CALIFORNIA WATER COMMISSION

Additional Information for the Commission on Delta Habitat Conservation and Conveyance Geologic Exploration Activities

January 18, 2012

Presentation Overview:

- INTRODUCTION OF STAFF
- PURPOSE OF THIS PRESENTATION
- GEOLOGIC EXPLORATION
- PROJECT DESCRIPTION
- TYPICAL EQUIPMENT AND TYPES OF EXPLORATION

INTRODUCTION OF STAFF

- Allan Davis, Supervising Land Agent, DWR
- Gordon Enas, Principal Engineer, DWR

PURPOSE OF THIS PRESENTATION

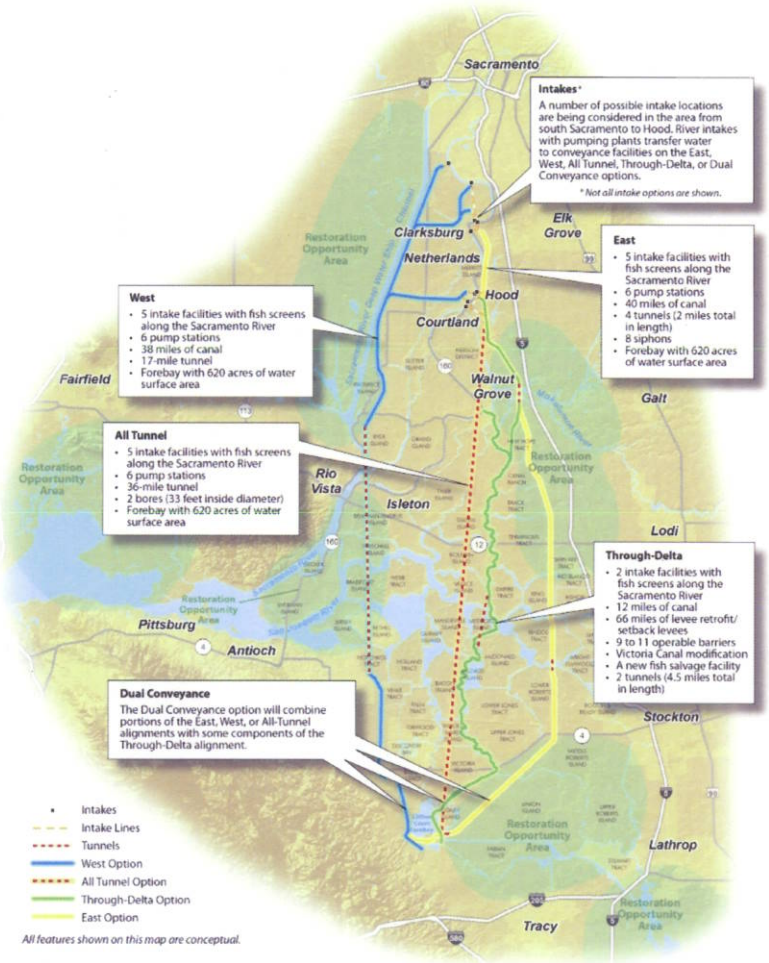
To provide information to the California Water Commission (CWC) on the Delta Habitat Conservation and Conveyance Program's Geologic Exploration Activities.

Topics

- What is the project?
- Why is the geologic exploration necessary?
- Intakes, Forebays and Canal options
  - Tunnel option
- Current geotechnical data
- Geology logs, Tunnel profile, and Exploration
- Typical equipment and types of exploration
  - SPT (drill hole)
  - CPT (cone penetration testing)
  - Test Pits
- Funding

Project Description

- In his letter dated February 28, 2008, the governor requested that four different conveyance options to move surface water from the North Delta to the South Delta be investigated as solutions to help reduce the deteriorating conditions in the Delta.
- Geotechnical field investigations are required to acquire data that could be used to support the preparation of the environmental documentation, feasibility studies, and preliminary engineering needed to evaluate each option.



Project Description (cont'd)

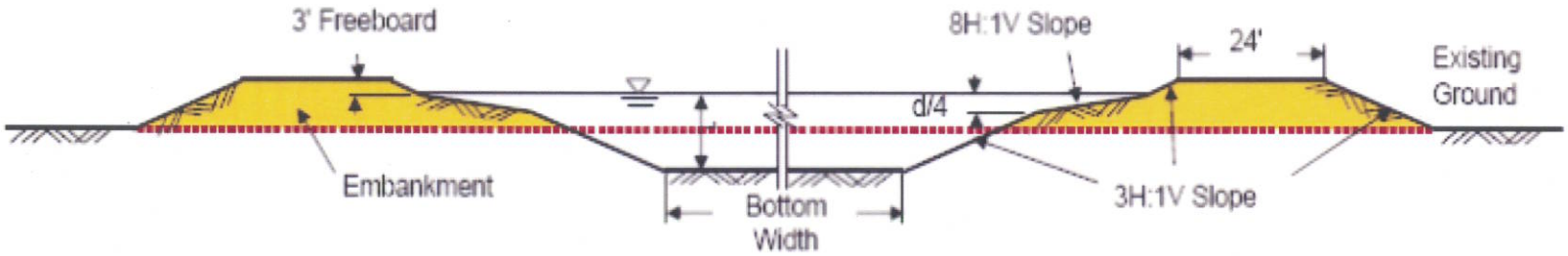
- The Description of the Department's Geotechnical Investigations "Project"

The Geo-technical studies Project is best described in the Notice of Determination for the Final Supplemental Initial Study/Mitigated Negative Declaration dated September 23, 2010 (SCH No. 2010062041):

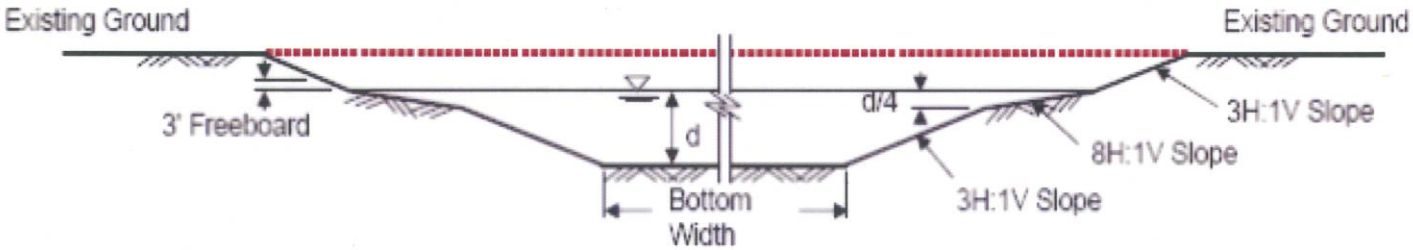
"Project Description

The Department of Water Resources is planning to conduct overwater and land geotechnical borings, perform cone penetration tests (CPT) and dig approximately 30 small test pits in order to test soils in the Sacramento-San Joaquin Delta. DWR will investigate the engineering properties of the soils within a narrow corridor transecting the Delta. The purpose of the investigation is to gather necessary geotechnical information to support the preparation of a draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the proposed BDCP and/or preliminary engineering design for the Delta Habitat Conservation and Conveyance Program. This testing is necessary because of the lack of geotechnical data available to DWR in the Project location."

Intakes, Forebay, and Canal Options



Typical Canal Section with Fill Embankment
Not to Scale

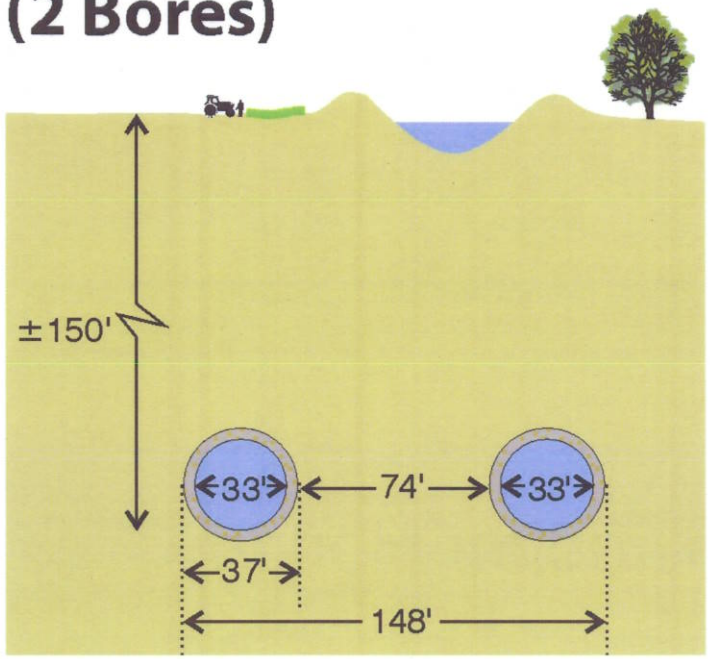


Typical Canal Section with No Fill Embankment
Not to Scale

Isolated Conveyance Facility
All Tunnel Option

Tunnel Option

Tunnel Conveyance (2 Bores)

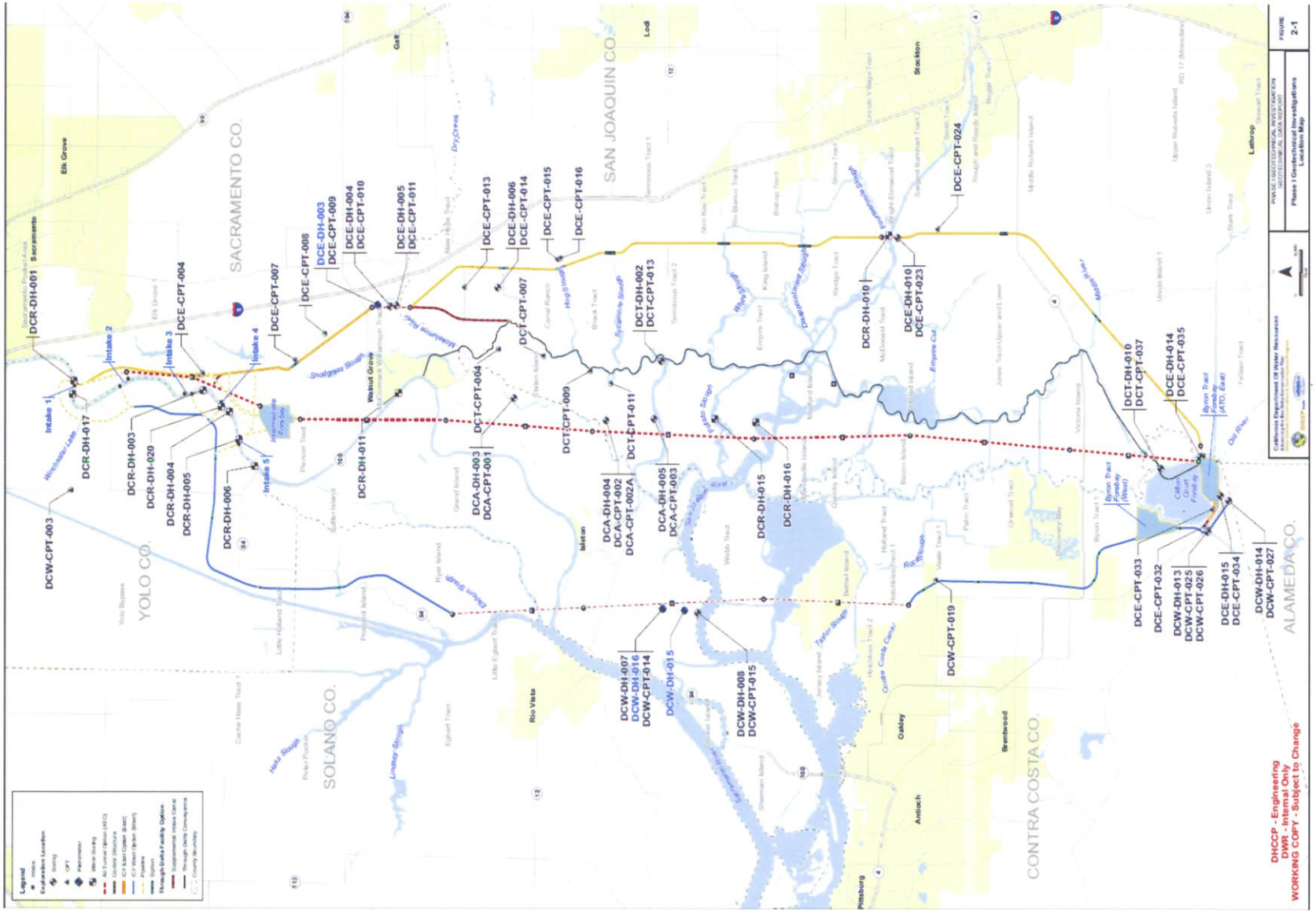


Dimensions are preliminary and subject to change

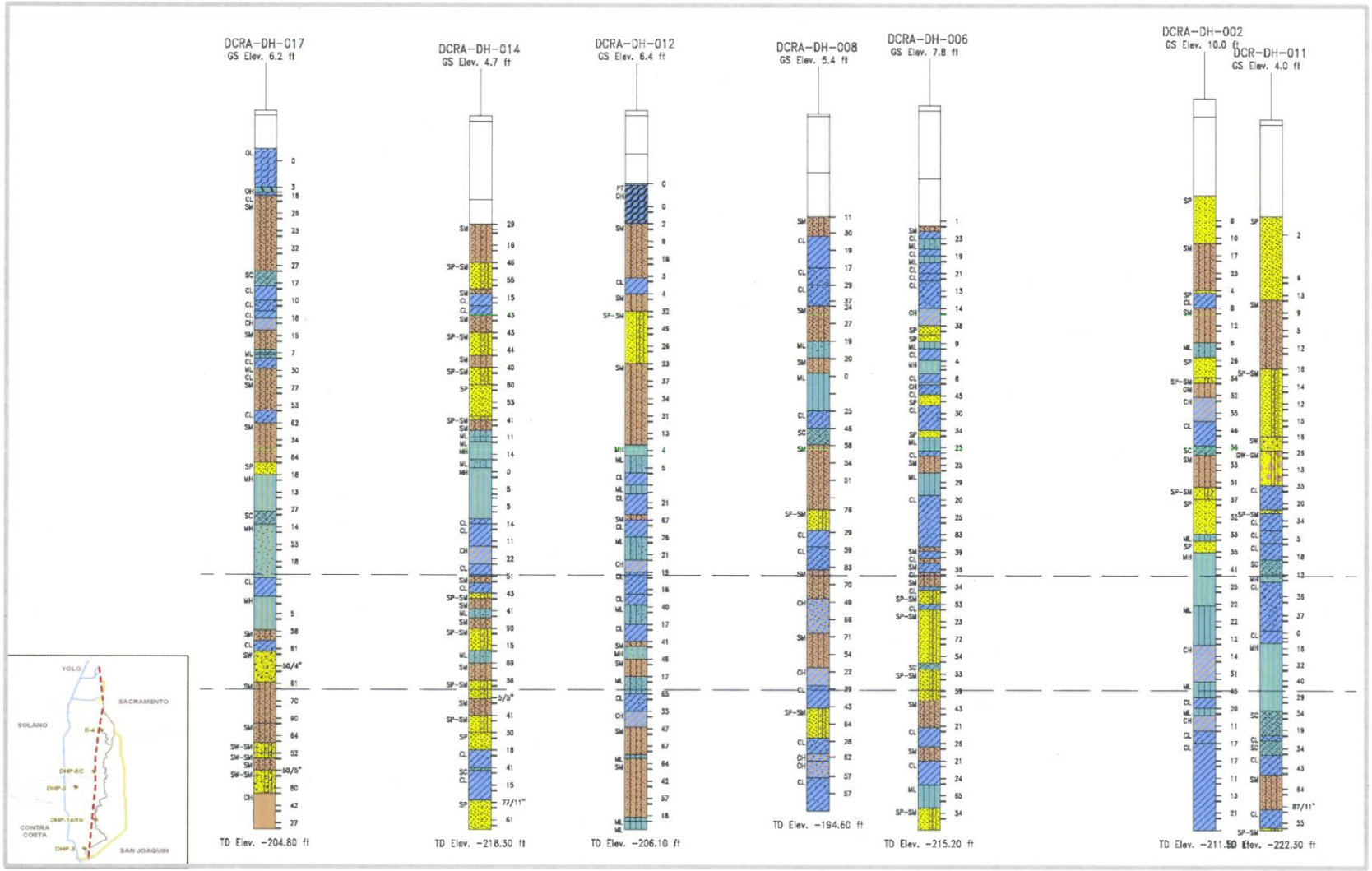
0 100

SCALE IN FEET

Current Geotechnical Data

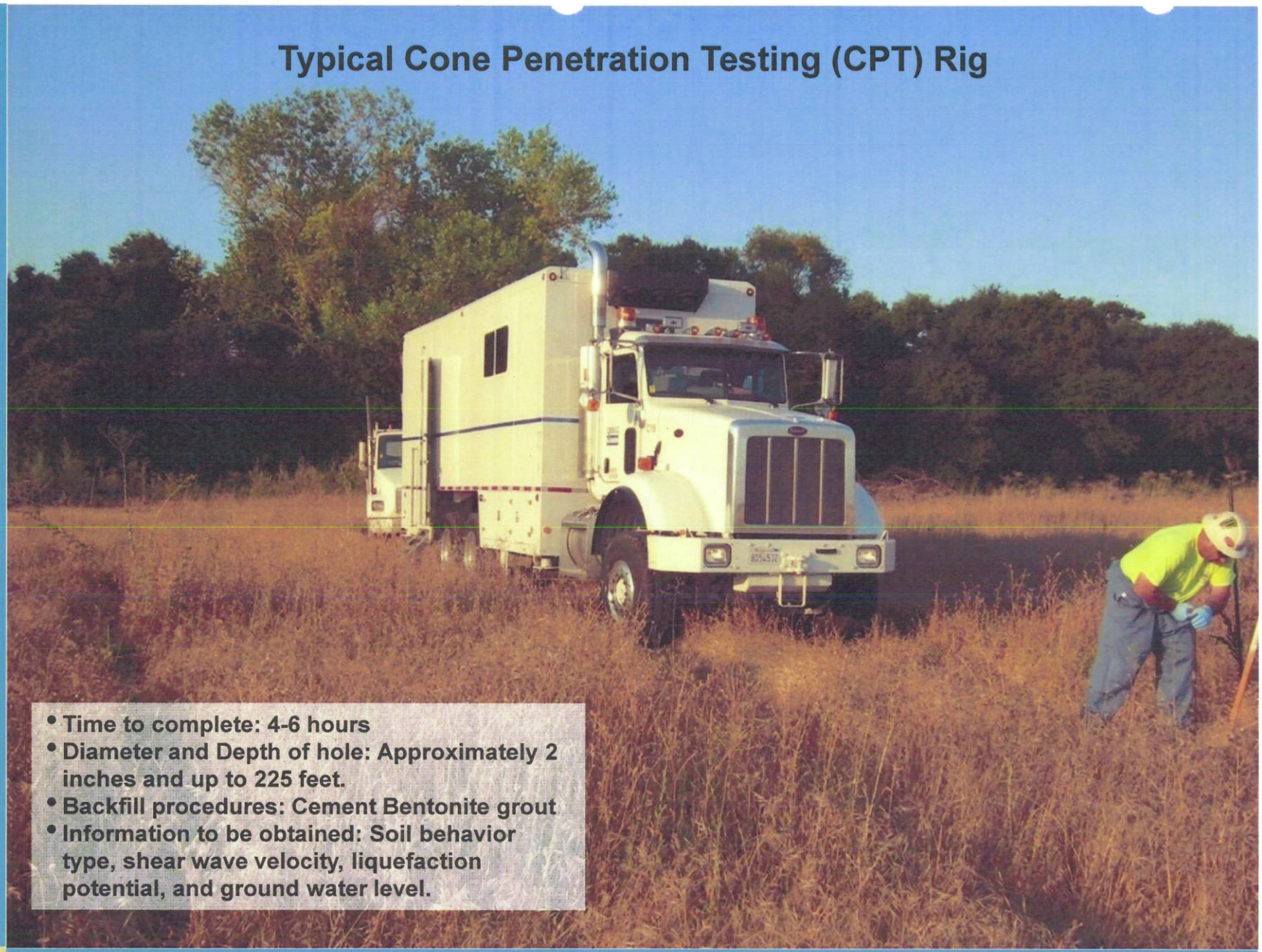

Legend
Intake
Exploration Location
Boring
CPT
Piezometer
Other Boring
Alt Tunnel Option (ATO)
Gravity Diversion
ICF Conveyance (East)
ICF Water Option (West)
Pipeline
Siphon
Through-Delta Facility Options
Supplemental Intake Canal
Through Delta Conveyance
County Boundary
Intake 1
Intake 2
Intake 3
Intake 4
Intake 5
DCR-DH-001
DCR-DH-017
DCR-DH-003
DCR-DH-020
DCR-DH-004
DCR-DH-005
DCR-DH-006
DCR-DH-011
DCW-CPT-003
DCE-CPT-004
DCE-CPT-007
DCE-CPT-008
DCE-DH-003
DCE-CPT-009
DCE-DH-004
DCE-CPT-010
DCE-DH-005
DCE-CPT-011
DCE-CPT-013
DCE-DH-006
DCE-CPT-014
DCE-CPT-015
DCE-CPT-016
DCT-CPT-007
DCT-CPT-004
DCA-DH-003
DCA-CPT-001
DCT-CPT-009
DCA-DH-004
DCA-CPT-002
DCA-CPT-002A
DCT-CPT-011
DCT-DH-002
DCT-CPT-013
DCA-DH-005
DCA-CPT-003
DCR-DH-015
DCR-DH-016
DCR-DH-010
DCE-DH-010
DCE-CPT-023
DCE-CPT-024
DCW-DH-007
DCW-DH-016
DCW-CPT-014
DCW-DH-015
DCW-DH-008
DCW-CPT-015
DCW-CPT-019
DCT-DH-010
DCT-CPT-037
DCE-DH-014
DCE-CPT-035
DCE-CPT-033
DCE-CPT-032
DCW-DH-013
DCW-CPT-025
DCW-CPT-026
DCE-DH-015
DCE-CPT-034
DCW-DH-014
DCW-CPT-027
YOLO CO.
SACRAMENTO CO.
SAN JOAQUIN CO.
SOLANO CO.
CONTRA COSTA CO.
ALAMEDA CO.
Elk Grove
Sacramento
Walnut Grove
Isleton
Rio Vista
Pittsburg
Antioch
Oakley
Bethel Island
Stockton
Lodi
Lathrop
Galt
Shadgrass Slough
Hog Slough
Dry Creek
Mokelumne River
Sacramento River
Delta Cross Channel
Old River
Empire Cut
Taylor Slough
Rock Slough
Byron Tract Forebay (West)
Byron Tract Forebay (ATO, East)
Clifton Court Forebay
Intermediate Forebay
Winchester Lake
Hass Slough
Lindsey Slough
Cache Slough
Sandy Beach Slough
Sherman Island
Jersey Island
Bacon Island
Holland Island
Bethel Island
Webb Tract
Palm Tract
Victoria Island
Middle Roberts Island
Upper Roberts Island
Union Island 1
Union Island 3
Stark Tract
Bacon Island
Grand Island
Ryer Island
Little Egbert Tract
Egbert Tract
Little Holland Tract
Pierson Tract
Peterson Island
Cache Haas Tract 1
Peter Pocket
Little Hass Tract
Lower Island
Bacon Island
Bacon Island 1
Bacon Island 2
Holland Tract
Holland Tract 1
Holland Tract 2
Bethel Island
Jersey Island
Sherman

Geology Logs and Tunnel Profile



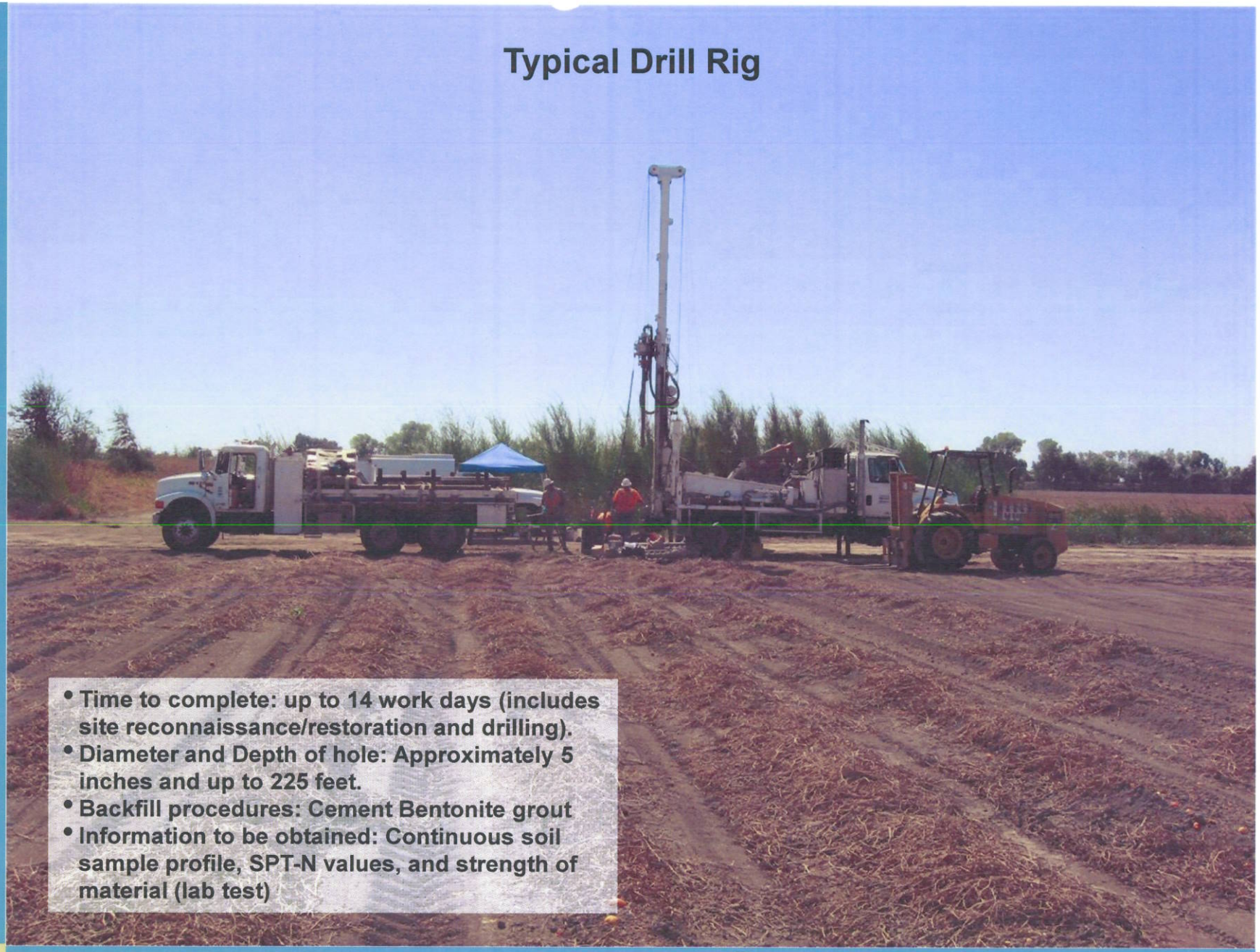
Typical Over Water Drilling Rig

Typical Cone Penetration Testing (CPT) Rig



- Time to complete: 4-6 hours
- Diameter and Depth of hole: Approximately 2 inches and up to 225 feet.
- Backfill procedures: Cement Bentonite grout
- Information to be obtained: Soil behavior type, shear wave velocity, liquefaction potential, and ground water level.

Typical Drill Rig



- Time to complete: up to 14 work days (includes site reconnaissance/restoration and drilling).
- Diameter and Depth of hole: Approximately 5 inches and up to 225 feet.
- Backfill procedures: Cement Bentonite grout
- Information to be obtained: Continuous soil sample profile, SPT-N values, and strength of material (lab test)

Typical Test Pit

- Time to complete: 2-4 hours
- Size of pit: Approximately 3 feet x 12 feet x 20 feet
- Backfill procedures: Refill pit with original material.
- Information to be obtained: Bulk sample, examine and perform density test, view of soil profile.

Funding

- Under the funding agreements, the Department bills certain state and federal water agencies via the State Water Project Annual Statement of Charges. In 2011, the Department obtained through the SWP Annual Statement of Charges all the funds necessary to cover costs of this work.