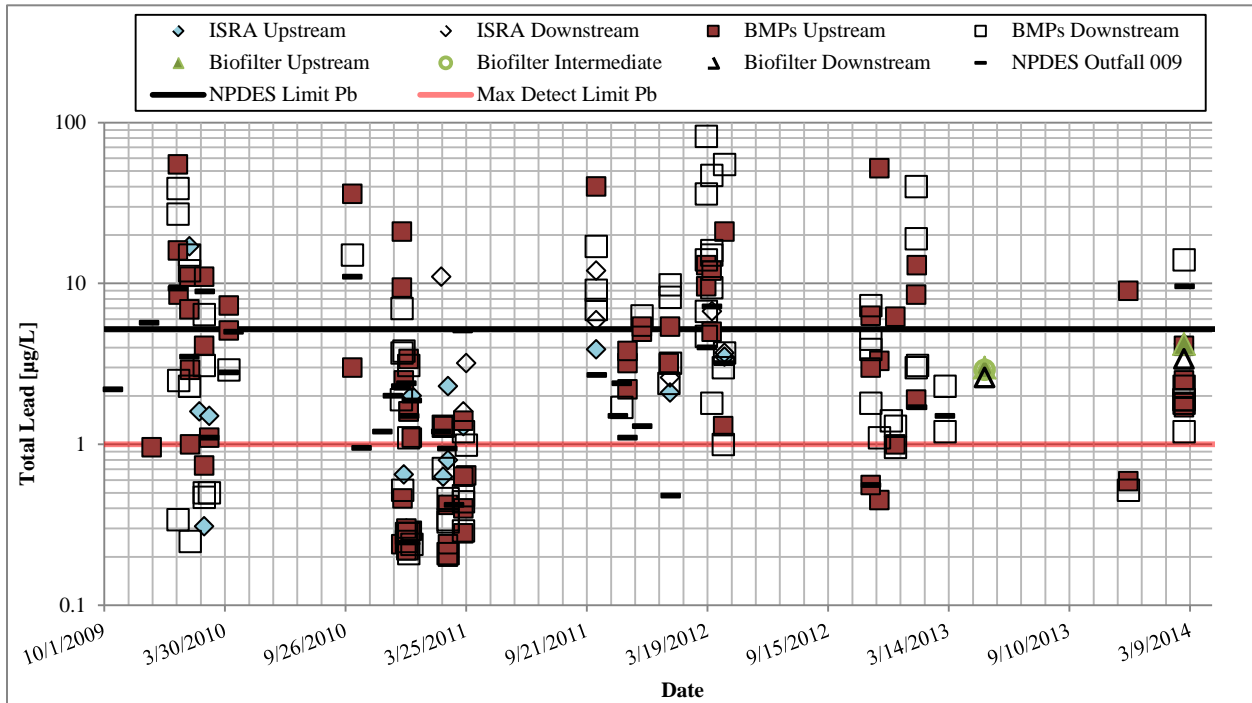


Background CM Upstream monitoring locations 8 and 11 were discontinued for the 2011-2012 monitoring season

Sample results measured below the detection limit have been excluded. Results shown below the maximum detection limit line correspond to samples with a detection limit less than the maximum detection limit.

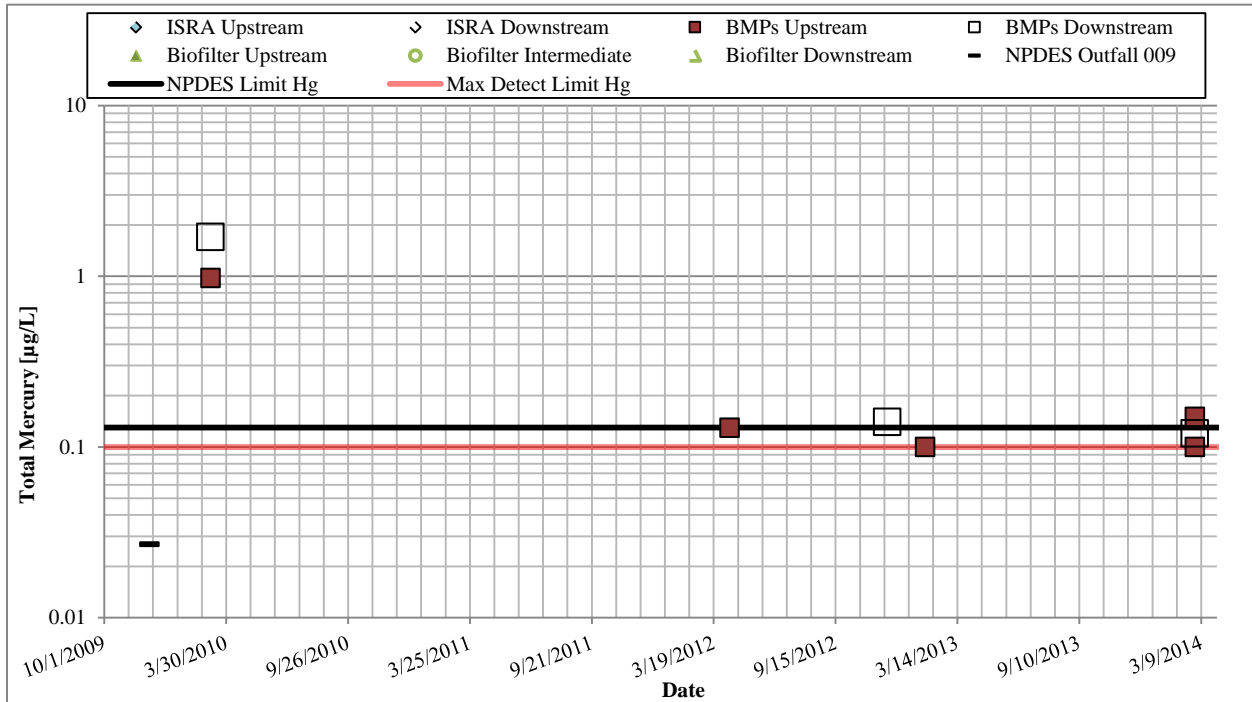
# OUTFALL 009 TIMESERIES CHARTS ISRA PERFORMANCE MONITORING PROGRAM

## LEAD



Background CM Upstream monitoring locations 8 and 11 were discontinued for the 2011-2012 monitoring season

## MERCURY

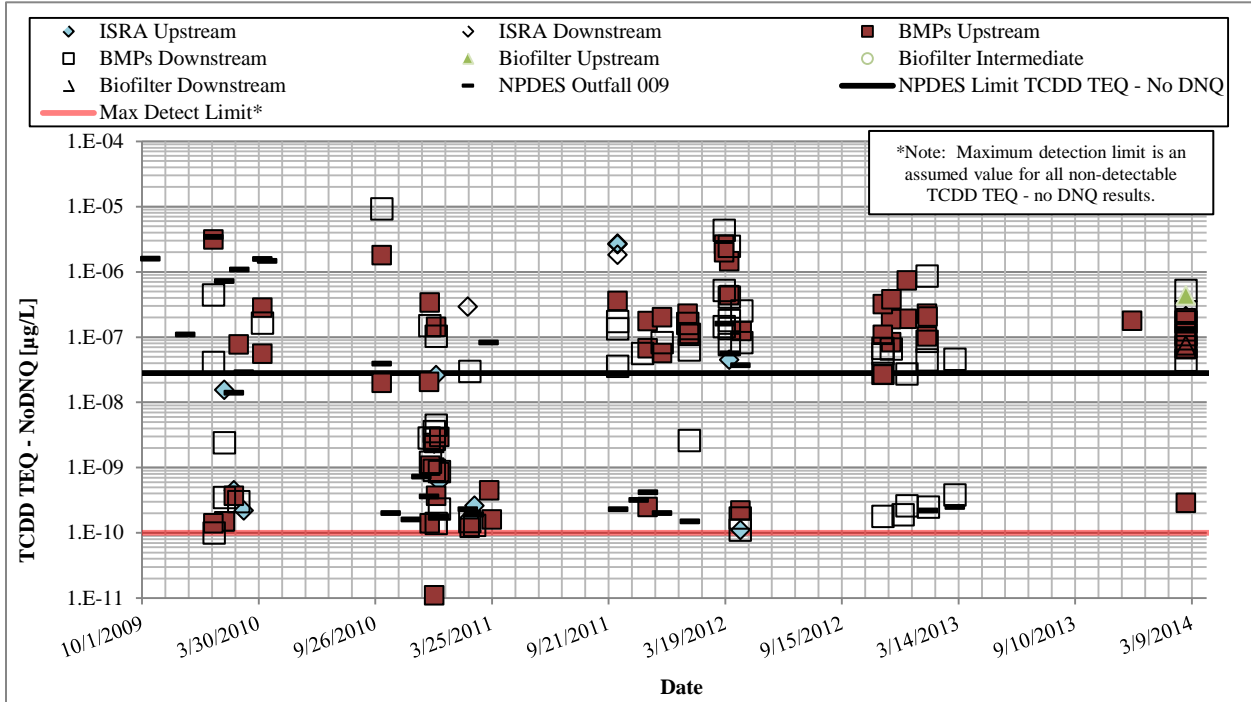


Background CM Upstream monitoring locations 8 and 11 were discontinued for the 2011-2012 monitoring season

Sample results measured below the detection limit have been excluded. Results shown below the maximum detection limit line correspond to samples with a detection limit less than the maximum detection limit.

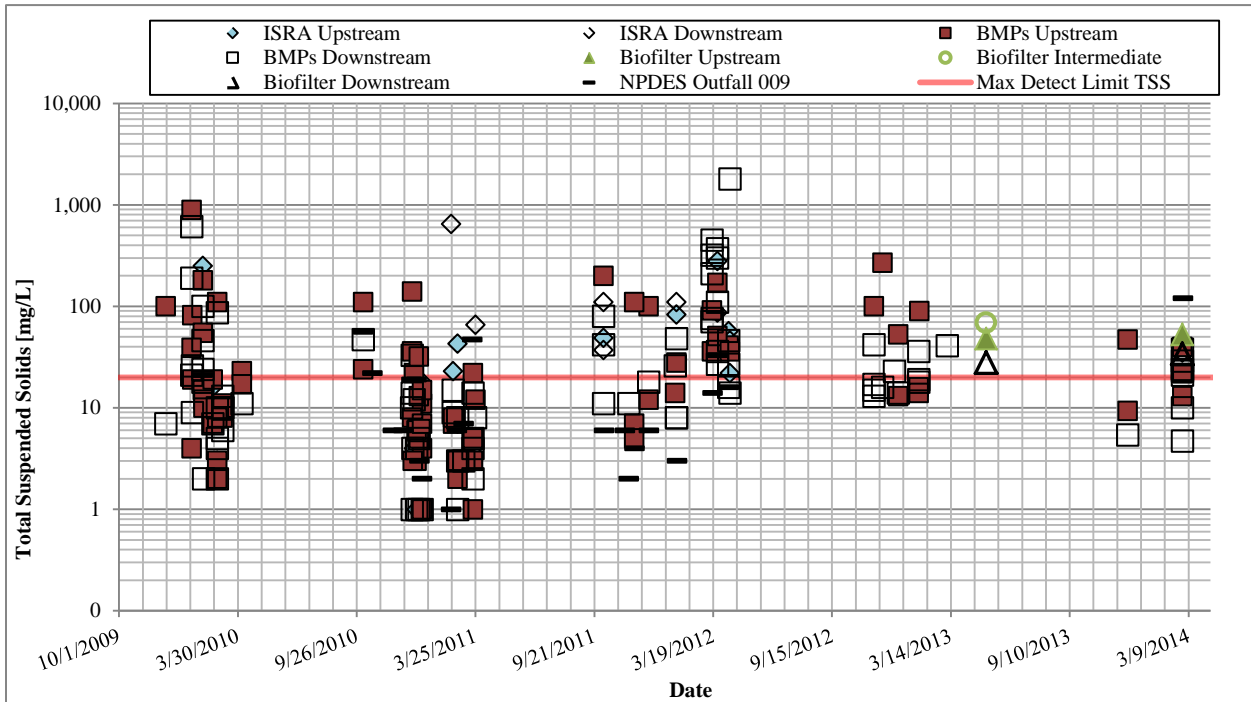
# OUTFALL 009 TIMESERIES CHARTS ISRA PERFORMANCE MONITORING PROGRAM

## DIOXINS (TCDD-TEQ – no DNQ)



Background CM Upstream monitoring locations 8 and 11 were discontinued for the 2011-2012 monitoring season

## TSS



Background CM Upstream monitoring locations 8 and 11 were discontinued for the 2011-2012 monitoring season

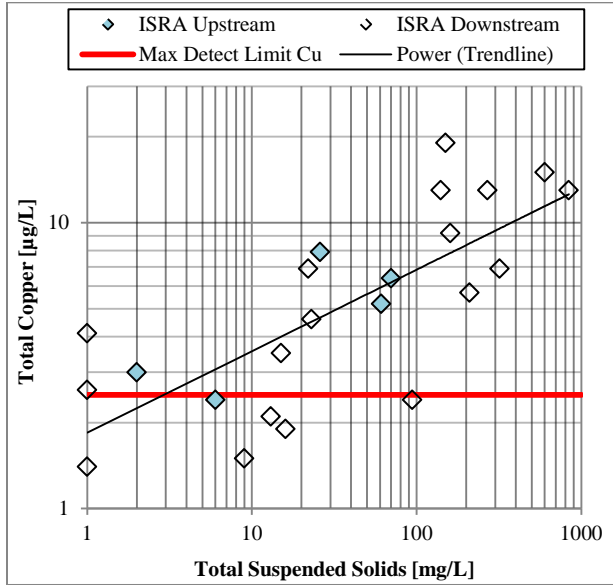
Sample results measured below the detection limit have been excluded. Results shown below the maximum detection limit line correspond to samples with a detection limit less than the maximum detection limit.

**APPENDIX C-2**

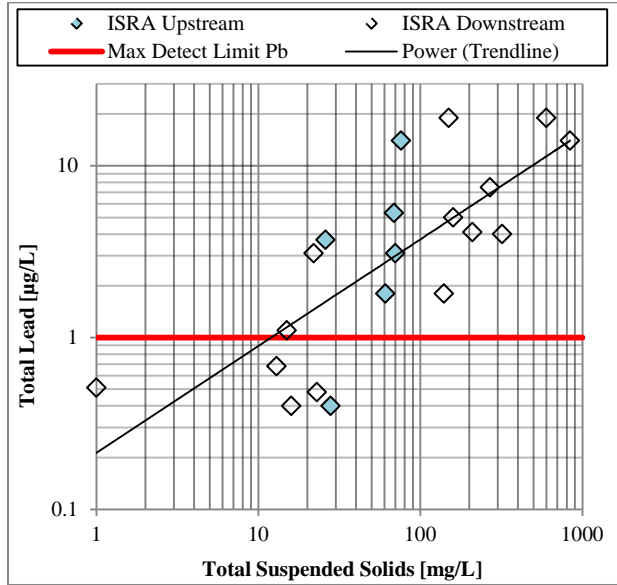
**PERFORMANCE MONITORING DATA GRAPHS –  
COC CORRELATIONS**

## OUTFALL 008 CORRELATION CHARTS ISRA PERFORMANCE MONITORING PROGRAM

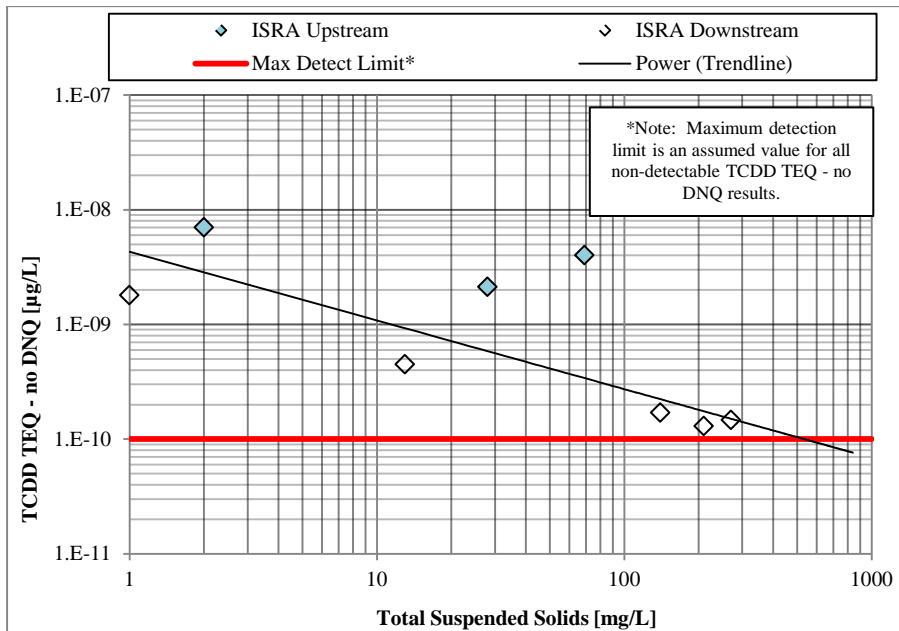
### COPPER VS TSS



### LEAD VS TSS



### DIOXINS (TCDD-TEQ – no DNQ) VS TSS

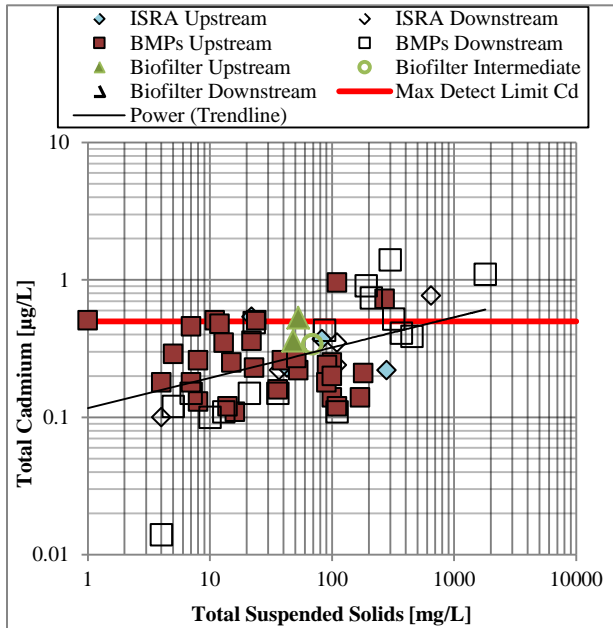


Sample results measured below the detection limit have been excluded. Results shown below the maximum detection limit line correspond to samples with a detection limit less than the maximum detection limit.

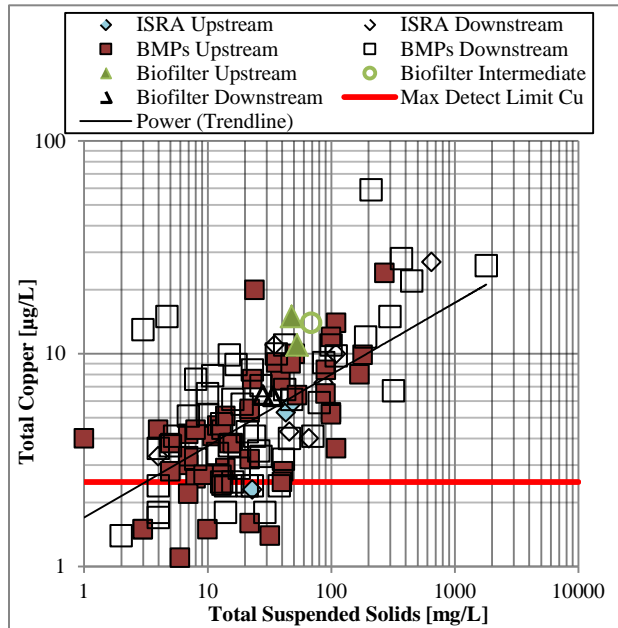
Several CM Upstream locations are also shown as background locations on the BMP Performance Monitoring plots.

## OUTFALL 009 CORRELATION CHARTS ISRA PERFORMANCE MONITORING PROGRAM

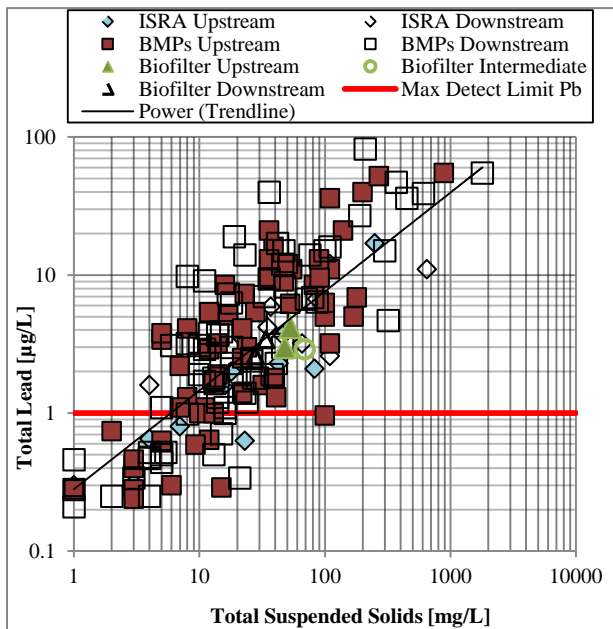
### CADMIUM VS TSS



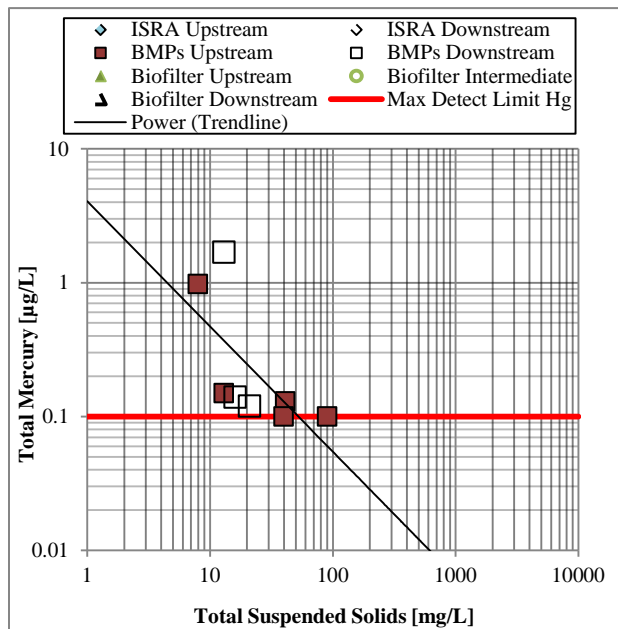
### COPPER VS TSS



### LEAD VS TSS



### MERCURY VS TSS



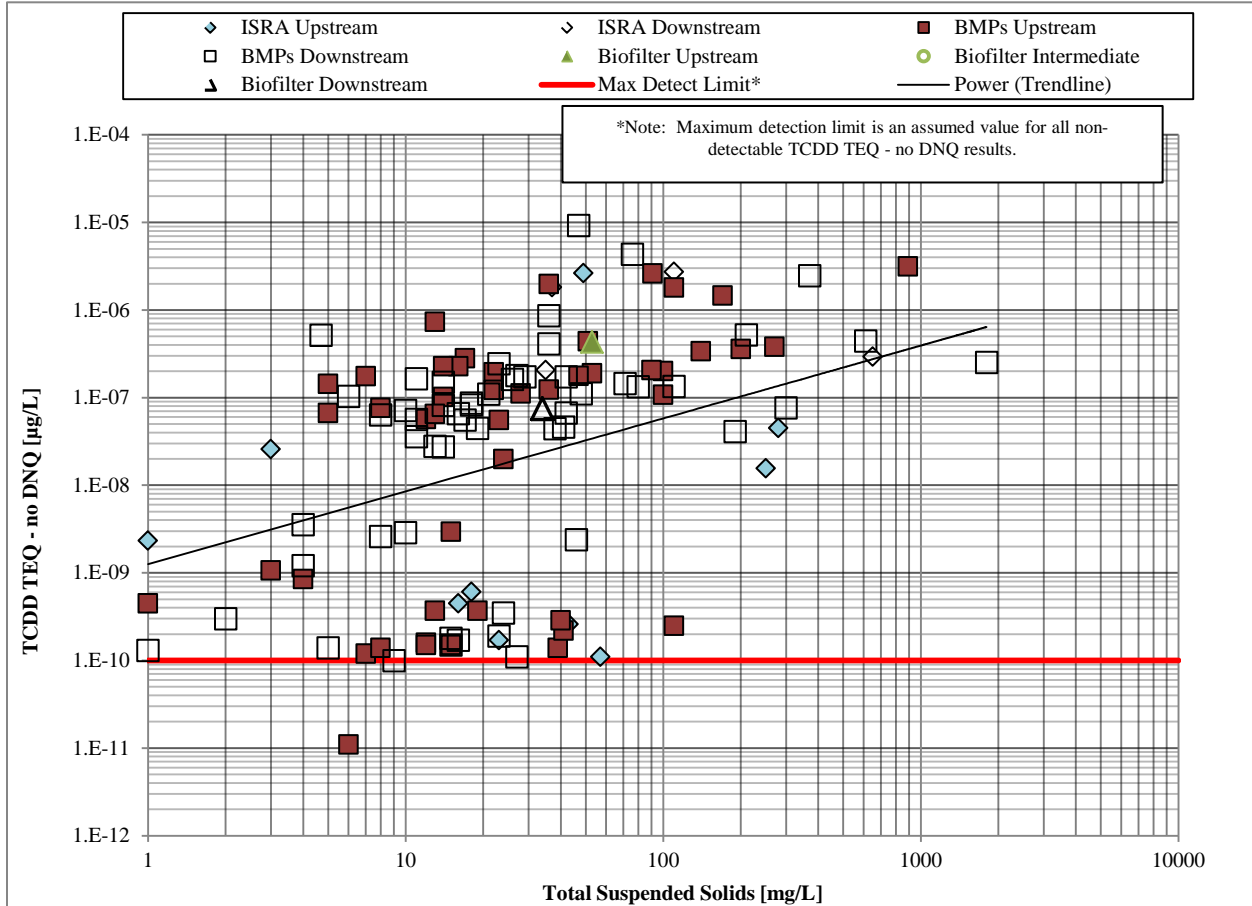
Sample results measured below the detection limit have been excluded. Results shown below the maximum detection limit line correspond to samples with a detection limit less than the maximum detection limit.

Several CM Upstream locations are also shown as background locations on the BMP Performance Monitoring plots.



**OUTFALL 009 CORRELATION CHARTS  
ISRA PERFORMANCE MONITORING PROGRAM**

**DIOXINS (TCDD-TEQ – no DNQ) VS TSS**



Sample results measured below the detection limit have been excluded. Results shown below the maximum detection limit line correspond to samples with a detection limit less than the maximum detection limit.

Several CM Upstream locations are also shown as background locations on the BMP Performance Monitoring plots.