

APPENDIX A

STORMWATER BMP CONCEPT DESIGNS

FOR

SANTA SUSANA SITE

WATERSHED 009, NASA AND BOEING PROPERTIES

(ALL CONCEPTS SUBJECT TO MODIFICATION WITH ADDITIONAL ENGINEERING ANALYSIS)

SEPTEMBER 2012

NOTES:

1. AERIAL IMAGERY USED FOR BASE PLANS HEREIN WAS PROVIDED BY MWH GLOBAL, INC. AND WAS FLOWN ON JUNE 2, 2010.
2. CONTOUR DATA SHOWN REPRESENT 1 FT ELEVATION DATA PROVIDED BY MWH GLOBAL, INC.
3. PROPOSED BMP FEATURES AND FOOTPRINTS ARE APPROXIMATE AND, UNLESS OTHERWISE NOTED, ARE INTENDED TO REFLECT INITIAL SIZING BASED ON SURFACE WATER EXPERT PANEL'S SITE-SPECIFIC SIZING (1 YEAR, 24 HOUR STORM EVENT) AND GENERAL GUIDANCE FROM THE VENTURA COUNTY TECHNICAL GUIDANCE MANUAL.
4. DRAWINGS ARE FOR DESIGN CONCEPT ILLUSTRATION ONLY, ARE PRELIMINARY, SUBJECT TO CHANGE, AND ARE NOT FOR CONSTRUCTION.
5. BIOLOGICAL AND UTILITY SURVEYS REQUIRED AT MOST LOCATIONS. ENGINEERING/CONSTRUCTION FEASIBILITY ASSESSMENT ALSO REQUIRED. COUNTY GRADING AND BUILDING/CONSTRUCTION PERMITS AS WELL AS PERMITS ASSOCIATED WITH WORK IN JURISDICTIONAL DRAINAGE ALSO NEED TO BE CONSIDERED.
6. BMPS SITED ON NASA PROPERTY ARE EXPECTED TO BE DESIGNED BY CH2MHILL.
7. DRAINAGE FEATURES SHOWN REFLECT GENERAL STORMWATER RUNOFF CONVEYANCE PATHWAYS AND DO NOT NECESSARILY REPRESENT JURISDICTIONAL DRAINAGE FEATURES.

DRAWING INDEX

DRAWING NO.	TITLE
1	TITLE SHEET
2	LOCUS AND KEY MAP
3	ELV AREA BMPS
4	24-INCH CULVERT DRAINAGE AREA BMPS
5	B1 MEDIA FILTER BMPS
6	CM9 ROAD RUNOFF

LEGEND

EXISTING CONDITIONS

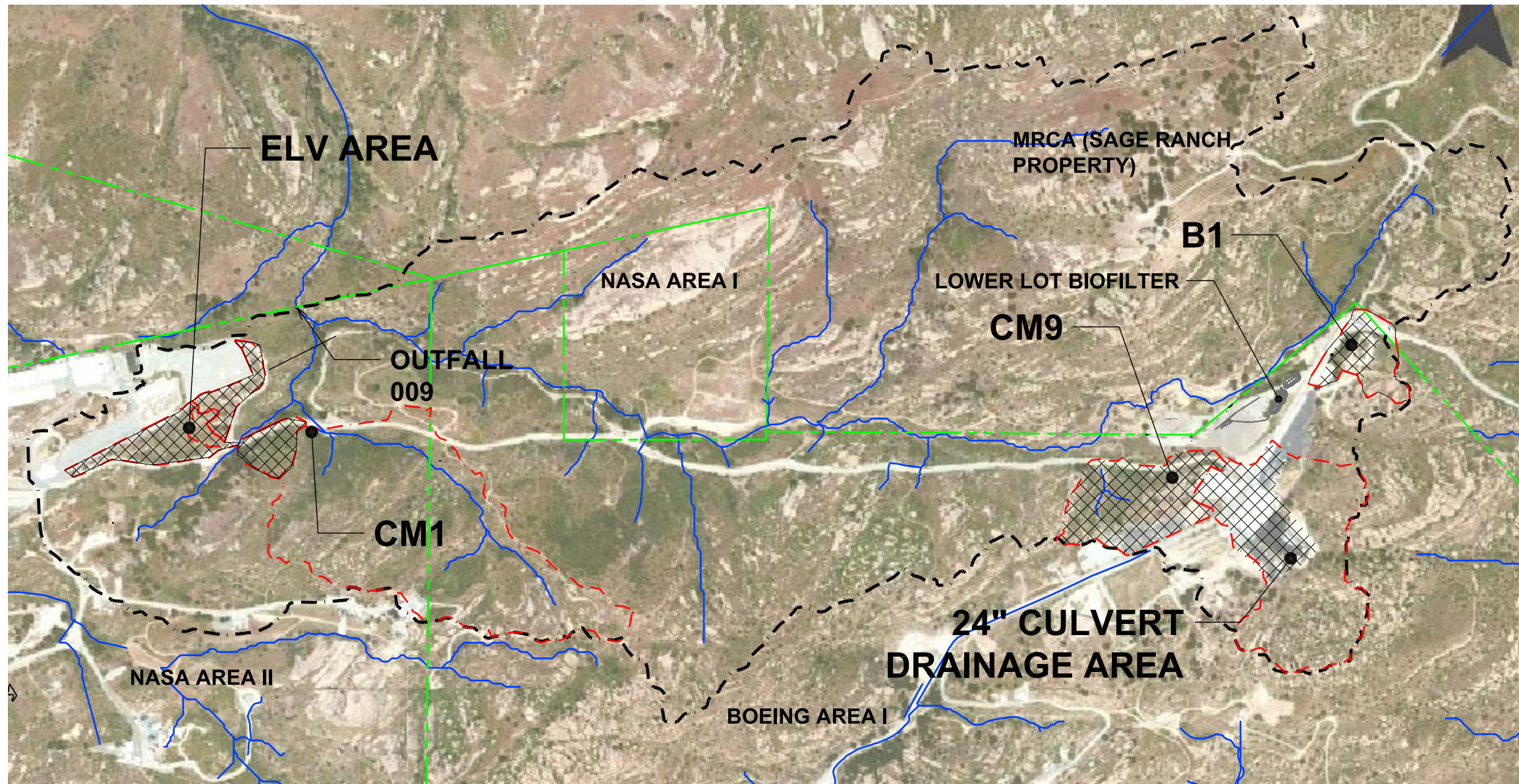
	DRAINAGE (SEE NOTE 7)
	PROPERTY LINE
	DRAIN PIPE
	ISRA BOUNDARY
	RFI BOUNDARY
	SUBCATCHMENT BOUNDARY
	WATERSHED 009 BOUNDARY
	EASEMENT BOUNDARY (COLOR VARIES FOR CLARITY)
	BMP SUBAREA MONITORING LOCATION
	RIPRAP
	MONITORING WELL
	UTILITY POLE

PROPOSED CONDITIONS

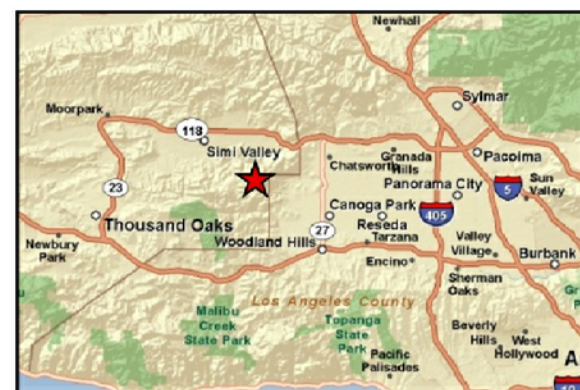
	DRAIN PIPE
	SANDBAG / EARTH BERM
	CHANNEL RECONSTRUCTION
	VEGETATED SWALE
	RIPRAP
	ASPHALT REMOVAL
	FILTER/BASIN WATER SURFACE LEVEL AT OVERFLOW INVERT
	GEOCELL BACKFILLED WITH GRAVEL
	FLOW DIRECTION

L:\PROJECT FOLDERS\BOEING\SB0363S BOEING STORMWATER 2012\CADD\CONCEPTUAL DESIGN\092512\SB0636S--1001 NASA CONCEPT BMP DESIGNS

L:\PROJECT FOLDERS\BOEING\SB0363S BOEING STORMWATER 2012\CADD\CONCEPTUAL DESIGN\091312\SHEET 2 - LOCUS PLAN



- LEGEND:**
- PROPERTY BOUNDARY
 - - - 009 WATERSHED BOUNDARY
 - - - SUBCATCHMENT BOUNDARY
 - X X X X AREA TREATED BY NEW RECOMMENDED BMPS



TITLE: **LOCUS AND KEY MAP**

PREPARED BY:
Geosyntec consultants
 924 ANACAPA STREET, SUITE 4A
 SANTA BARBARA, CA 93101
 PHONE: 805.897.3800

PREPARED FOR:

 BOEING NASA
 SANTA SUSANA SITE
 VENTURA COUNTY, CALIFORNIA

PROJECT:
**STORMWATER BMP CONCEPT DESIGNS
 SANTA SUSANA SITE WATERSHED 009**

DESIGNED BY:
AQ

DRAWN BY:
AQ

REVIEWED BY:
DHB

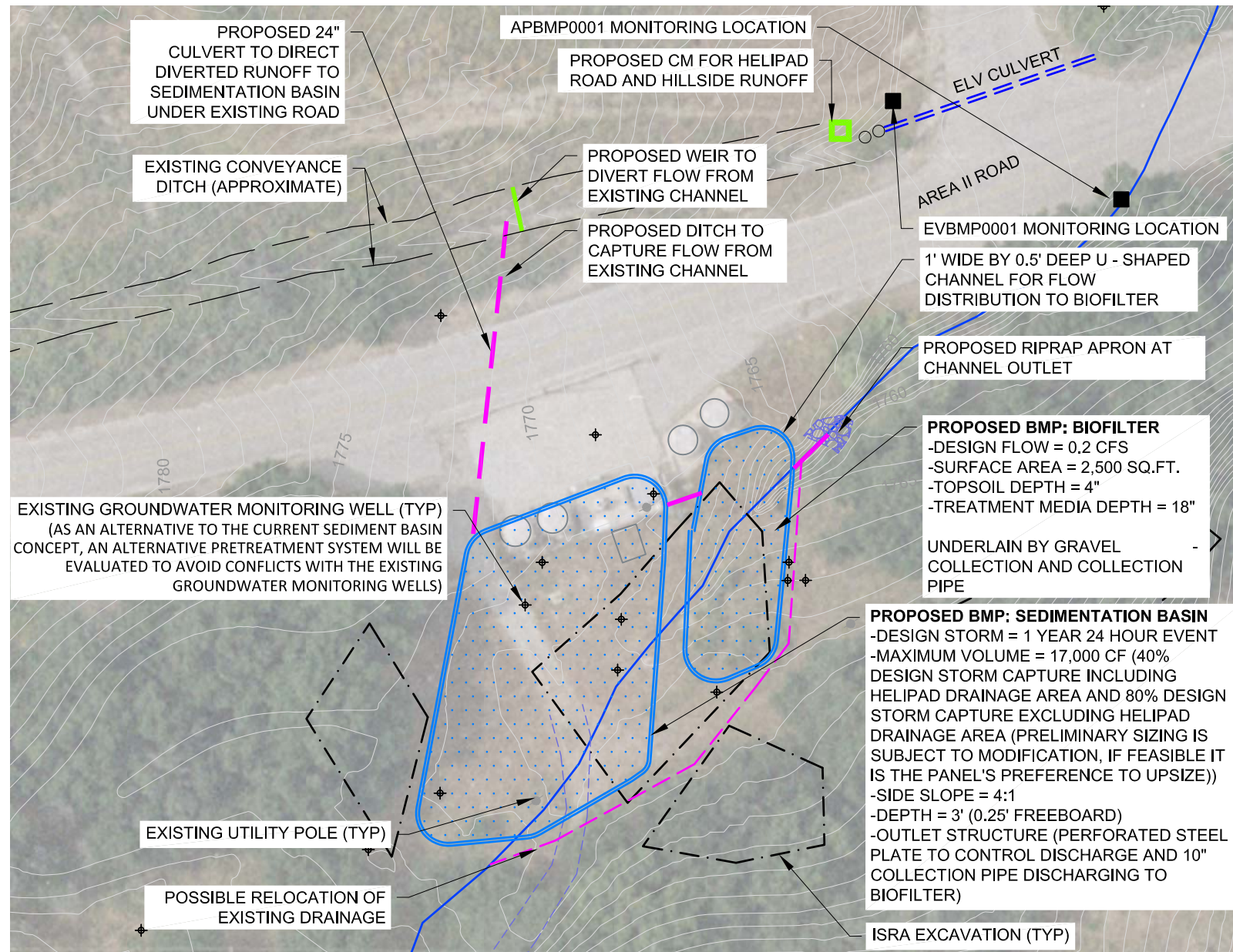
APPROVED BY:
BS

DATE:
SEPT 2012

PROJ. NO.:
SB0363S

DRAWING:
2

L:\PROJECT FOLDERS\BOEING\SB0363S BOEING STORMWATER 2012\CADD\CONCEPTUAL DESIGN\092512\SB0636S--1001 NASA CONCEPT BMP DESIGNS



ELV SEDIMENTATION BASIN AND BIOFILTER

ELV NOTES:

1. THE GROUNDWATER TREATMENT FACILITIES AND PARKING AREA NEAR THE SEDIMENTATION BASIN AND BIOFILTER DEPICTED IN THE AERIAL IMAGERY WERE REMOVED DURING PREVIOUS ISRA ACTIVITIES.

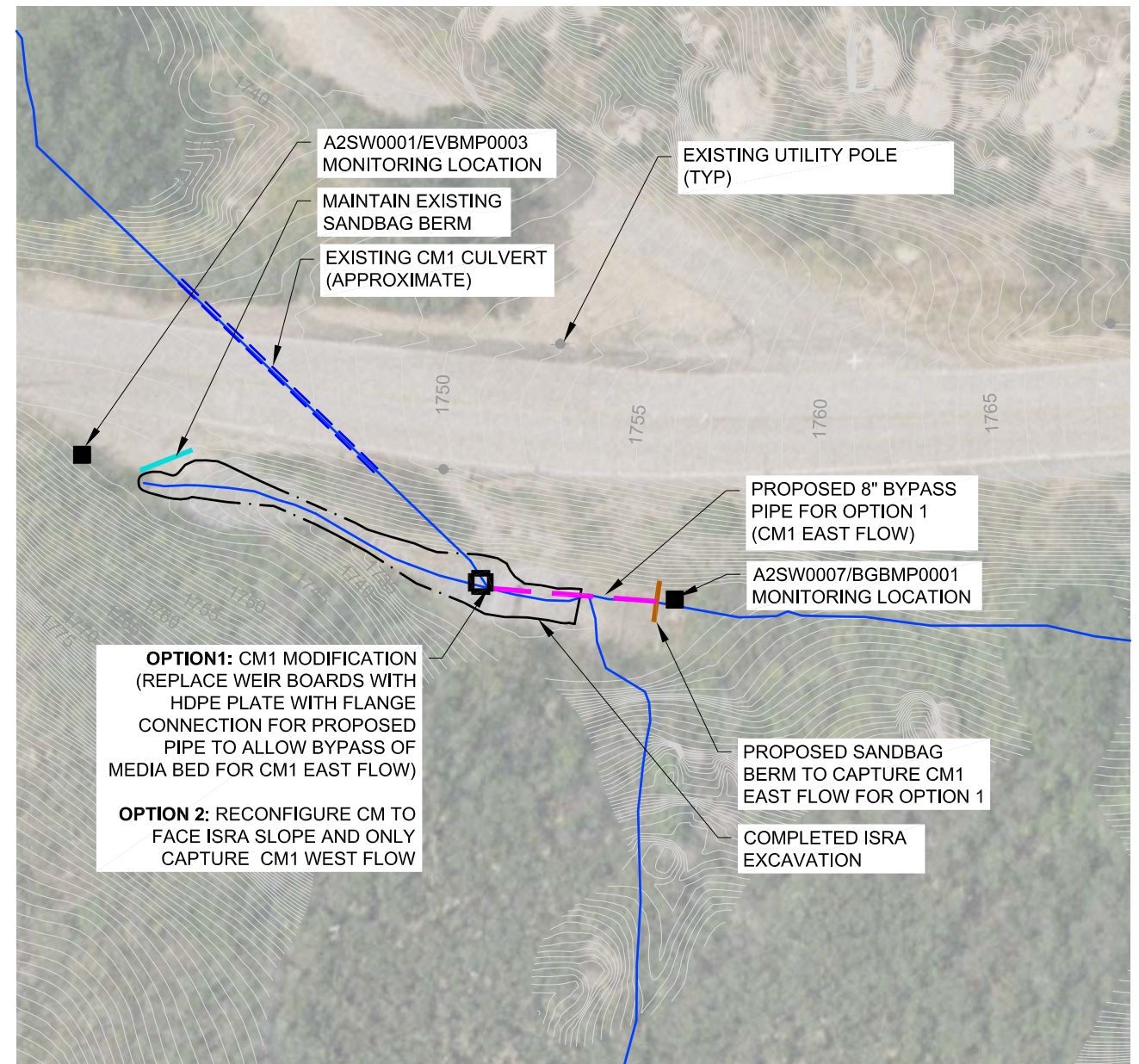
2. THE SEDIMENT BASIN AND BIOFILTER LOCATIONS AND CONFIGURATION WILL BE SUBJECT TO FURTHER EVALUATION



NORTH

CONCEPTUAL DESIGN

NOTE: PROPOSED DESIGN FEATURES WERE PRELIMINARILY SIZED AND ARE APPROXIMATE. FINAL BMP DESIGN DETAILS AND SIZES WILL BE CONFIRMED BASED ON ENGINEERING DESIGN ANALYSIS. FINAL DESIGNS WILL BE SUBJECT TO ENGINEERING FEASIBILITY ASSESSMENT, PERMITTING CONSTRAINTS (I.E., REGULATORY AGENCY REQUIREMENTS), AND EXPERT PANEL AND PROPERTY OWNER REVIEW AND APPROVAL.



CM1 BYPASS

CM1 NOTES:

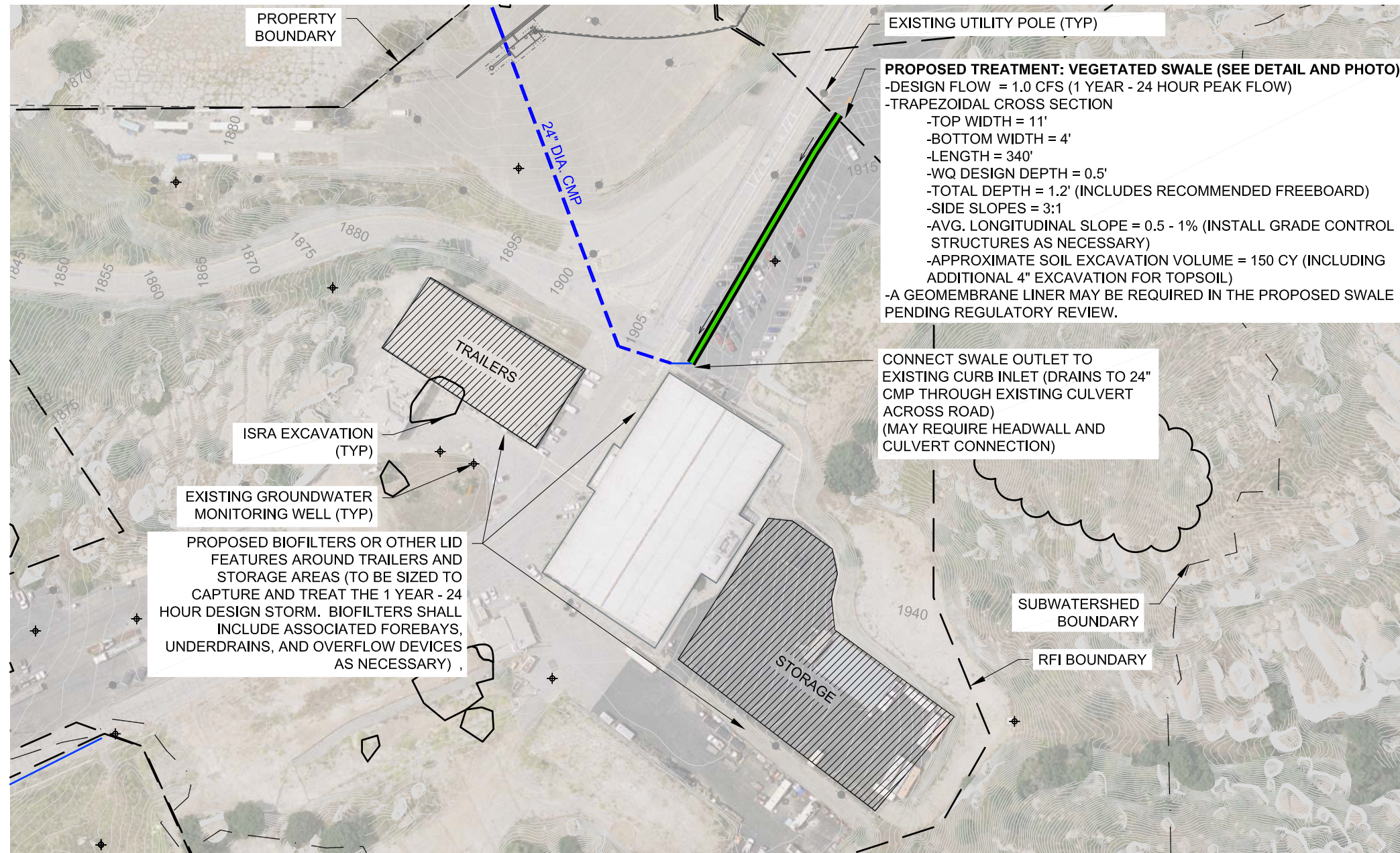
1. FURTHER FEASIBILITY STUDIES TO ENLARGE STORAGE AT CM1 AND UPSTREAM OF THE EXISTING SANDBAG BERM SHOULD BE CONDUCTED AS PLANNING PROCEEDS



NORTH

TITLE: ELV AREA BMPS	PREPARED BY: Geosyntec consultants 924 ANACAPA STREET, SUITE 4A SANTA BARBARA, CA 93101 PHONE: 805.897.3800	PREPARED FOR: BOEING NASA SANTA SUSANA SITE VENTURA COUNTY, CALIFORNIA	PROJECT: STORMWATER BMP CONCEPT DESIGNS SANTA SUSANA SITE WATERSHED 009	DESIGNED BY: AQ	REVIEWED BY: DHB	DATE: SEPT 2012	DRAWING: 3
				DRAWN BY: AQ	APPROVED BY: BS	PROJ. NO.: SB0363S	

L:\PROJECT FOLDERS\BOEING\SB03633S BOEING STORMWATER 2012\CADD\CONCEPTUAL DESIGN\092512\SB06365--1001 NASA CONCEPT BMP DESIGNS



APPROXIMATE LOCATION OF PROPOSED VEGETATED SWALE AND CONNECTION TO EXISTING CURB INLET

SITE PHOTO

NOT TO SCALE

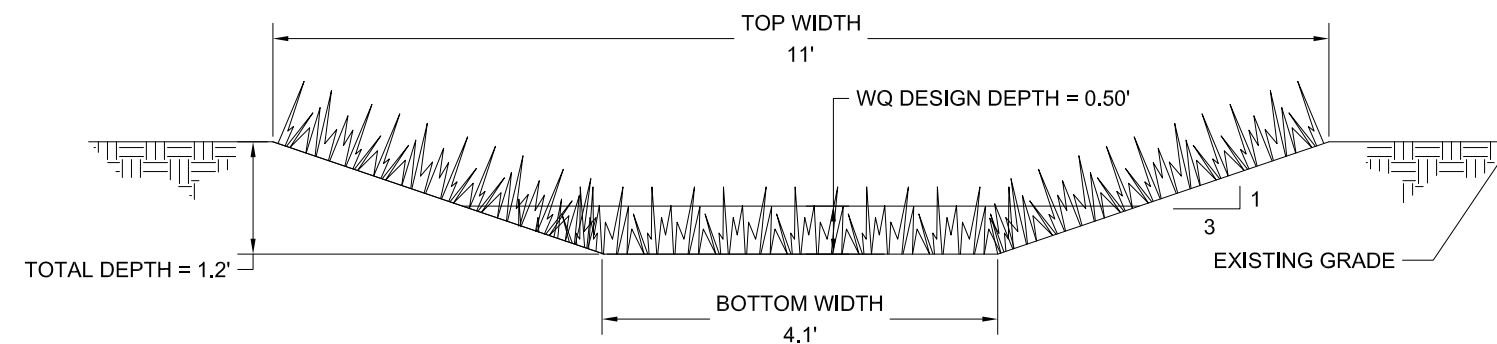
CONCEPTUAL DESIGN

NOTES:

1. PROPOSED DESIGN FEATURES WERE PRELIMINARILY SIZED AND ARE APPROXIMATE. FINAL BMP DESIGN DETAILS AND SIZES WILL BE CONFIRMED BASED ON ENGINEERING DESIGN ANALYSIS. FINAL DESIGNS WILL BE SUBJECT TO ENGINEERING FEASIBILITY ASSESSMENT, PERMITTING CONSTRAINTS (I.E., REGULATORY AGENCY REQUIREMENTS), AND EXPERT PANEL AND PROPERTY OWNER REVIEW AND APPROVAL.
2. BMP DESIGN AND PLACEMENT WILL BE SUBJECT TO MODIFICATION PENDING FINAL ASPHALT REMOVAL AND VISITOR CENTER LOCATION



NORTH



CROSS SECTIONAL ILLUSTRATION OF PROPOSED VEGETATED SWALE

DETAIL

TITLE: **24-INCH CULVERT DRAINAGE AREA BMPS**

PREPARED BY: **Geosyntec** consultants
 924 ANACAPA STREET, SUITE 4A
 SANTA BARBARA, CA 93101
 PHONE: 805.897.3800

PREPARED FOR: **BOEING** **NASA**
 SANTA SUSANA SITE
 VENTURA COUNTY, CALIFORNIA

PROJECT: **STORMWATER BMP CONCEPT DESIGNS
 SANTA SUSANA SITE WATERSHED 009**

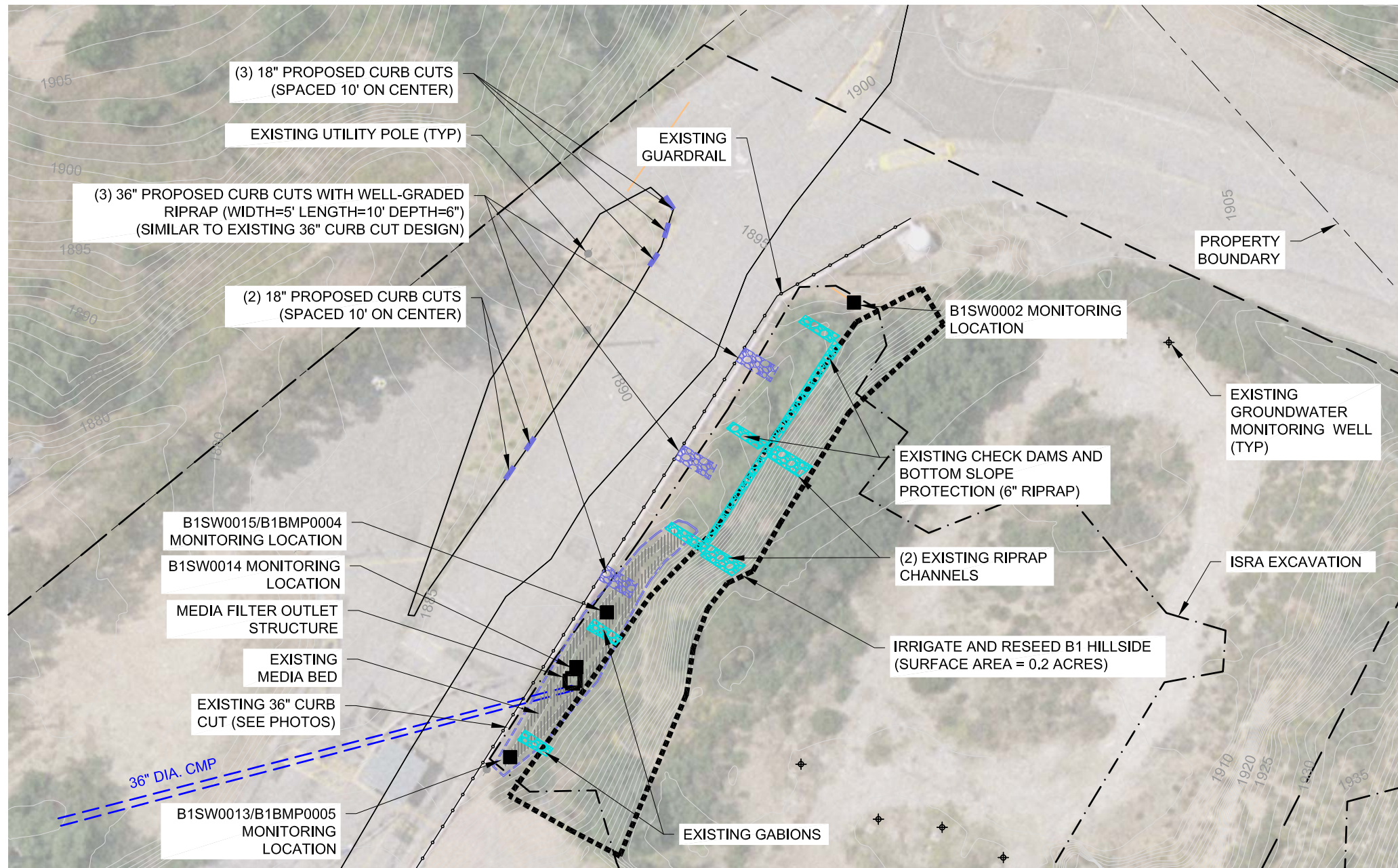
DESIGNED BY: AQ
 DRAWN BY: AQ

REVIEWED BY: DHB
 APPROVED BY: BS

DATE: SEPT 2012
 PROJ. NO.: SB0363S

DRAWING: **4**

L:\PROJECT FOLDERS\BOEING\SB0363S BOEING STORMWATER 2012\CADD\CONCEPTUAL DESIGN\092512\SB0636S--1001 NASA CONCEPT BMP DESIGNS



CONCEPTUAL DESIGN

NOTE: PROPOSED DESIGN FEATURES WERE PRELIMINARILY SIZED AND ARE APPROXIMATE. SUBAREA DRAINAGE BOUNDARIES ARE NOT SHOWN AS THEY ARE UNDEFINED FOR THIS AREA. FINAL BMP DESIGN DETAILS AND SIZES WILL BE CONFIRMED BASED ON SITE VISIT AND ENGINEERING DESIGN JUDGMENT AND ANALYSIS. FINAL DESIGNS WILL BE SUBJECT TO ENGINEERING FEASIBILITY ASSESSMENT, PERMITTING CONSTRAINTS (I.E., REGULATORY AGENCY REQUIREMENTS), AND EXPERT PANEL AND PROPERTY OWNER REVIEW AND APPROVAL.



PHOTO #1: LOOKING SOUTHEAST AT EXISTING CURB CUT DRAINING TOWARDS EXISTING CHECK DAMS. THIS DESIGN IS RECOMMENDED FOR THE (3) 36" PROPOSED CURB CUTS.



PHOTO #2: LOOKING NORTHWEST AT RIPRAP INSTALLED AFTER EXISTING CURB CUT. THIS DESIGN IS RECOMMENDED FOR THE (3) 36" PROPOSED CURB CUTS.

SITE PHOTOS

TITLE: B1 MEDIA FILTER	PREPARED BY: Geosyntec consultants	924 ANACAPA STREET, SUITE 4A SANTA BARBARA, CA 93101 PHONE: 805.897.3800	PREPARED FOR: BOEING NASA	SANTA SUSANA SITE VENTURA COUNTY, CALIFORNIA	PROJECT: STORMWATER BMP CONCEPT DESIGNS SANTA SUSANA SITE WATERSHED 009	DESIGNED BY: AQ	REVIEWED BY: DHB	DATE: SEPT 2012	DRAWING: 5
	DRAWN BY: AQ	APPROVED BY: BS	PROJ. NO.: SB0363S						