County of San Bernardino

NOTICE OF PREPARATION

DATE: September 20, 2013

TO: Responsible Agencies and Interested Parties

SUBJECT: Notice of Preparation of a Draft Environmental Impact Report

PROJECT TITLE: LAKE GREGORY DAM REHABILITATION PROJECT, CRESTLINE, SAN BERNARDINO COUNTY.

The Lake Gregory Dam Rehabilitation Project consists of construction of physical improvements to the dam, earthen material hauling and processing, relocation of utilities on Lake Drive, and interim traffic detour routes. The project and three (3) alternatives will be analyzed as described later in this Notice of Preparation.

An environmental review of the project must be conducted in accordance with the California Environmental Quality Act (CEQA). Implementation of the project will require discretionary approvals from state and local agencies, and therefore, this project is subject to the environmental review requirements of CEQA. As a Lead Agency for CEQA, the County of San Bernardino issues this Notice of Preparation for the proposed Lake Gregory Dam Rehabilitation Project in the unincorporated community of Crestline.

The County of San Bernardino Special Districts Department will prepare an Environmental Impact Report (EIR) to evaluate whether potentially significant environmental effects will result from the project. The EIR analysis will assess the effects of the proposed project on the environment, identify potentially significant impacts, and identify feasible mitigation measures to reduce or eliminate potentially significant environmental impacts. The EIR also will discuss potentially feasible alternatives to the proposed project that may accomplish basic project objectives, while lessening or eliminating any potentially significant project impacts.

This Notice of Preparation provides a description of the proposed project and solicits comments from responsible agencies, trustee agencies, federal, state and local agencies and the general public, on the scope and content of the environmental document to be prepared to analyze the environmental impacts of the proposed project. Comments received in response to this Notice will be reviewed and considered by the County in determining the scope of the EIR. Due to time limits as defined by CEQA, your response should be sent at the earliest possible date, but no later than thirty (30) days after publication of this notice. For agencies, we need to know the views of your agency as to the scope and content of the environmental information that is germane to your agency's statutory responsibilities in connection with the proposed project.

Comments and questions regarding this Notice of Preparation may be directed to:

Carrie Hyke, District Planner
Special Districts Department
157 West Fifth Street
San Bernardino, CA 92415-0450

Tele. (909) 387-5530
Email: Carrie.Hyke @ sdd.sbcounty.gov

Please include the name, phone number, and address of the contact person in your response.

PROJECT DESCRIPTION

Background

Lake Gregory Regional Park, originally a privately built and owned recreational facility, has been in operation since the completion of the dam on October 26, 1938. The San Bernardino County Regional Parks Department took ownership of the dam, lake, the water in the lake, and the park on November 7, 1977 from the Crest Forest County Water District and now operates the Lake Gregory Regional Park (Park) as a public facility. Within the Park, the 81 acre lake is operated for public recreation (primarily as a boating and fishery resource). Lake Gregory is located in the San Bernardino Mountains approximately 14 miles north of the City of San Bernardino in the community of Crestline. The lake is accessible via Lake Drive from Highway 138 to Crestline. The project site occurs in Section 23, Township 2 North, Range 4 West, San Bernardino Baseline and Meridian, and found on the San Bernardino North USGS 7.5-minute topographic quadrangle. (See Figure 1, Vicinity Map) The dam is located on Assessor Parcel Number 0337-202-15.

Lake Gregory has a current surface area of approximately 81 acres and a current maximum depth of approximately 60 feet at its ordinary high water mark and spillway elevation of 4,517 feet above mean sea level. The capacity varies seasonally and on average is 2,100 acre-feet. Outflow from Lake Gregory normally flows down Houston Creek, which empties into Silverwood Lake. The State Division of Safety of Dams (DSOD) has placed the lake under restricted use due to insufficient capacity of the outlet works and unresolved issues regarding dam stability during a seismic event. The dam does not meet the minimum factor of safety requirements for pseudostatic seismic loading and post-earthquake stability and the low level drain does not meet DSOD's requirements for evacuating the lake in an emergency. (See Figure 2, Existing Site Conditions)

The homogenous earthen dam was constructed in the 1930's and did not incorporate the drains that are now installed on all dams. The release valves to be used to drain the lake or take pressure off the dam in the event of an emergency, consisted of two 12-inch diameter lines installed within the low level outlet works tunnel at an elevation of 4459-feet above sea level. Although both valves were installed in 1936, only one of the lines was plumbed out of the outlet works tunnel. Regional Parks Staff used to routinely exercise the valve connected to the single drain line; however, the valve that was not plumbed has not been tested since the original installation. (See Figure 3, Dam Profile A-A_1 and Figure 4, Typical Dam Section)

Lake Gregory is located in a highly seismic area with the Lake Gregory Fault underlying the lake itself. The maximum credible earthquake however would be the San Andreas Fault with a magnitude of 8.5 and a horizontal acceleration of 0.65g. (See Figure 5, Geologic Map) Concerns regarding the seismic stability of the dam were first raised in 1986 as a result of an

on-site inspection and review of the original plans and construction photographs by the DSOD. As a result, DSOD prepared a 90-page document entitled "Lake Gregory Dam Safety Review Report," which confirmed the issues with the dam. In response, the County commissioned a seismic analysis of the dam. On December 1, 1986, Pioneer Consultants completed and submitted a stability analysis that was deemed incomplete and consequently not accepted by DSOD. In 1991, Woodward-Clyde Consultants picked up where the previous consultant left off and submitted a second study to DSOD in June 1991. This study was likewise deemed incomplete and not approved by DSOD. After three more years, Woodward-Clyde revised and updated their analysis and resubmitted in May of 1994 with similar results. In 2004, Mr. D. Scott Magorien was engaged by the County Architecture and Engineering Department to prepare and submit a fault hazard evaluation report to the DSOD, which was also not approved. Questions/concerns about the dam's stability during a major earthquake focus on a 30-foot wide horizontal section of the dam beginning approximately 50 feet from the top that was poorly compacted when the dam was constructed. From analysis of the dam's construction history, as well as review of core samples taken in 2010 by drilling four test holes into the dam, the subject area is inconsistent with the properly constructed and compacted areas above and below this section. The District, utilizing the services of its consultant Tetra Tech, was able to prepare, submit and obtain DSOD approval of the final stability analysis in January of 2012. This study identifies and quantifies the deficiencies of the dam.

A major earthquake, most likely triggered along the San Andreas Fault, could shake the dam strongly enough that liquefaction of the construction material would occur in the 30-foot section, possibly causing the crest of the dam to deform enough to allow water to top the crest of the dam which could result in failure. Upon completion and acceptance of the stability analysis, the District explored eleven potential options to stabilize the dam. Of the eleven options, four were found to be acceptable to the DSOD and provided minimal impacts to the level of water in the lake. It is important to note that there is no artificial method of introducing new water to the lake and the lake level is dependent on rainfall and storm runoff to maintain its water level. Of the four options discussed below, the downstream stabilization buttress is the preferred and approved alternative.

Alternatives

As noted above, eleven alternatives for remediation of the dam were formulated and reviewed by state and local agencies. Of these, four potential alternatives were selected based on feasibility, costs and impacts to the Park operations. Of the four, the Alternatives Evaluation Study recommended the "Downstream Stabilization Buttress" as the most viable and cost effective project, which was subsequently approved by DSOD. (See Figure 6, Alternative 1 Conceptual Downstream Stabilization Buttress) Focus in the EIR will center around the preferred alternative and the other three alternatives will be looked at to a lesser degree. The four alternatives are as follows:

Downstream Stabilization Buttress. This is the preferred and DSOD approved alternative and consists of constructing a stabilization buttress on the downstream slope of the dam. The location of the buttress is anticipated to be on Assessor Parcel Number 0337-151-07. The project would include the removal of trees and vegetation from the downstream slope of the dam, the removal of the existing clean placed rock on the downstream slope, removal of foundation material at the base of the dam, the addition of a new 25-foot average thickness earthen buttress extending beyond the current toe of the embankment, installation of a drainage system to pick up water moving through the liquefaction zone, and placement of new slope

protection. Earthen material source(s) will be needed and the District is in the process of obtaining and stockpiling material in anticipation of the future construction. The stockpile yard is located at the Thousand Pines Christian Camp (Assessor Parcel Numbers 0337-131-02 and 04), approximately 2 miles from the dam as driven on existing roads. The stockpile area and the haul route to get the material to the dam should be considered and analyzed in the EIR.

Cement Deep Soil Mixing strengthening of low density zone. In simplest terms, the Cement Deep Soil Mixing (CDSM) alternative would consist of injecting the CDSM to form columns in a grid pattern on the downstream side in a 40-foot wide band all the way across the embankment. This method would provide stiffness in the low density zone, reducing liquefaction potential. (See Figure 7, Alternative 2 (Formerly Alt. 4) CDSM Stabilization)

Stone column strengthening of low density zone. Stone columns would be constructed in a series of three rows on the downstream side, all the way across the embankment. This installation would provide stiffness in the low density zone, reducing liquefaction potential. (See Figure 8, Alternative 3 (Formerly Alt. 5) Stone Column Stabilization)

Upstream asphalt facing. In this alternative, an asphalt slope would be constructed to overlay the upstream slope of the dam. This would provide a firm, semi-permeable face to the dam. The lake would have to be completely dewatered to construct this alternative. (See Figure 9, Alternative 4 (Formerly Alt. 10) Upstream Asphalt Face)

Material Import and Processing

The Downstream Stabilization Buttress alternative, the preferred and DSOD approved alternative, would require the largest amount of earthen material to construct, as compared to the other alternatives. Preliminary estimates of the gross quantity of material that will be needed for the buttress range up to 70,000 cubic yards (cy) before processing, placing, compacting, shrinkage and subsidence. The material will require processing before use to introduce clay and silt components to the granular material currently being stockpiled for the dam remediation project. It is expected that waste material will be generated and will need to be stockpiled at another location for future use by others.

Preliminary locations of source material include dredged material from the Lake Gregory Swim Beach Silt Management Project, currently stockpiled at Thousand Pines Camp in Crestline, additional Lake Arrowhead dredging material stockpiled at the District's Papoose Lake Dam in Lake Arrowhead, and the material yet to be dredged from the second phase of dredging at Lake Gregory. Staging areas will be needed for processing, material stockpiles and contractor's equipment. In addition to staging and processing at the source material locations and at the project construction site, the Crestline Sanitation District has a facilities yard nearby that may be used.

Haul routes for importing the material to the project site will require coordination with County Public Works, County Fire Department, County Sheriff, California Highway Patrol and others. The project would also include rehabilitation of haul routes from any excessive wear and damage due to the project.

All material planned for use has already been excavated and stockpiled; so a new borrow site is not planned for the project.

Environmental Setting

The landscape surrounding and adjacent to Lake Gregory consists of both native and non-native vegetation types. Residential and commercial development exists adjacent to the project site as well as all around the lake.

Native forest communities surrounding the lake and interspersed within the nearby residential areas consist of both pinyon juniper woodland and southern yellow pine forest. Evergreen and cedar trees line the streets and are on private property surrounding the project area. Other vegetation includes wetland type species, surrounded by evergreen forest, interspersed with native and non-native annuals. While the lake itself does not contain any tree species, the western section of the lake's main native plant components were identified and include: willow species (*Salix spp*), southern cattail (*Typha domingensis*), incense cedar (*Calocedrus decurrens*), sugar pine (*Pinus lambertiana*), and Jeffrey pine (*Pinus jeffreyi*).

Although the area has commercial and residential development, the potential exists for a diverse array of fauna including, but not limited to, the following: coyotes (*Canis latrans*), bobcats (*Felis rufus*), gray squirrels (*Sciurus griseus*), chipmunks, and many different species of bats. Common bird species include mountain chickadees (*Poecile gambeli*), spotted (*Pipilo maculatus*) and California towhees (*Pipilo crissalis*), dark-eyed juncos (*Junco hyemalis*) and Steller's jays (*Cyanocitta stelleri*). Common reptiles include side blotch (*Uta stansburiano*) and fence lizards (*Sceloporus occidentalis*), mountain king snakes (*Lampropeltis zonata*), gopher snakes (*Pituophis melanoleuces*), and southern Pacific rattlesnakes (*Crotalus virdis helleri*).

The southern rubber boa, a state listed species of special concern is found within this quadrangle; however, the project site lies outside of the known distribution and occupied habitat of the species.

Fisheries Overview

The Lake Gregory fishery is stocked annually with trout by the California Department of Fish and Wildlife (CDFW). The latest annual trout plant numbers according to CDFW were 24,000 pounds of rainbow trout and 6,000 pounds of brown trout in 2012 and 24,000 pounds of rainbow trout and 12,000 pounds of brown trout in 2013.

In 2010, eight fish species (in addition to trout) were identified to occur in the lake: black crappie, bluegill, brown bullhead, goldfish, prickly sculpin, common carp, largemouth bass, and tule perch. In 2010 high numbers of black crappie were once again observed in relation to other species present. CDFW concluded that the overpopulation of crappie was having negative effects on the other species found in the lake. In January of 2010 CDFW planted 325 lbs. of large rainbow and brown trout (averaging three pounds) to control the crappie population.

Reference Documents

Stability Investigation, Lake Gregory Dam, Tetra Tech, February 2012

Draft Alternatives Evaluation, Rehabilitation of Lake Gregory Dam, Tetra Tech, June 2012

Habitat Assessment and Focused Surveys for Southwestern Willow Flycatcher, Gonzales Environmental Consulting, July 2013

Draft Fisheries Assessment, Lilburn Corporation, July 2013

Potential Environmental Impacts

The Lead Agency has determined that this project could result in significant environmental impacts and/or have a significant impact on the quality of the human environment. As such, preparation of an EIR is appropriate for further analysis. The Lead Agency has identified the following environmental considerations as potential significant effects of the project:

- Aesthetics
- Air Quality
- Biological Resources
- Cultural Resources
- Hazards & Hazardous Materials
- Hydrology & Water Quality
- Geology and Soils
- Noise
- Public Services
- Recreation
- Traffic
- Utilities

The public comment period on this Notice of Preparation will end on **October 21, 2013**. For further information, please call (909) 387-5530. Written comments should be addressed to:

Carrie Hyke, District Planner
Special Districts Department
157 West Fifth Street
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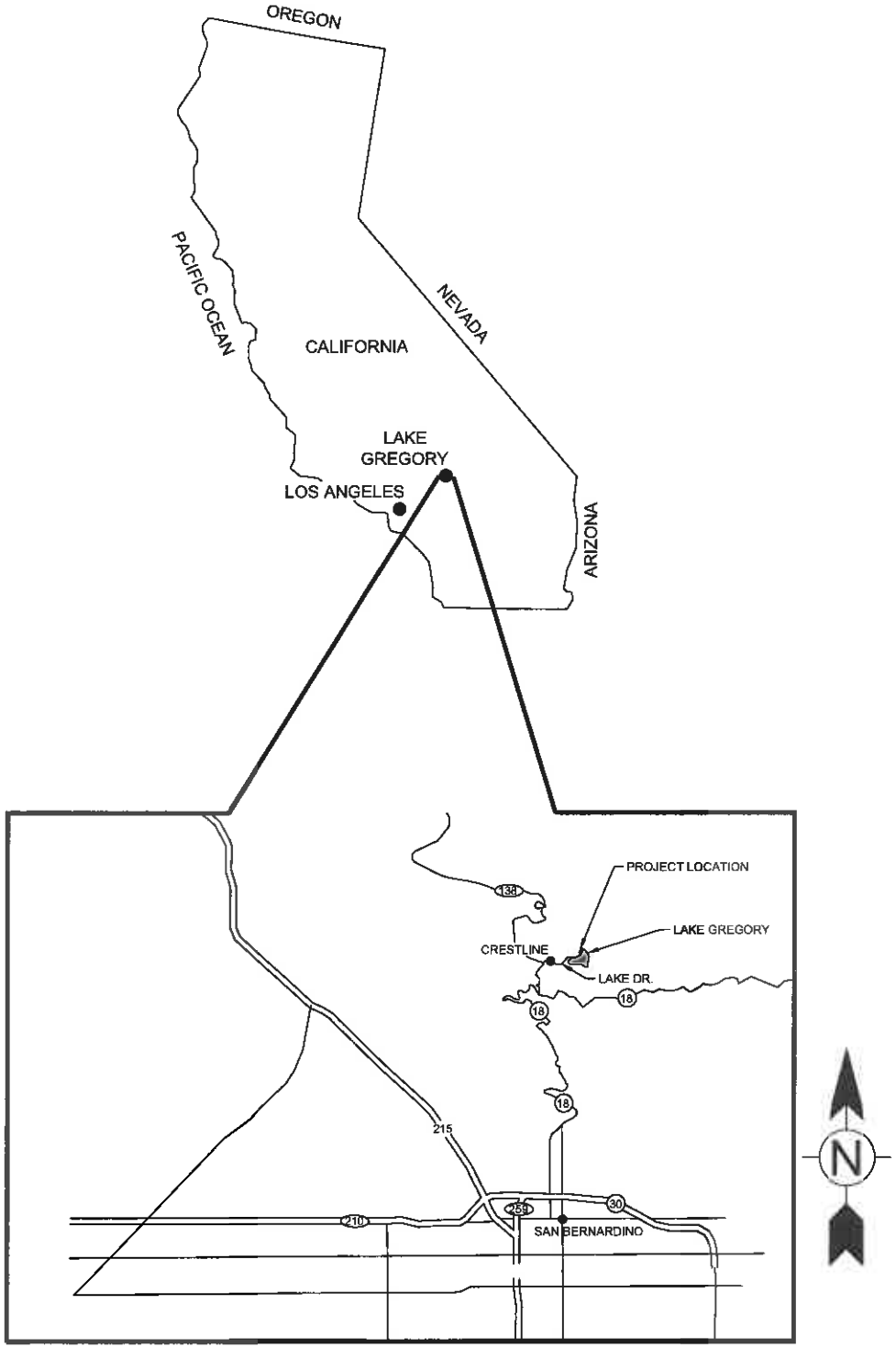
Tele. (909) 387-5530
Email: Carrie.Hyke @ sdd.sbcounty.gov

Sincerely,

Carrie Hyke, AICP, District Planner
Special Districts Department
County of San Bernardino

Attachments:

Figure 1 - Vicinity Map
Figure 2 - Existing Site Conditions
Figure 3 - Dam Profile A-A_1
Figure 4 - Typical Dam Section
Figure 5 - Geologic Map
Figure 6 - Alternative 1 Conceptual Downstream Stabilization Buttress
Figure 7 - Alternative 2 (Formerly Alt. 4) CDSM Stabilization
Figure 8 - Alternative 3 (Formerly Alt. 5) Stone Column Stabilization
Figure 9 - Alternative 4 (Formerly Alt. 10) Upstream Asphalt Face



VICINITY MAP

SCALE 1" = 4 MI

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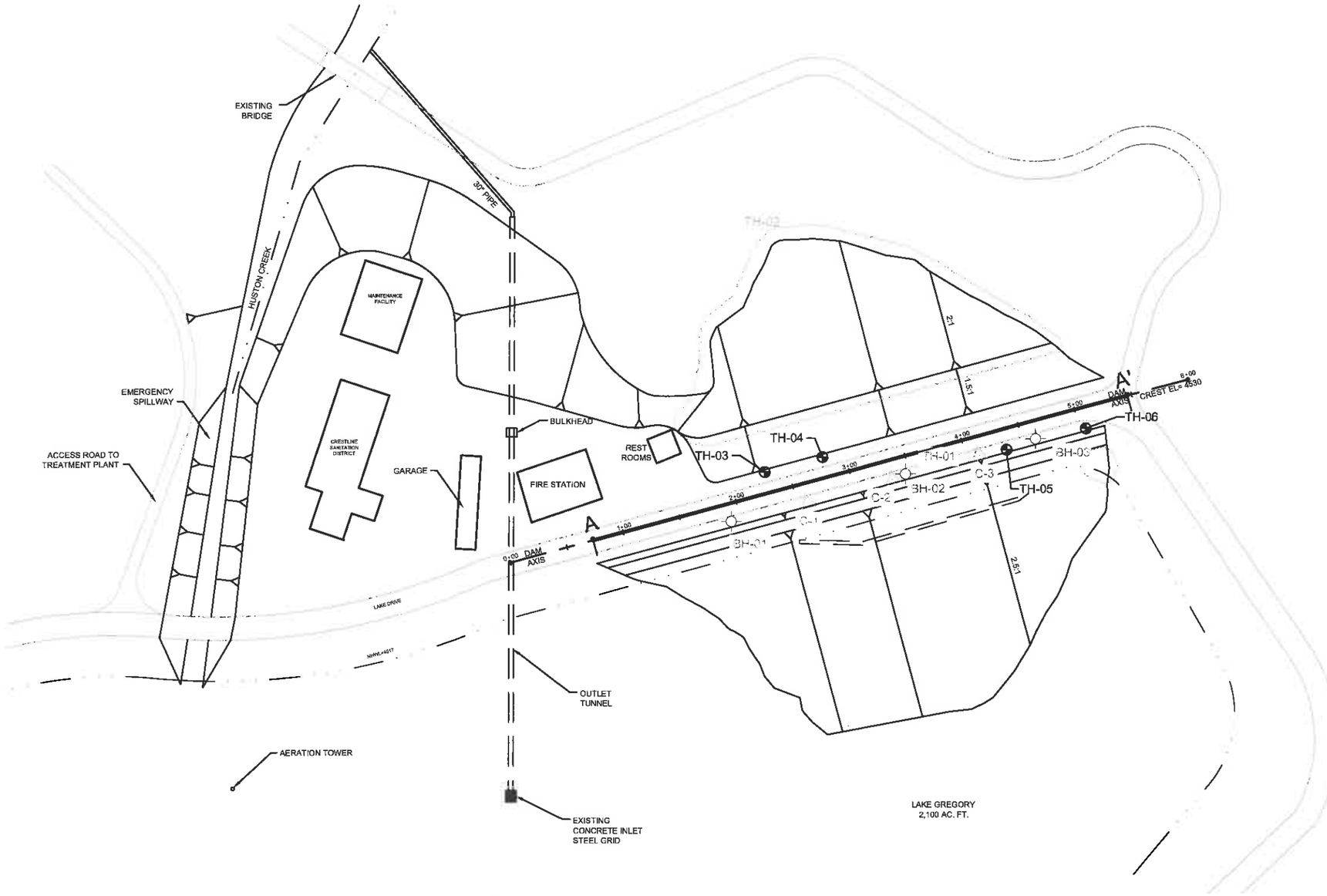
COUNTY OF SAN BERNARDINO

LAKE GREGORY

VICINITY MAP

Project No.:	133-19705-10001
Date:	12-5-11
Designed By:	JD
FIGURE	1

Bar Measures 1 inch



N

0 50' 100'

SCALE: 1" = 100'

LEGEND:

- NHWL = 4517
- EXISTING ROAD
- C-1 — PIONEER CONE PENETROMETER TEST LOCATION
- BH-03 — PIONEER HOLLOW STEM AUGER BORING LOCATION
- TH-01 — TETRA TECH HOLLOW STEM AUGER BORING LOCATION (02-2009)
- TH-03 — TETRA TECH BORING (03-2011)

NOTES:

1. DRAWINGS BASED ON AERIAL PHOTOGRAPHY AND AS-BUILT DRAWINGS FROM 1941. A SURVEY WAS NOT PERFORMED.
2. PIEZOMETERS INSTALLED IN EACH 2011 BORING EXCEPT TH-03.

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COUNTY OF SAN BERNARDINO

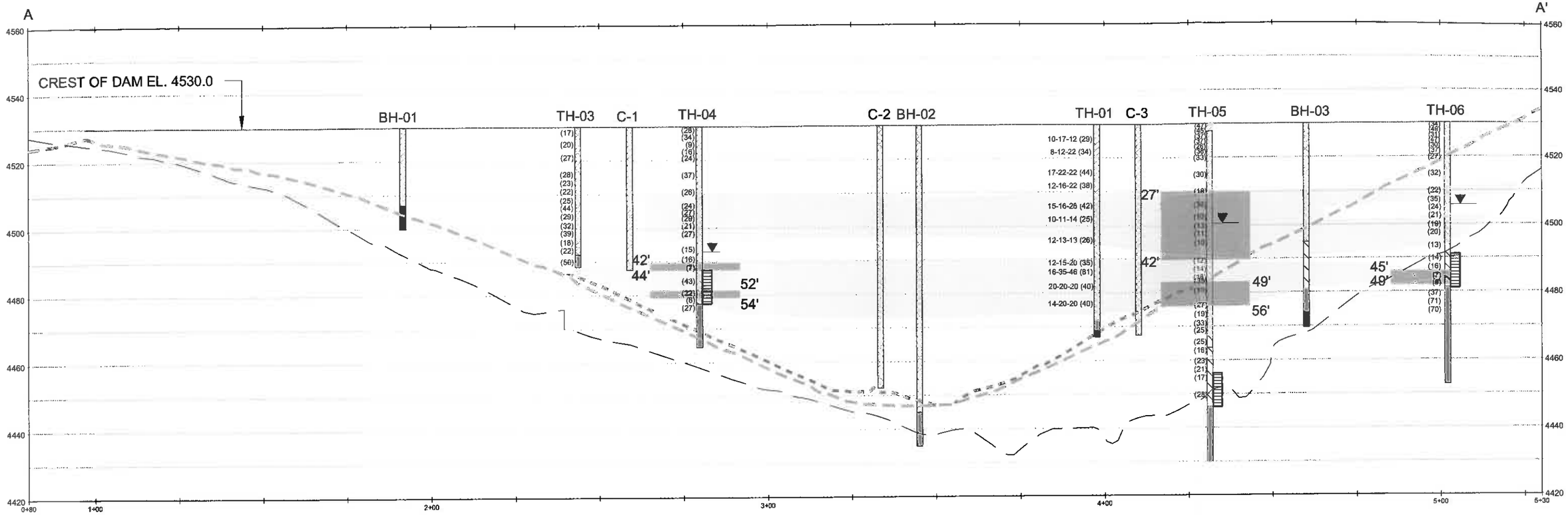
LAKE GREGORY

EXISTING SITE CONDITIONS

Project No.:	133-19705-10001
Date:	6-22-11
Designed By:	

FIGURE 2

Bar Measures 1 inch



PROFILE
(LOOKING DOWNSTREAM)

0 15' 30'
SCALE: 1" = 30'

LEGEND:

- AREAS OF POTENTIAL LIQUEFACTION (DRAFT REPORT JUNE, 2011)
- AS-BUILT FOUNDATION PROFILE PROJECTED FROM CUTOFF WALL (1941)
- STRIPPED GROUND SURFACE (1936 DESIGN REPORT)
- ORIGINAL GROUND SURFACE (1936 DESIGN REPORT)
- EMBANKMENT FILL
- RESIDUAL SOILS
- WEATHERED BEDROCK
- BEDROCK
- REVISED AREAS OF POTENTIAL LIQUEFACTION (NOVEMBER, 2011)
- WATER LEVEL MEASURED 5-23-11
- 10' LONG PIEZOMETER SLOTTED SECTION (10 SLOT)
- (25) $(N_1)_{60}$- SPT BLOW COUNT CORRECTED TO ER=60% AND AN EFFECTIVE OVERBURDEN STRESS OF 1 ATM

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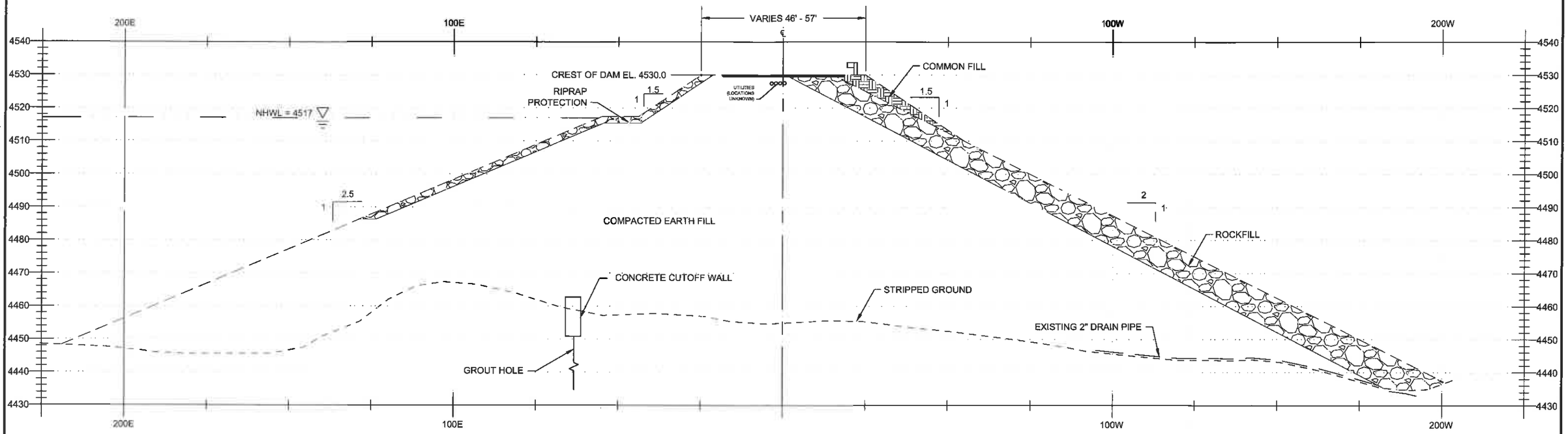
COUNTY OF SAN BERNARDINO
LAKE GREGORY
DAM PROFILE A-A'

Project No.:	133-19705-10001
Date:	12-5-11
Designed By:	JD
FIGURE	3

Bar Measures 1 inch



TYPICAL EXISTING DAM SECTION (2)

0 15' 30'

SCALE: 1" = 30'

1/30/2012 3:33:05 PM - P:\19705\133-19705-10001\DOCS\REPORTS\FIGURES FOR REPORT\FIGURE 3-TYP DAM SECTION.DWG - MORISON, MICHAEL

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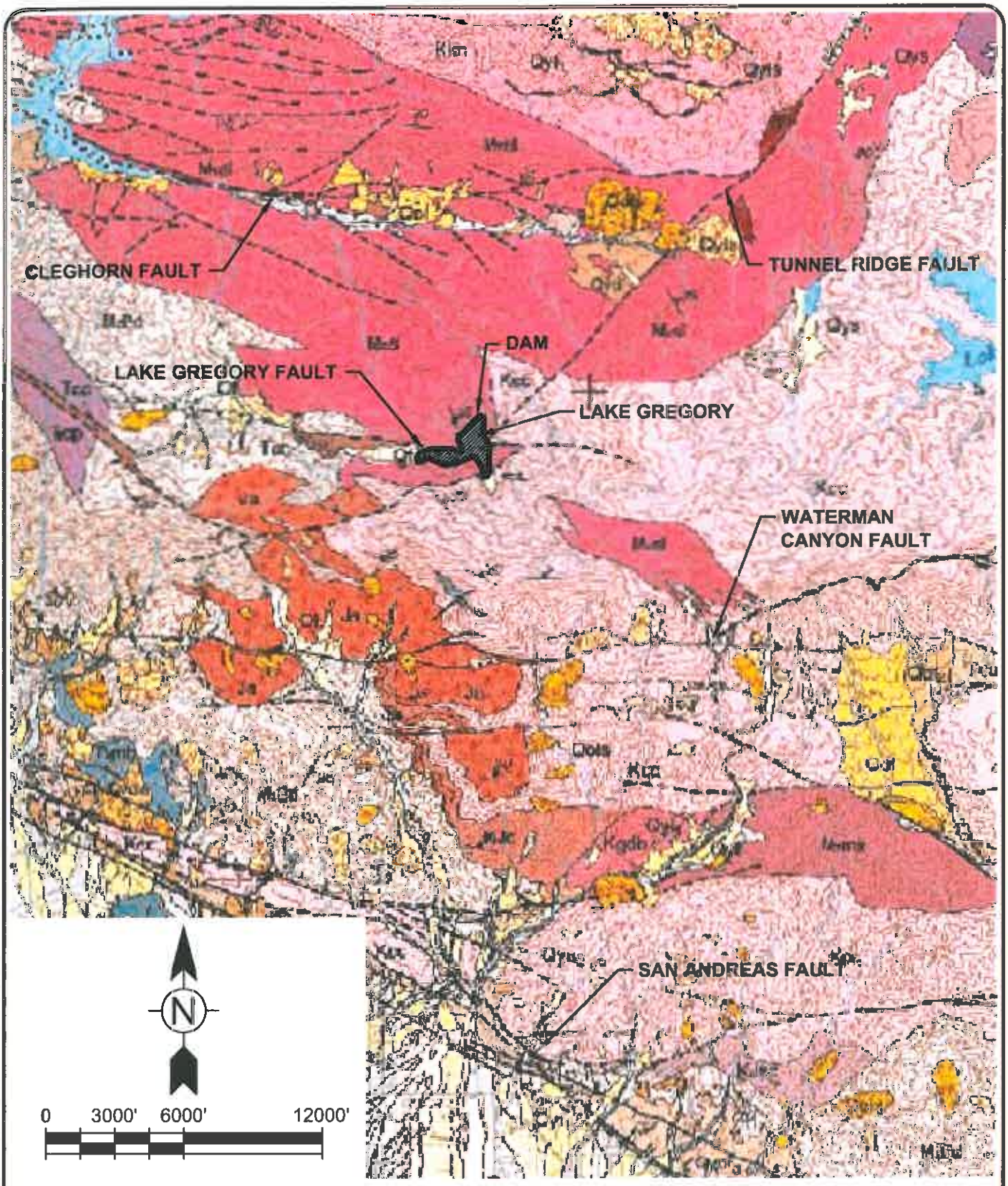
COUNTY OF SAN BERNARDINO

LAKE GREGORY

TYPICAL DAM SECTION

Project No.:	133-19705-10001
Date:	12-5-11
Designed By:	JD
FIGURE	4

Bar Measures 1 inch



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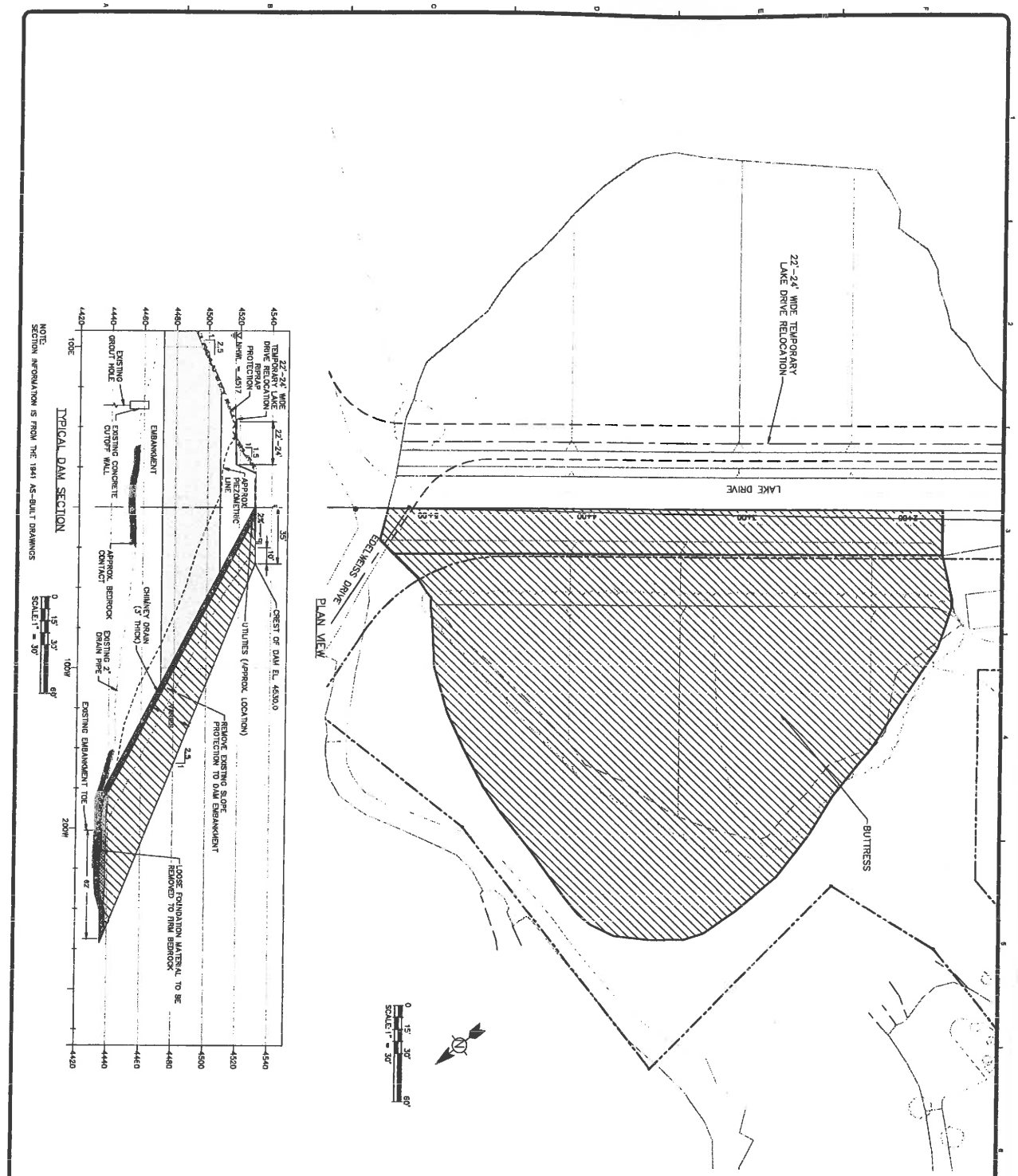
COUNTY OF SAN BERNARDINO

LAKE GREGORY

GEOLOGIC MAP
LAKE GREGORY

Project No.:	133-19705-10001
Date:	12-5-11
Designed By:	JD
FIGURE	5

Bar Measures 1 inch



COUNTY OF SAN BERNARDINO	MARK	DATE	DESCRIPTION	BY
LAKE GREGORY	1	5-29-12	PREPARED	MM
ALTERNATIVE 1 CONCEPTUAL DOWNSTREAM STABILIZATION BUTTRESS				

Project No.: 133-01297-12008
Designed By: JD
Drawn By: MM
Checked By: RGT

FIG 6

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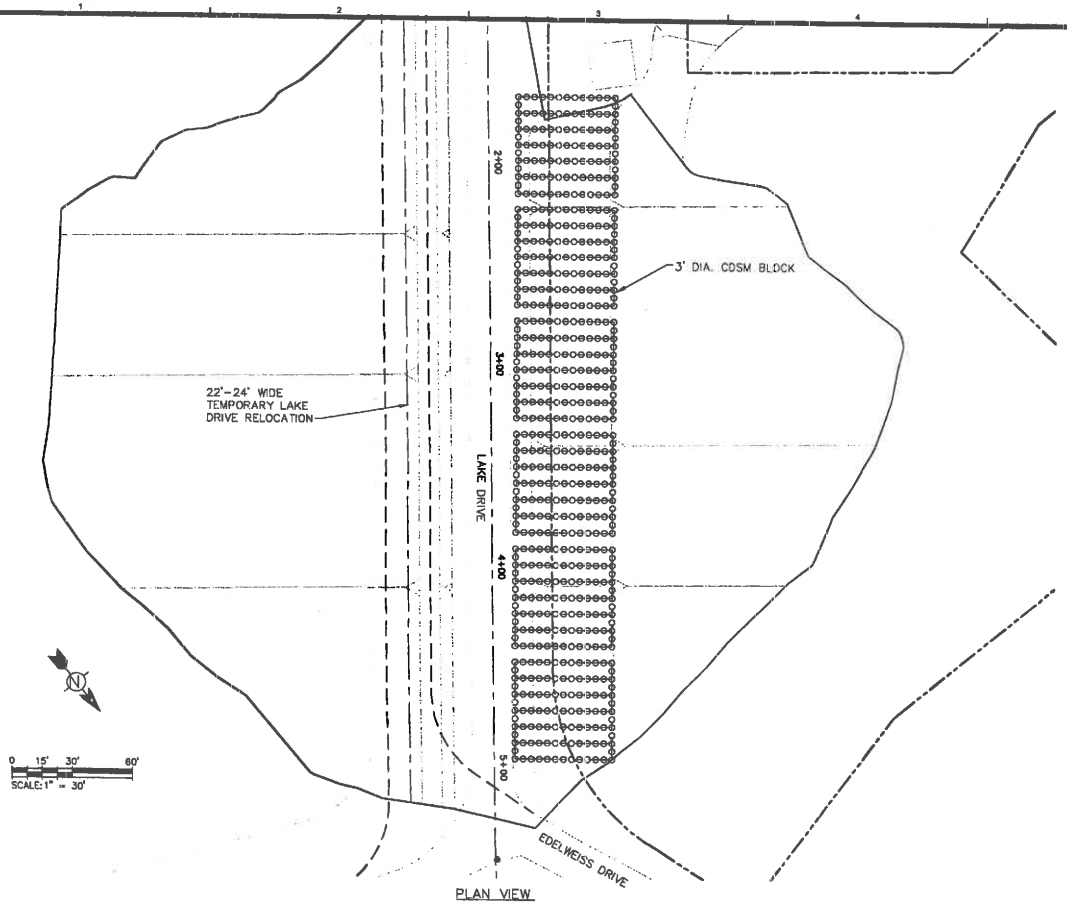
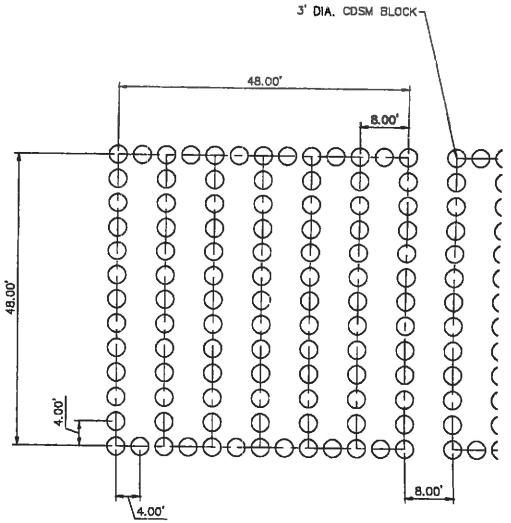
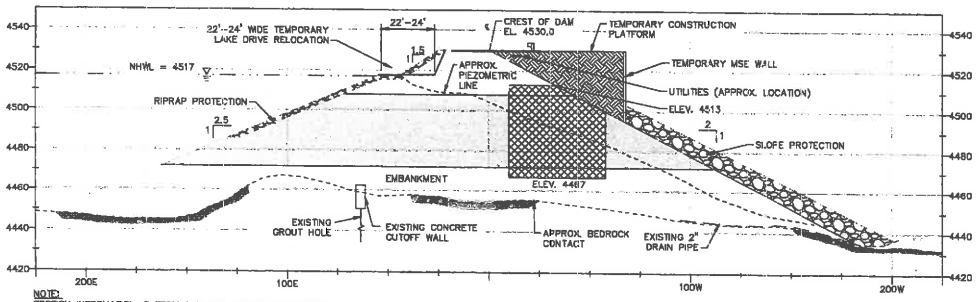


PLAN VIEW



TYPICAL CDSM BLOCK LAYOUT



NOTE:
SECTION INFORMATION IS FROM THE 1941 AS-BUILT DRAWINGS

TYPICAL EXISTING DAM SECTION

0 15' 30' 60'
SCALE: 1" = 30'

LEGEND:

- SLOPE PROTECTION
- LOW DENSITY ZONE
- BEDROCK
- CEMENT DEEP SOIL MIXING (CDSM) STABILIZATION

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FIG 7

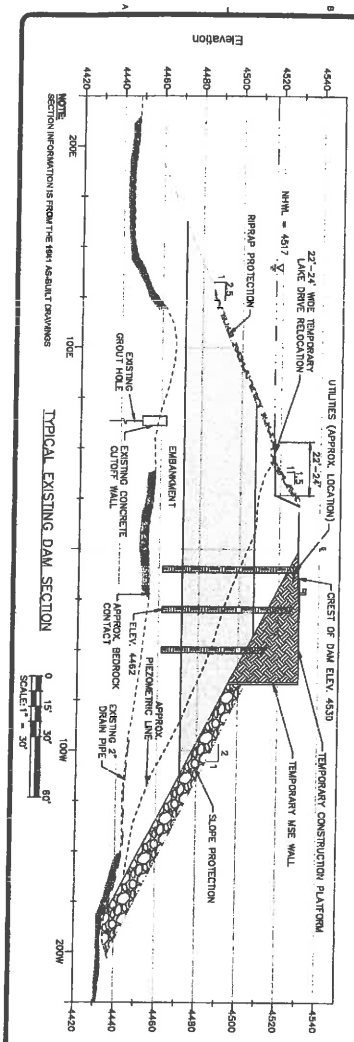
MARK	DATE	DESCRIPTION	BY
1	5-Jan-12	PREPARED	MM

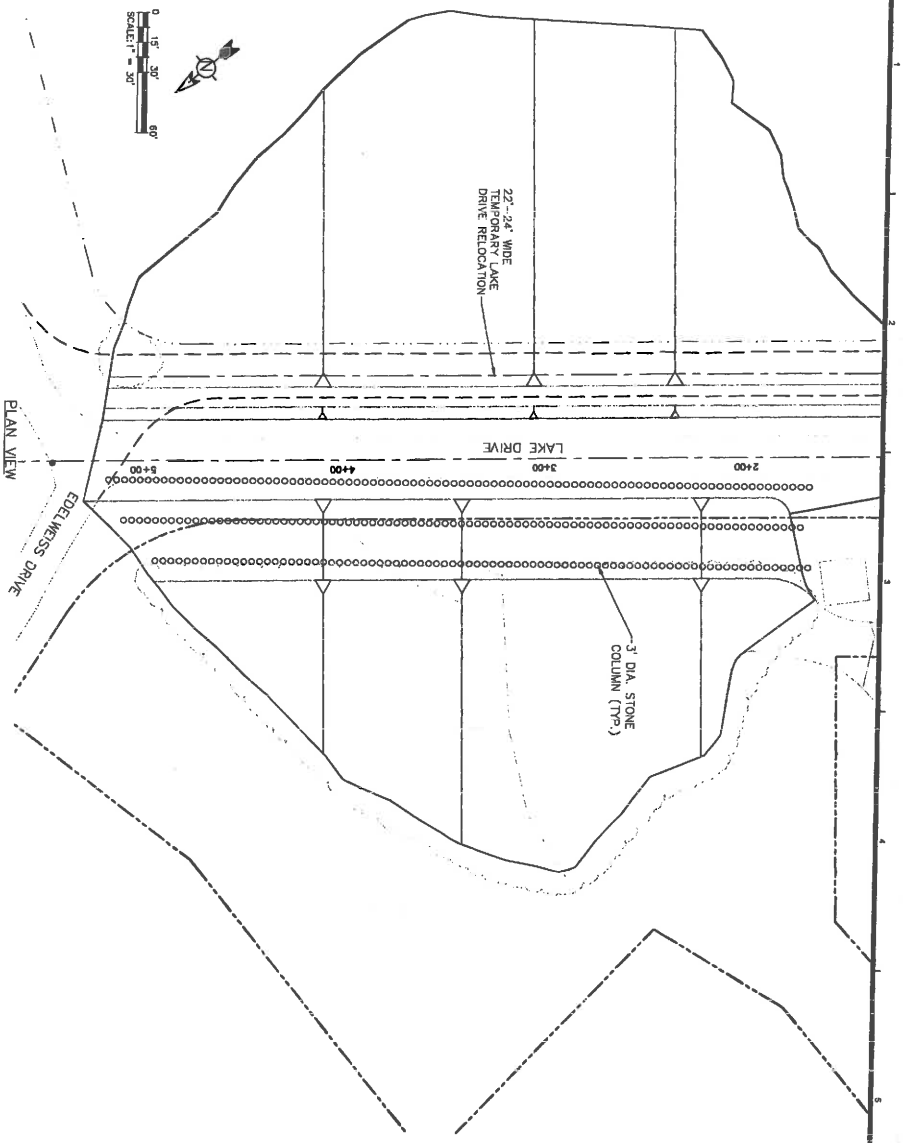
COUNTY OF SAN BERNARDINO
LAKE GREGORY

ALTERNATIVE 4
CDSM STABILIZATION

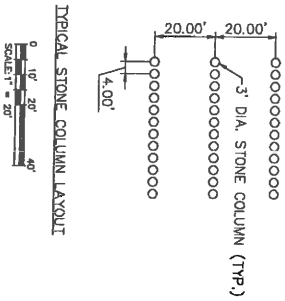
Project No.:	183-01297-12009
Designed By:	JO
Drawn By:	MM
Checked By:	RJT

Bar Measures 1 inch





LEGEND:
- SLOPE PROTECTION
- LOW DENSITY ZONE
- BEDROCK
- STONE COLUMN STABILIZATION



Project No:	133-01297-12008	COUNTY OF SAN BERNARDINO	
Designed By:	JD	LAKE GREGORY	
Drawn By:	MM	ALTERNATIVE 5 STONE COLUMN STABILIZATION	
Checked By:	RJT		

MARK	DATE	DESCRIPTION	BY
1	5-29-12	PREPARED	MM

FIG 8

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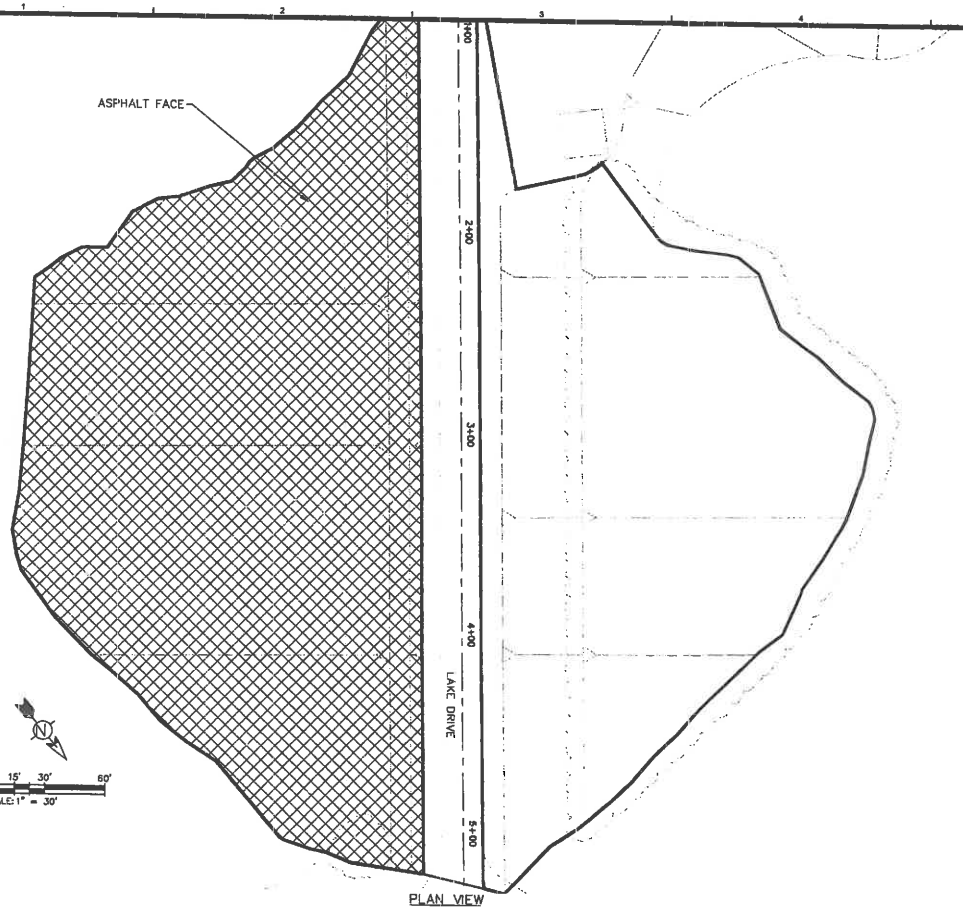
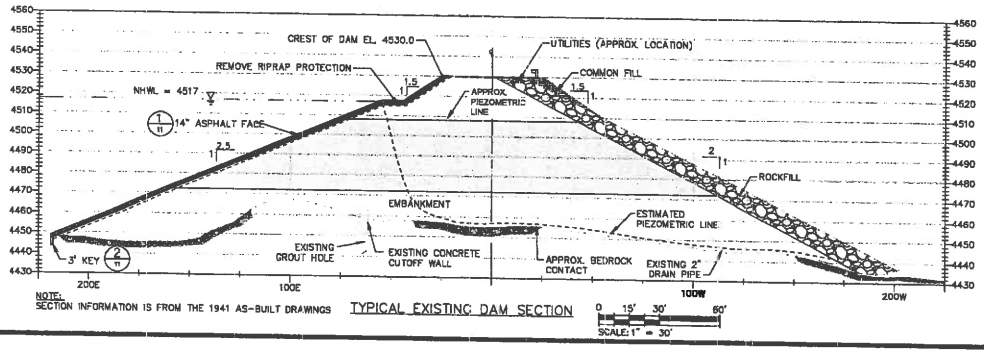


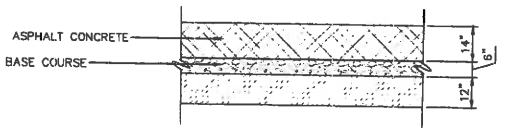
PLAN VIEW



NOTE:
SECTION INFORMATION IS FROM THE 1941 AS-BUILT DRAWINGS

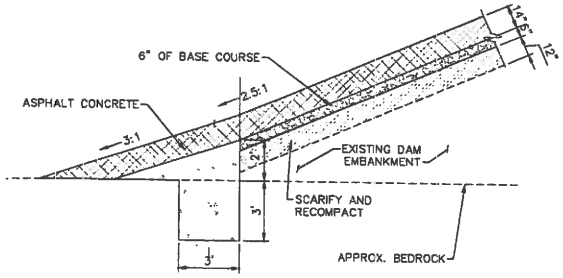
TYPICAL EXISTING DAM SECTION

0 15' 30' 60'
SCALE: 1" = 30'



TYPICAL ASPHALT FACE SECTION (1)

0 1' 2' 4'
SCALE: 1"=2'



TYPICAL KEY WALL DETAIL (2)

0 1.5' 3' 6'
SCALE: 1"=3'

LEGEND:
- SLOPE PROTECTION
- LOW DENSITY ZONE
- BEDROCK
- 14" ASPHALT FACE

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FIG 9

MARK	DATE	DESCRIPTION	BY
1	5-29-12	PREPARED	MM

COUNTY OF SAN BERNARDINO
LAKE GREGORY
ALTERNATIVE 10
UPSTREAM ASPHALT FACE

Project No.:	103-012SV-12008
Designed By:	JD
Drawn By:	MM
Checked By:	RJT

Bar Measures 1 inch