
**FIGURES FOR SOUTHERN LOST HILLS
OILFIELD BASIN PLAN AMENDMENT
DRAFT STAFF REPORT**

Figure ES-1 Project Location Map with UIC Well Locations

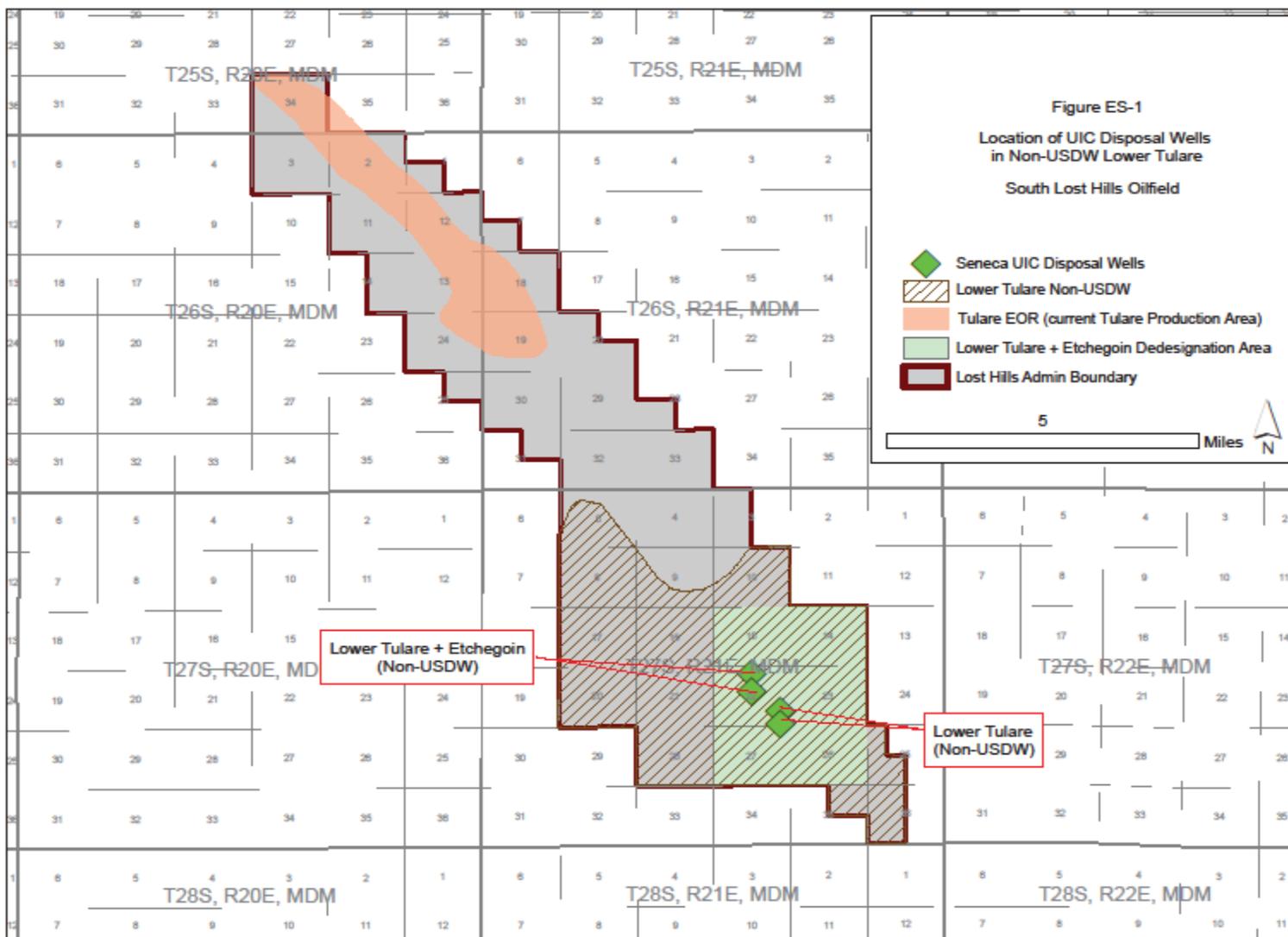


Figure 1-1 Lost Hills Oilfield Location Map, San Joaquin Valley, CA



Figure 1-2 UIC Wells Location Map Southern Lost Hills Oilfield

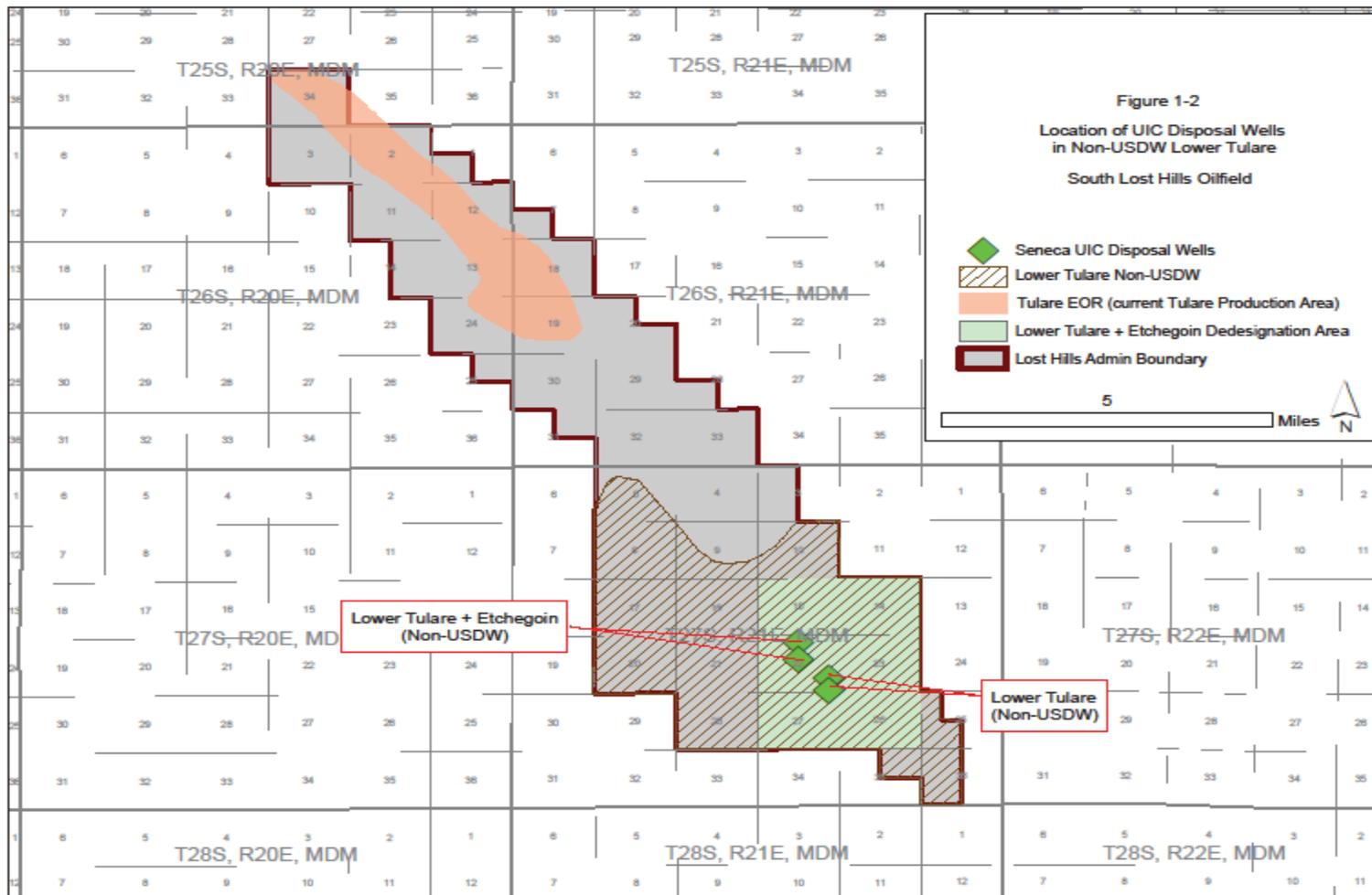


Figure 1-3 Location of UIC Disposal and Oilfield Production Wells, Southern Lost Hills Oilfield

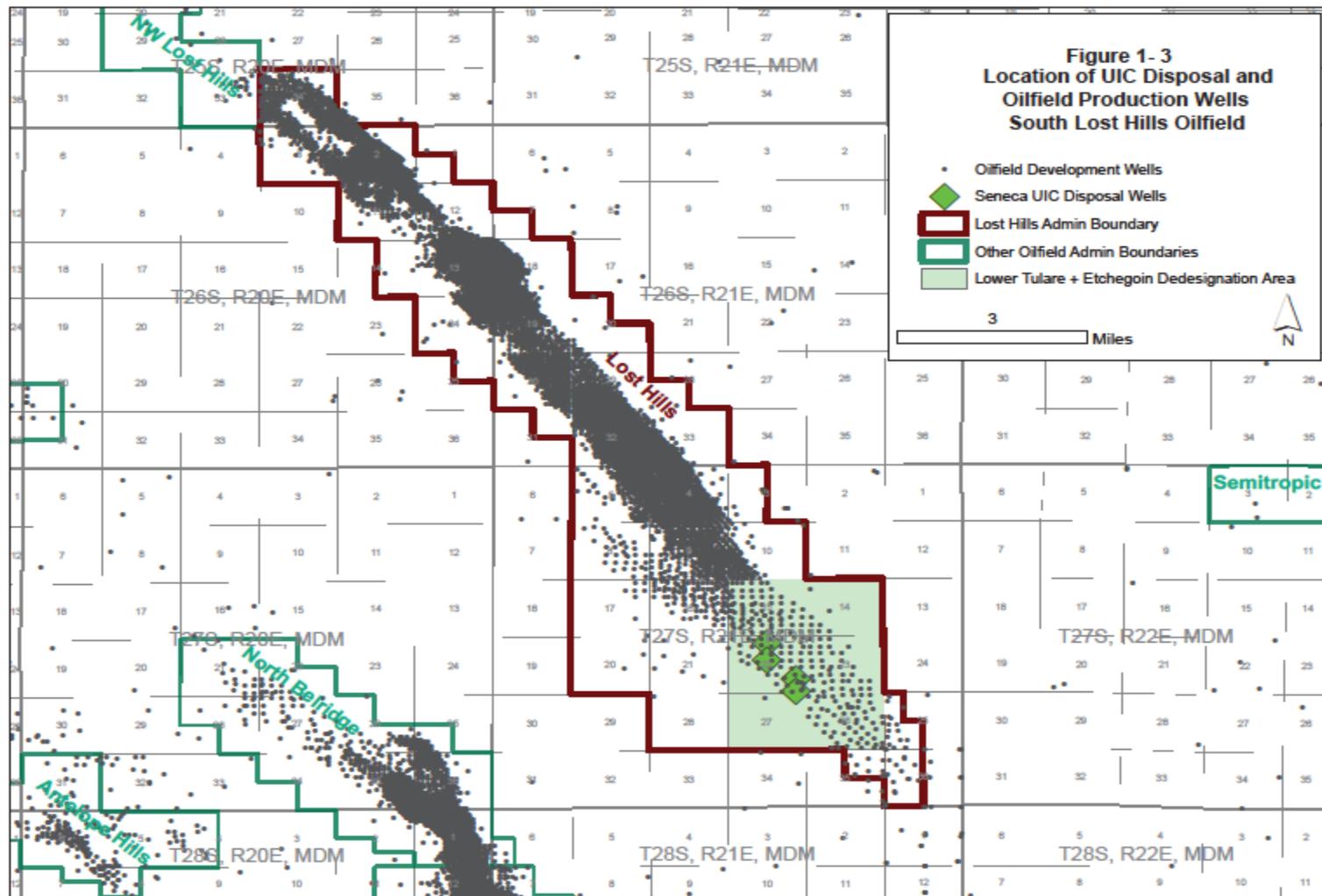
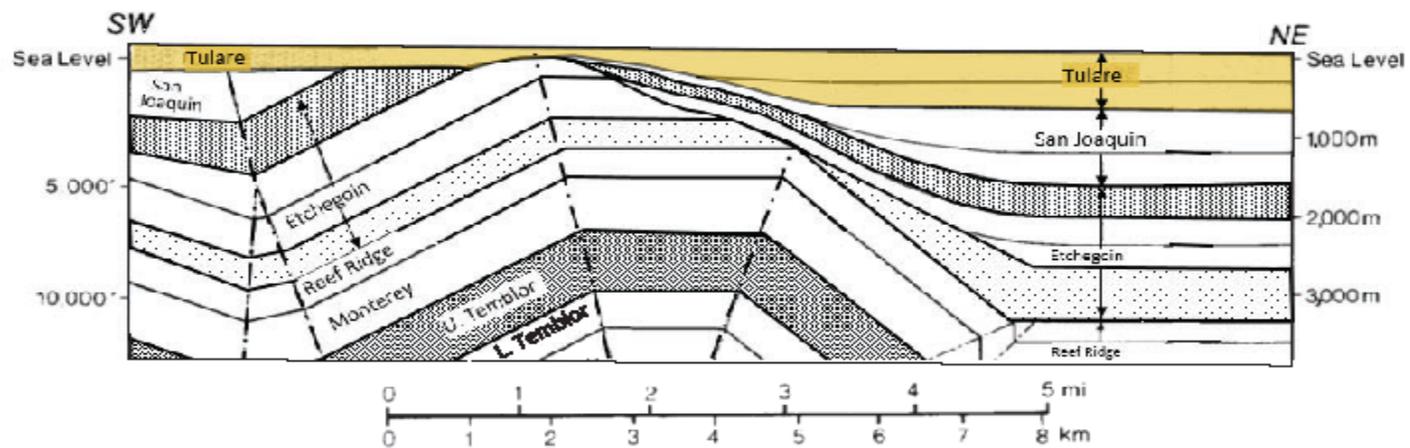


Figure 1-4 Structural Cross-Section of the Lost Hills Anticline

Figure 1-4 : Structural Cross-Section Over Lost Hills Anticline

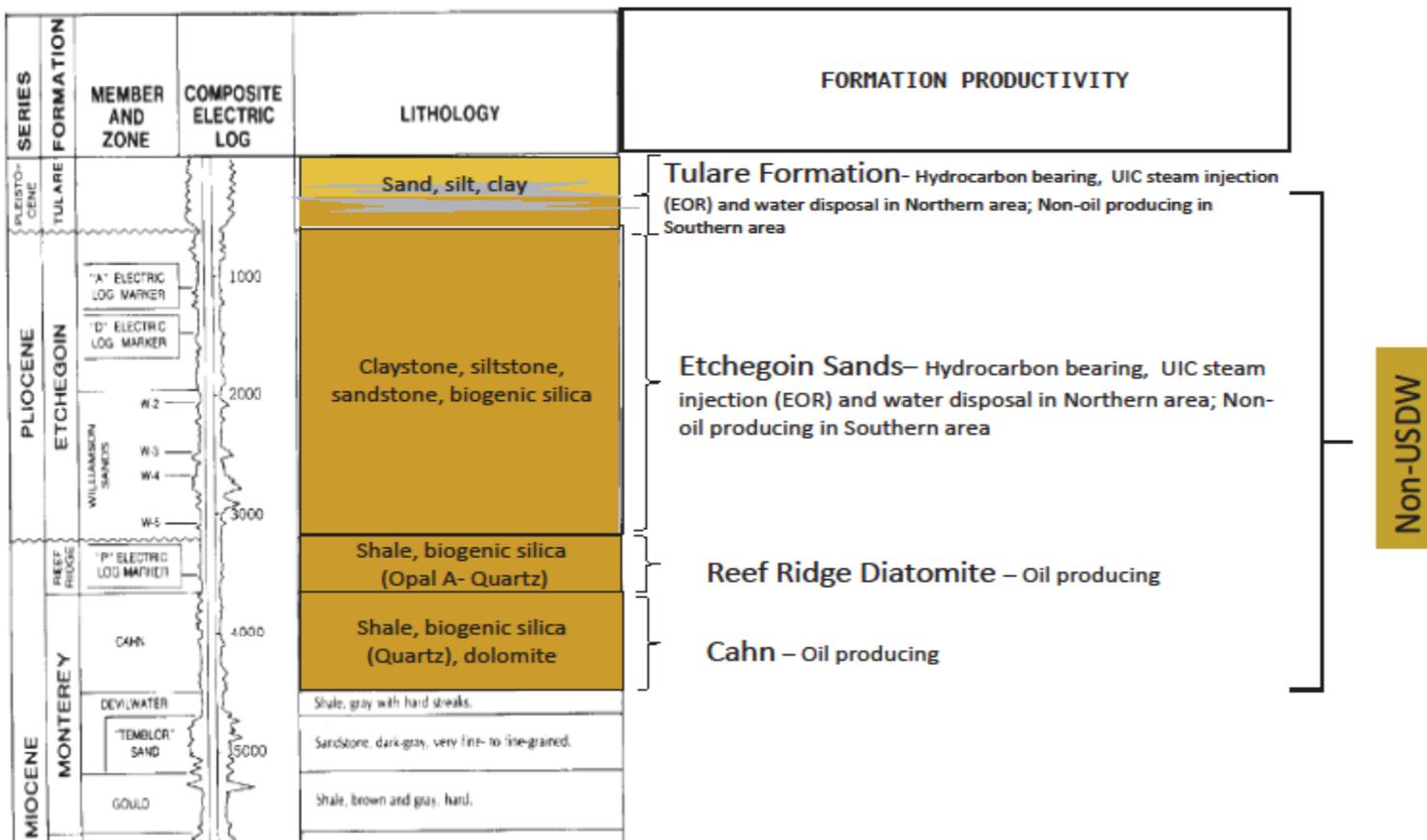


- Asymmetric fold with erosion of Etchegoin and San Joaquin Formations with eastward deposition of Tulare Formation thinning onto the structure and thickening to the east.

Adapted From Medwedeff, 1989

Figure 1-5 Type Log, Stratigraphic Column and Formation Production for Lost Hills Oilfield

Figure 1-5: Type log, Stratigraphic Column and Formation Production



Adapted From California Oil & Gas Fields, Volume 1, DOGGR 1973

Figure 1-6 Tulare Depositional Block Diagram

Figure 1-6: Tulare Depositional Block Diagram

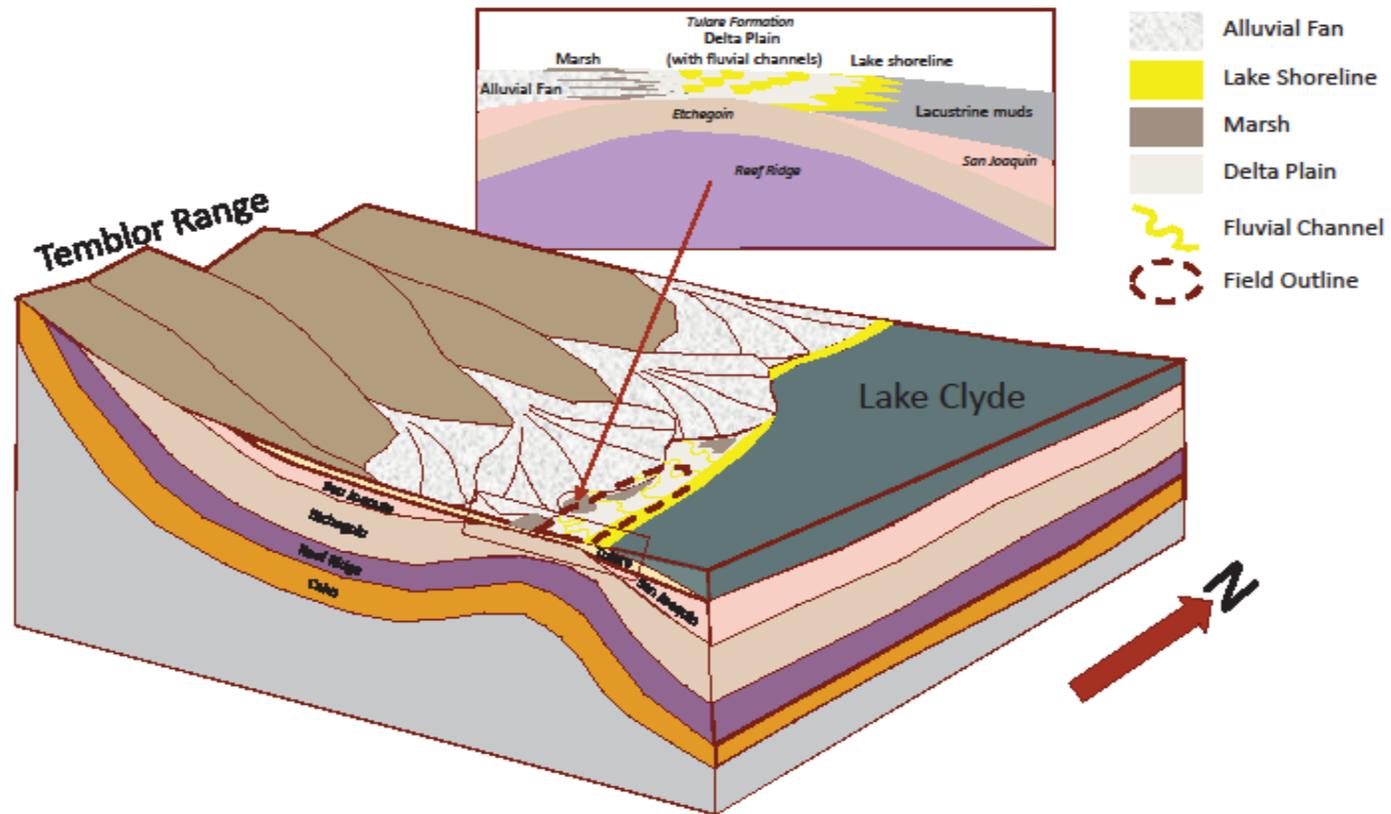


Figure 1-7 Tulare Formation Isochore Thickness Contour Map

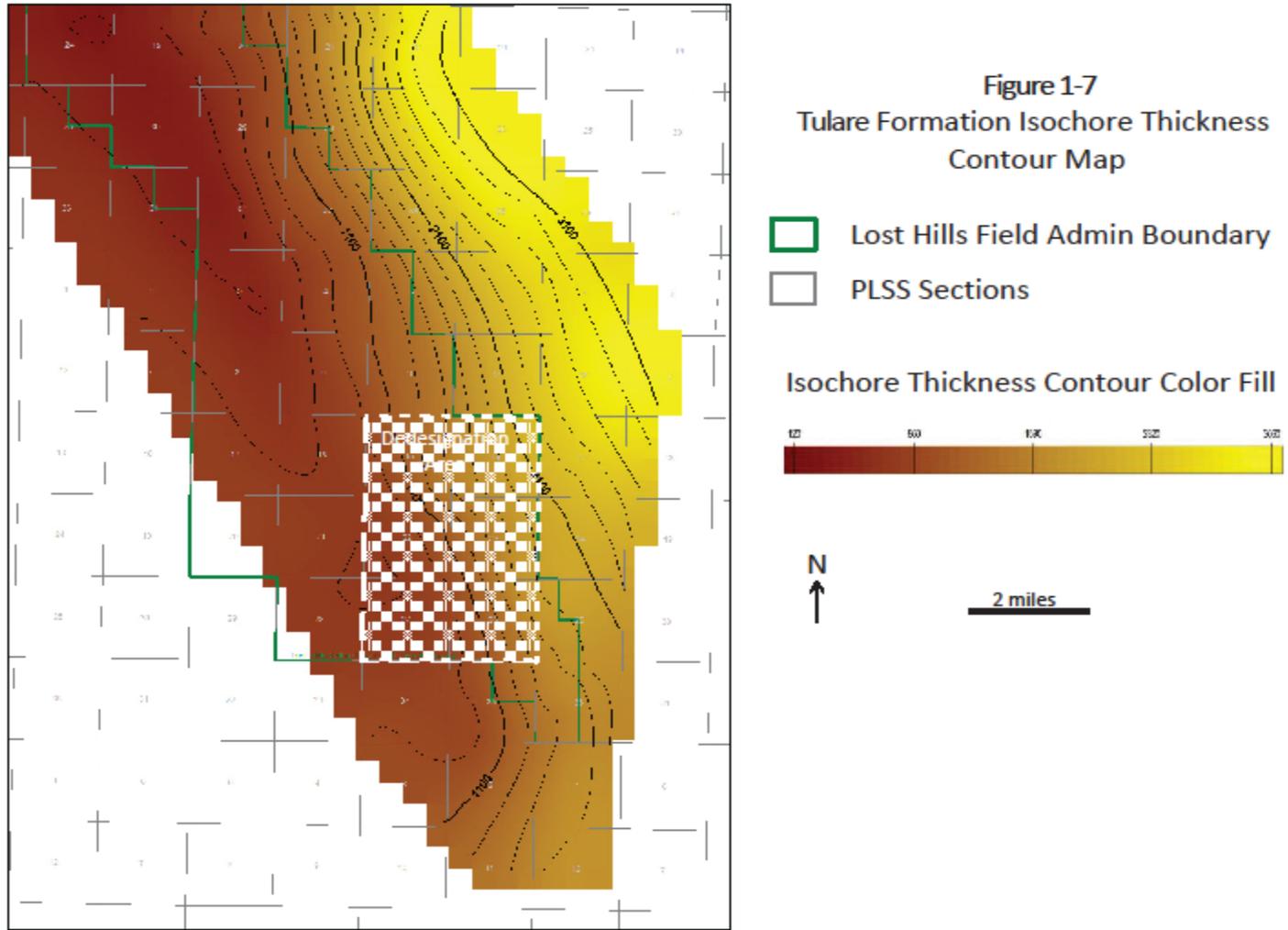


Figure 1-8 Lower Tulare Member Isochore Thickness Contour Map

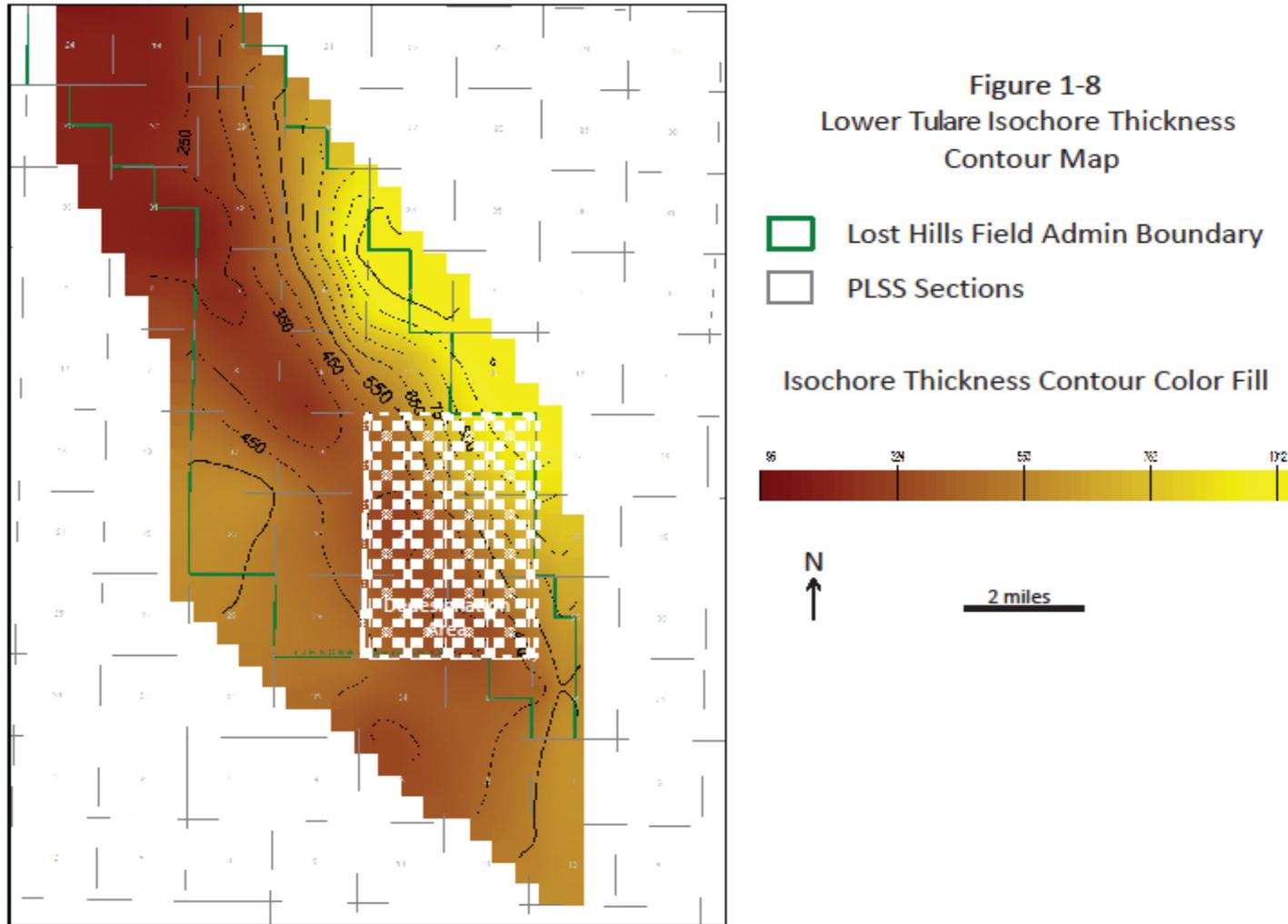


Figure 1-9 Tulare Formation Type Log, Lost Hills Oilfield

Figure 1-9
Tulare Type Log
Lost Hills
Oilfield

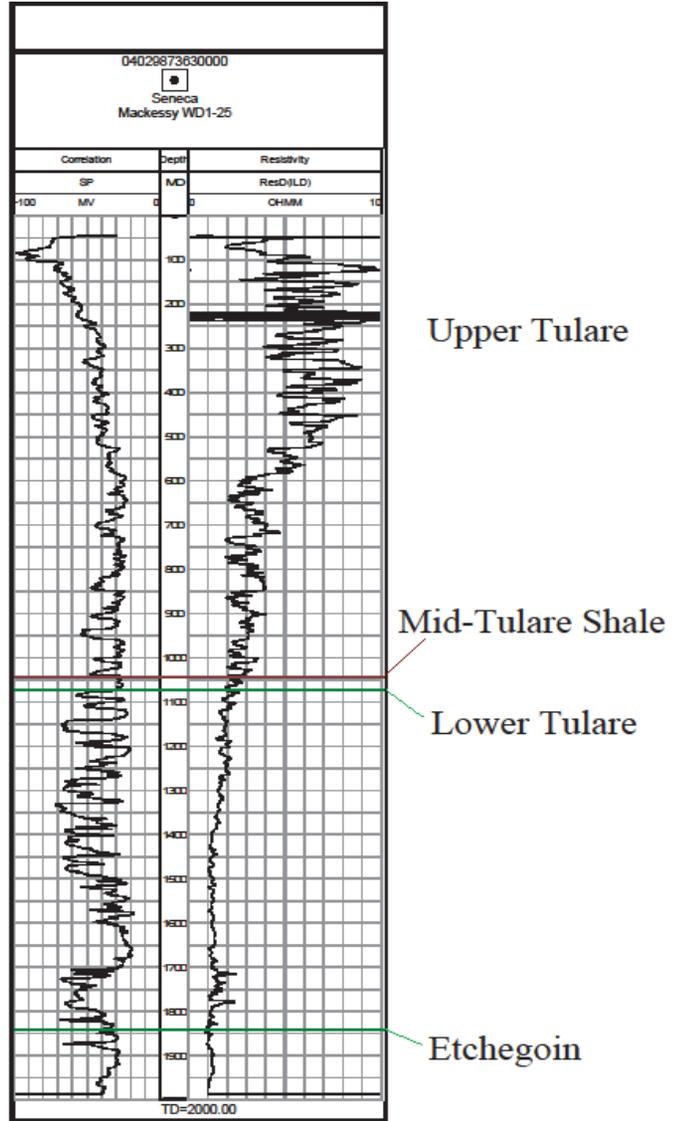


Figure 1-10 Mid-Tulare Shale Isochore Thickness Contour Map

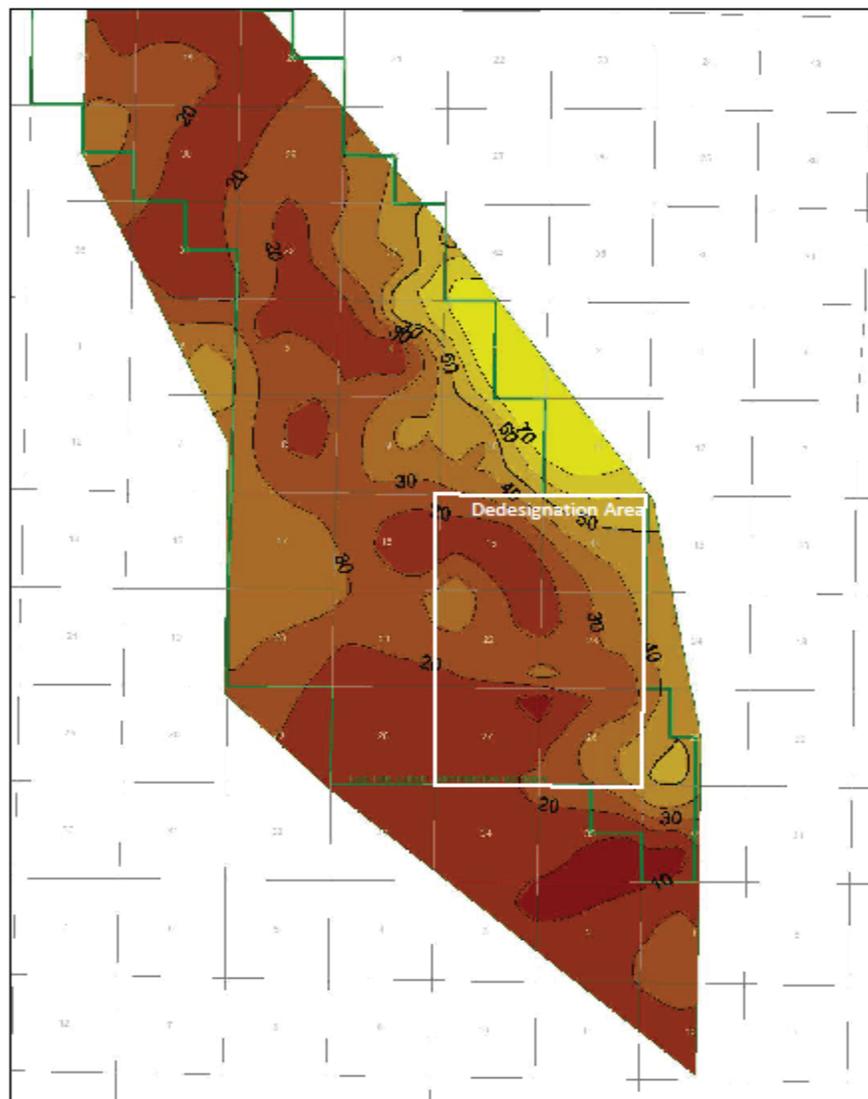


Figure 1-10
Mid-Tulare Shale Isochore Map

□ Lost Hills Field Admin Boundary

□ PLSS Sections

Isochore Thickness Contour Color Fill



N
↑

2 miles



Figure 1-11 Geologic Cross-Sections Location Map, Southern Lost Hills Oilfield

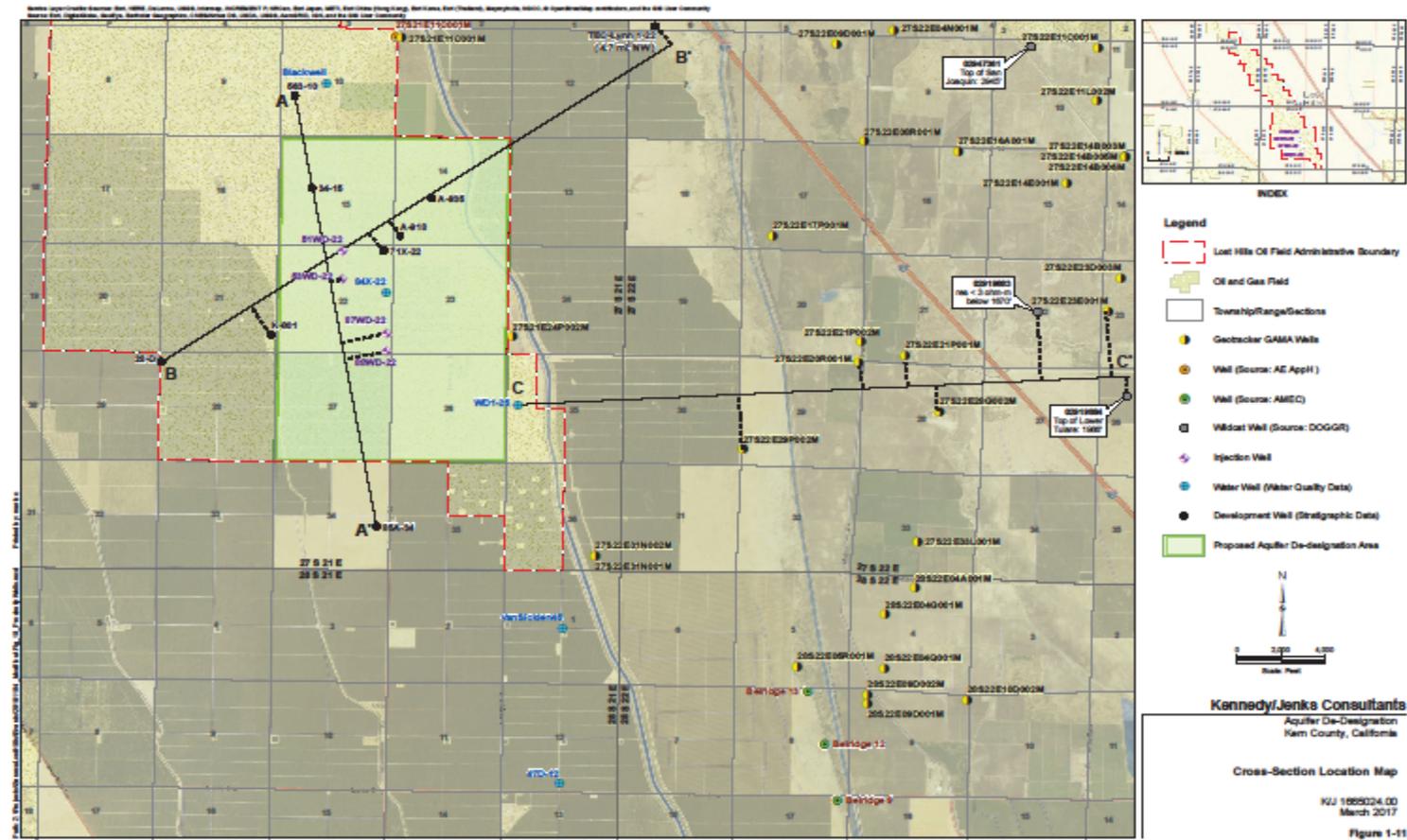


Figure 1-12 Geologic Cross-Section A-A' – North-Northwest to South-Southeast – Southern Lost Hills Oilfield

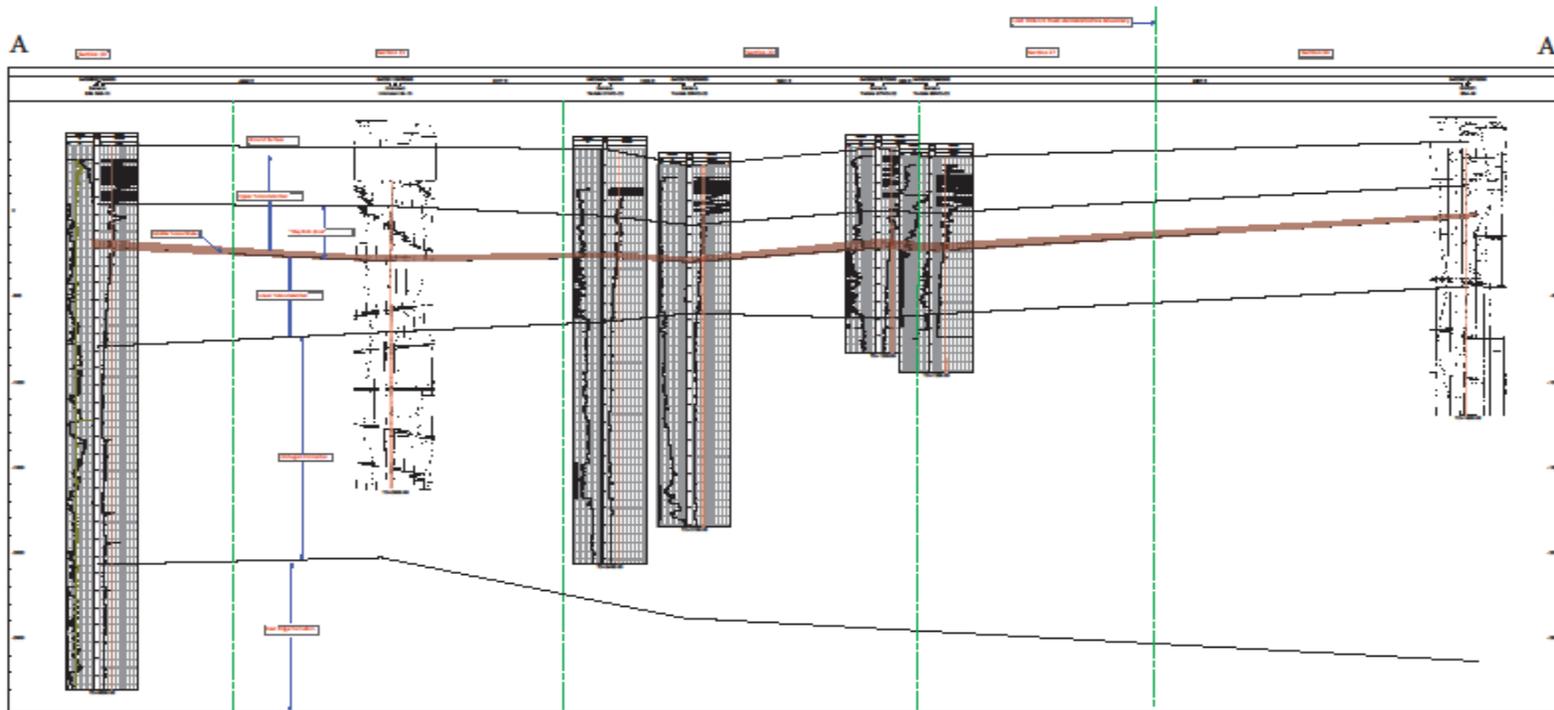


Figure 1-12. Geologic Cross-Section A-A' - North-Northwest to South-Southeast - South Lost Hills Oilfield

Figure 1-13 Geologic Cross-Section B-B' – West-Southwest to East-Northeast, Southern Lost Hills Oilfield

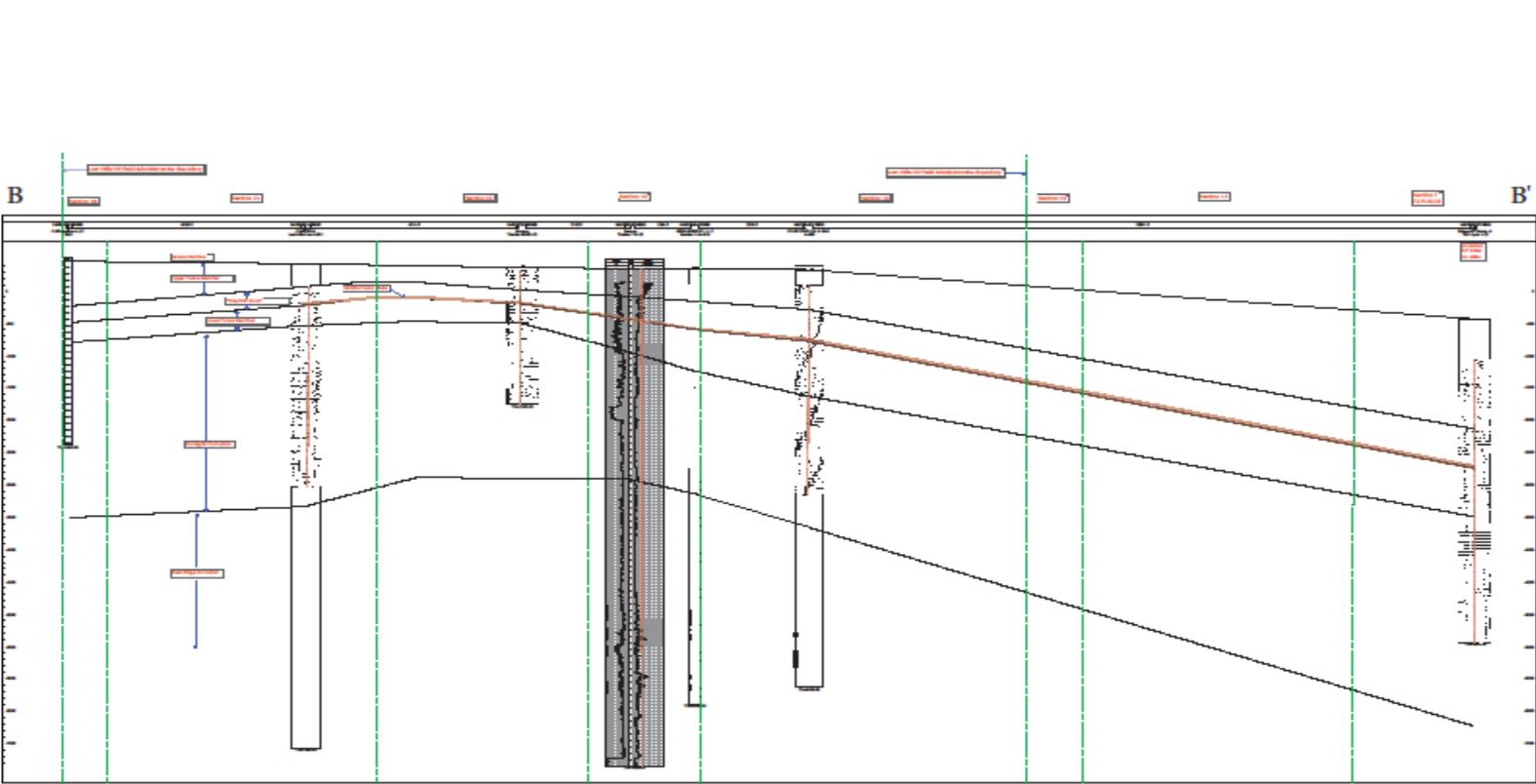


Figure 1-13. Geologic Cross-Section B-B' - West-Southwest to East-Northeast - South Lost Hills Oilfield

Figure 1-14 Etchegoin Formation Isochore Thickness Contour Map

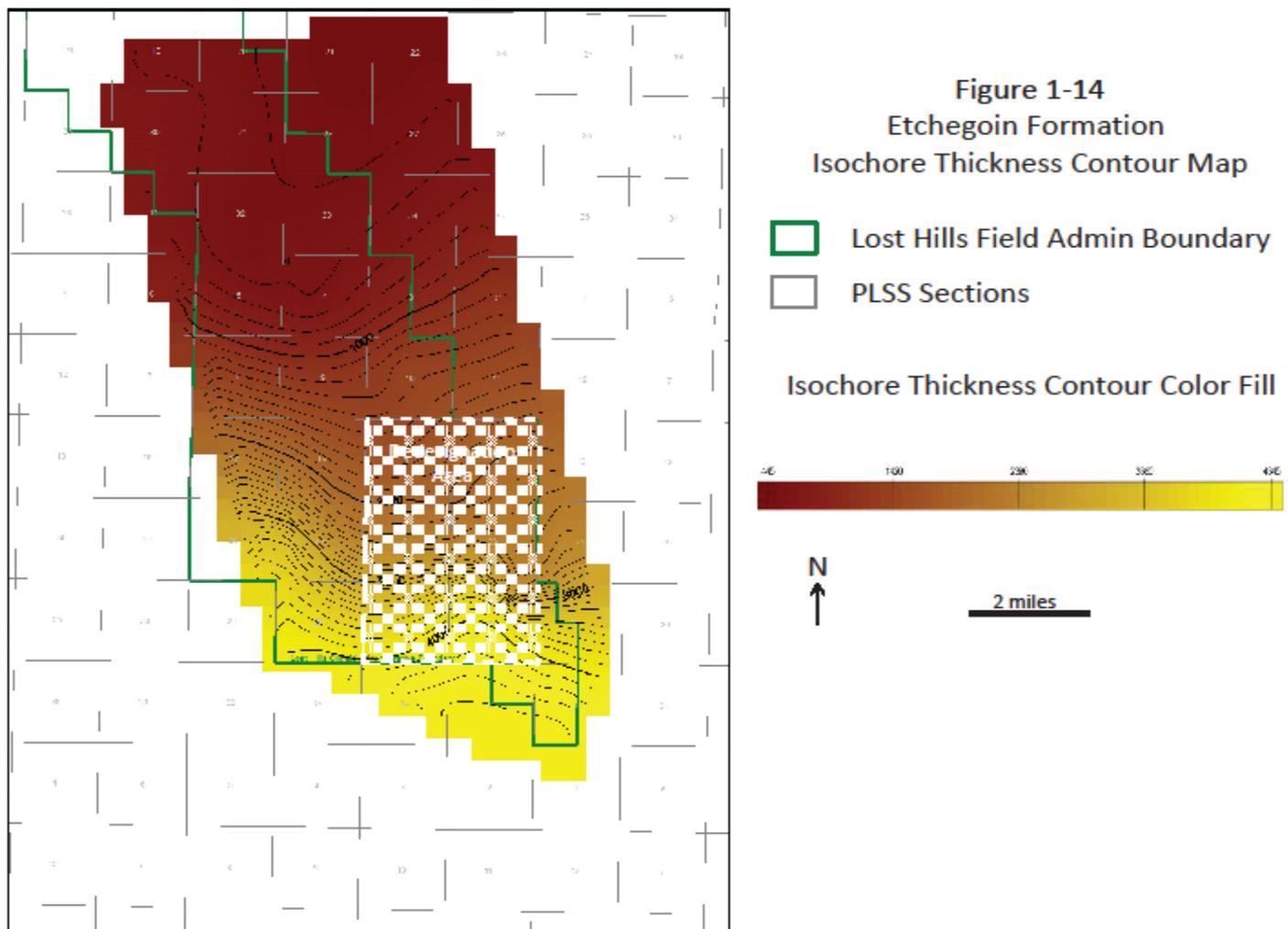


Figure 1-15 Etchegoin Formation Type Log, Southern Lost Hills Oilfield

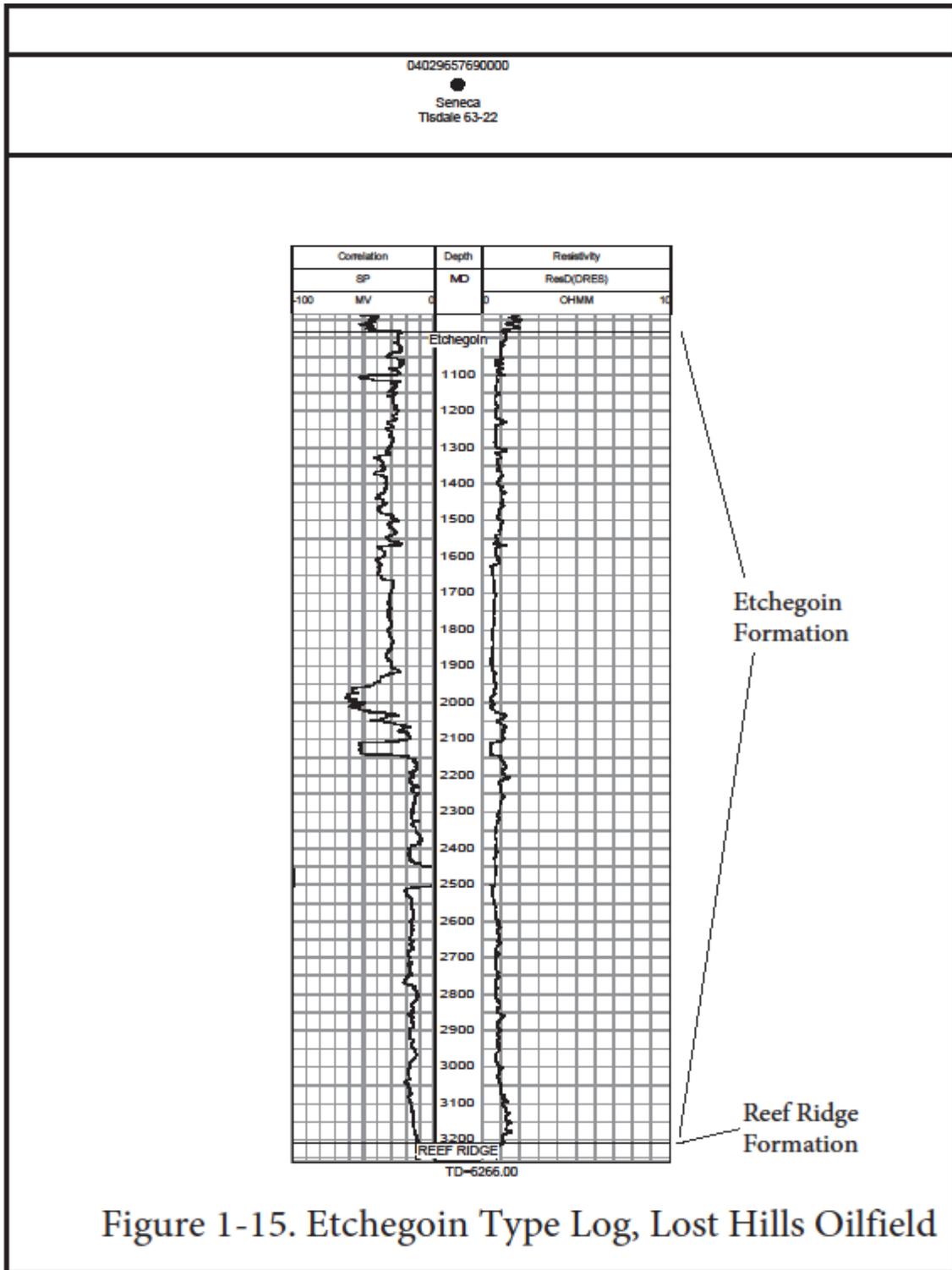


Figure 1-16 Map Showing Modflow Modeling Results for Disposal Injection Water Plume

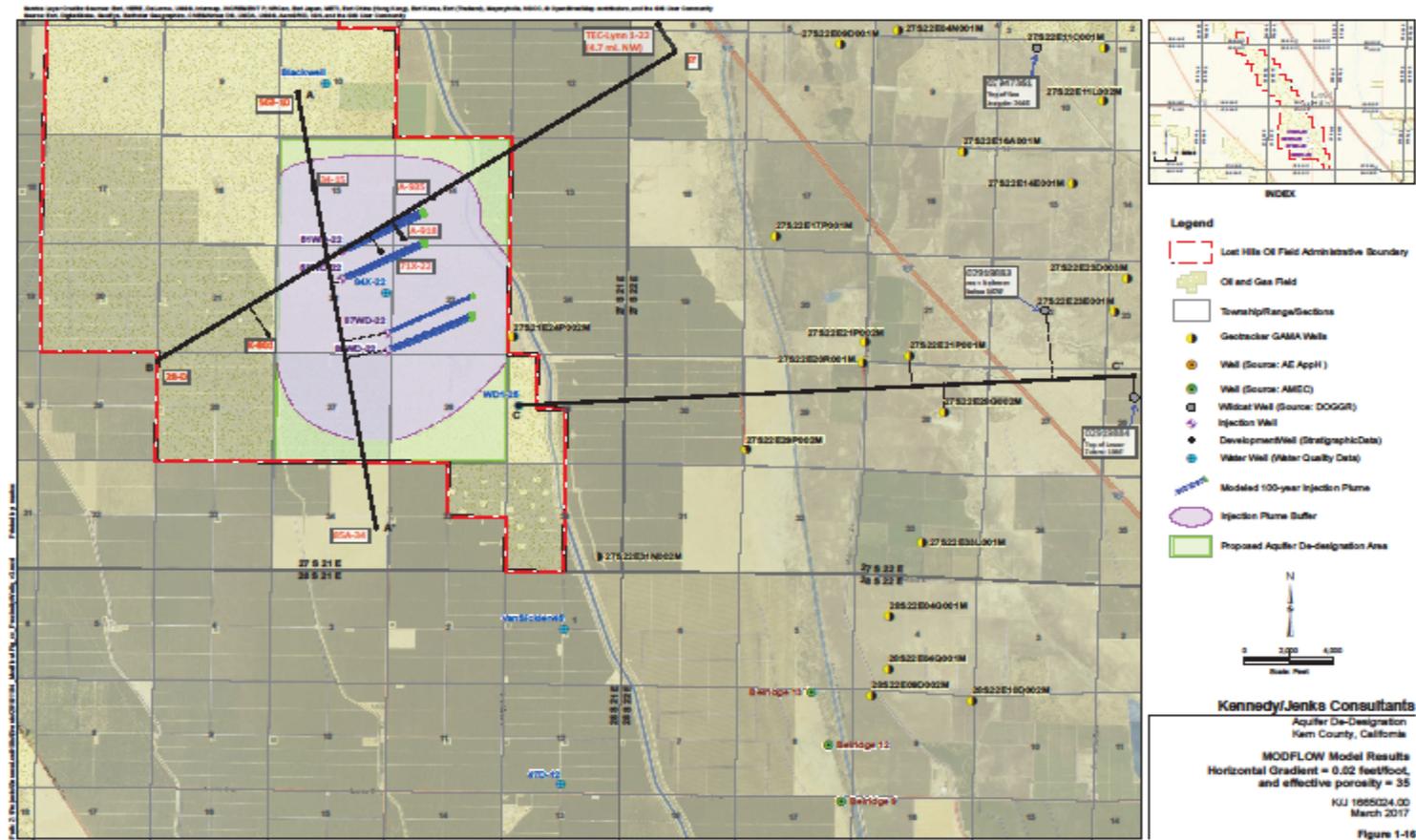


Figure 1-17 Map Showing Groundwater TDS Data for Wells Within the Lost Hills Oilfield

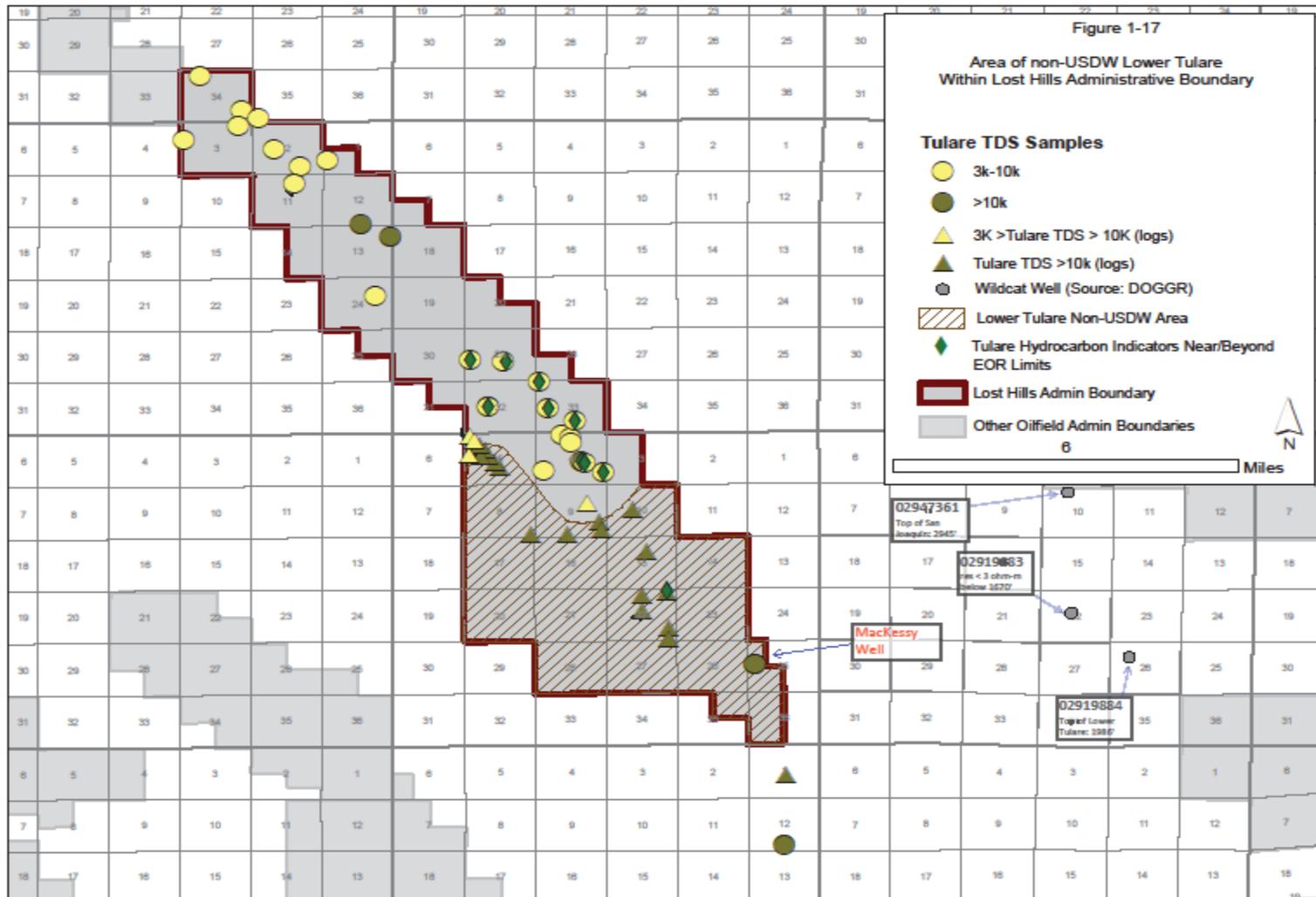


Figure 1-18 Geologic Cross-Section A-A' Showing 100-Year Plume Boundary, Buffer Zone and De-designation Zone

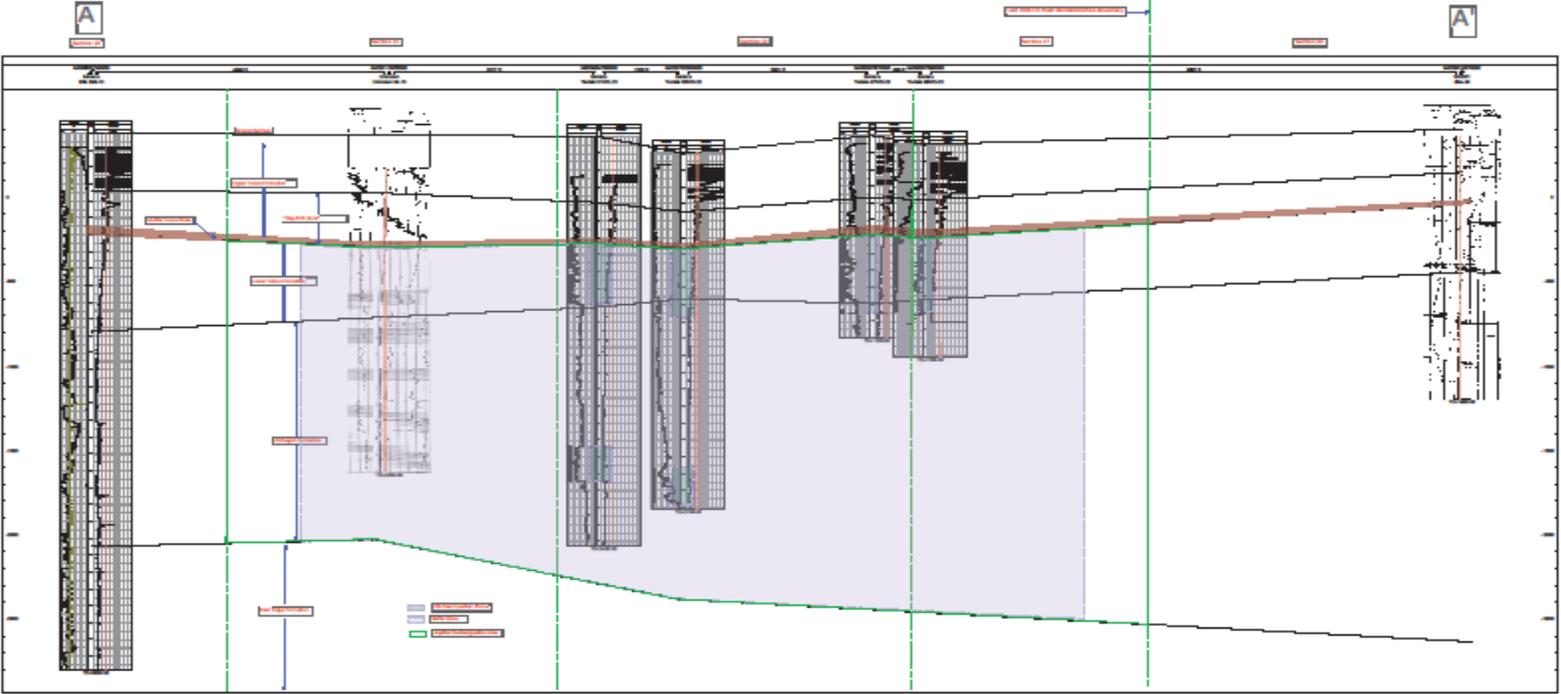


Figure 1-18. Geologic Cross-Section A-A' showing 100-Year Injection Plume, Buffer Zone and Aquifer De-Designation Area, Lost Hills Oilfield

Figure 1-19 Geologic Cross-Section B-B' Showing 100-Year Plume Boundary, Buffer Zone and De-designation Zone

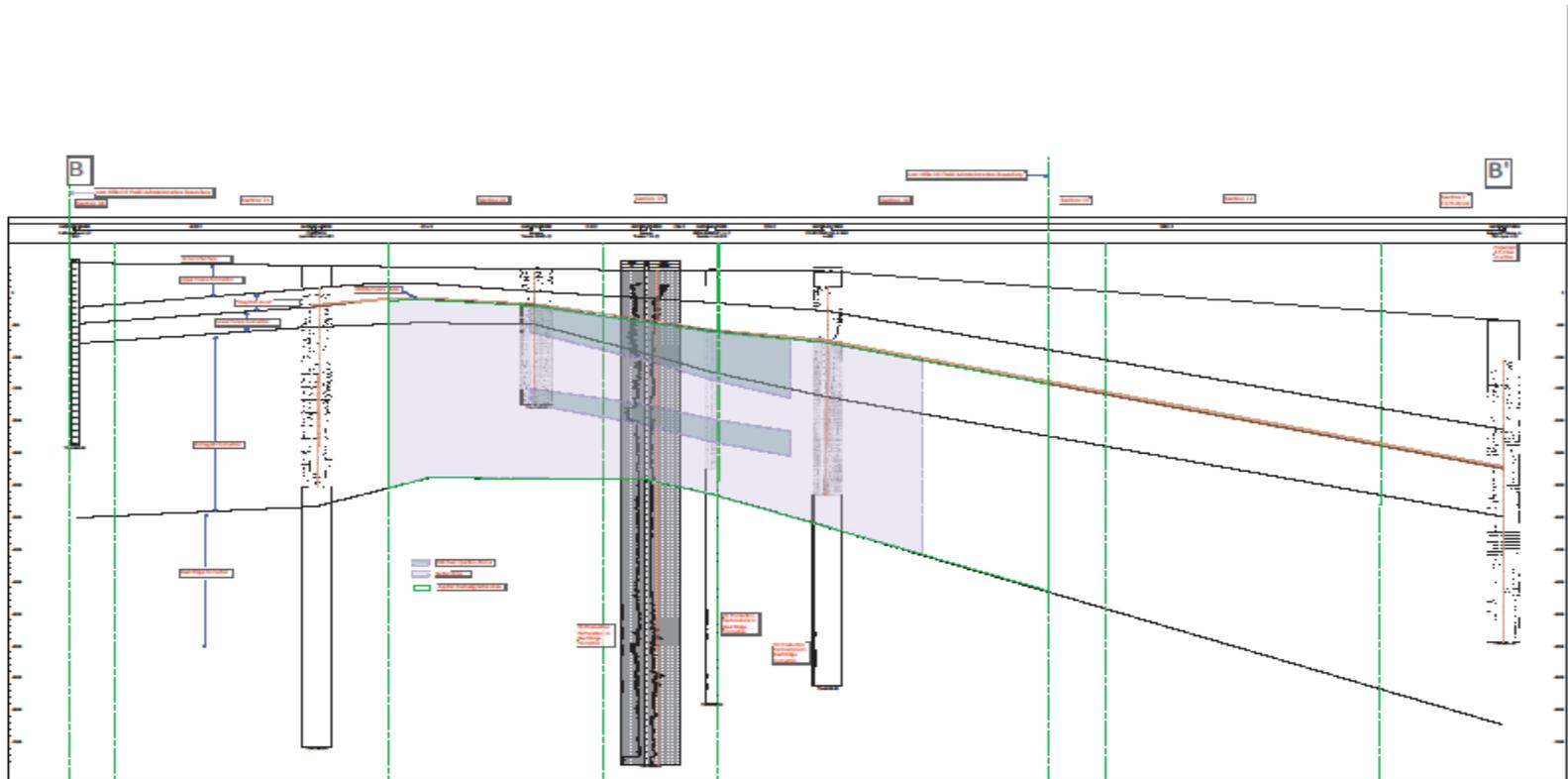


Figure 1-19. Geologic Cross-Section B-B' showing 100-Year Injection Plume, Buffer Zone and Aquifer De-Designation Area, Lost Hills Oilfield

Figure 1-20 Mudlogs Showing Lithologies of the Tulare Formation and the Upper Etchegoin Formation

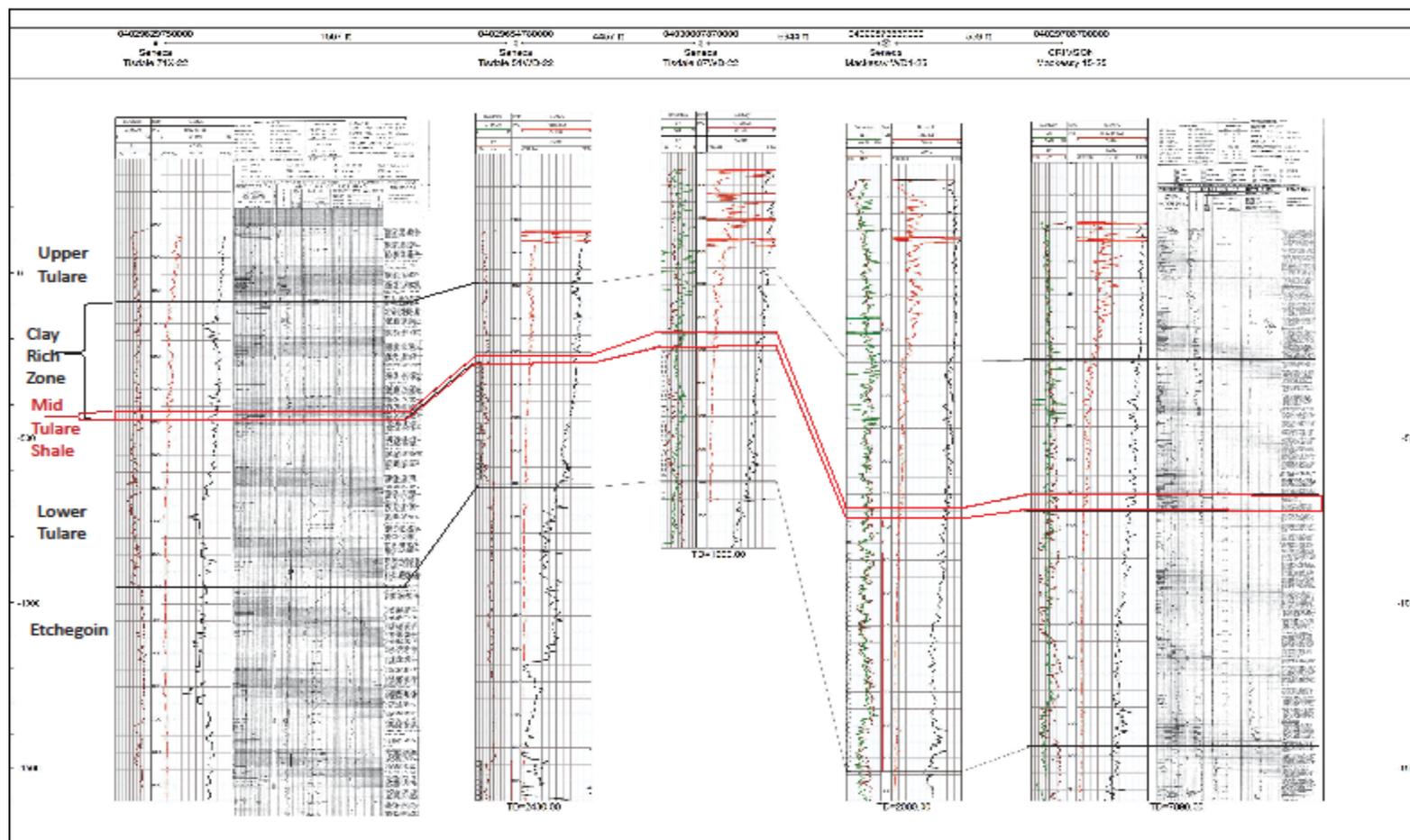
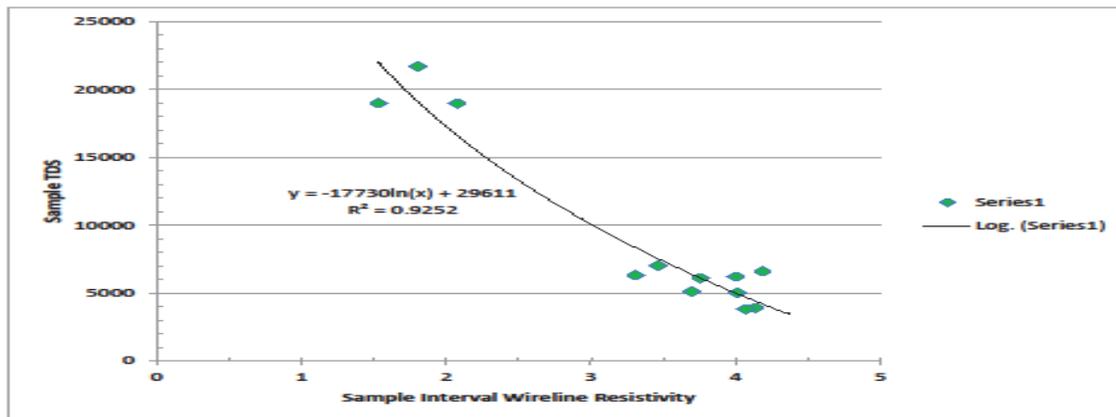


Figure 1-20. Mudlogs Showing Lithologic Descriptions of the Tulare Formation and Upper Etchegoin Formation

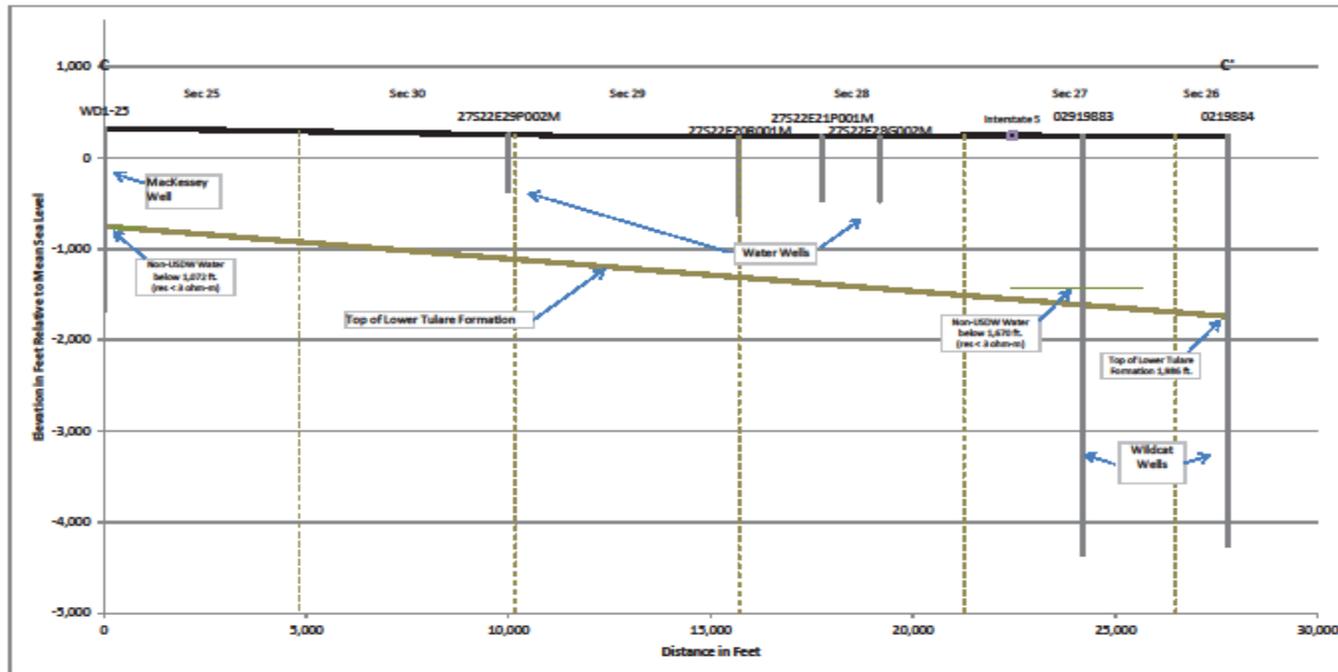
Figure 1-21 Cross Plot of Sample Interval Resistivity and TDS



Source: Tulare Aquifer Exemption Application

Figure 1-21. Cross Plot of Sample Interval Resistivity and TDS

Figure 1-22 Geologic Cross-Section C-C' Southern Lost Hills Oilfield



Data Sources:
 Seneca Resources: Mackessey Well
 Geotracker GAMA Database: Water Wells
 DOGGR Database: Wildcat (Anyfield) Wells

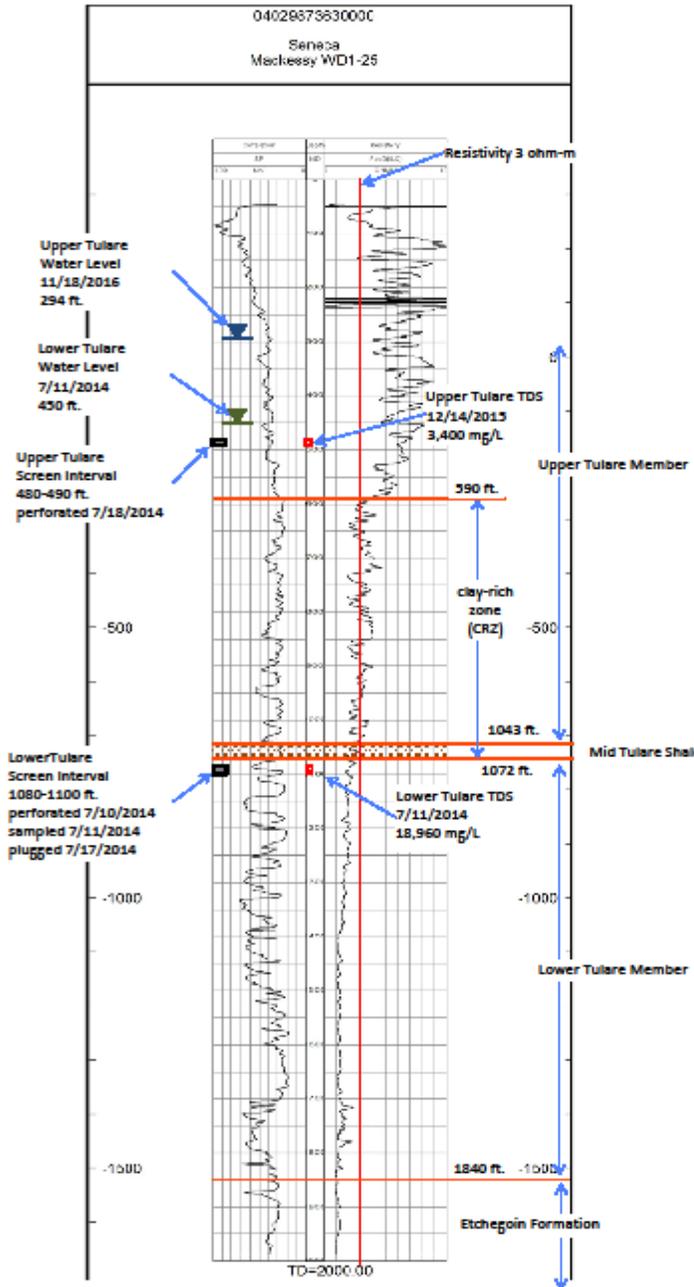
Kennedy/Jenks Consultants

Aquifer De-Designation
 Kern County, California

Cross Section C-C'

K/J 1665024.00
 March 2017
 Figure 1-22

Figure 1-23 MacKessy Well Log with Stratigraphy, Water Levels and Water Quality Data



Kennedy/Jenks Consultants

Aquifer De-Designation
Kern County, California

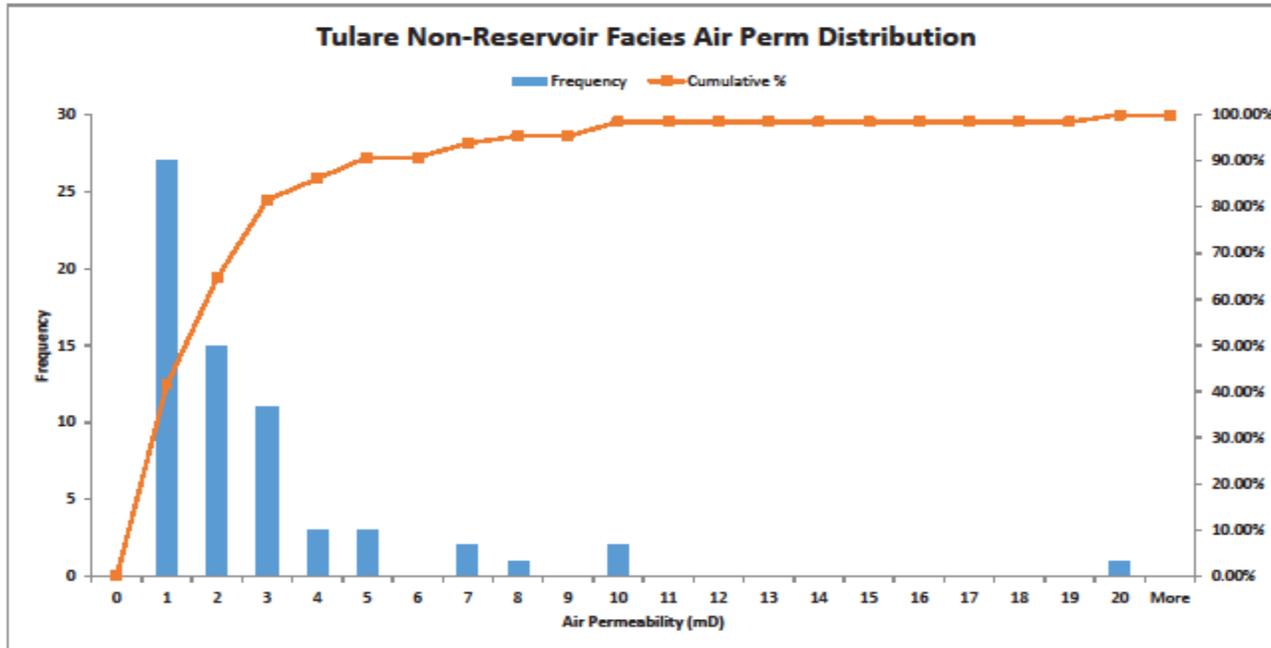
**MacKessy Well WD1-25
Stratigraphy, Water Levels, and
Water Quality Data**

K/J 1665024.00

April 2019

Figure 1-23

Figure 1-14 Plot of Mid-Tulare Shale Air Permeabilities



Legend
mD millidarcy

Source: Seneca Resources Corporation

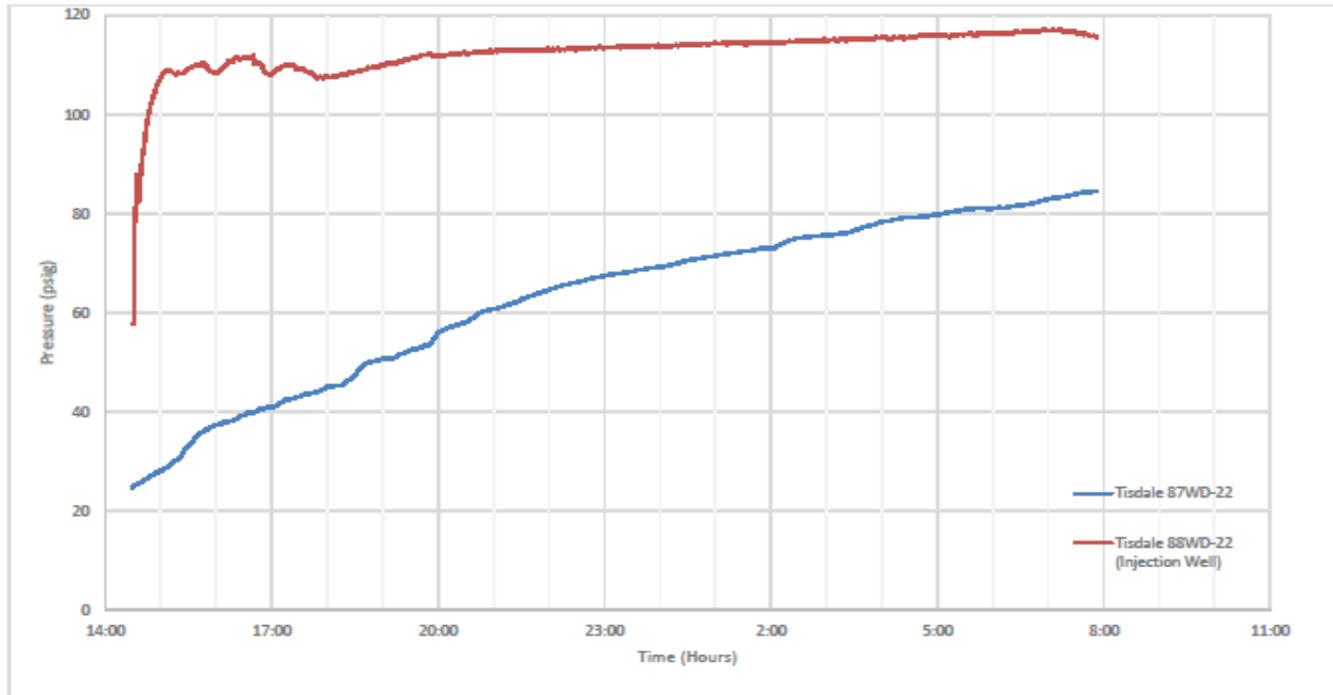
Kennedy/Jenks Consultants

Aquifer De-Designation
Kern County, California

**Air Permeability Measurements
In the Mid Tulare Shale**

K/J 1665024.00
September 2017
Figure 1-24

Figure 1-25 Plot of Pump Test Results for Tisdale Wells 87WD-22 and 88WD-22 (Injection Well)



Legend

Test performed on 14 and 15 September 2017

During the test, water was injected into 88WD-22 and 87WD-22 was monitored.

psig - pounds per square inch of mercury

Source: Seneca Resources Corporation

Kennedy/Jenks Consultants

Aquifer De-Designation

Kern County, California

Pump Test Results

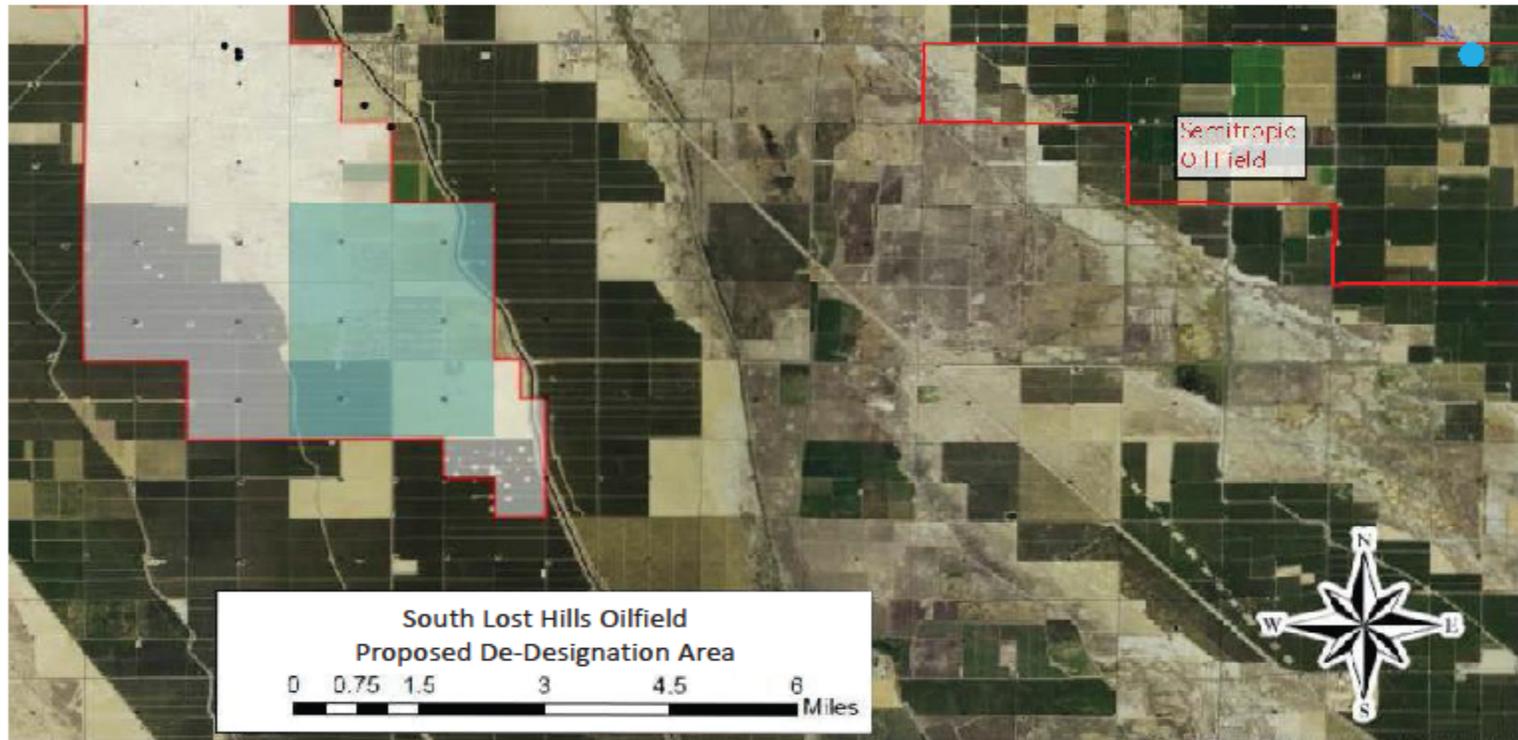
Tisdale 87WD-22 and 88WD-22

K/J 1665024.00

September 2017

Figure 1-25

Figure 1-26 Map Showing Location of Closest MUN Well to the Lost Hills Oilfield



Legend

-  Proposed De-Designation Area
-  Nearest Municipal Well to De-Designation Area
-  Oilfield Administrative Boundary

Figure 1-26. Location of Nearest MUN Well to Lost Hills Oilfield