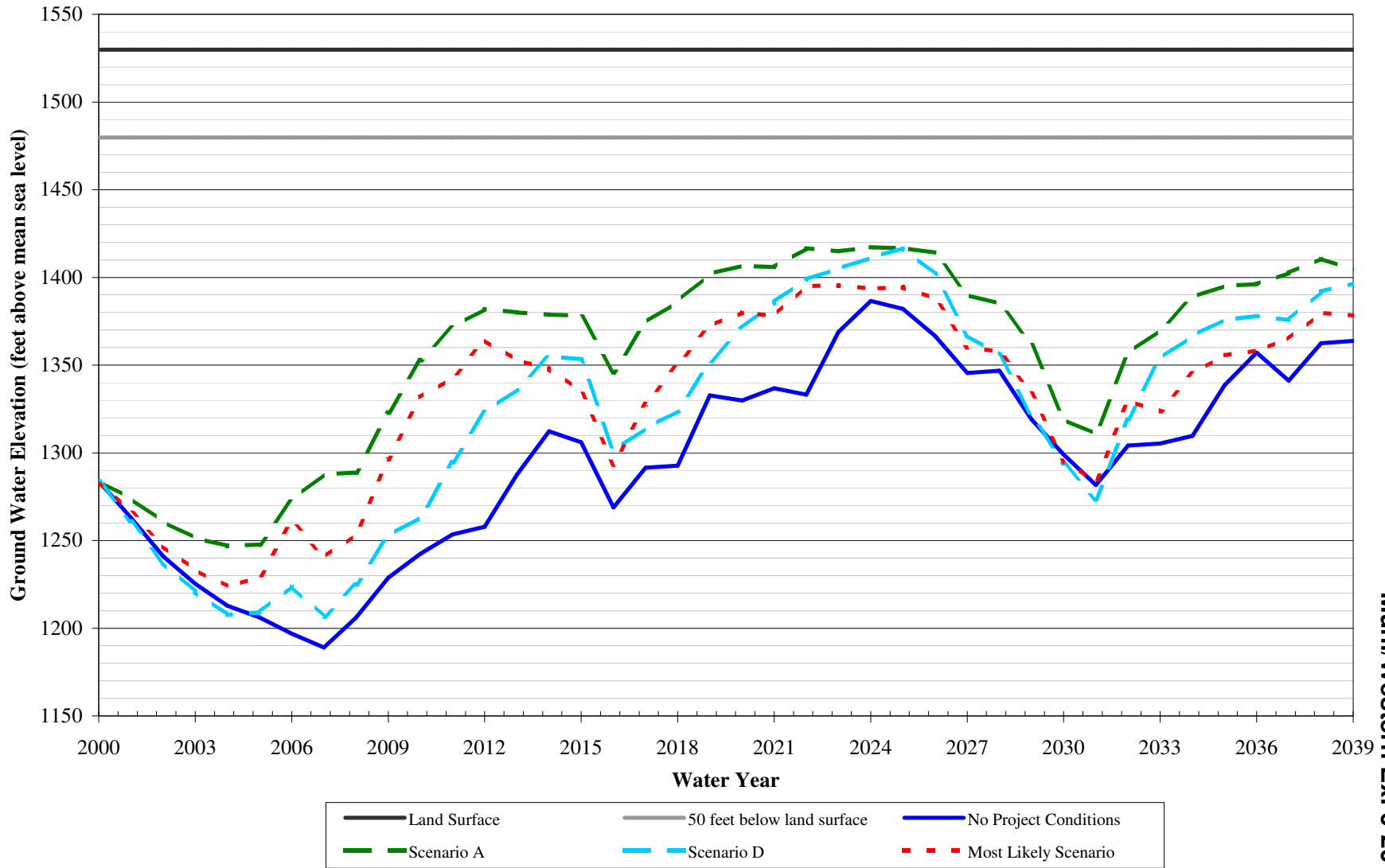
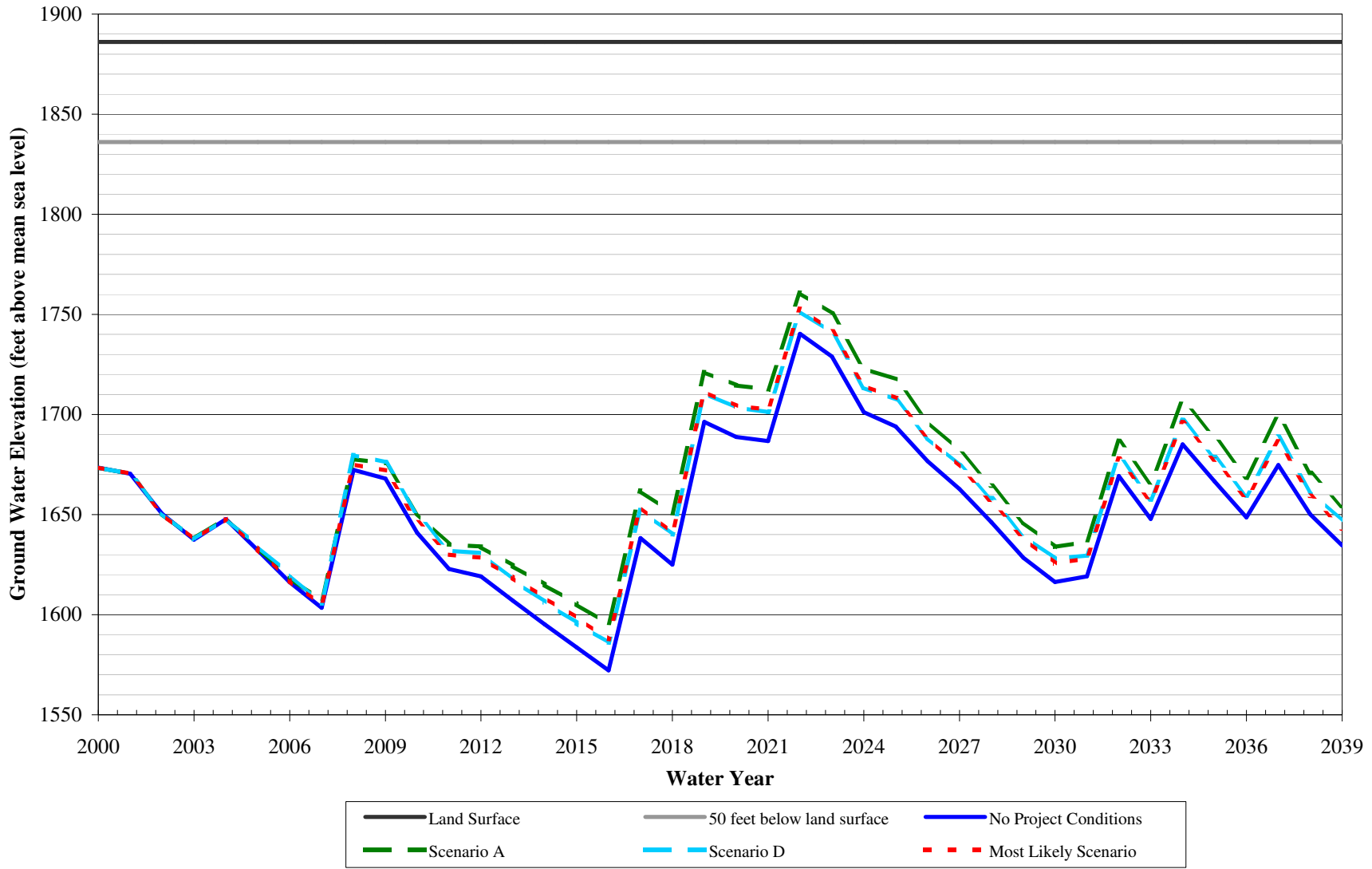


Figure B 29c. Hydrograph for IW-03



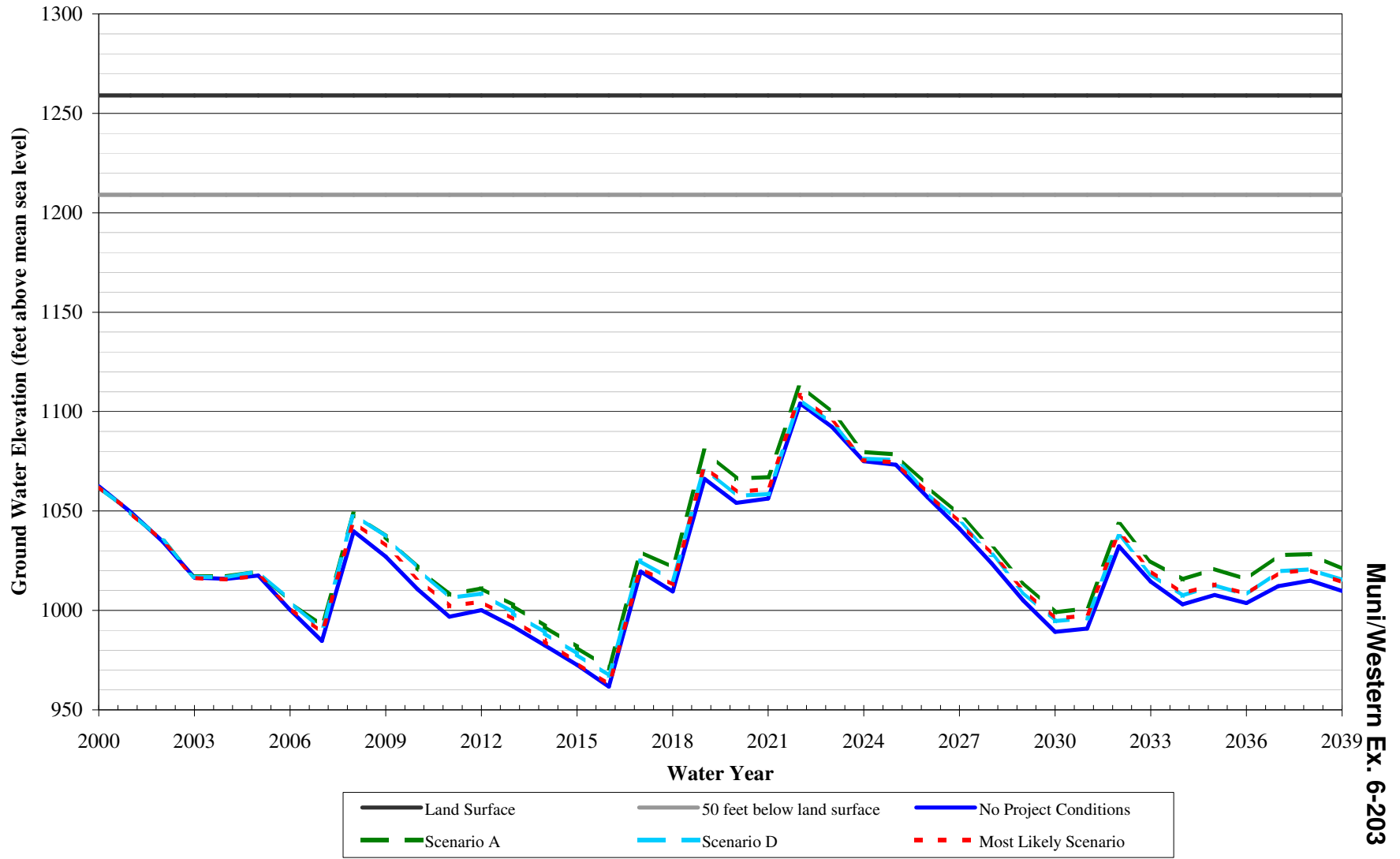
Muni/Western Ex. 6-201

Figure B 29d. Hydrograph for IW-04



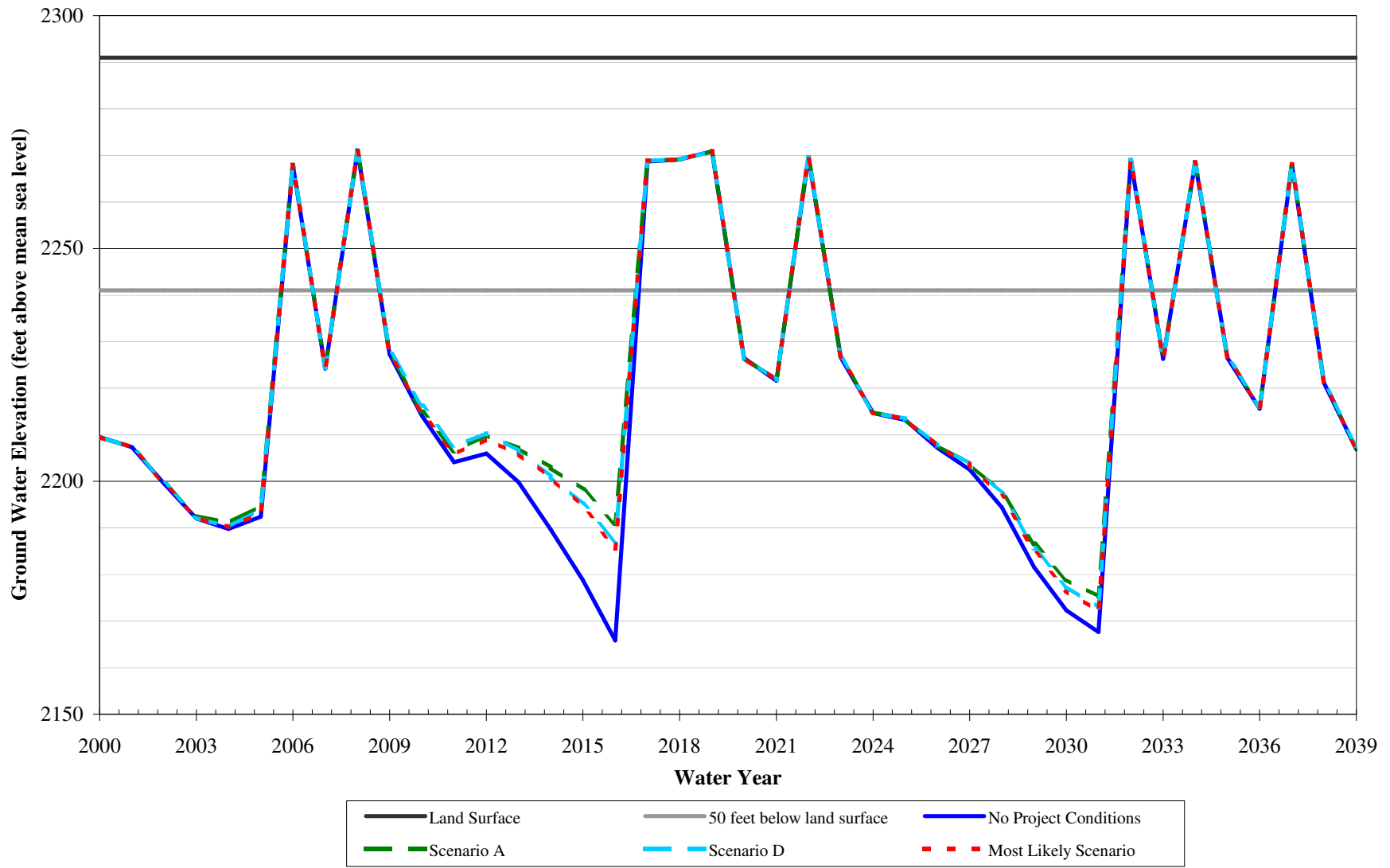
Muni/Western Ex. 6-202

Figure B 29e. Hydrograph for IW-05



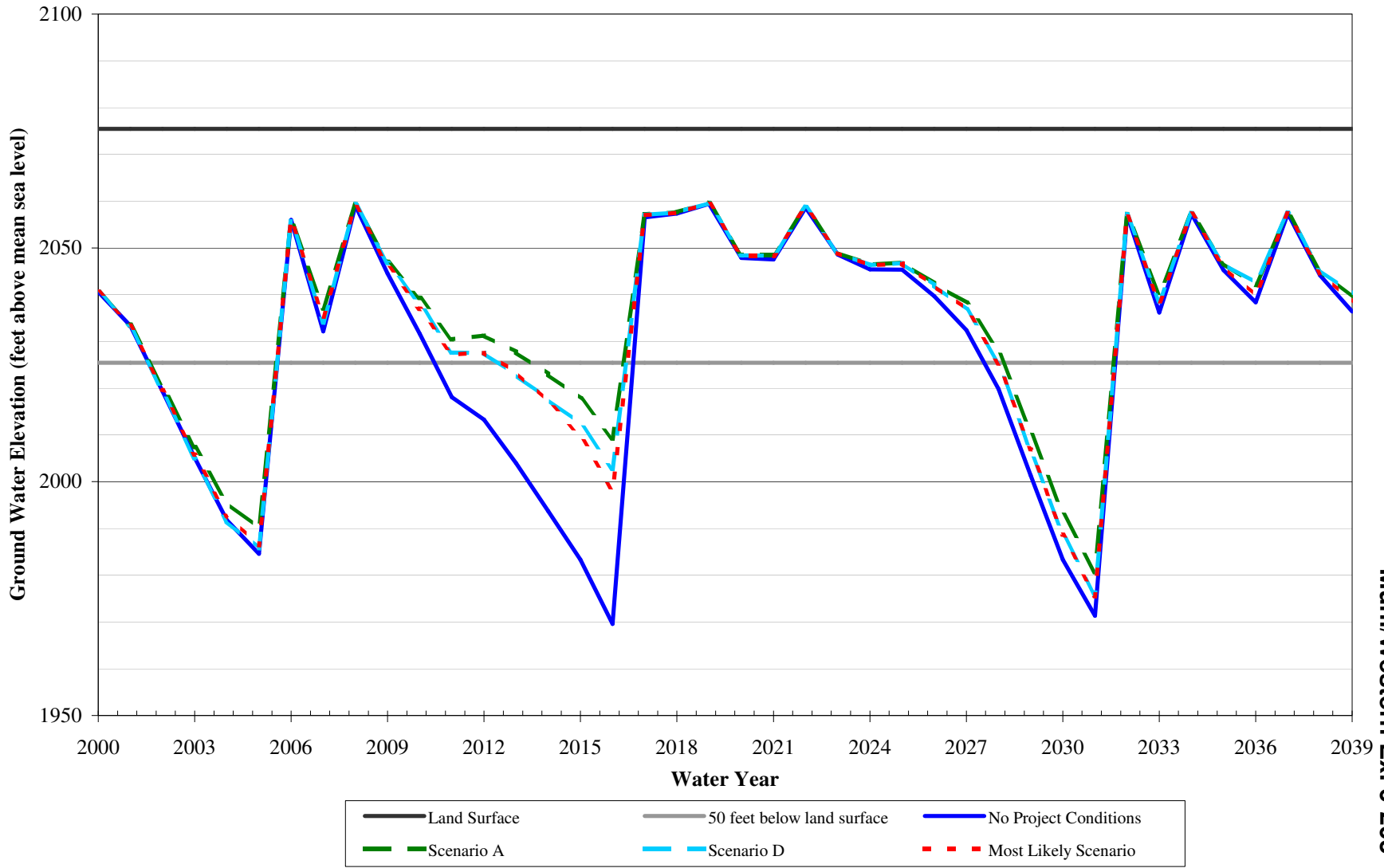
Muni/Western Ex. 6-203

Figure B 29f. Hydrograph for IW-06



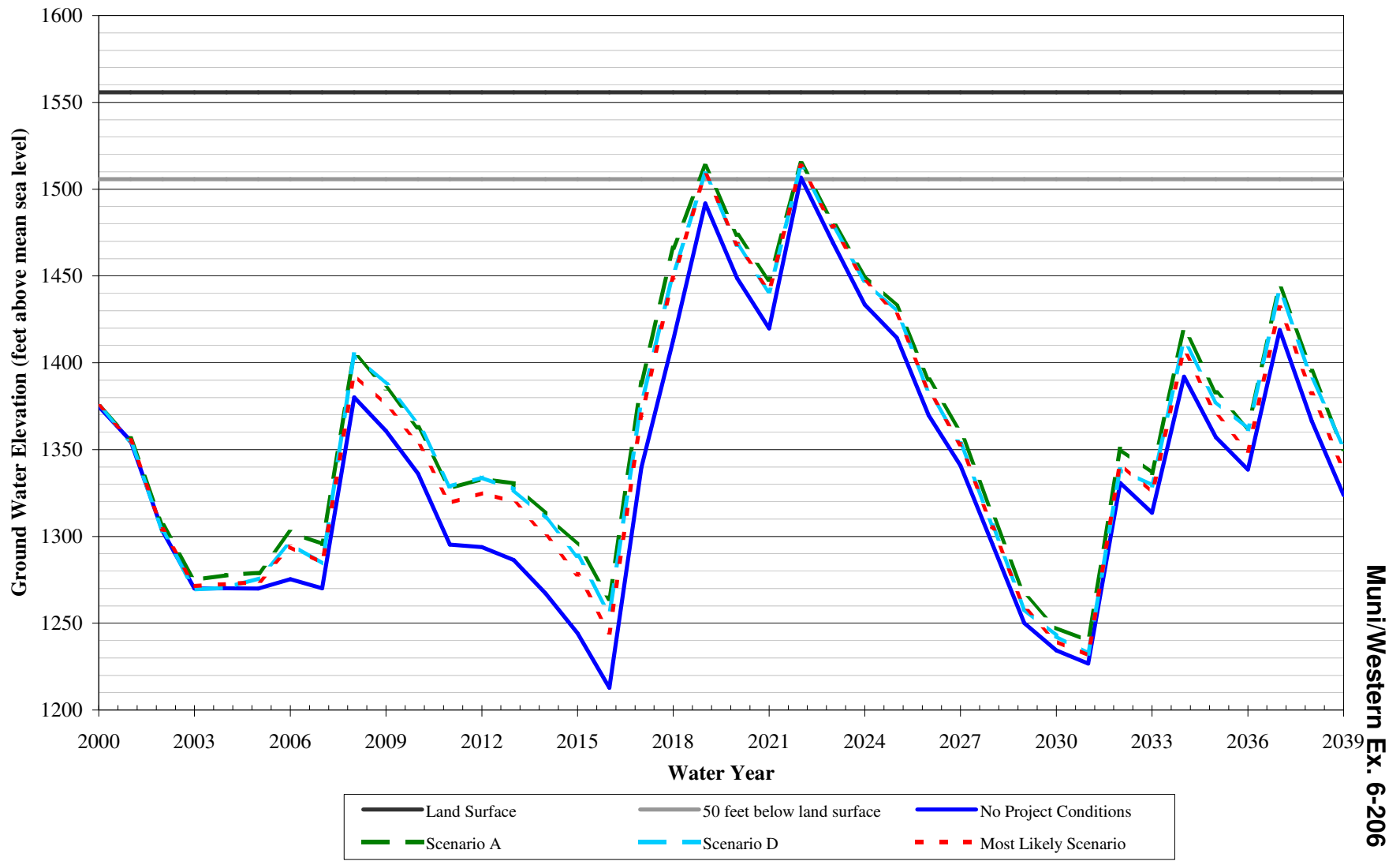
Muni/Western Ex. 6-204

Figure B 29g. Hydrograph for IW-07



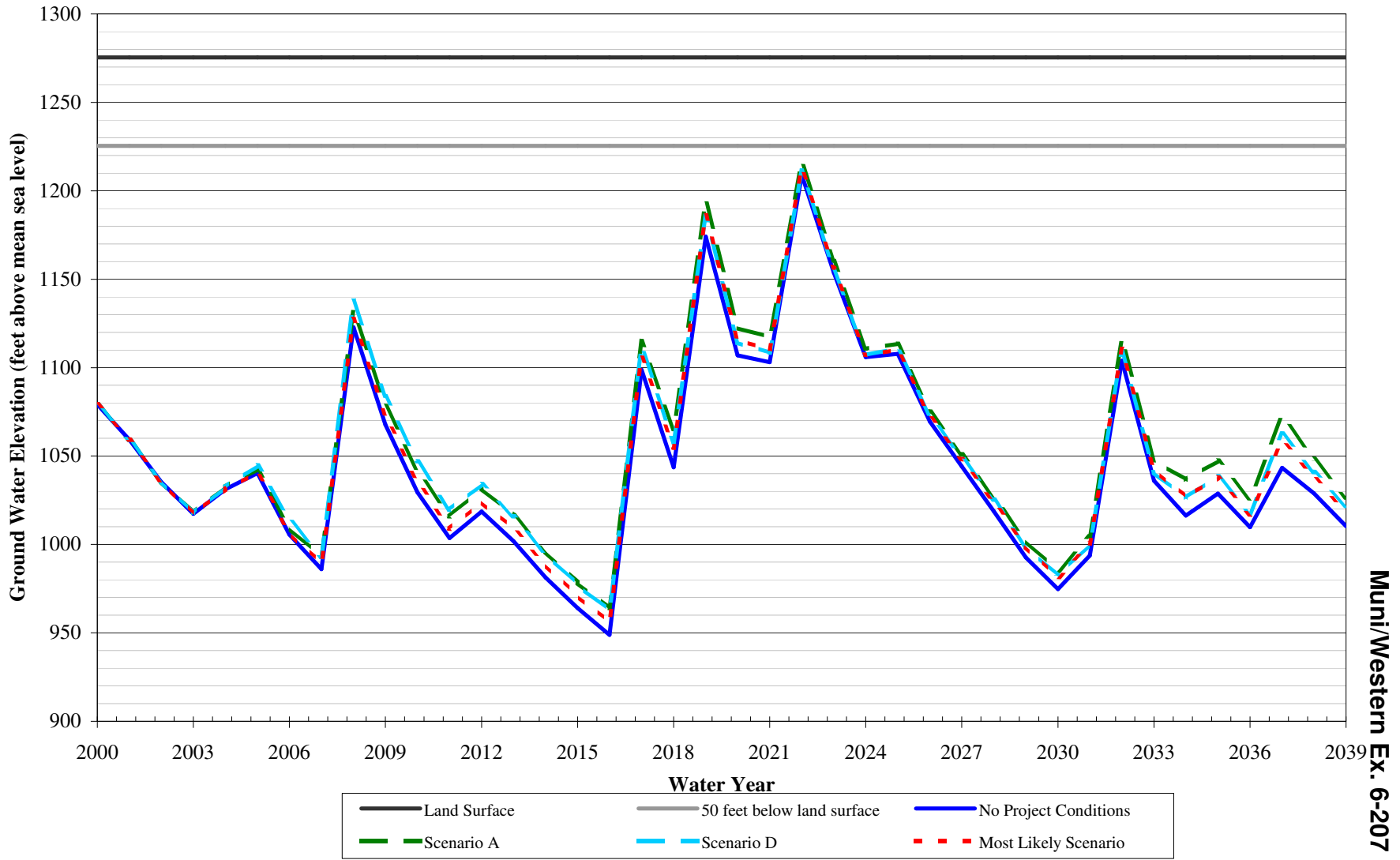
Muni/Western Ex. 6-205

Figure B 29h. Hydrograph for IW-09



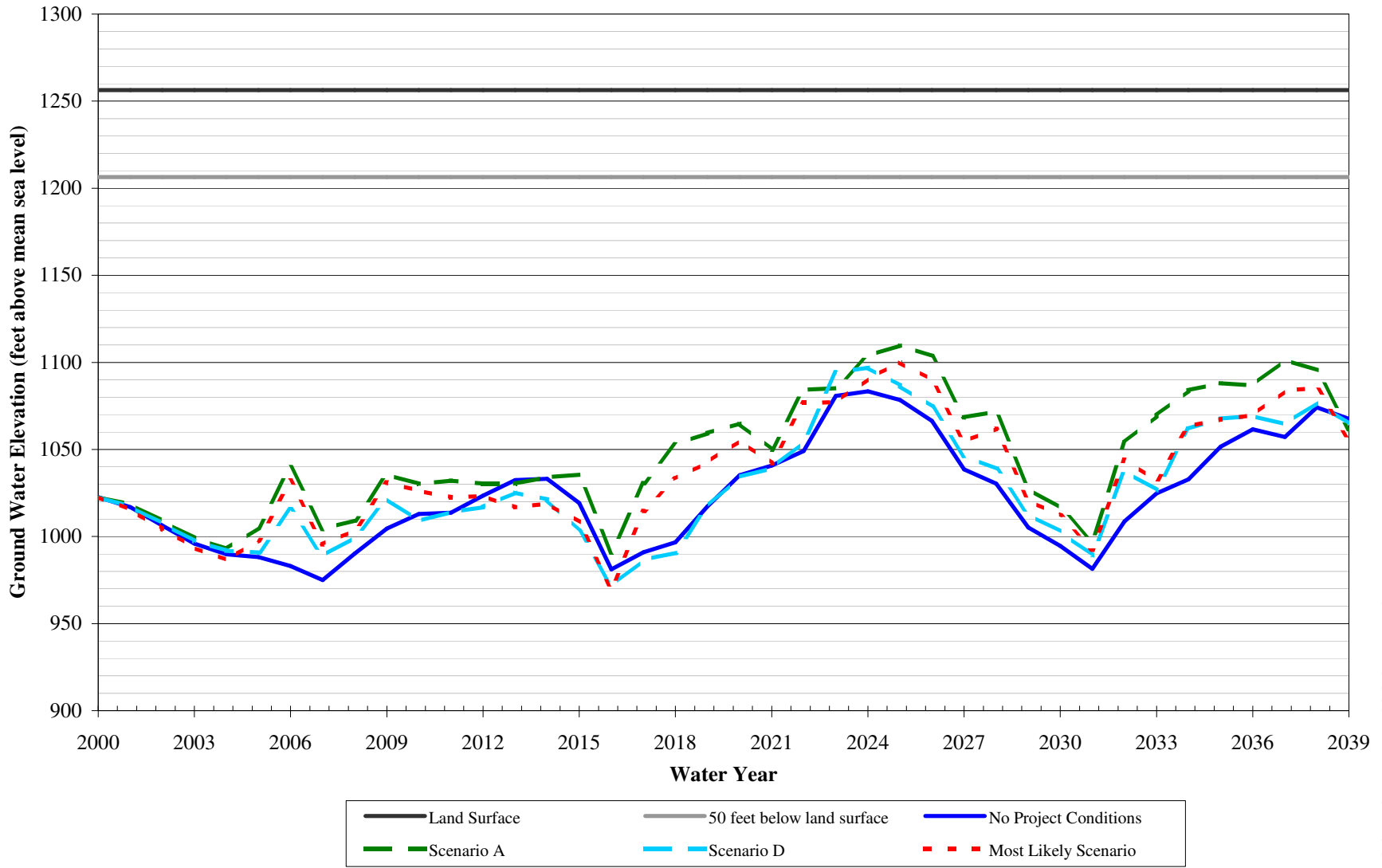
Muni/Western Ex. 6-206

Figure B 29i. Hydrograph for IW-09



Muni/Western Ex. 6-207

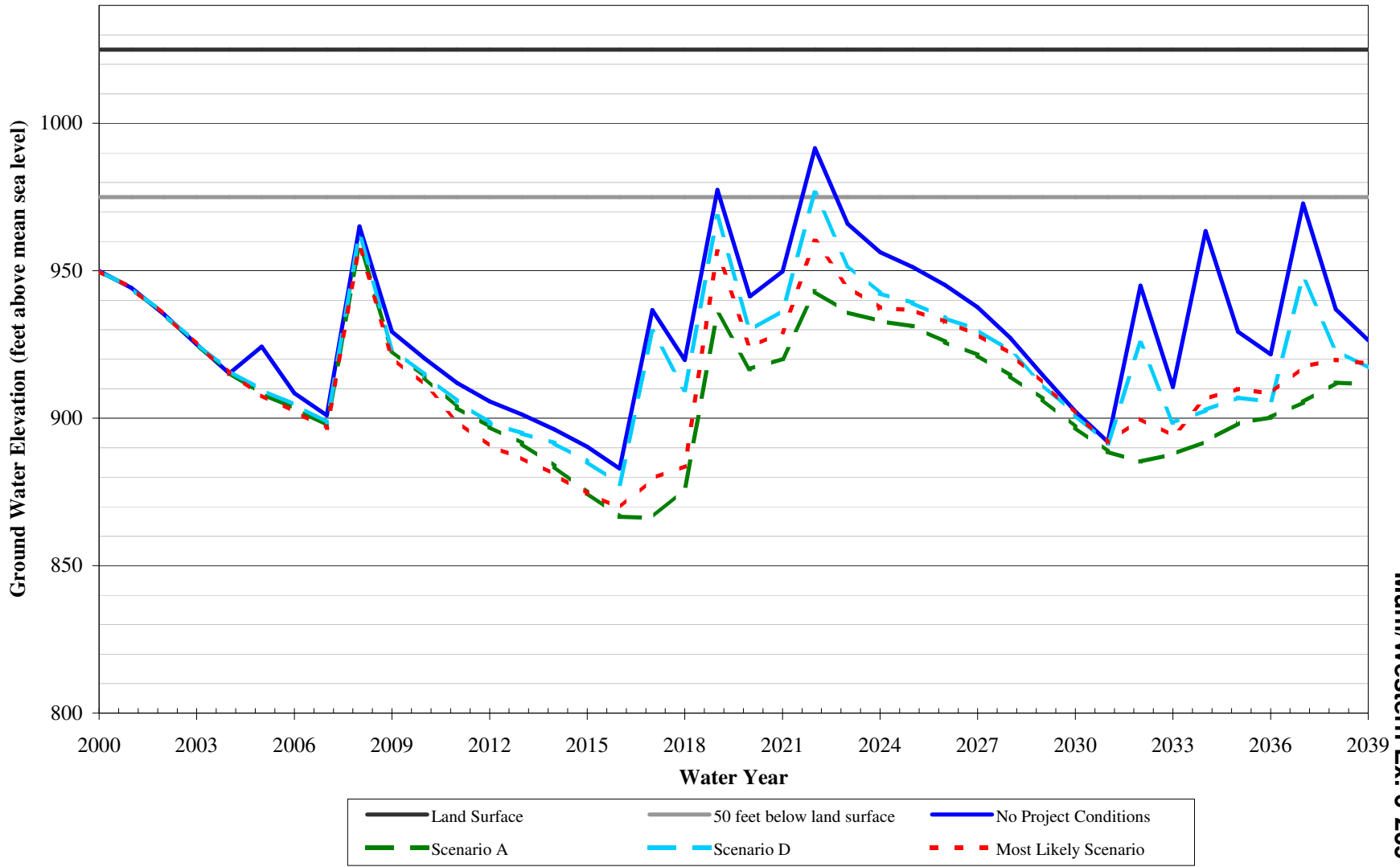
Figure B 29j. Hydrograph for IW-10



Muni/Western Ex. 6-208

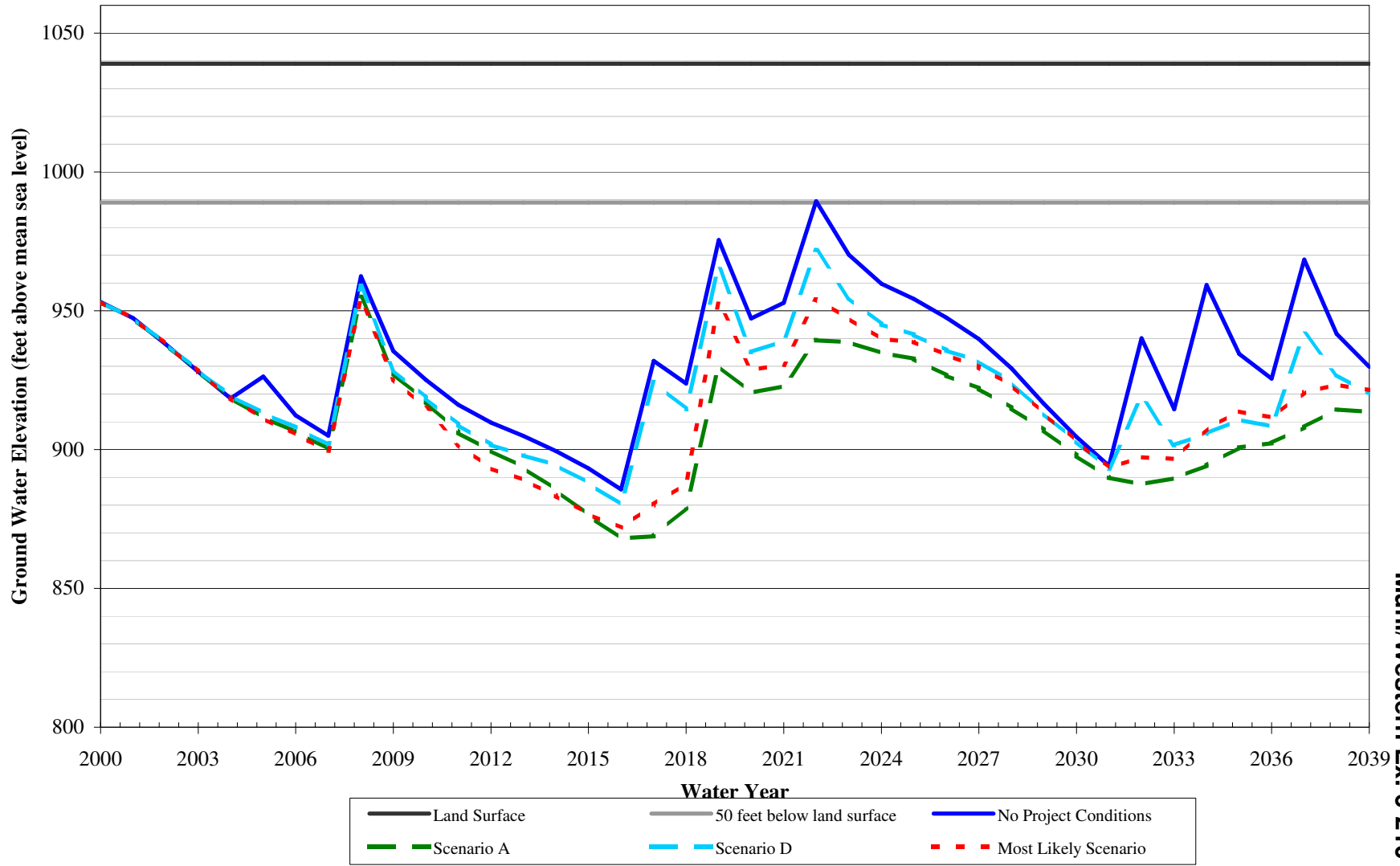


Figure B 29k. Hydrograph for IW-11



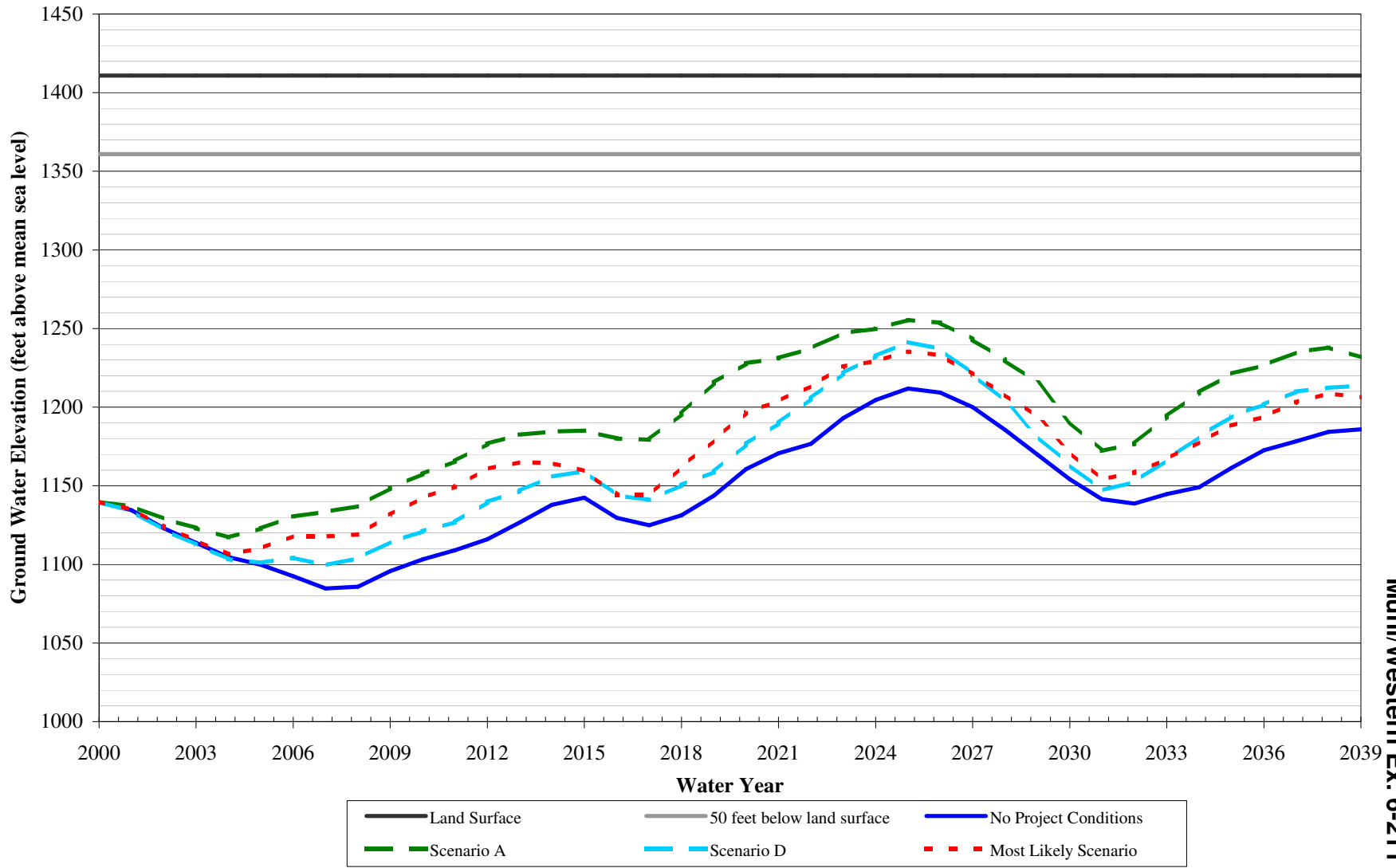
Muni/Western Ex. 6-209

Figure B 29I. Hydrograph for IW-12



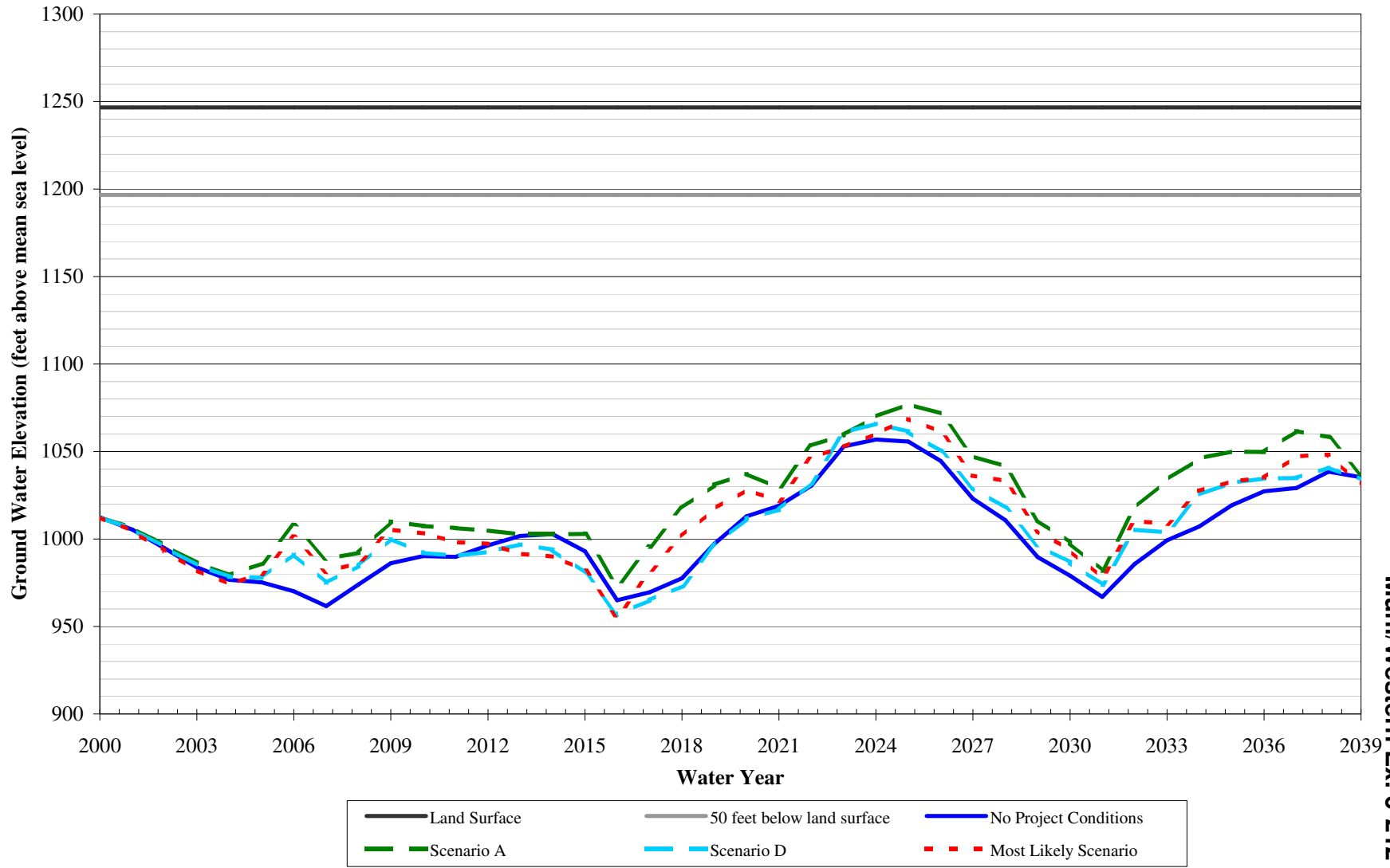
Muni/Western Ex. 6-210

Figure B 29m. Hydrograph for IW-13



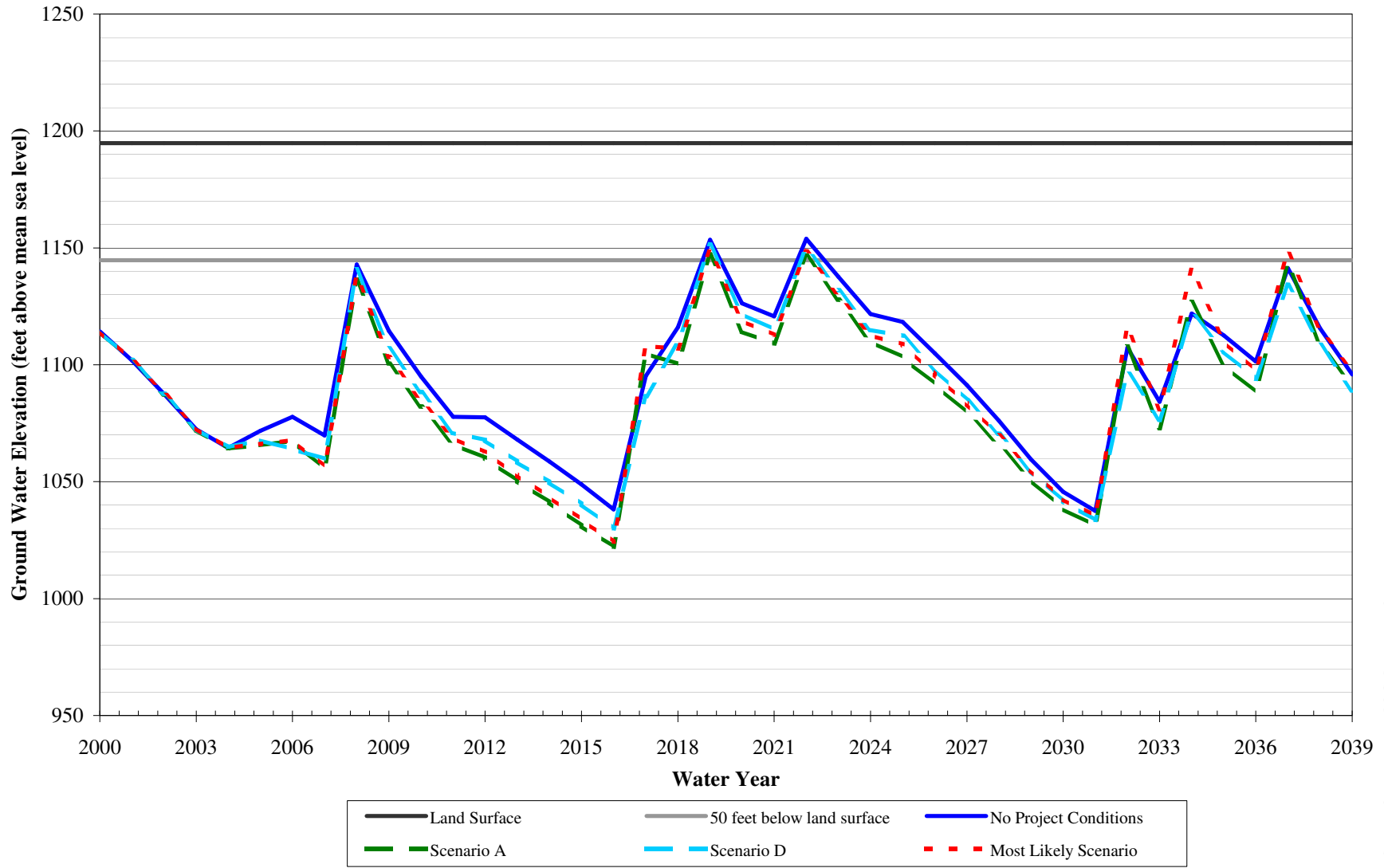
Muni/Western Ex. 6-211

Figure B 29n. Hydrograph for IW-14



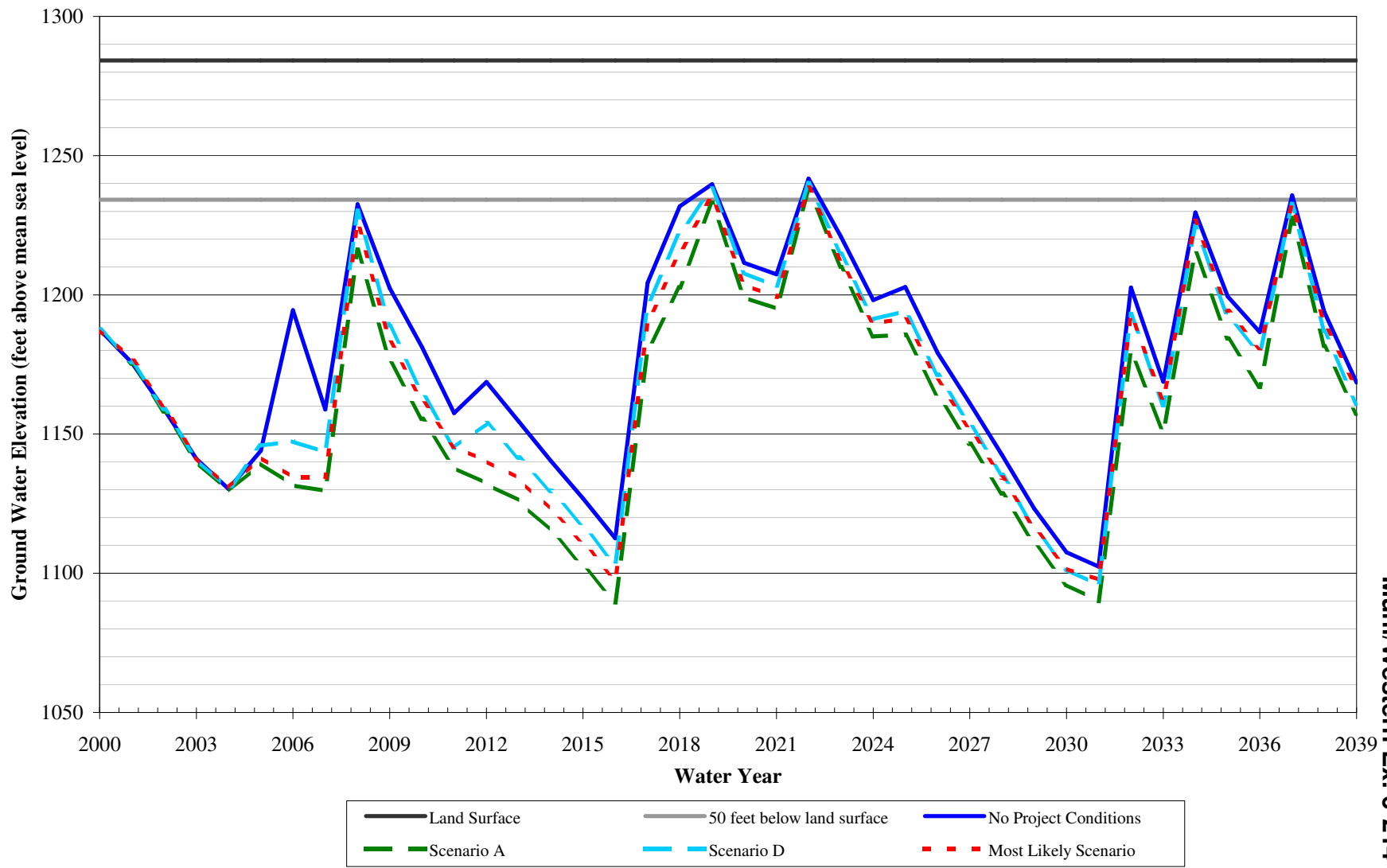
Muni/Western Ex. 6-212

Figure B 29o. Hydrograph for IW-15



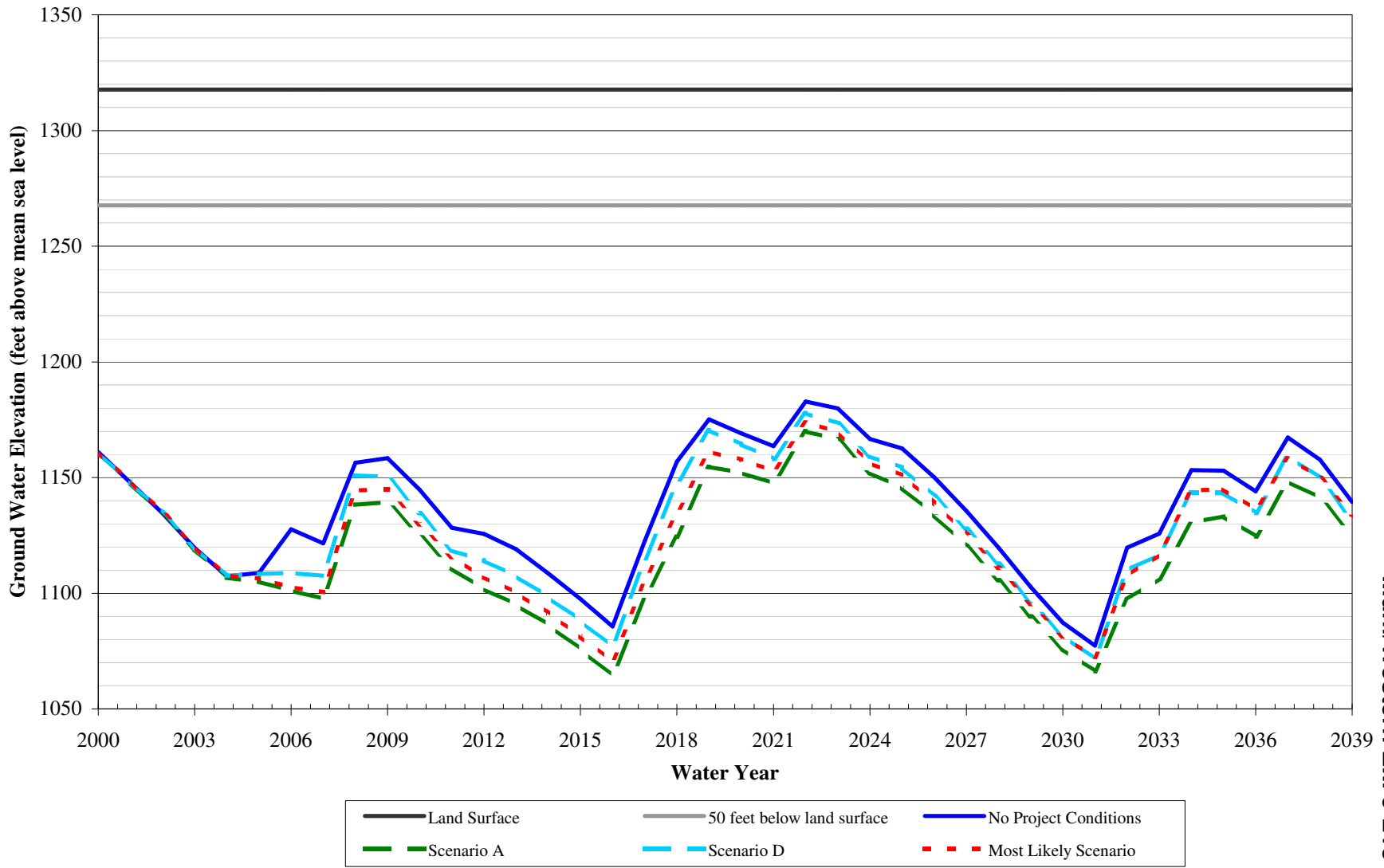
Muni/Western Ex. 6-213

Figure B 29p. Hydrograph for IW-16



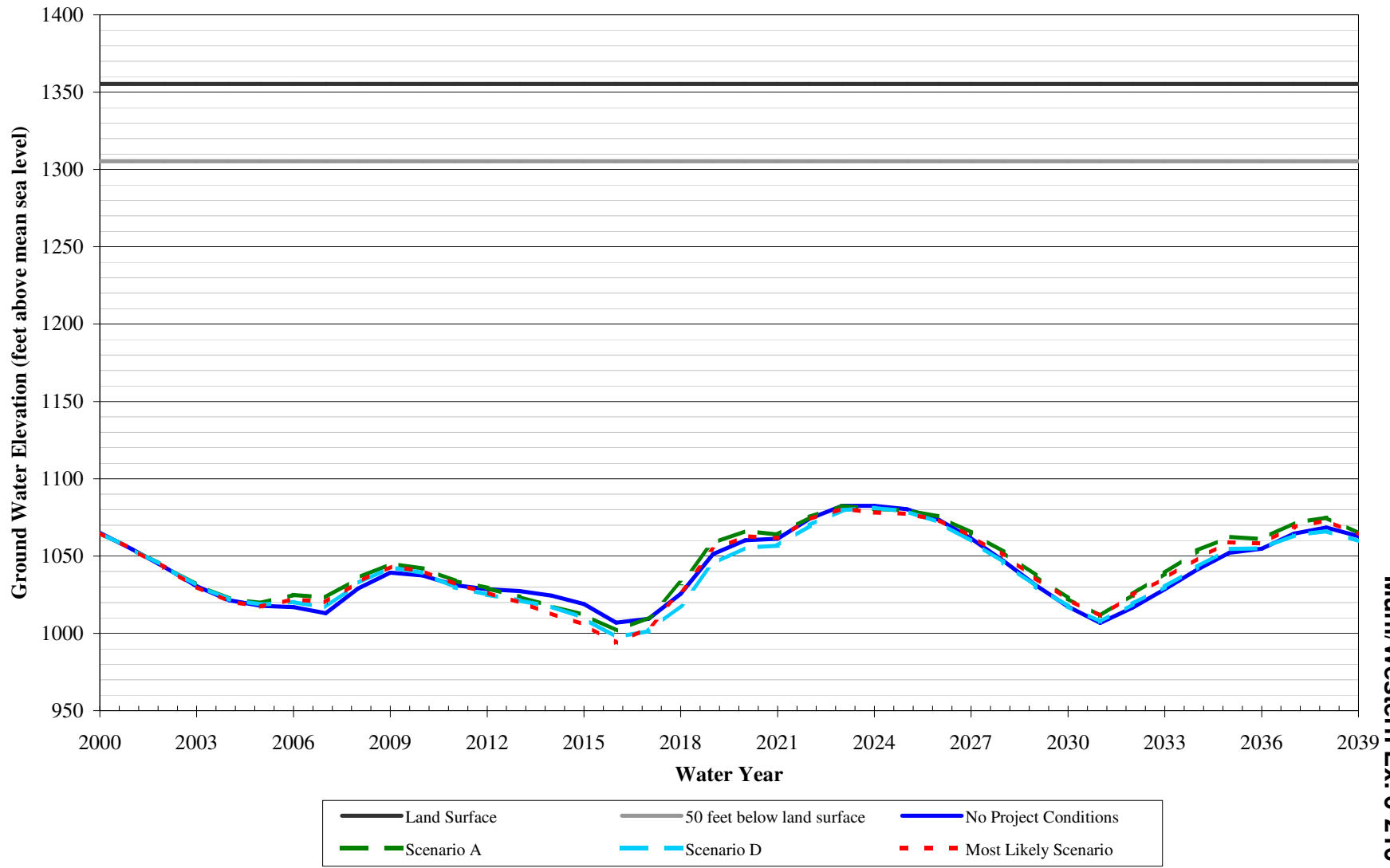
Muni/Western Ex. 6-214

Figure B 29q. Hydrograph for IW-17



Muni/Western Ex. 6-215

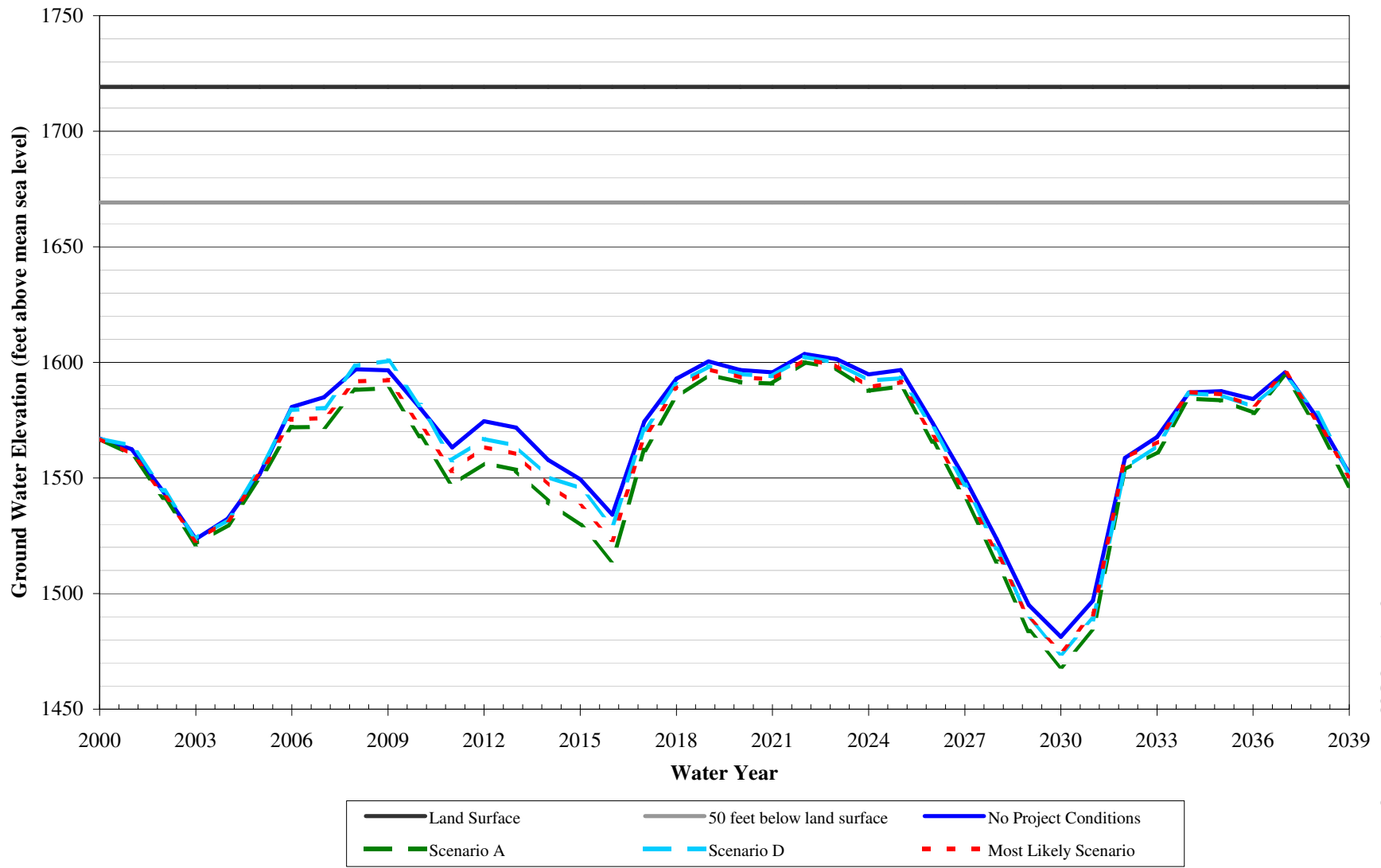
Figure B 29r. Hydrograph for IW-18



Muni/Western Ex. 6-216

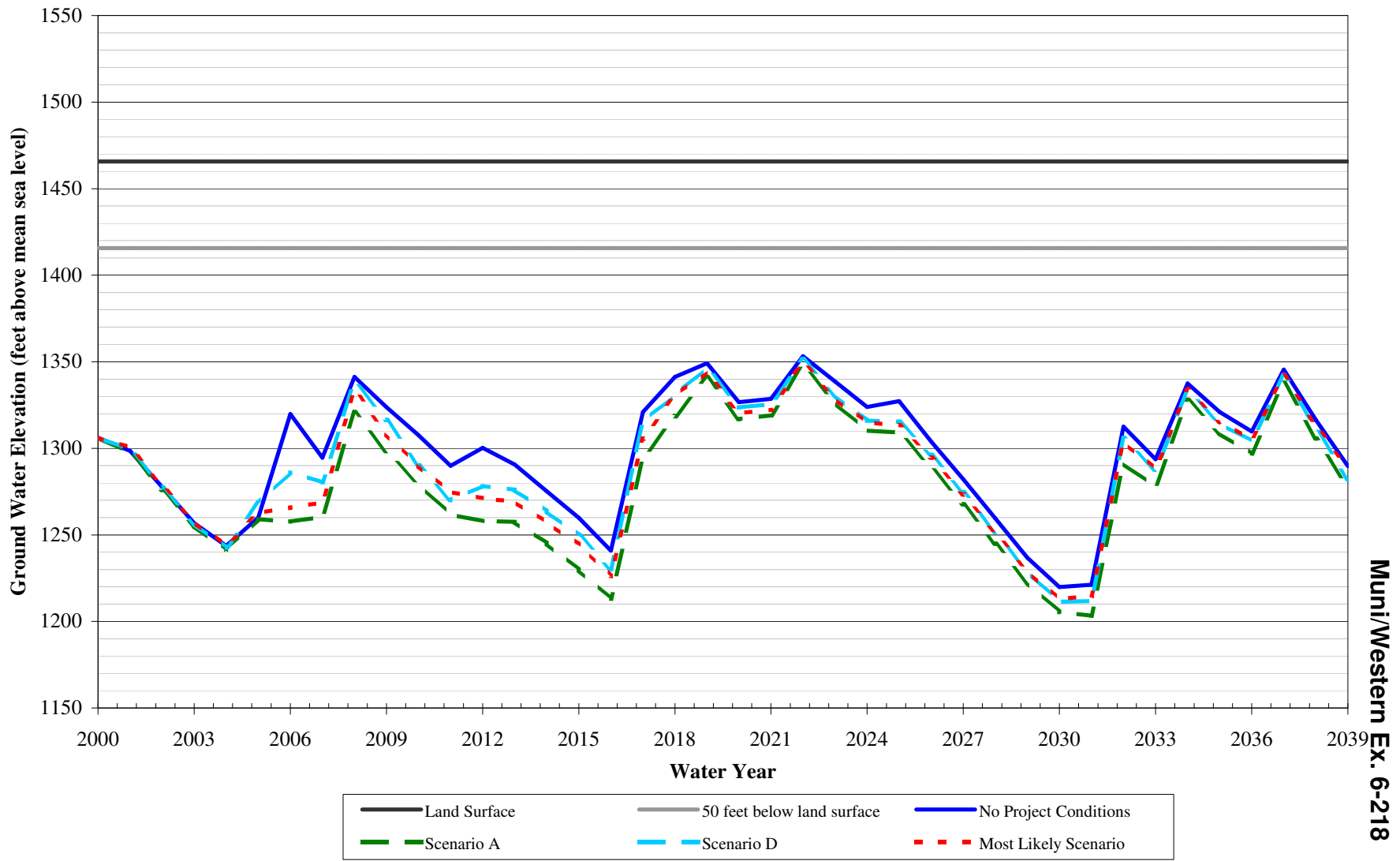


Figure B 29s. Hydrograph for IW-19



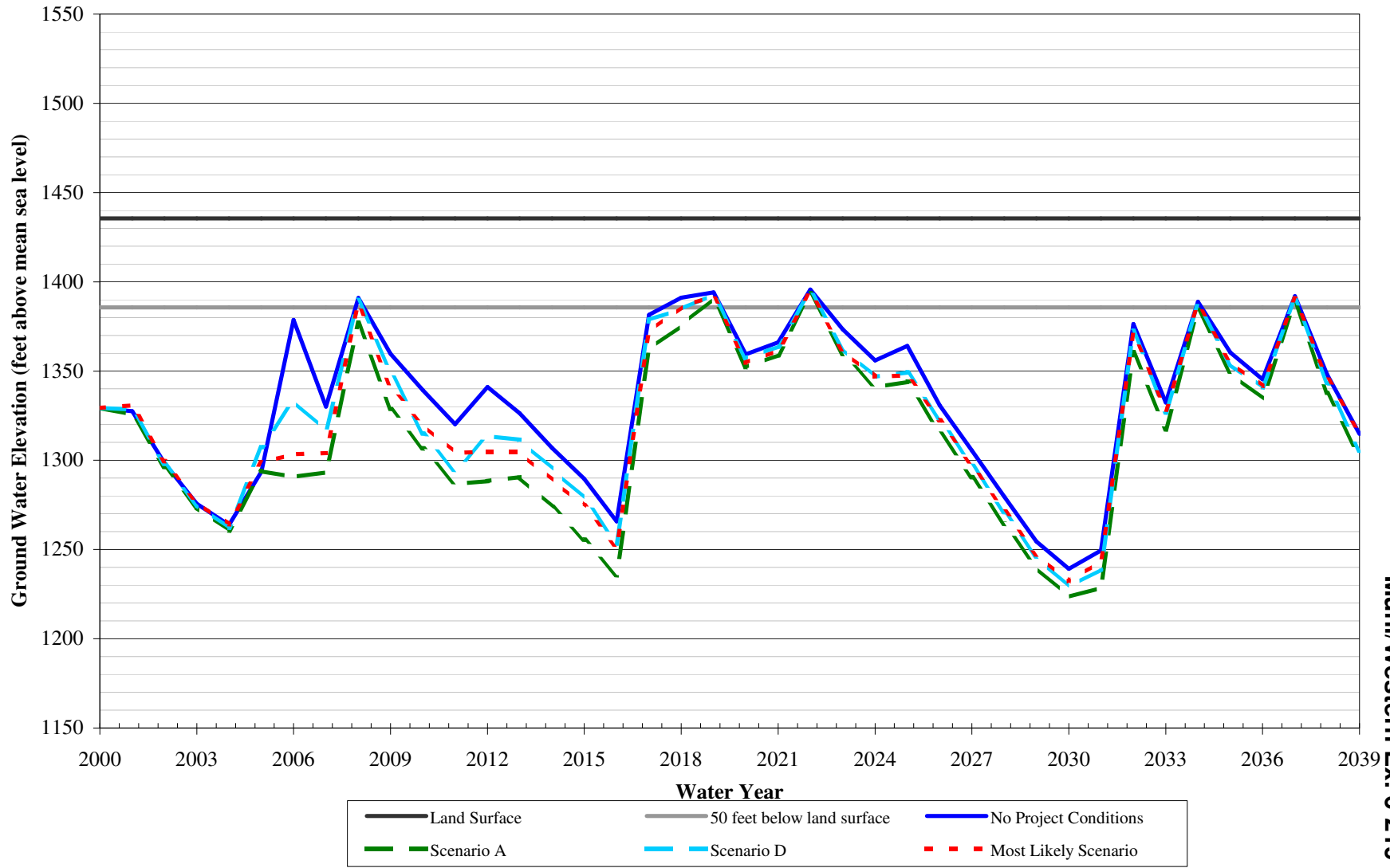
Muni/Western Ex. 6-217

Figure B 29t. Hydrograph for IW-20



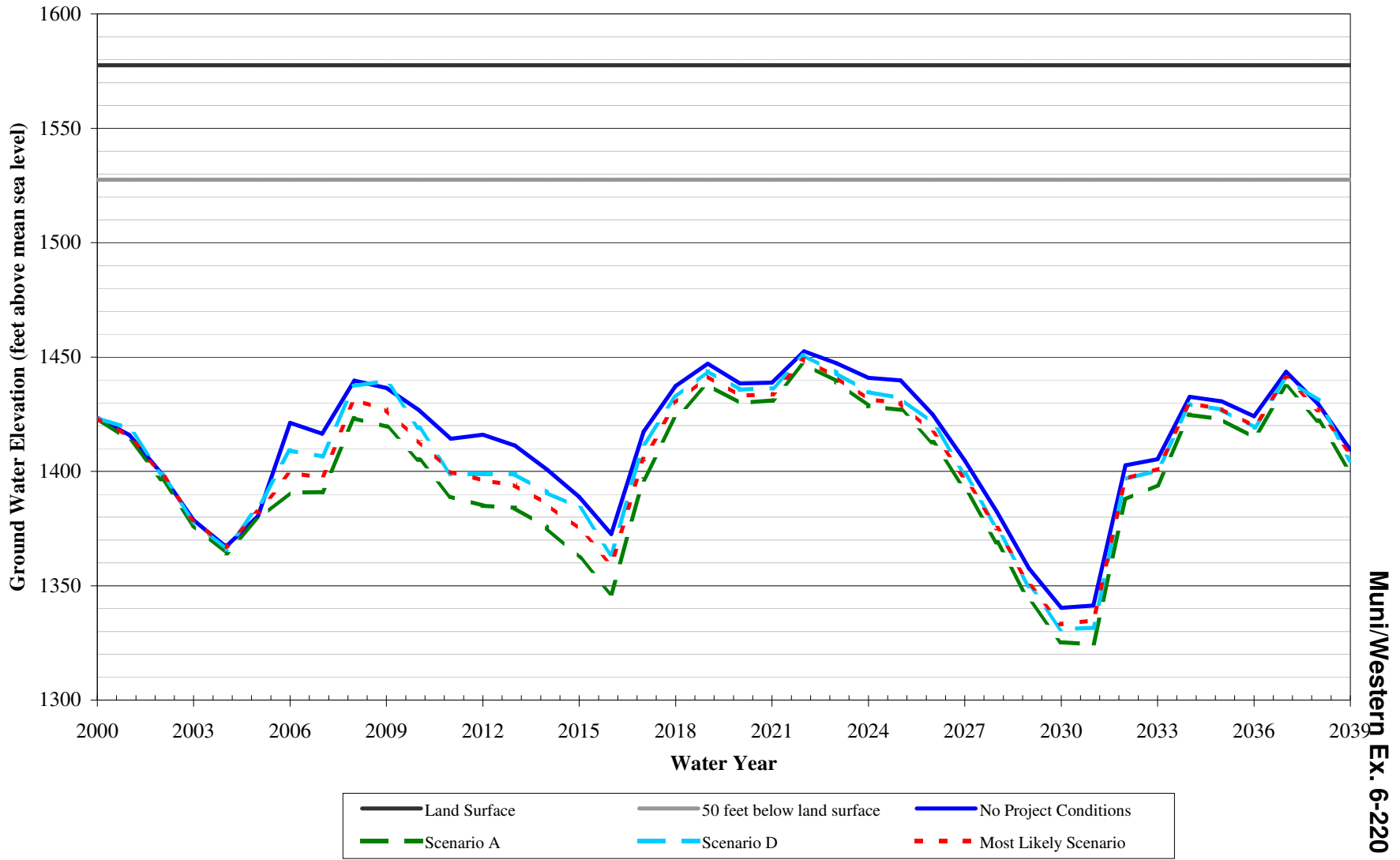
Muni/Western Ex. 6-218

Figure B 29u. Hydrograph for IW-21



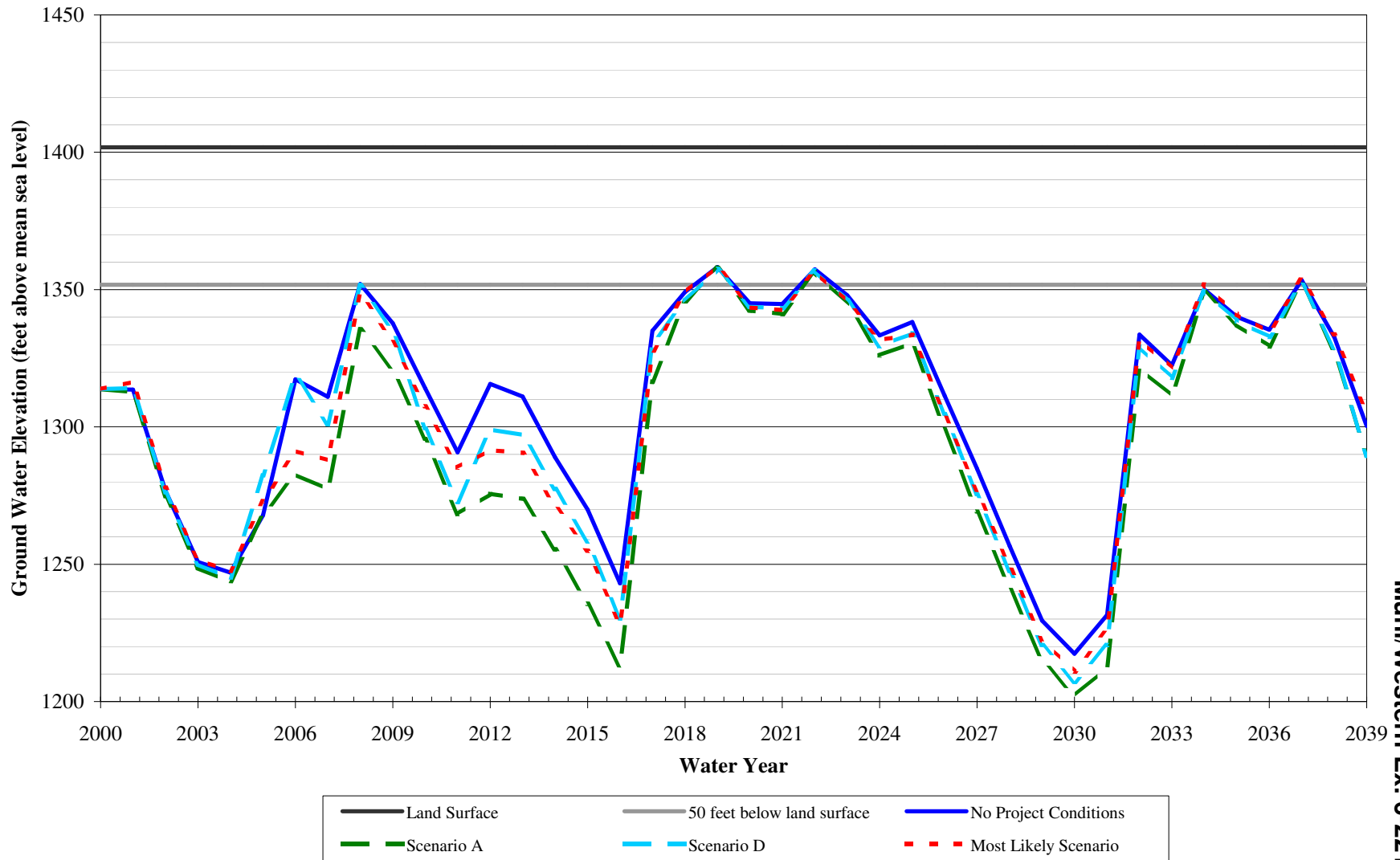
Muni/Western Ex. 6-219

Figure B 29v. Hydrograph for IW-22



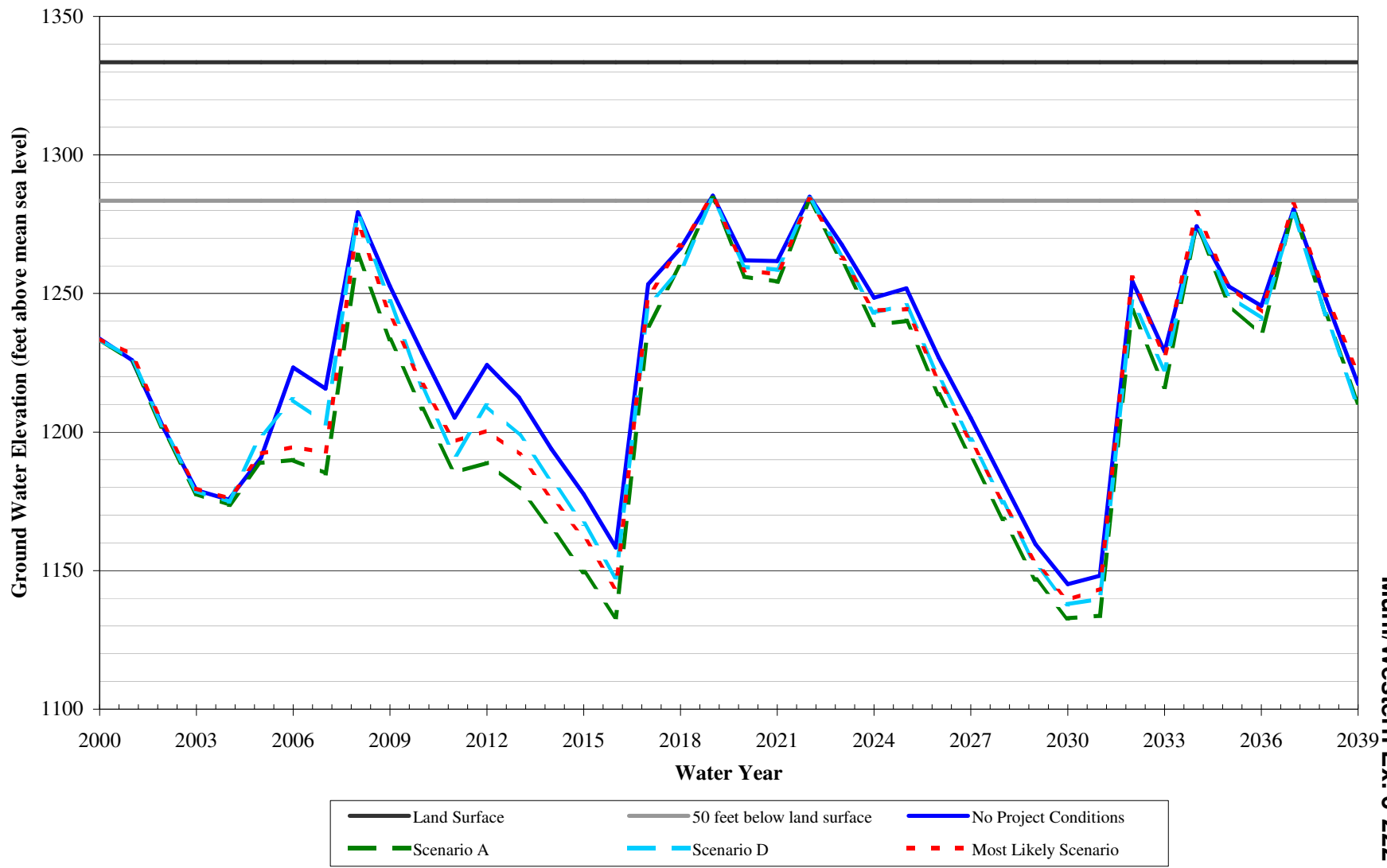
Muni/Western Ex. 6-220

Figure B 29w. Hydrograph for IW-23



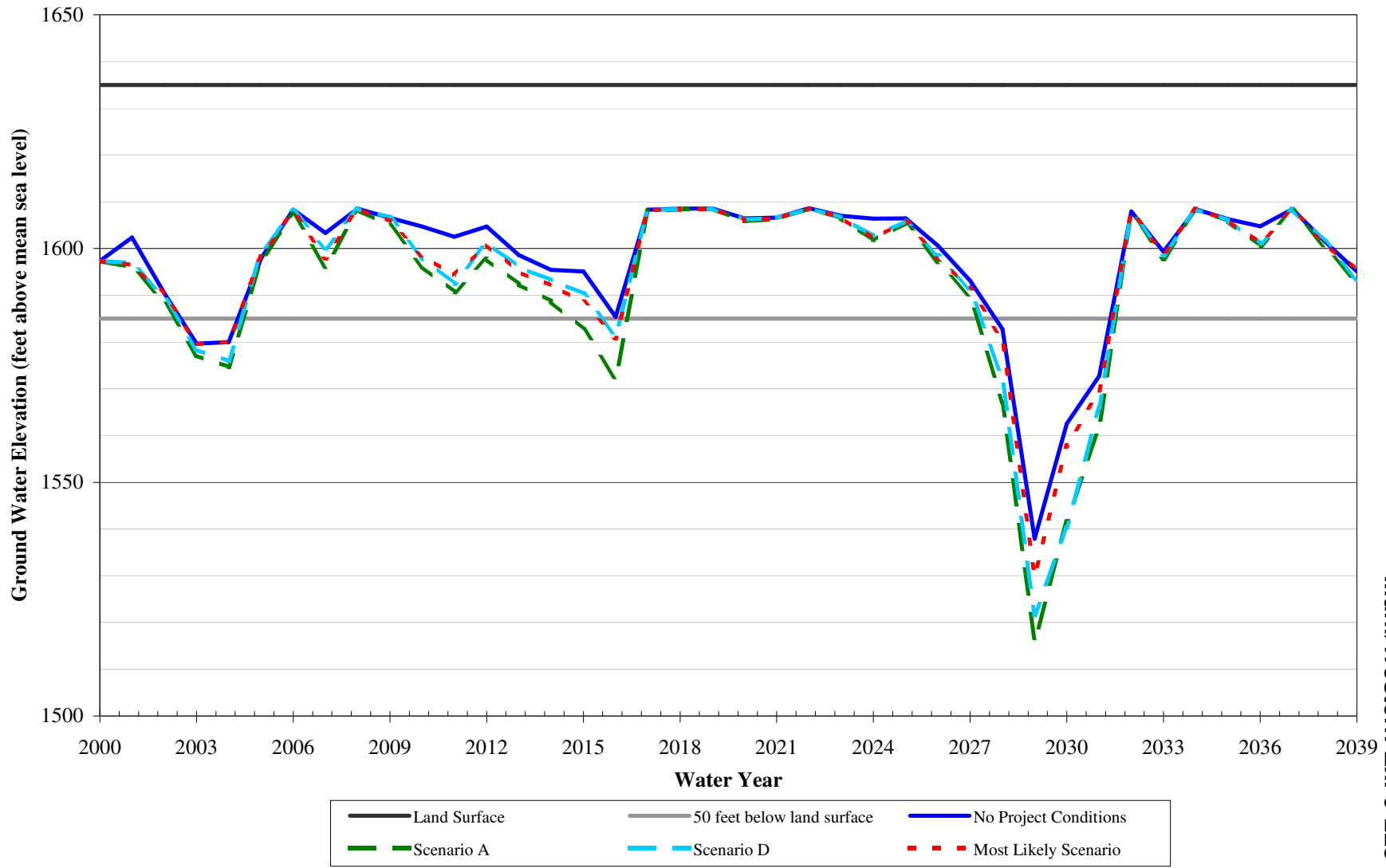
Muni/Western Ex. 6-221

Figure B 29x. Hydrograph for IW-24

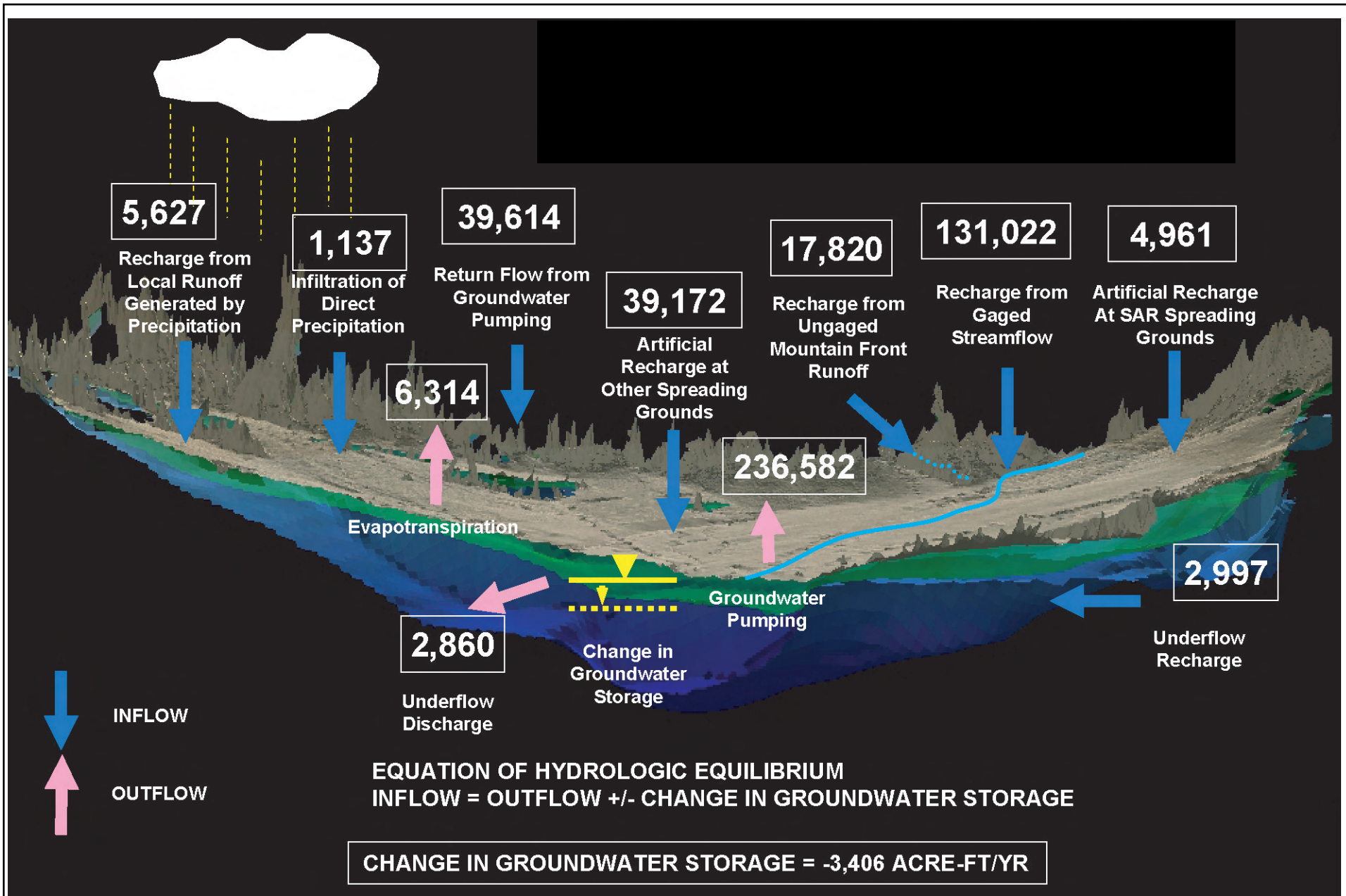


Muni/Western Ex. 6-222

Figure B 29y. Hydrograph for IW-25



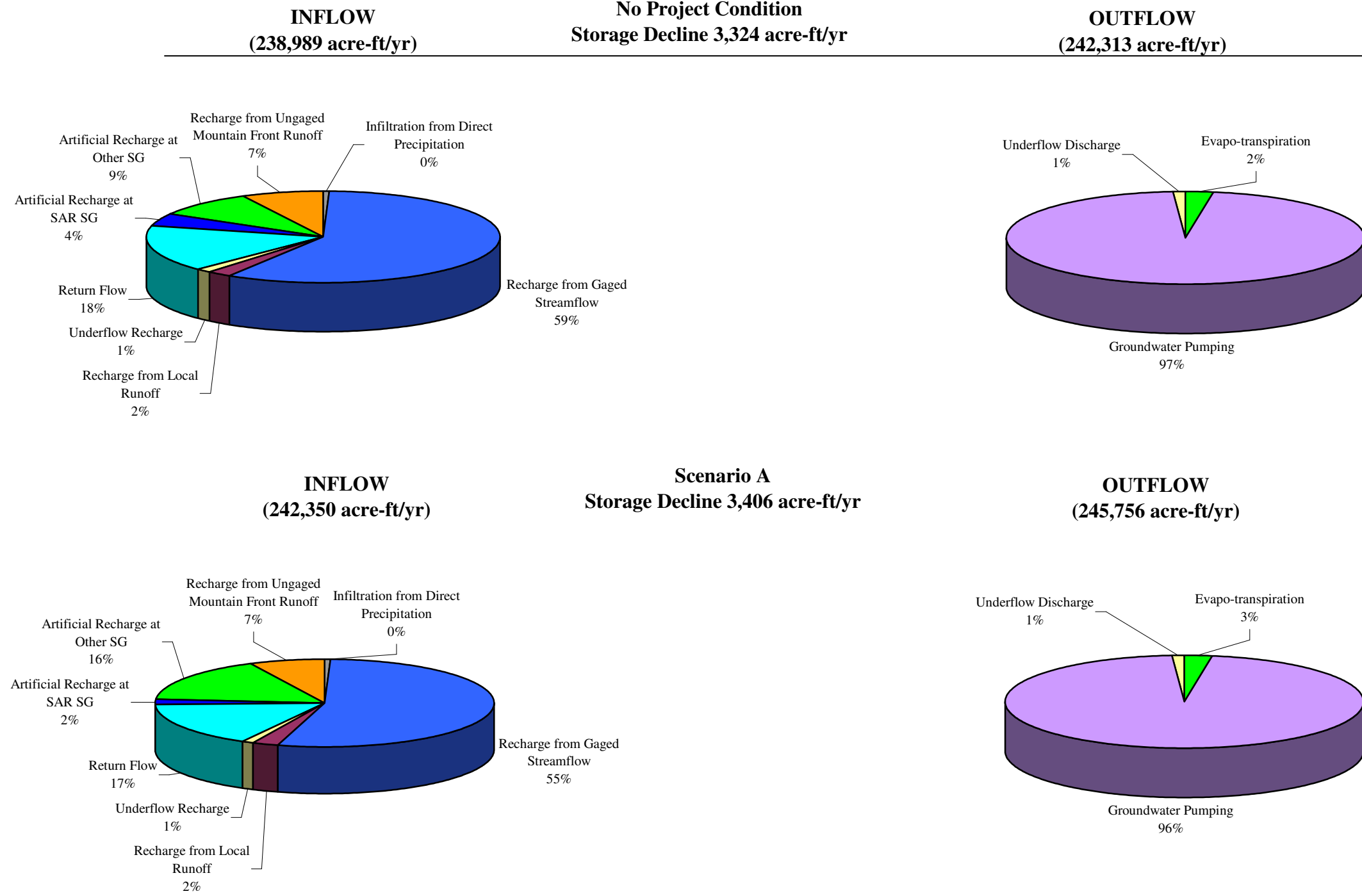
Muni/Western Ex. 6-223



Muni/Western Ex. 6-224	Drawn: DEW	SANTA ANA RIVER WATER RIGHTS HEARING - TESTIMONY OF DENNIS E. WILLIAMS	<b>HYDROLOGIC BUDGET FOR SCENARIO A</b> <b>2001-2039 (UNITS IN ACRE-FT/YR)</b>	 GEOSCIENCE Support Services, Incorporated P.O. Box 220, Claremont, CA 91711 Tel: (909)920-0707 Fax: (909)920-0403 www.gssiwater.com
	Checked:			
	Approved:			
	Date: 16-APR-07			



Comparisons of Groundwater Budgets for SBBA Between No Project Condition and Scenario A - 2001 to 2039

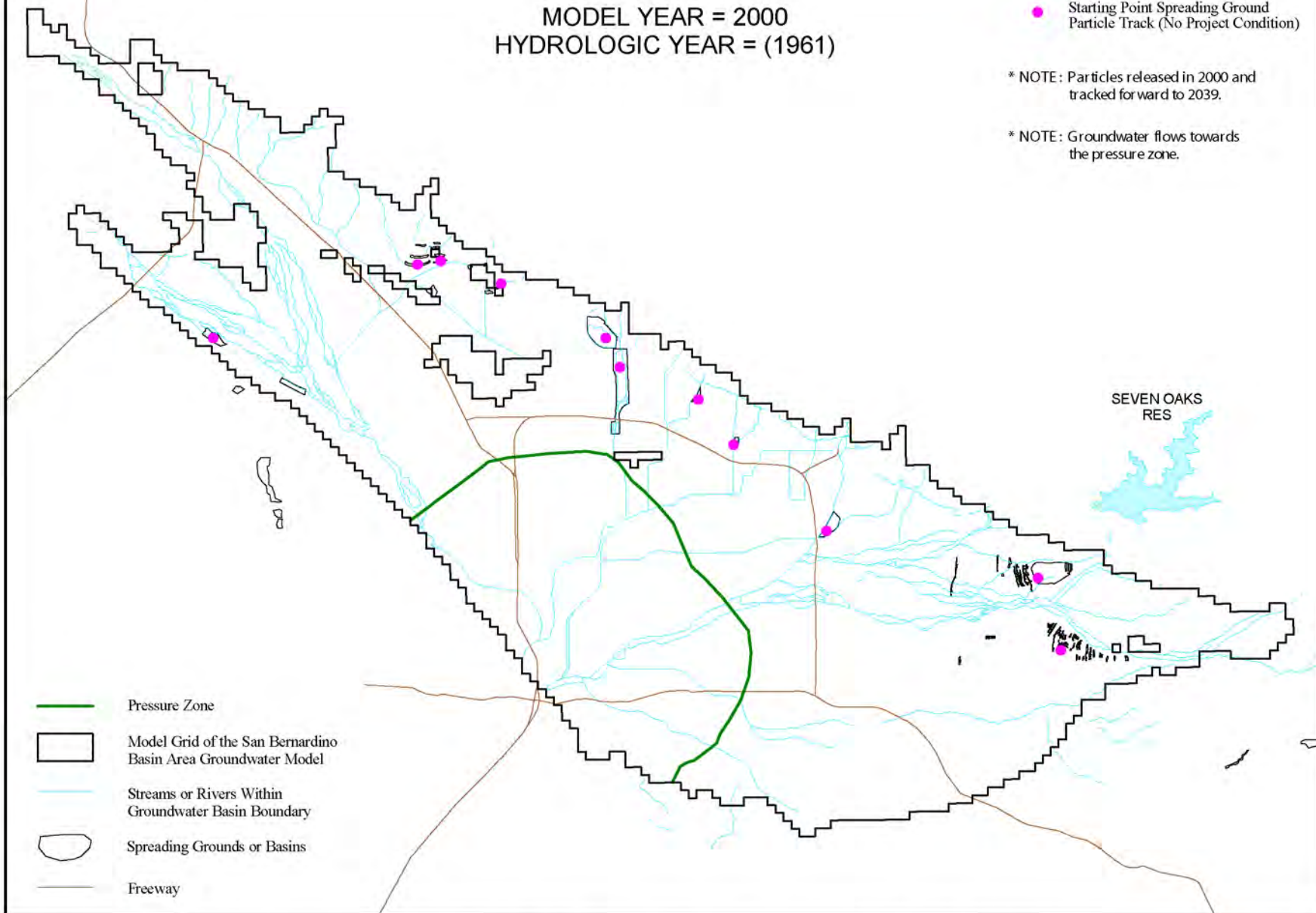


MODEL YEAR = 2000  
HYDROLOGIC YEAR = (1961)

● Starting Point Spreading Ground Particle Track (No Project Condition)

\* NOTE: Particles released in 2000 and tracked forward to 2039.

\* NOTE: Groundwater flows towards the pressure zone.



- Pressure Zone
- Model Grid of the San Bernardino Basin Area Groundwater Model
- Streams or Rivers Within Groundwater Basin Boundary
- Spreading Grounds or Basins
- Freeway





SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR

PARTICLE TRACKS FROM SPREADING GROUNDS,  
NO PROJECT CONDITION VERSUS SCENARIO A, MODEL YEAR 2000

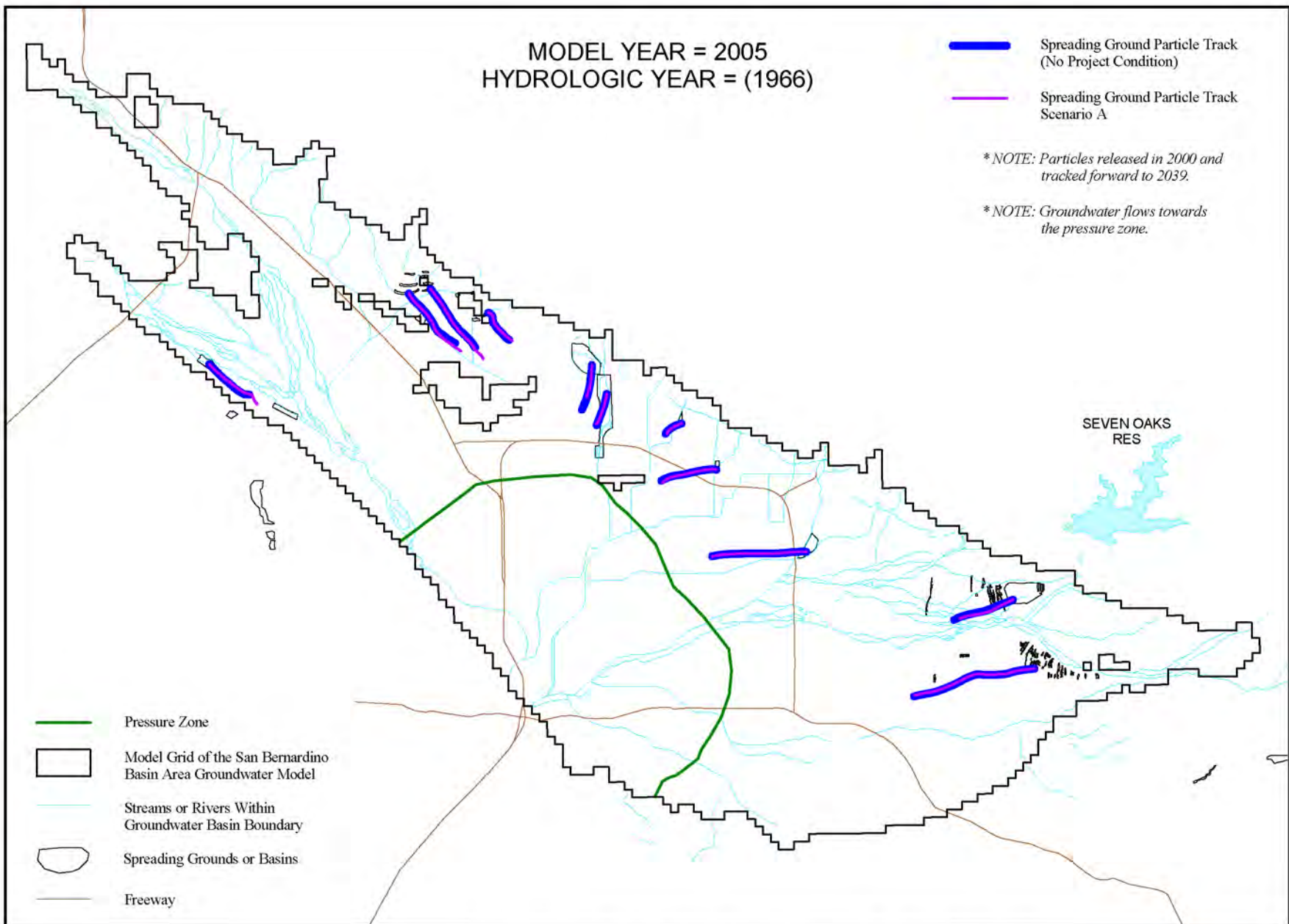
Figure B 44(a)






MODEL YEAR = 2005  
 HYDROLOGIC YEAR = (1966)

-  Spreading Ground Particle Track (No Project Condition)
-  Spreading Ground Particle Track Scenario A

*\* NOTE: Particles released in 2000 and tracked forward to 2039.*

*\* NOTE: Groundwater flows towards the pressure zone.*



-  Pressure Zone
-  Model Grid of the San Bernardino Basin Area Groundwater Model
-  Streams or Rivers Within Groundwater Basin Boundary
-  Spreading Grounds or Basins
-  Freeway





SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR

PARTICLE TRACKS FROM SPREADING GROUNDS,  
 NO PROJECT CONDITION VERSUS SCENARIO A, MODEL YEAR 2005

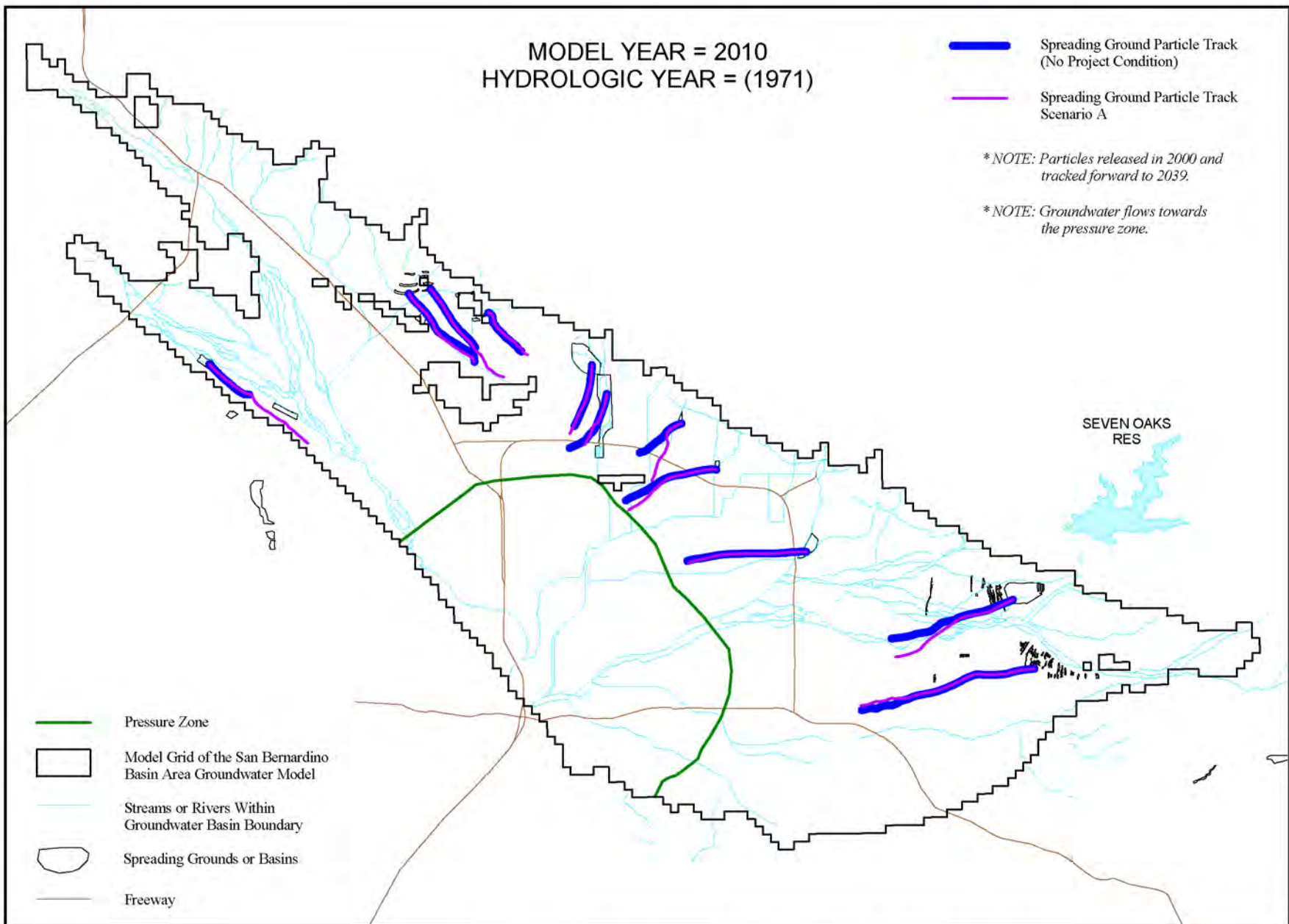
Figure B 44(b)






MODEL YEAR = 2010  
 HYDROLOGIC YEAR = (1971)

-  Spreading Ground Particle Track (No Project Condition)
-  Spreading Ground Particle Track Scenario A

*\* NOTE: Particles released in 2000 and tracked forward to 2039.*

*\* NOTE: Groundwater flows towards the pressure zone.*



-  Pressure Zone
-  Model Grid of the San Bernardino Basin Area Groundwater Model
-  Streams or Rivers Within Groundwater Basin Boundary
-  Spreading Grounds or Basins
-  Freeway

SEVEN OAKS RES





SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR

**PARTICLE TRACKS FROM SPREADING GROUNDS,  
 NO PROJECT CONDITION VERSUS SCENARIO A, MODEL YEAR 2010**

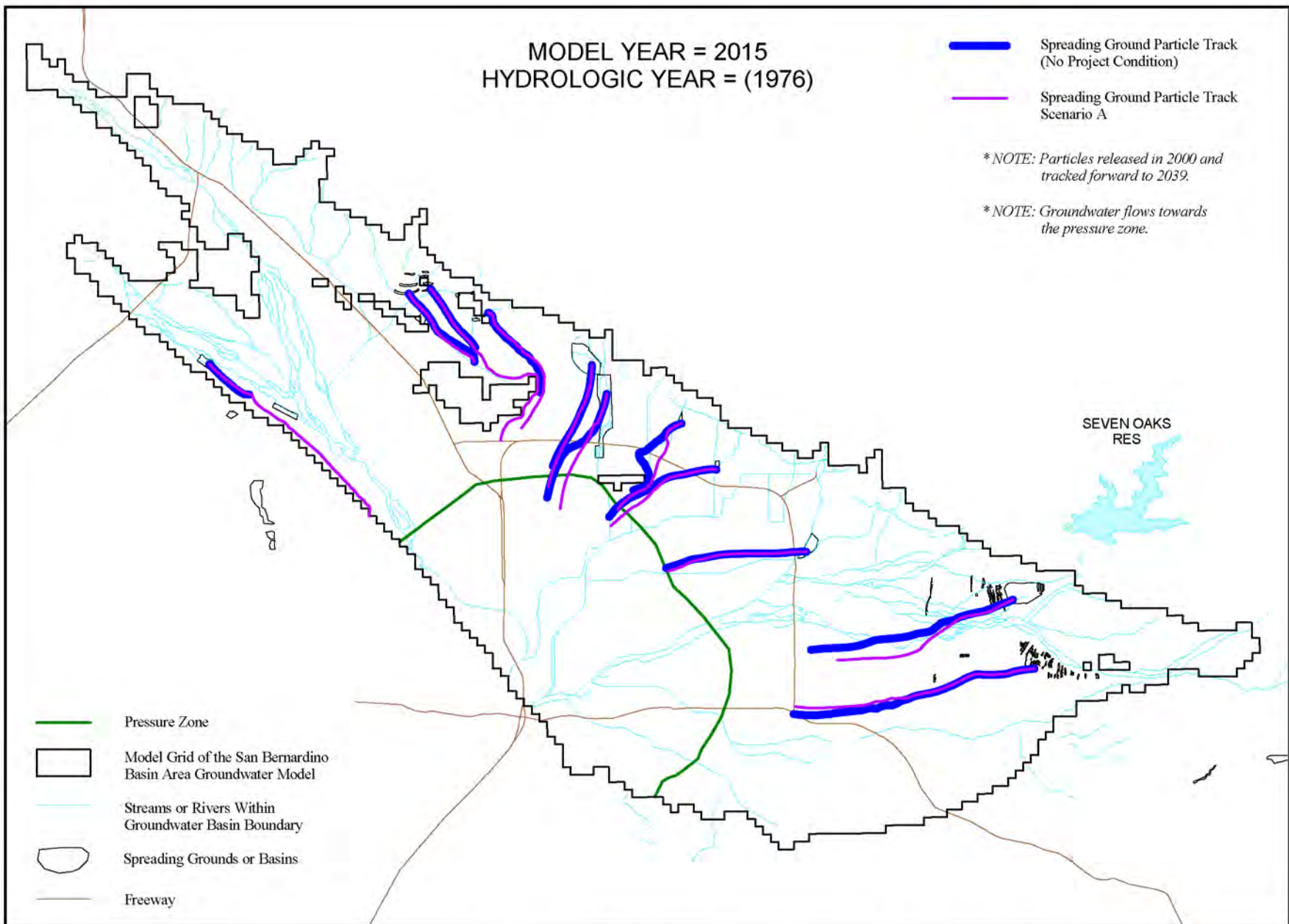
Figure B 44(c)






MODEL YEAR = 2015  
 HYDROLOGIC YEAR = (1976)

-  Spreading Ground Particle Track (No Project Condition)
-  Spreading Ground Particle Track Scenario A

*\* NOTE: Particles released in 2000 and tracked forward to 2039.*

*\* NOTE: Groundwater flows towards the pressure zone.*



-  Pressure Zone
-  Model Grid of the San Bernardino Basin Area Groundwater Model
-  Streams or Rivers Within Groundwater Basin Boundary
-  Spreading Grounds or Basins
-  Freeway

SEVEN OAKS RES



SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR

**PARTICLE TRACKS FROM SPREADING GROUNDS,  
 NO PROJECT CONDITION VERSUS SCENARIO A, MODEL YEAR 2015**

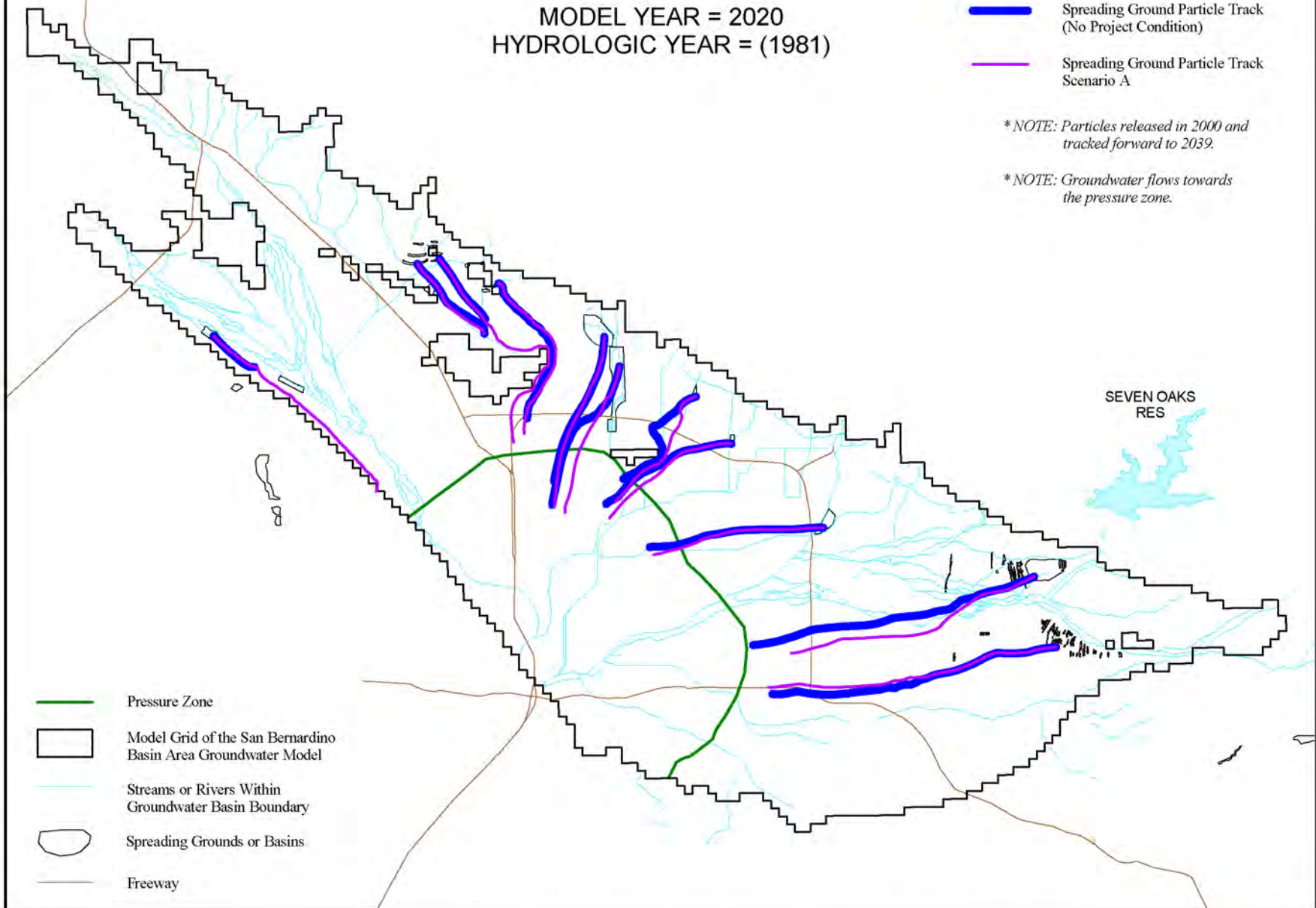
Figure B 44(d)

MODEL YEAR = 2020  
HYDROLOGIC YEAR = (1981)

- Spreading Ground Particle Track (No Project Condition)
- Spreading Ground Particle Track Scenario A

\*NOTE: Particles released in 2000 and tracked forward to 2039.

\*NOTE: Groundwater flows towards the pressure zone.



- Pressure Zone
- Model Grid of the San Bernardino Basin Area Groundwater Model
- Streams or Rivers Within Groundwater Basin Boundary
- Spreading Grounds or Basins
- Freeway

SEVEN OAKS RES



SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR

PARTICLE TRACKS FROM SPREADING GROUNDS,  
NO PROJECT CONDITION VERSUS SCENARIO A, MODEL YEAR 2020

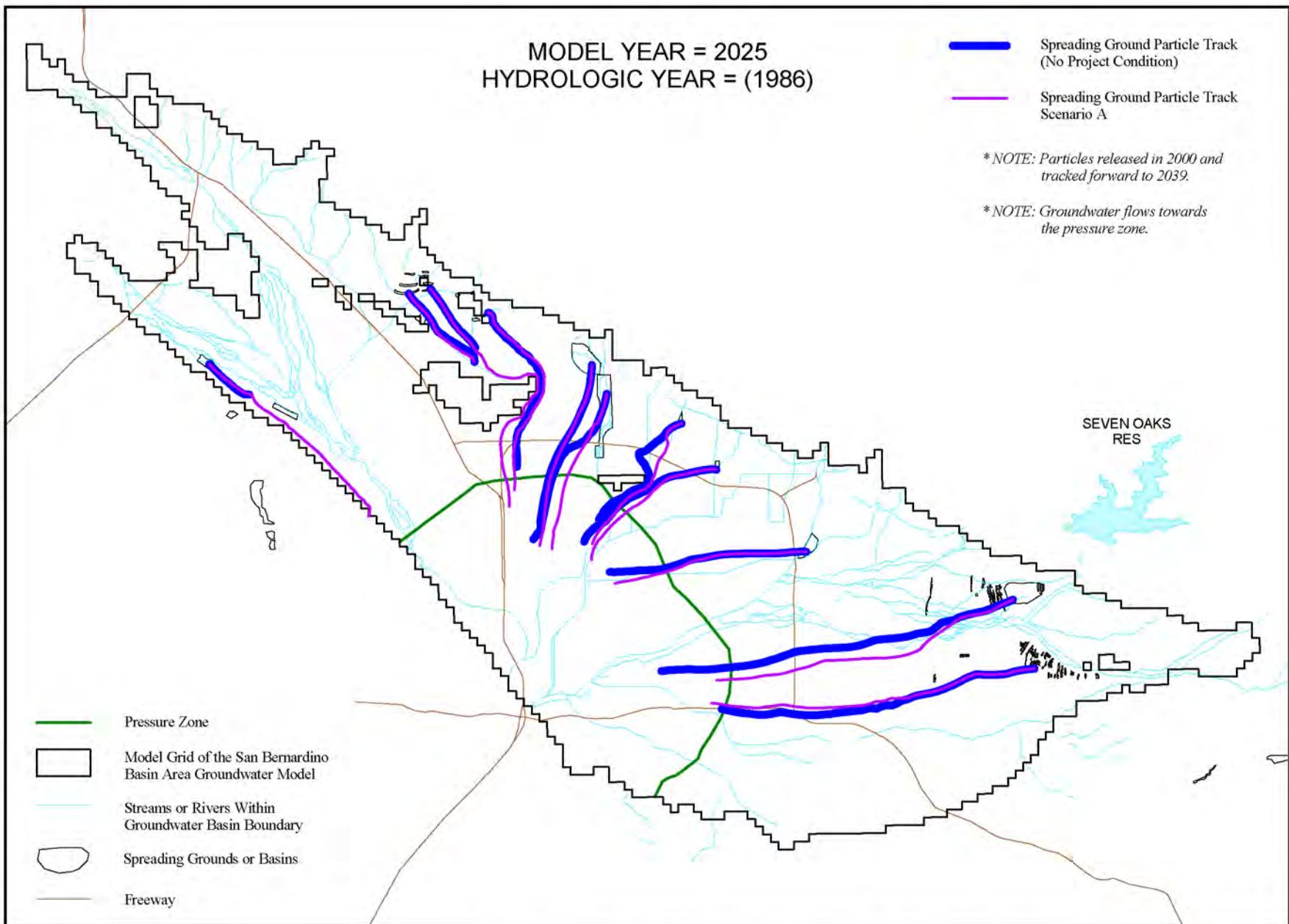
Figure B 44(e)

MODEL YEAR = 2025  
 HYDROLOGIC YEAR = (1986)

- Spreading Ground Particle Track (No Project Condition)
- Spreading Ground Particle Track Scenario A

*\* NOTE: Particles released in 2000 and tracked forward to 2039.*

*\* NOTE: Groundwater flows towards the pressure zone.*



- Pressure Zone
- Model Grid of the San Bernardino Basin Area Groundwater Model
- Streams or Rivers Within Groundwater Basin Boundary
- Spreading Grounds or Basins
- Freeway

SEVEN OAKS RES



SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR

**PARTICLE TRACKS FROM SPREADING GROUNDS,  
 NO PROJECT CONDITION VERSUS SCENARIO A, MODEL YEAR 2025**

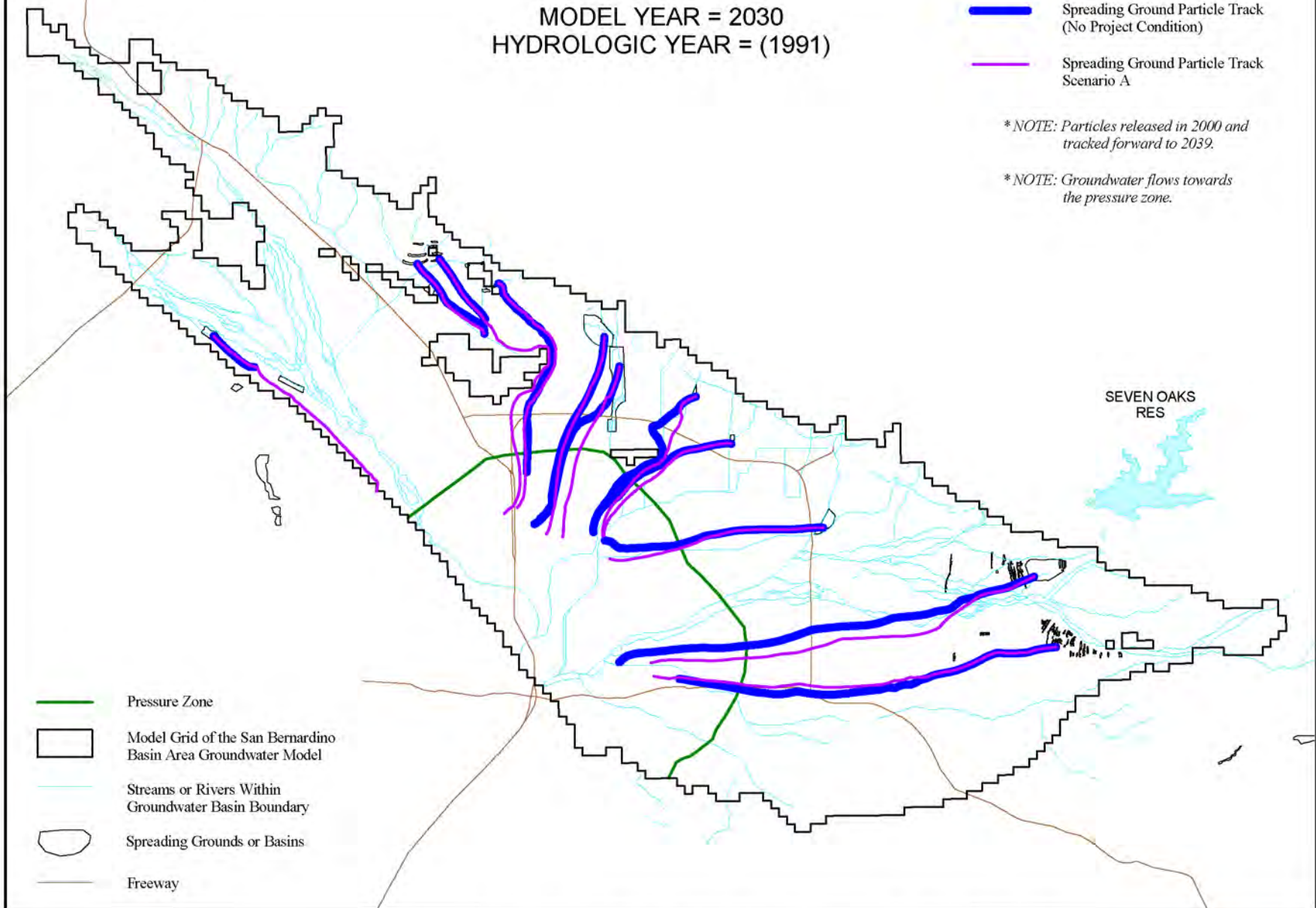
Figure B 44(f)

MODEL YEAR = 2030  
HYDROLOGIC YEAR = (1991)

- Spreading Ground Particle Track (No Project Condition)
- Spreading Ground Particle Track Scenario A

\*NOTE: Particles released in 2000 and tracked forward to 2039.

\*NOTE: Groundwater flows towards the pressure zone.



- Pressure Zone
- Model Grid of the San Bernardino Basin Area Groundwater Model
- Streams or Rivers Within Groundwater Basin Boundary
- Spreading Grounds or Basins
- Freeway

SEVEN OAKS RES



SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR

PARTICLE TRACKS FROM SPREADING GROUNDS,  
NO PROJECT CONDITION VERSUS SCENARIO A, MODEL YEAR 2030

Figure B 44(g)

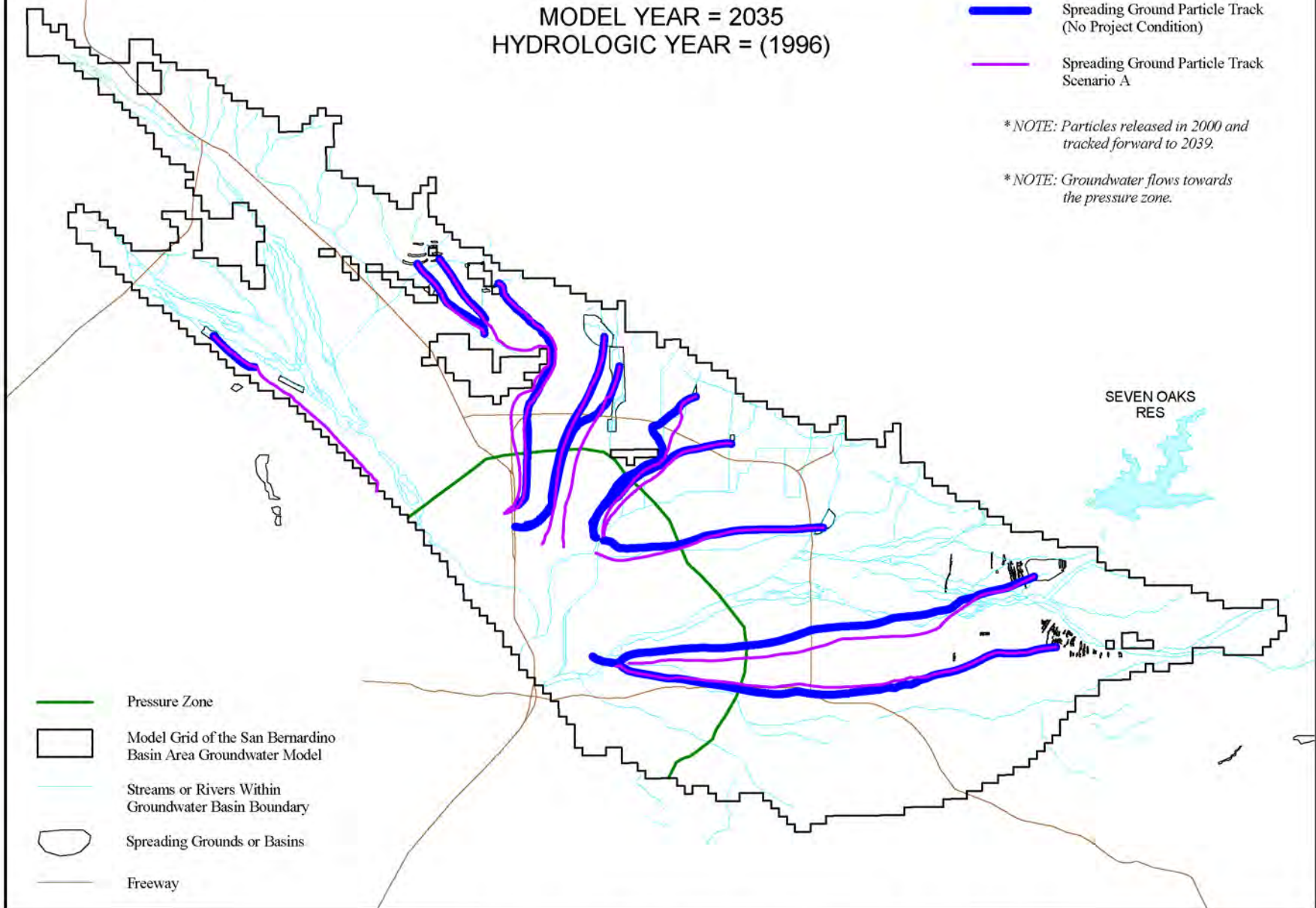


MODEL YEAR = 2035  
HYDROLOGIC YEAR = (1996)

- Spreading Ground Particle Track (No Project Condition)
- Spreading Ground Particle Track Scenario A

\*NOTE: Particles released in 2000 and tracked forward to 2039.

\*NOTE: Groundwater flows towards the pressure zone.



- Pressure Zone
- Model Grid of the San Bernardino Basin Area Groundwater Model
- Streams or Rivers Within Groundwater Basin Boundary
- Spreading Grounds or Basins
- Freeway

SEVEN OAKS RES



SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR

PARTICLE TRACKS FROM SPREADING GROUNDS,  
NO PROJECT CONDITION VERSUS SCENARIO A, MODEL YEAR 2035

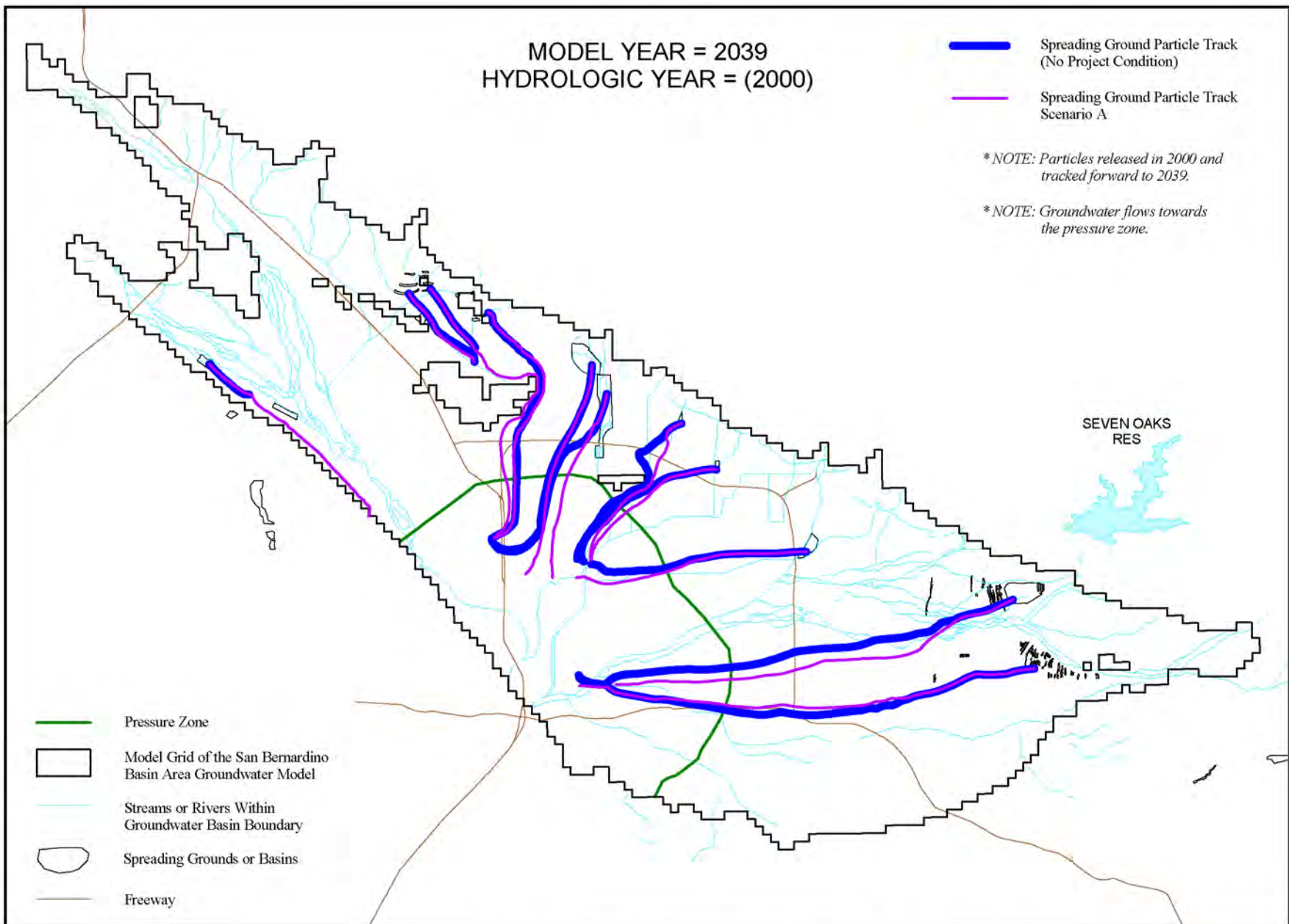
Figure B 44(h)

MODEL YEAR = 2039  
 HYDROLOGIC YEAR = (2000)

- Spreading Ground Particle Track (No Project Condition)
- Spreading Ground Particle Track Scenario A

*\* NOTE: Particles released in 2000 and tracked forward to 2039.*

*\* NOTE: Groundwater flows towards the pressure zone.*



- Pressure Zone
- Model Grid of the San Bernardino Basin Area Groundwater Model
- Streams or Rivers Within Groundwater Basin Boundary
- Spreading Grounds or Basins
- Freeway

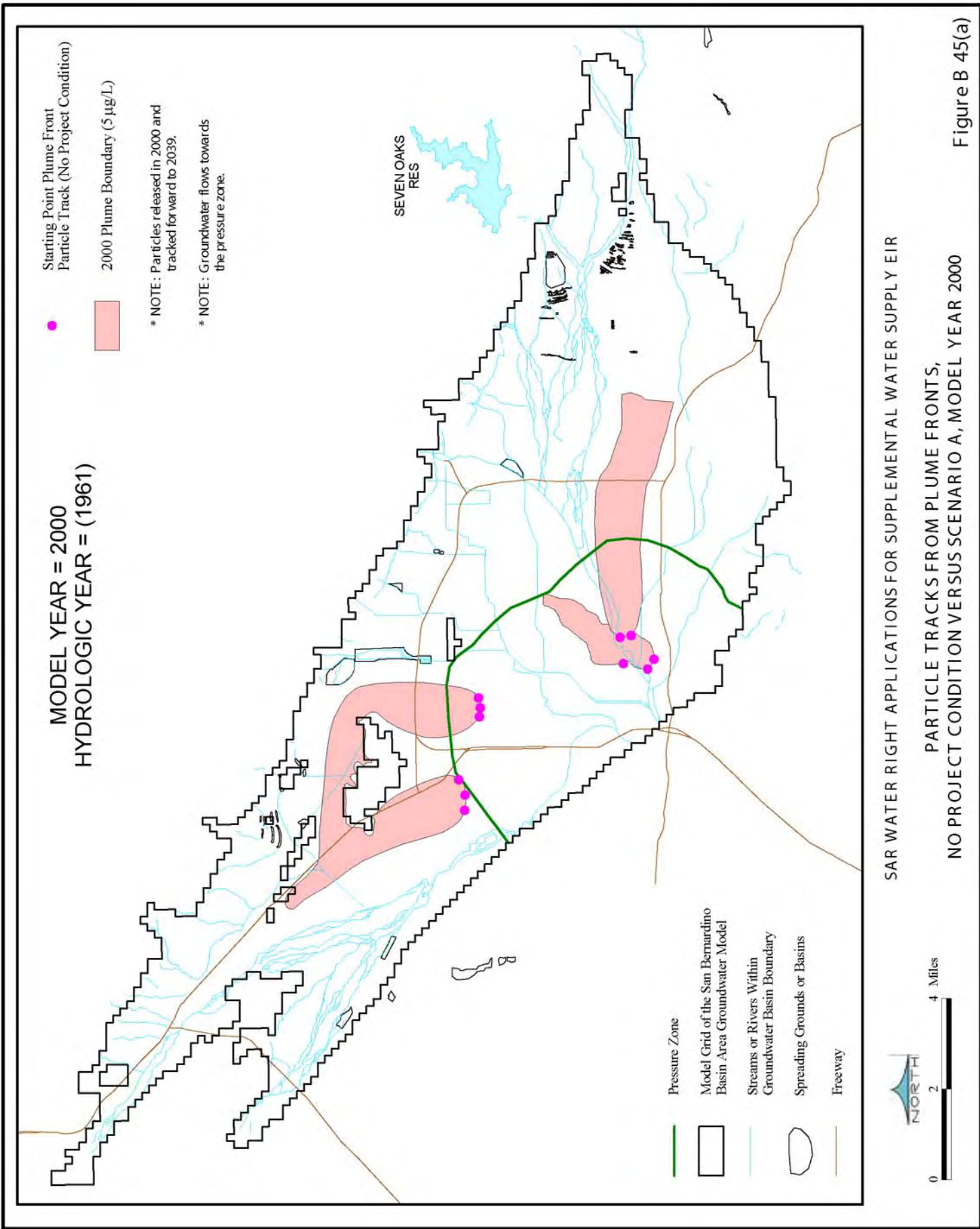
SEVEN OAKS RES



SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR

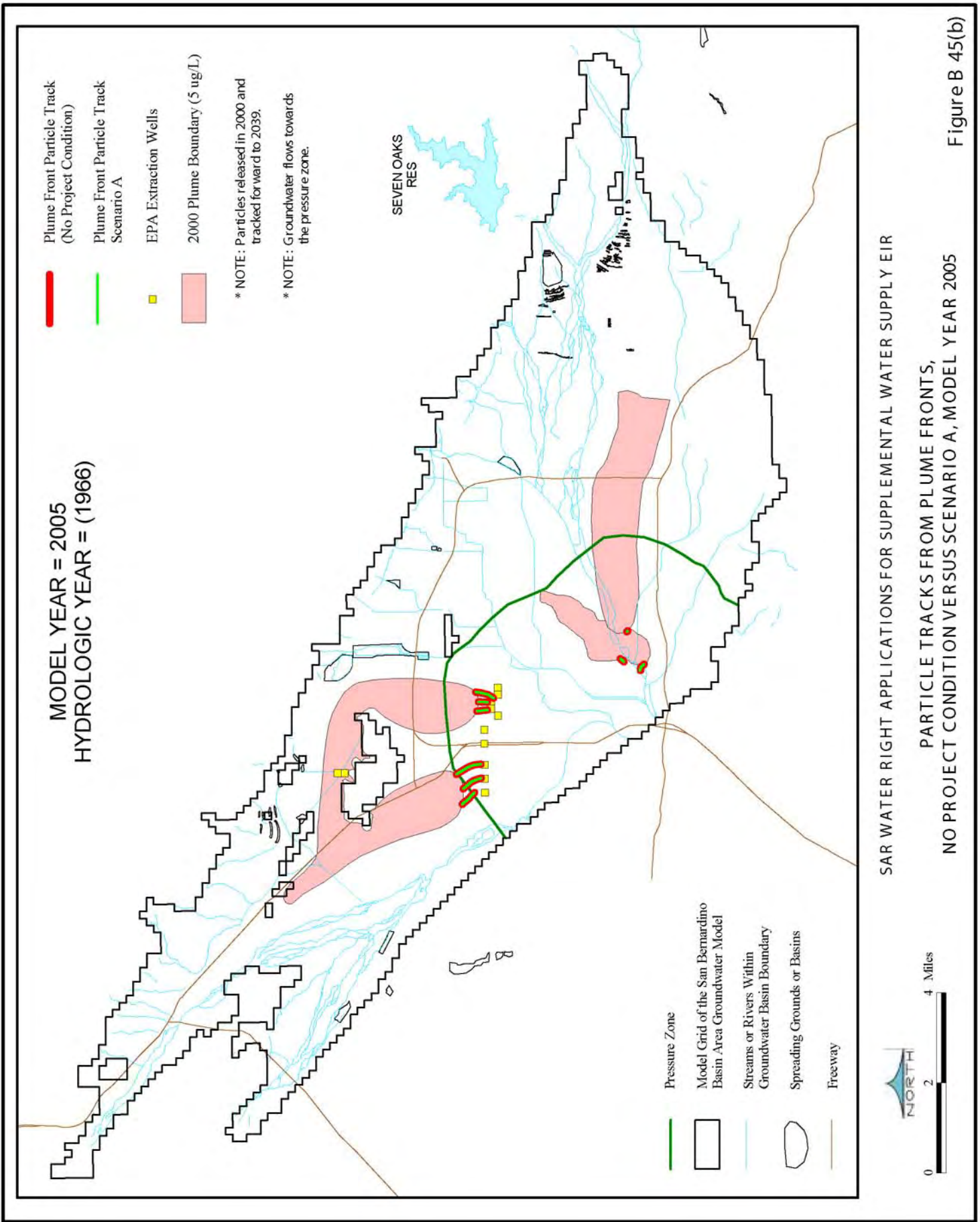
**PARTICLE TRACKS FROM SPREADING GROUNDS,  
 NO PROJECT CONDITION VERSUS SCENARIO A, MODEL YEAR 2039**

Figure B 44(i)



SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR  
 PARTICLE TRACKS FROM PLUME FRONTS,  
 NO PROJECT CONDITION VERSUS SCENARIO A, MODEL YEAR 2000

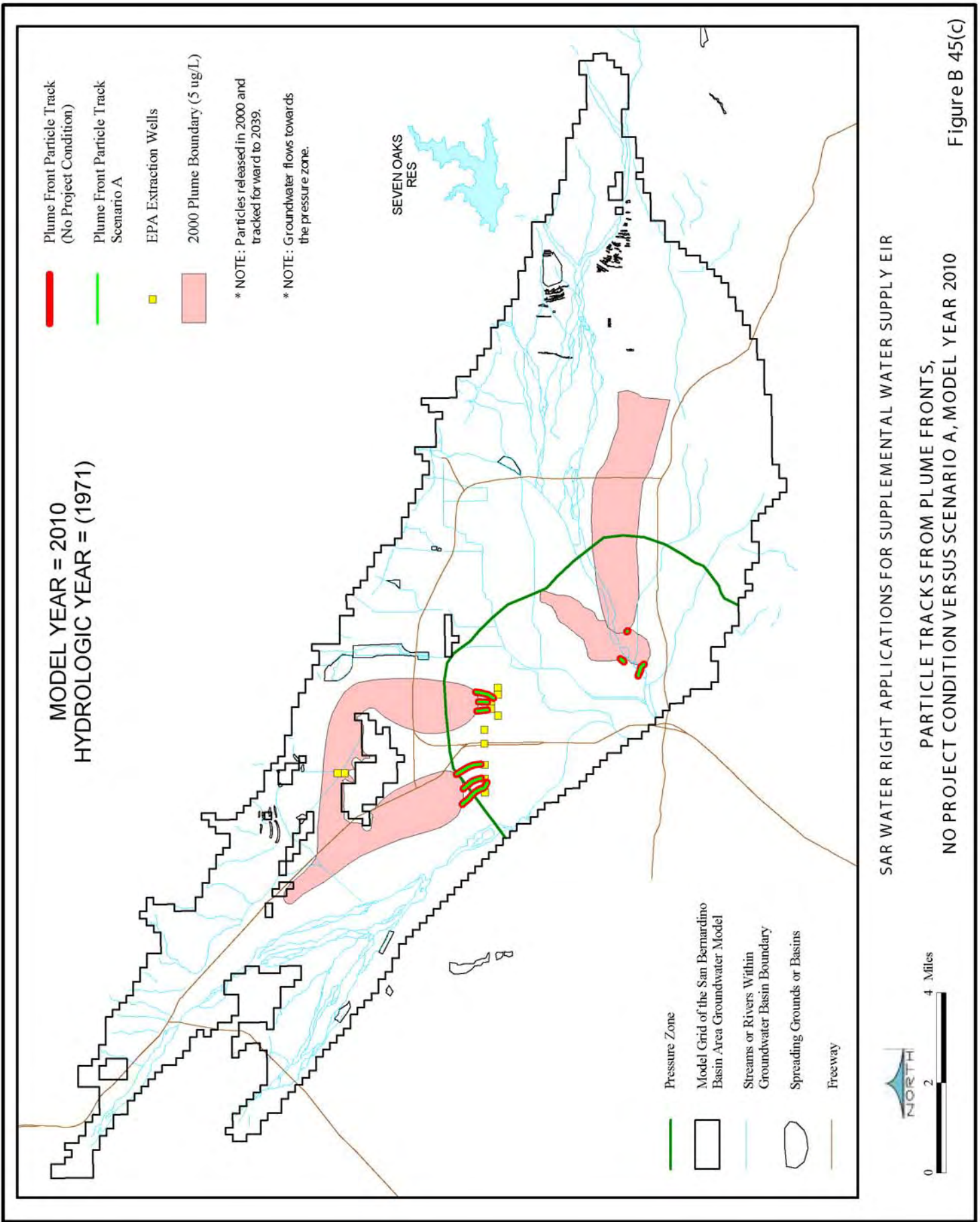
Figure B 45(a)



SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR

PARTICLE TRACKS FROM PLUME FRONTS,  
NO PROJECT CONDITION VERSUS SCENARIO A, MODEL YEAR 2005

Figure B 45(b)



SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR

PARTICLE TRACKS FROM PLUME FRONTS,  
NO PROJECT CONDITION VERSUS SCENARIO A, MODEL YEAR 2010

Figure B 45(c)

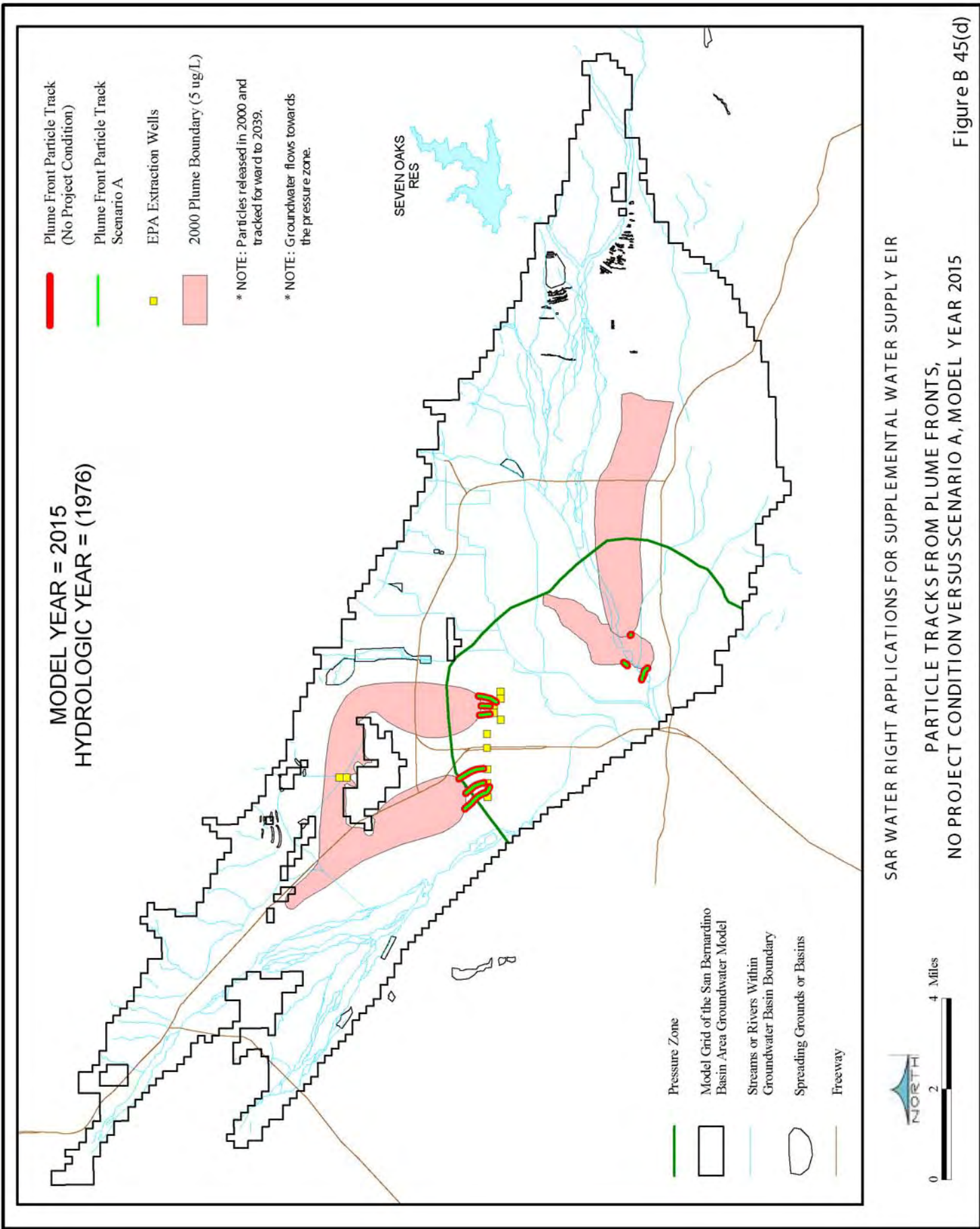
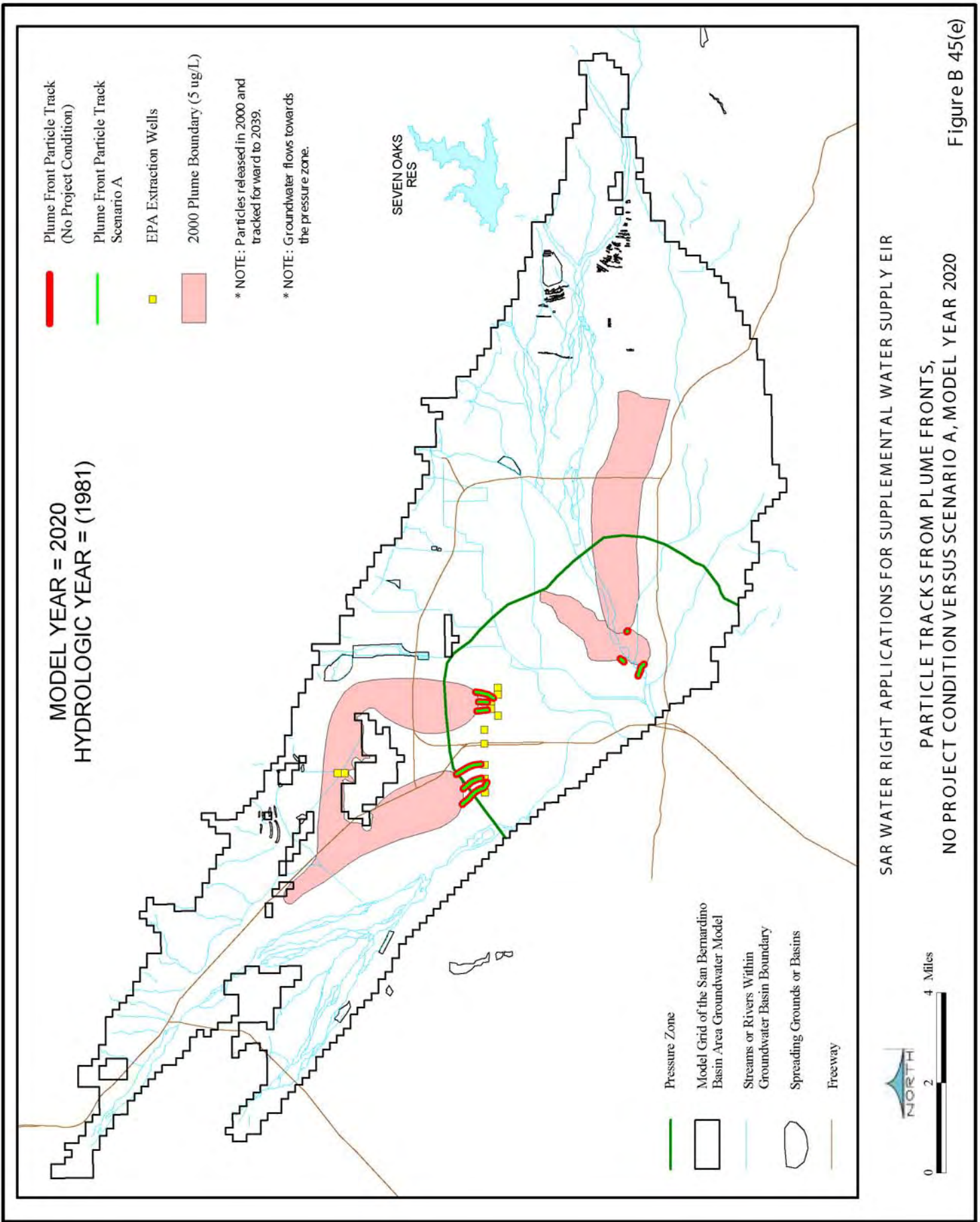


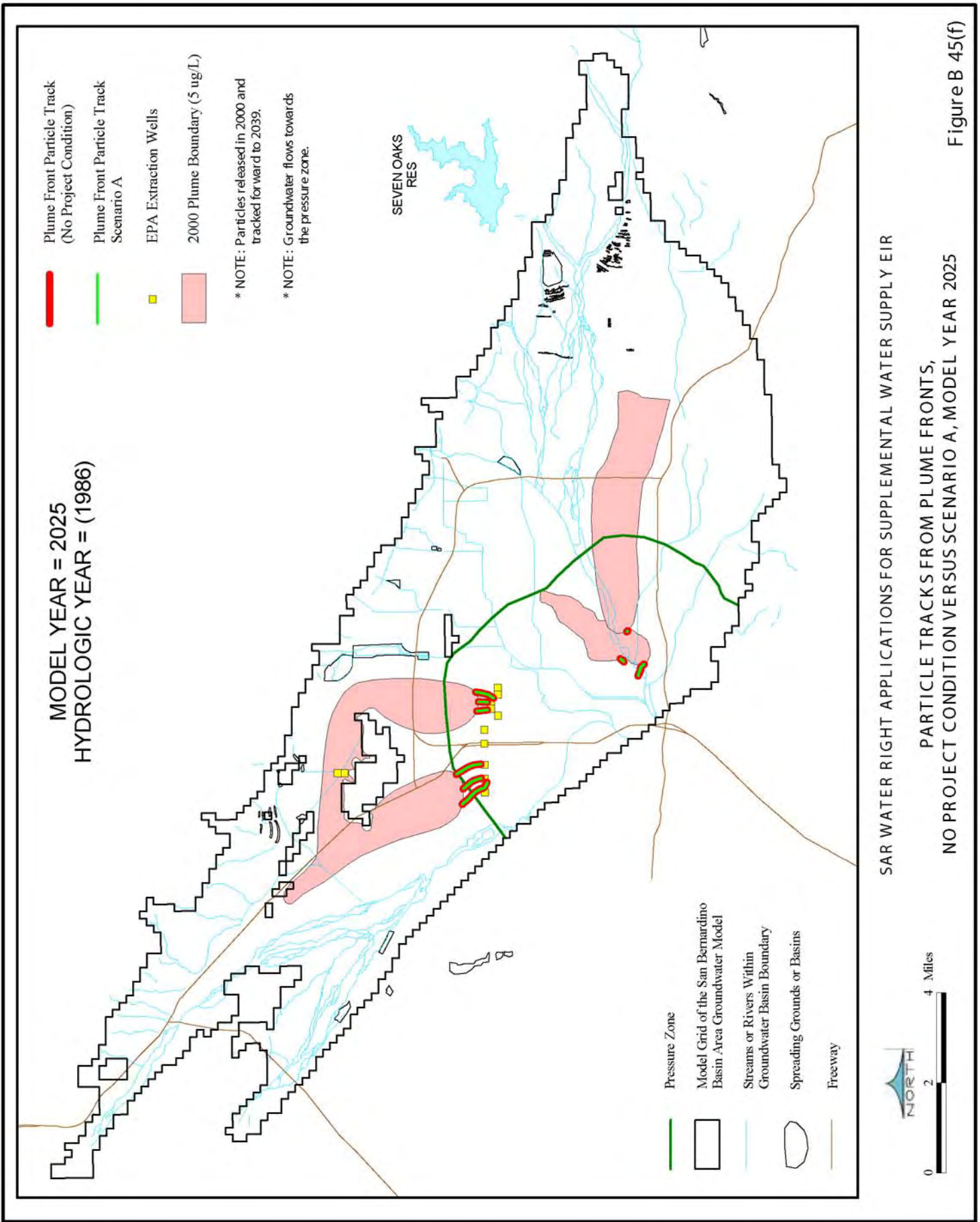
Figure B 45(d)



SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR

PARTICLE TRACKS FROM PLUME FRONTS,  
NO PROJECT CONDITION VERSUS SCENARIO A, MODEL YEAR 2020

Figure B 45(e)

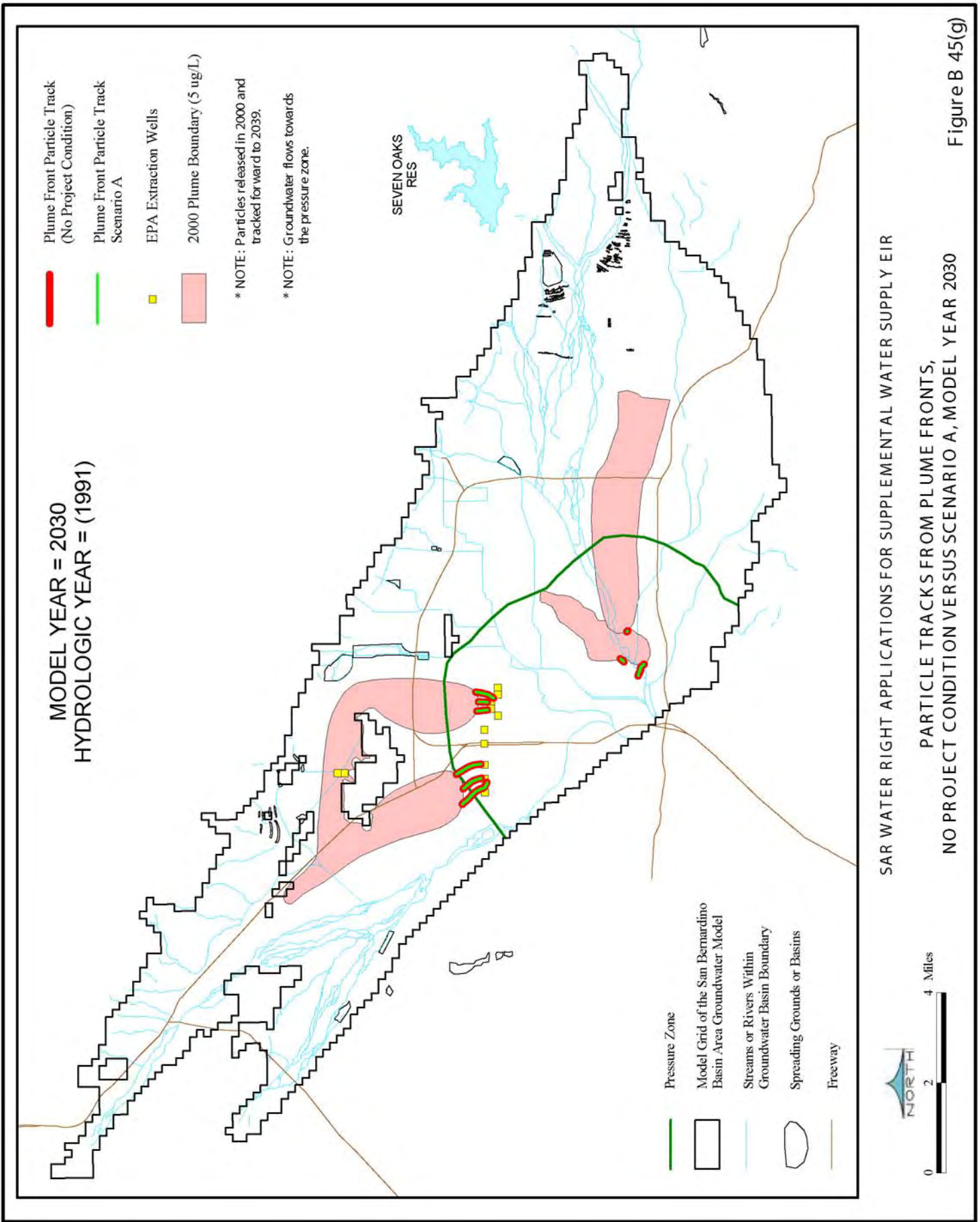


SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR

PARTICLE TRACKS FROM PLUME FRONTS,  
NO PROJECT CONDITION VERSUS SCENARIO A, MODEL YEAR 2025

Figure B 45(f)

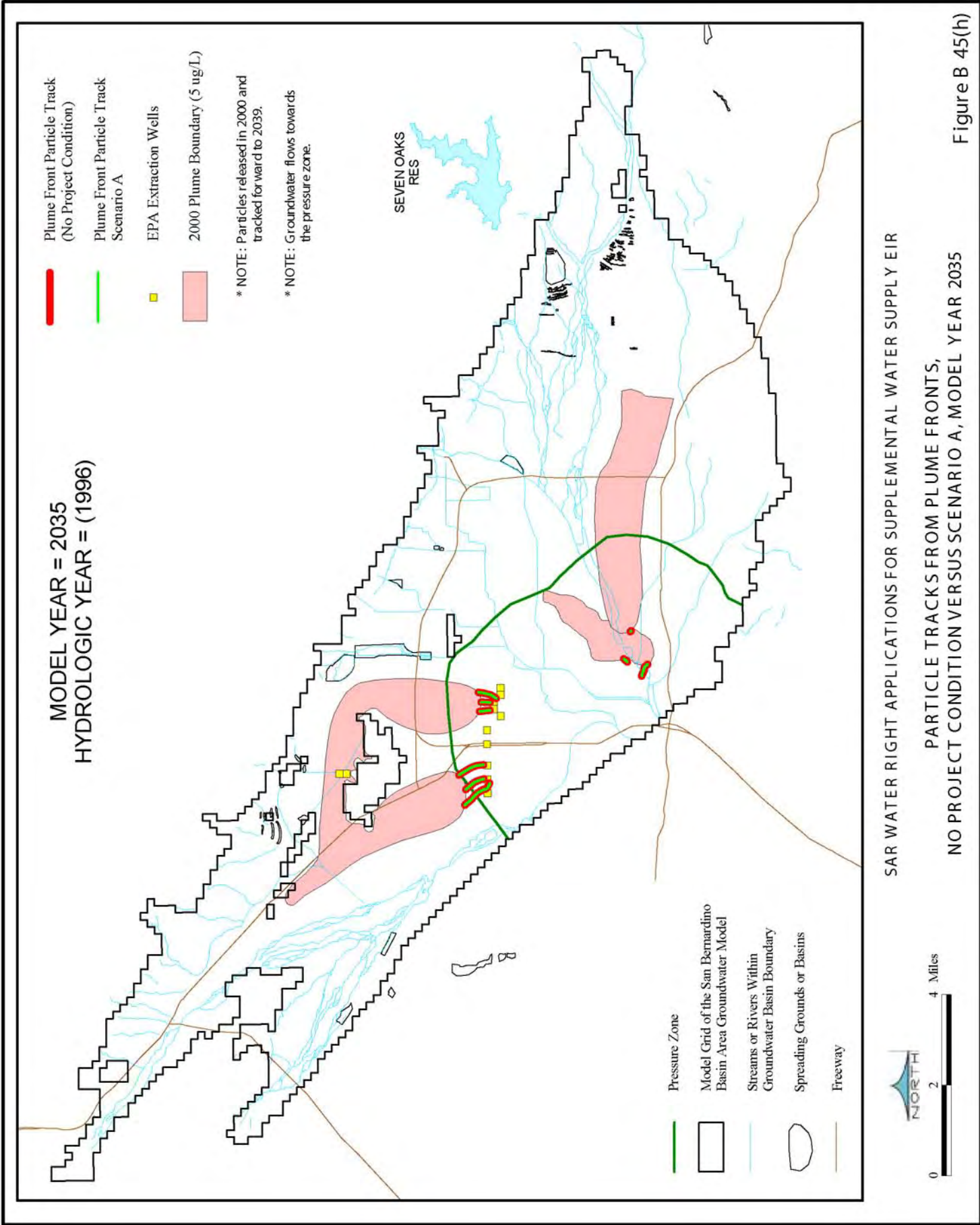




SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR

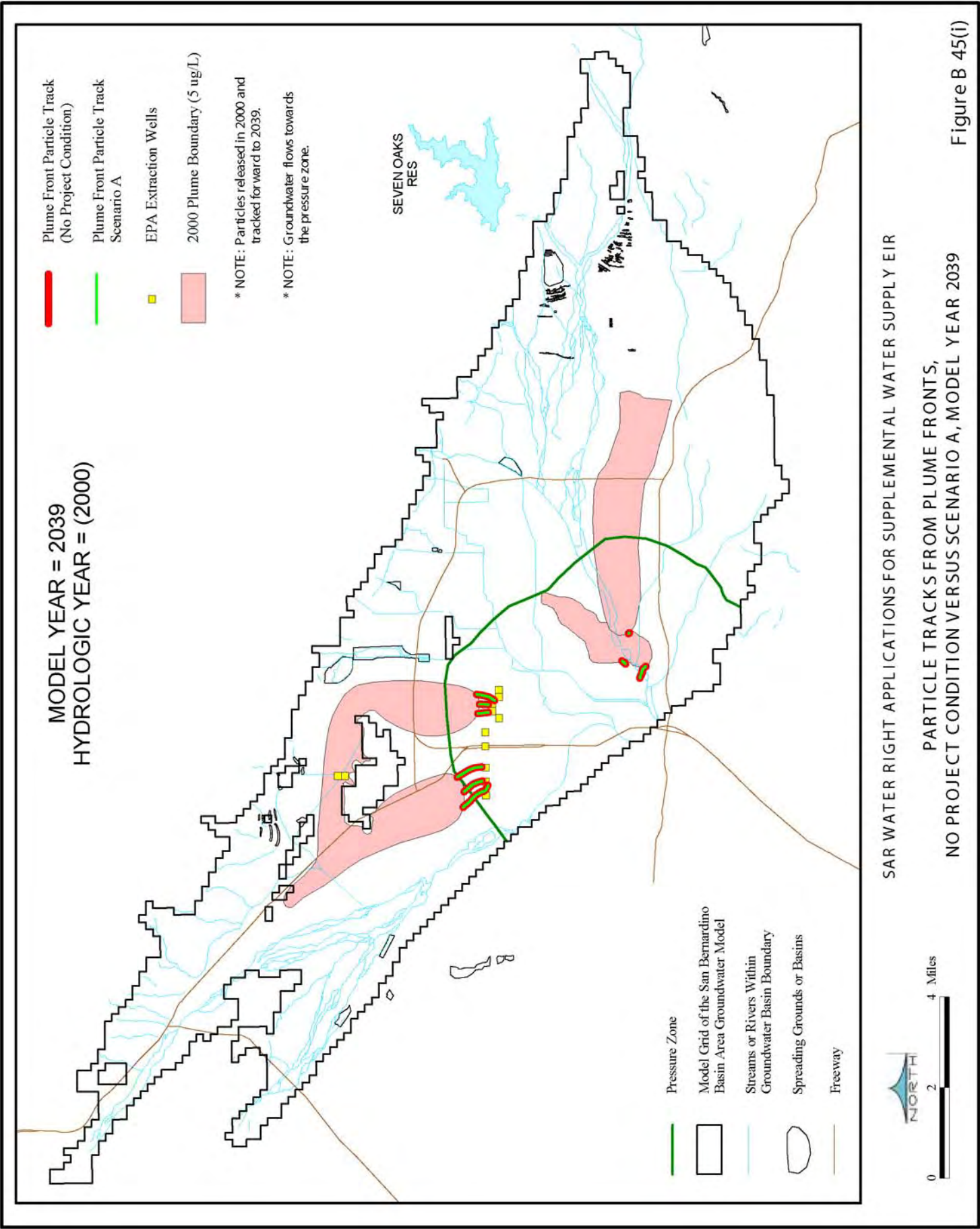
PARTICLE TRACKS FROM PLUME FRONTS,  
NO PROJECT CONDITION VERSUS SCENARIO A, MODEL YEAR 2030

Figure B 45(g)



SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR  
 PARTICLE TRACKS FROM PLUME FRONTS,  
 NO PROJECT CONDITION VERSUS SCENARIO A, MODEL YEAR 2035

Figure B 45(h)



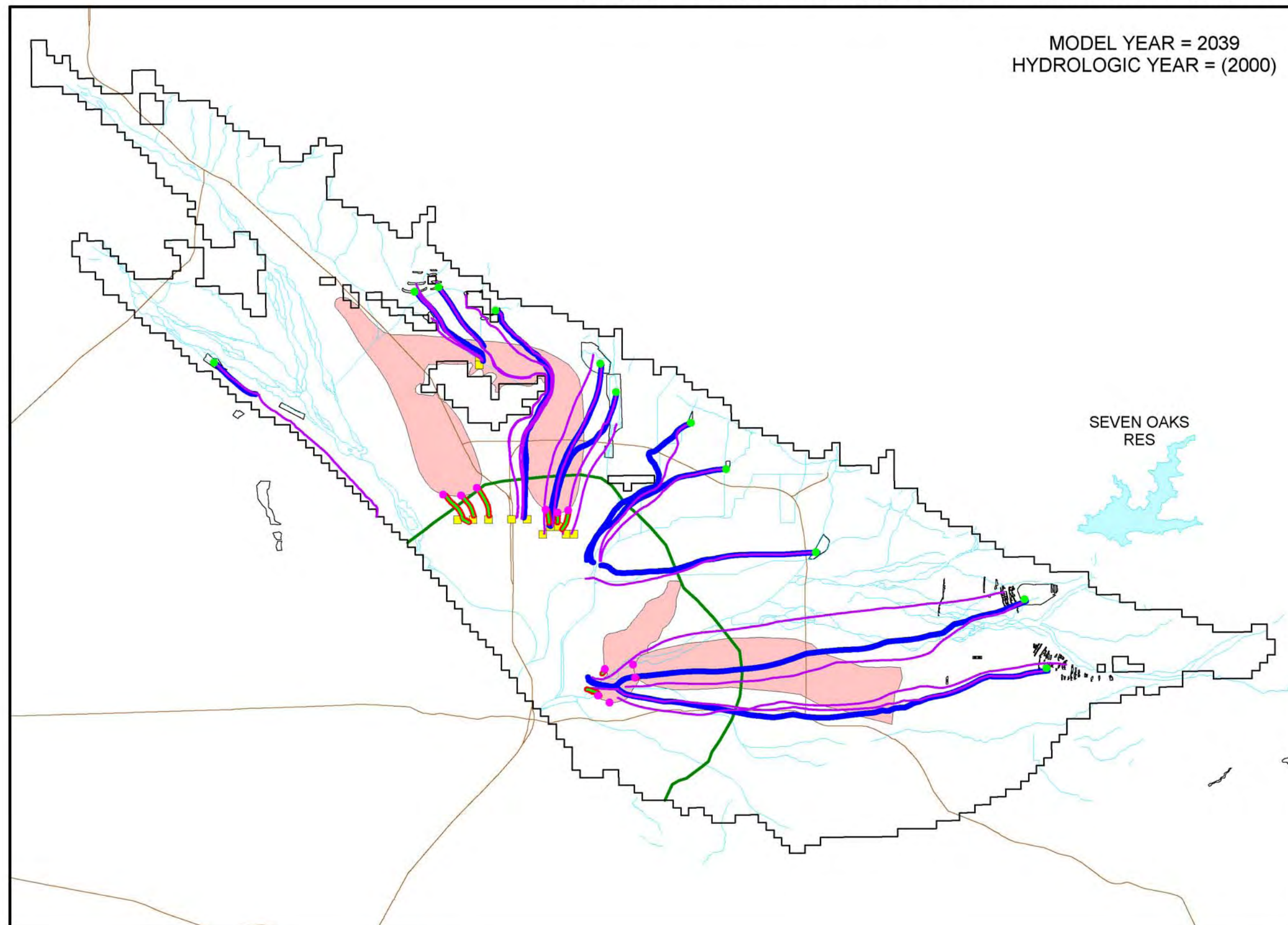
SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR  
 PARTICLE TRACKS FROM PLUME FRONTS,  
 NO PROJECT CONDITION VERSUS SCENARIO A, MODEL YEAR 2039

Figure B 45(i)

GROUNDWATER TECHNICAL APPENDIX  
 SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR

MODEL YEAR = 2039  
 HYDROLOGIC YEAR = (2000)

PARTICLE TRACKS FROM BOTH SPREADING GROUNDS AND PLUME FRONTS, YEAR 2039, NO PROJECT CONDITION VERSUS SCENARIO A



EXPLANATION

- Starting Point Spreading Ground Particle Track (No Project Condition)
- Spreading Ground Particle Track (No Project Condition)
- Spreading Ground Particle Track Scenario A
- Starting Point Plume Front Particle Track (No Project Condition)
- Plume Front Particle Track (No Project Condition)
- Plume Front Particle Track Scenario A
- EPA Extraction Wells
- 2000 Plume Boundary (5 µg/L)
- Pressure Zone
- Model Grid of the San Bernardino Basin Area Groundwater Model
- Streams or Rivers Within Groundwater Basin Boundary
- Spreading Grounds or Basins
- Freeway

\* NOTE: Particles released in 2000 and tracked forward to 2039.

\* NOTE: Groundwater flows towards the pressure zone.

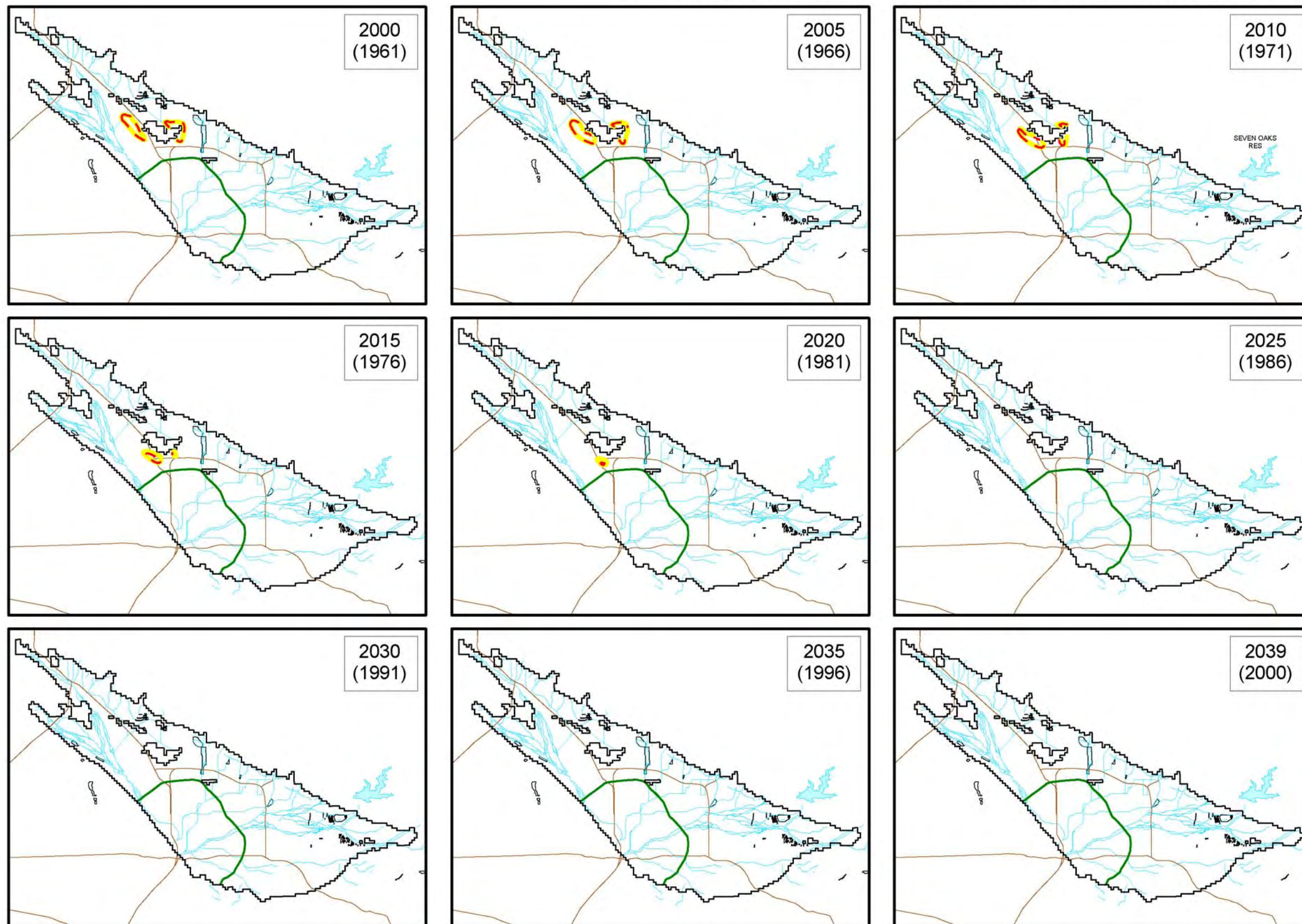
Map Projection:  
 State Plane 1927 (California Zone V)



Figure B 46

SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR

**PCE PLUME BOUNDARY  
LAYER 1  
NO PROJECT CONDITION  
VERSUS SCENARIO A**



EXPLANATION

Yellow Line PCE Plume Boundary (5 ug/L)  
Layer 1, No Project Condition

--- PCE Plume Boundary (5 ug/L)  
Layer 1, Scenario A

2000 (1961) Model Year  
(Assumed Hydrological Year)

— Pressure Zone

□ Model Grid of the San Bernardino  
Basin Area Groundwater Model

— Streams or Rivers Within  
Groundwater Basin Boundary

○ Spreading Grounds or Basins

— Freeway

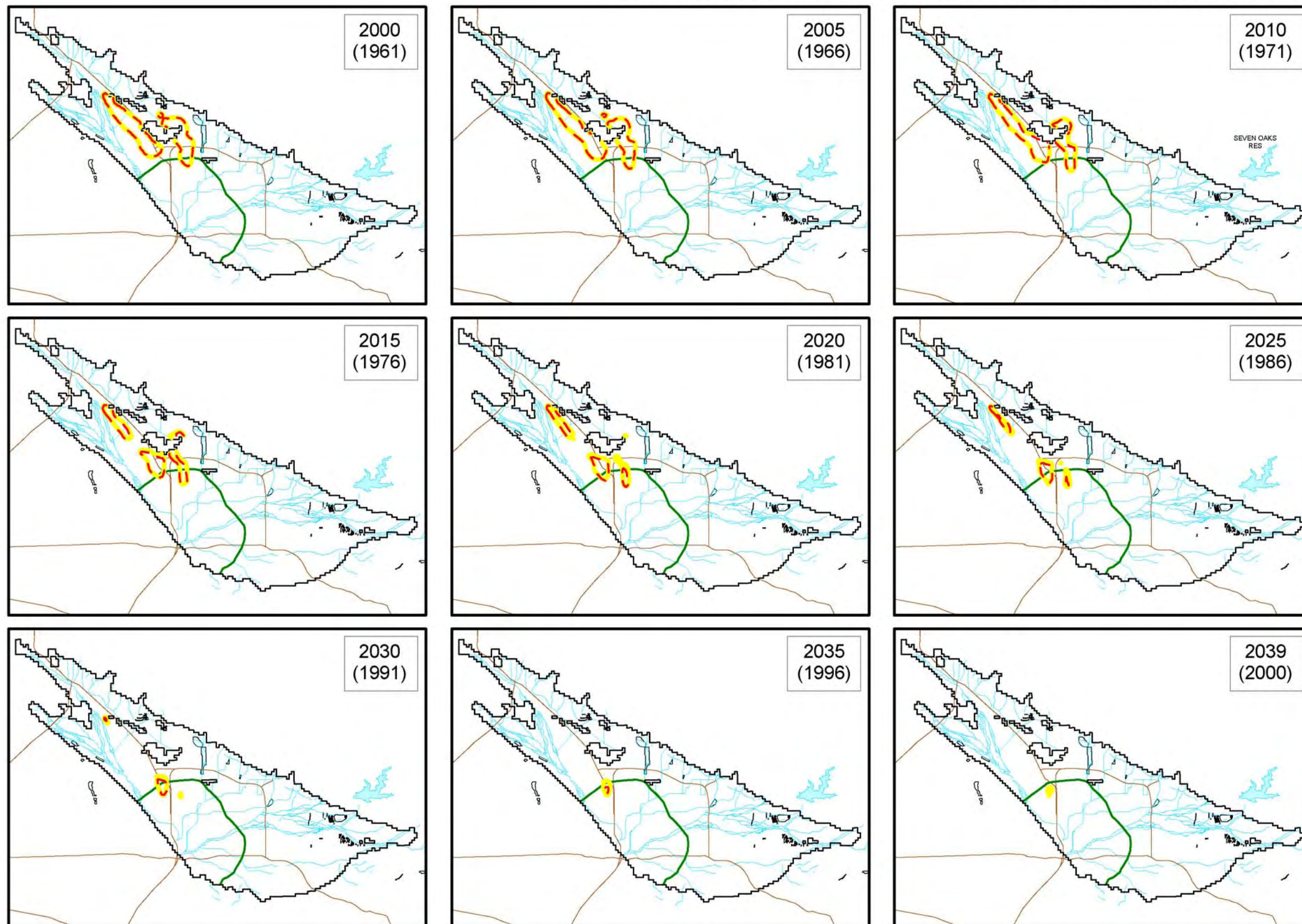
Map Projection:  
State Plane 1927 (California Zone V)



**Figure B 62**

SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR

**PCE PLUME BOUNDARY  
LAYER 2  
NO PROJECT CONDITION  
VERSUS SCENARIO A**



EXPLANATION

Yellow Line PCE Plume Boundary (5 ug/L)  
Layer 2, No Project Condition

--- PCE Plume Boundary (5 ug/L)  
Layer 2, Scenario A

2000 (1961) Model Year  
(Assumed Hydrological Year)

— Pressure Zone

□ Model Grid of the San Bernardino  
Basin Area Groundwater Model

— Streams or Rivers Within  
Groundwater Basin Boundary

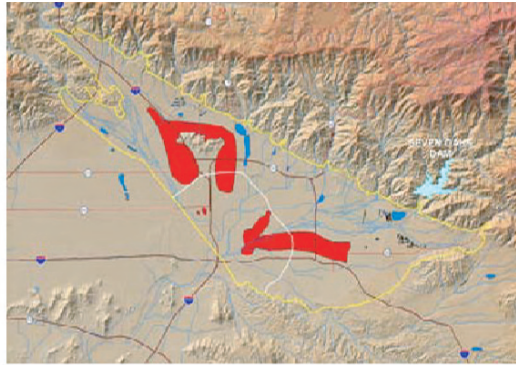
○ Spreading Grounds or Basins

— Freeway

Map Projection:  
State Plane 1927 (California Zone V)

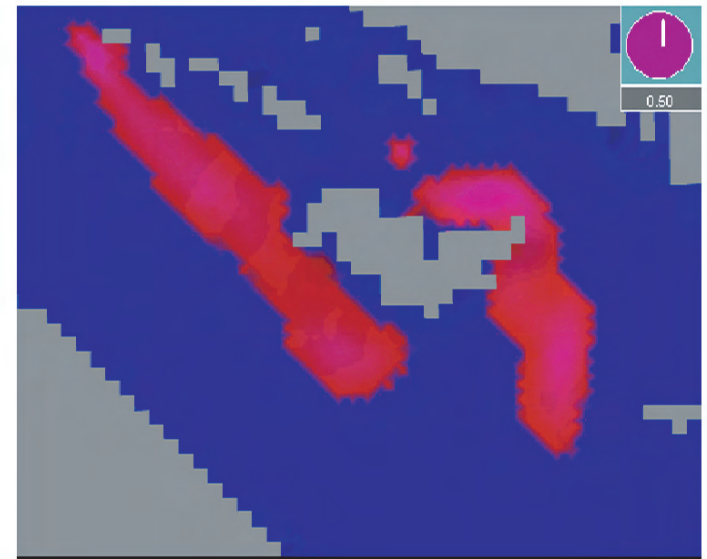
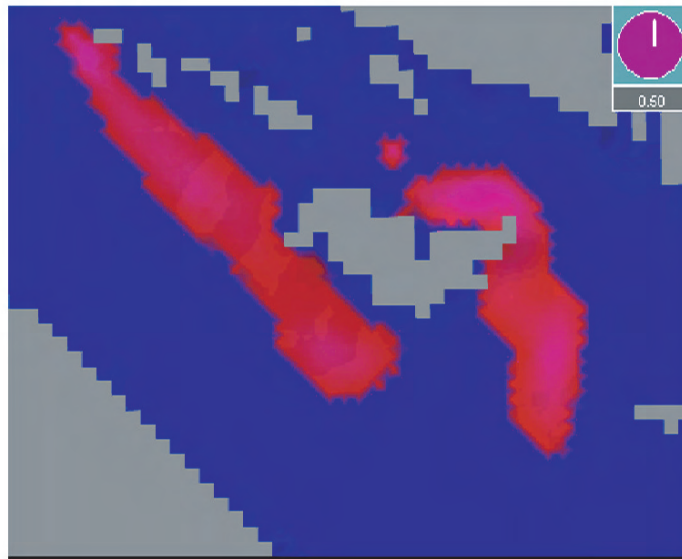


**Figure B 63**



**No Project Condition**


**Scenario A**



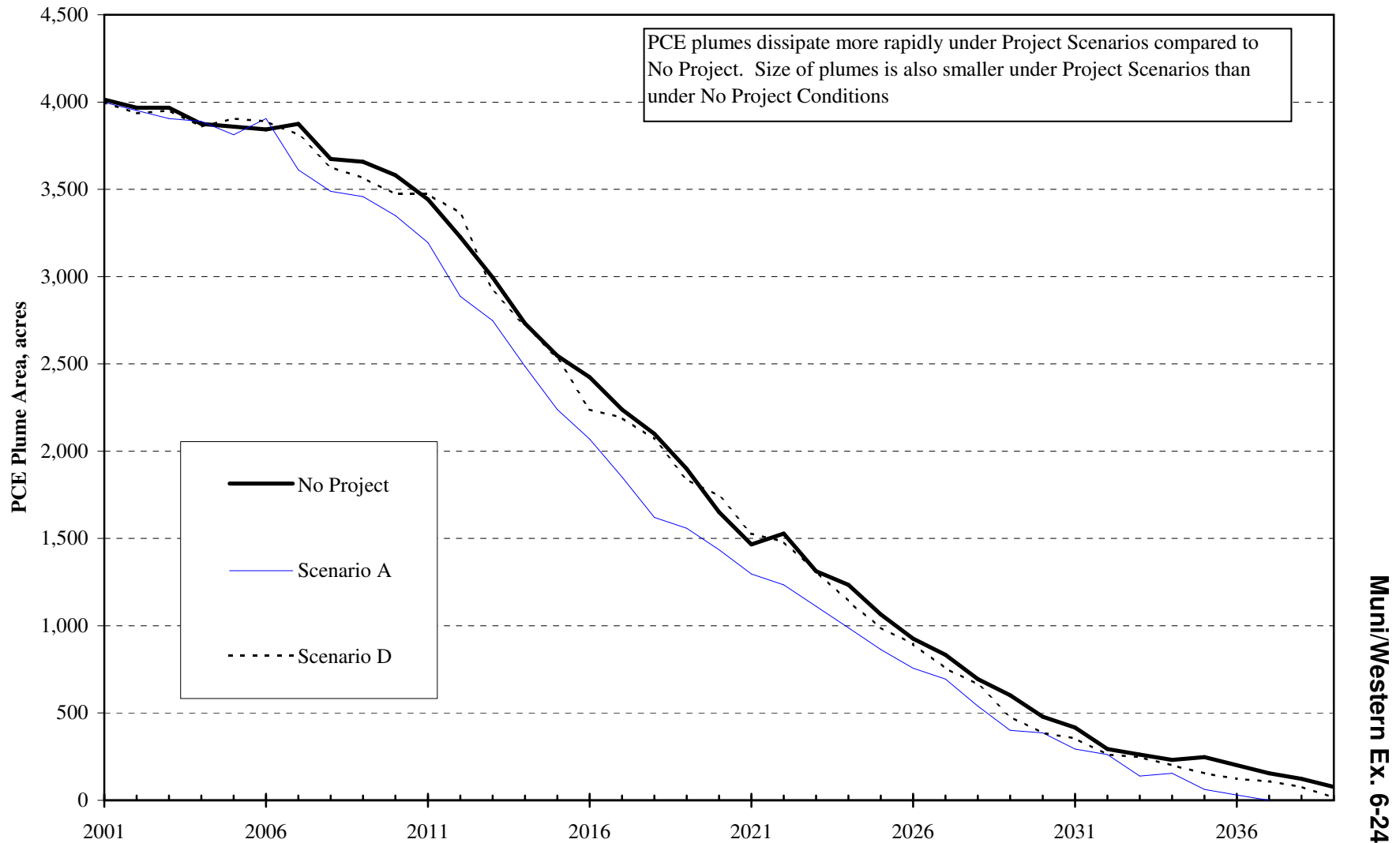
2001-2039

PCE Concentration  
Red: 5 µg/L  
Dark Blue: < 5 µg/L



Muni/Western Ex. 6-247	Drawn: DEW	SANTA ANA RIVER WATER RIGHTS HEARING - TESTIMONY OF DENNIS E. WILLIAMS	 GEO SCIENCE Support Services, Incorporated P.O. Box 220, Claremont, CA 91711 Tel: (909)920-0707 Fax: (909)920-0403 www.gssiwater.com
	Checked:		
	Approved:		
	Date: 16-APR-07		
SCREENSHOT OF PCE PLUME ANIMATION (SCENARIO A, 2001 - 2039)			

### PCE Plume Areas 2001 -2039

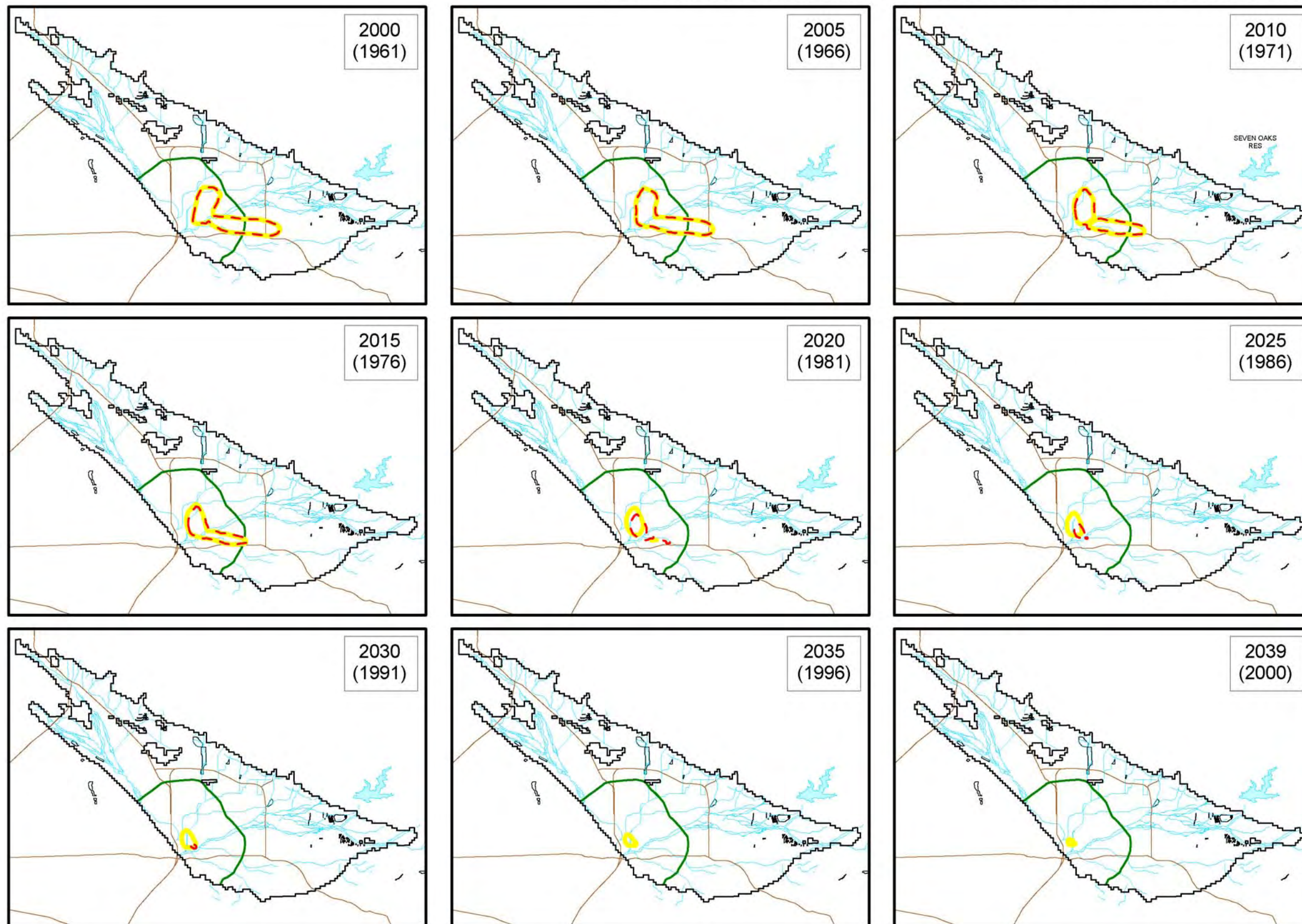


Muni/Western Ex. 6-248



SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR

**TCE PLUME BOUNDARY  
LAYER 1  
NO PROJECT CONDITION  
VERSUS SCENARIO A**



EXPLANATION

Yellow Line TCE Plume Boundary (5 ug/L)  
Layer 1, No Project Condition

--- TCE Plume Boundary (5 ug/L)  
Layer 1, Scenario A

2000 (1961) Model Year  
(Assumed Hydrological Year)

— Pressure Zone

□ Model Grid of the San Bernardino  
Basin Area Groundwater Model

— Streams or Rivers Within  
Groundwater Basin Boundary

○ Spreading Grounds or Basins

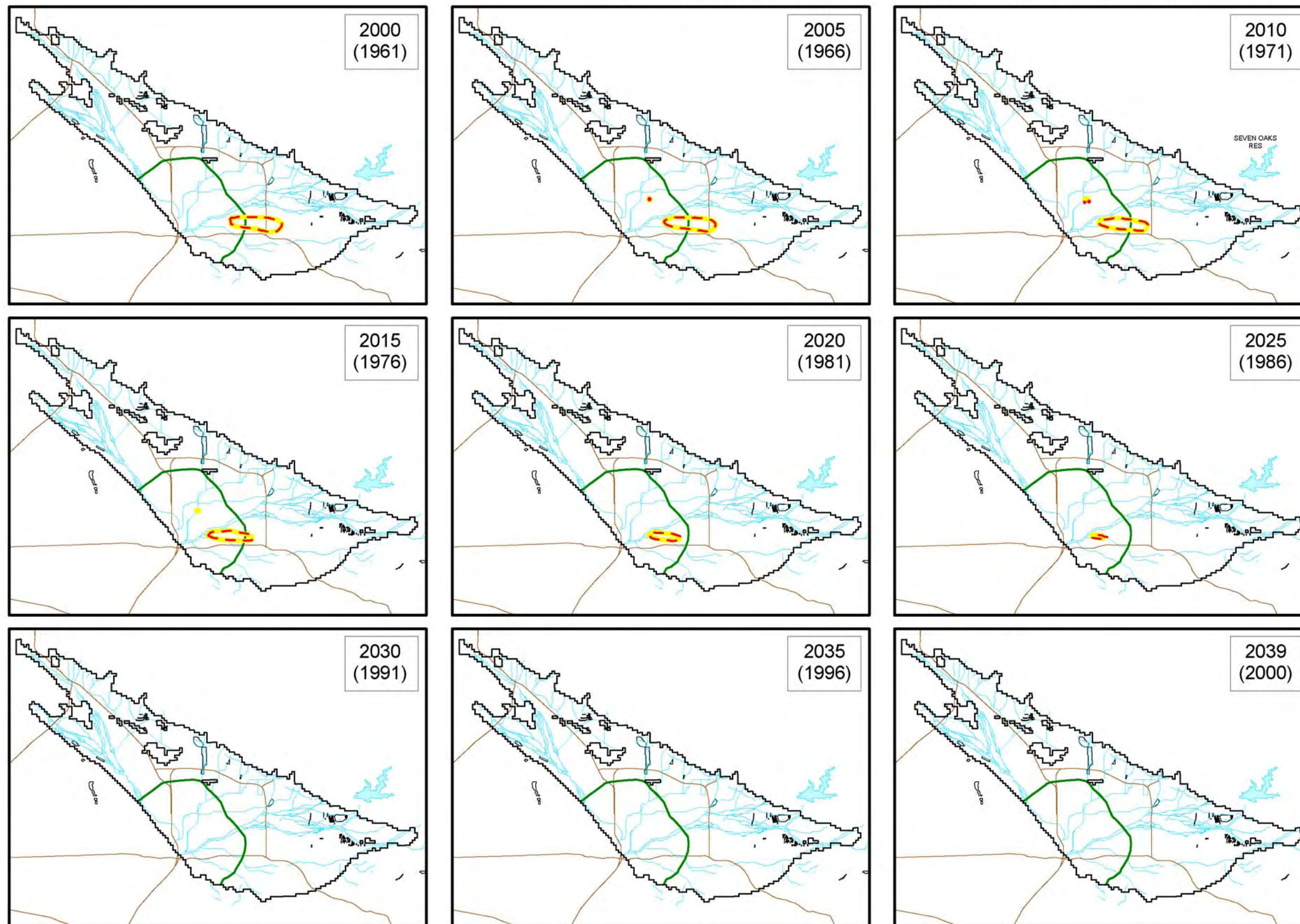
— Freeway

Map Projection:  
State Plane 1927 (California Zone V)



**Figure B 70**

SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR



**TCE PLUME BOUNDARY  
LAYER 2  
NO PROJECT CONDITION  
VERSUS SCENARIO A**

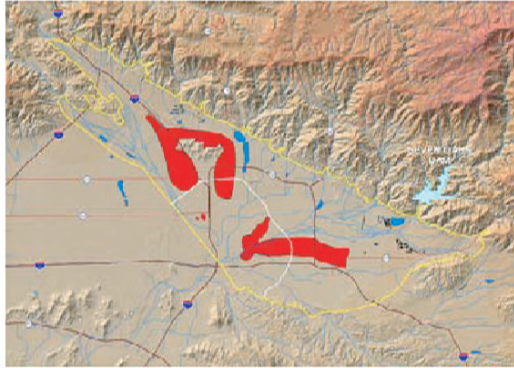
EXPLANATION

- Yellow Line TCE Plume Boundary (5 ug/L) Layer 2, No Project Condition
- - - TCE Plume Boundary (5 ug/L) Layer 2, Scenario A
- 2000 (1961) Model Year (Assumed Hydrological Year)
- Pressure Zone
- Model Grid of the San Bernardino Basin Area Groundwater Model
- Streams or Rivers Within Groundwater Basin Boundary
- Spreading Grounds or Basins
- Freeway

Map Projection:  
State Plane 1927 (California Zone V)

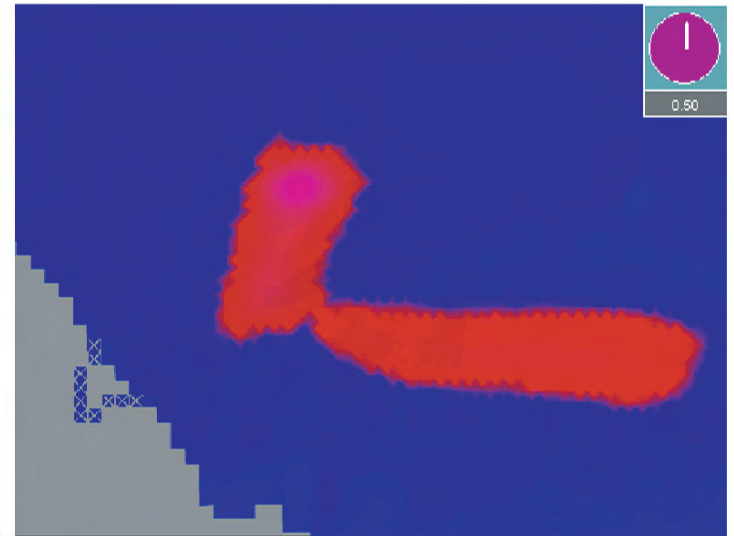
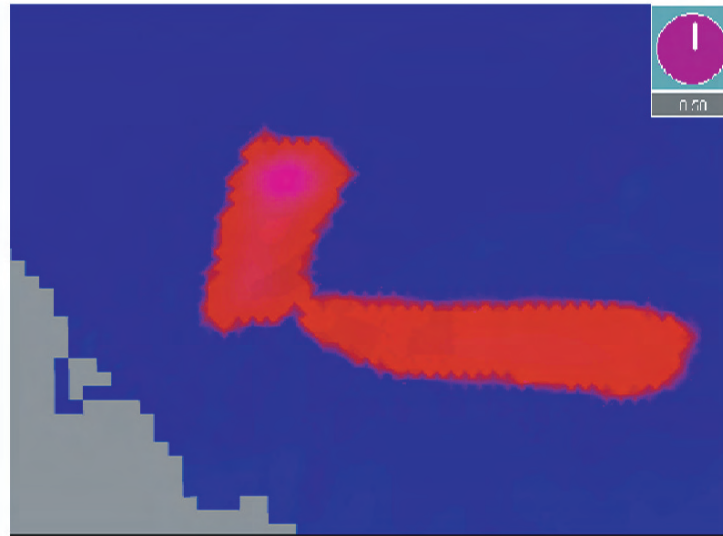


**Figure B 71**



**No Project Condition**

**Scenario A**



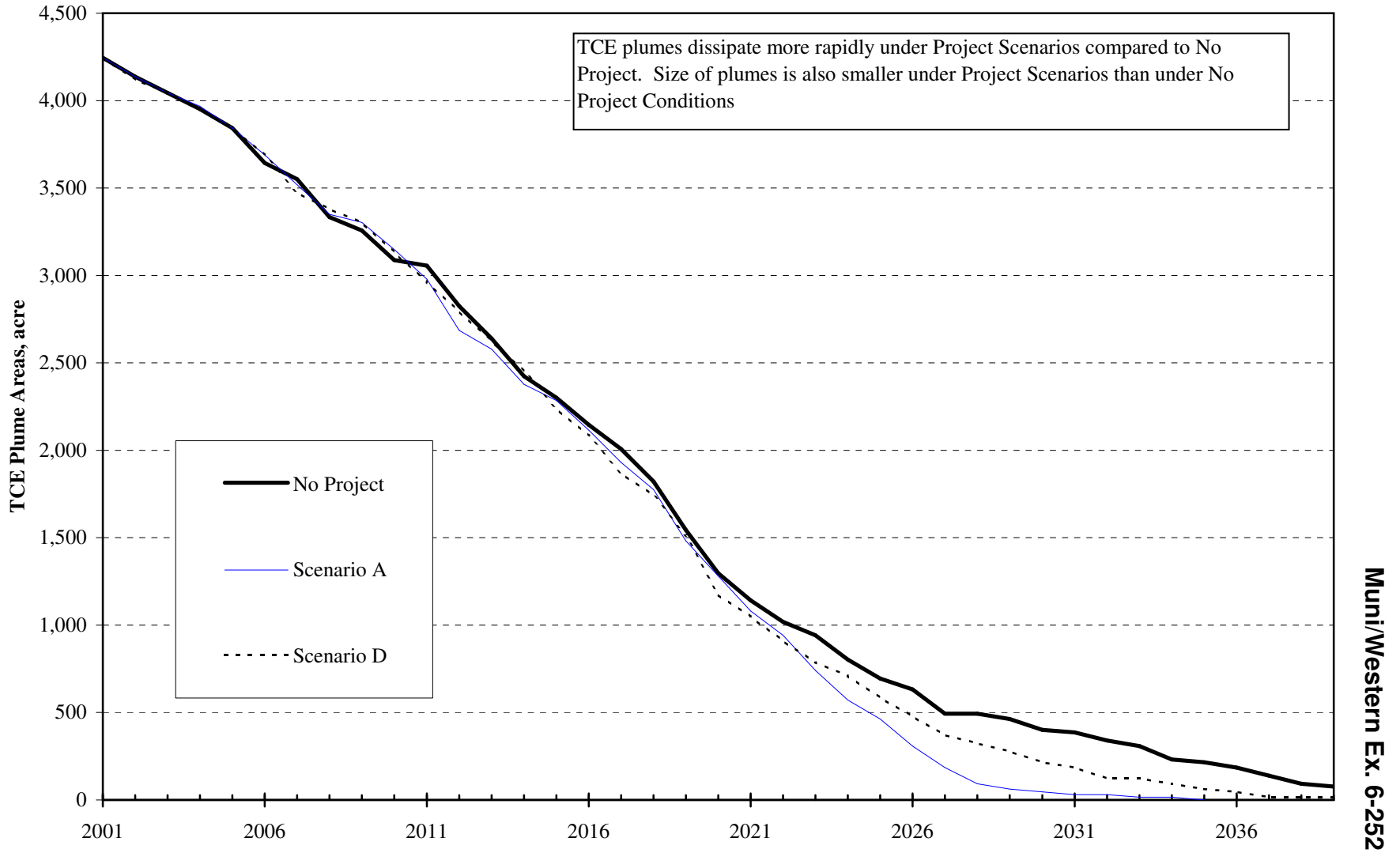
2001-2039

TCE Concentration  
Red: 5 µg/L  
Dark Blue: < 5 µg/L



Muni/Western Ex. 6-251	Drawn: DEW	SANTA ANA RIVER WATER RIGHTS HEARING - TESTIMONY OF DENNIS E. WILLIAMS	<p>GEO SCIENCE Support Services, Incorporated P.O. Box 220, Claremont, CA 91711 Tel: (909)920-0707 Fax: (909)920-0403 www.gssiwater.com</p>
	Checked:		
	Approved:		
	Date: 16-APR-07		
<p><b>SCREENSHOT OF TCE PLUME ANIMATION (SCENARIO A, 2001 - 2039)</b></p>			

### TCE Plume Areas 2001 -2039



Muni/Western Ex. 6-252

Figure B 74a. TDS Concentrations for IW-01.

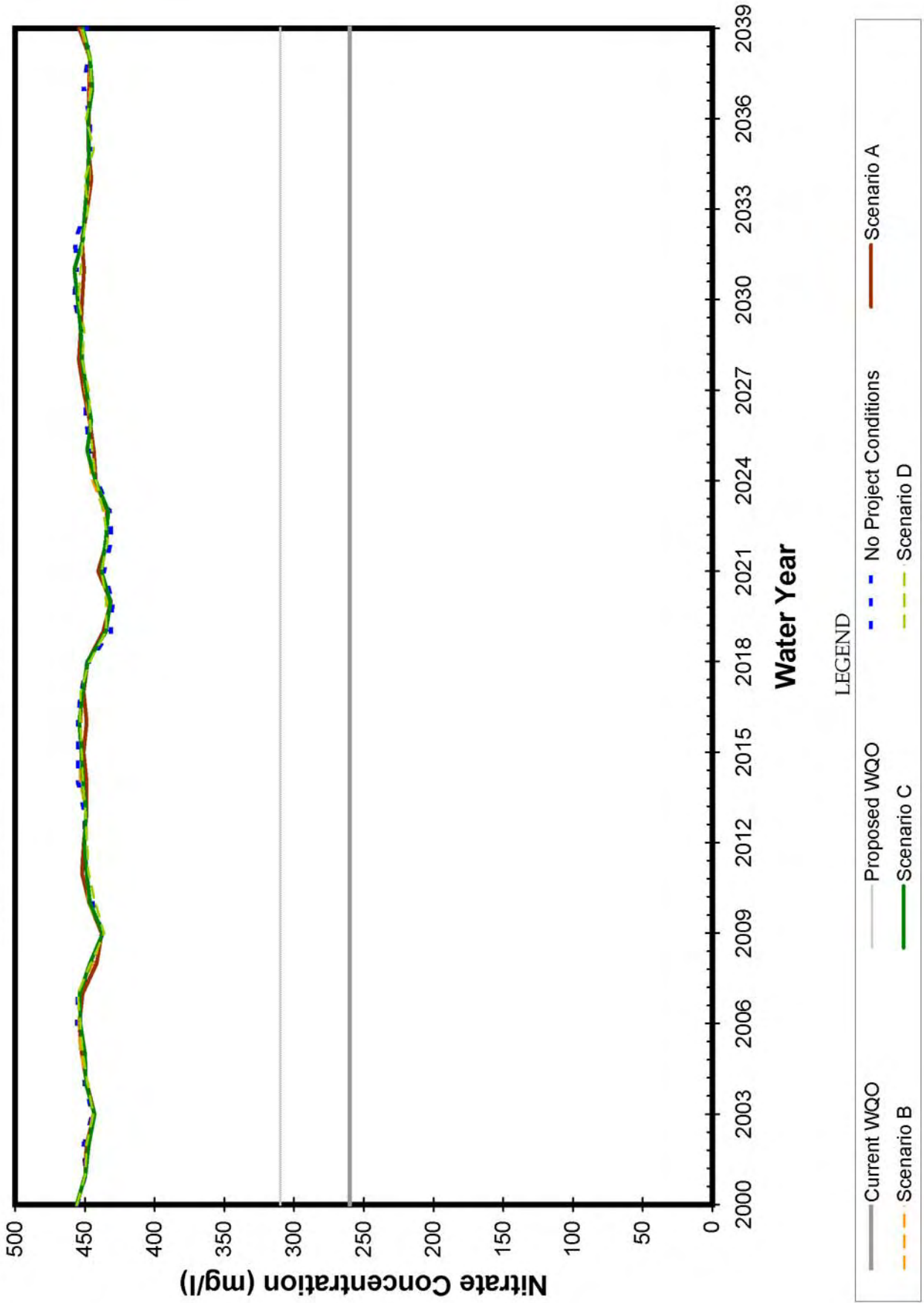


Figure B 74b. TDS Concentrations for IW-02.

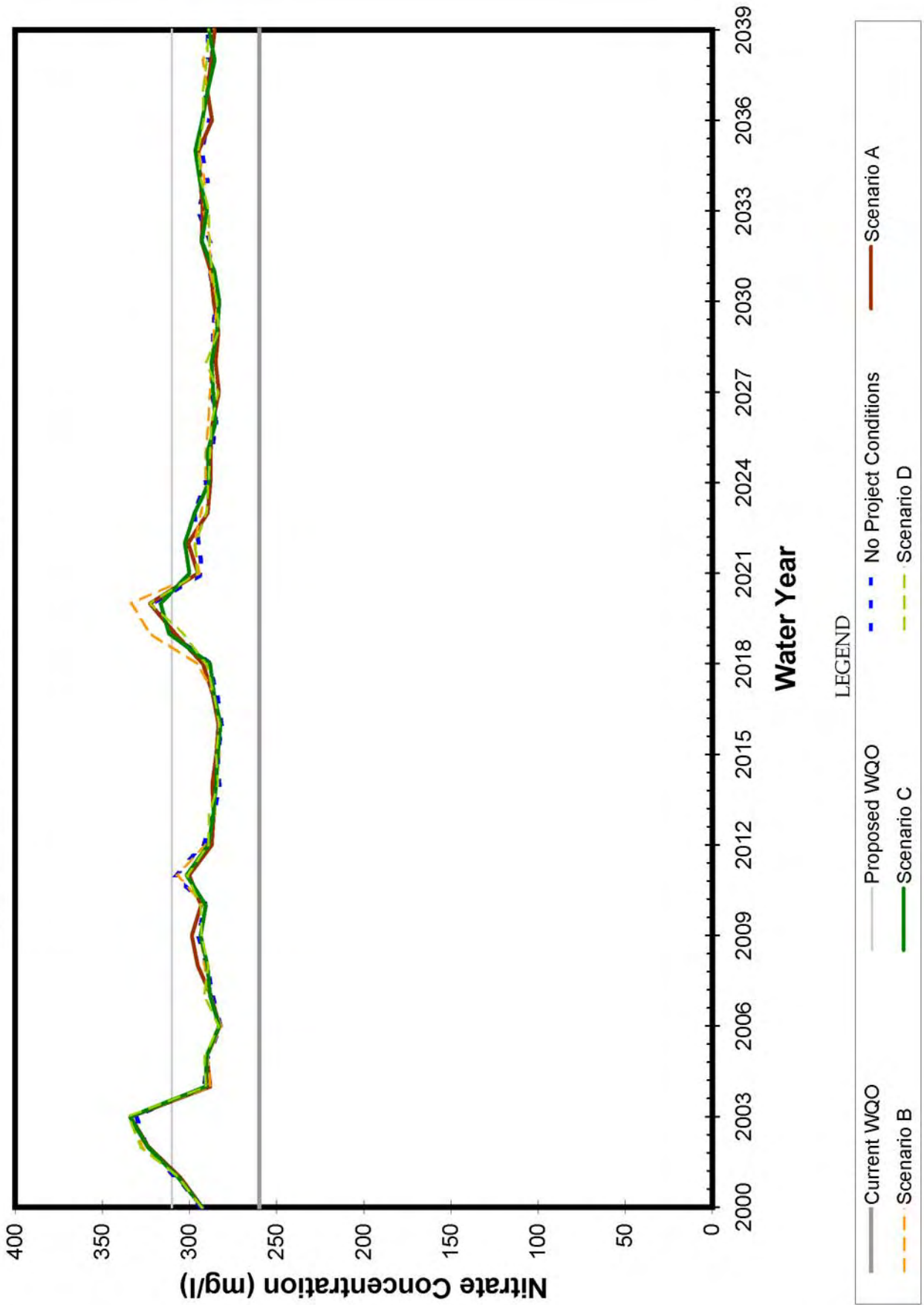


Figure B 74c. TDS Concentrations for IW-03.

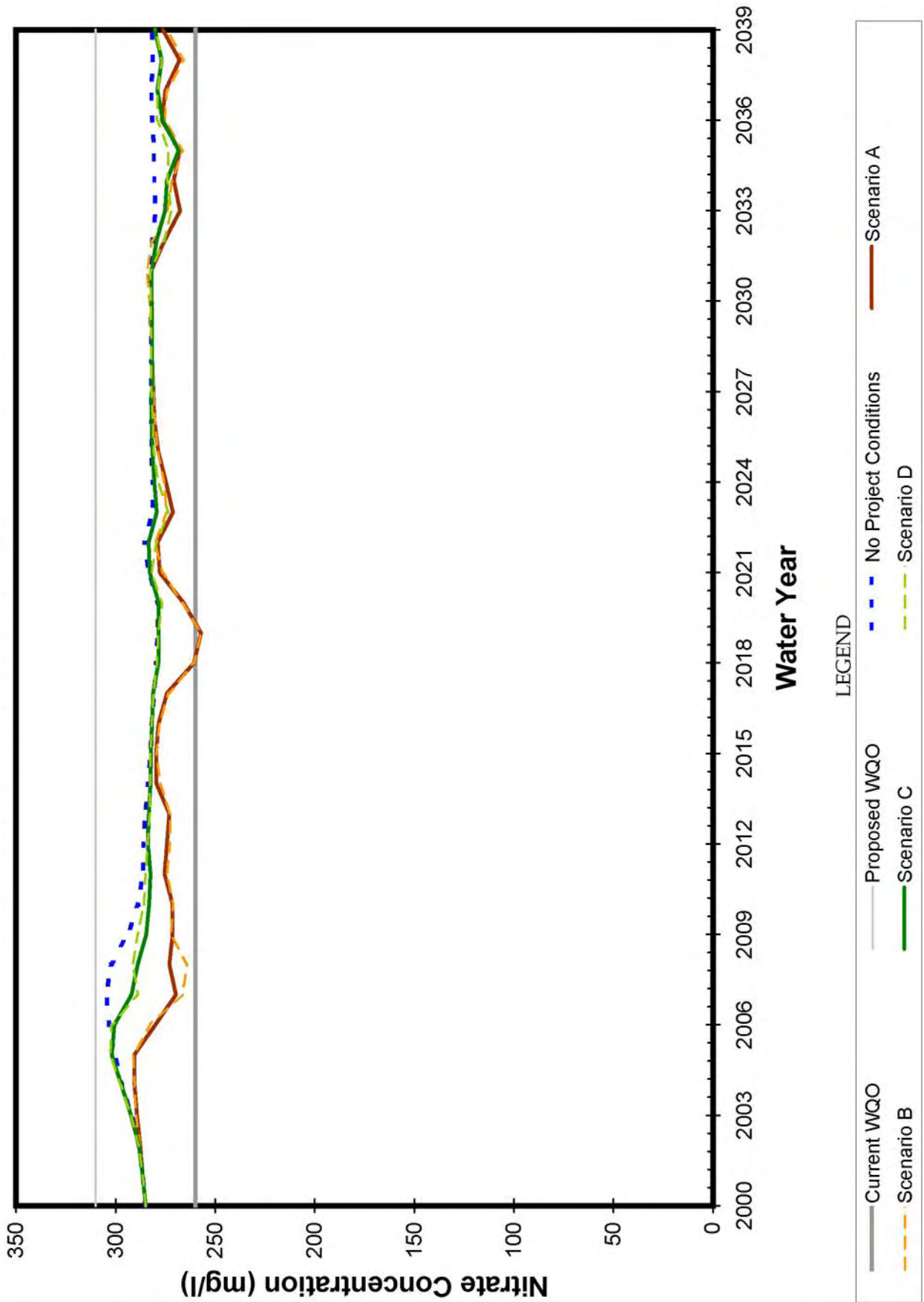


Figure B 74d. TDS Concentrations for IW-04.





Figure B 74e. TDS Concentrations for IW-05.

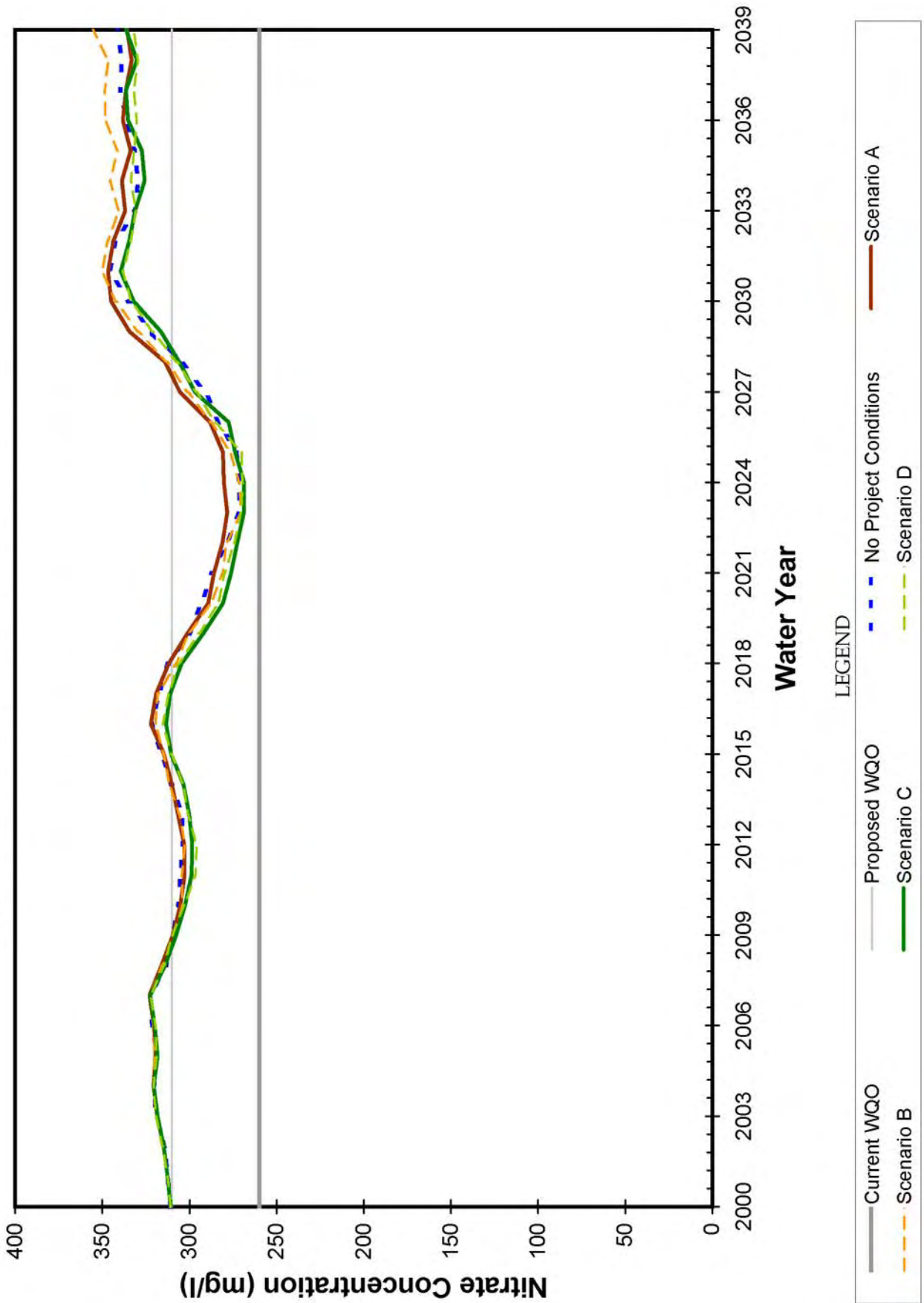


Figure B 74f. TDS Concentrations for IW-06.



Figure B 74g. TDS Concentrations for IW-07.

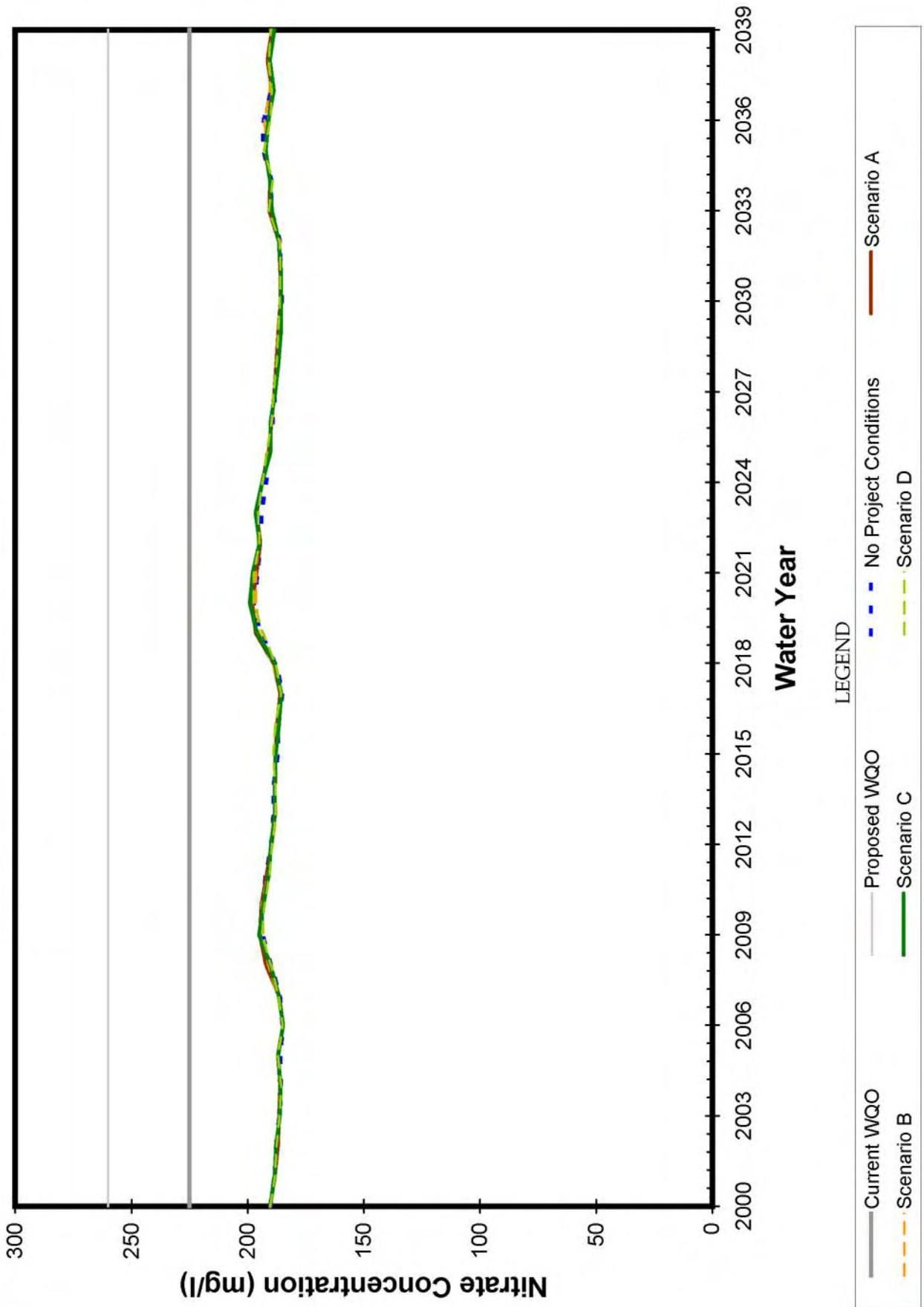


Figure B 74h. TDS Concentrations for IW-08.

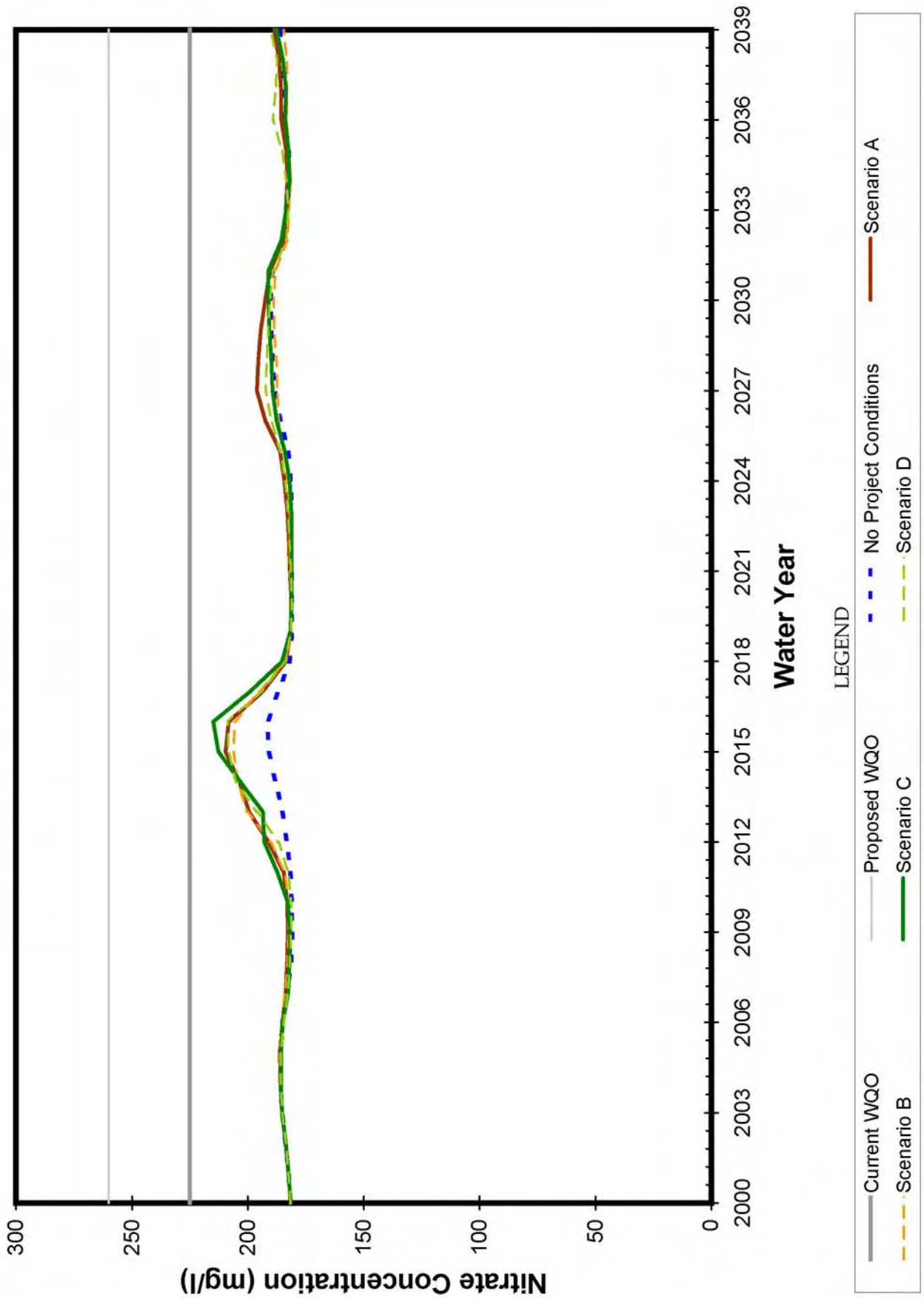


Figure B 74i. TDS Concentrations for IW-09.

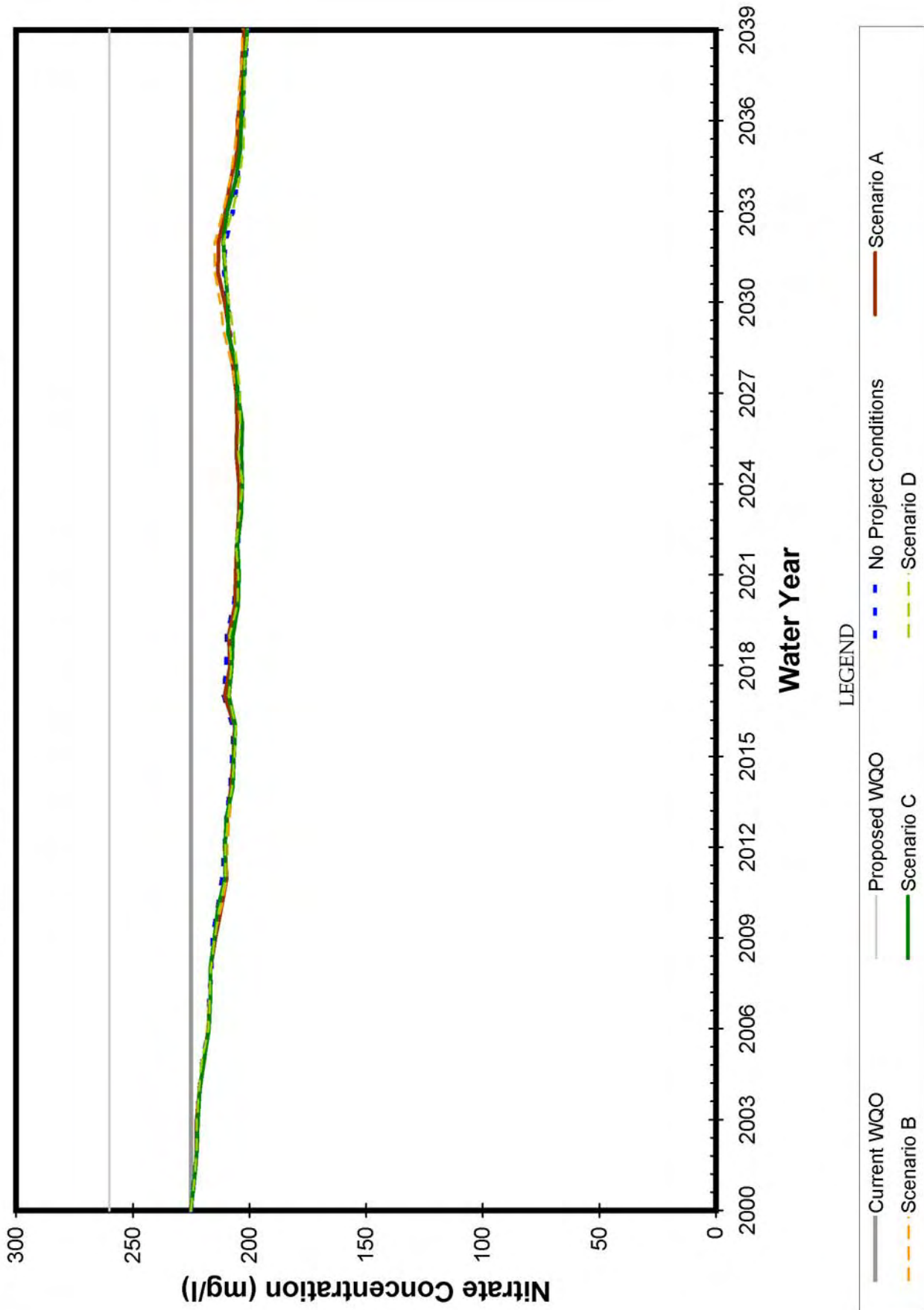


Figure B 74j. TDS Concentrations for IW-10.

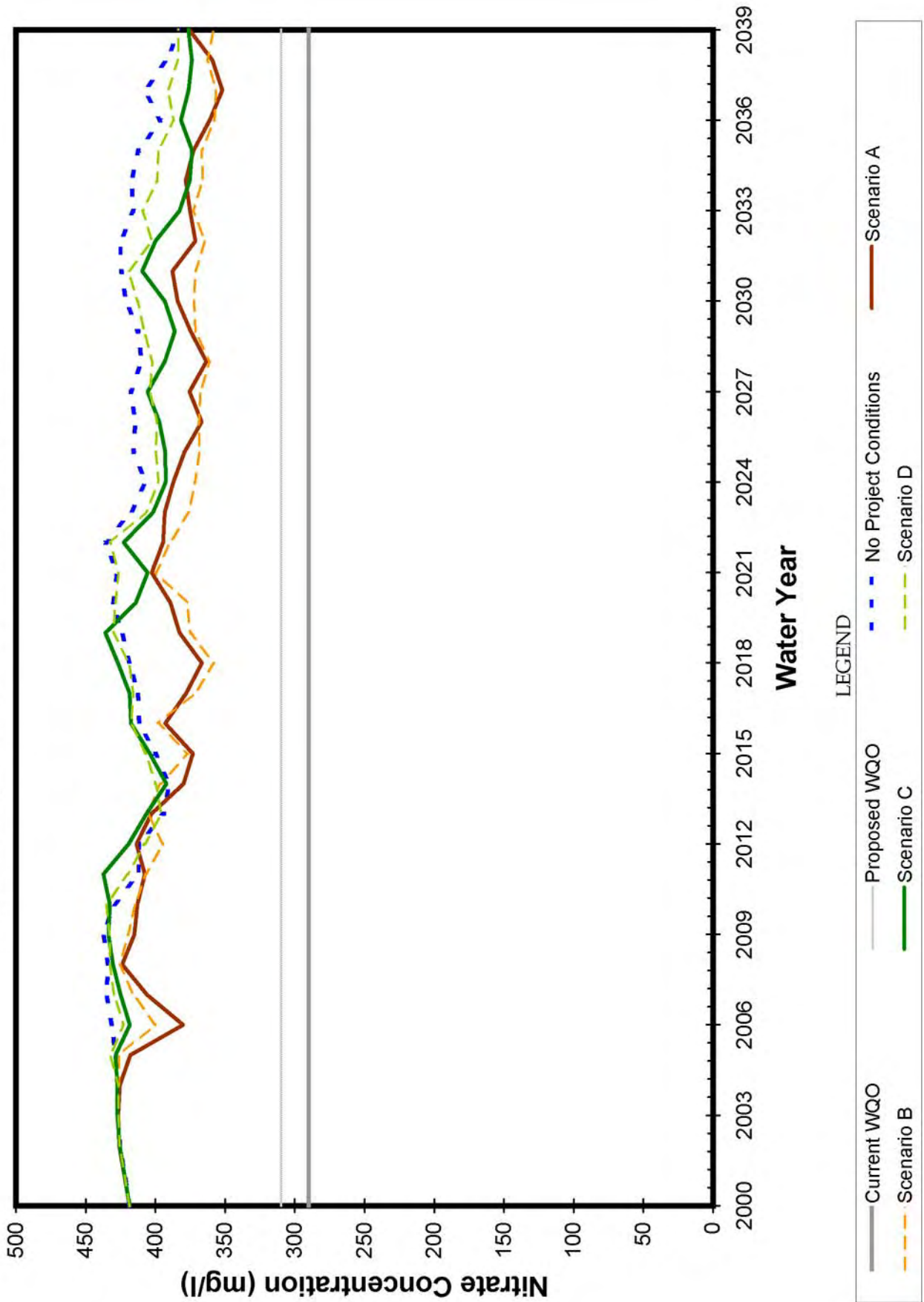


Figure B 74k. TDS Concentrations for IW-11.

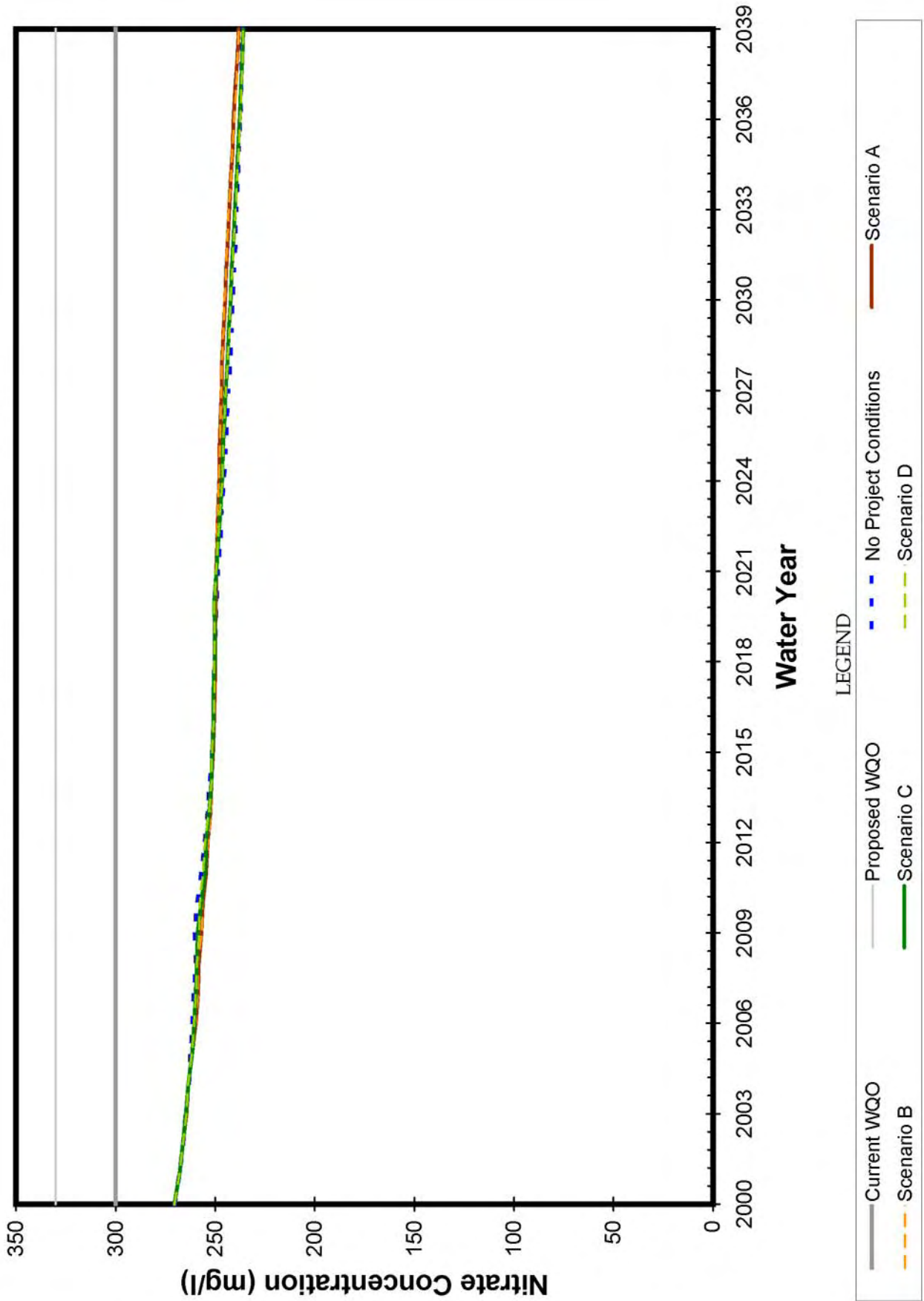


Figure B 74I. TDS Concentrations for IW-12.

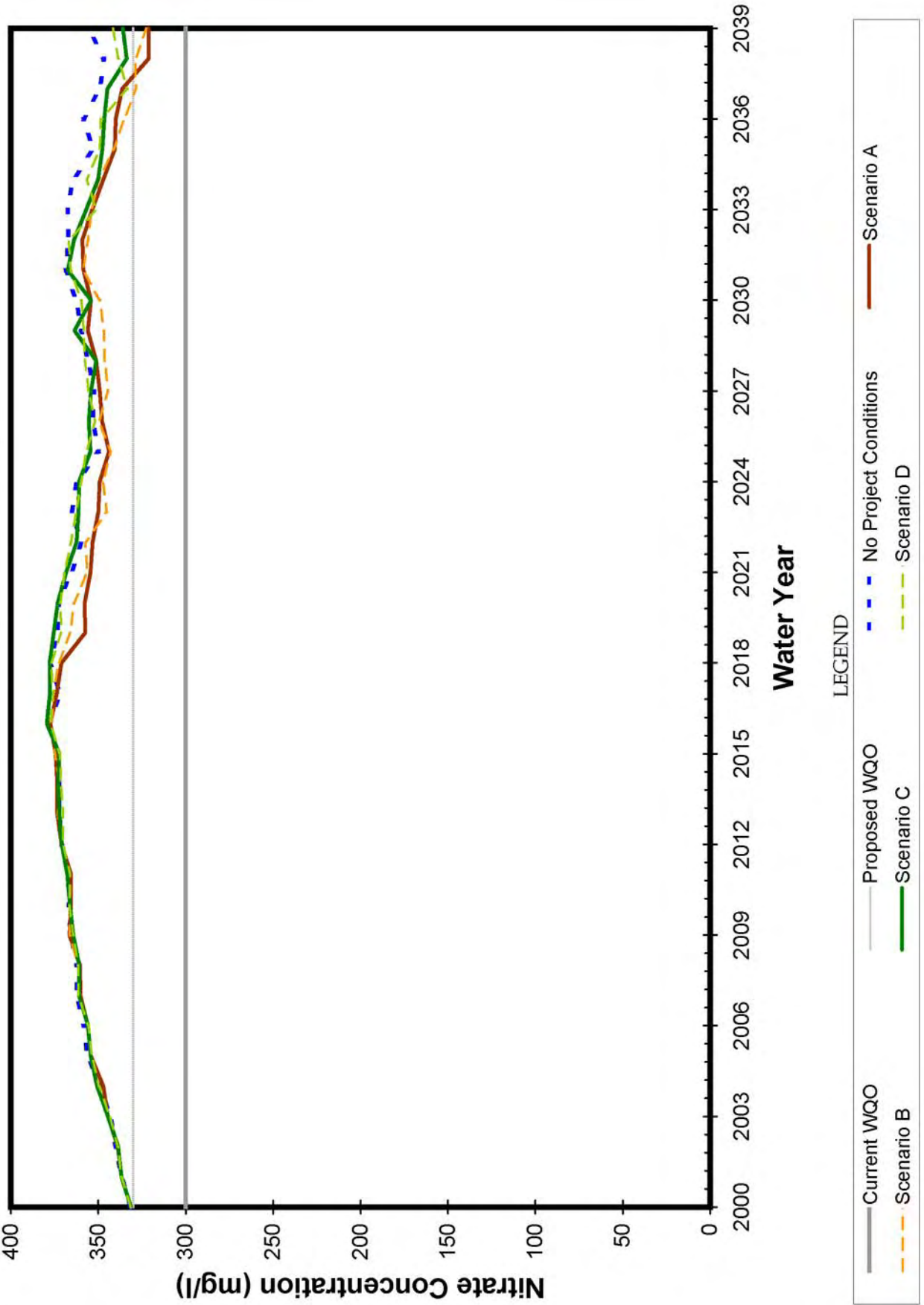




Figure B 74m. TDS Concentrations for IW-13.

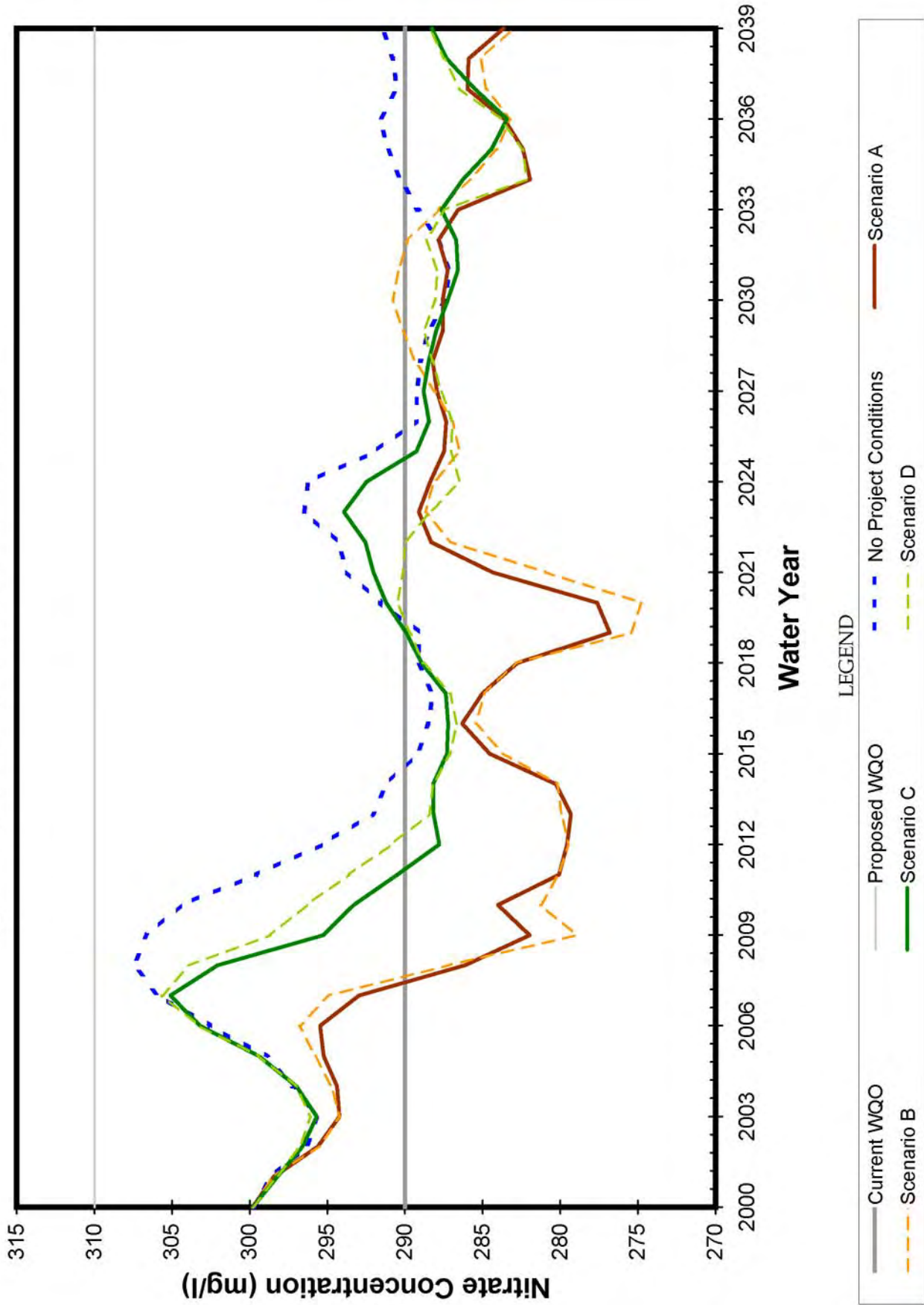


Figure B 74n. TDS Concentrations for IW-14.

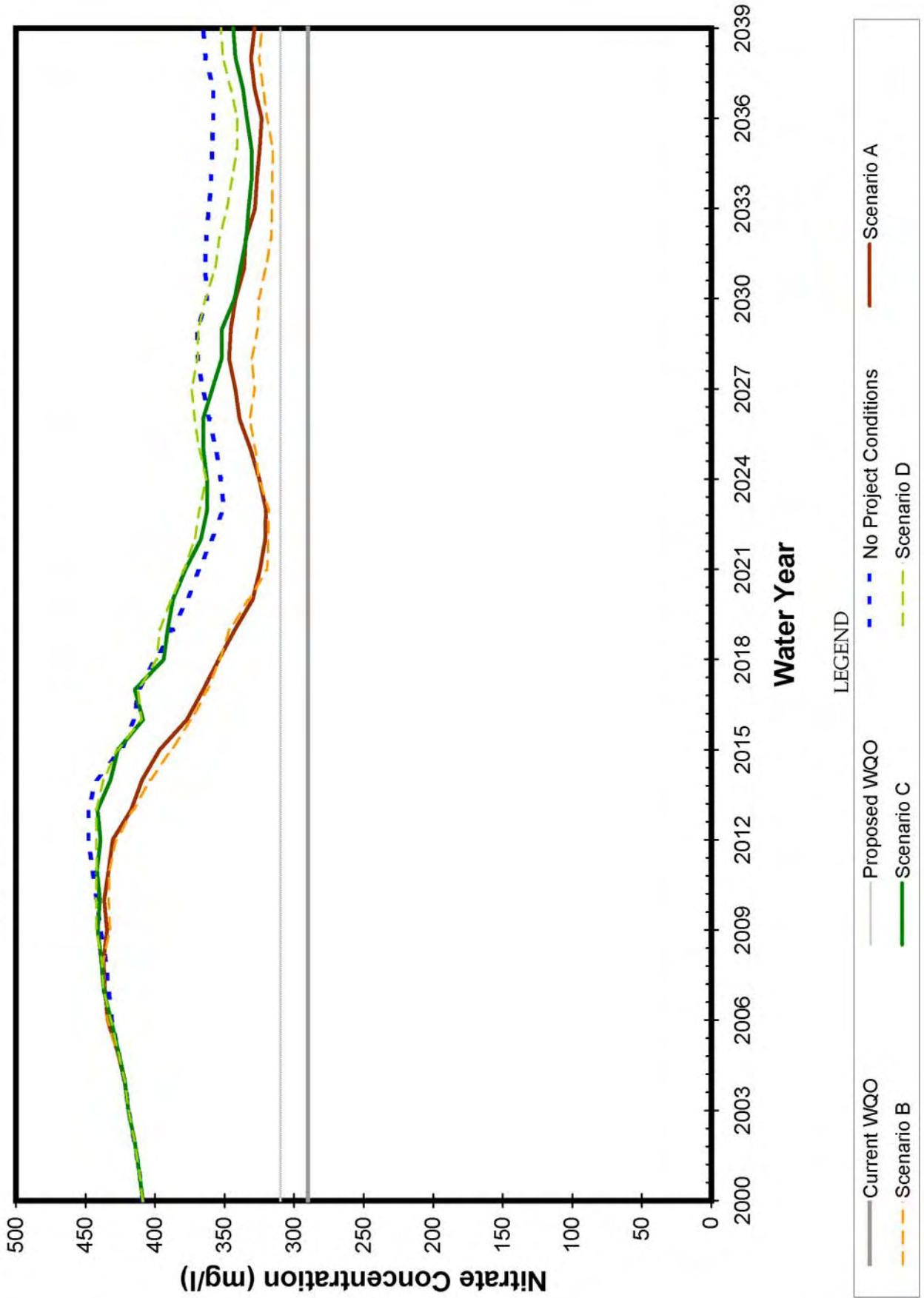




Figure B 74p. TDS Concentrations for IW-16.

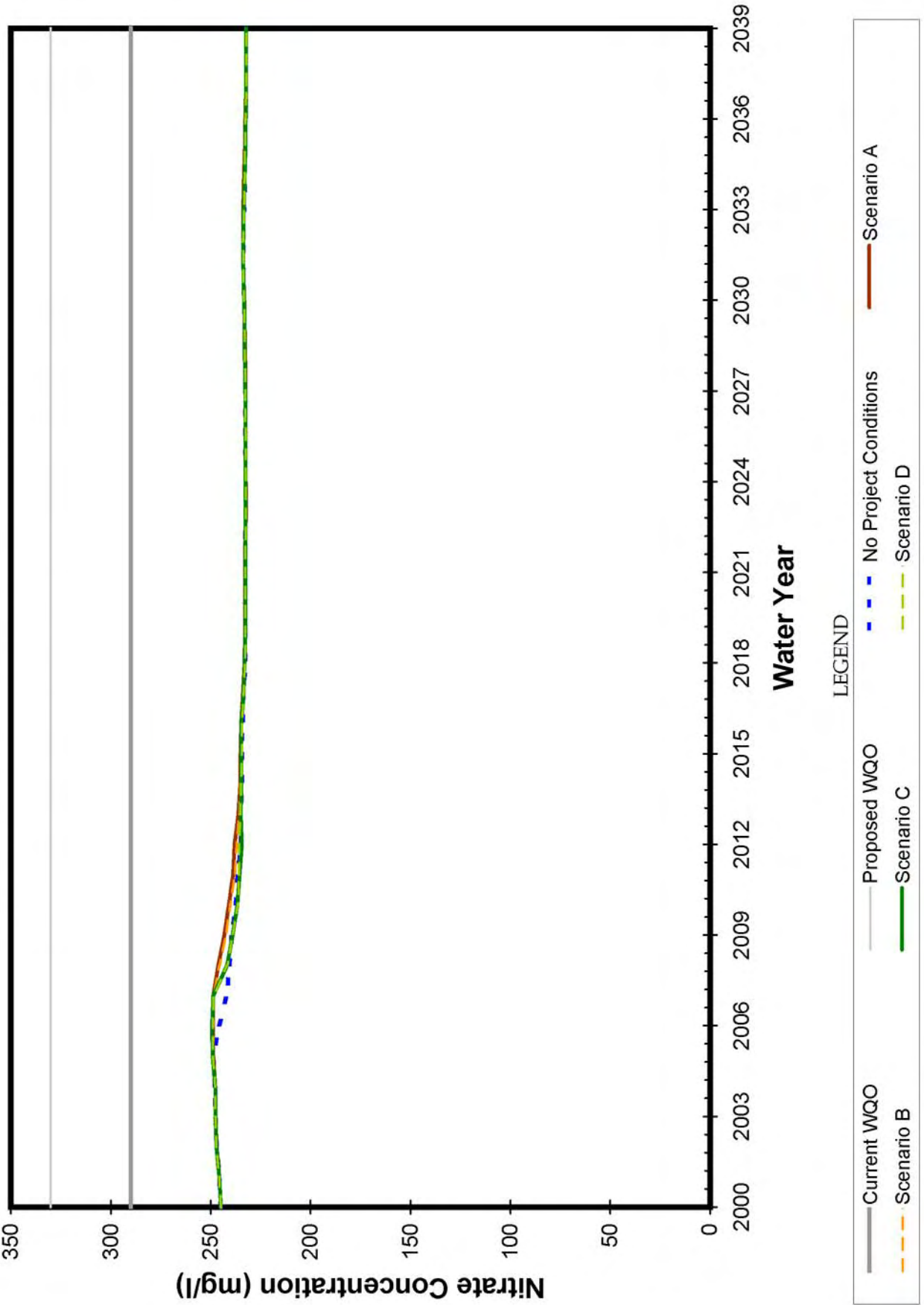


Figure B 74q. TDS Concentrations for IW-17.

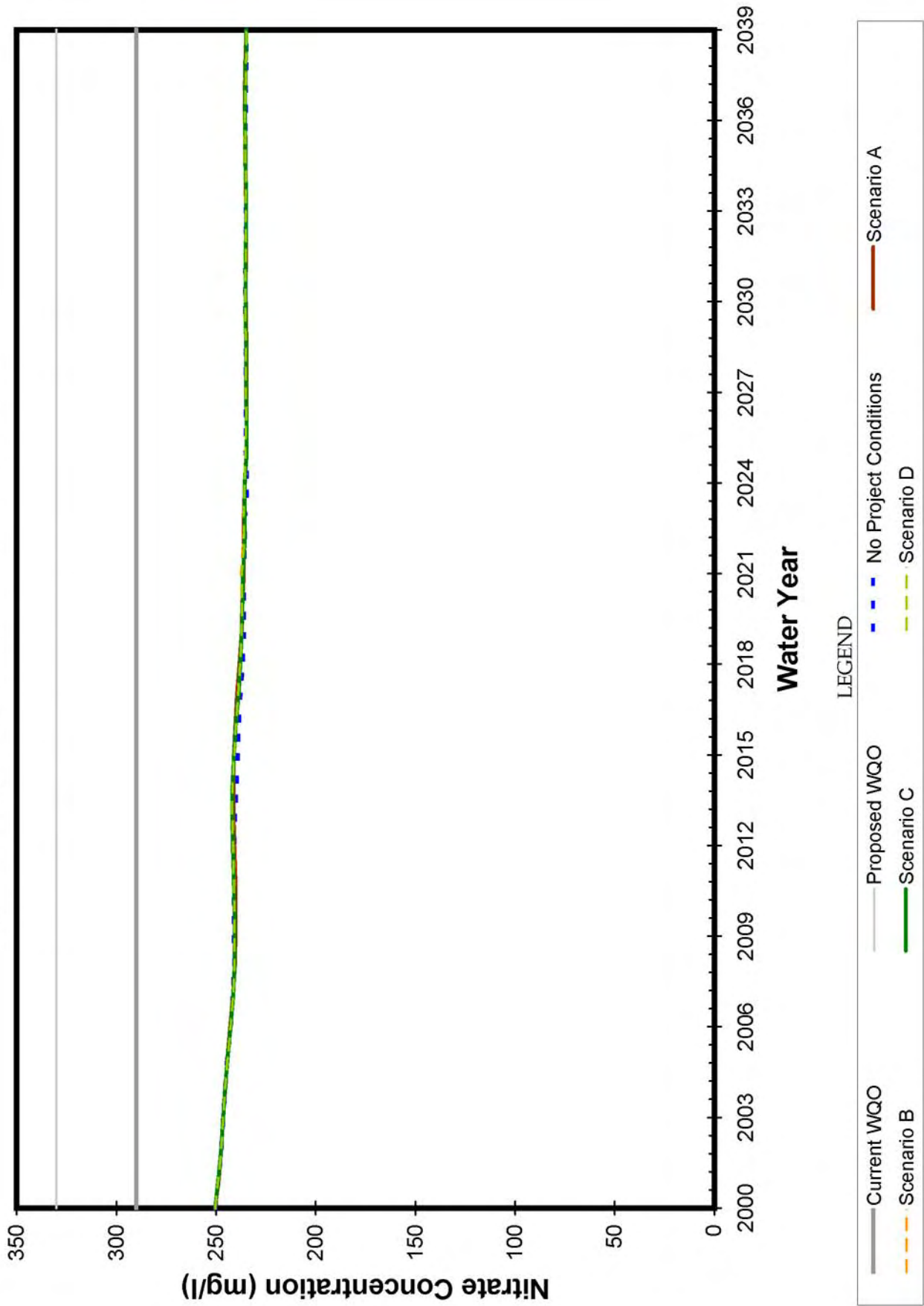


Figure B 74r. TDS Concentrations for IW-18.

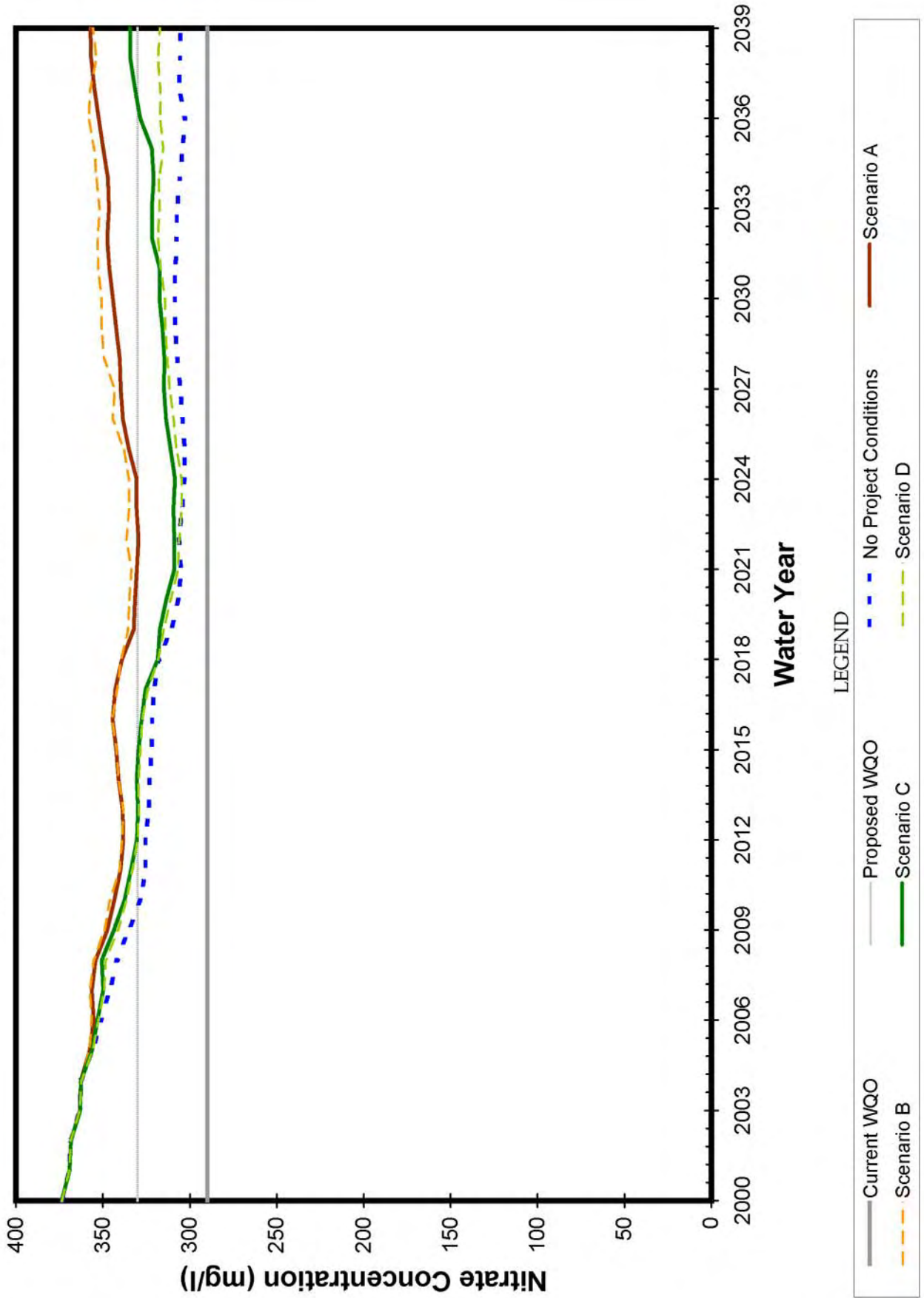


Figure B 74s. TDS Concentrations for IW-19.

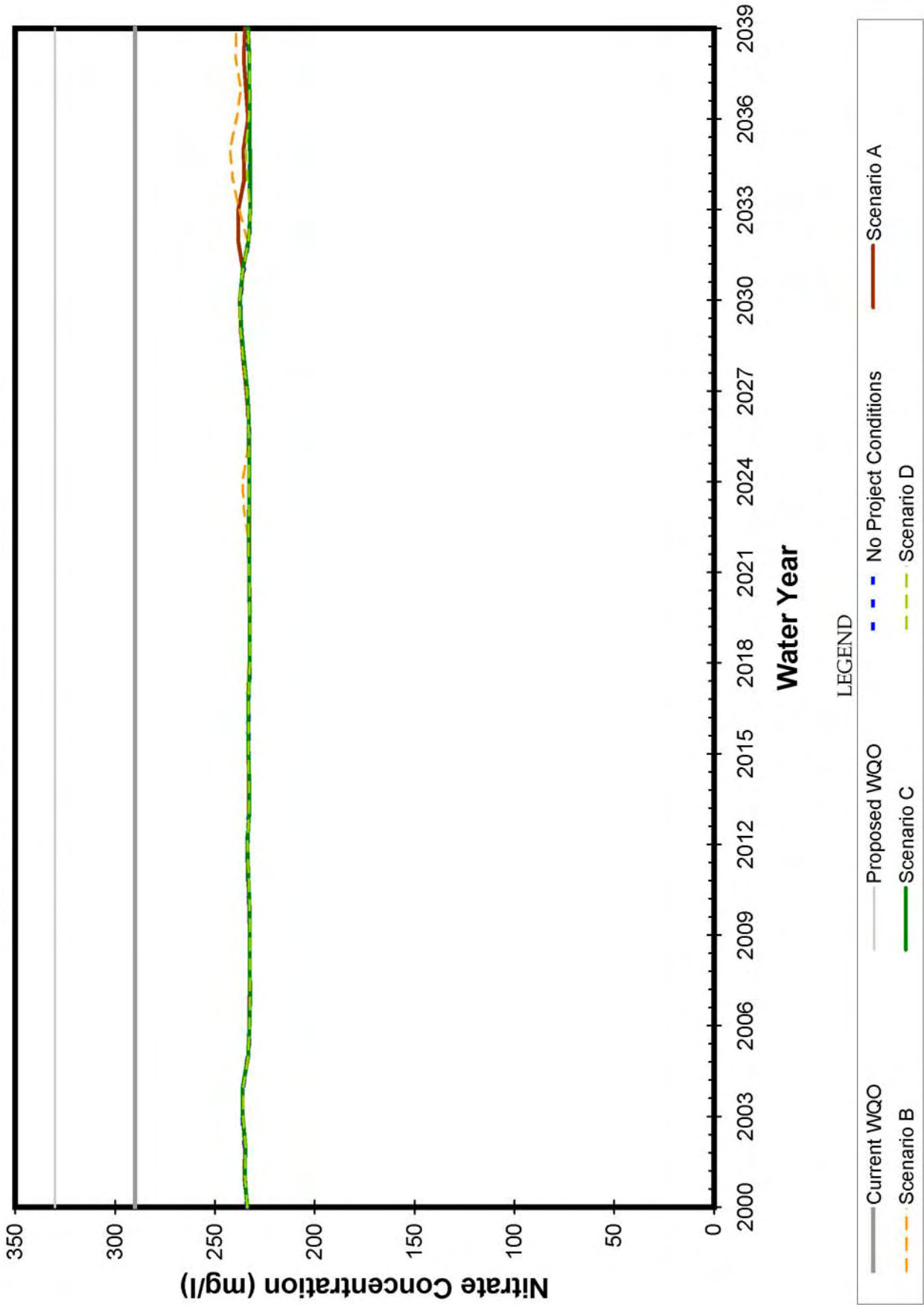


Figure B 74t. TDS Concentrations for IW-20.

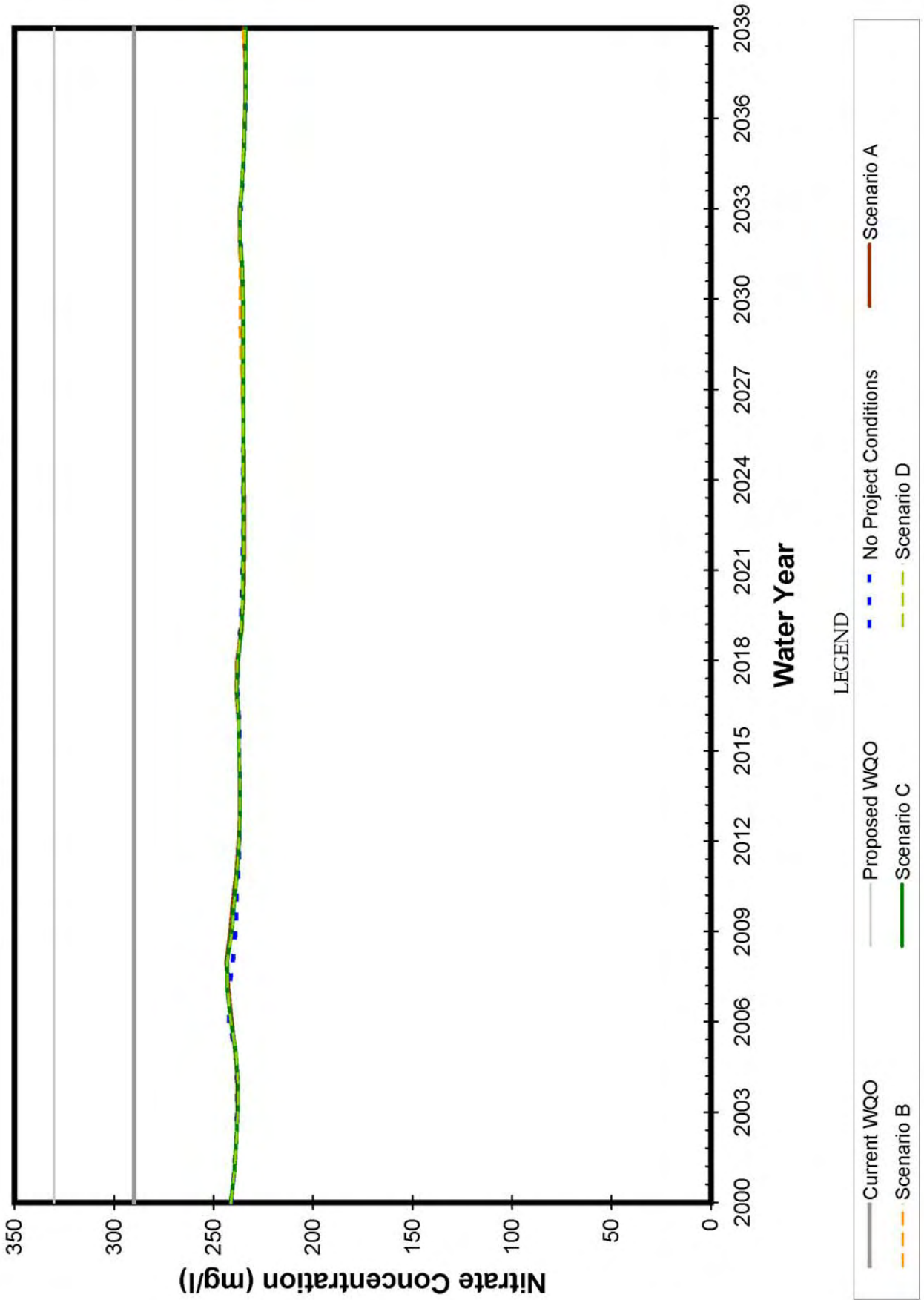




Figure B 74u. TDS Concentrations for IW-21.

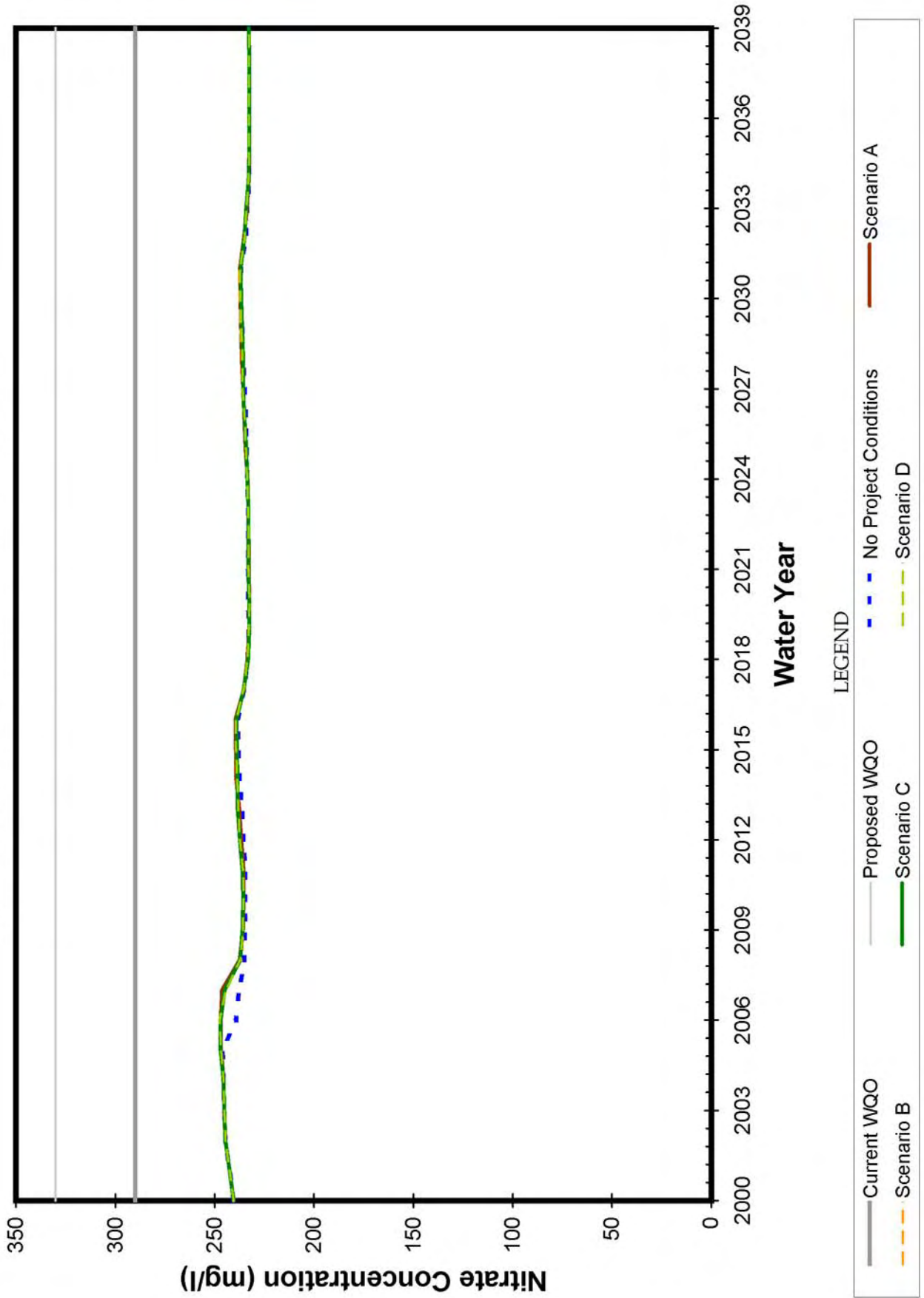


Figure B 74v. TDS Concentrations for IW-22.

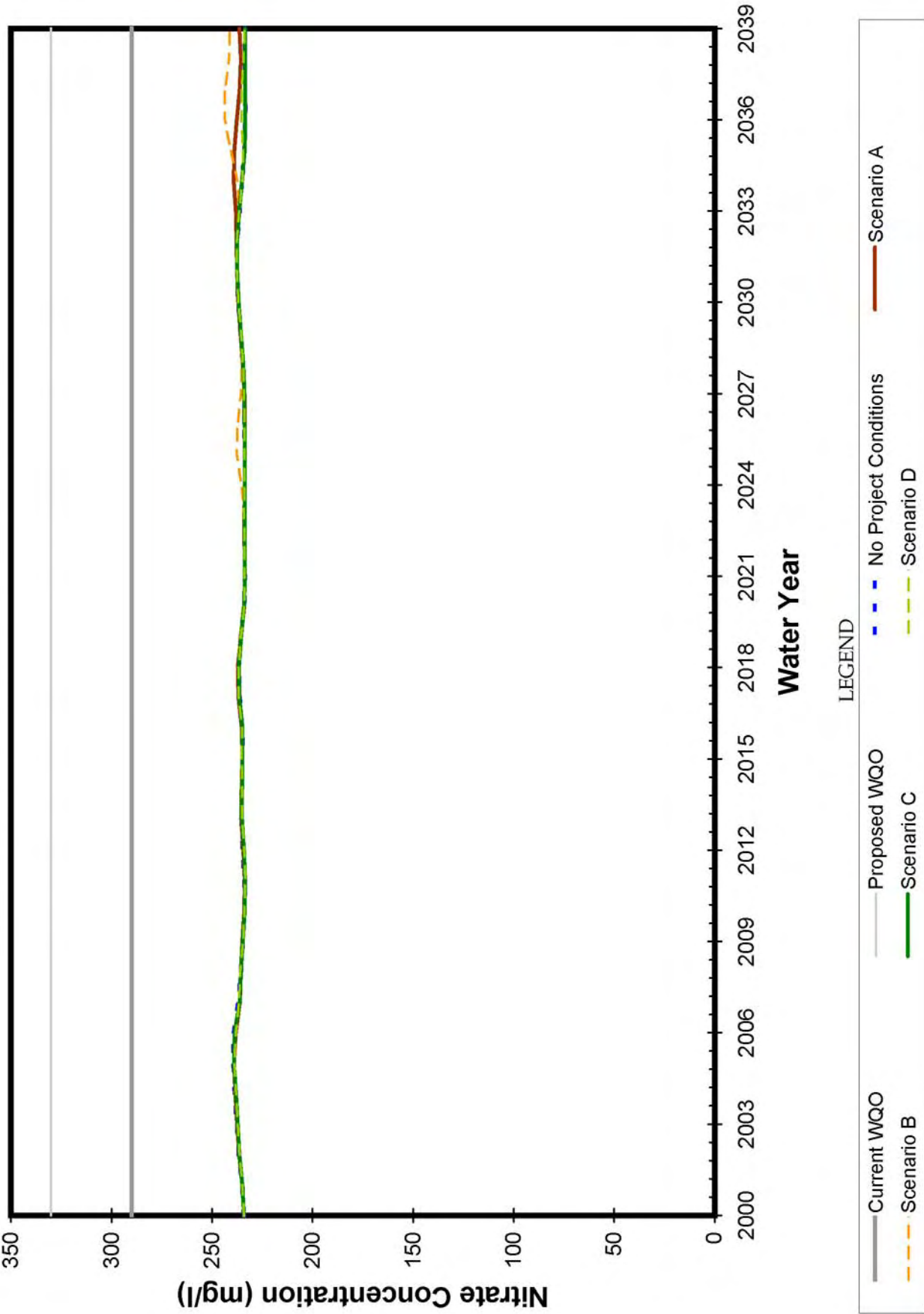


Figure B 74w. TDS Concentrations for IW-23.

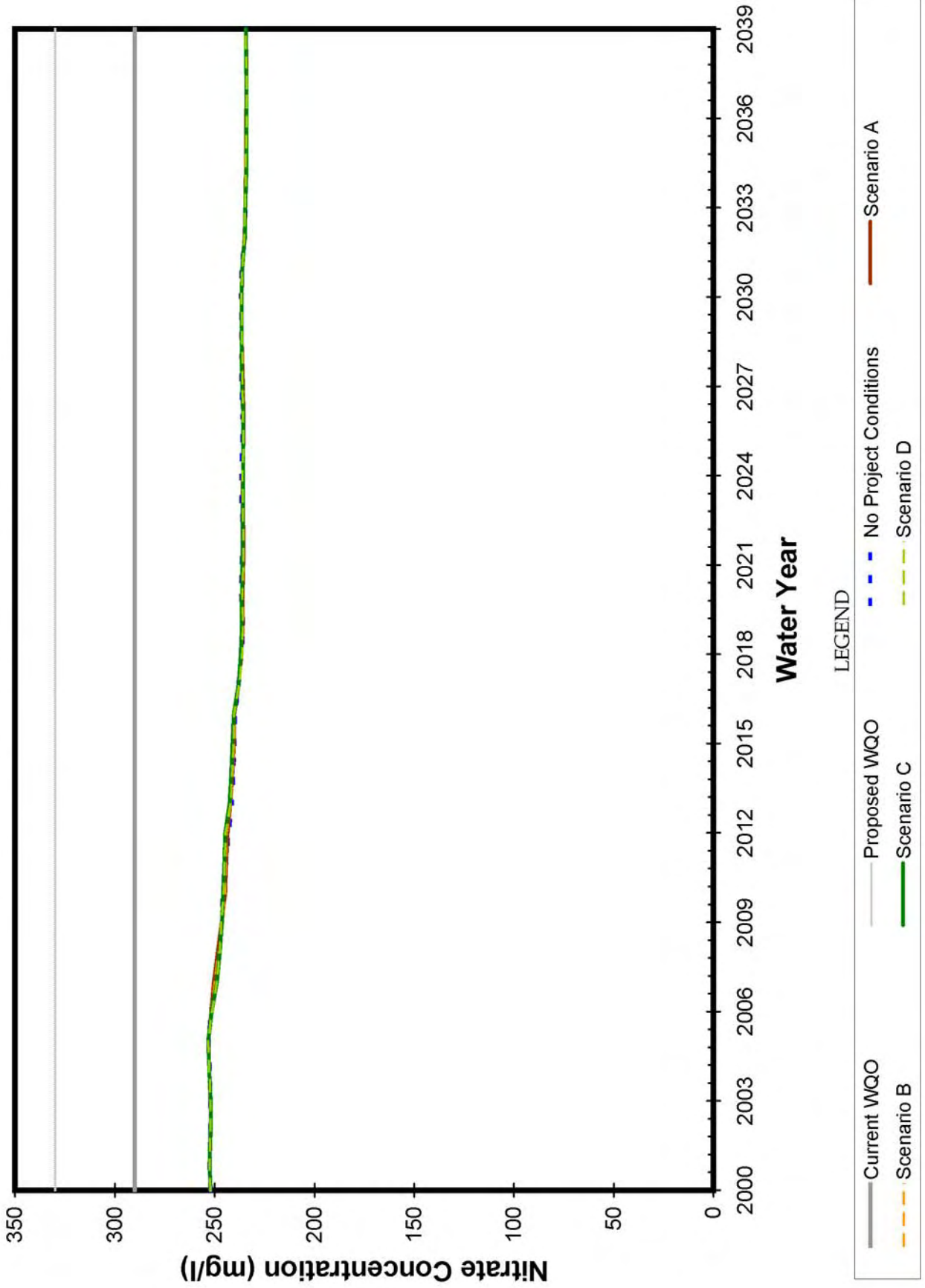


Figure B 74x. TDS Concentrations for IW-24.

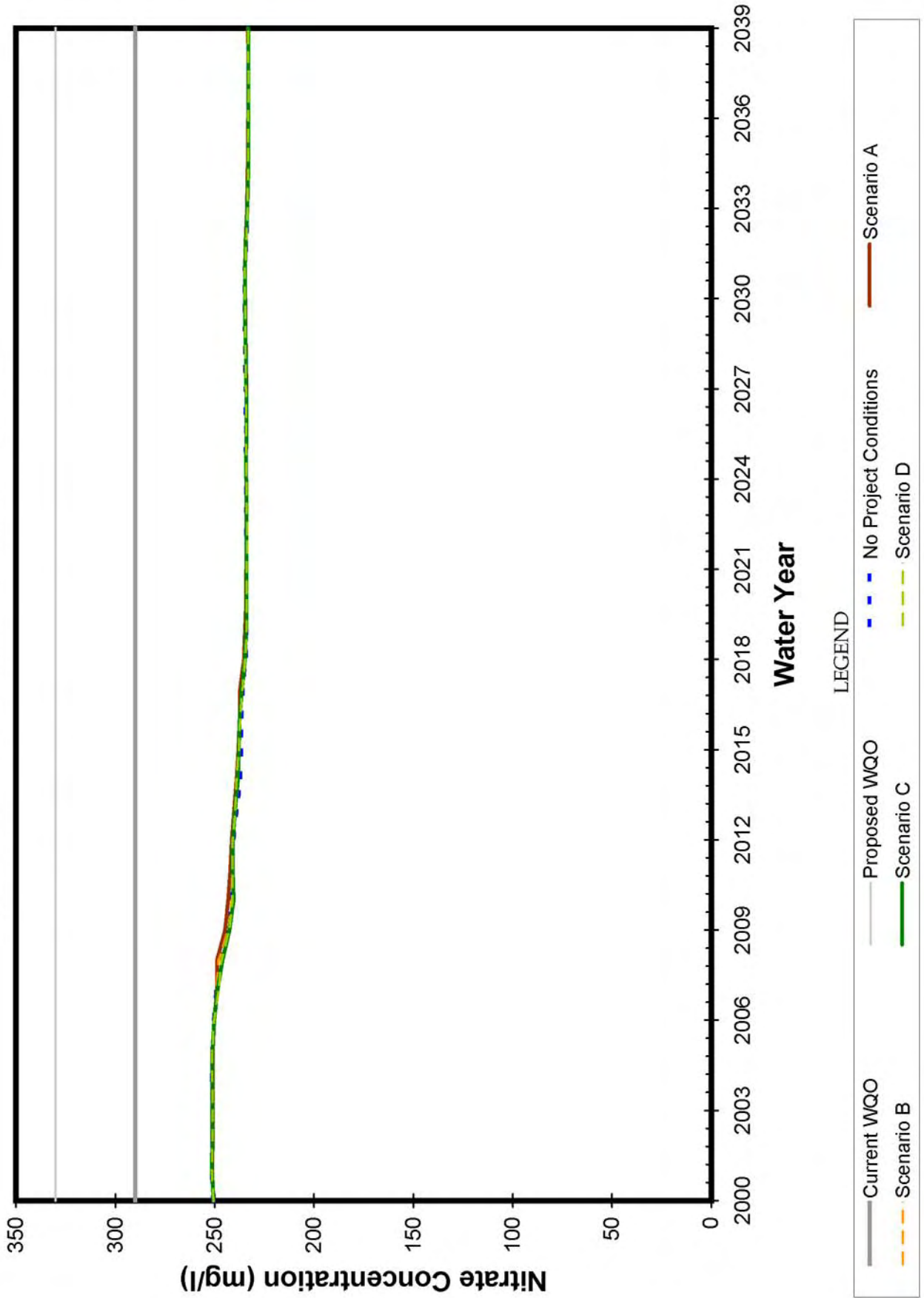


Figure B 74y. TDS Concentrations for IW-25.

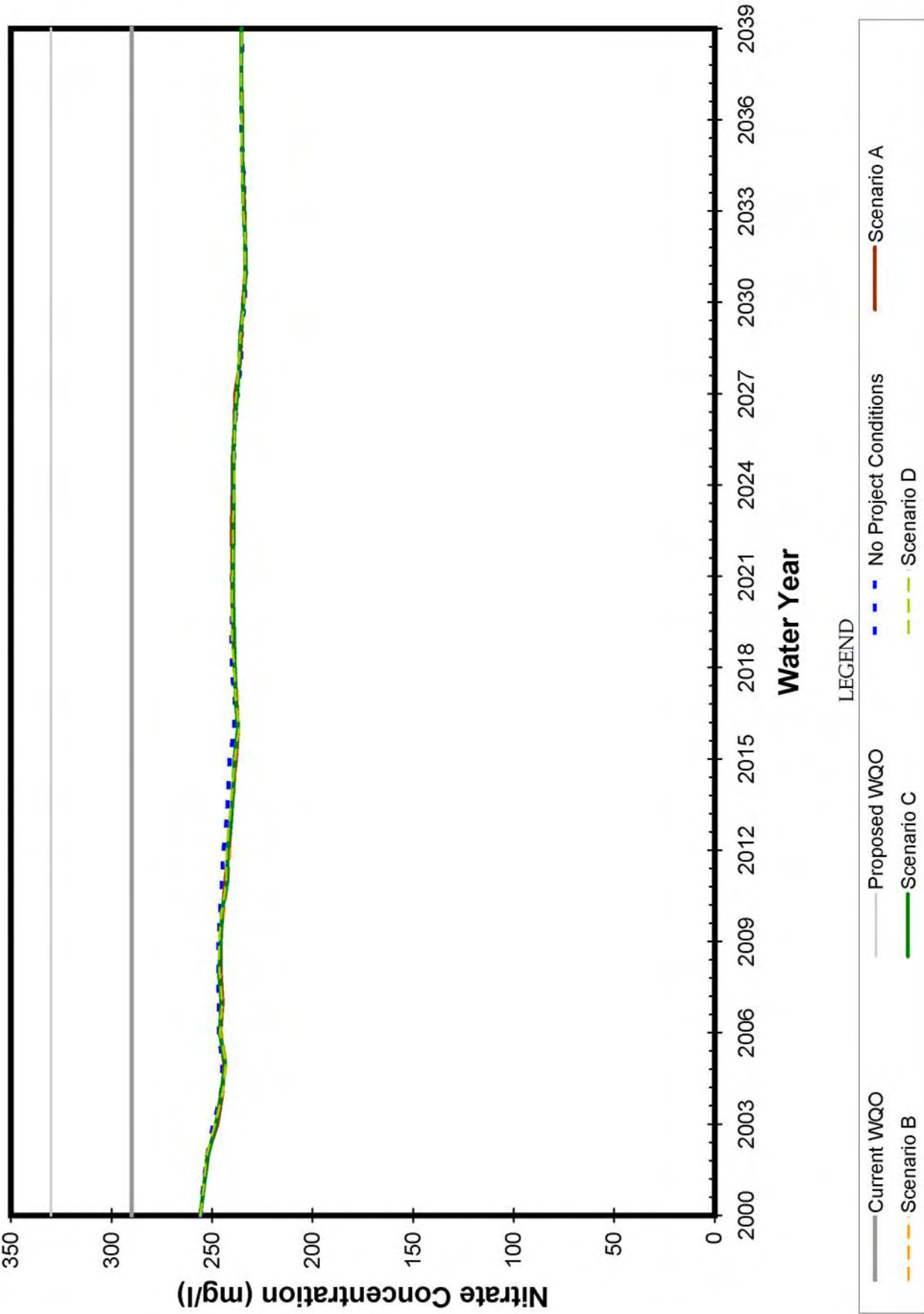


Figure B 74z. TDS Concentrations for SG-1 Devil Canyon / Sweetwater SG.

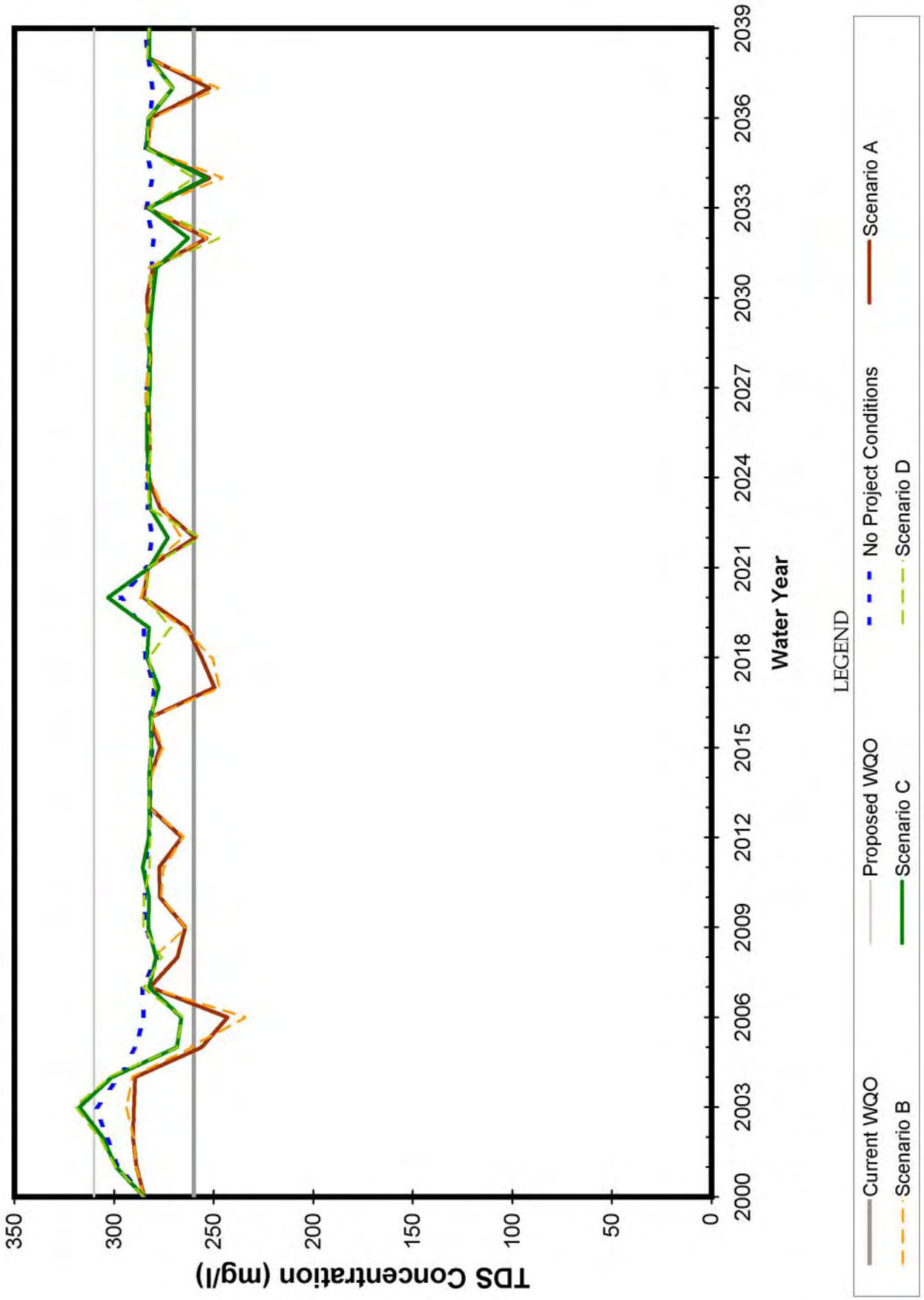


Figure B 74aa. TDS Concentrations for SG-2 Santa Ana River SG

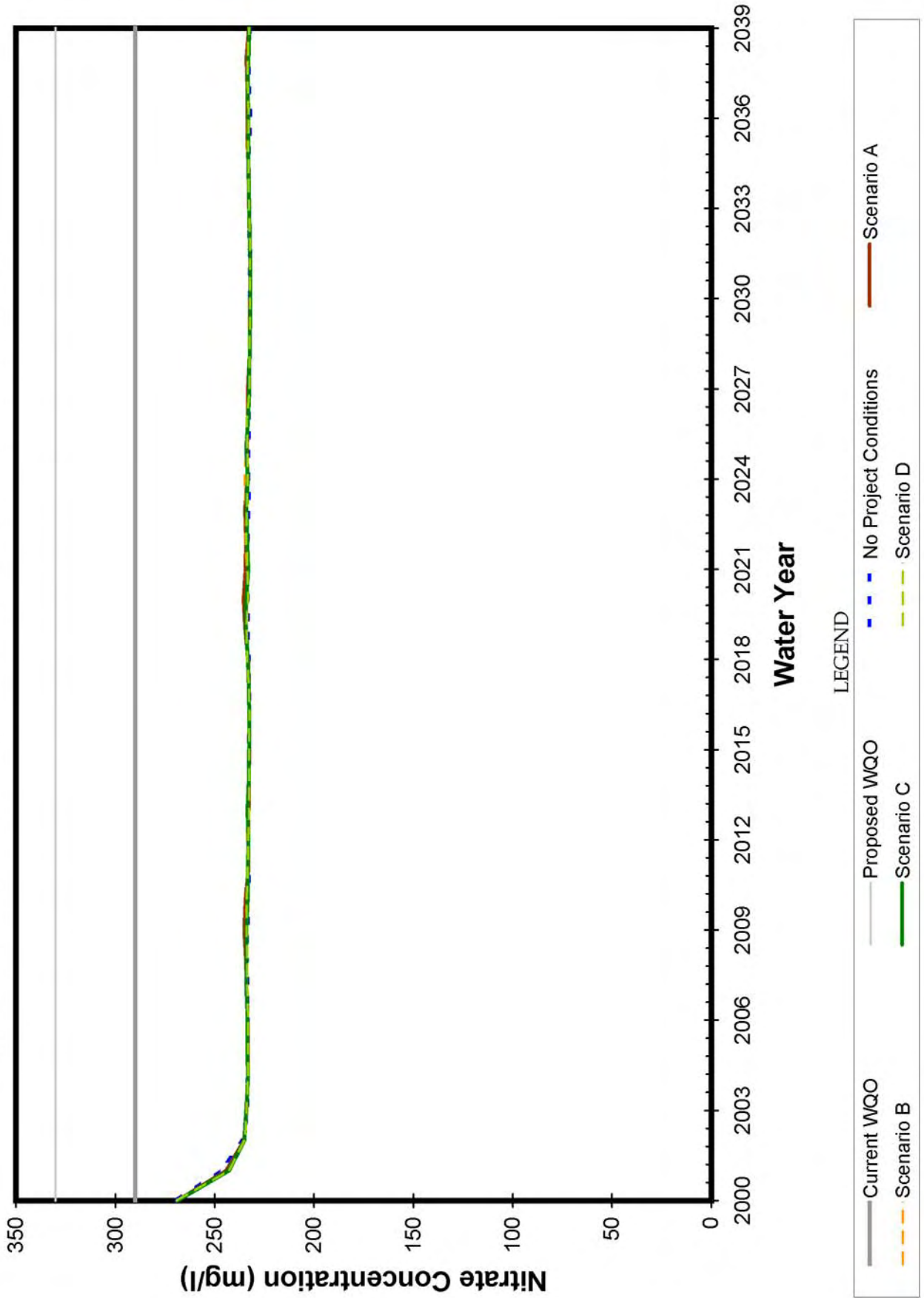


Figure B 74ab. TDS Concentrations for SG-3 Waterman SG.

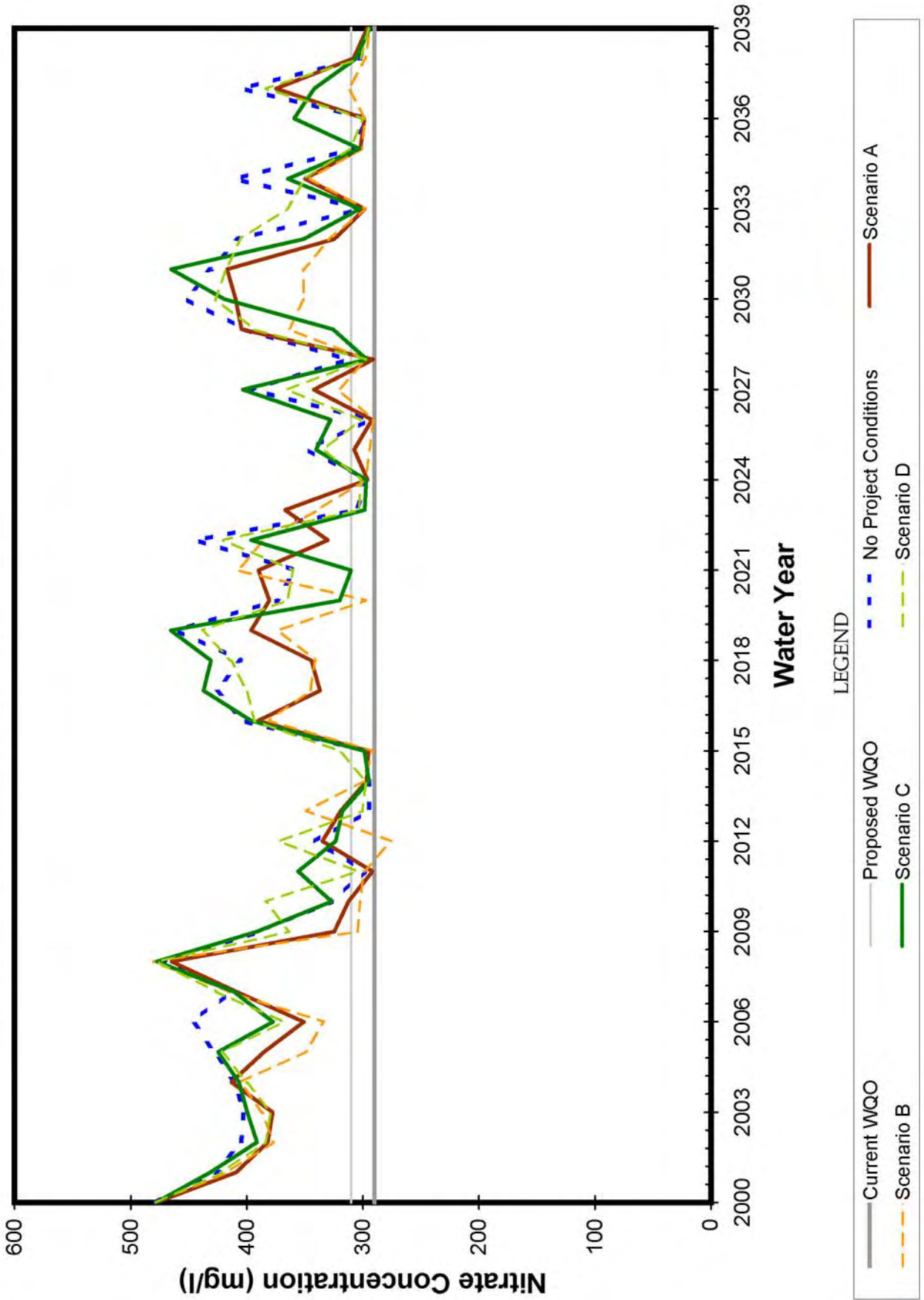




Figure B 74ac. TDS Concentrations for SG-4 Badger SG.

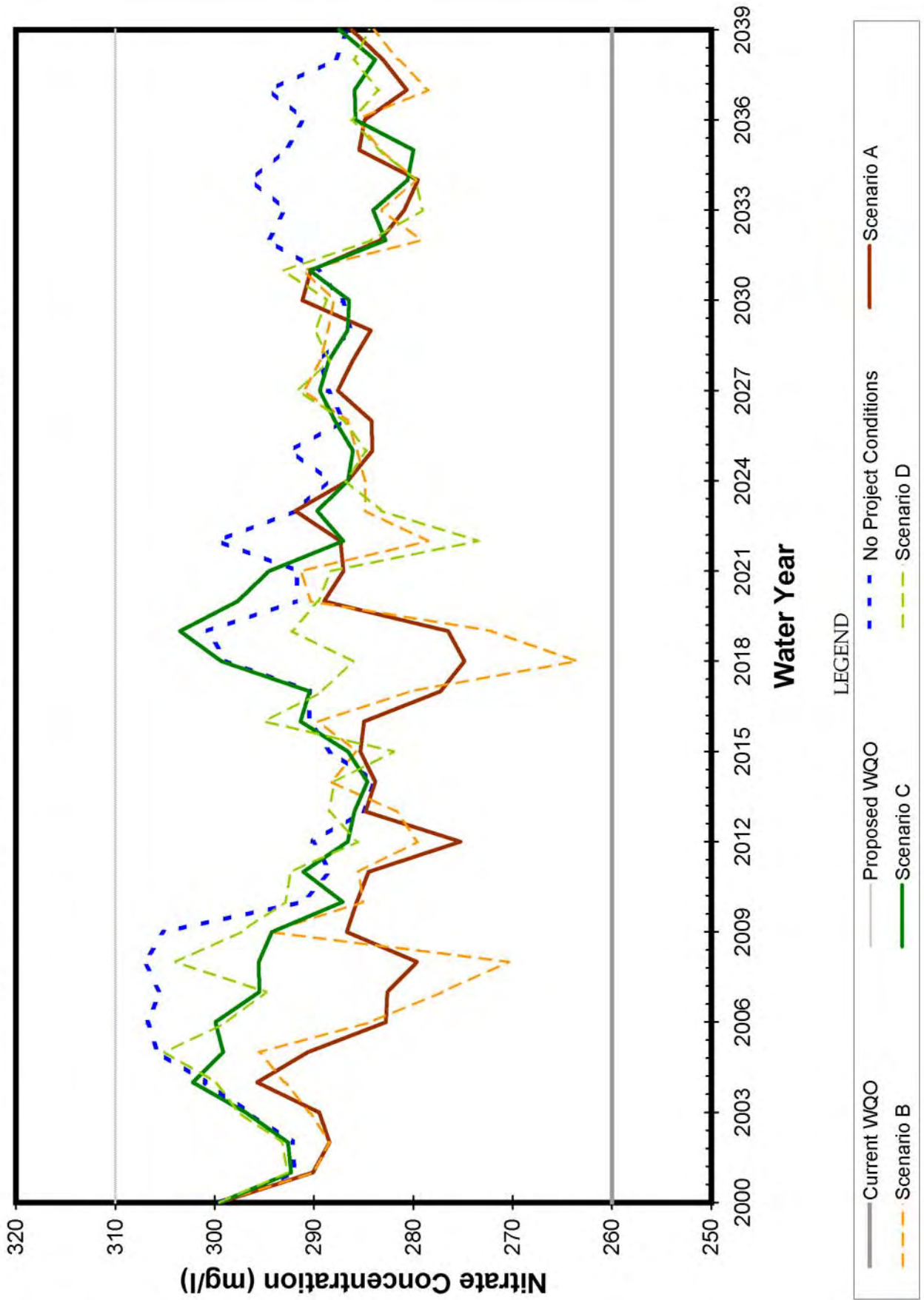


Figure B 74ad. TDS Concentrations for SG-5 Patton SG.

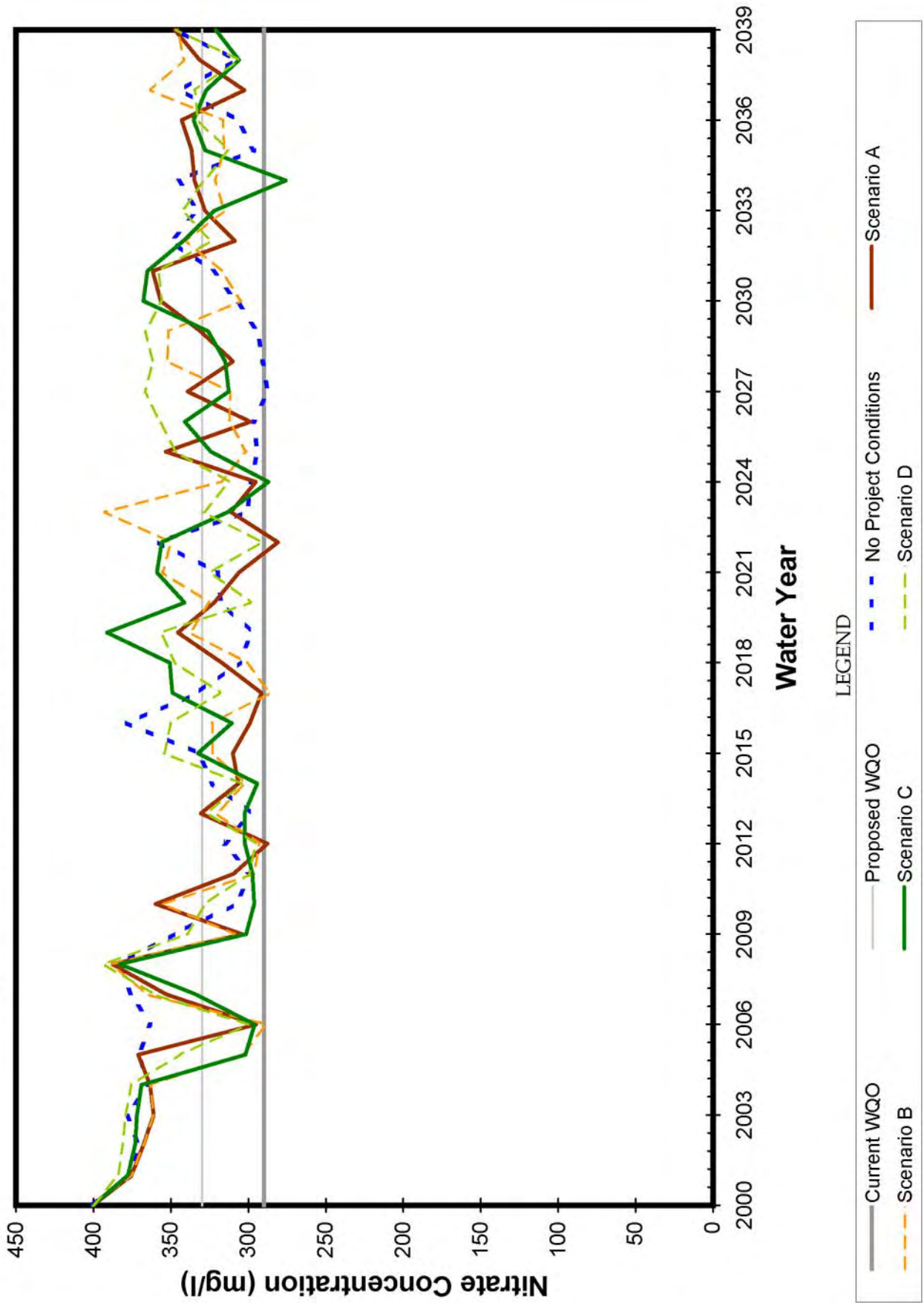


Figure B 74ae. TDS Concentrations for SG-6 Mill Creek SG.

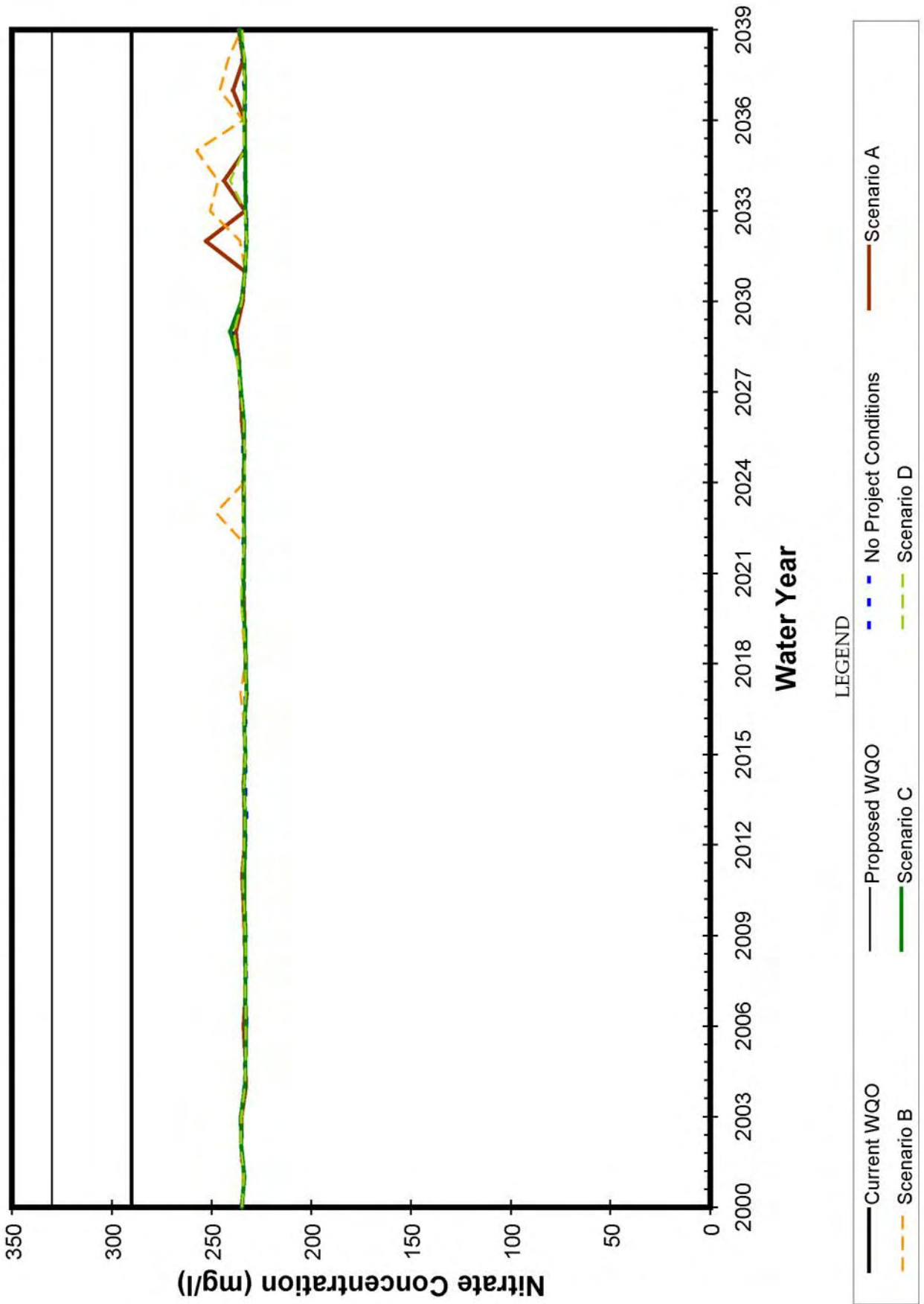


Figure B 74af. TDS Concentrations for SG-7 City Creek SG.

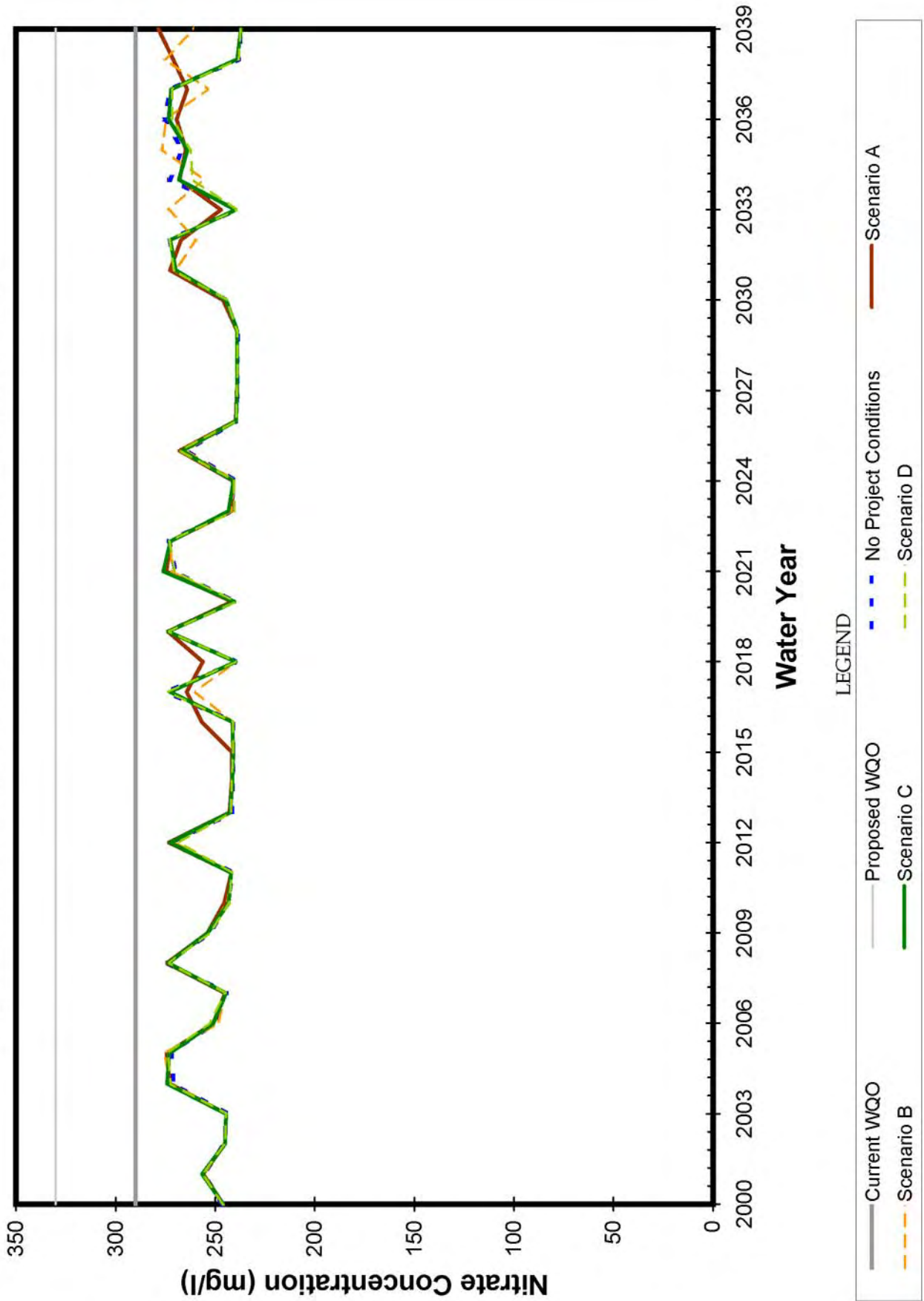


Figure B 74ag. TDS Concentrations for SG-8 East Twin Creek SG.

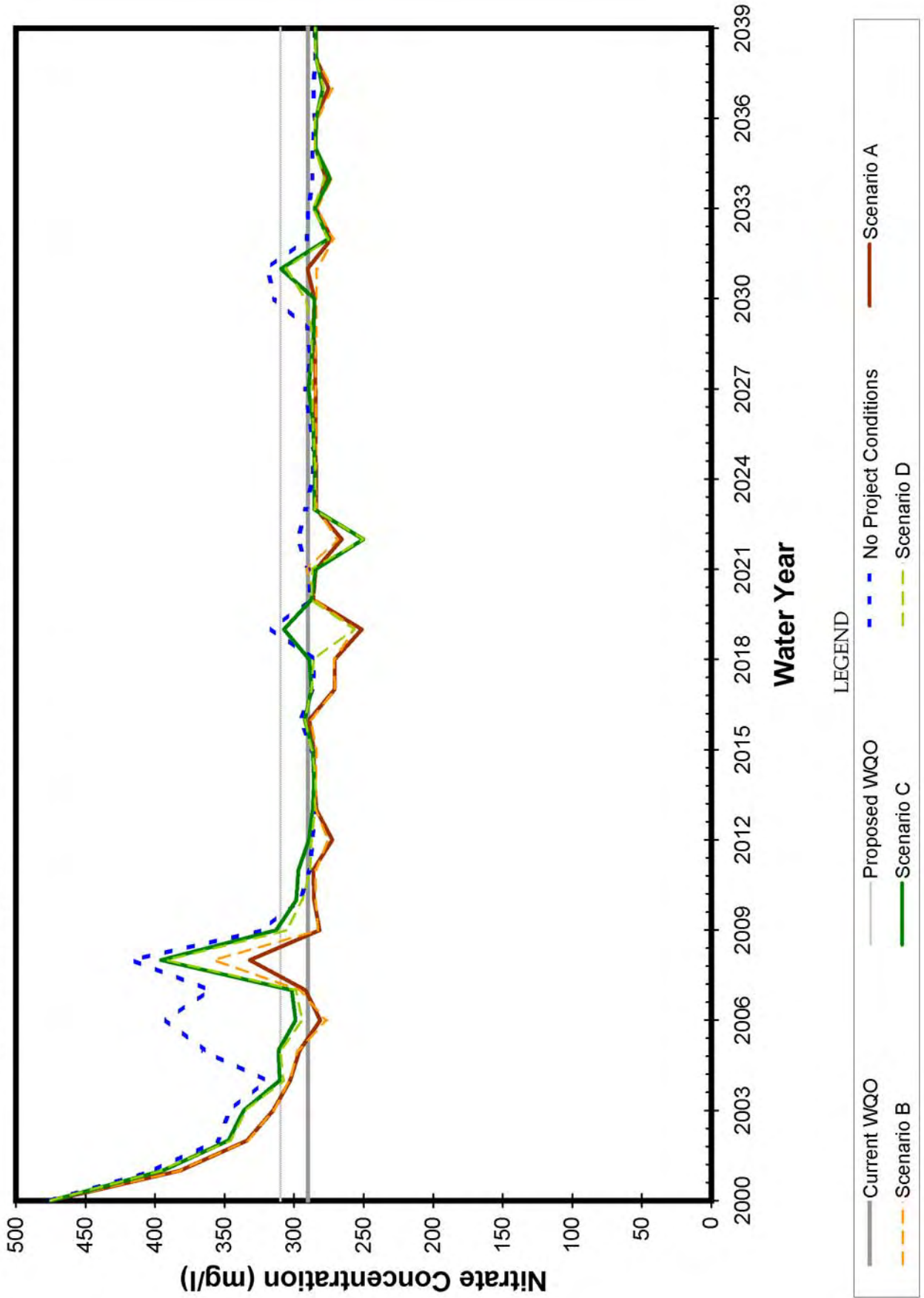
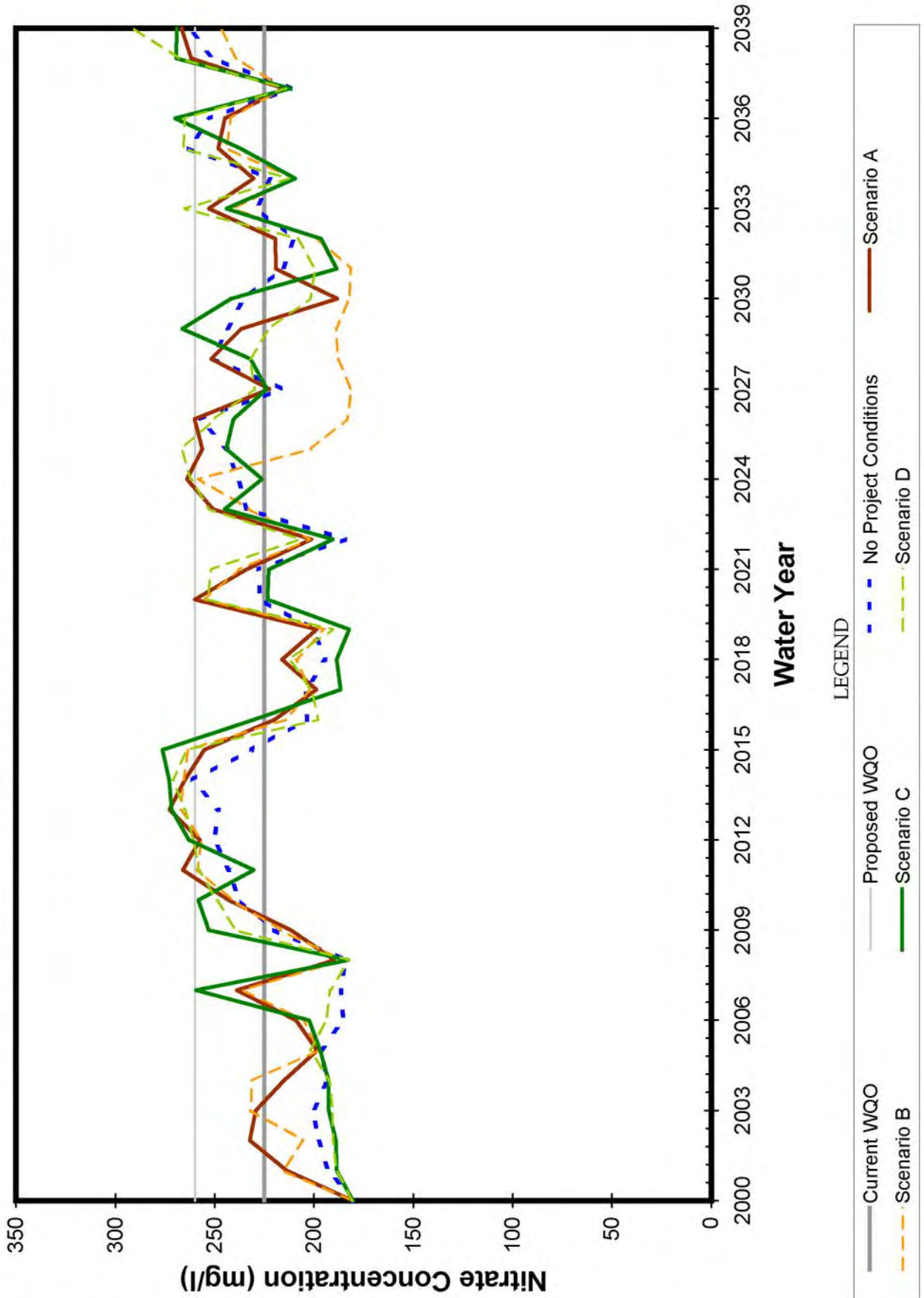


Figure B 74ah. TDS Concentrations for SG-9 Lytle Creek SG.



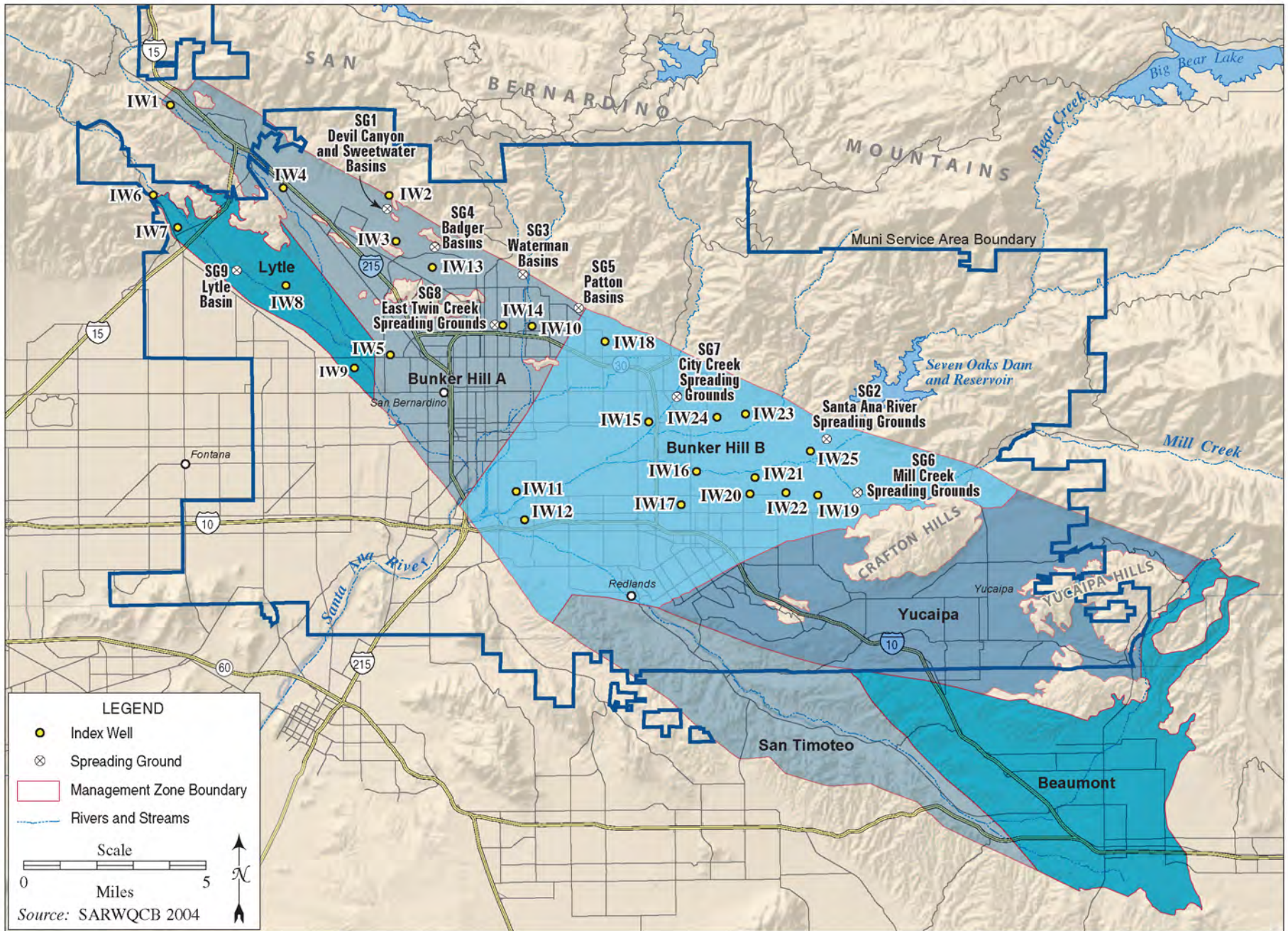


Figure 3.2-16. Location of Index Wells and Spreading Grounds in Relation to Proposed SARWQCB Management Zone Boundaries

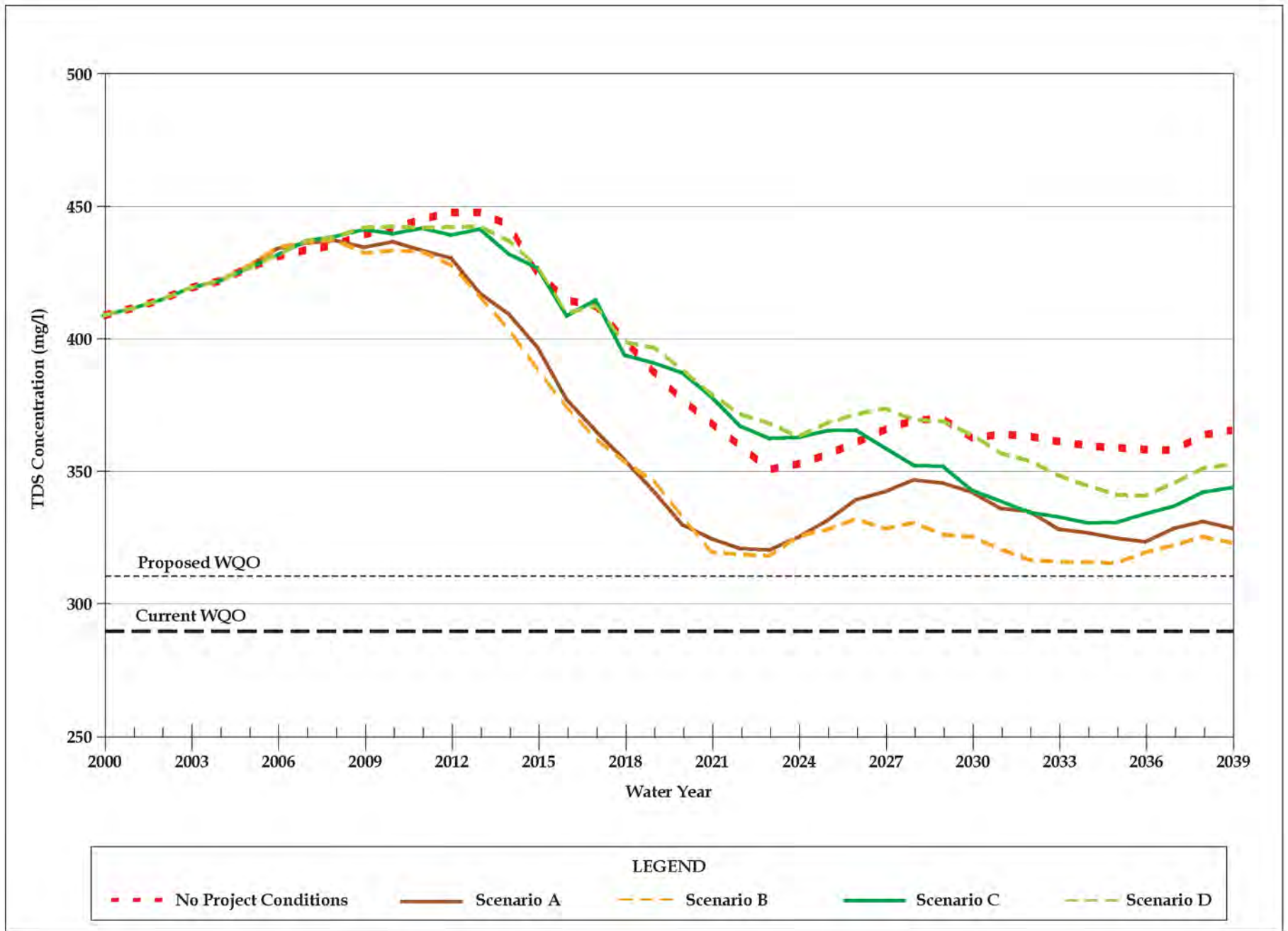


Figure 3.2-17. TDS Concentrations at IW14, Leroy Street Well



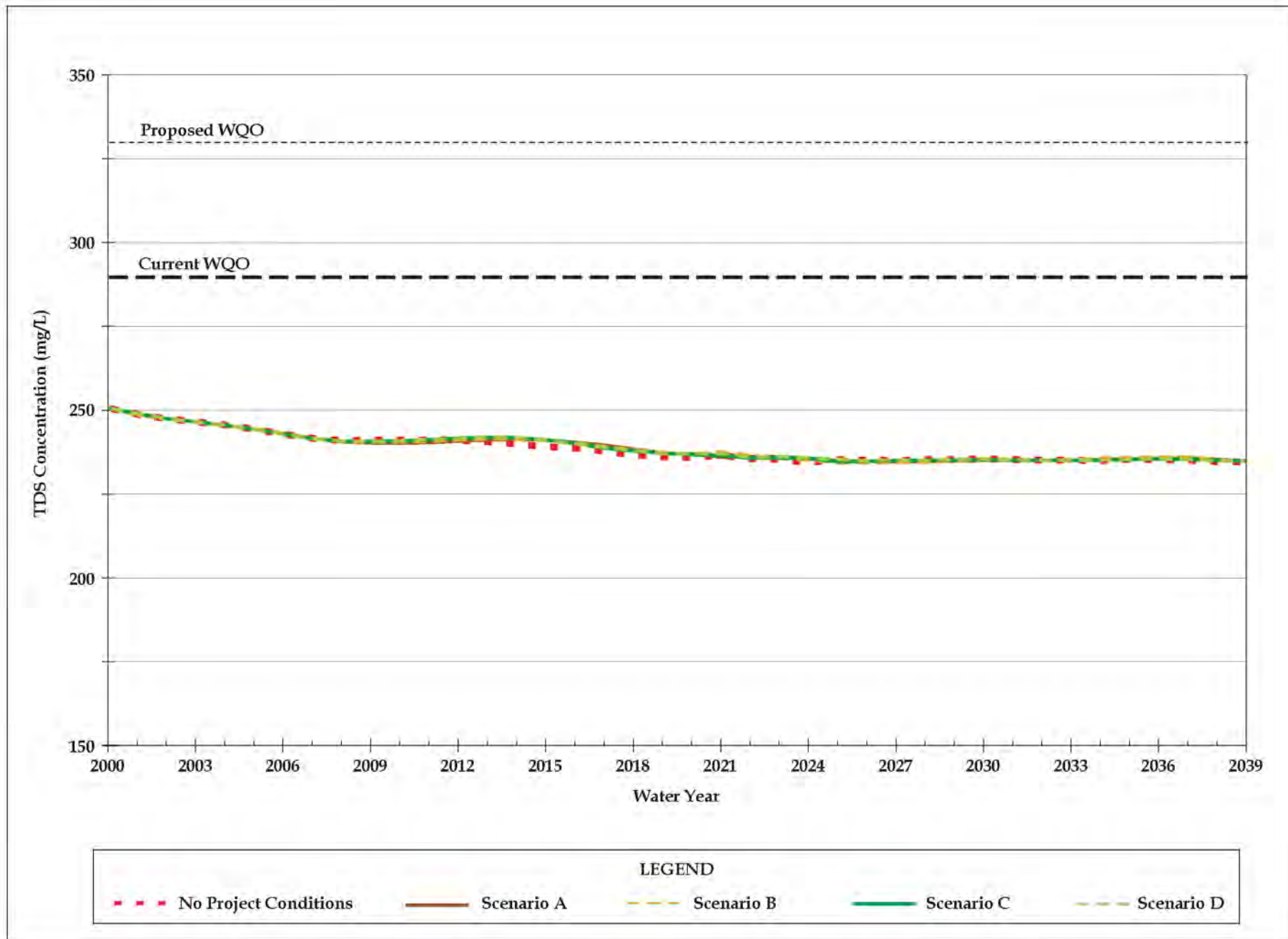


Figure 3.2-18. TDS Concentrations at IW17, Well 32

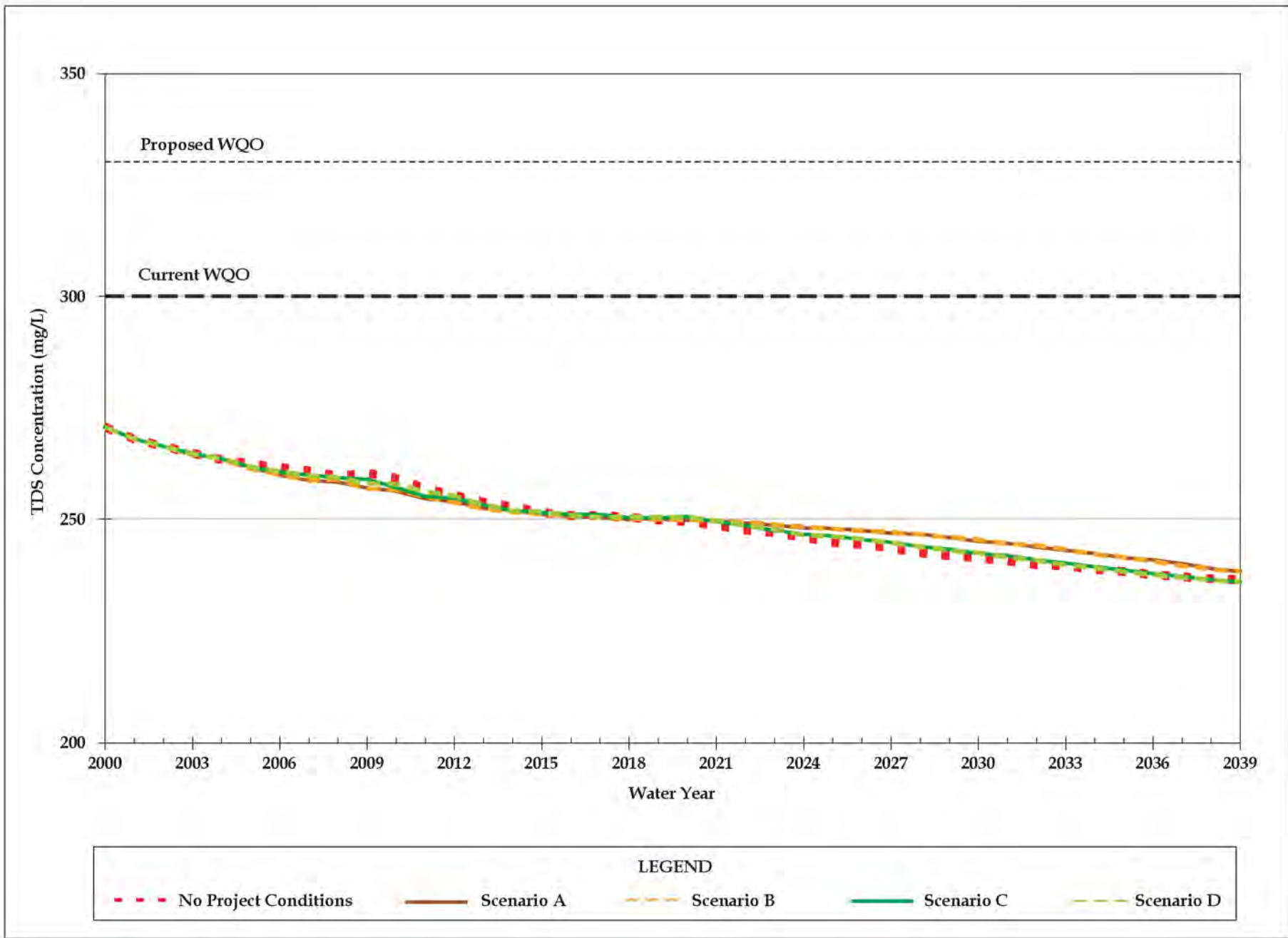


Figure 3.2-19. TDS Concentrations at IW11, Raub 1 Well

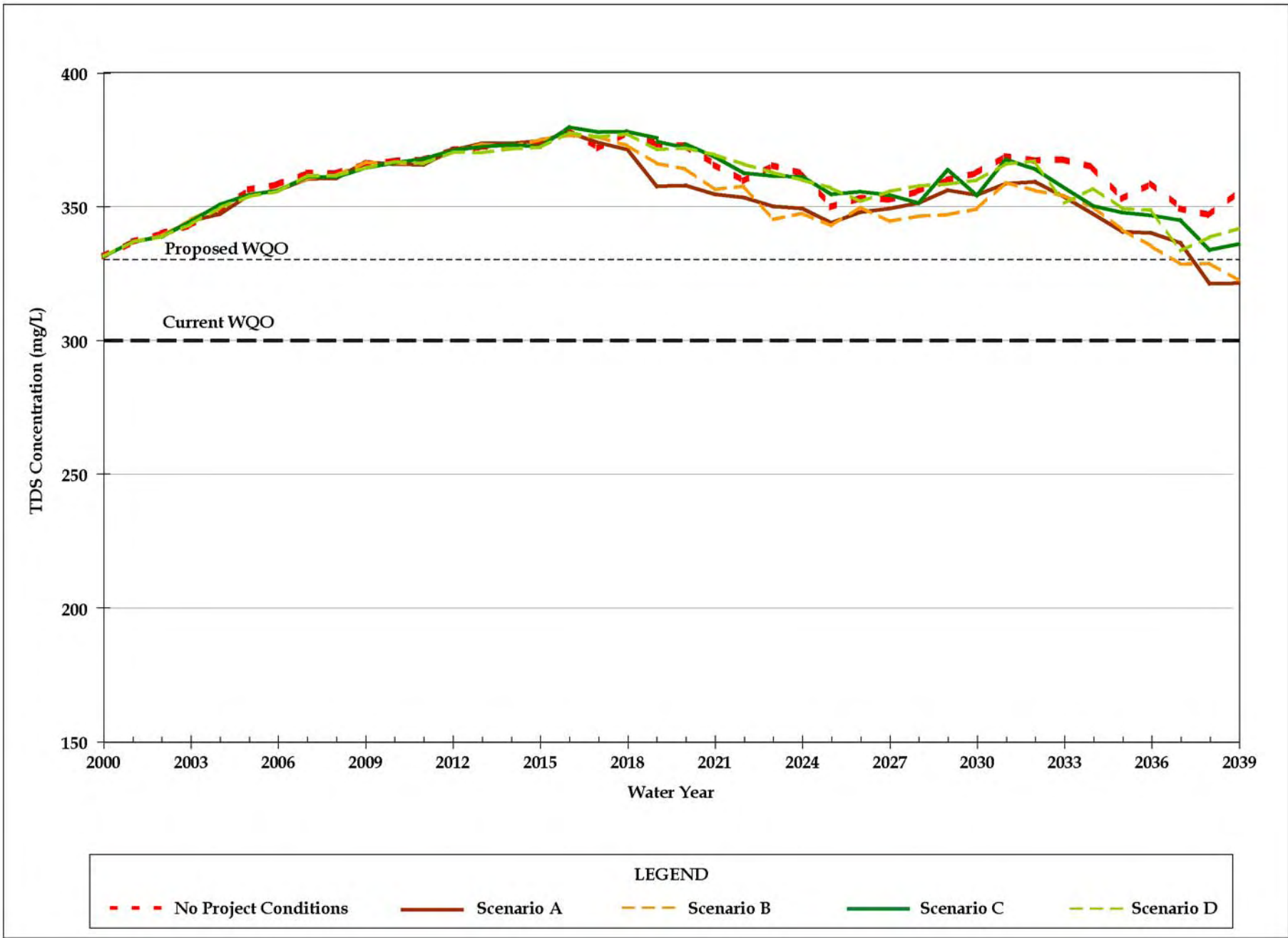


Figure 3.2-20. TDS Concentrations at IW12, Lower Kelly Well

Figure B 75a. Nitrate Concentrations for IW-01.

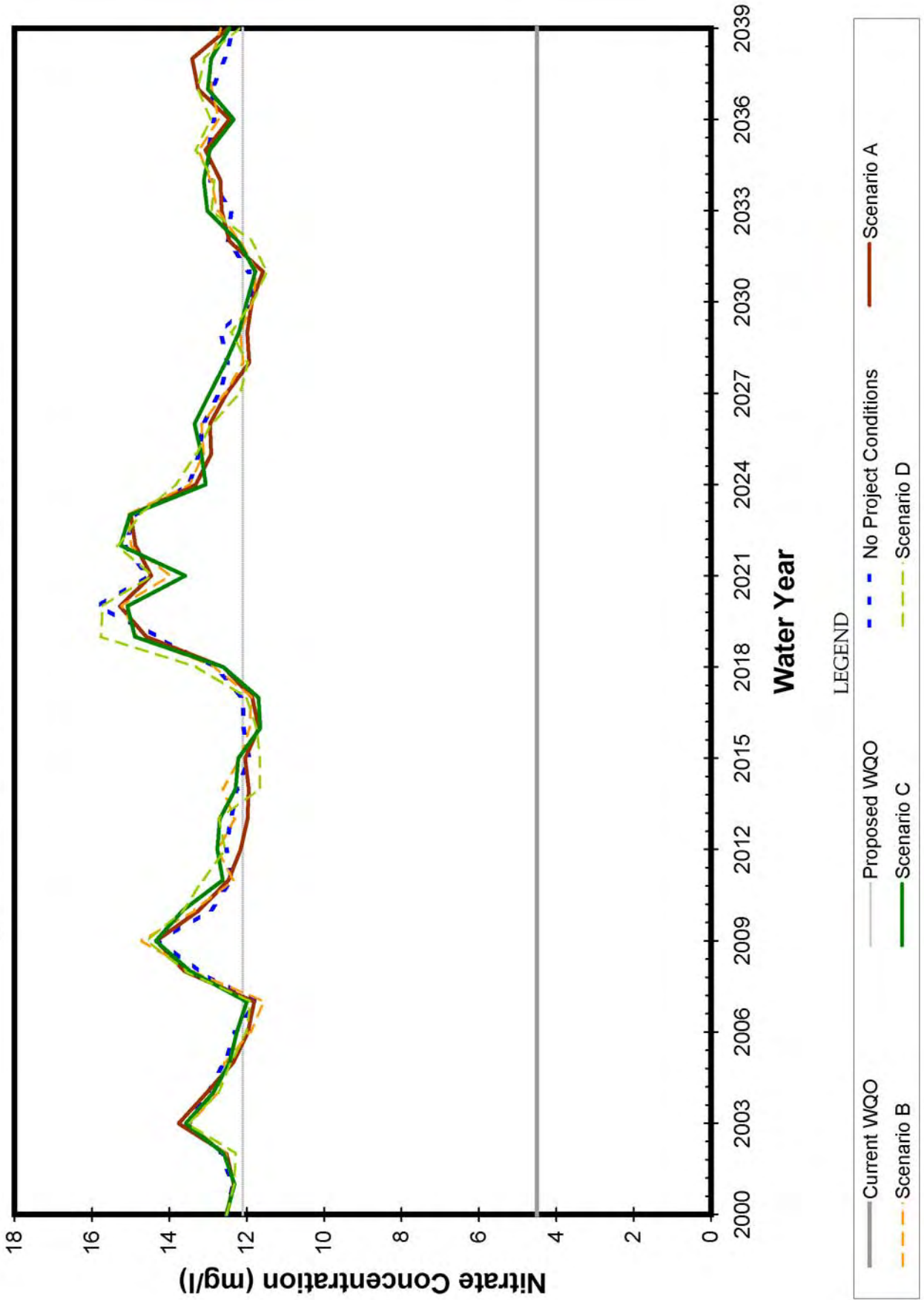


Figure B 75b. Nitrate Concentrations for IW-02.

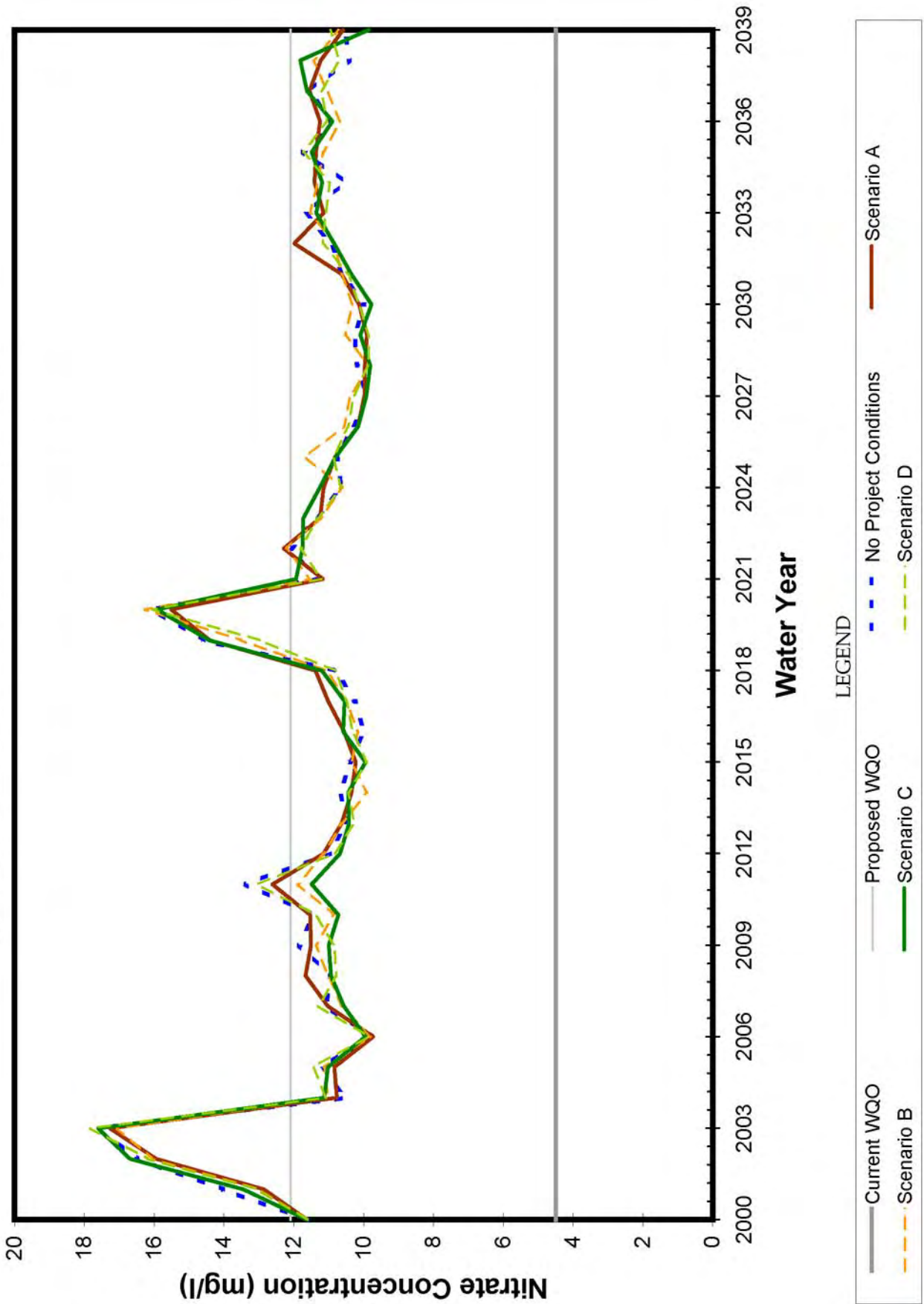


Figure B 75c. Nitrate Concentrations for IW-03.

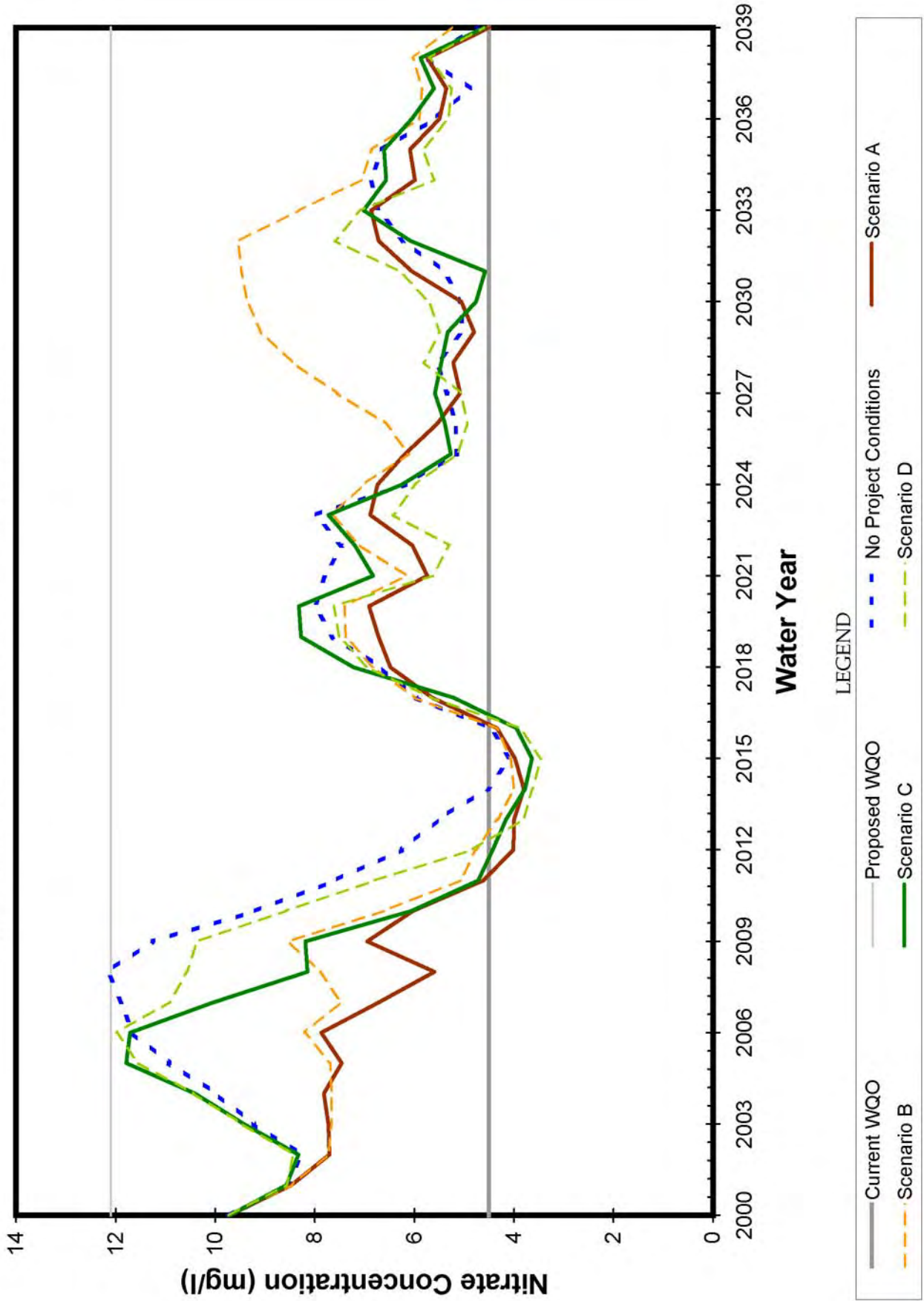
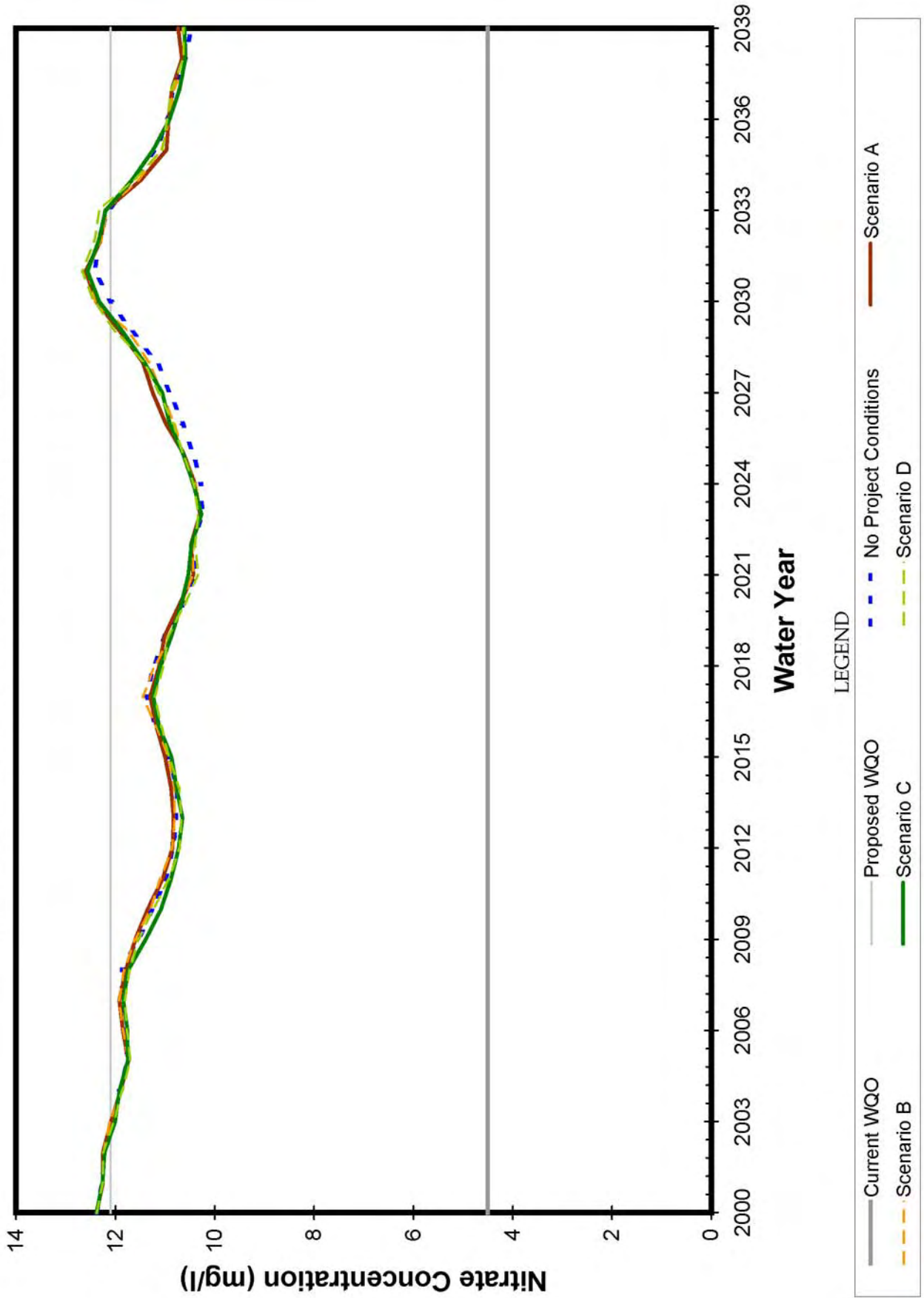


Figure B 75d. Nitrate Concentrations for IW-04.



LEGEND

- Current WQO
- Proposed WQO
- Scenario A
- Scenario B
- Scenario C
- Scenario D
- No Project Conditions

Figure B 75e. Nitrate Concentrations for IW-05.

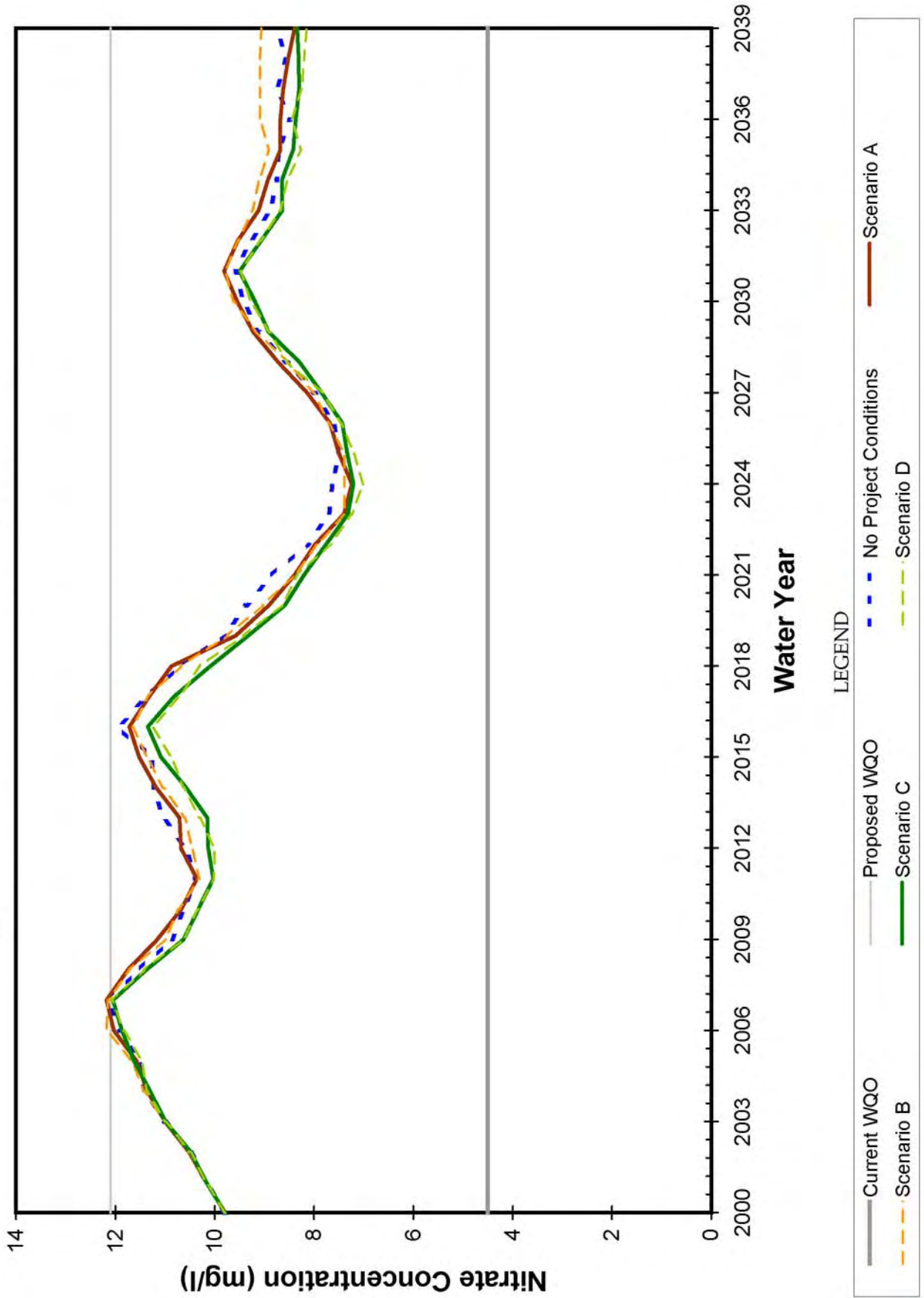




Figure B 75f. Nitrate Concentrations for IW-06.

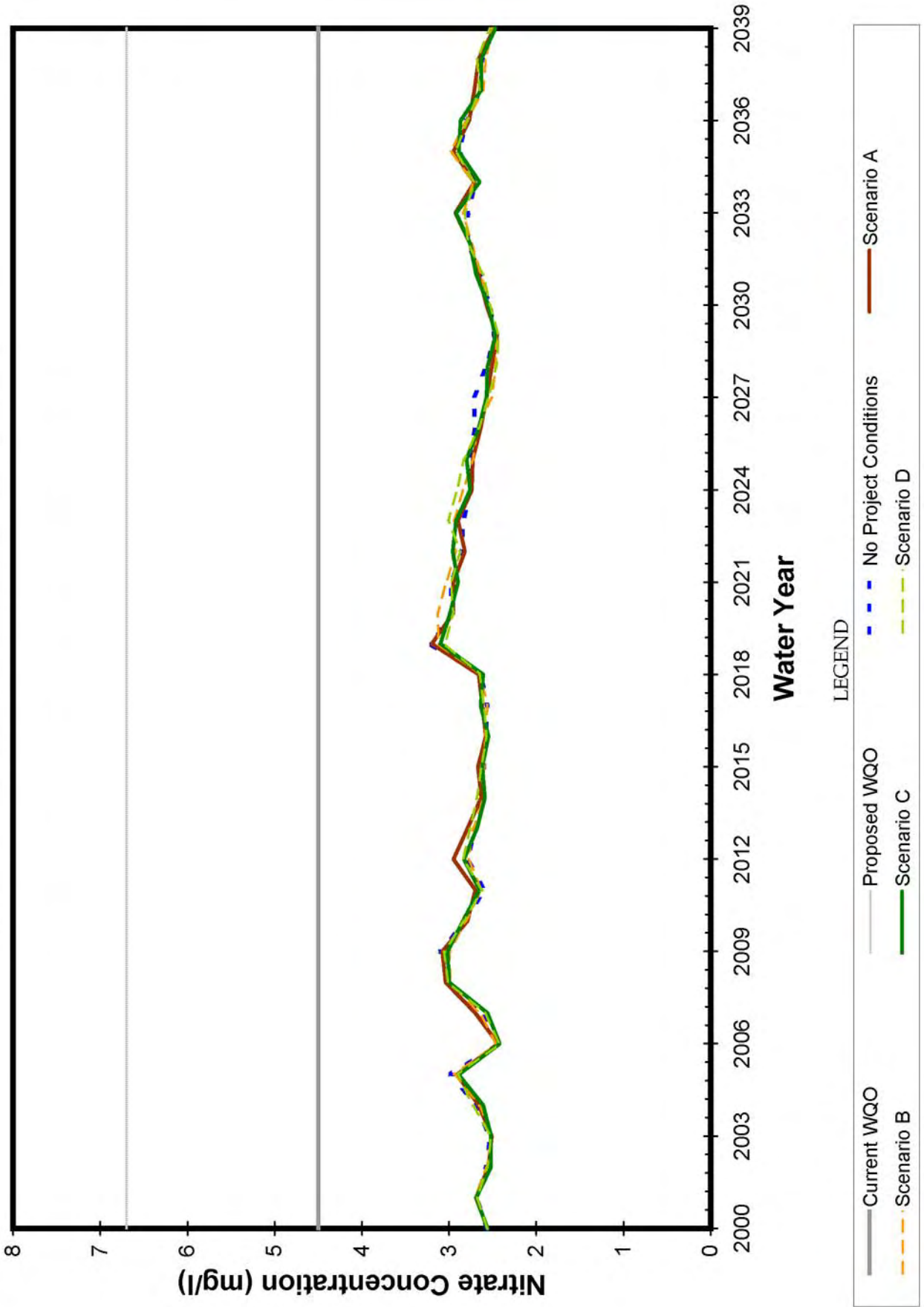


Figure B 75g. Nitrate Concentrations for IW-07.

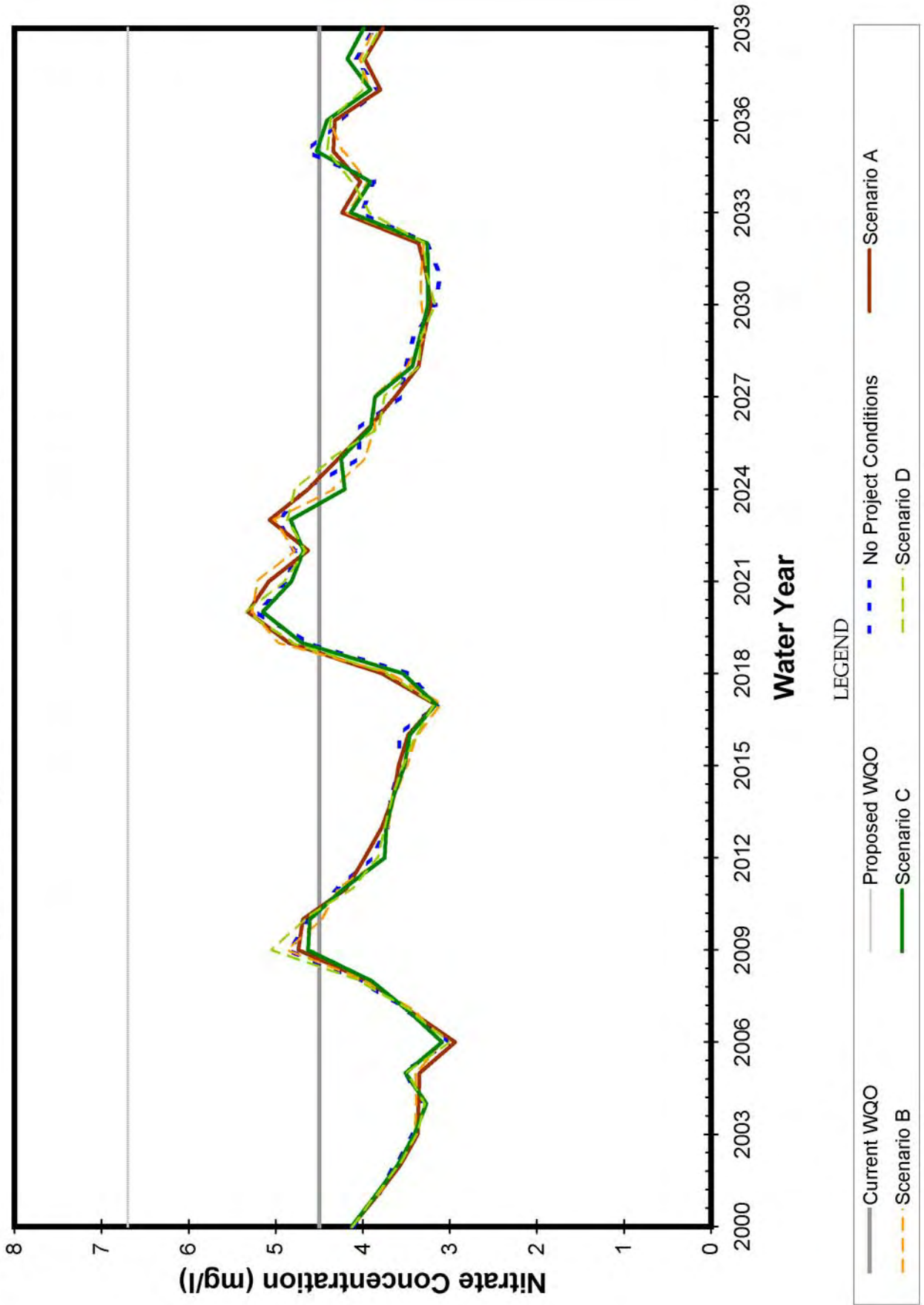


Figure B 75h. Nitrate Concentrations for IW-08.

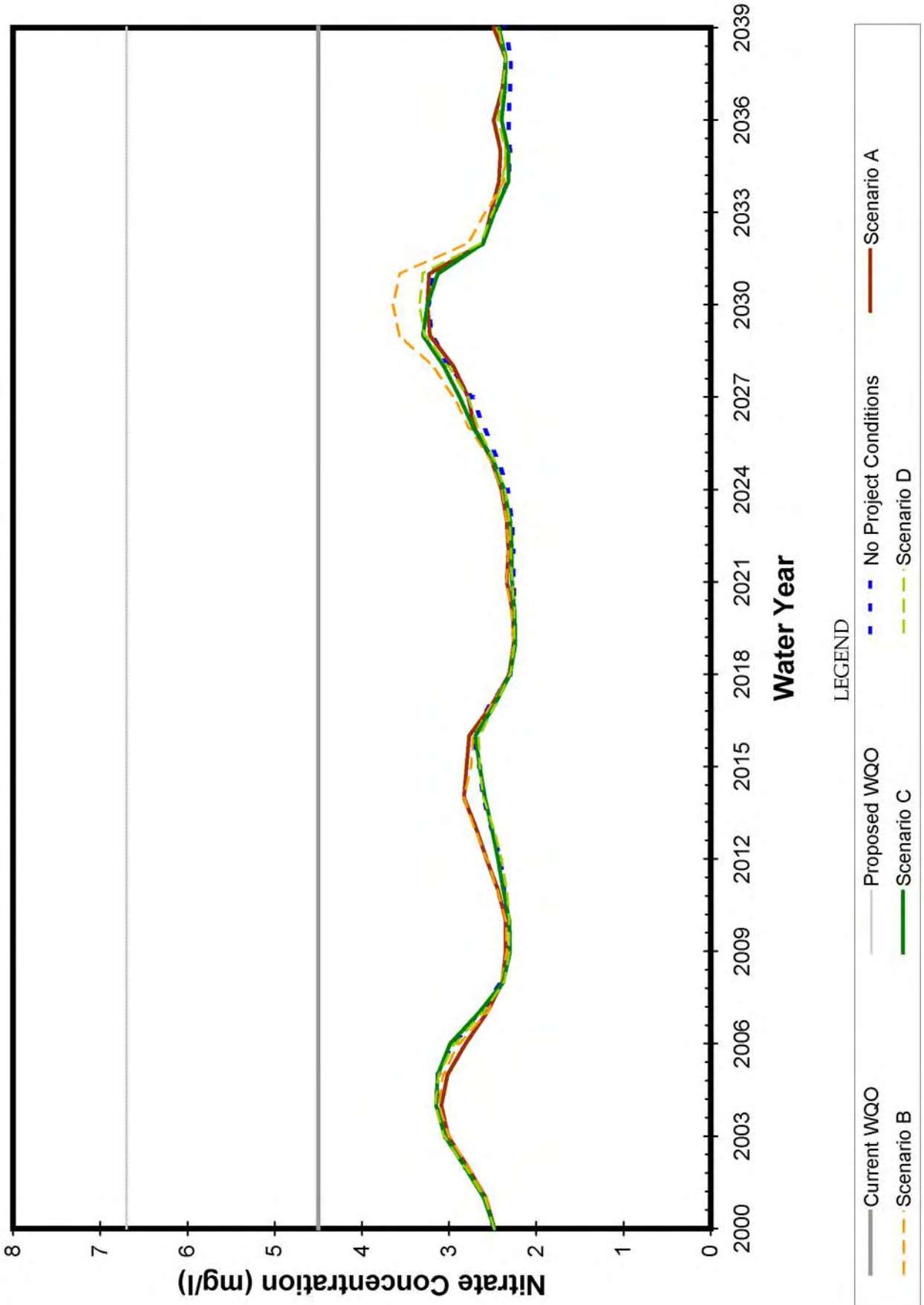


Figure B 75i. Nitrate Concentrations for IW-09.

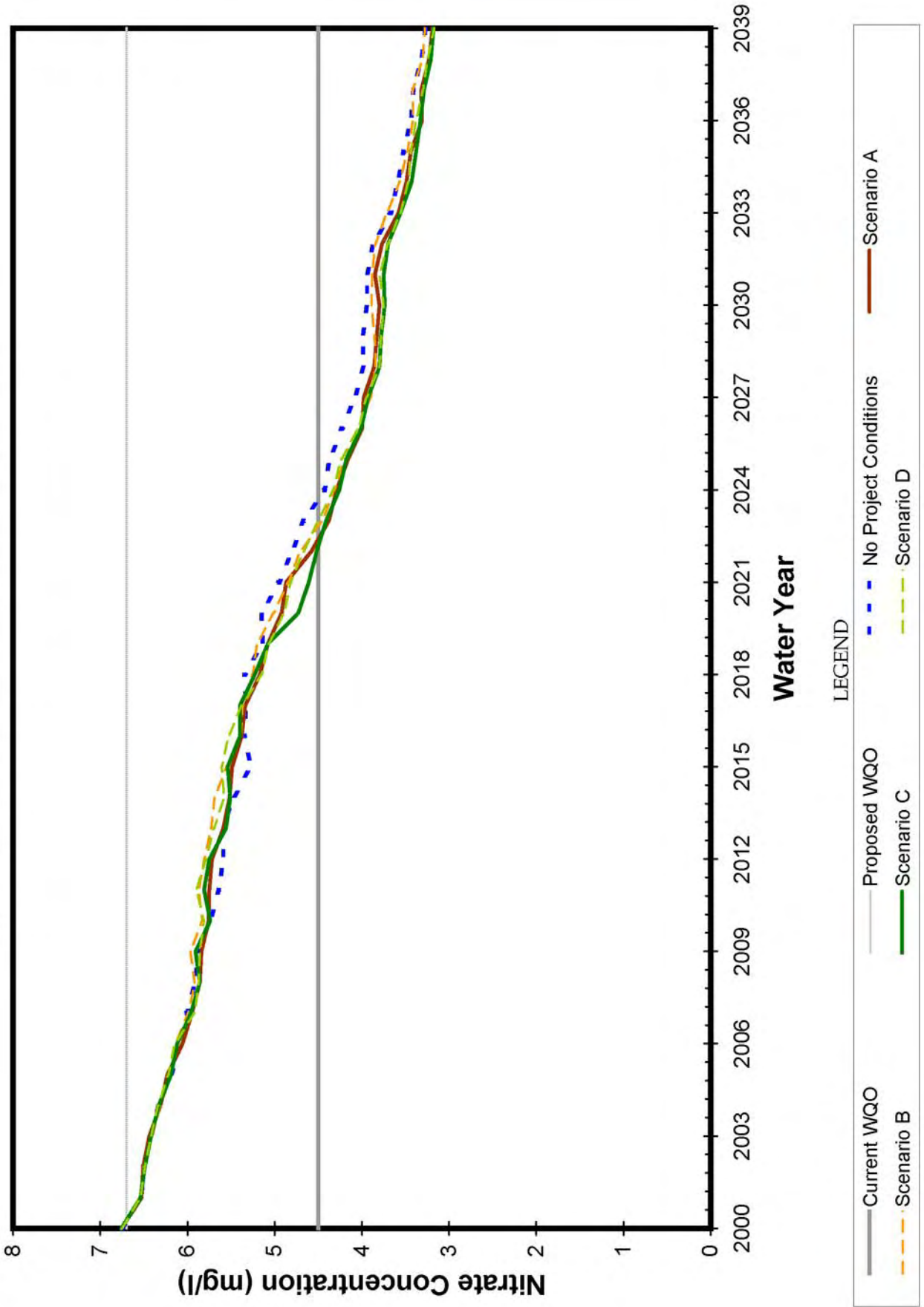
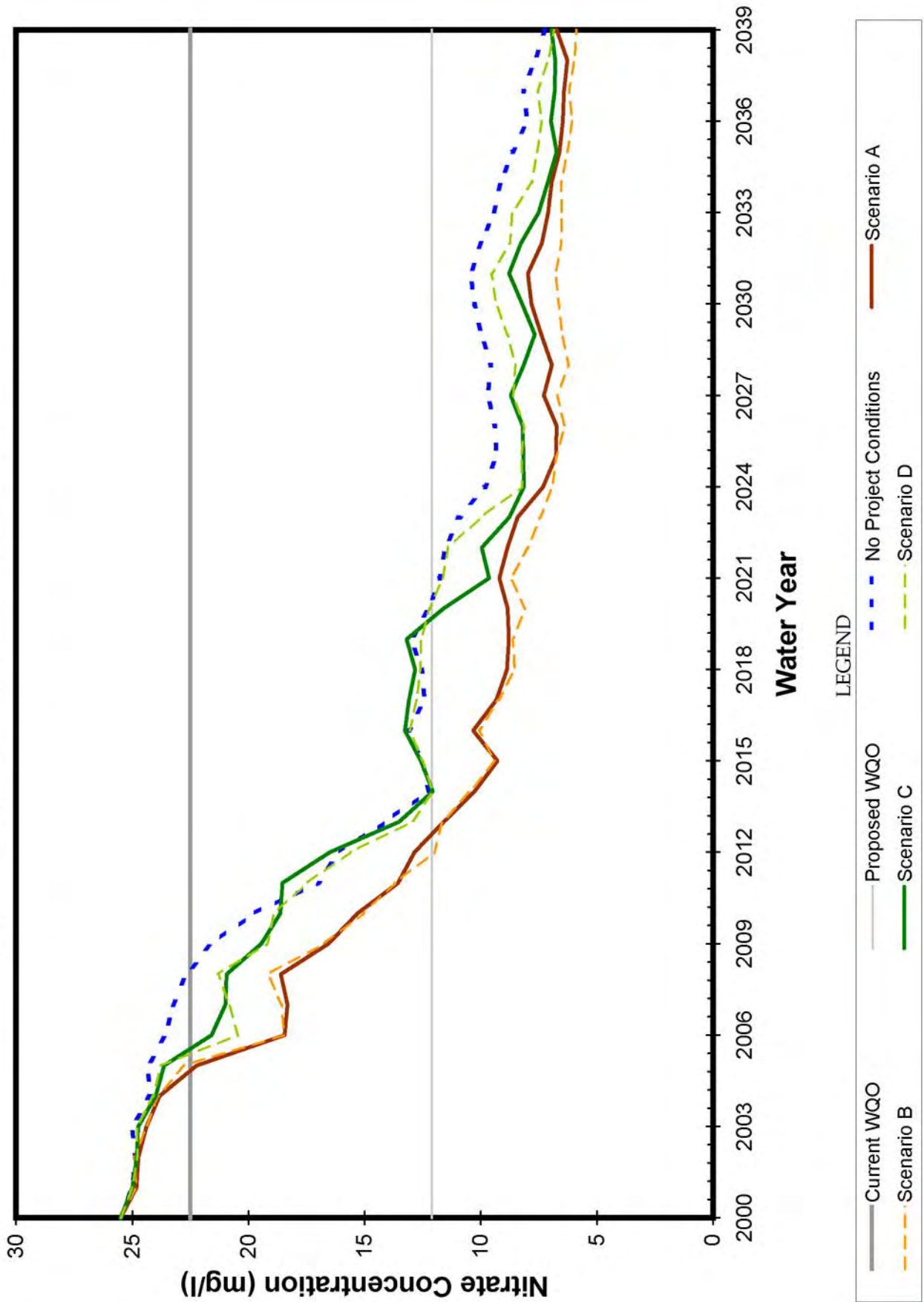


Figure B 75j. Nitrate Concentrations for IW-10.



FigureB 75k. Nitrate Concentrations for IW-11.

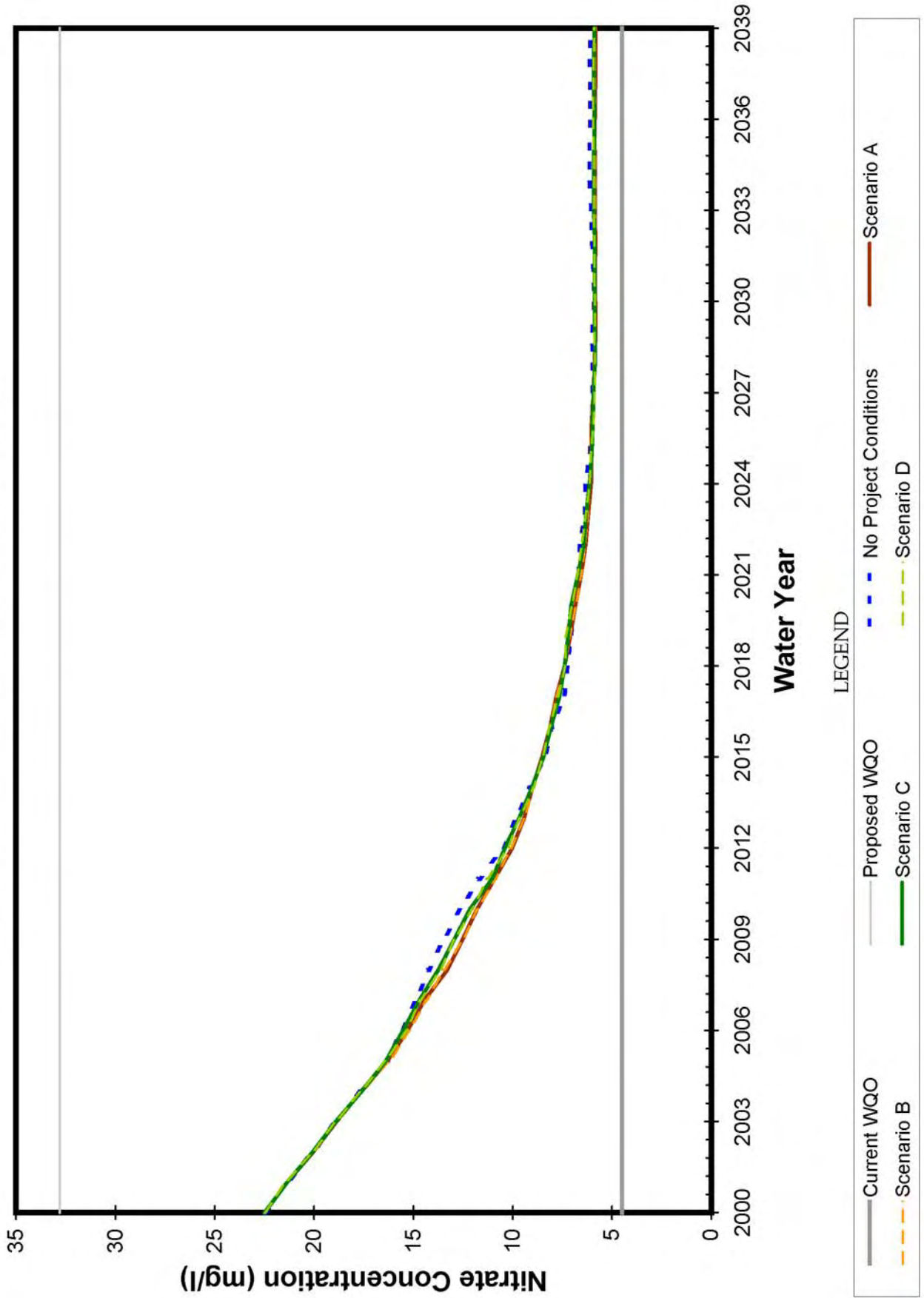


Figure B 75I. Nitrate Concentrations for IW-12.

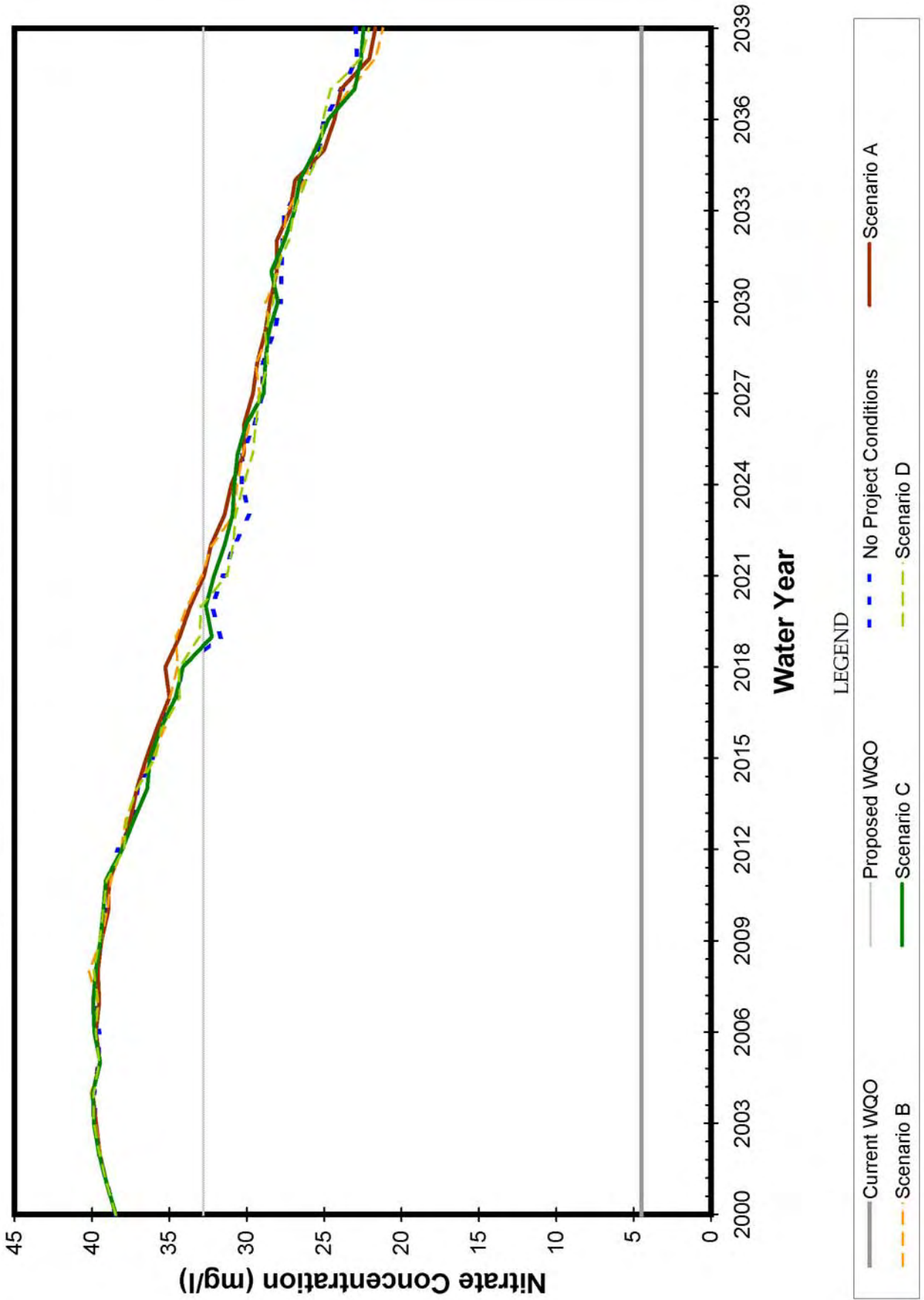


Figure B 75m. Nitrate Concentrations for IW-13.

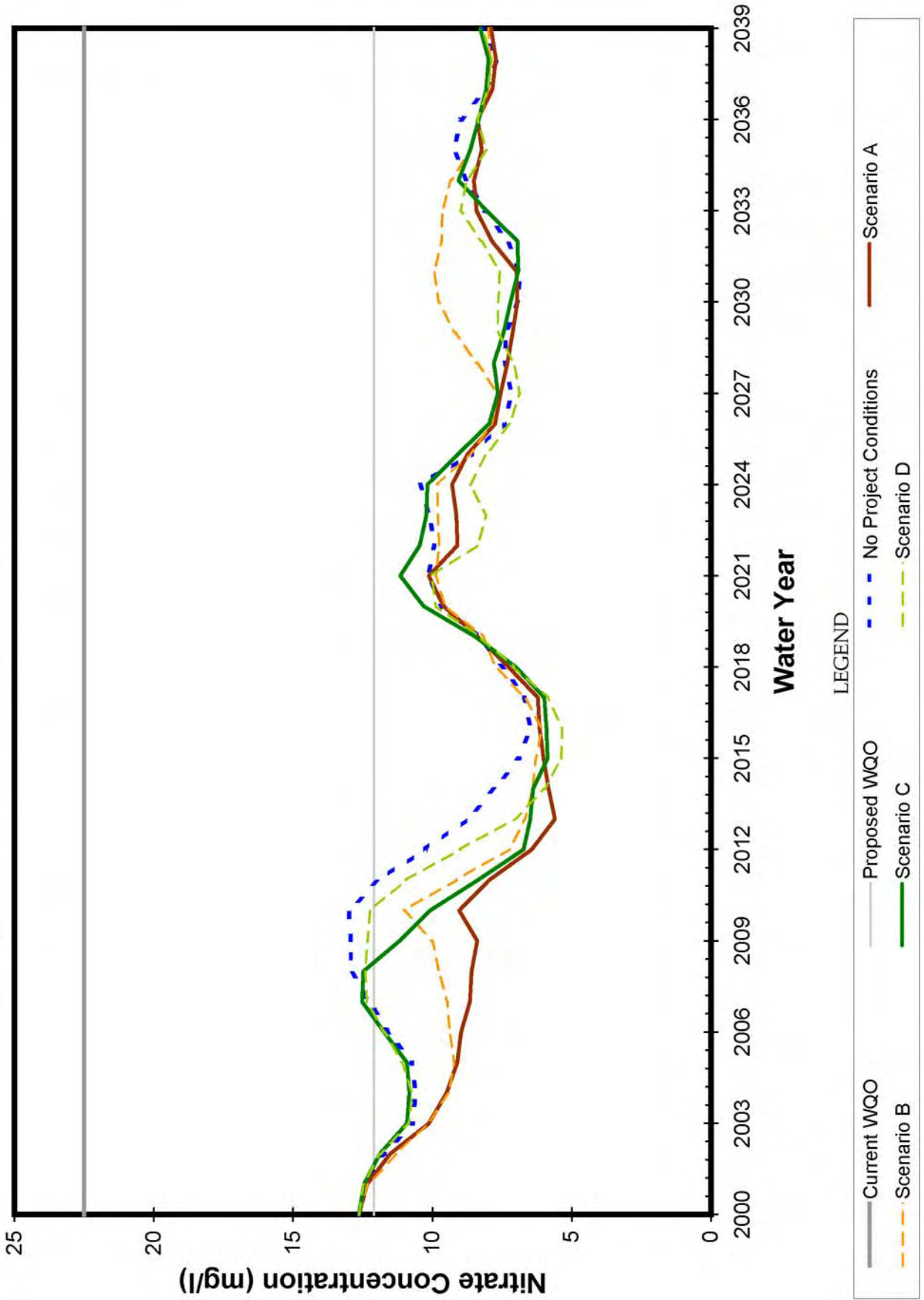




Figure B 75n. Nitrate Concentrations for IW-14.

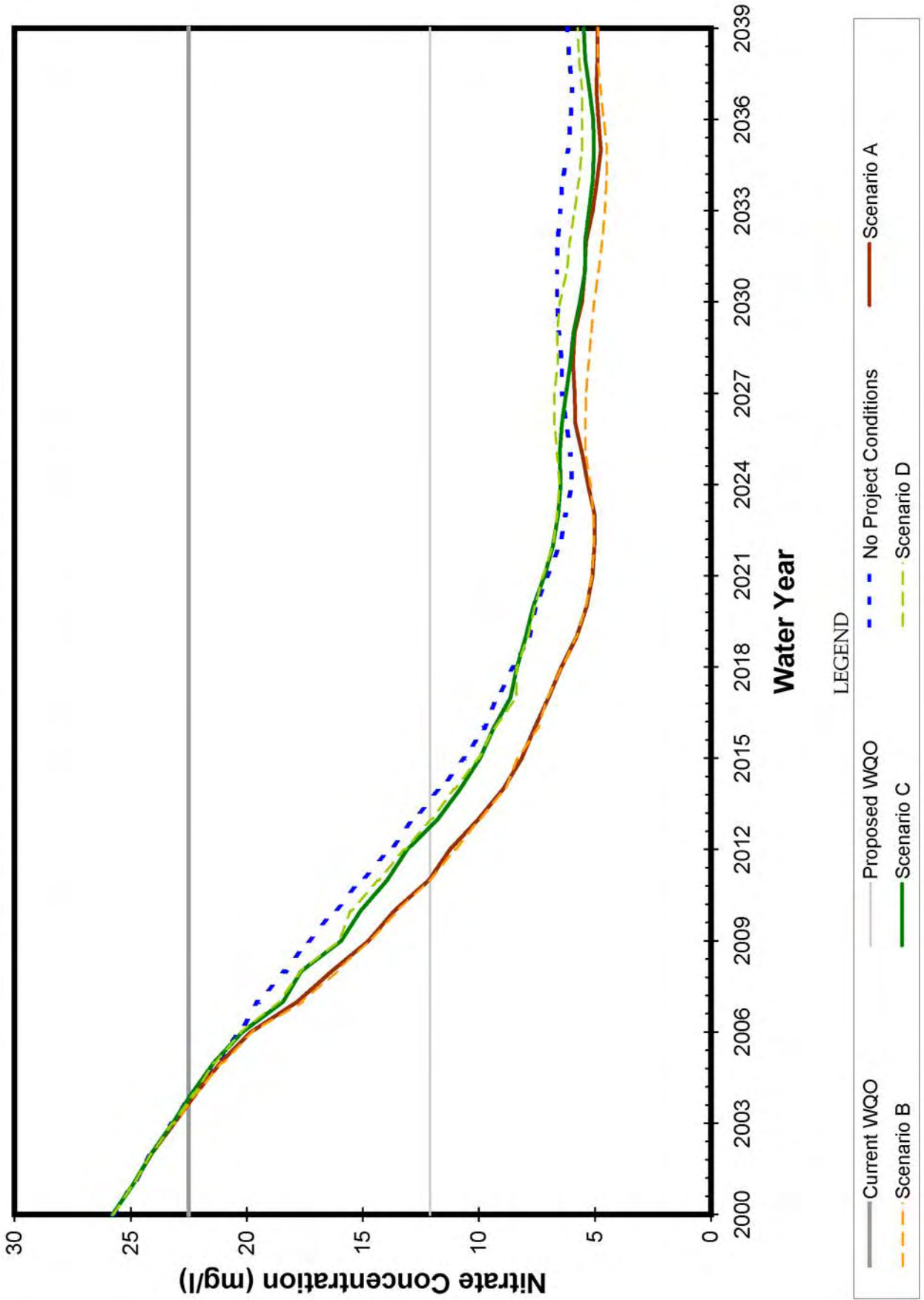


Figure B 75o. Nitrate Concentrations for IW-15.

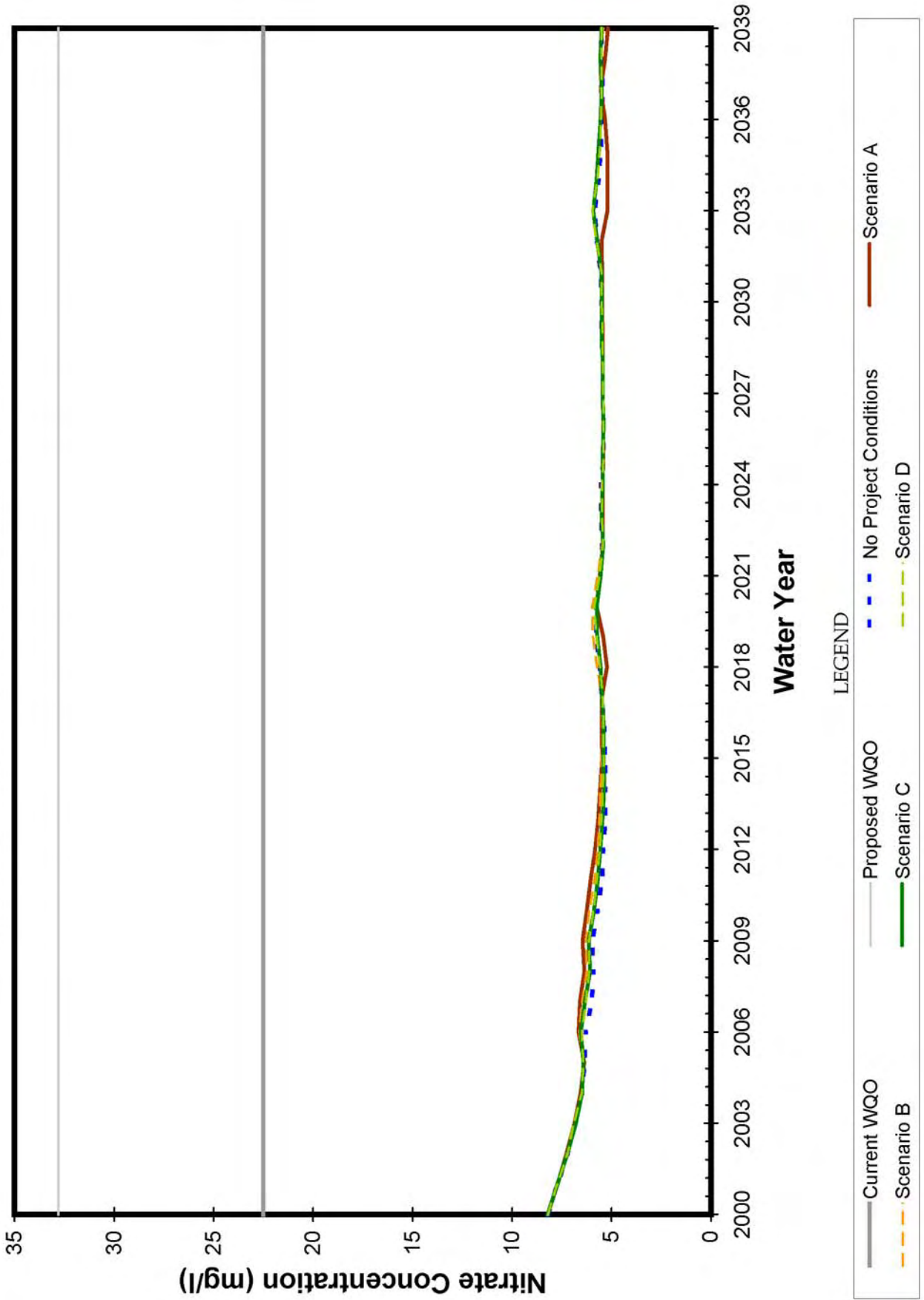


Figure B 75p. Nitrate Concentrations for IW-16.

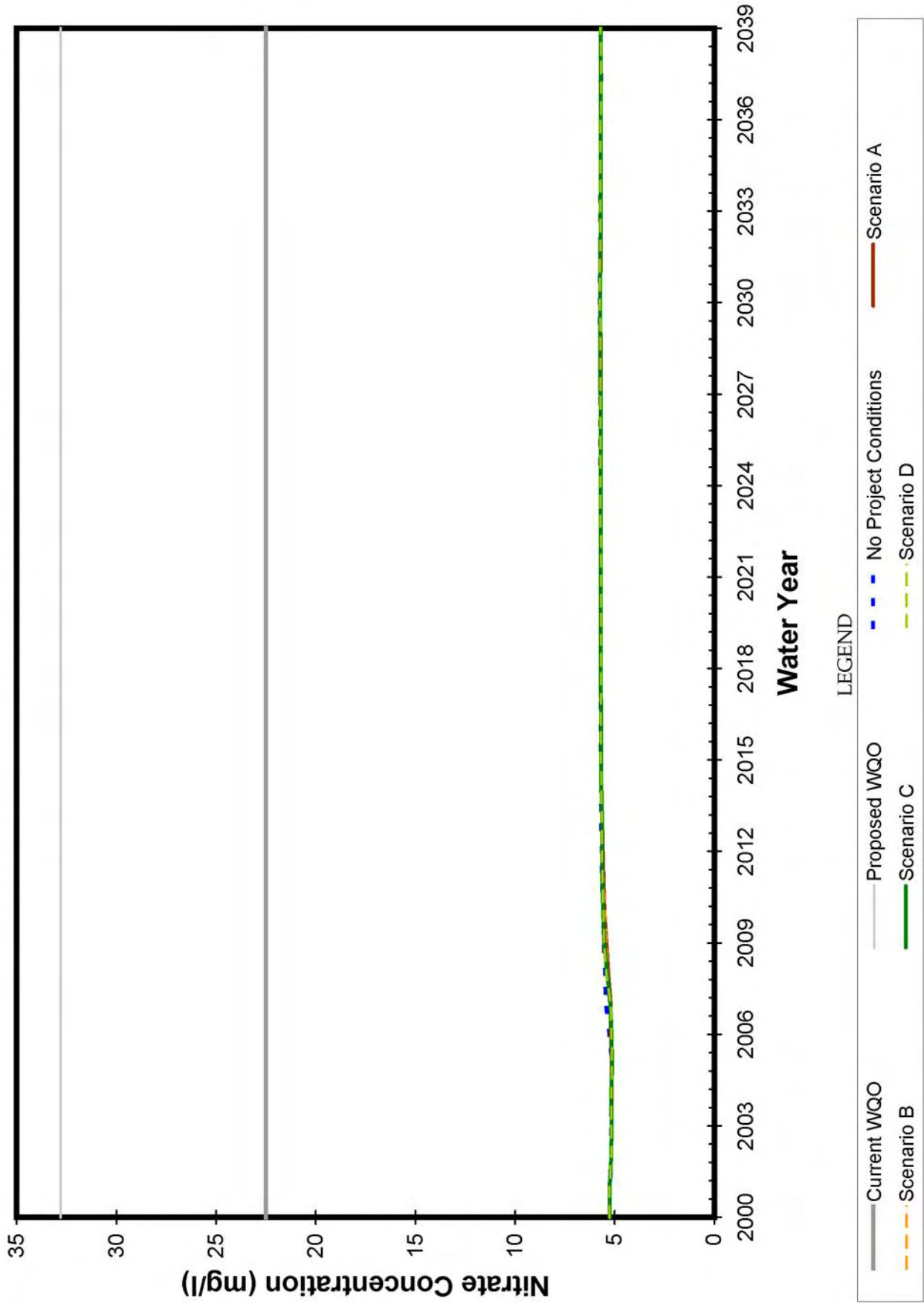


Figure B 75q. Nitrate Concentrations for IW-17.

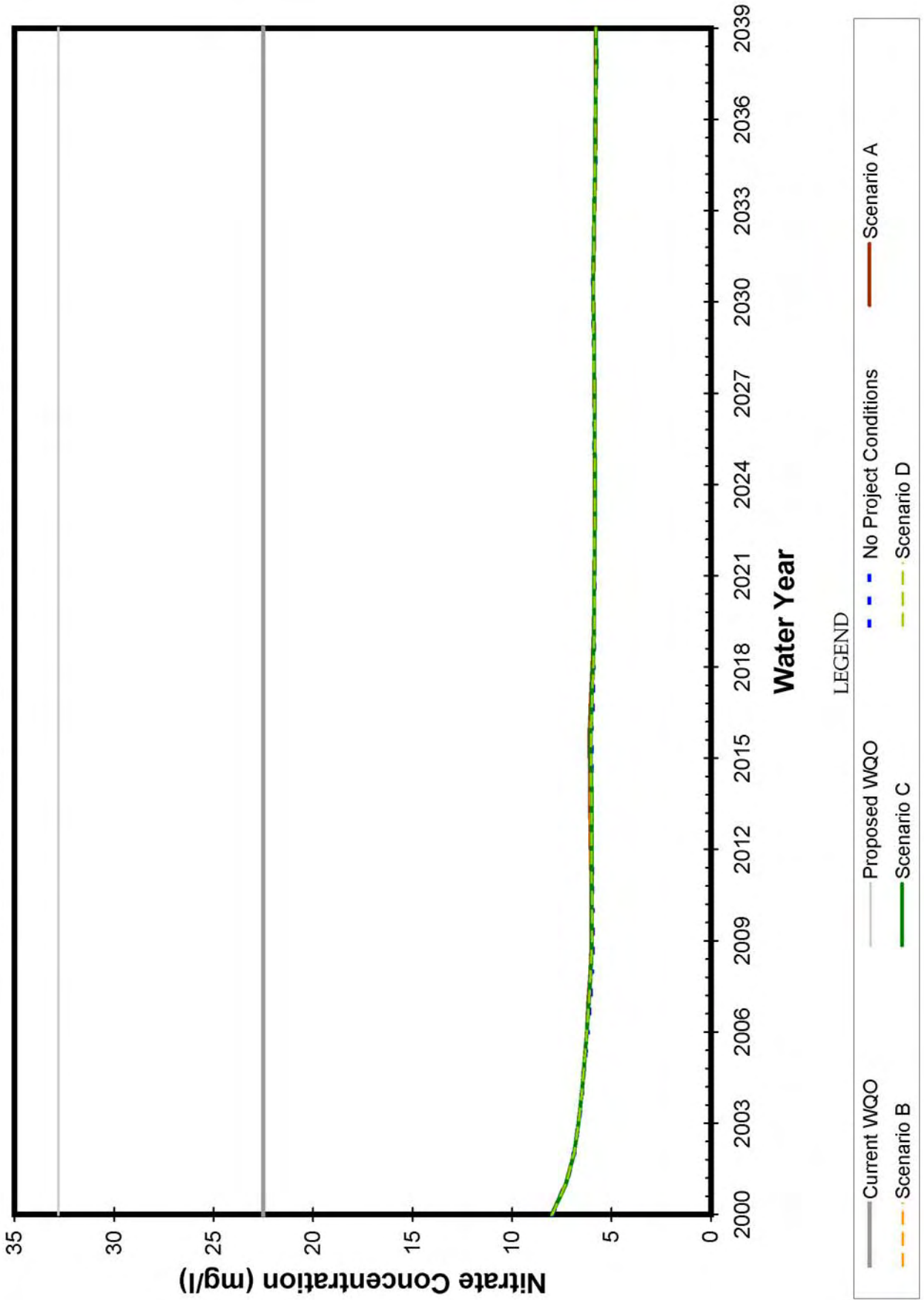


Figure B 75r. Nitrate Concentrations for IW-18.

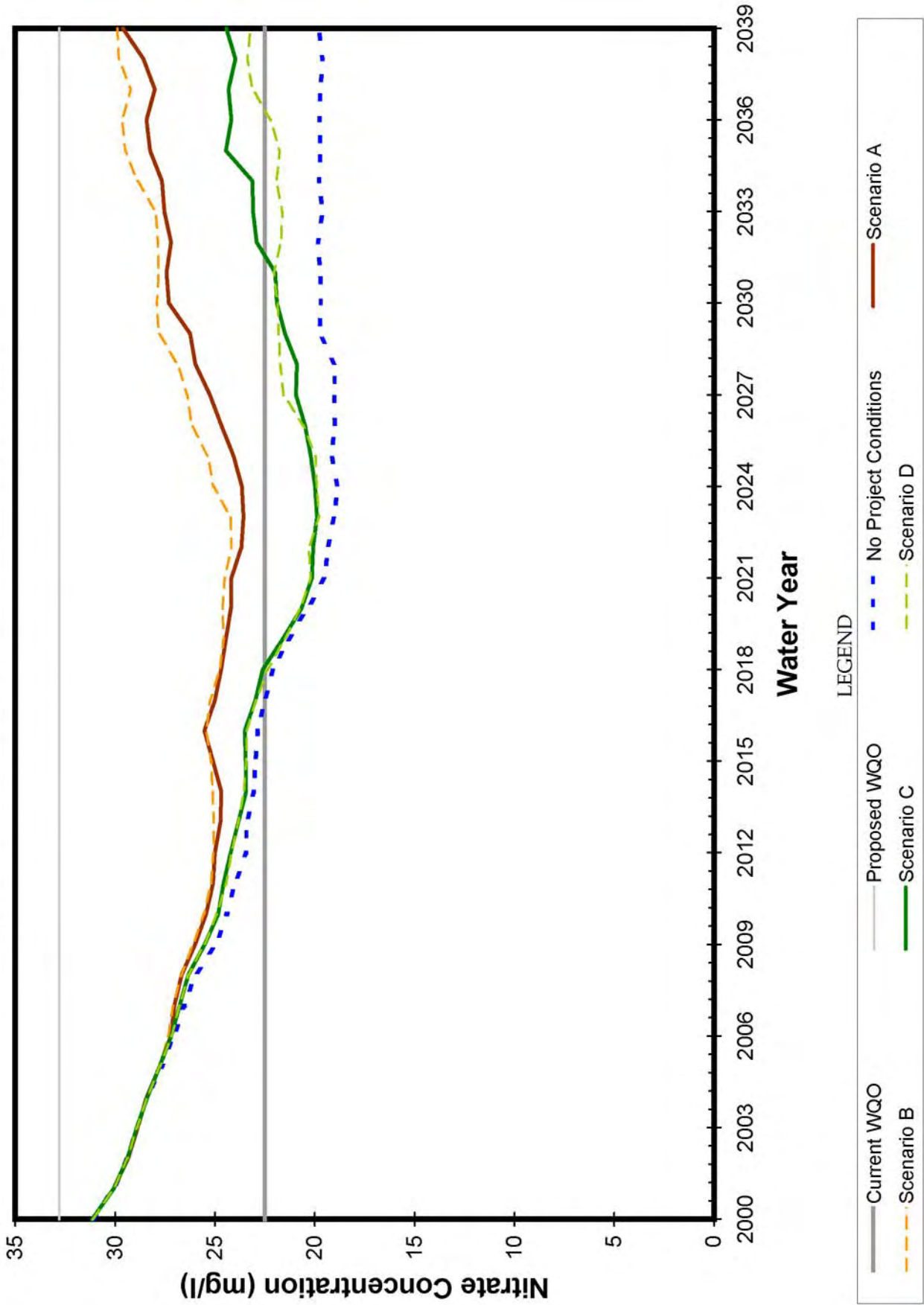


Figure B 75s. Nitrate Concentrations for IW-19.

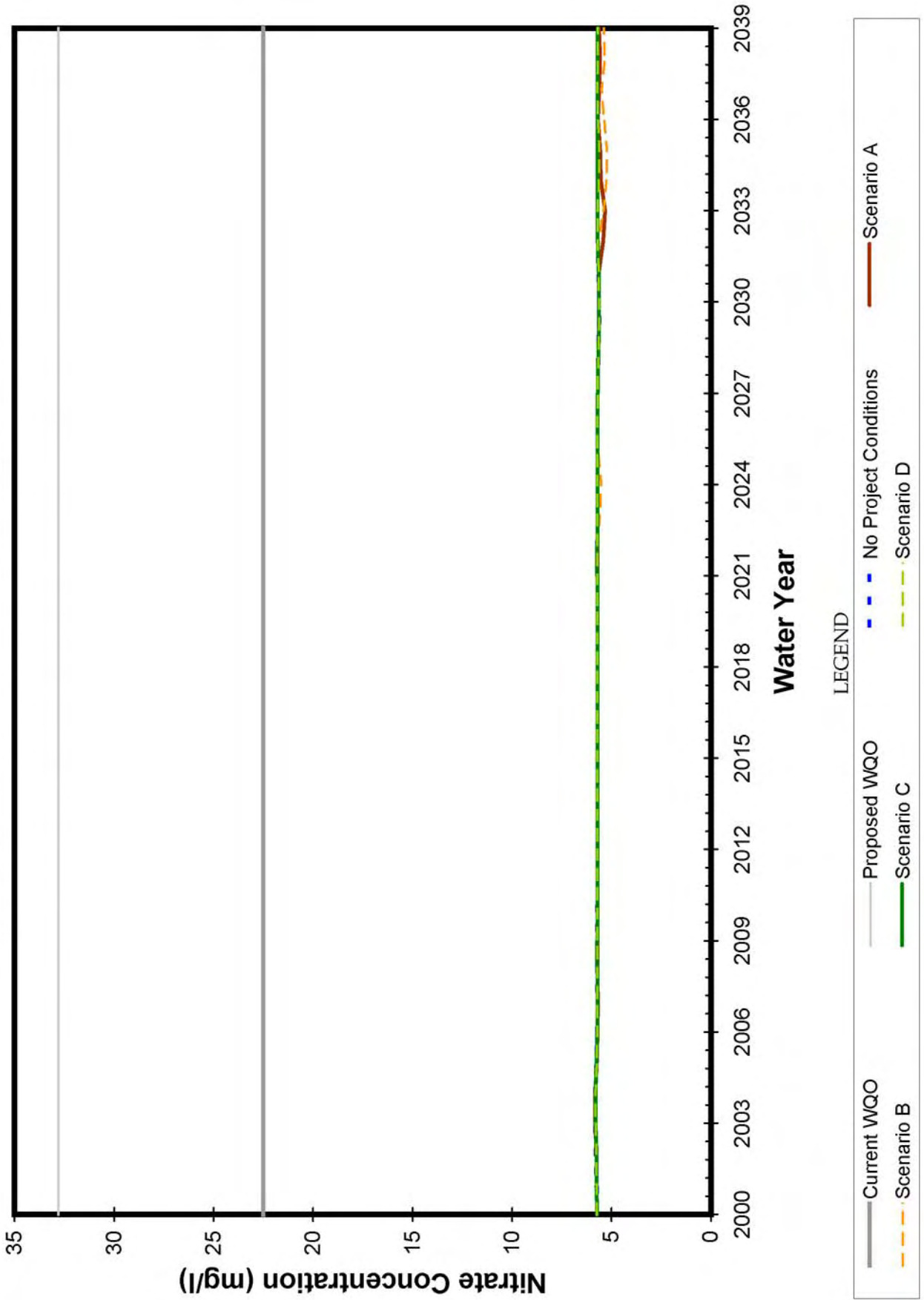


Figure B 75t. Nitrate Concentrations for IW-20.

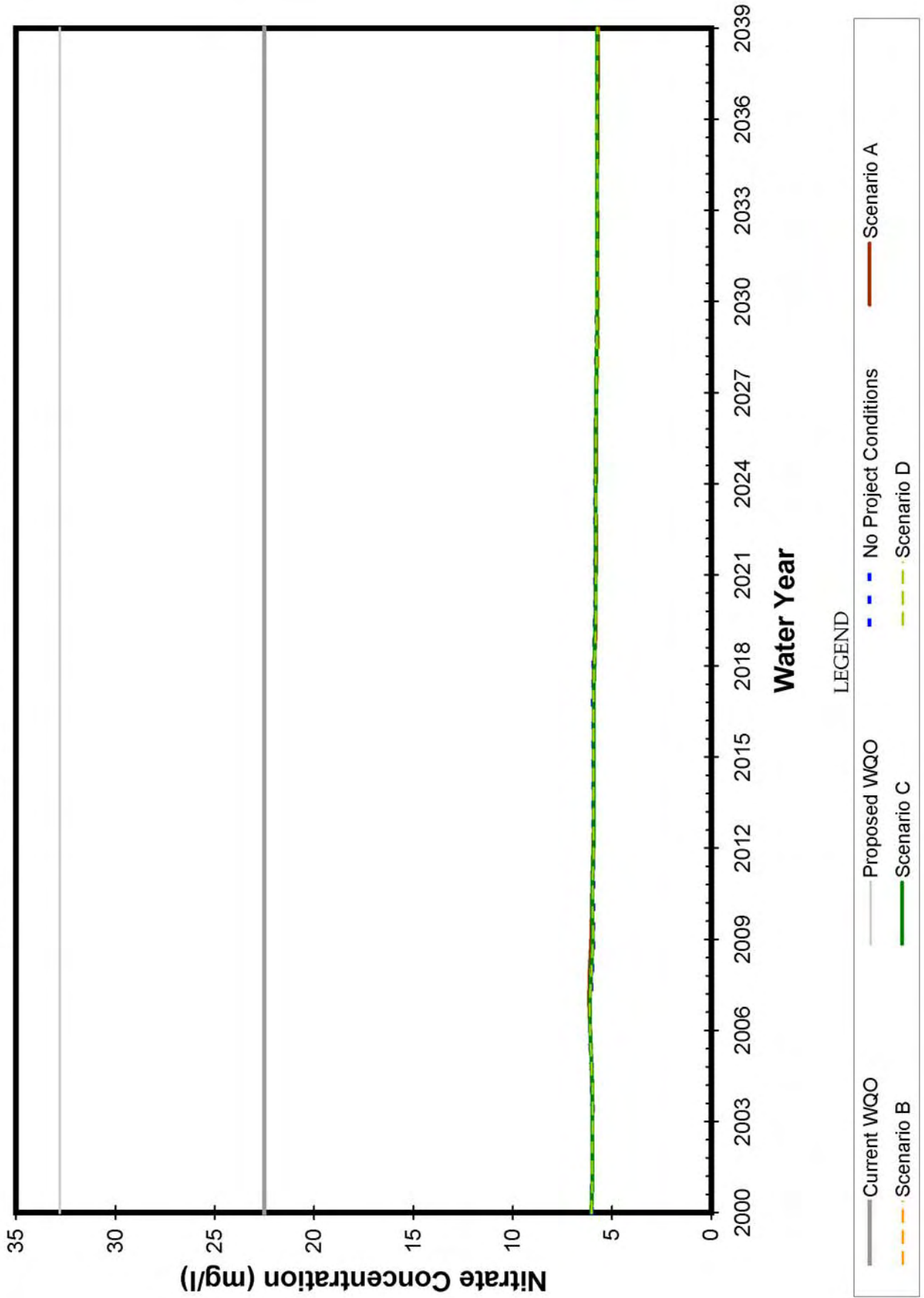


Figure B 75u. Nitrate Concentrations for IW-21.

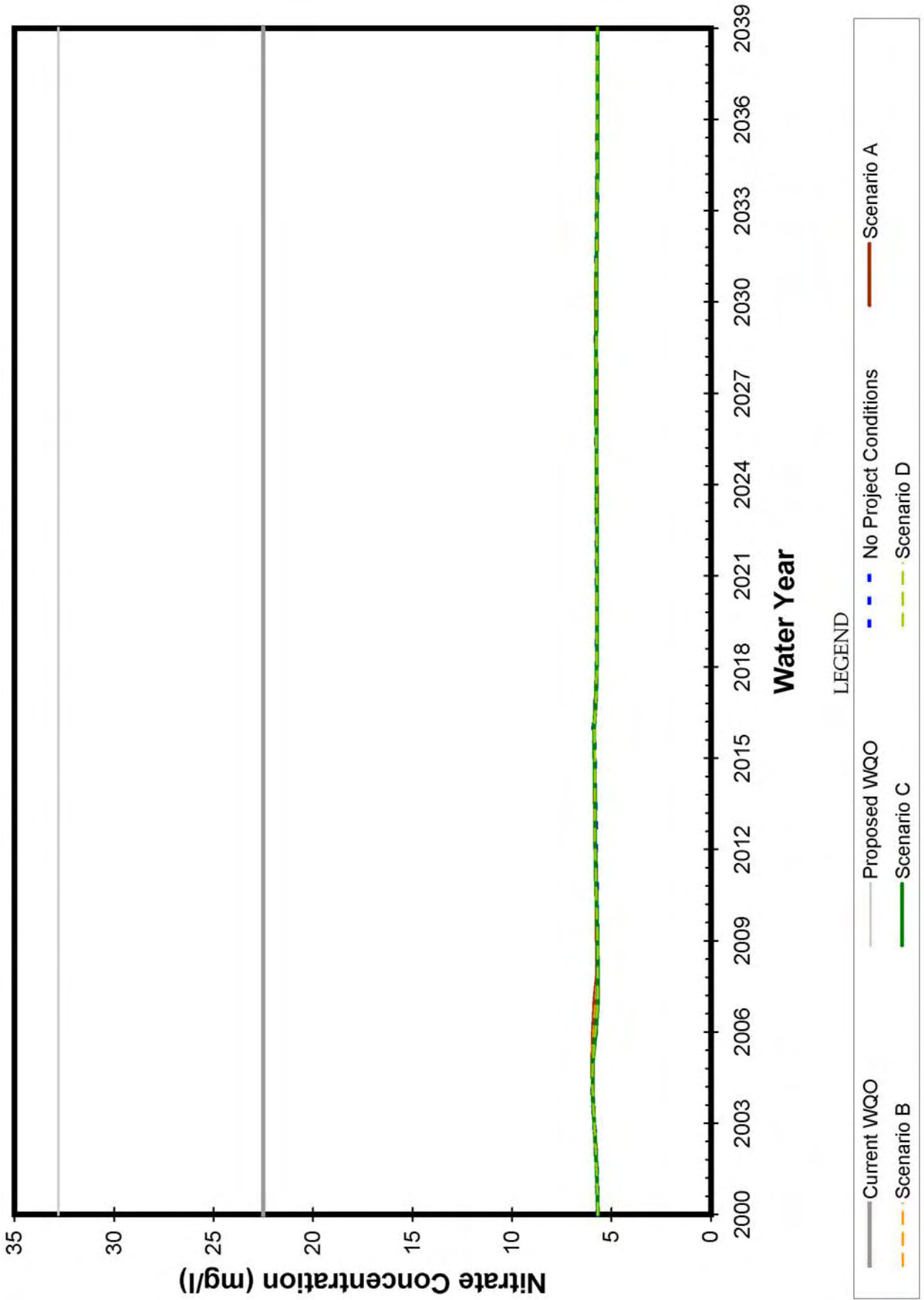




Figure B 75v. Nitrate Concentrations for IW-22.

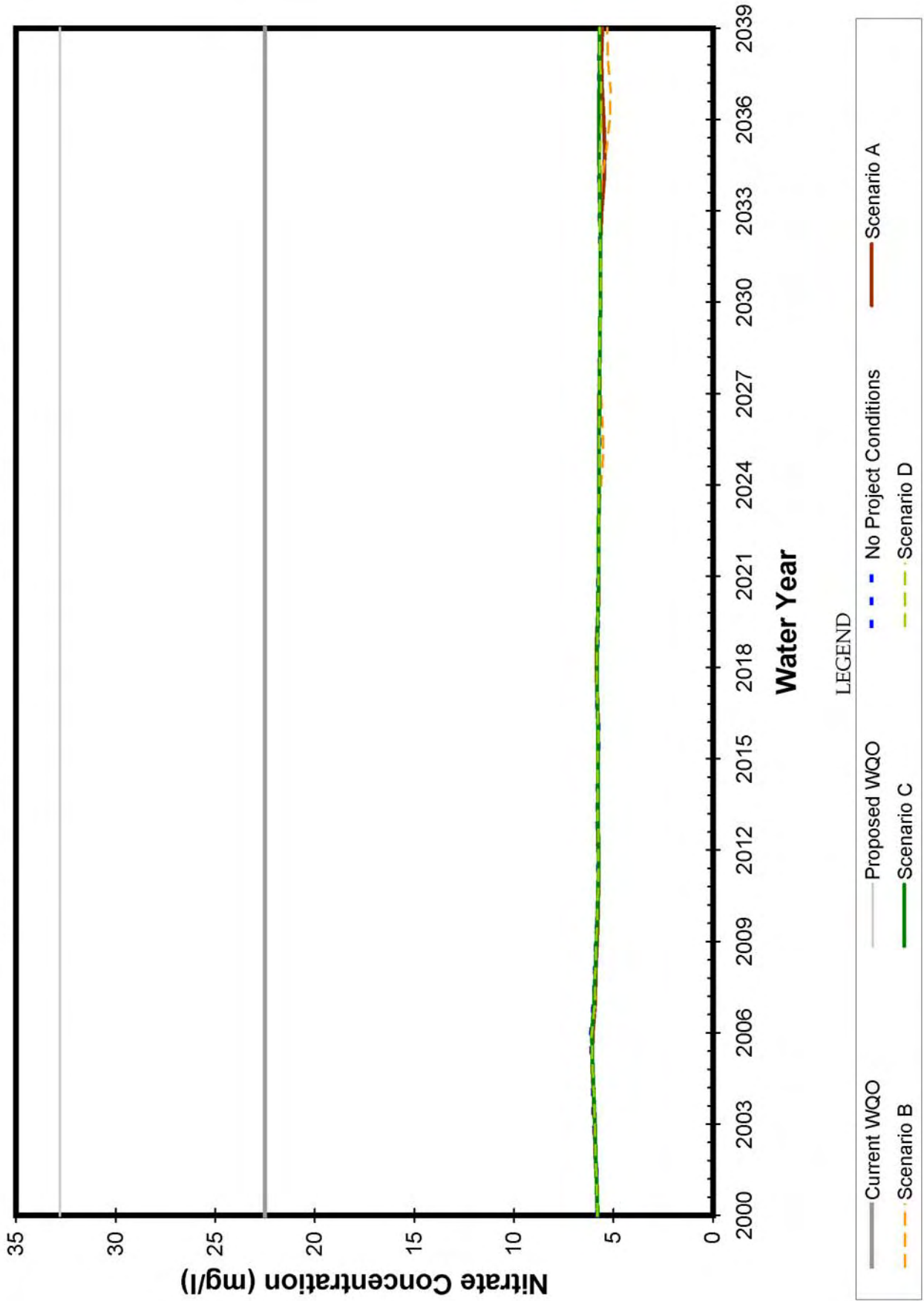


Figure B 75w. Nitrate Concentrations for IW-23.

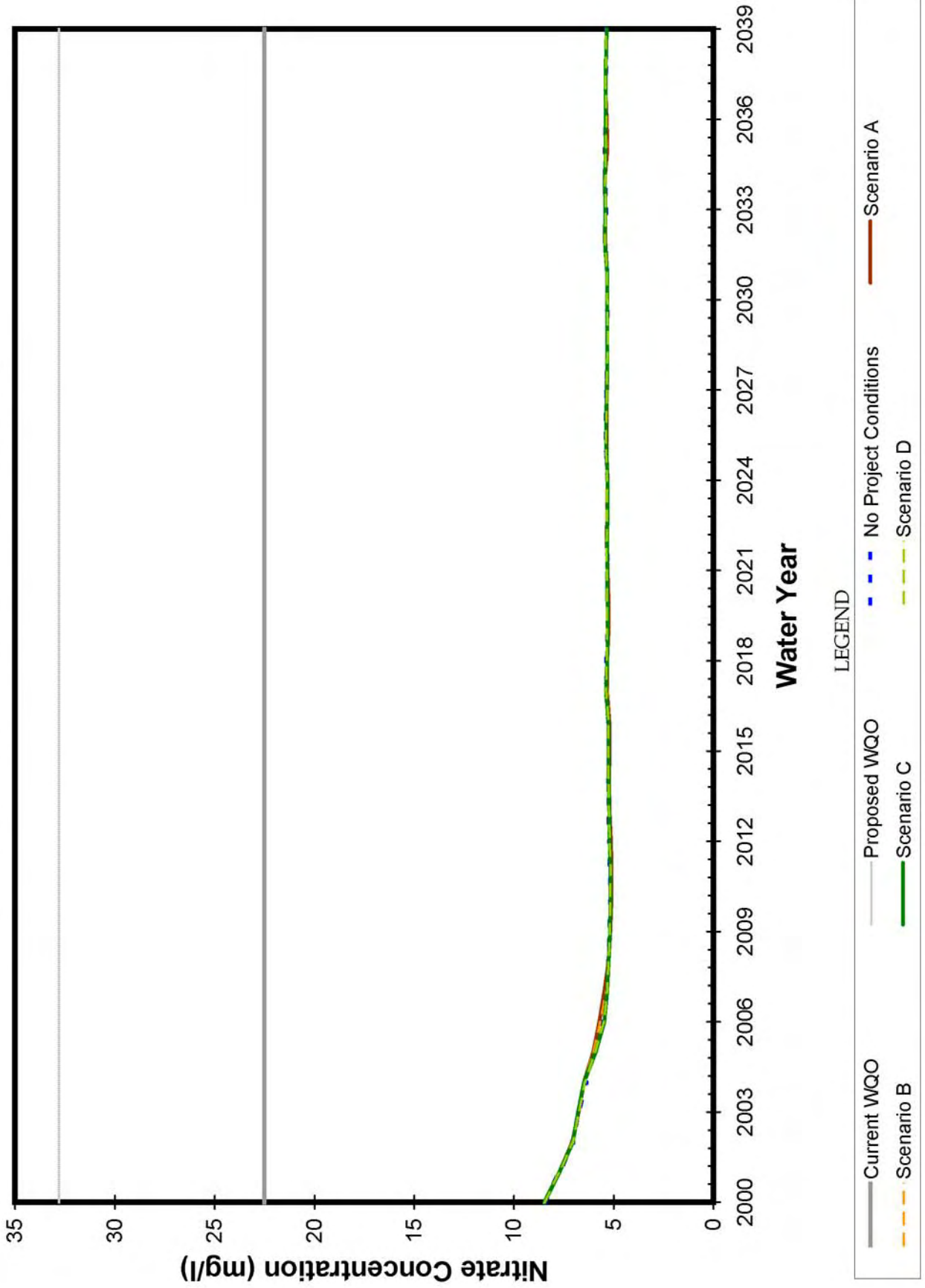


Figure B 75x. Nitrate Concentrations for IW-24.

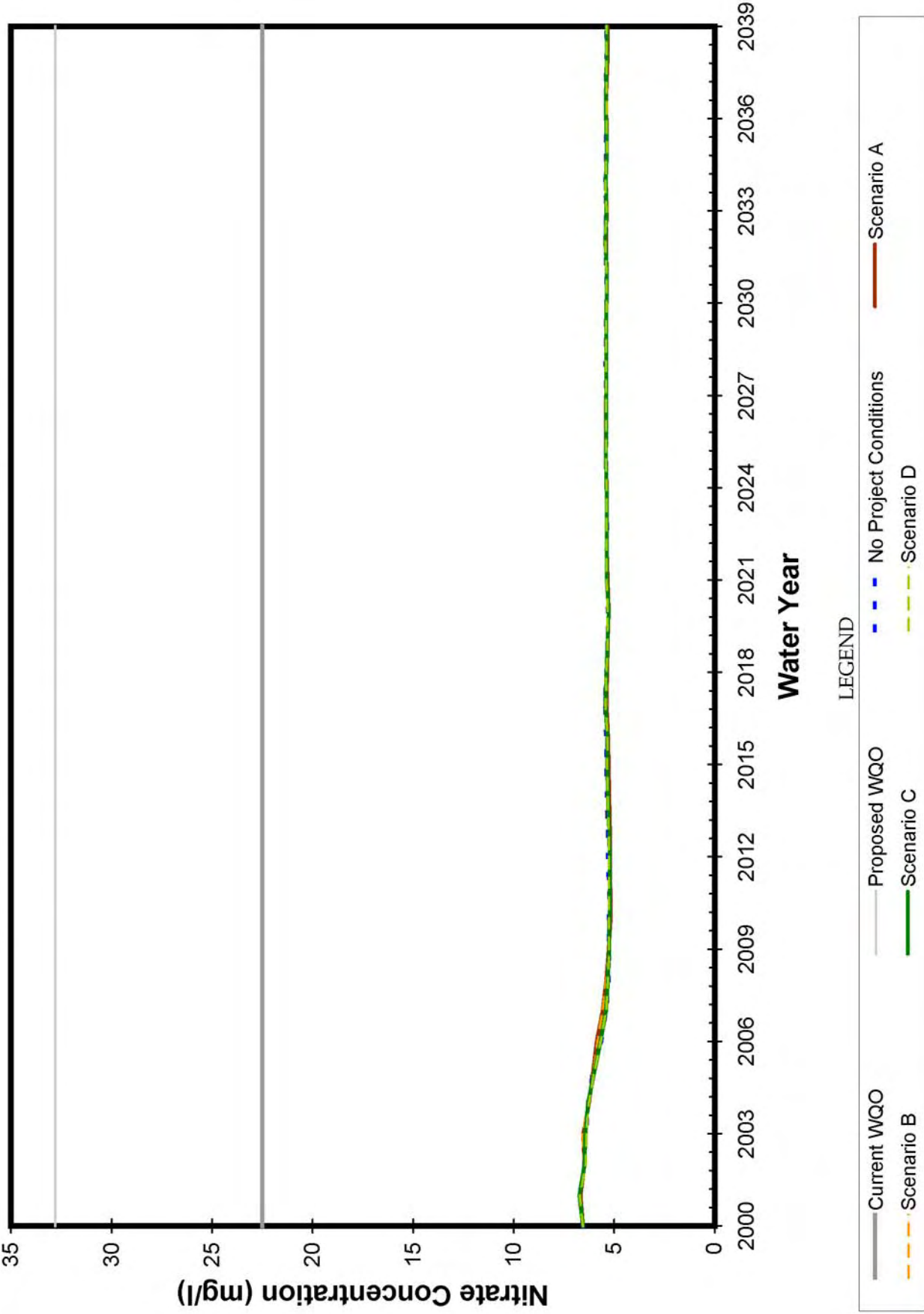


Figure B 75y. Nitrate Concentrations for IW-25.

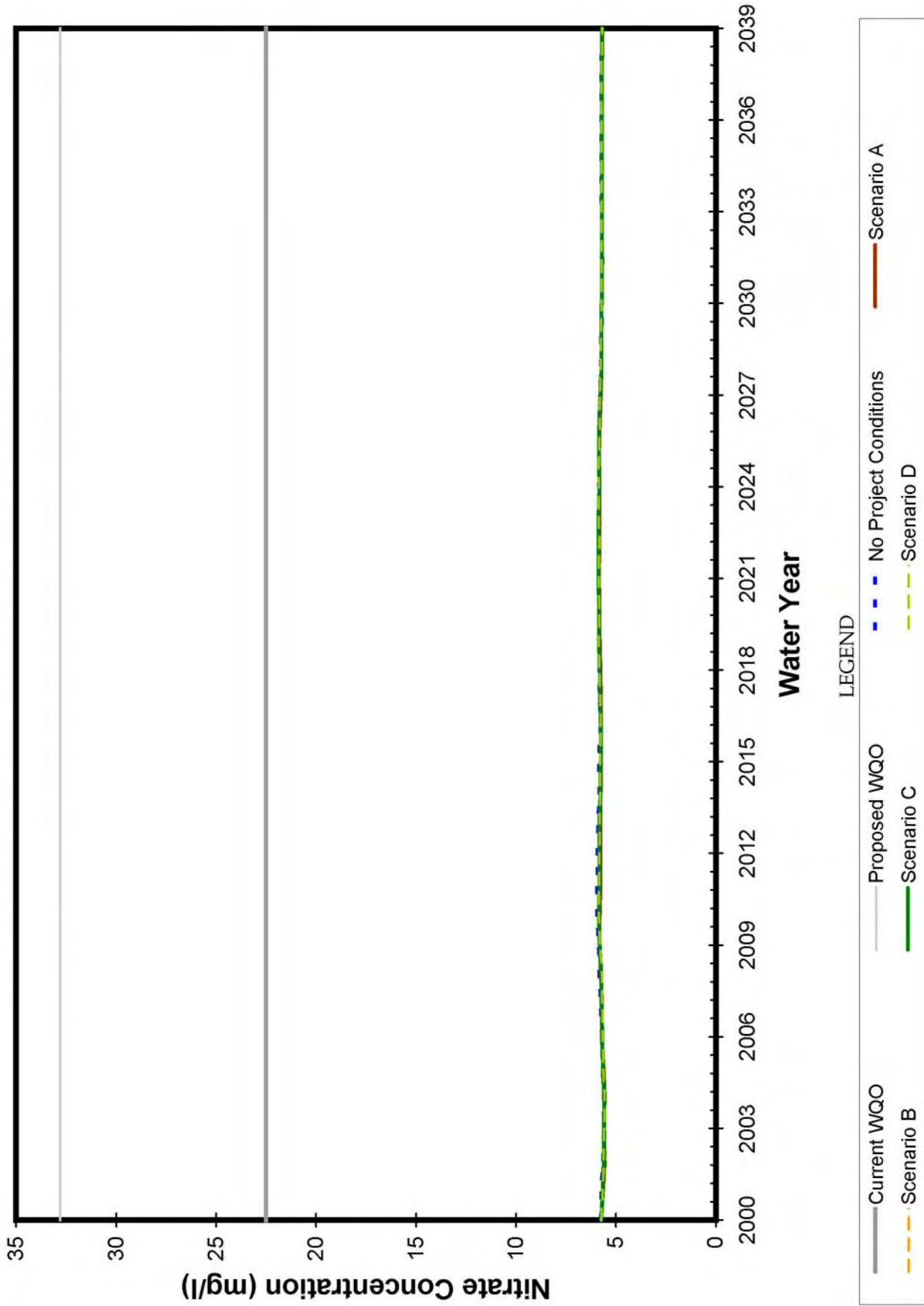


Figure B 75z. Nitrate Concentrations for SG-1 Devil Canyon / Sweetwater SG.

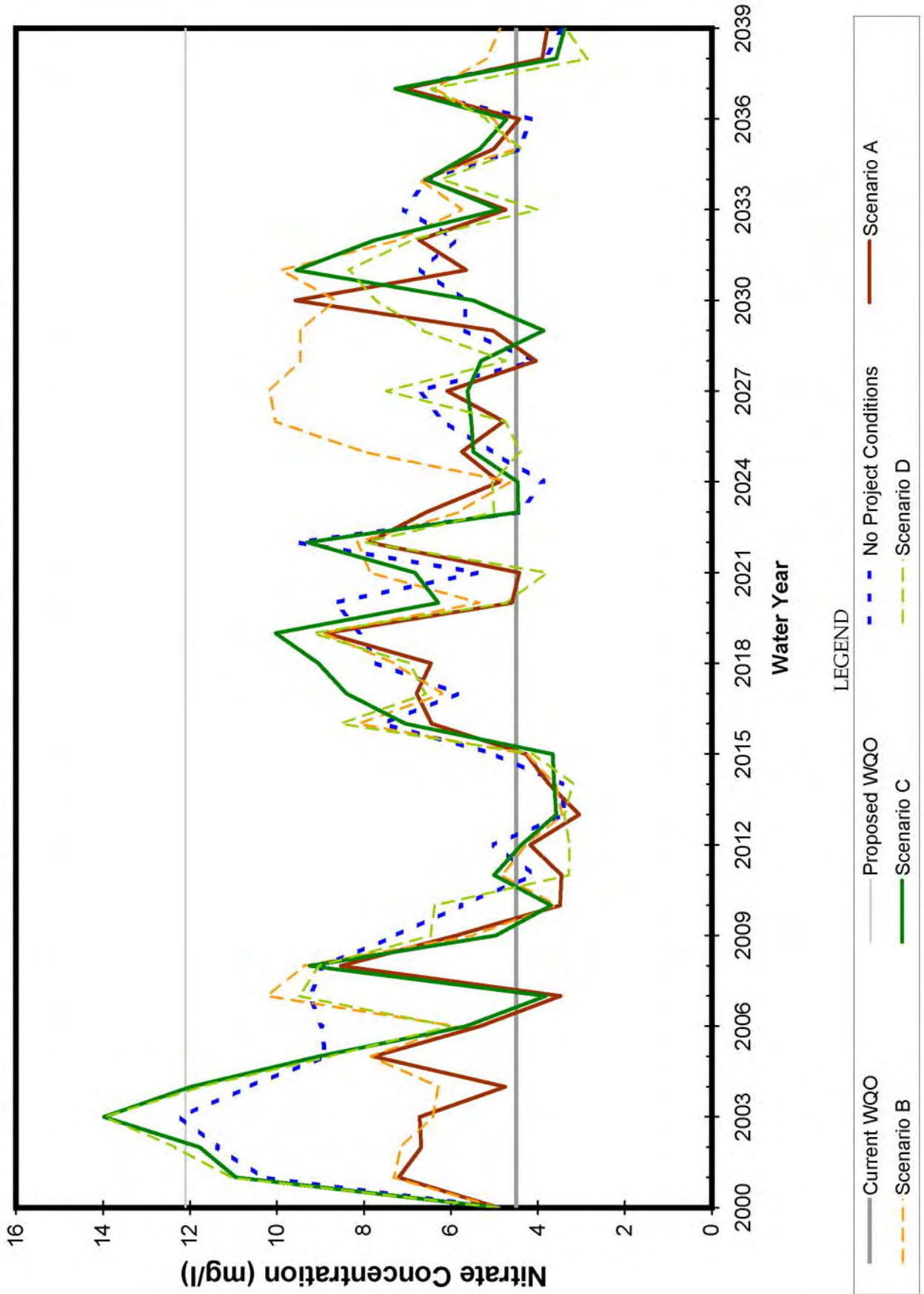


Figure B 75aa. Nitrate Concentrations for SG-2 Santa Ana River SG

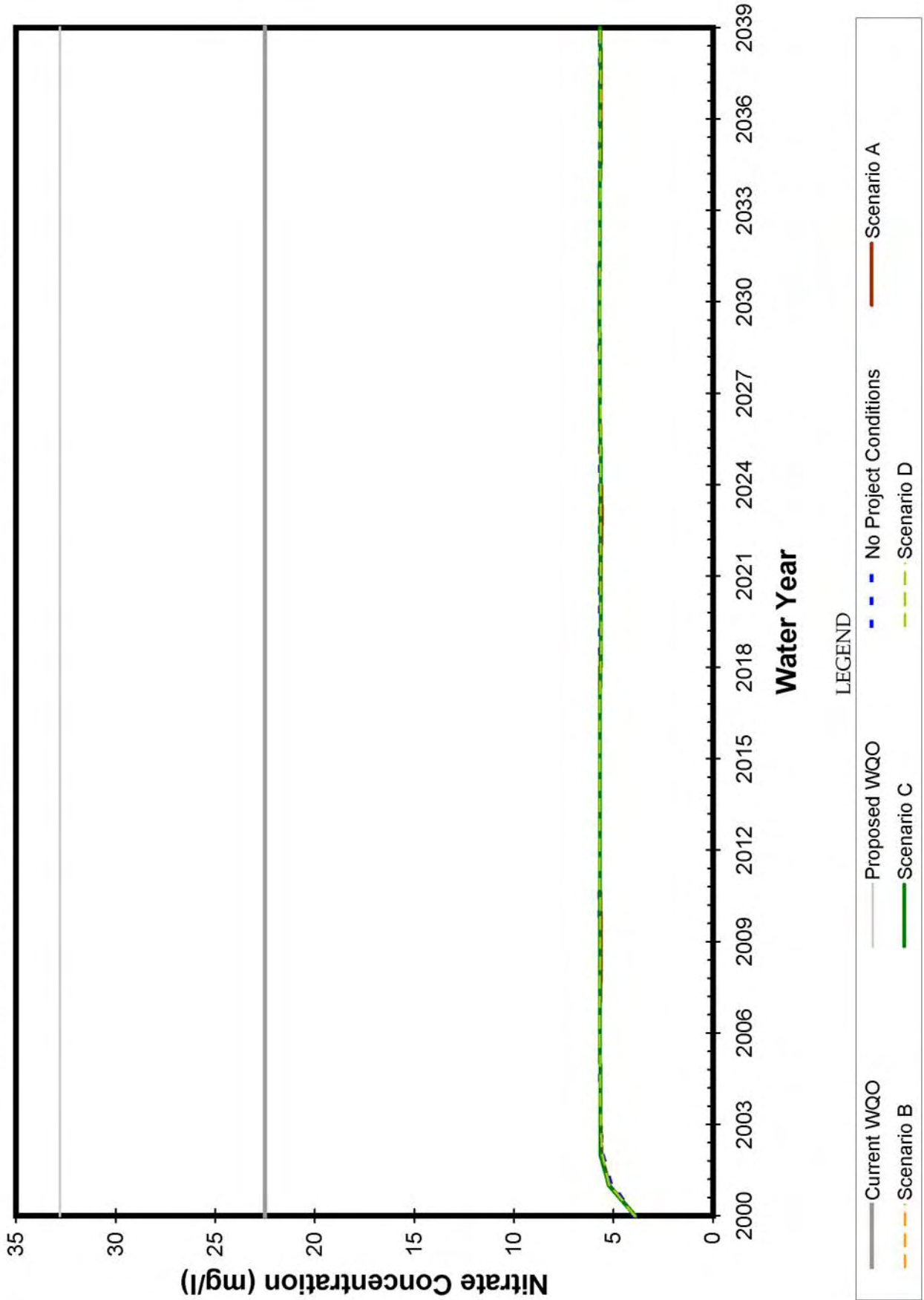


Figure B 75ab. Nitrate Concentrations for SG-3 Waterman SG.

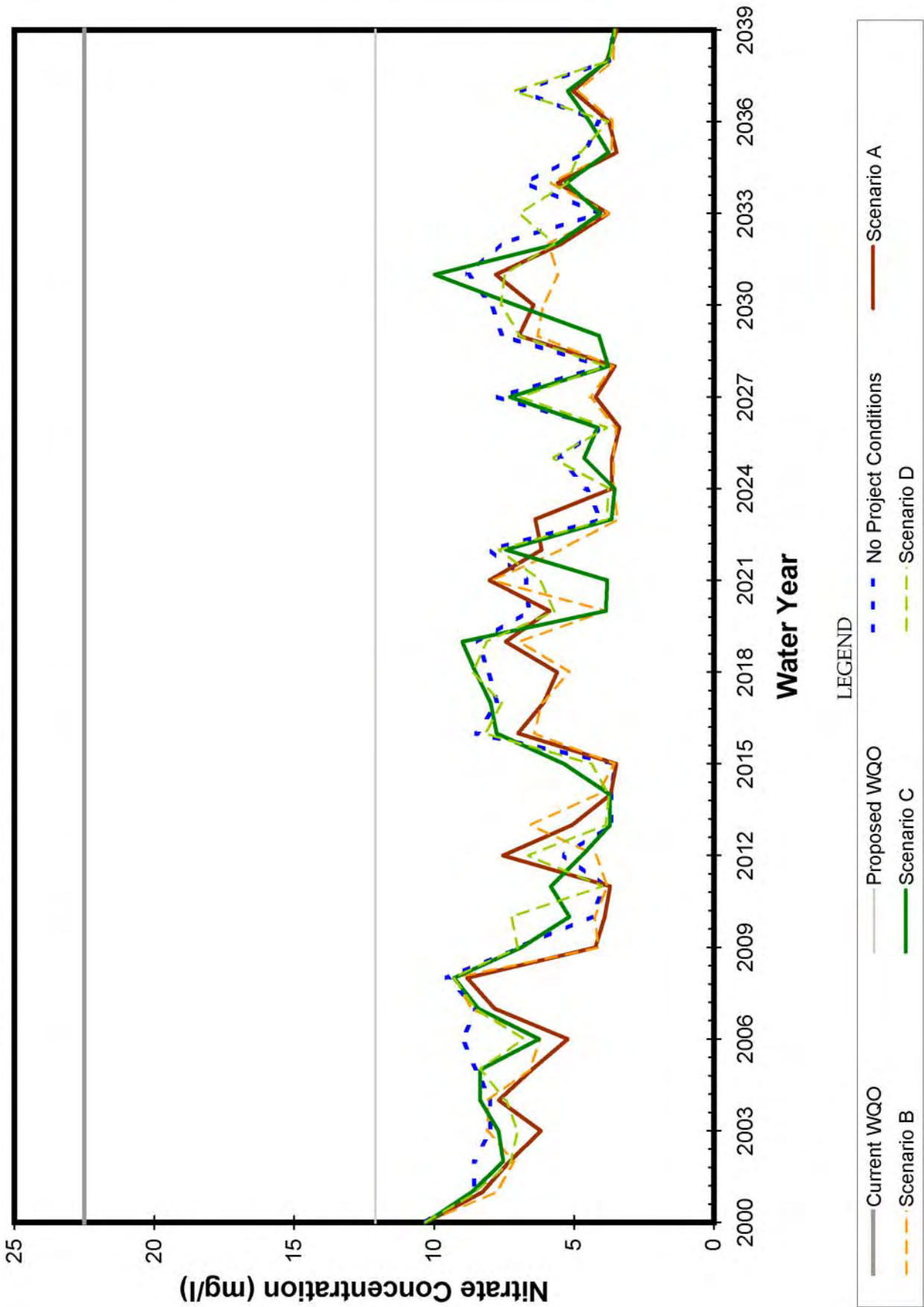


Figure B 75ac. Nitrate Concentrations for SG-4 Badger SG.

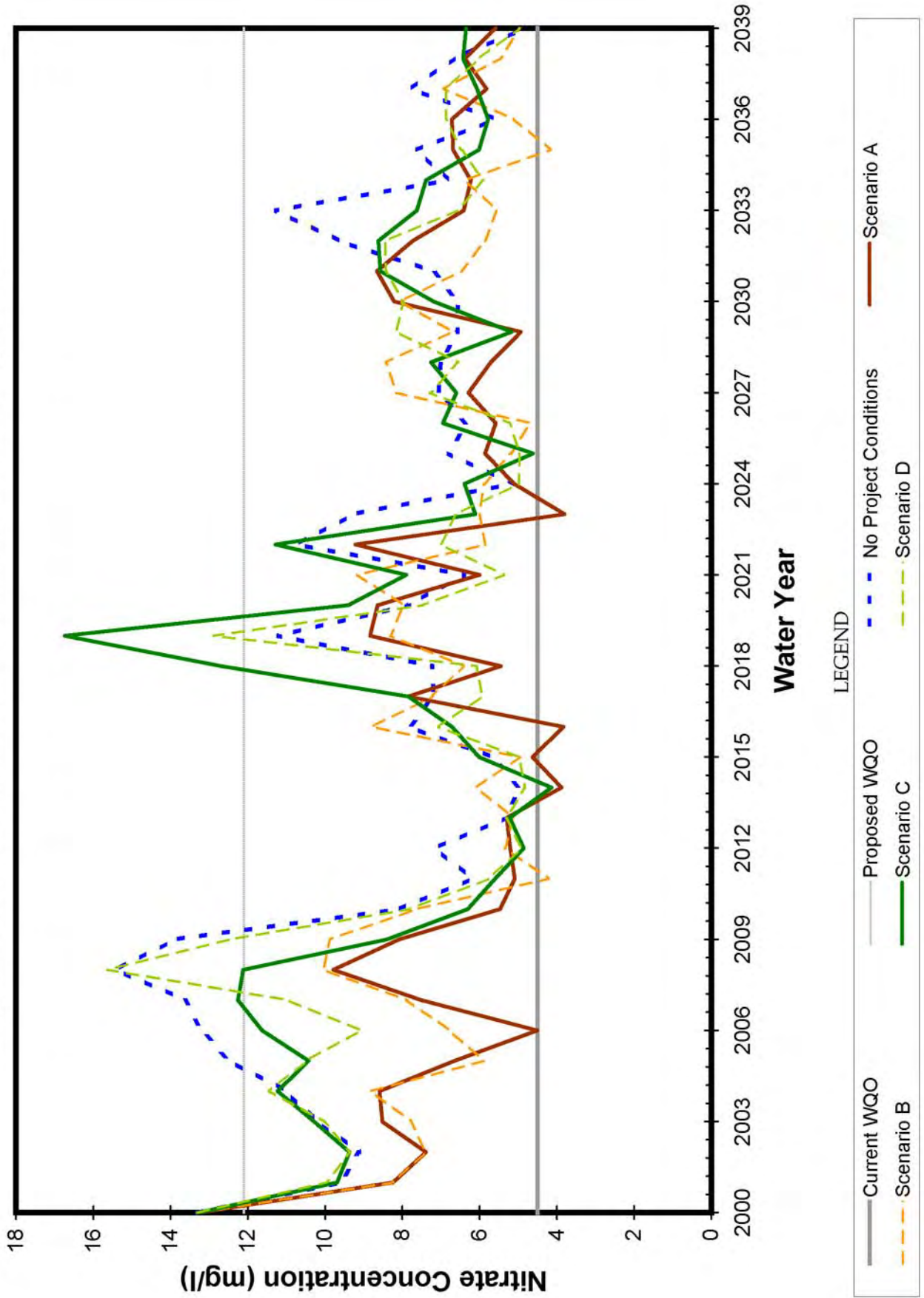




Figure B 75ad. Nitrate Concentrations for SG-5 Patton SG.

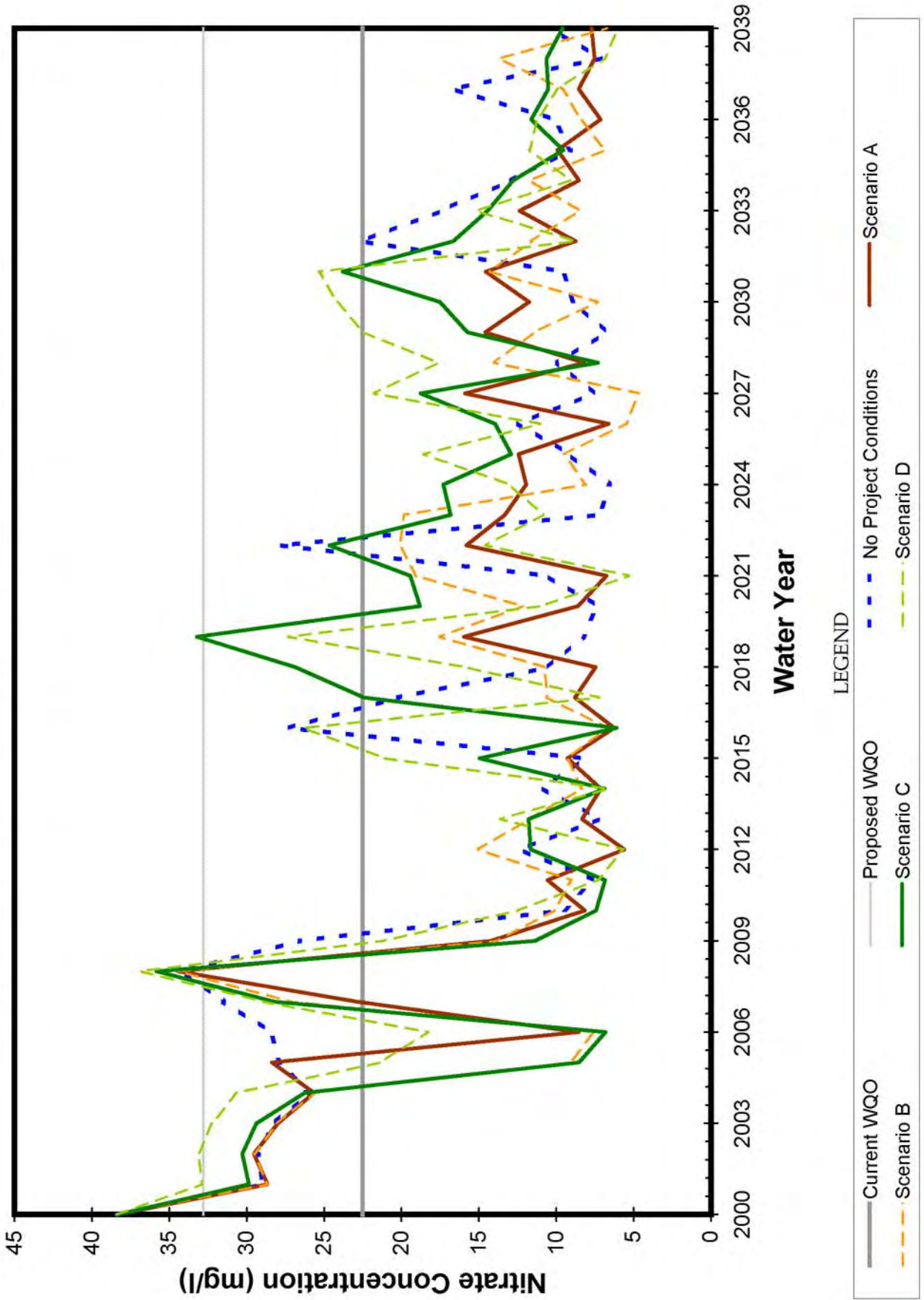


Figure B 75ae. Nitrate Concentrations for SG-6 Mill Creek SG.

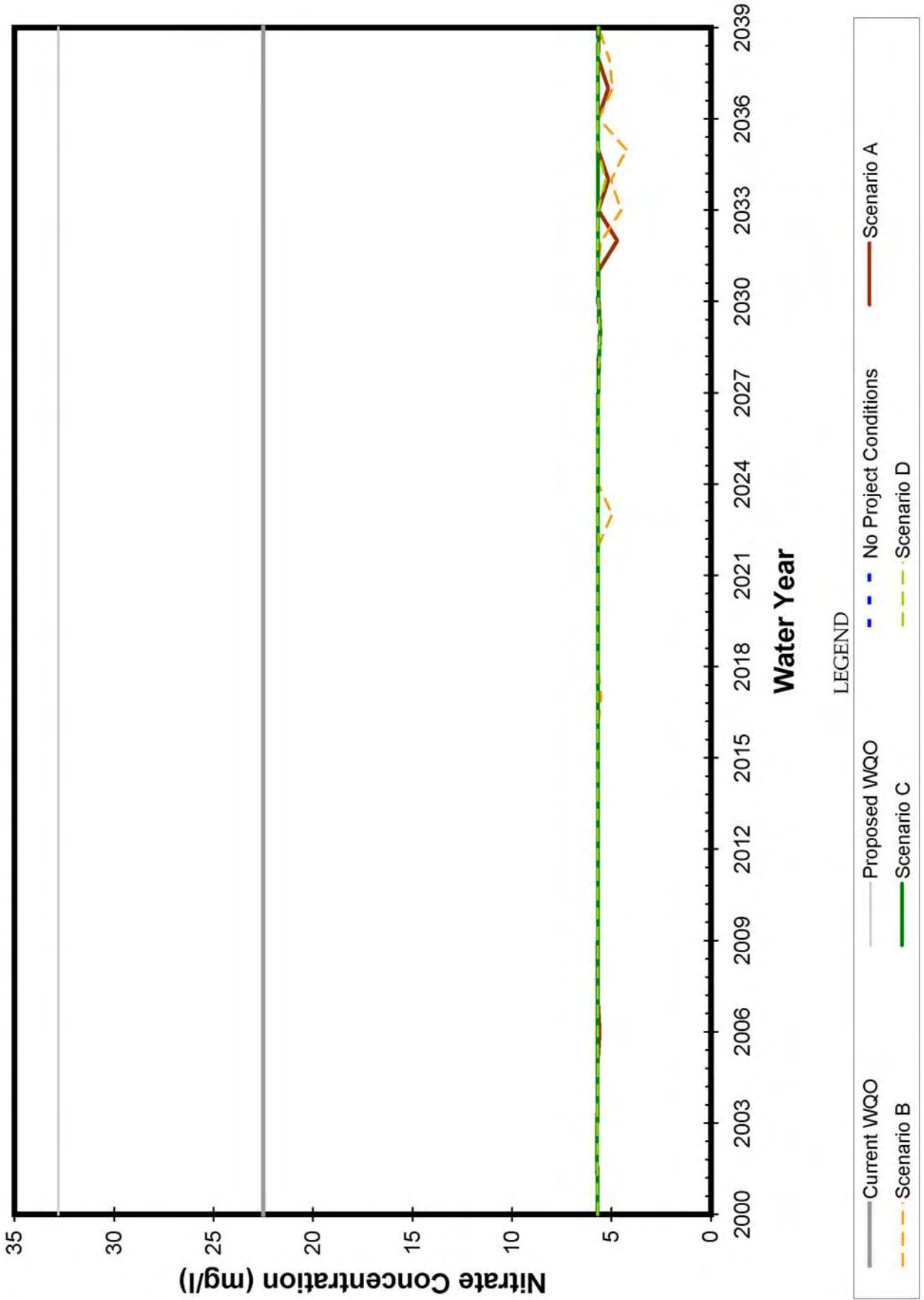


Figure B 75af. Nitrate Concentrations for SG-7 City Creek SG.

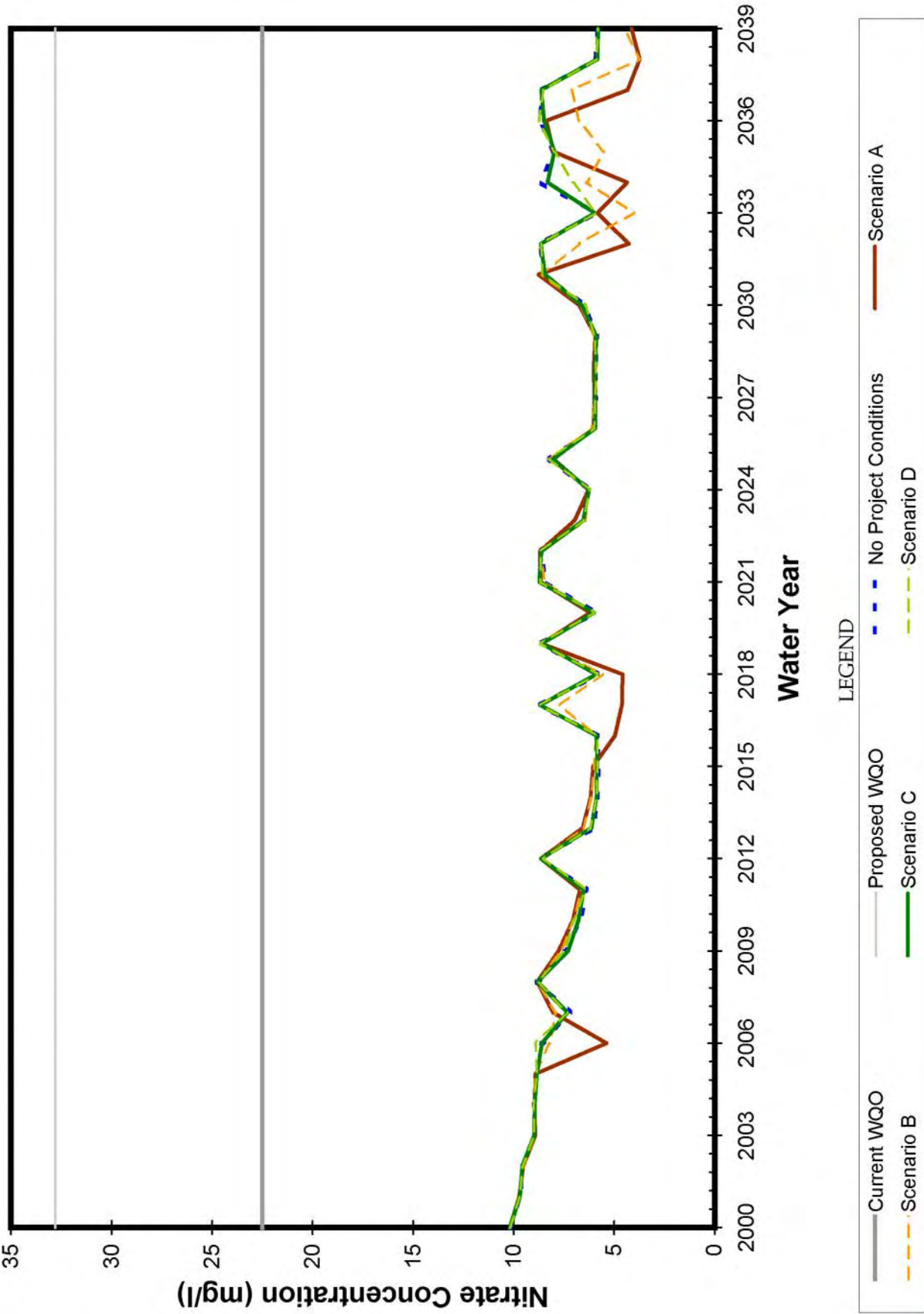


Figure B 75ag. Nitrate Concentrations for SG-8 East Twin Creek SG.

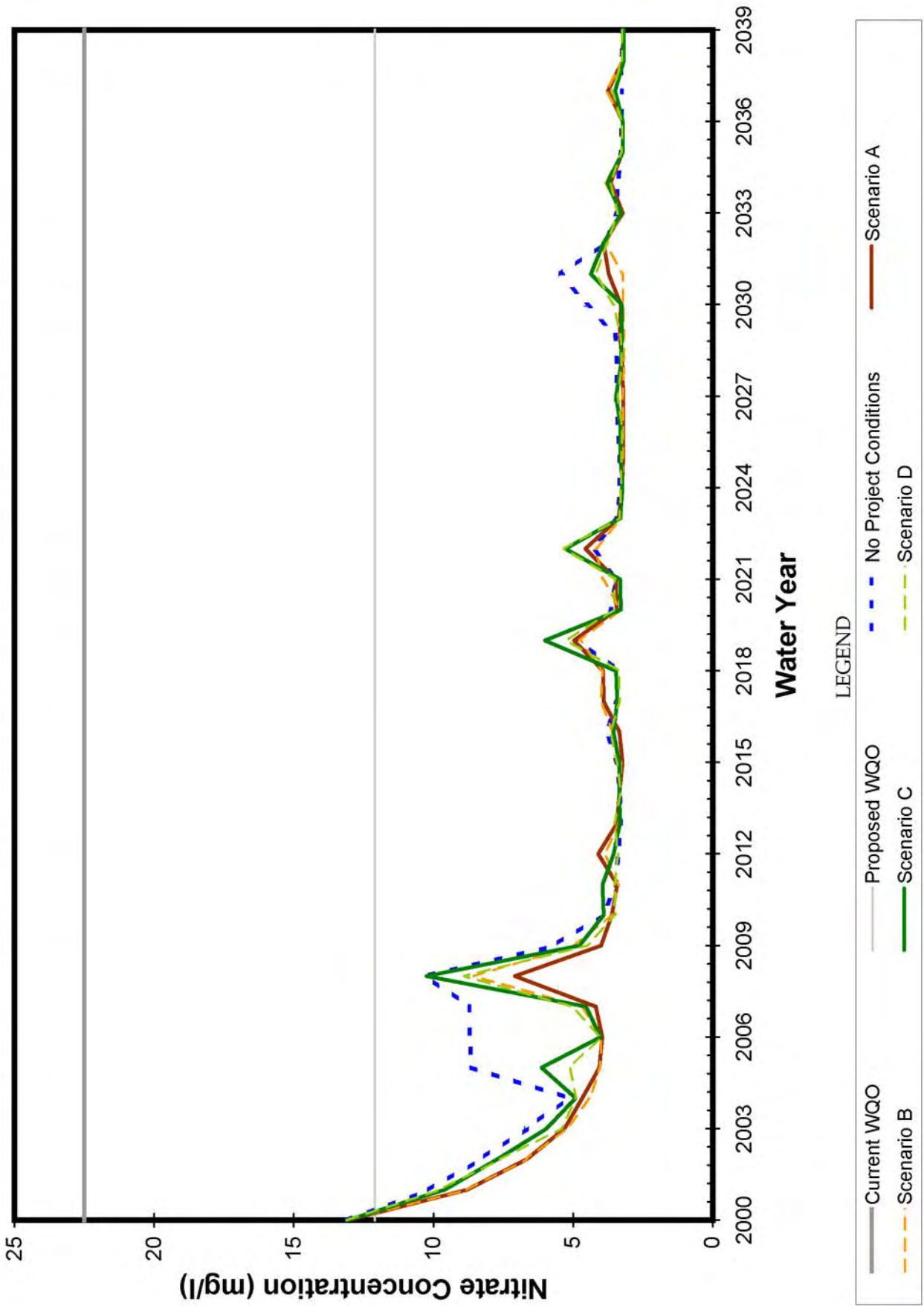
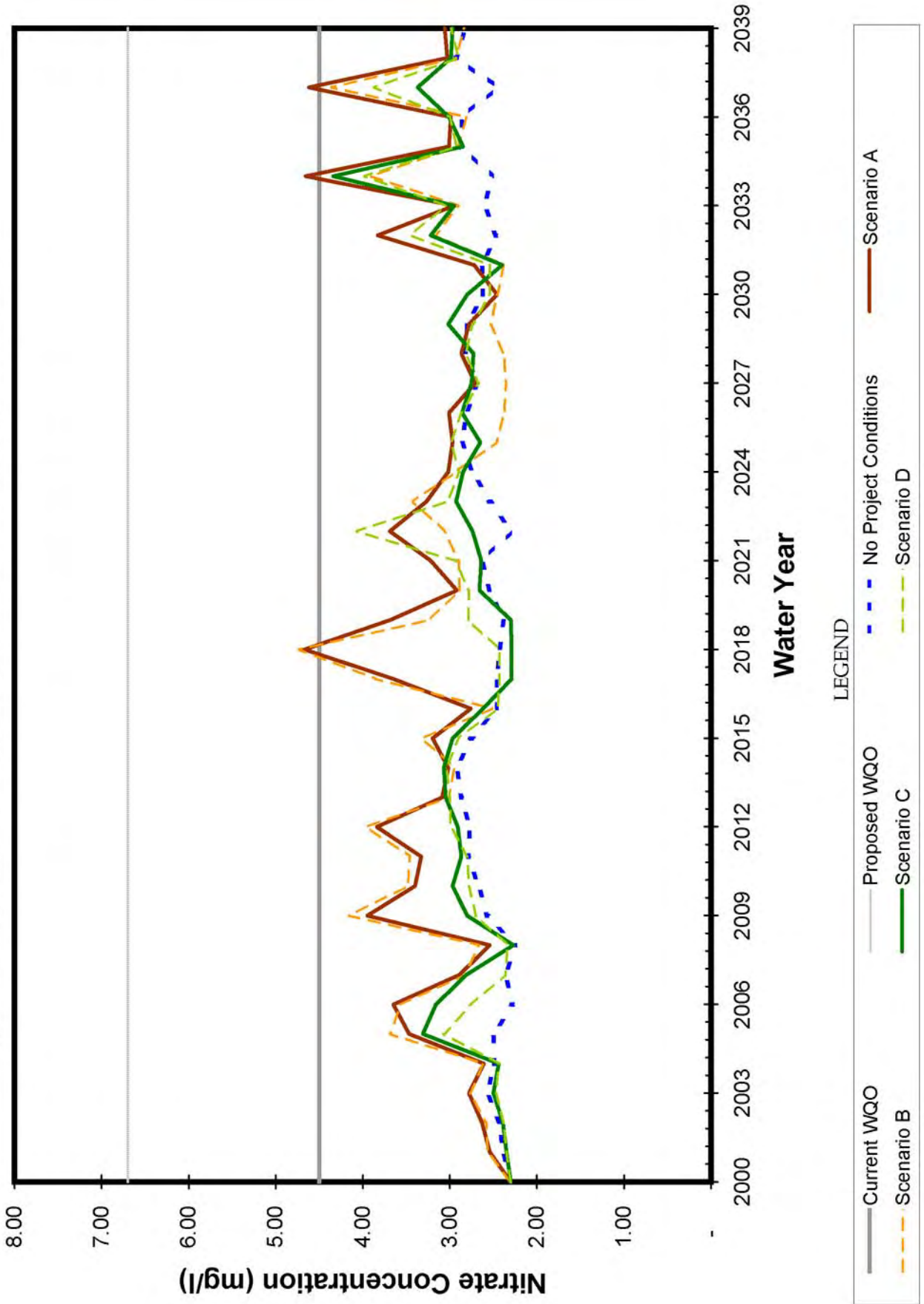
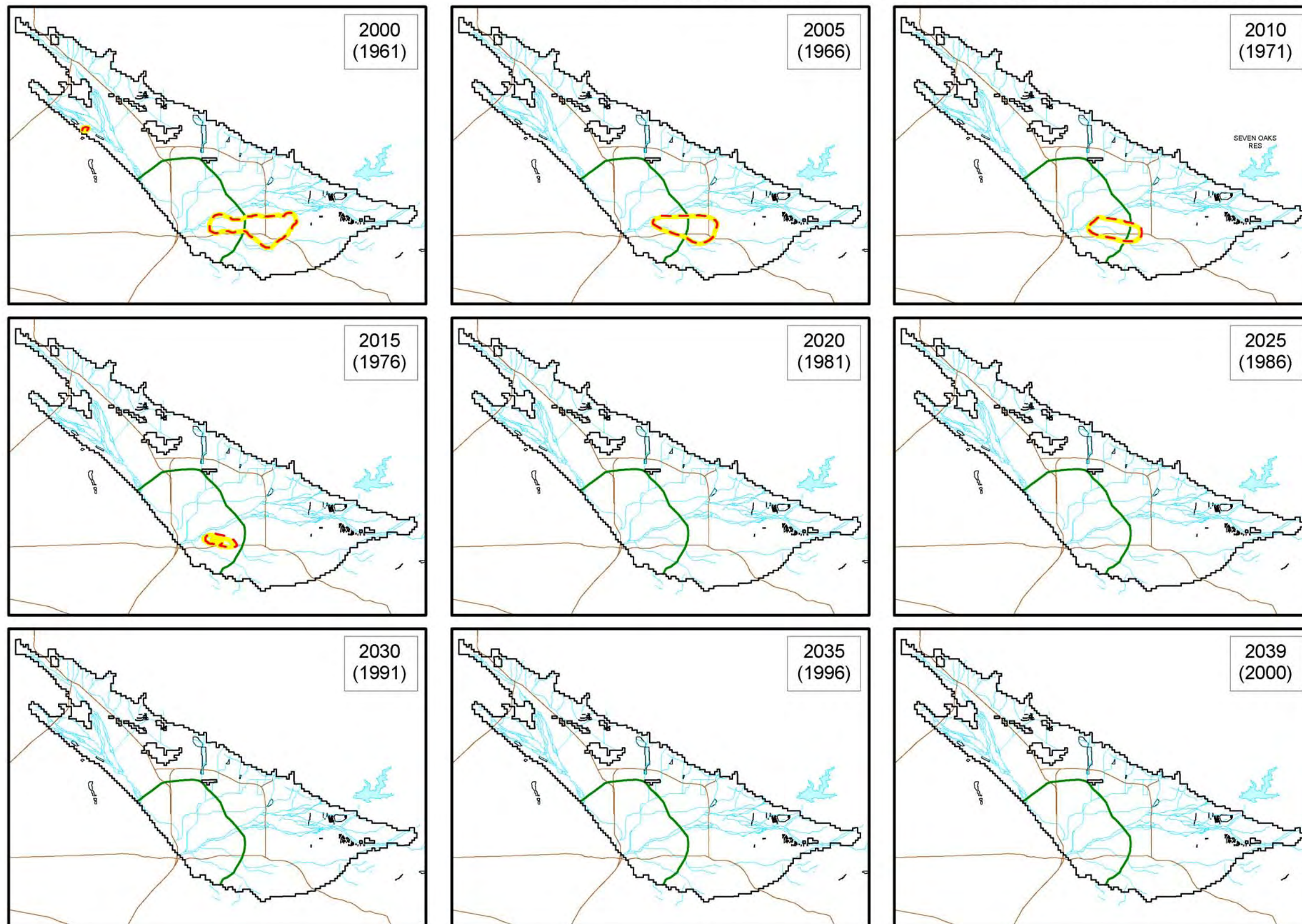


Figure B 75ah. Nitrate Concentrations for SG-9 Lytle Creek SG.



SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR

**PERCHLORATE PLUME BOUNDARY  
LAYER 1  
NO PROJECT CONDITION  
VERSUS SCENARIO A**



EXPLANATION

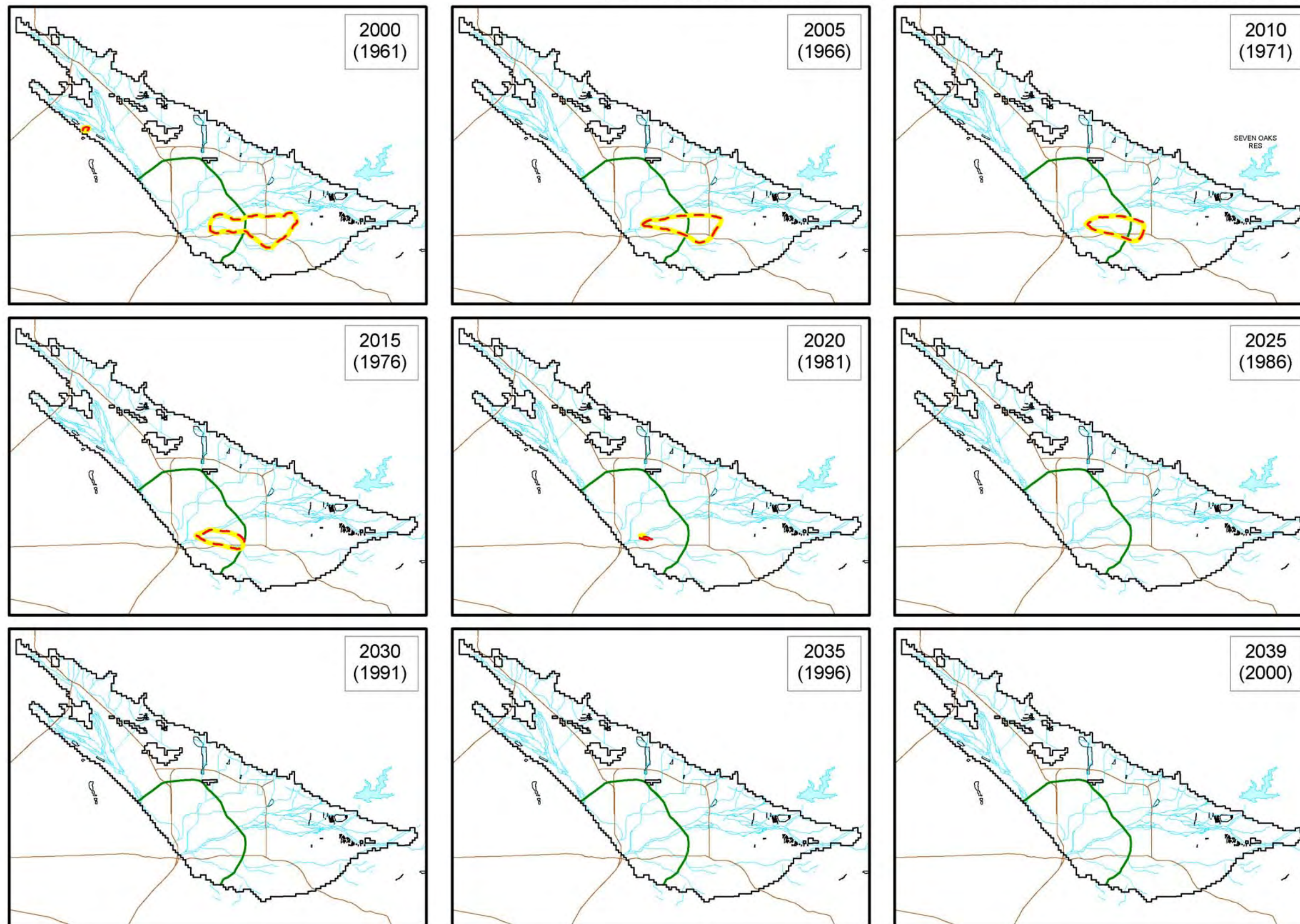
- Yellow Line Perchlorate Plume Boundary (6 ug/L) Layer 1, No Project Condition
- - - Perchlorate Plume Boundary (6 ug/L) Layer 1, Scenario A
- 2000 (1961) Model Year (Assumed Hydrological Year)
- Pressure Zone
- Model Grid of the San Bernardino Basin Area Groundwater Model
- Streams or Rivers Within Groundwater Basin Boundary
- Spreading Grounds or Basins
- Freeway

Map Projection:  
State Plane 1927 (California Zone V)



**Figure B 80**

SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR



**PERCHLORATE PLUME BOUNDARY LAYER 2 NO PROJECT CONDITION VERSUS SCENARIO A**

EXPLANATION

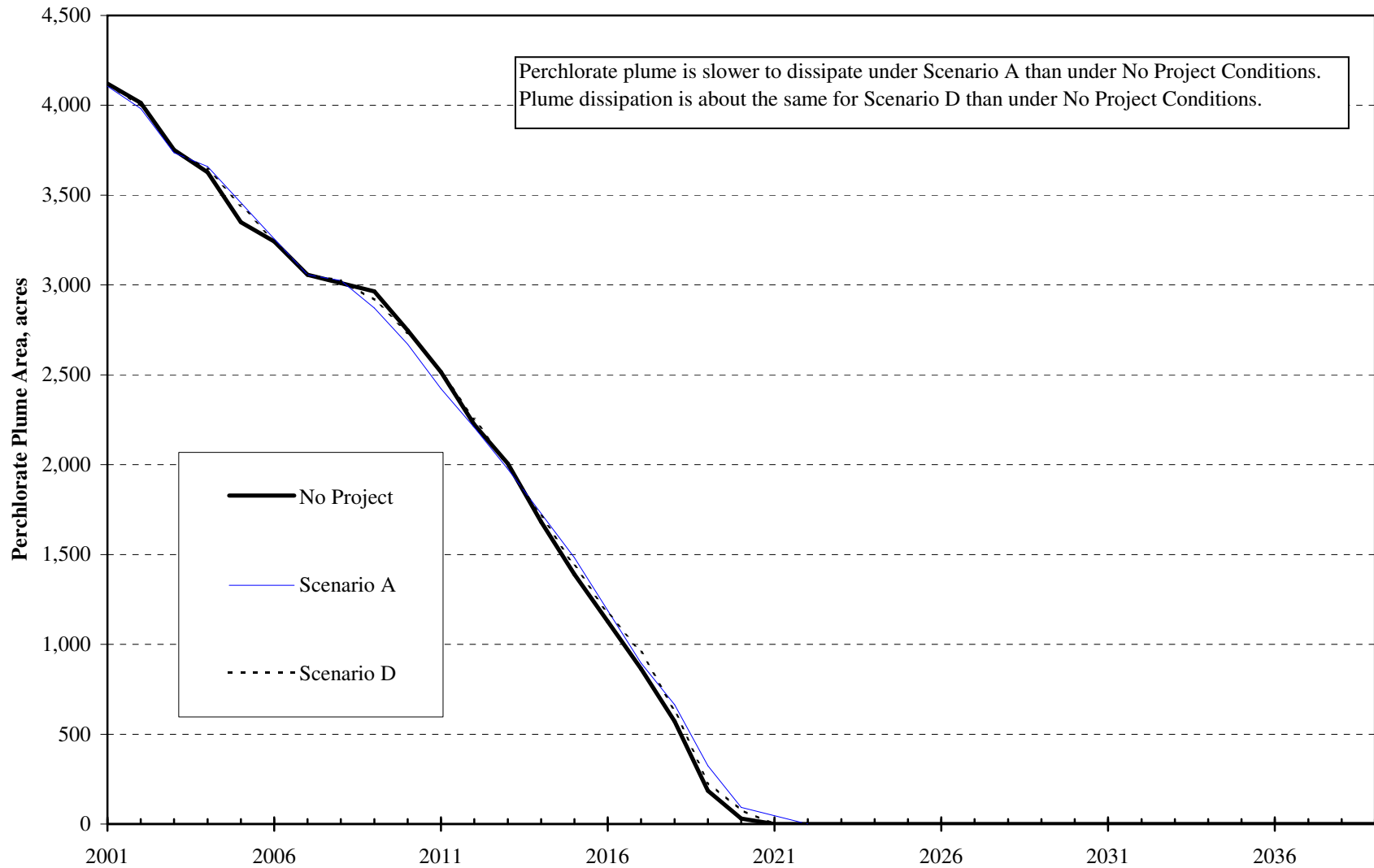
- Perchlorate Plume Boundary (6 ug/L) Layer 2, No Project Condition
- Perchlorate Plume Boundary (6 ug/L) Layer 2, Scenario A
- Model Year (Assumed Hydrological Year)
- Pressure Zone
- Model Grid of the San Bernardino Basin Area Groundwater Model
- Streams or Rivers Within Groundwater Basin Boundary
- Spreading Grounds or Basins
- Freeway

Map Projection:  
State Plane 1927 (California Zone V)



**Figure B 81**

### Perchlorate Plume Areas 2001 -2039

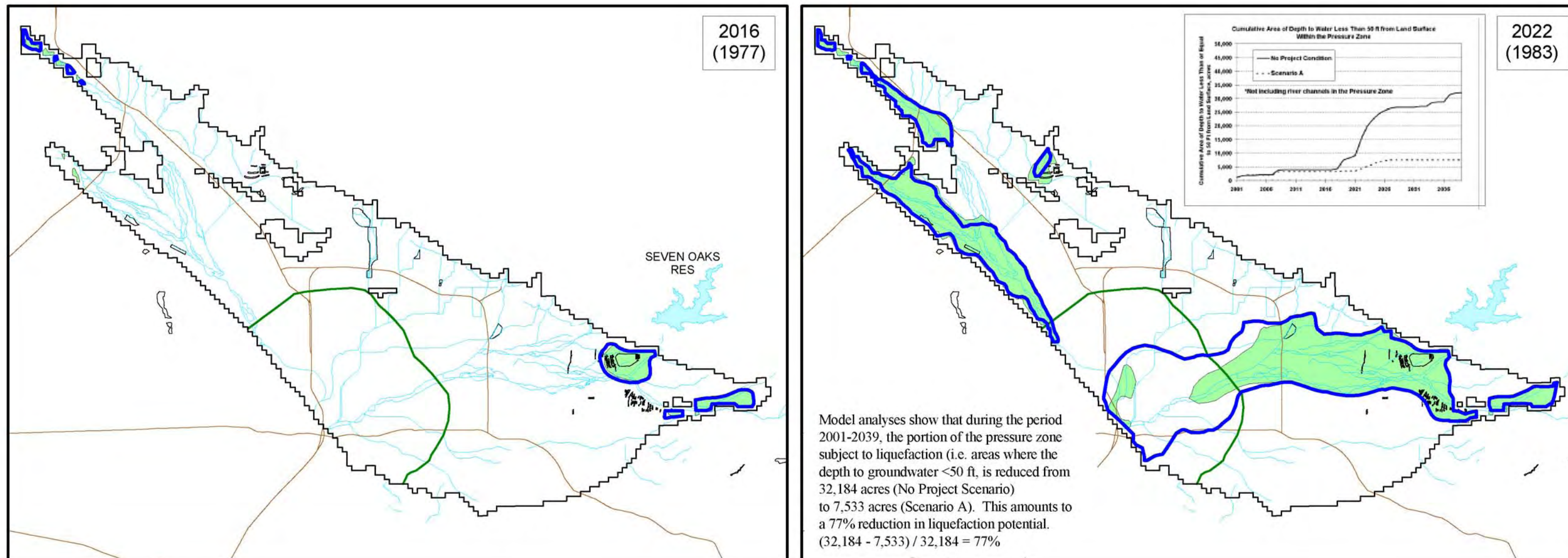


Muni/Western Ex. 6-328



**GROUNDWATER TECHNICAL APPENDIX  
SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR**

**DEPTH TO GROUNDWATER  
LESS THAN 50 FT FROM LAND SURFACE  
FOR NO PROJECT CONDITION  
AND SCENARIO A  
YEARS 2016 AND 2022**



**EXPLANATION**

- No Project Condition Depth to Water Less Than 50 ft From Land Surface
- Scenario A Depth to Water Less Than 50 ft From Land Surface
- Model Year (Hydrological Year)
- Pressure Zone
- Model Grid of the San Bernardino Basin Area Groundwater Model
- Streams or Rivers Within Groundwater Basin Boundary
- Spreading Grounds or Basins
- Freeway



0 3 6 Miles

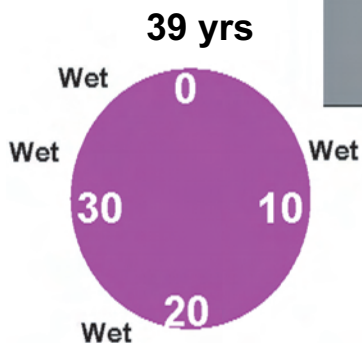
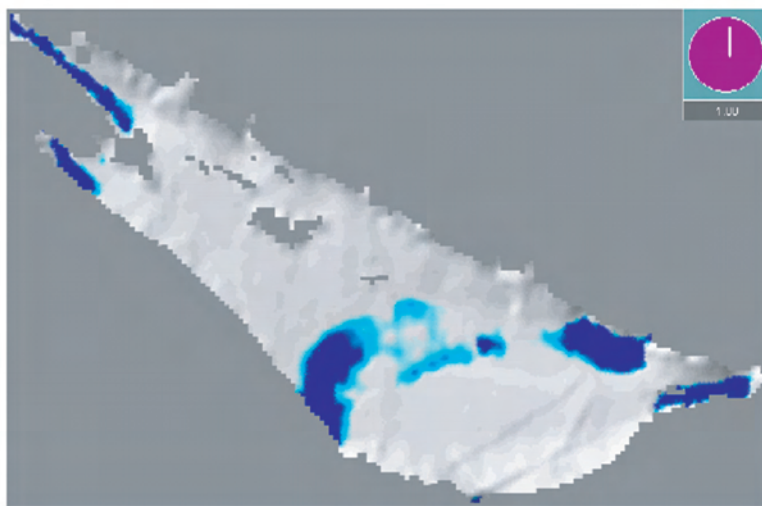
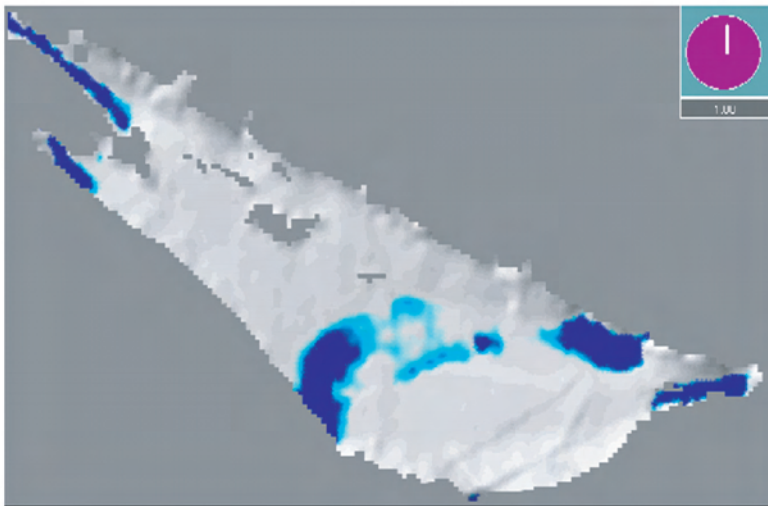
Map Projection:  
State Plane 1927 (California Zone V)

**Figure B 32**

Depth to Water  
 Dark Blue: <50 ft  
 Light Blue: 50-70 ft  
 Light Gray: >70 ft

**No Project Condition**

**Scenario A**



2001-2039



Muni/Western Ex. 6-330	Drawn: DEW
	Checked:
	Approved:
	Date: 16-APR-07







SANTA ANA RIVER WATER RIGHTS HEARING - TESTIMONY OF DENNIS E. WILLIAMS

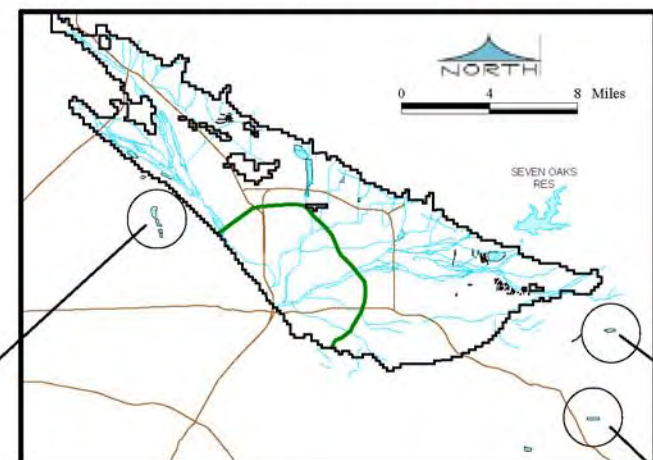
**SCREENSHOT OF LIQUEFACTION POTENTIAL ANIMATION (SCENARIO A, 2001 - 2039)**

**GEOSCIENCE**

GEOSCIENCE Support Services, Incorporated  
 P.O. Box 220, Claremont, CA 91711  
 Tel: (909)920-0707 Fax: (909)920-0403  
 www.gssiwater.com

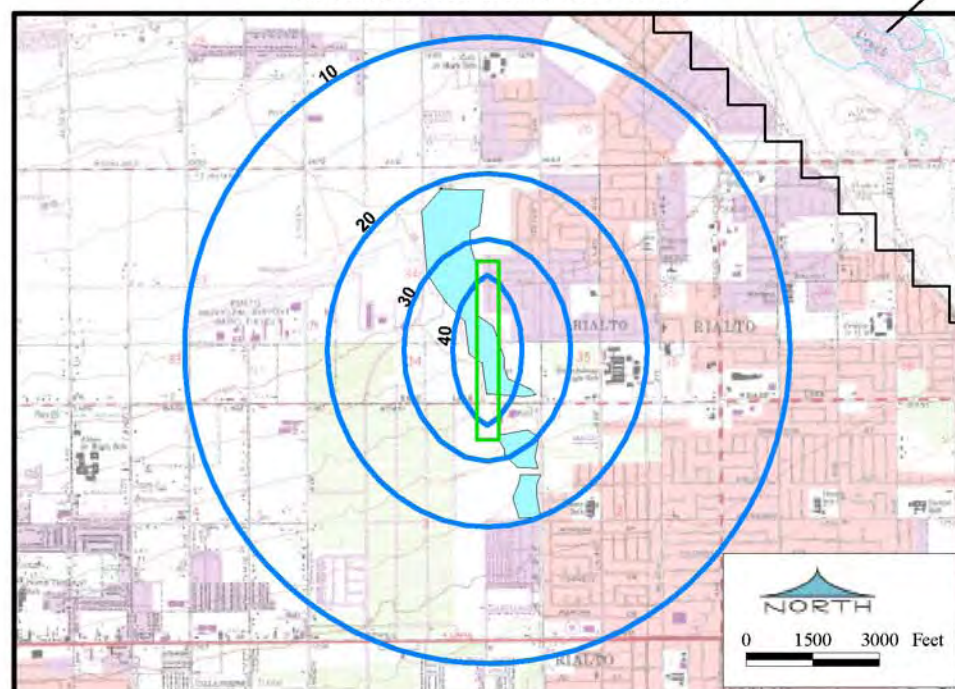
**GROUNDWATER TECHNICAL APPENDIX  
SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR**

- EXPLANATION**
-  20 Calculated Groundwater Mound Height, ft
  -  Equivalent Rectangular Spreading Basin Used by Hantush Equation
  -  Model Grid of the San Bernardino Basin Area Groundwater Model
  -  Streams or Rivers Within Groundwater Basin Boundary
  -  Spreading Grounds or Basins
  -  Freeway



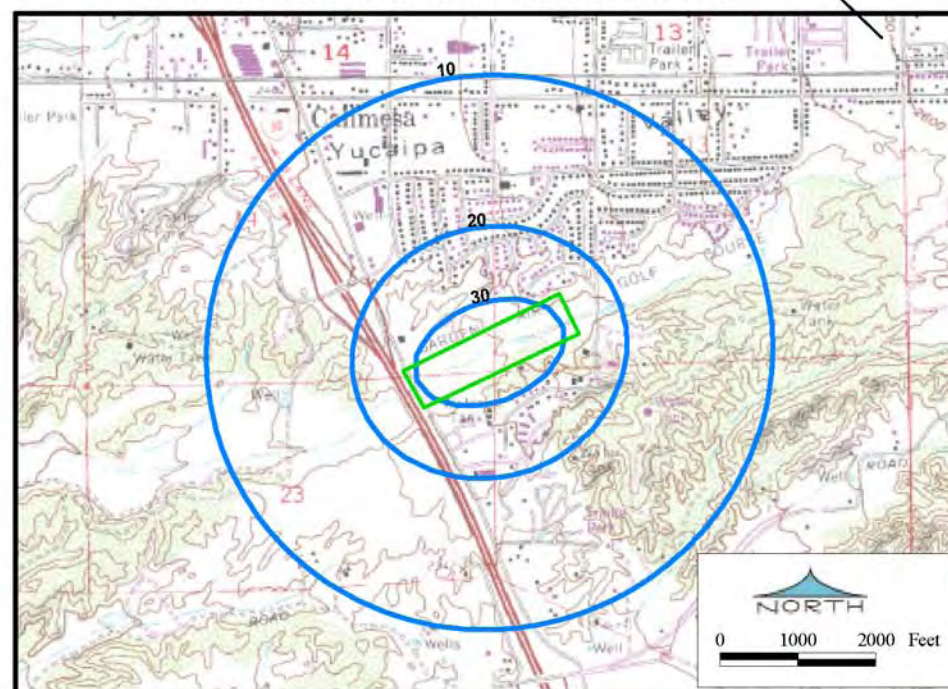
**GROUNDWATER MOUNDS  
RESULTING FROM  
ARTIFICIAL RECHARGE  
AT CACTUS,  
GARDEN AIR CREEK AND  
WILSON SPREADING GROUNDS  
SCENARIO A**

**CACTUS SPREADING GROUNDS**



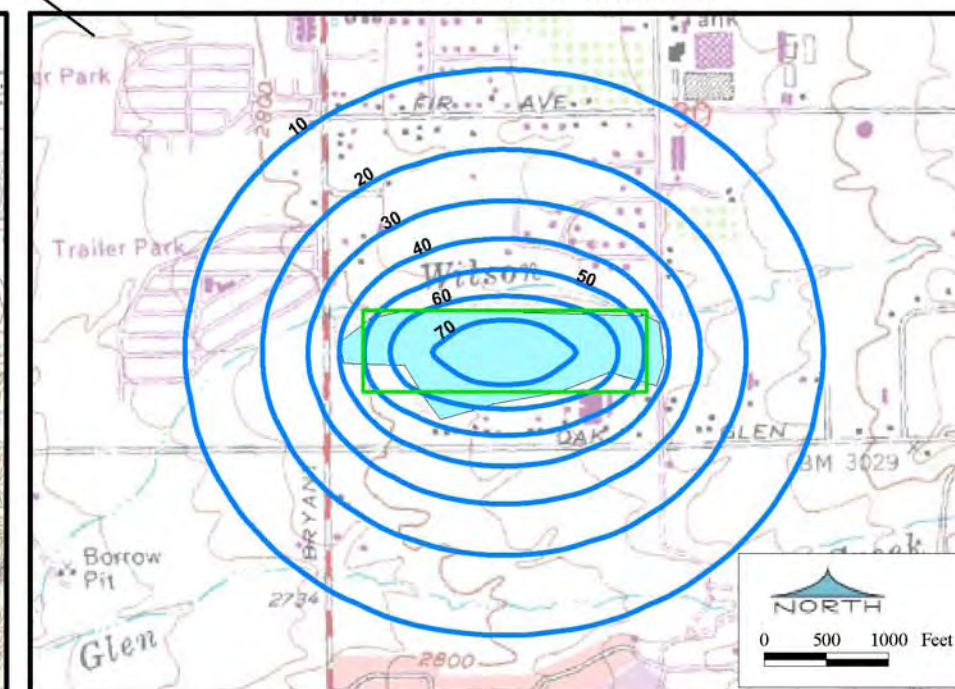
Total Recharge Volume = 18,953 acre-ft  
 Maximum Groundwater Elevation = 1,248 ft amsl  
 Length = 4,000 ft  
 Width = 500 ft  
 Total Area = 46 acres  
 Land Surface Elevation = 1,400 ft amsl  
 Basement Complex Elevation = 550 ft amsl  
 Initial Groundwater Elevation = 1,200 ft amsl  
 Effective Porosity = 0.15  
 Hydraulic Conductivity = 374 gpd/ft<sup>2</sup>  
 Recharge Rate = 2 ft/day

**GARDEN AIR CREEK SPREADING GROUNDS**



Total Recharge Volume = 5,745 acre-ft  
 Maximum Groundwater Elevation = 2,238 ft amsl  
 Length = 2,000 ft  
 Width = 566 ft  
 Total Area = 26 acres  
 Land Surface Elevation = 2,360 ft amsl  
 Basement Complex Elevation = 1,800 ft amsl  
 Initial Groundwater Elevation = 2,200 ft amsl  
 Effective Porosity = 0.15  
 Hydraulic Conductivity = 224 gpd/ft<sup>2</sup>  
 Recharge Rate = 1 ft/day

**WILSON SPREADING GROUNDS**

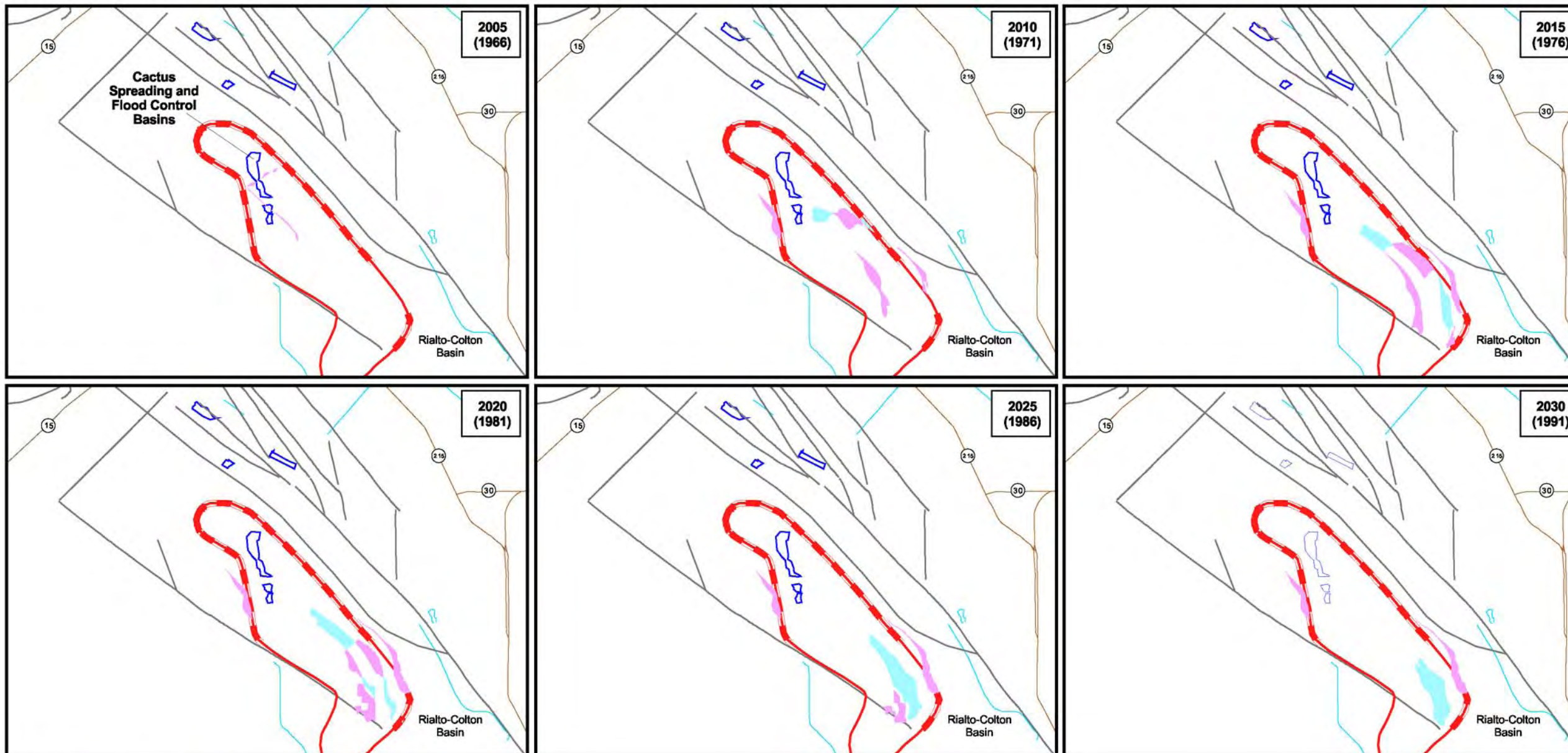


Total Recharge Volume = 2,154 acre-ft  
 Maximum Groundwater Elevation = 2,776 ft amsl  
 Length = 2,275 ft  
 Width = 650 ft  
 Total Area = 34 acres  
 Land Surface Elevation = 2,850 ft amsl  
 Basement Complex Elevation = 2,250 ft amsl  
 Initial Groundwater Elevation = 2,700 ft amsl  
 Effective Porosity = 0.15  
 Hydraulic Conductivity = 66 gpd/ft<sup>2</sup>  
 Recharge Rate = 1 ft/day

DOWNEY BRAND, LLP

SAR WATER RIGHT APPLICATIONS

**FORWARD PARTICLE TRACKING OF PERCHLORATE PLUME - CHANGES BETWEEN THE PROJECT (SCENARIO A) AND NO PROJECT CONDITIONS**



**EXPLANATION**

- |                    |   |  |   |
|--------------------|---|--|---|
| <b>2005 (1966)</b> | Model Year (Hydrological Year)          |  | Increased Plume Area Due to Project Implementation Compared to No Project Conditions Based on Forward Particle Tracking |
|                    | Current Rialto-Colton Perchlorate Plume |  | Decreased Plume Area Due to Project Implementation Compared to No Project Conditions Based on Forward Particle Tracking |
|                    | Fault                                   |  | Location Where Particles Were Released for Forward Tracking   |
|                    | Streams or Rivers                       |  |   |
|                    | Spreading Grounds and Basins            |  |   |
|                    | Freeway                                 |  |   |

**ATTORNEY-CLIENT WORKPRODUCT  
CONFIDENTIAL DRAFT**

1-NOV-06  
Map Projection:  
State Plane 1927 (California Zone V)

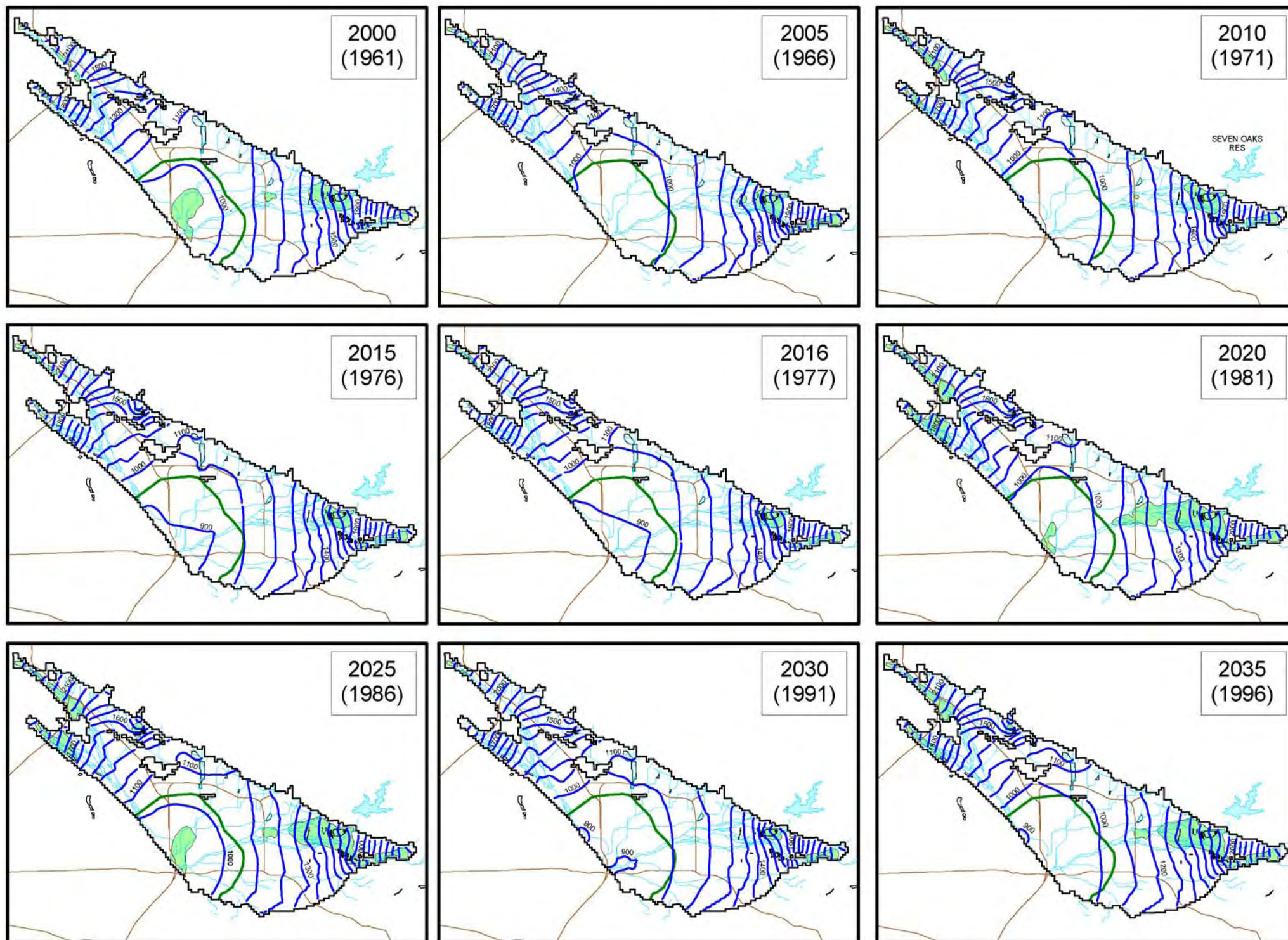


**GEOSCIENCE**  
GEOSCIENCE Support Services, Inc.  
P.O. Box 220, Claremont, CA 91711  
Tel: (909) 920-0707 Fax: (909) 920-3403  
www.gssiwater.com

**Figure 3-1**

**GROUNDWATER TECHNICAL APPENDIX  
SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR**

**GROUNDWATER ELEVATIONS  
AND AREAS OF DEPTH TO WATER LESS  
THAN 50 FT FROM LAND SURFACE  
LAYER 1  
SCENARIO D**



**EXPLANATION**

- Depth to Water Less Than 50 ft From Land Surface
- 1000 Groundwater Contour (100 ft interval) (ft above mean sea level)
- Model Grid of the San Bernardino Basin Area Groundwater Model
- Streams or Rivers Within Groundwater Basin Boundary
- Spreading Grounds or Basins
- Freeway
- Pressure Zone
- Model Year (Hydrological Year)

Area with Depth to Water less than 50 ft from land surface (acres)

Year	SBBA	PZ*
2001	7,224	1,204
2002	4,199	664
2003	2,640	185
2004	2,485	0
2005	3,612	0
2006	6,962	0
2007	5,140	0
2008	14,510	1,328
2009	7,718	123
2010	4,801	0
2011	3,674	0
2012	5,094	0
2013	4,801	0
2014	3,674	0
2015	3,257	0
2016	2,532	0
2017	9,509	62
2018	11,531	139
2019	20,252	2,099
2020	11,438	324
2021	11,531	540
2022	23,448	3,797
2023	16,007	1,960
2024	10,682	1,266
2025	10,759	1,081
2026	6,931	803
2027	4,585	525
2028	2,871	77
2029	1,667	0
2030	1,775	0
2031	2,084	0
2032	9,972	15
2033	5,989	0
2034	12,580	15
2035	8,428	0
2036	7,178	0
2037	14,340	587
2038	7,085	31
2039	4,384	0
<b>Total</b>	<b>297,347</b>	<b>16,825</b>

SBBA = San Bernardino Basin Area  
PZ = Pressure Zone, not including river channels

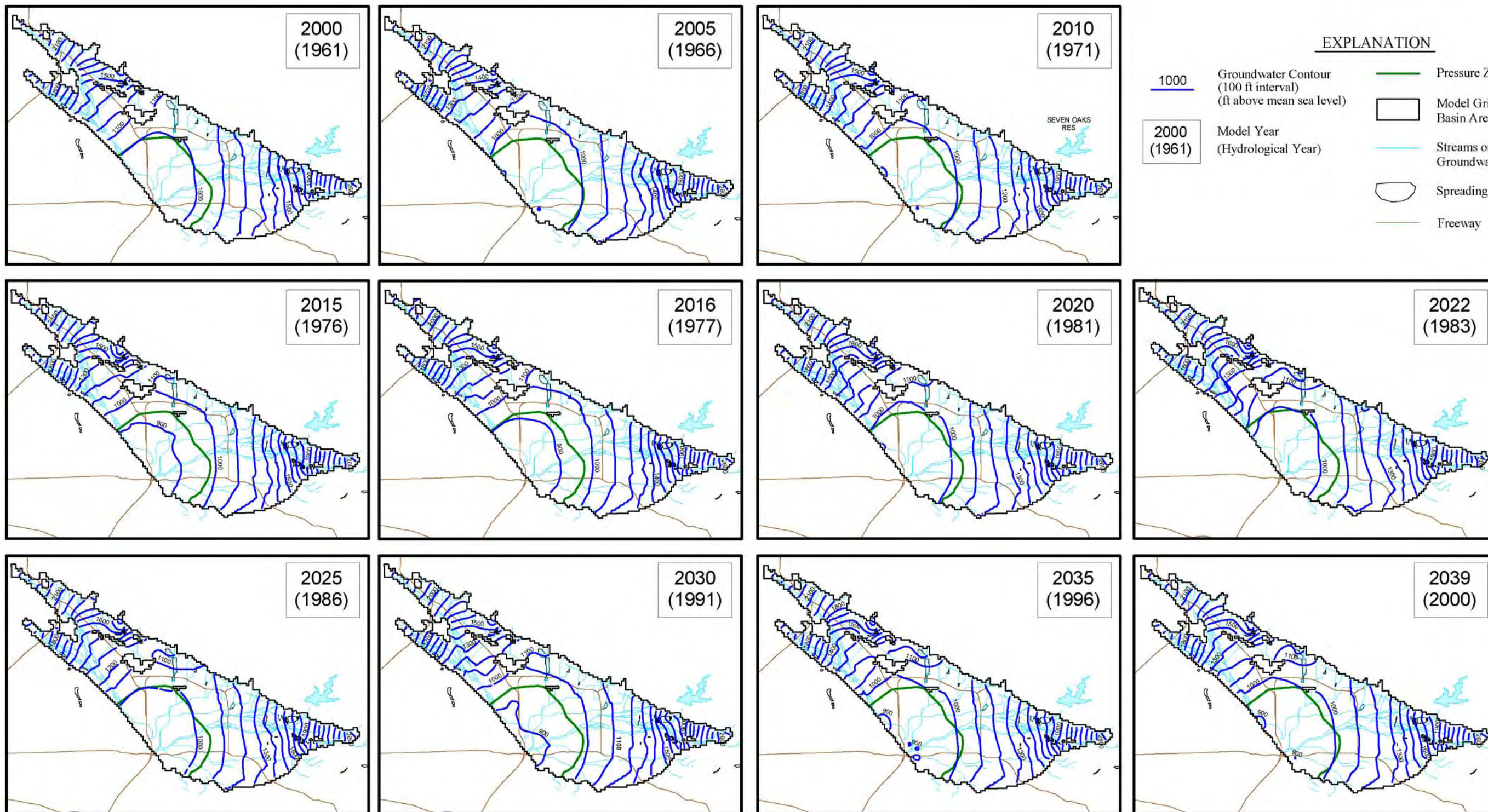
Map Projection:  
State Plane 1927 (California Zone V)



**Figure B 15**

**GROUNDWATER TECHNICAL APPENDIX  
SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR**

**GROUNDWATER ELEVATIONS  
LAYER 2  
SCENARIO D**



**EXPLANATION**

- Groundwater Contour (100 ft interval) (ft above mean sea level)
- Pressure Zone
- Model Grid of the San Bernardino Basin Area Groundwater Model
- Streams or Rivers Within Groundwater Basin Boundary
- Freeway
- Model Year (Hydrological Year)
- Spreading Grounds or Basins

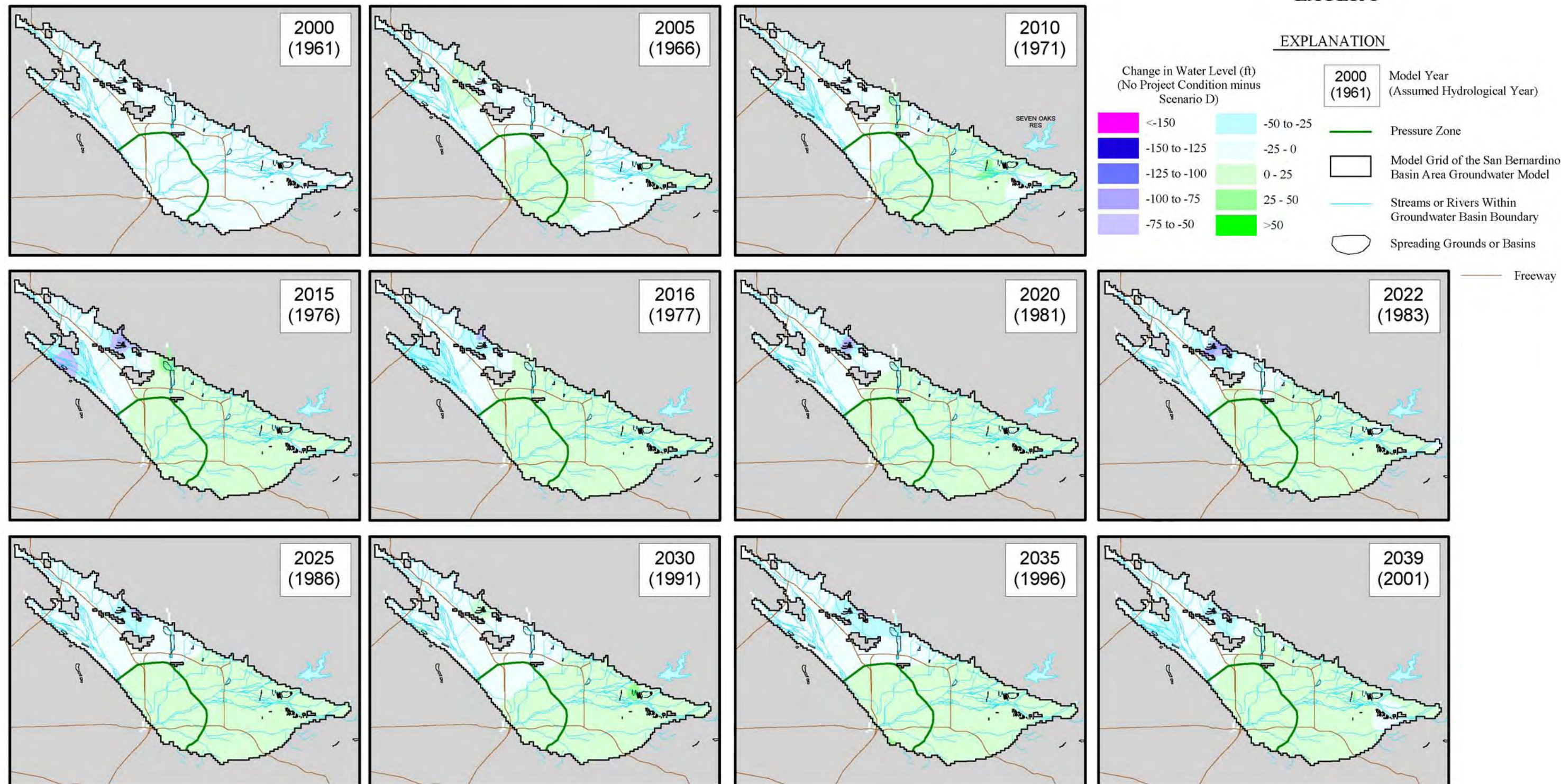
Map Projection:  
State Plane 1927 (California Zone V)



**Figure B 16**

**GROUNDWATER TECHNICAL APPENDIX  
SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR**

**DIFFERENCES IN GROUNDWATER LEVEL  
BETWEEN NO PROJECT CONDITION AND  
SCENARIO D  
LAYER 1**



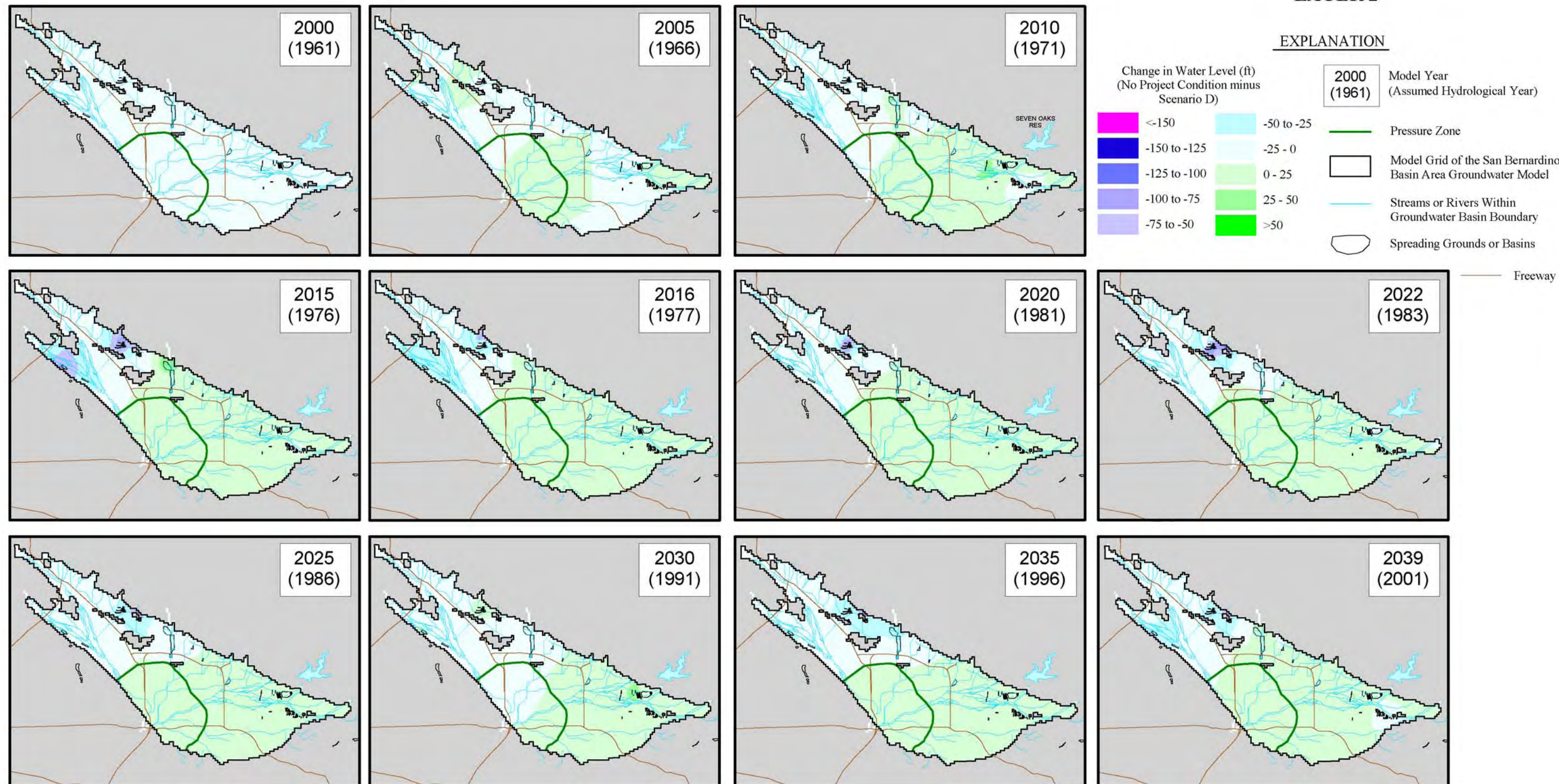
Map Projection:  
State Plane 1927 (California Zone V)



**Figure B 23**

**GROUNDWATER TECHNICAL APPENDIX  
SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR**

**DIFFERENCES IN GROUNDWATER LEVEL  
BETWEEN NO PROJECT CONDITION AND  
SCENARIO D  
LAYER 2**

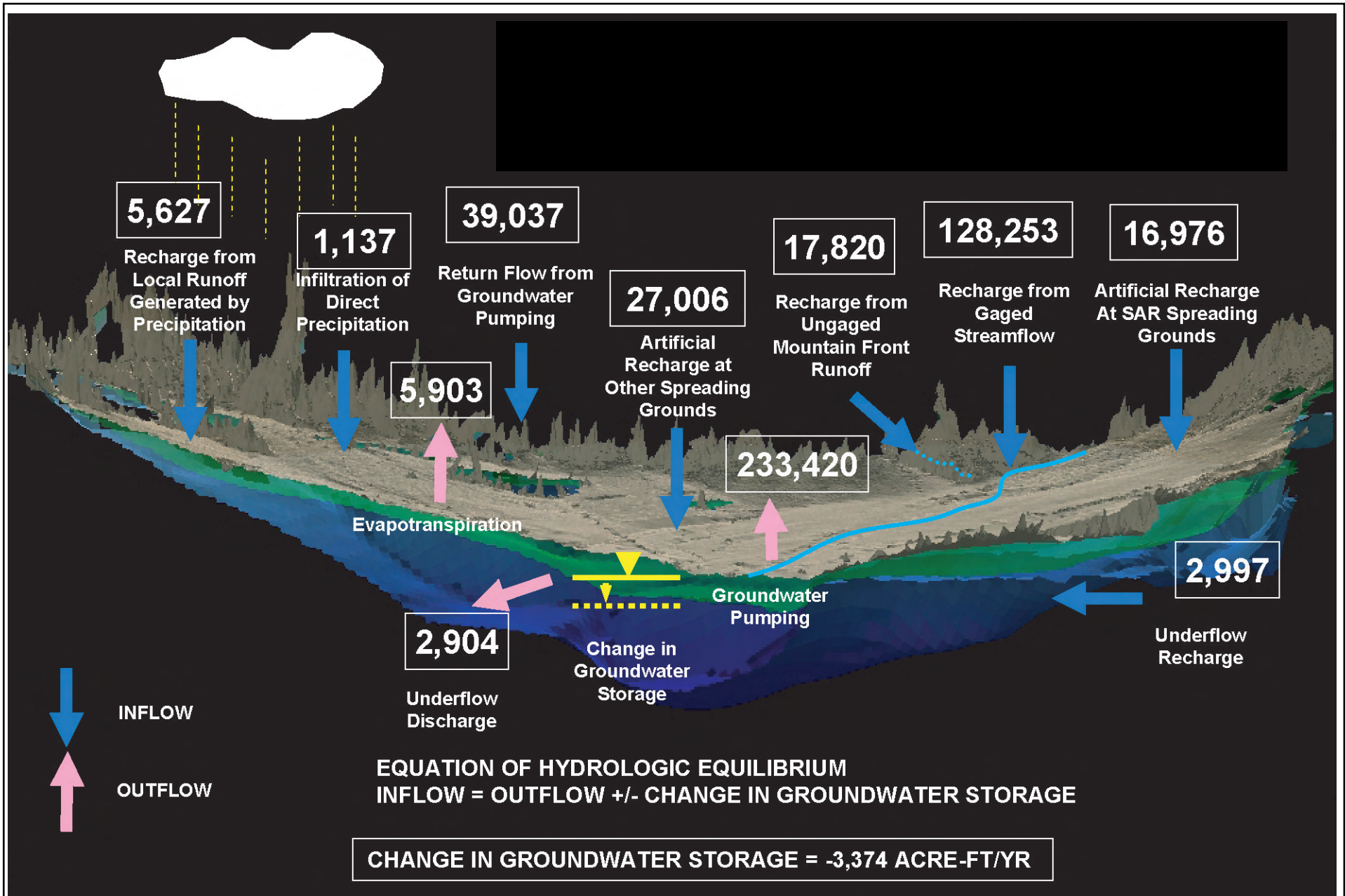


Map Projection:  
State Plane 1927 (California Zone V)



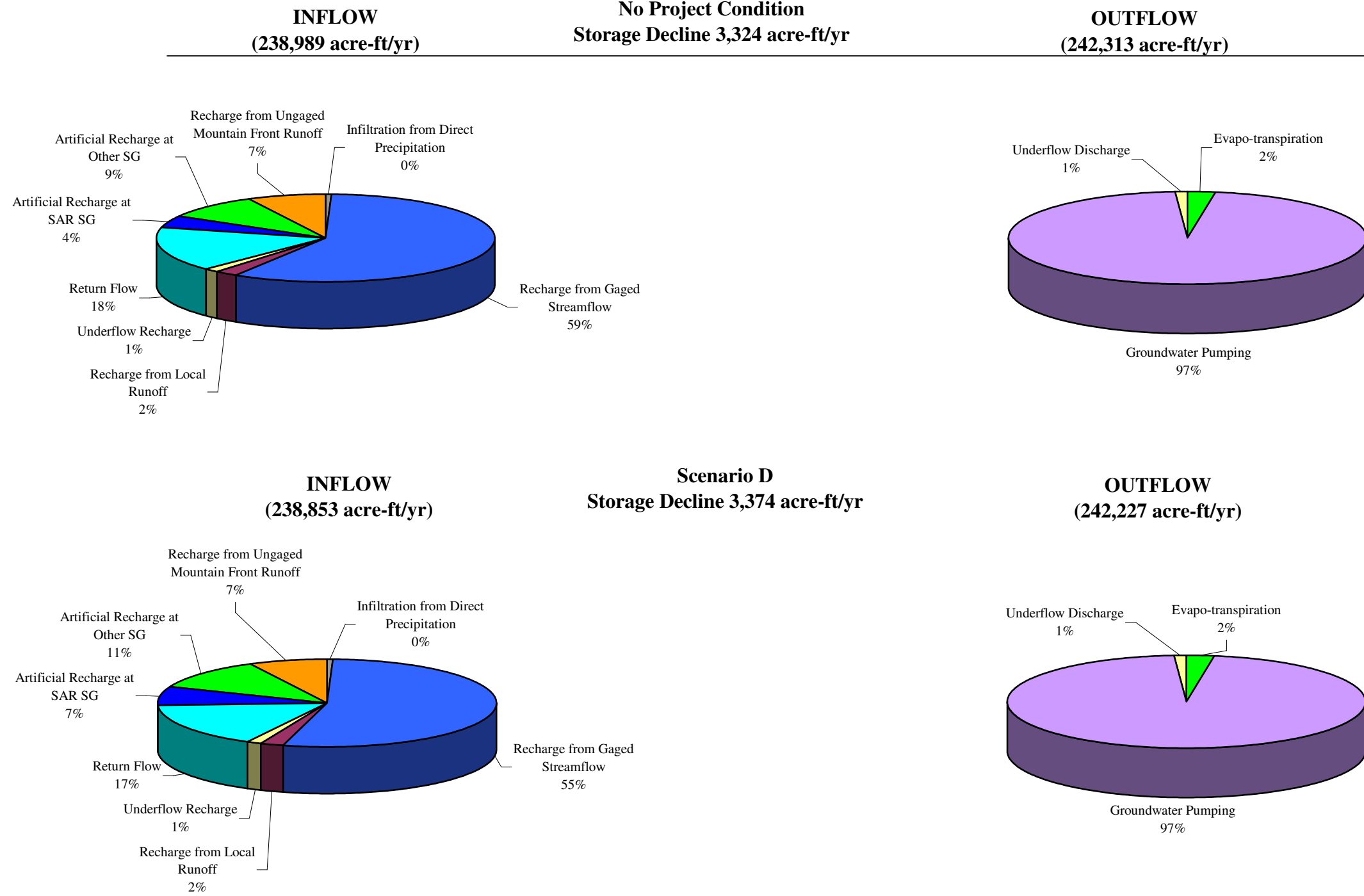
**Figure B 24**





Muni/Western Ex. 6-337	Drawn: DEW	SANTA ANA RIVER WATER RIGHTS HEARING - TESTIMONY OF DENNIS E. WILLIAMS	<b>HYDROLOGIC BUDGET FOR SCENARIO D</b> <b>2001-2039 (UNITS IN ACRE-FT/YR)</b>	<b>GEOSCIENCE</b> GEOSCIENCE Support Services, Incorporated P.O. Box 220, Claremont, CA 91711 Tel: (909)920-0707 Fax: (909)920-0403 www.gssiwater.com
	Checked:			
	Approved:			
	Date: 16-APR-07			

Comparisons of Groundwater Budgets for SBBA Between No Project Condition and Scenario D - 2001 to 2039



MODEL YEAR = 2000  
HYDROLOGIC YEAR = (1961)






Starting Point Spreading Ground Particle Track (No Project Condition)



\* NOTE: Particles released in 2000 and tracked forward to 2039.

\* NOTE: Groundwater flows towards the pressure zone.

SEVEN OAKS RES

-  Pressure Zone
-  Model Grid of the San Bernardino Basin Area Groundwater Model
-  Streams or Rivers Within Groundwater Basin Boundary
-  Spreading Grounds or Basins
-  Freeway

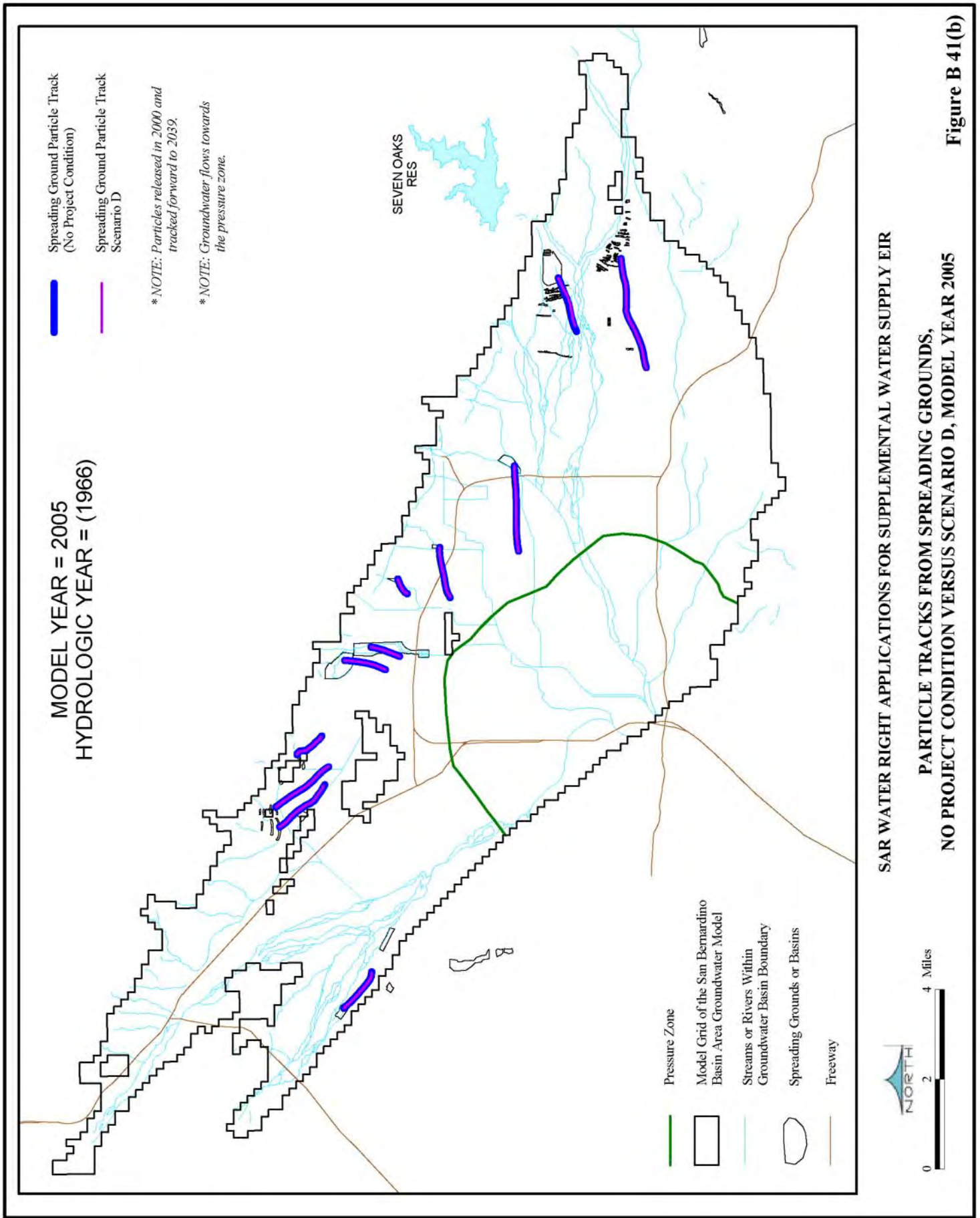


0 2 4 Miles

SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR

PARTICLE TRACKS FROM SPREADING GROUNDS,  
NO PROJECT CONDITION VERSUS SCENARIO D, MODEL YEAR 2000

Figure B 41(a)



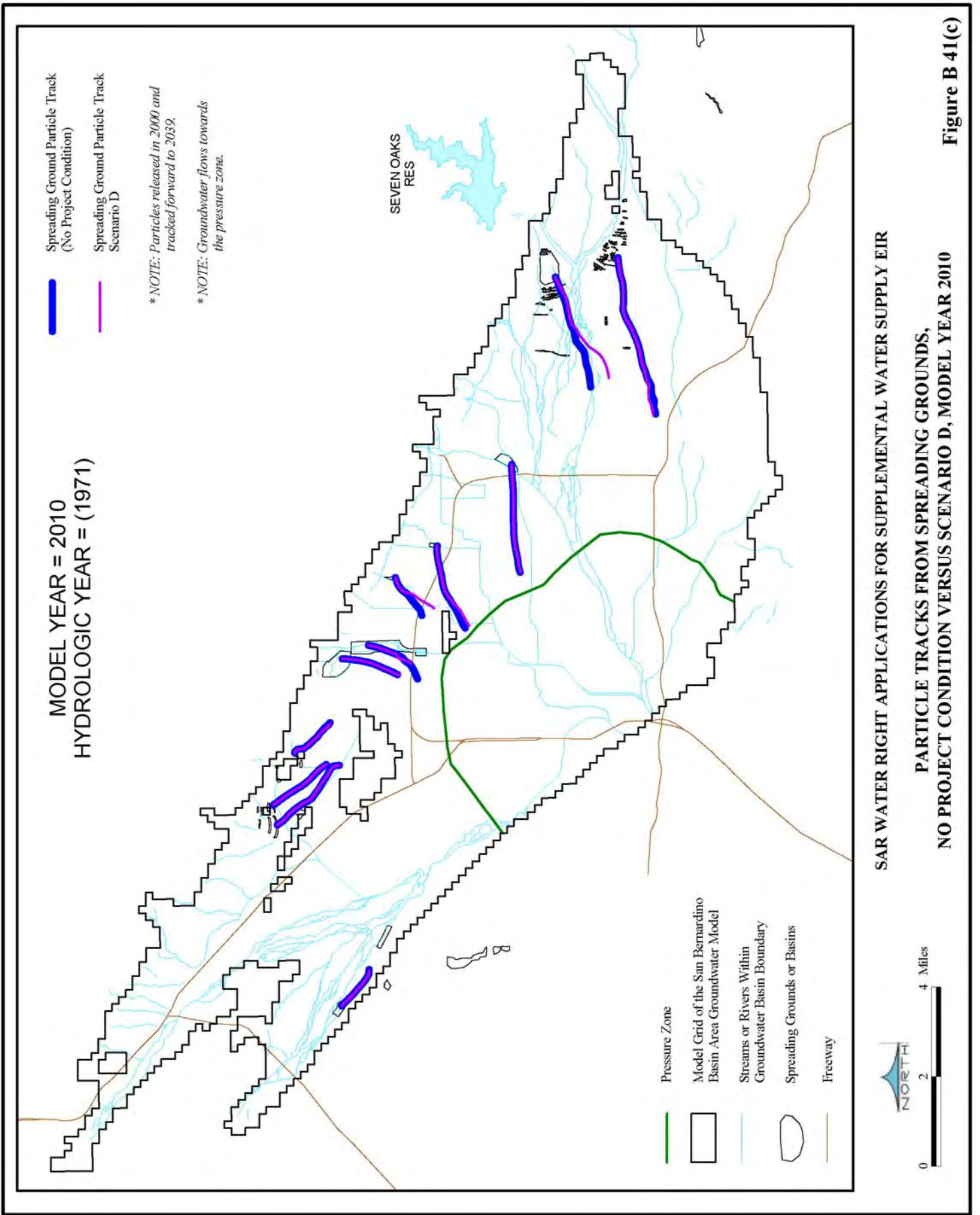
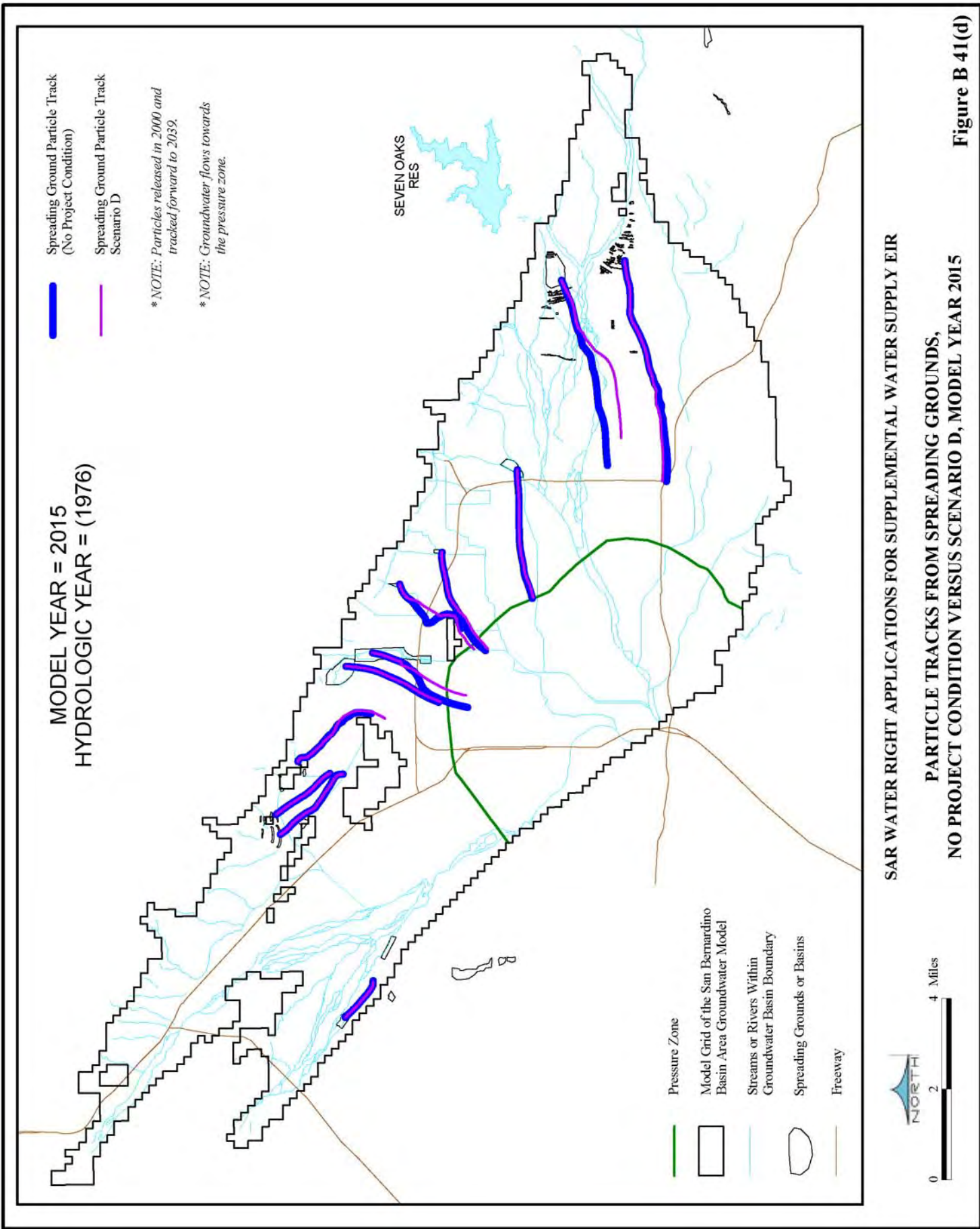
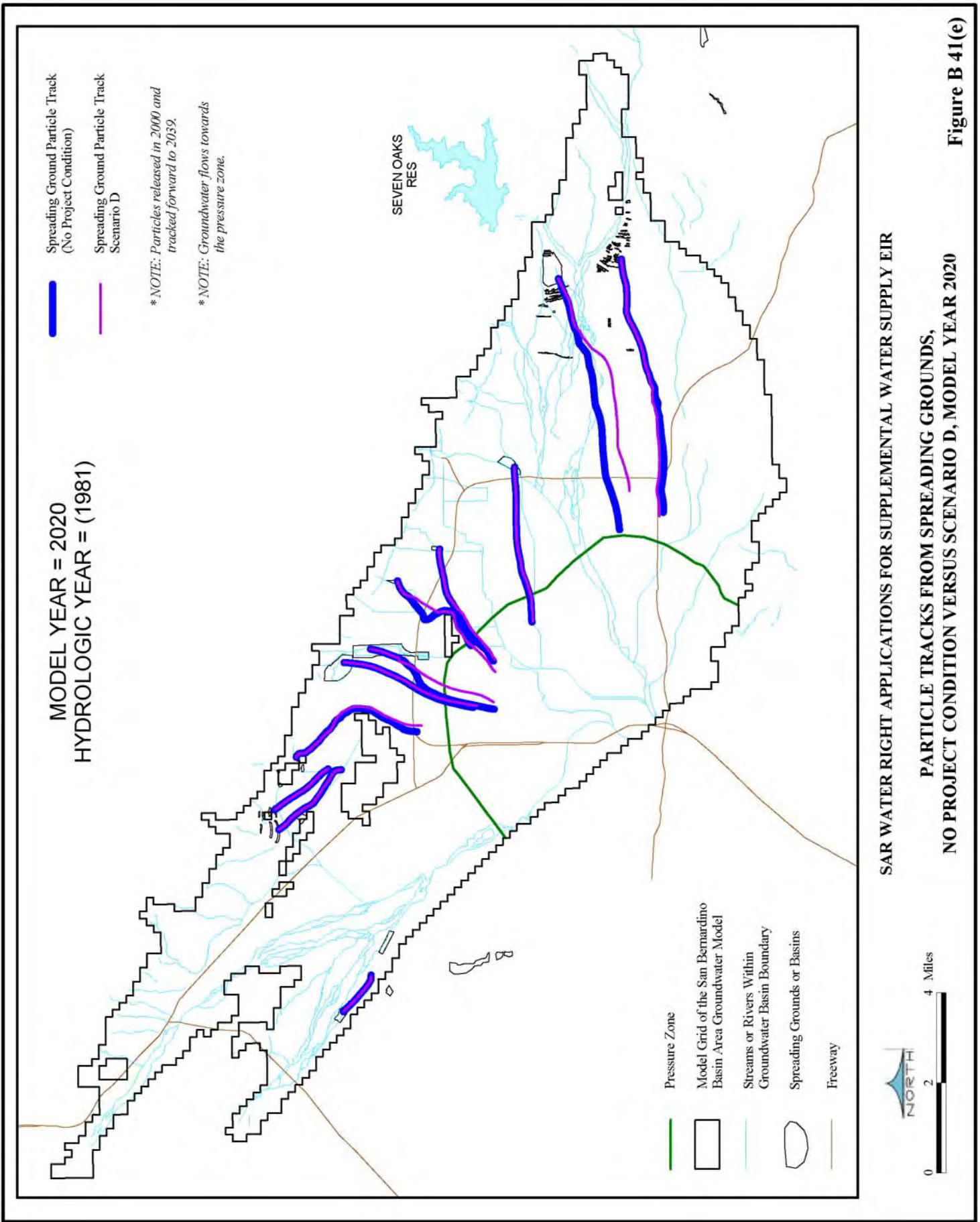


Figure B 41(c)

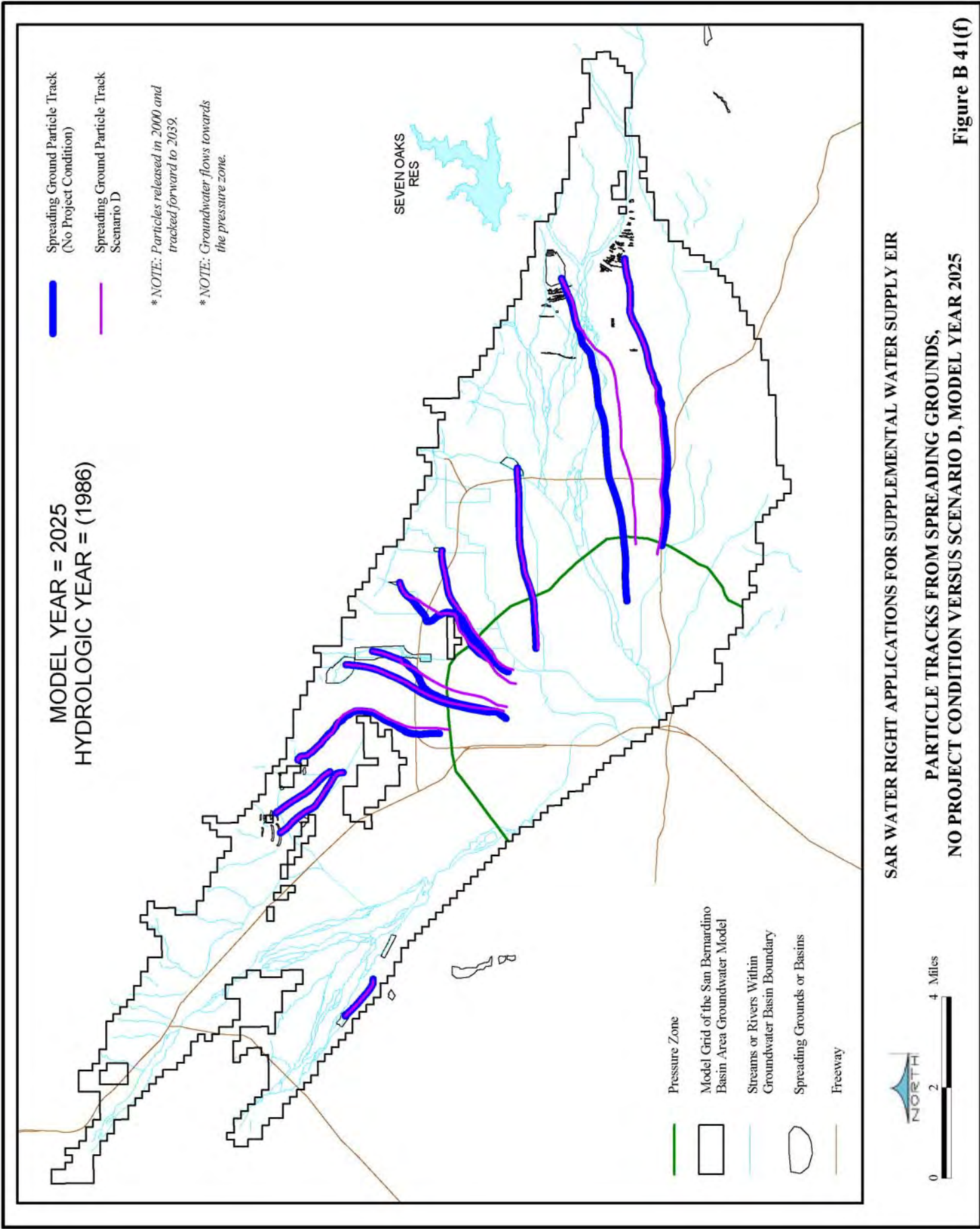




**SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR**

**PARTICLE TRACKS FROM SPREADING GROUNDS,  
NO PROJECT CONDITION VERSUS SCENARIO D, MODEL YEAR 2020**

**Figure B 41(e)**



SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR

PARTICLE TRACKS FROM SPREADING GROUNDS, NO PROJECT CONDITION VERSUS SCENARIO D, MODEL YEAR 2025

Figure B 41(f)



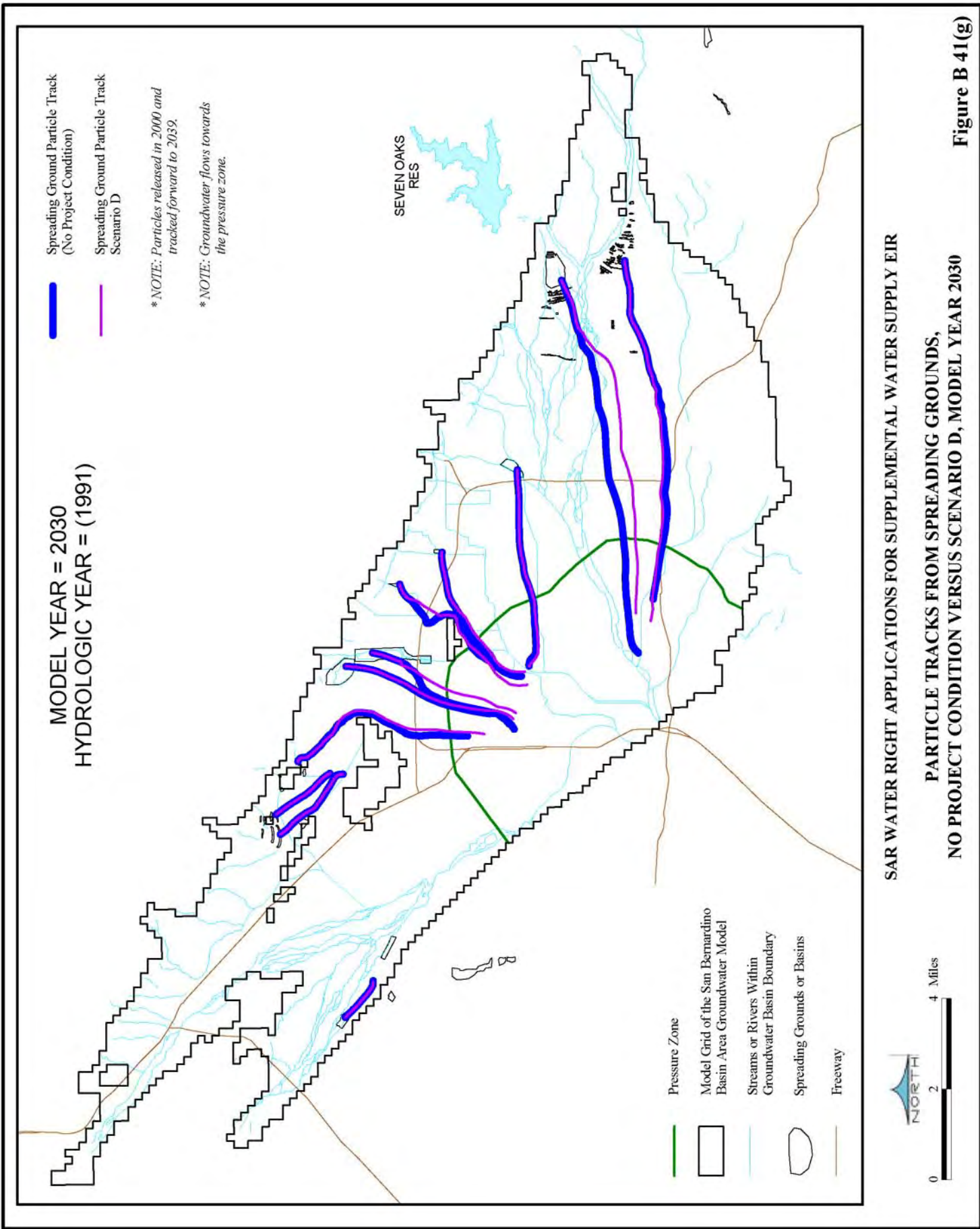
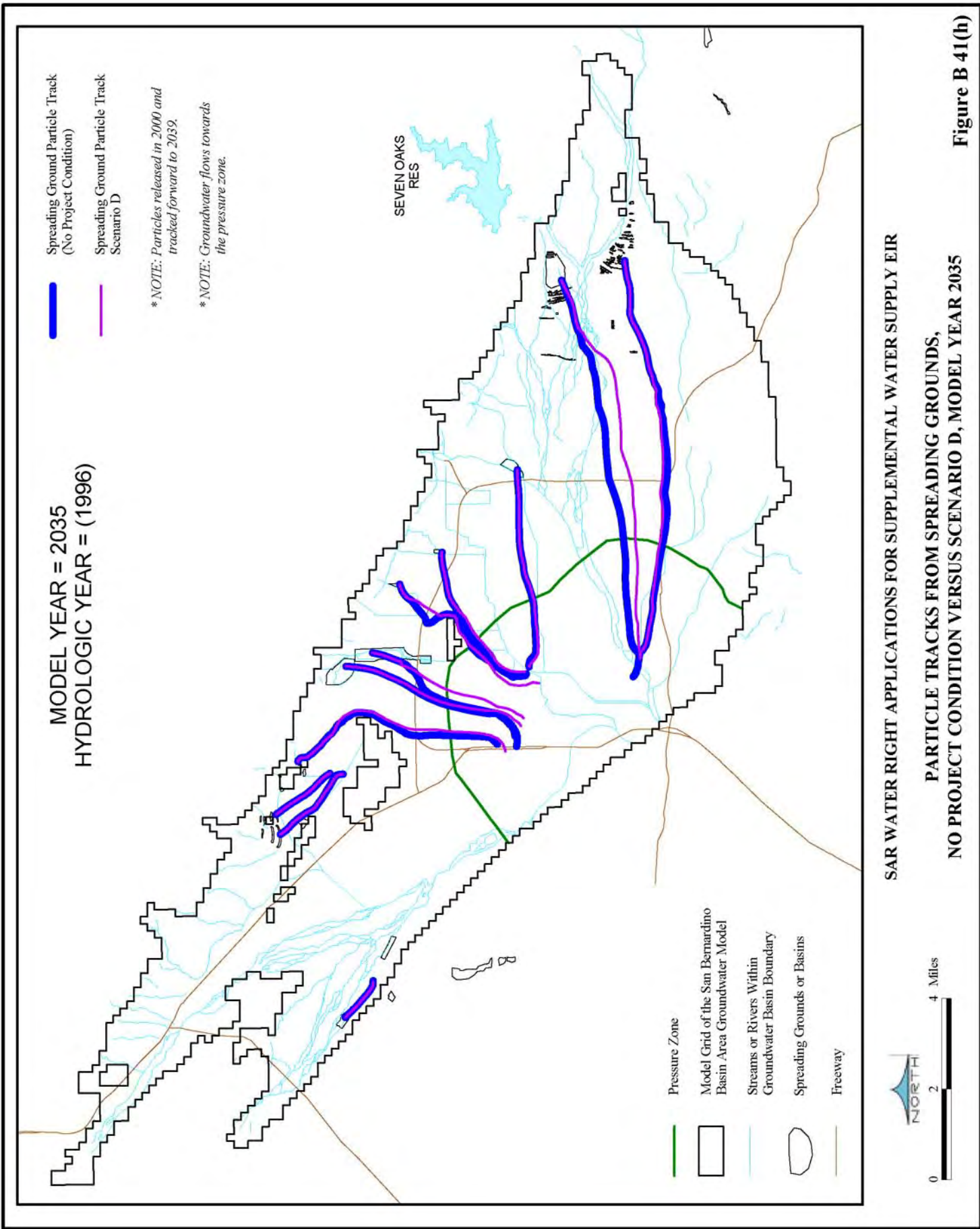
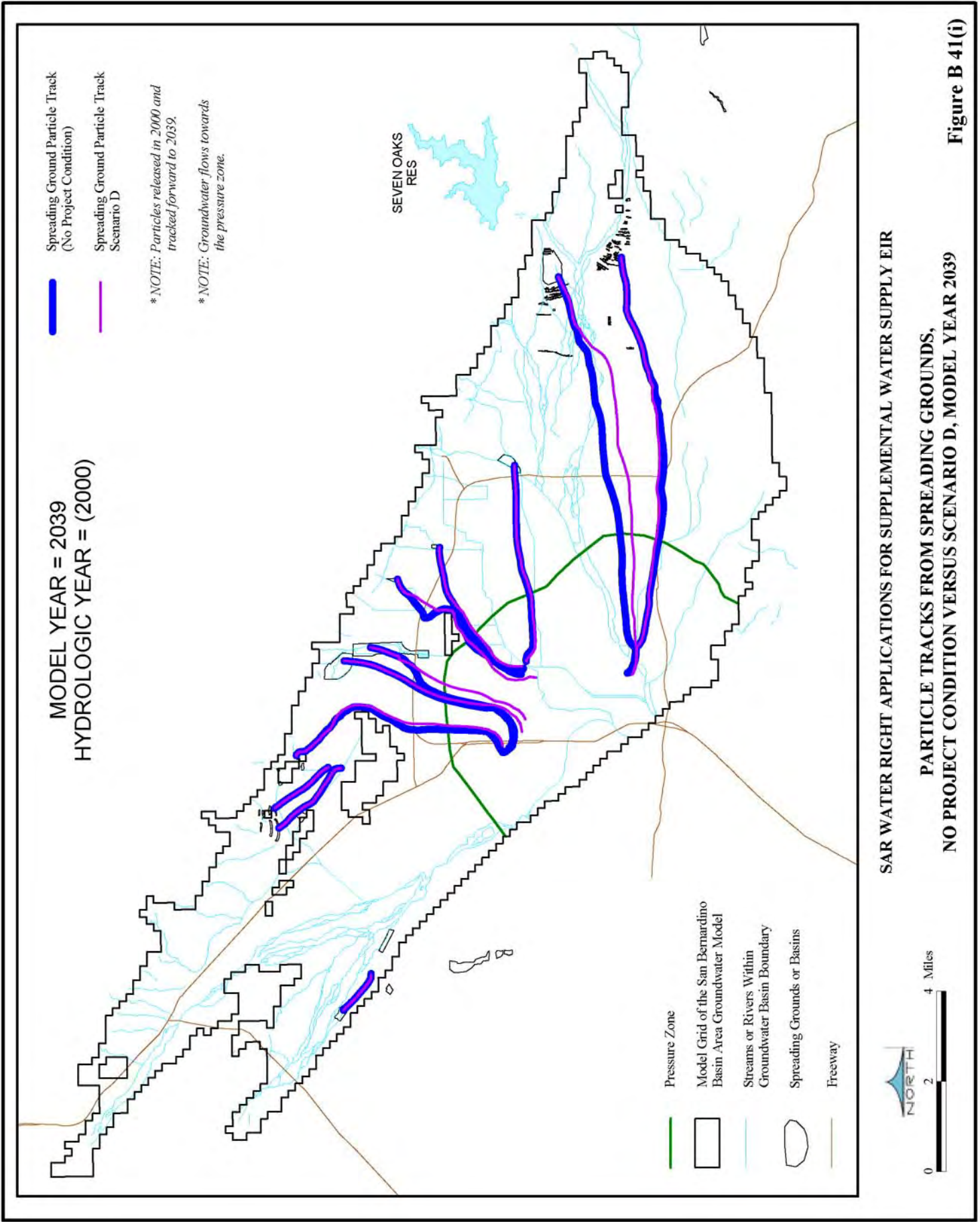


Figure B 41(g)





SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR

PARTICLE TRACKS FROM SPREADING GROUNDS, NO PROJECT CONDITION VERSUS SCENARIO D, MODEL YEAR 2039

Figure B 41(i)

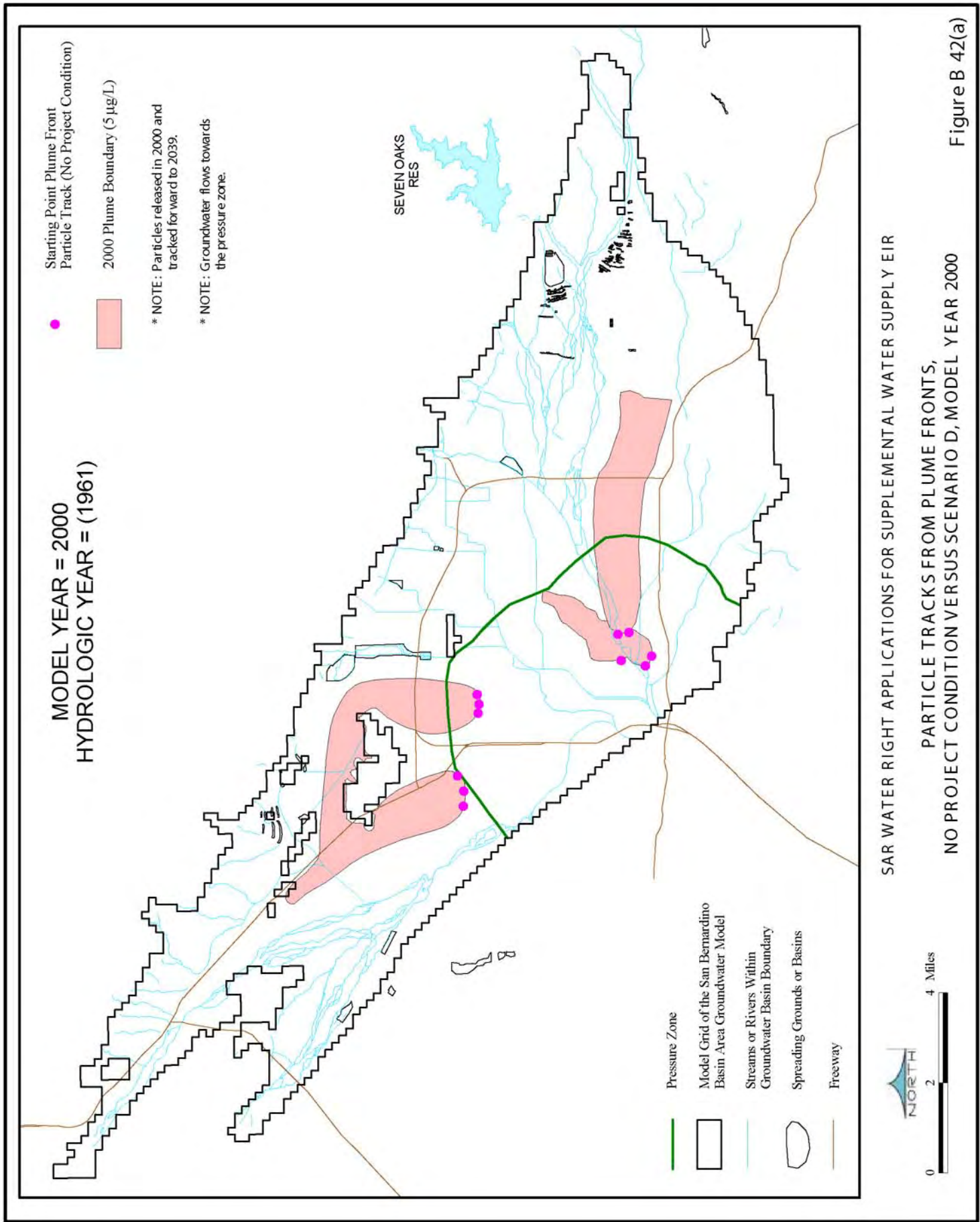


Figure B 42(a)

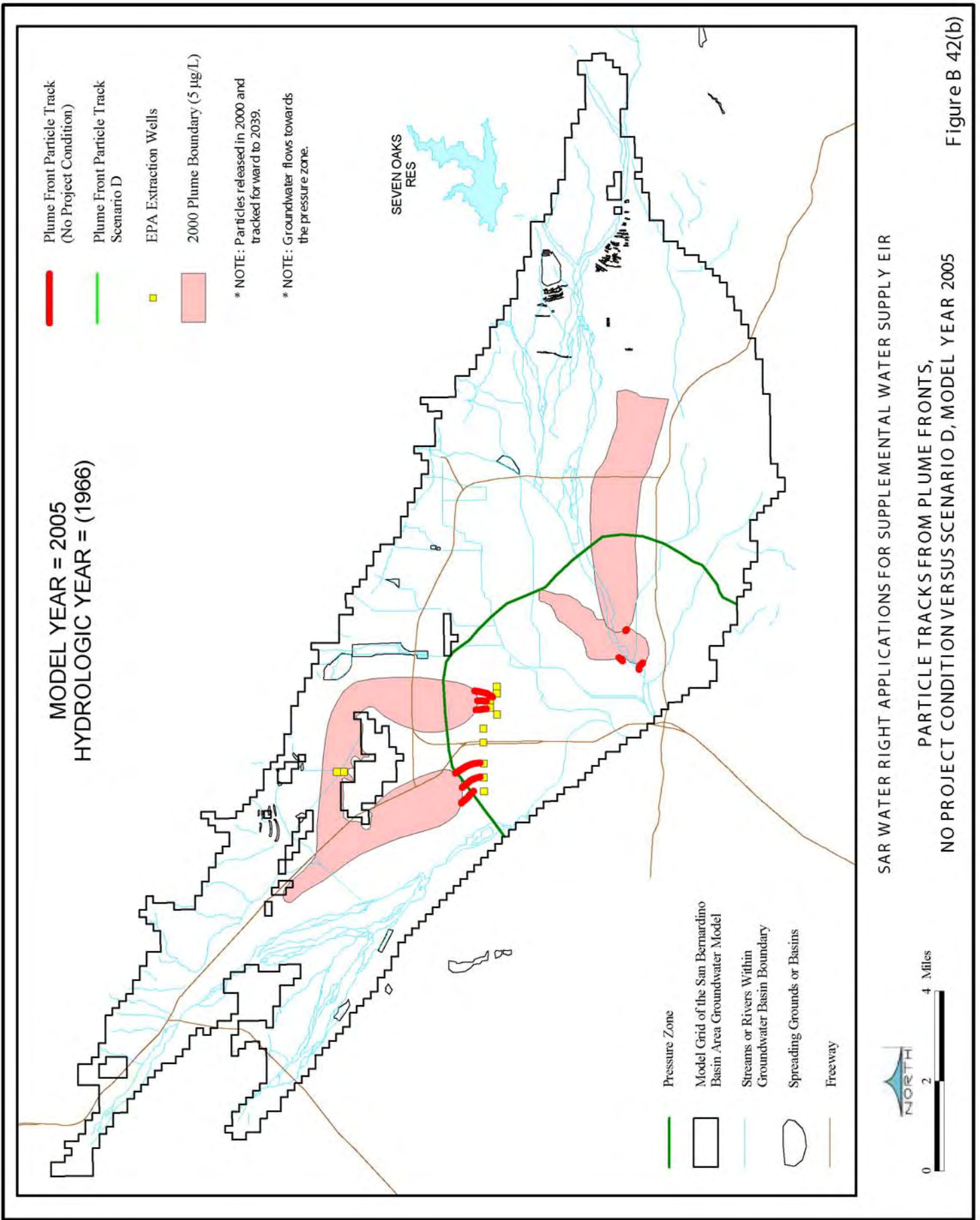
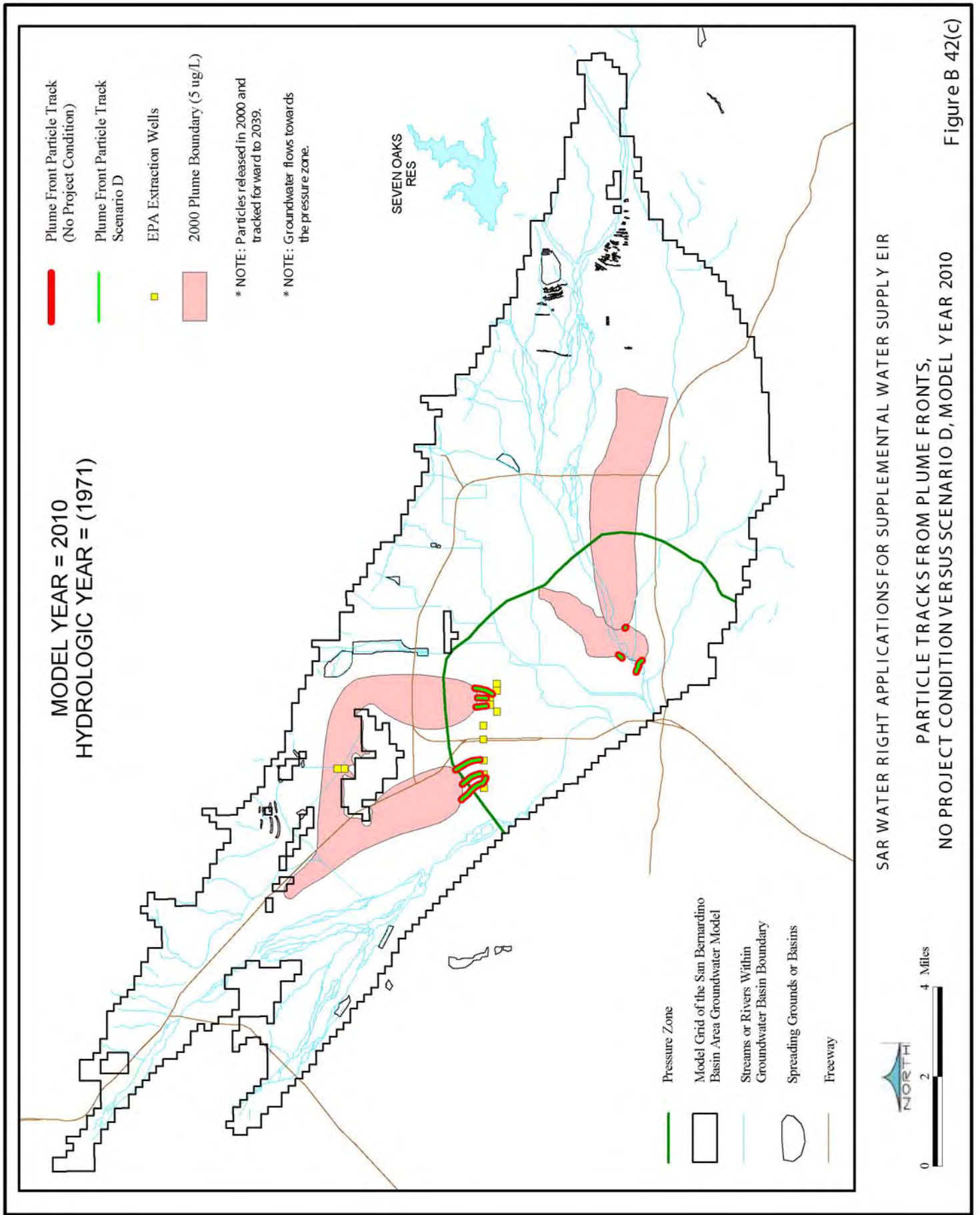


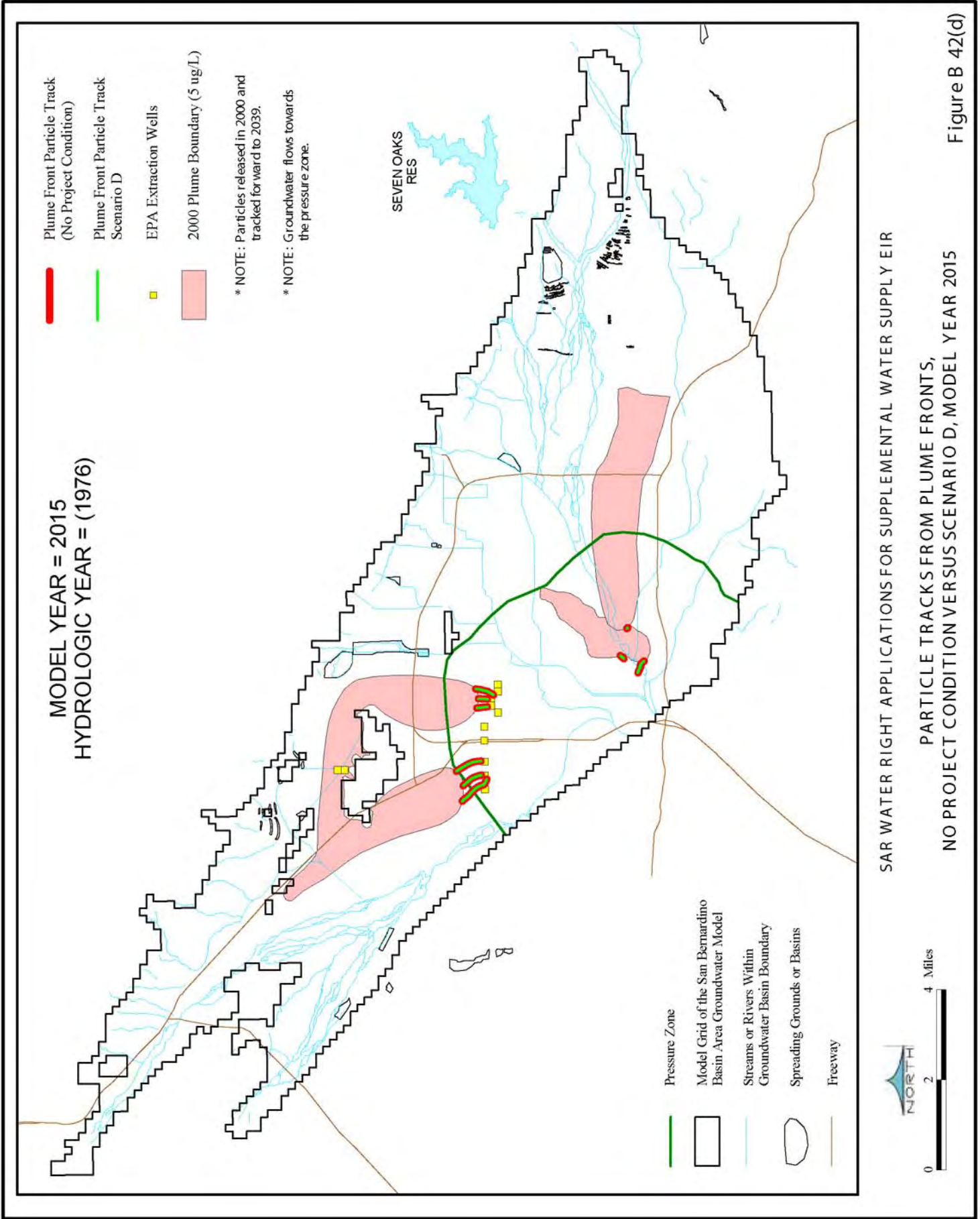
Figure B 42(b)



SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR

PARTICLE TRACKS FROM PLUME FRONTS,  
NO PROJECT CONDITION VERSUS SCENARIO D, MODEL YEAR 2010

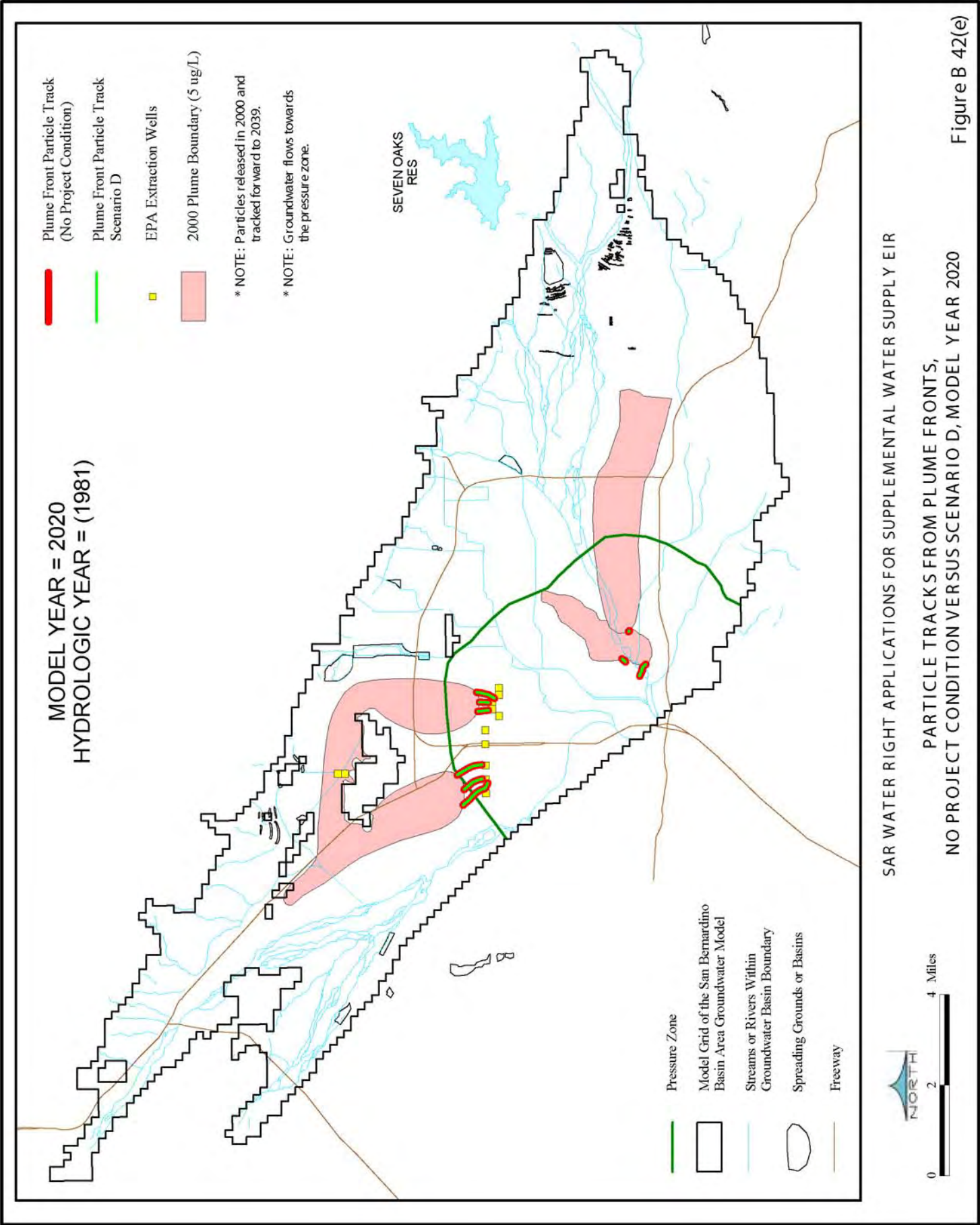
Figure B 42(c)



SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR

PARTICLE TRACKS FROM PLUME FRONTS,  
NO PROJECT CONDITION VERSUS SCENARIO D, MODEL YEAR 2015

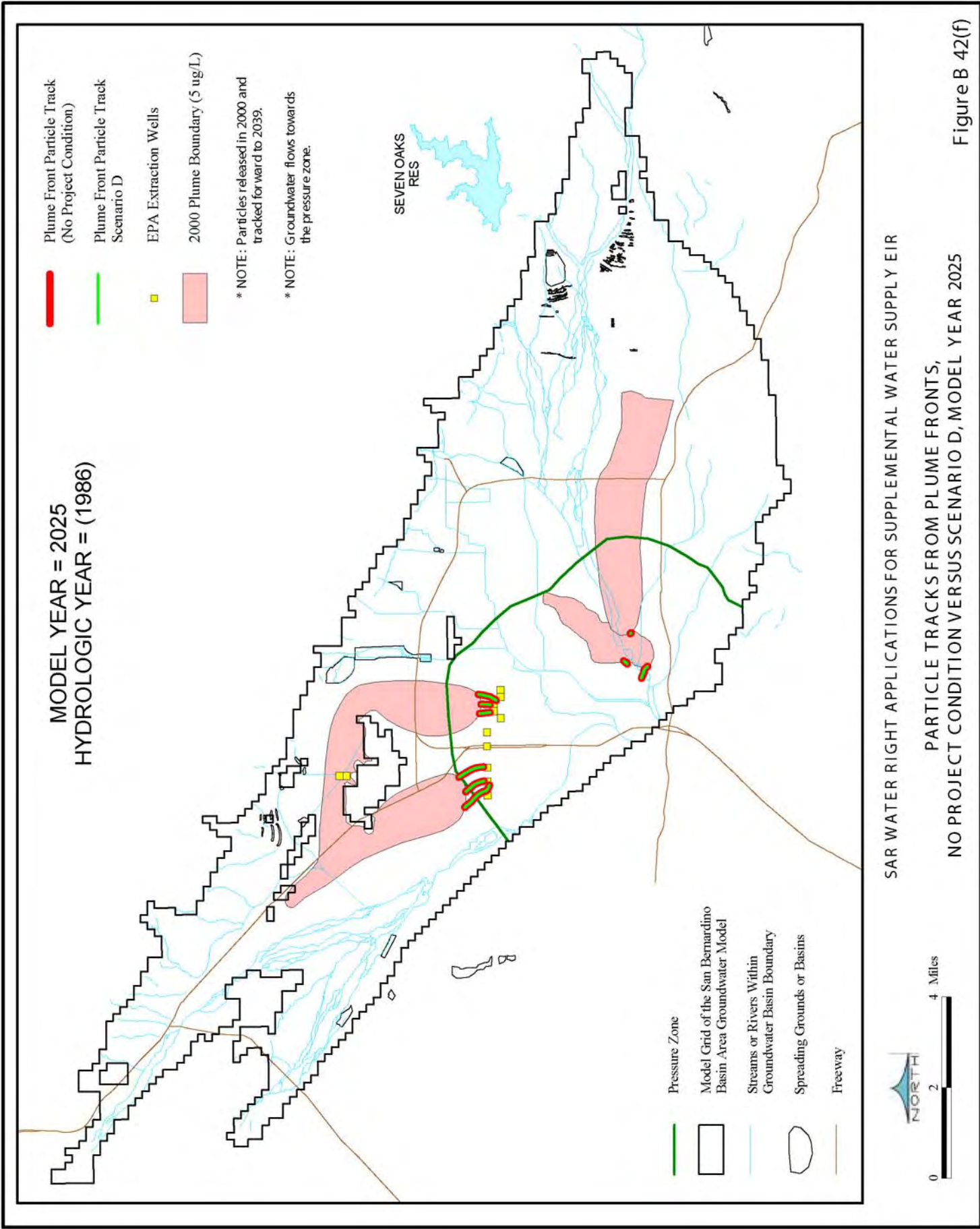
Figure B 42(d)



SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR  
 PARTICLE TRACKS FROM PLUME FRONTS,  
 NO PROJECT CONDITION VERSUS SCENARIO D, MODEL YEAR 2020

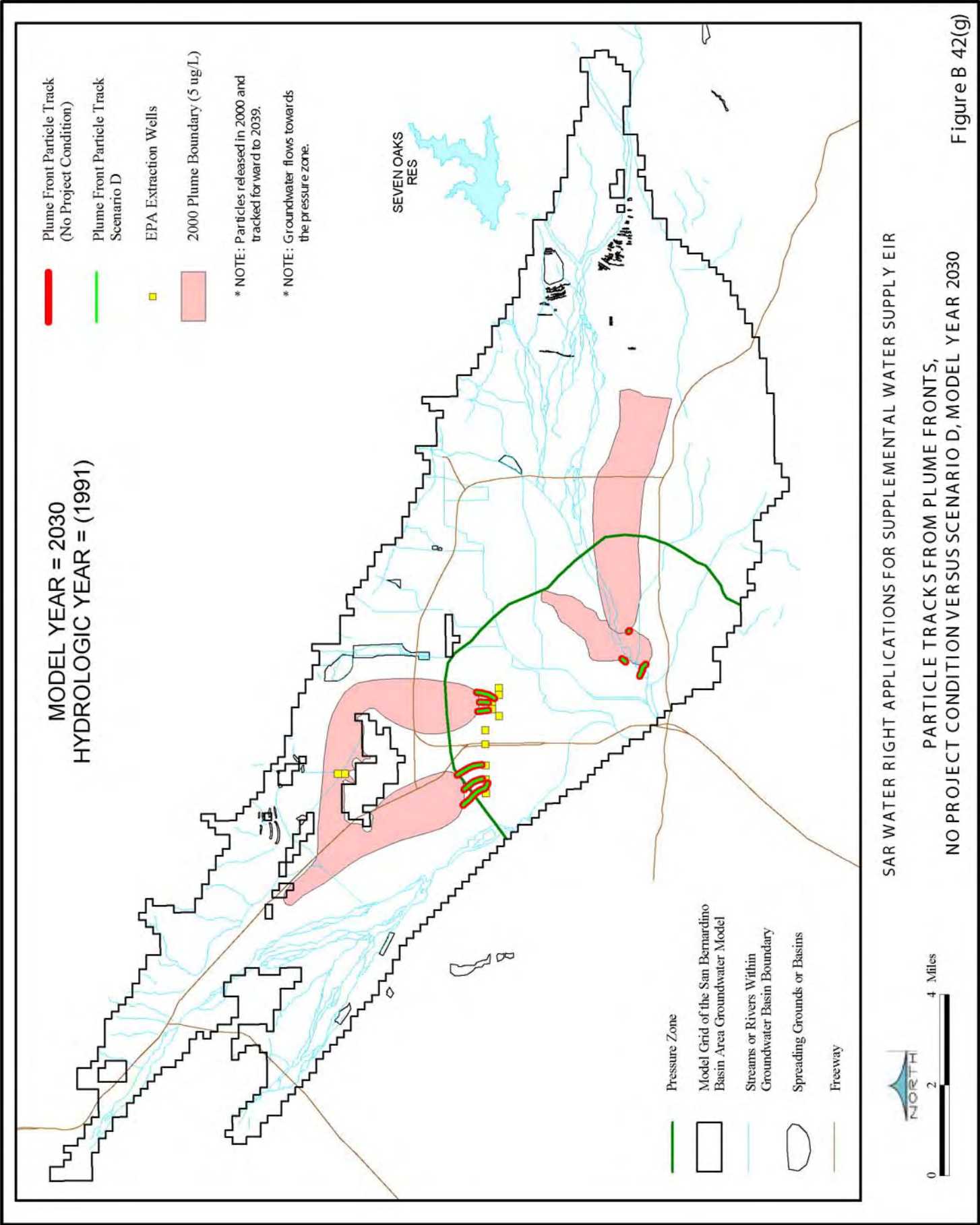
Figure B 42(e)





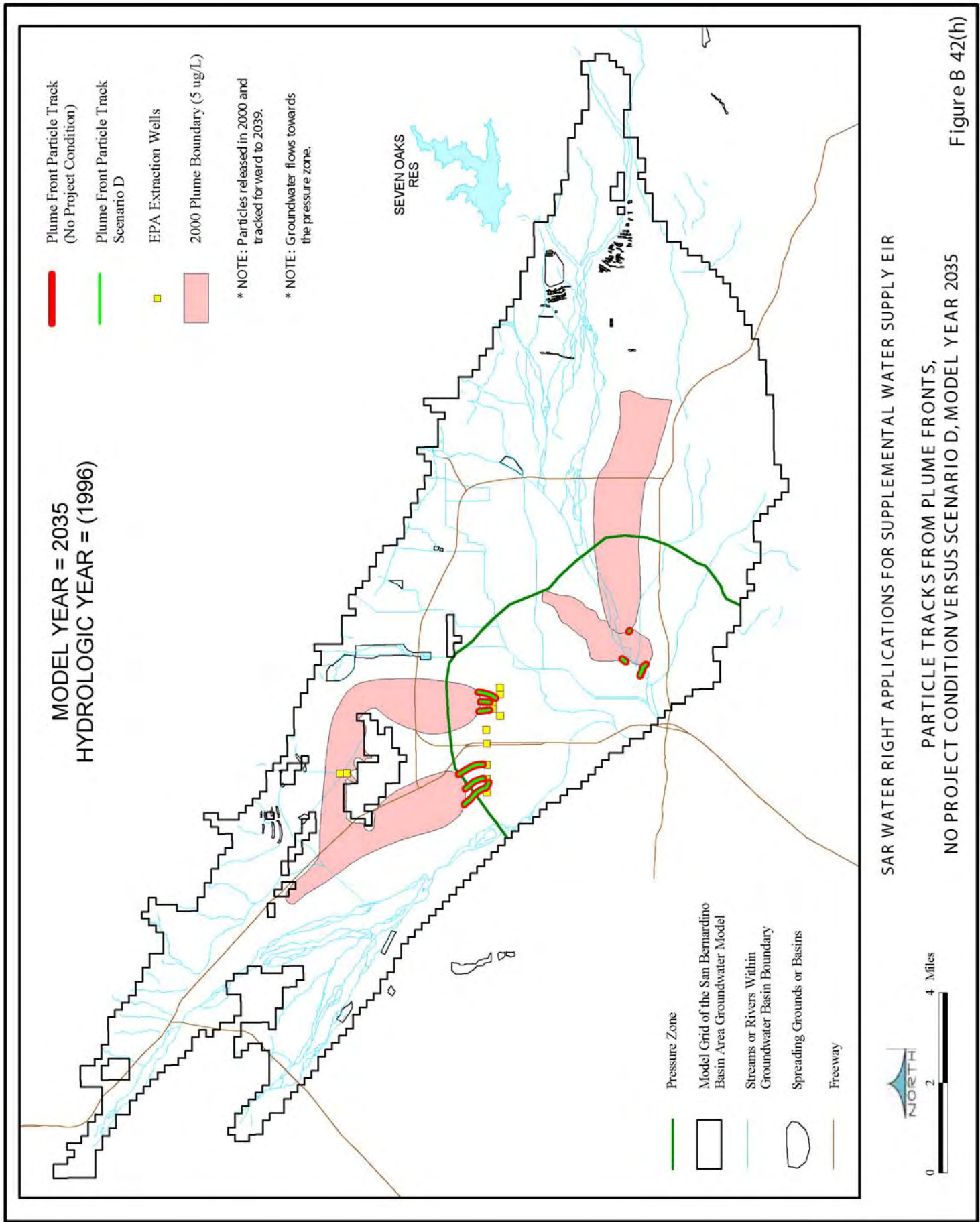
SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR  
 PARTICLE TRACKS FROM PLUME FRONTS,  
 NO PROJECT CONDITION VERSUS SCENARIO D, MODEL YEAR 2025

Figure B 42(f)



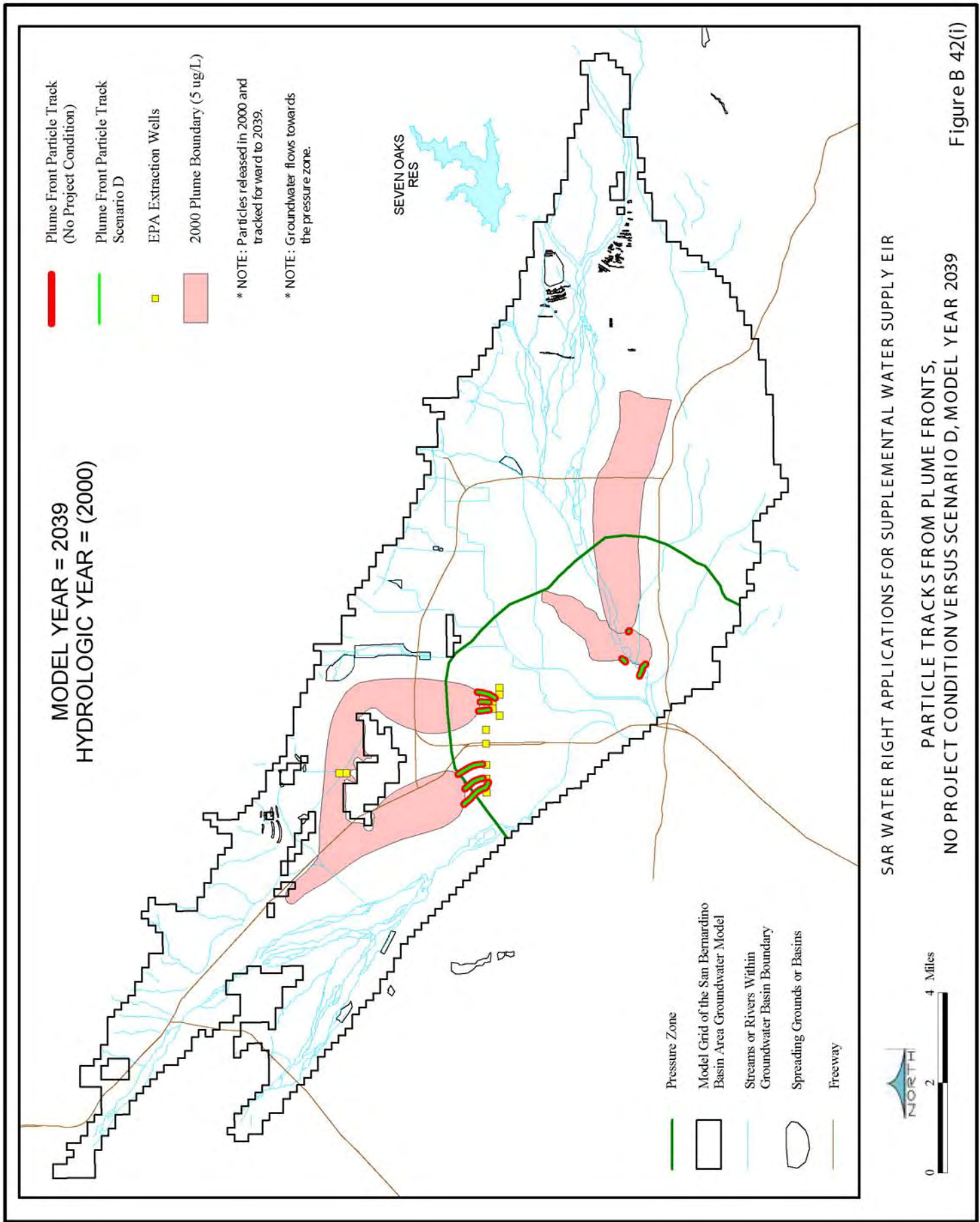
SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR  
 PARTICLE TRACKS FROM PLUME FRONTS,  
 NO PROJECT CONDITION VERSUS SCENARIO D, MODEL YEAR 2030

Figure B 42(g)



SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR  
 PARTICLE TRACKS FROM PLUME FRONTS,  
 NO PROJECT CONDITION VERSUS SCENARIO D, MODEL YEAR 2035

Figure B 42(h)



SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR

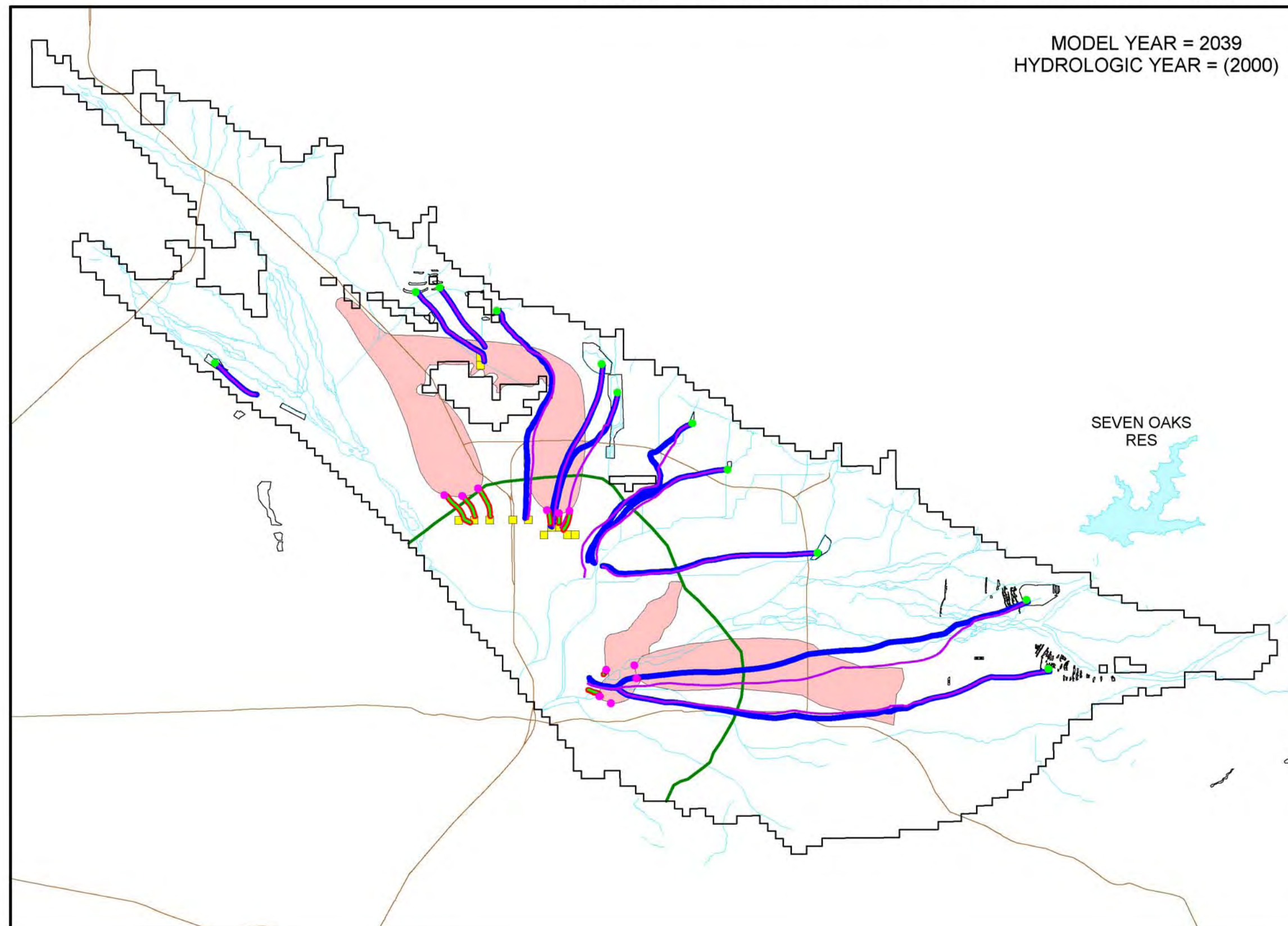
PARTICLE TRACKS FROM PLUME FRONTS,  
NO PROJECT CONDITION VERSUS SCENARIO D, MODEL YEAR 2039

Figure B 42(i)

GROUNDWATER TECHNICAL APPENDIX  
 SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR

MODEL YEAR = 2039  
 HYDROLOGIC YEAR = (2000)

PARTICLE TRACKS  
 FROM BOTH  
 SPREADING GROUNDS  
 AND PLUME FRONTS,  
 YEAR 2039,  
 NO PROJECT CONDITION  
 VERSUS SCENARIO D



EXPLANATION

- Starting Point Spreading Ground Particle Track (No Project Condition)
- Spreading Ground Particle Track (No Project Condition)
- Spreading Ground Particle Track Scenario D
- Starting Point Plume Front Particle Track (No Project Condition)
- Plume Front Particle Track (No Project Condition)
- Plume Front Particle Track Scenario D
- EPA Extraction Wells
- 2000 Plume Boundary (5 µg/L)
- Pressure Zone
- Model Grid of the San Bernardino Basin Area Groundwater Model
- Streams or Rivers Within Groundwater Basin Boundary
- Spreading Grounds or Basins
- Freeway

\* NOTE: Particles released in 2000 and tracked forward to 2039.

\* NOTE: Groundwater flows towards the pressure zone.



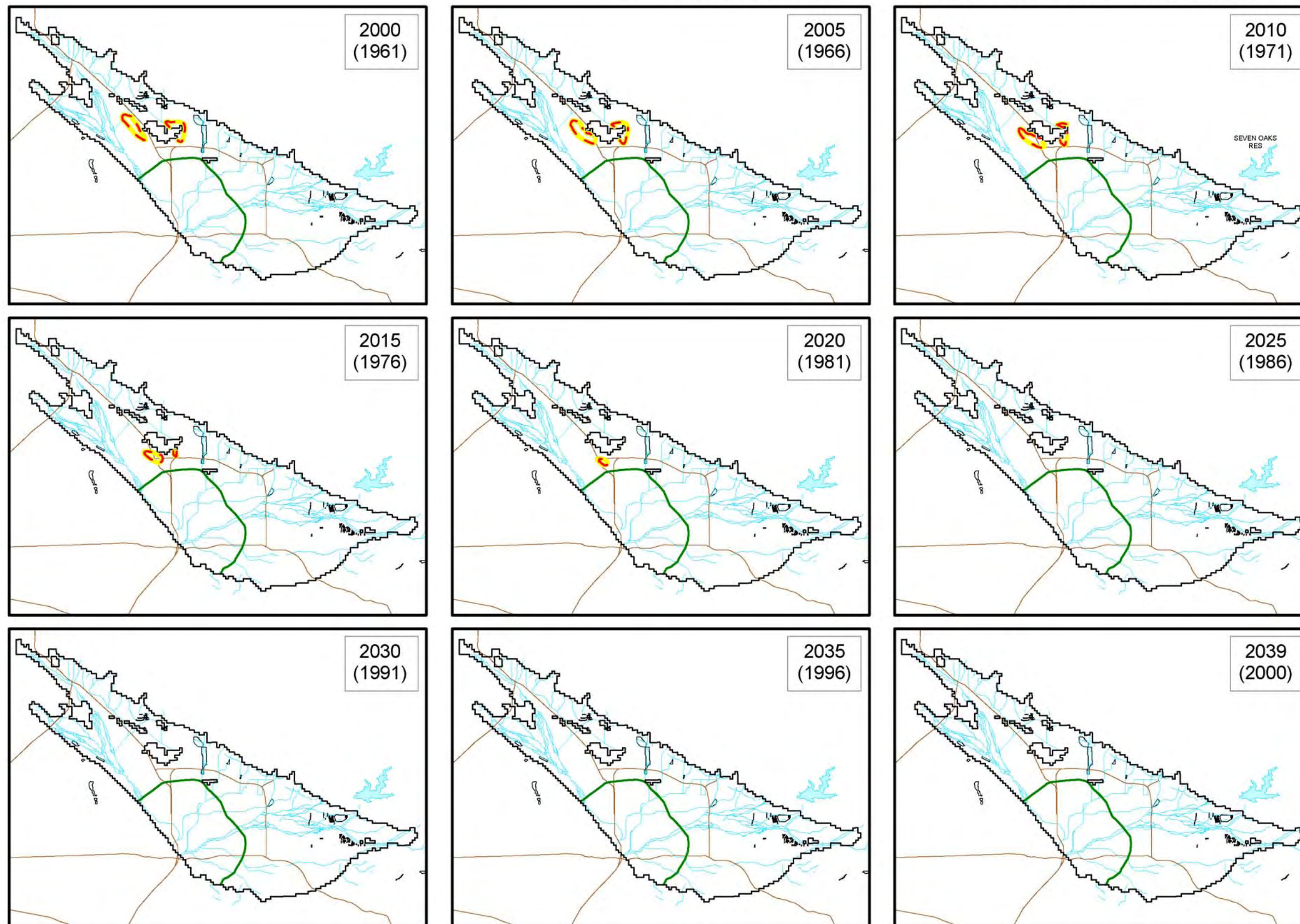
0 2 4 Miles

Map Projection:  
 State Plane 1927 (California Zone V)

Figure B 43

SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR

PCE PLUME BOUNDARY  
LAYER 1  
NO PROJECT CONDITION  
VERSUS SCENARIO D



EXPLANATION

Yellow Line PCE Plume Boundary (5 ug/L)  
Layer 1, No Project Condition

--- PCE Plume Boundary (5 ug/L)  
Layer 1, Scenario D

2000 (1961) Model Year  
(Assumed Hydrological Year)

— Pressure Zone

□ Model Grid of the San Bernardino  
Basin Area Groundwater Model

— Streams or Rivers Within  
Groundwater Basin Boundary

○ Spreading Grounds or Basins

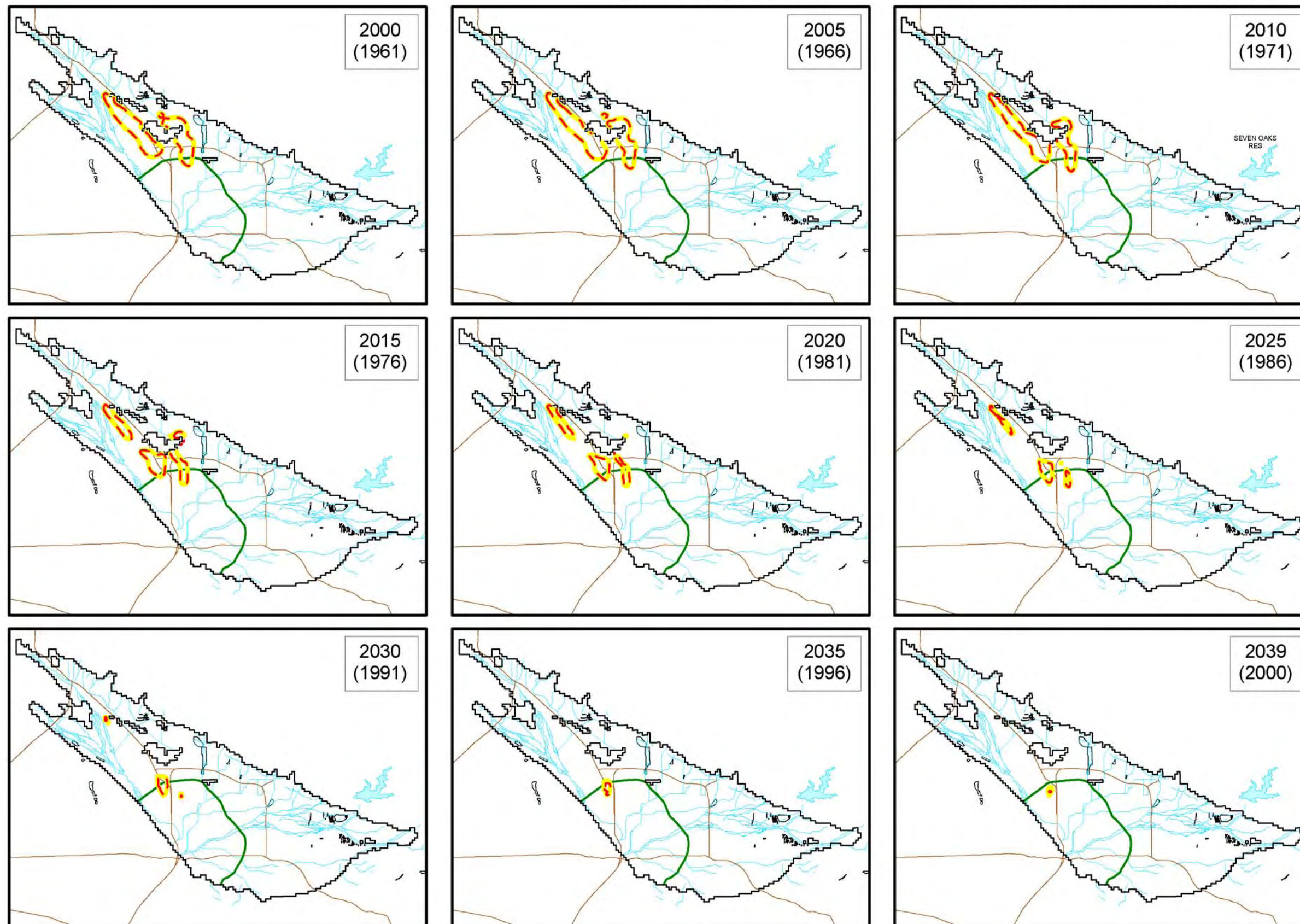
— Freeway

Map Projection:  
State Plane 1927 (California Zone V)



Figure B 60

SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR



**PCE PLUME BOUNDARY  
LAYER 2  
NO PROJECT CONDITION  
VERSUS SCENARIO D**

EXPLANATION

Yellow Line PCE Plume Boundary (5 ug/L)  
Layer 2, No Project Condition

--- PCE Plume Boundary (5 ug/L)  
Layer 2, Scenario D

2000 (1961) Model Year  
(Assumed Hydrological Year)

— Pressure Zone

Model Grid of the San Bernardino  
Basin Area Groundwater Model

Streams or Rivers Within  
Groundwater Basin Boundary

Spreading Grounds or Basins

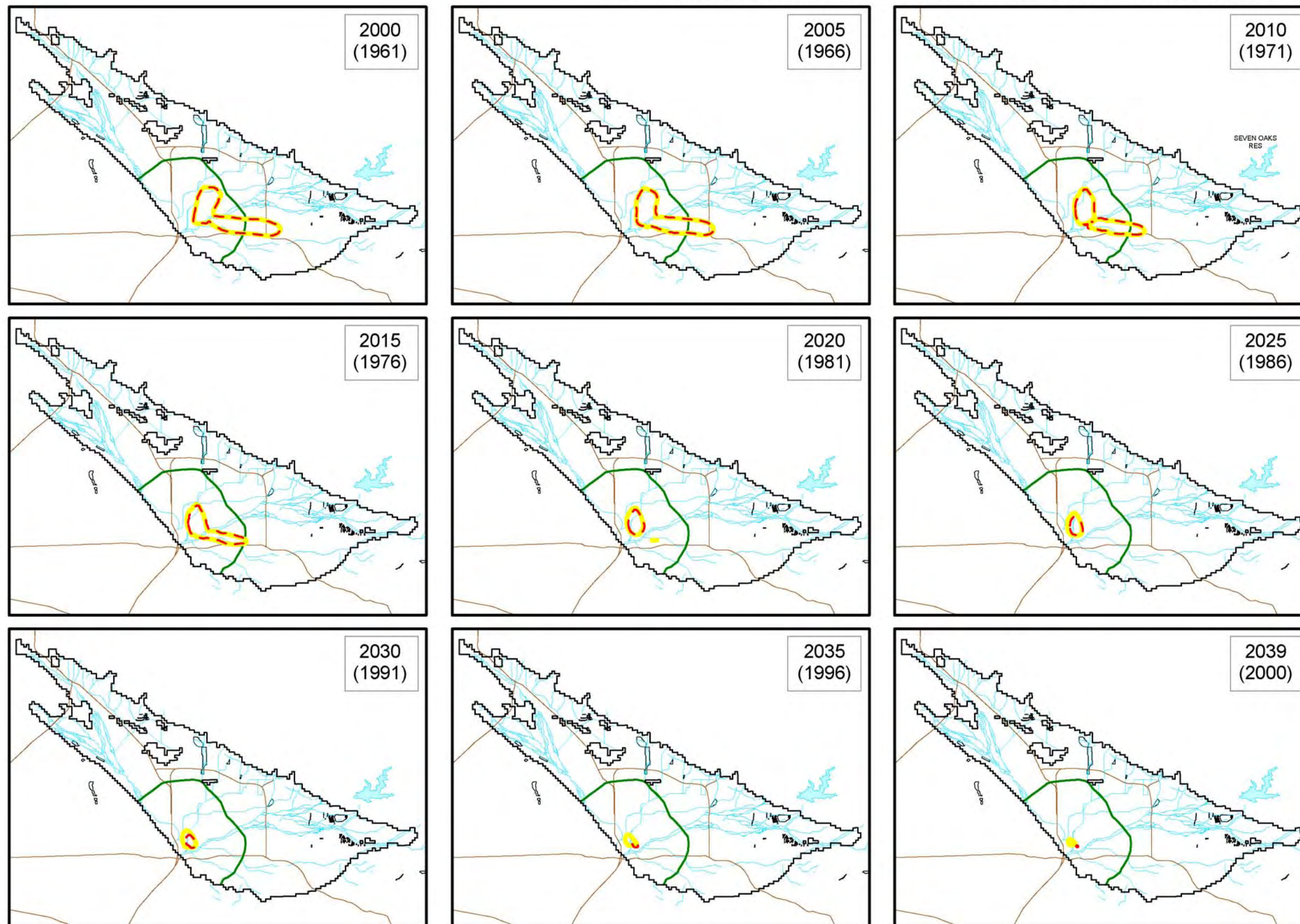
Freeway

Map Projection:  
State Plane 1927 (California Zone V)



**Figure B 61**

SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR



**TCE PLUME BOUNDARY  
LAYER 1  
NO PROJECT CONDITION  
VERSUS SCENARIO D**

EXPLANATION

Yellow Line TCE Plume Boundary (5 ug/L)  
Layer 1, No Project Condition

- - - TCE Plume Boundary (5 ug/L)  
Layer 1, Scenario D

2000 (1961) Model Year  
(Assumed Hydrological Year)

— Pressure Zone

□ Model Grid of the San Bernardino  
Basin Area Groundwater Model

— Streams or Rivers Within  
Groundwater Basin Boundary

○ Spreading Grounds or Basins

— Freeway

Map Projection:  
State Plane 1927 (California Zone V)

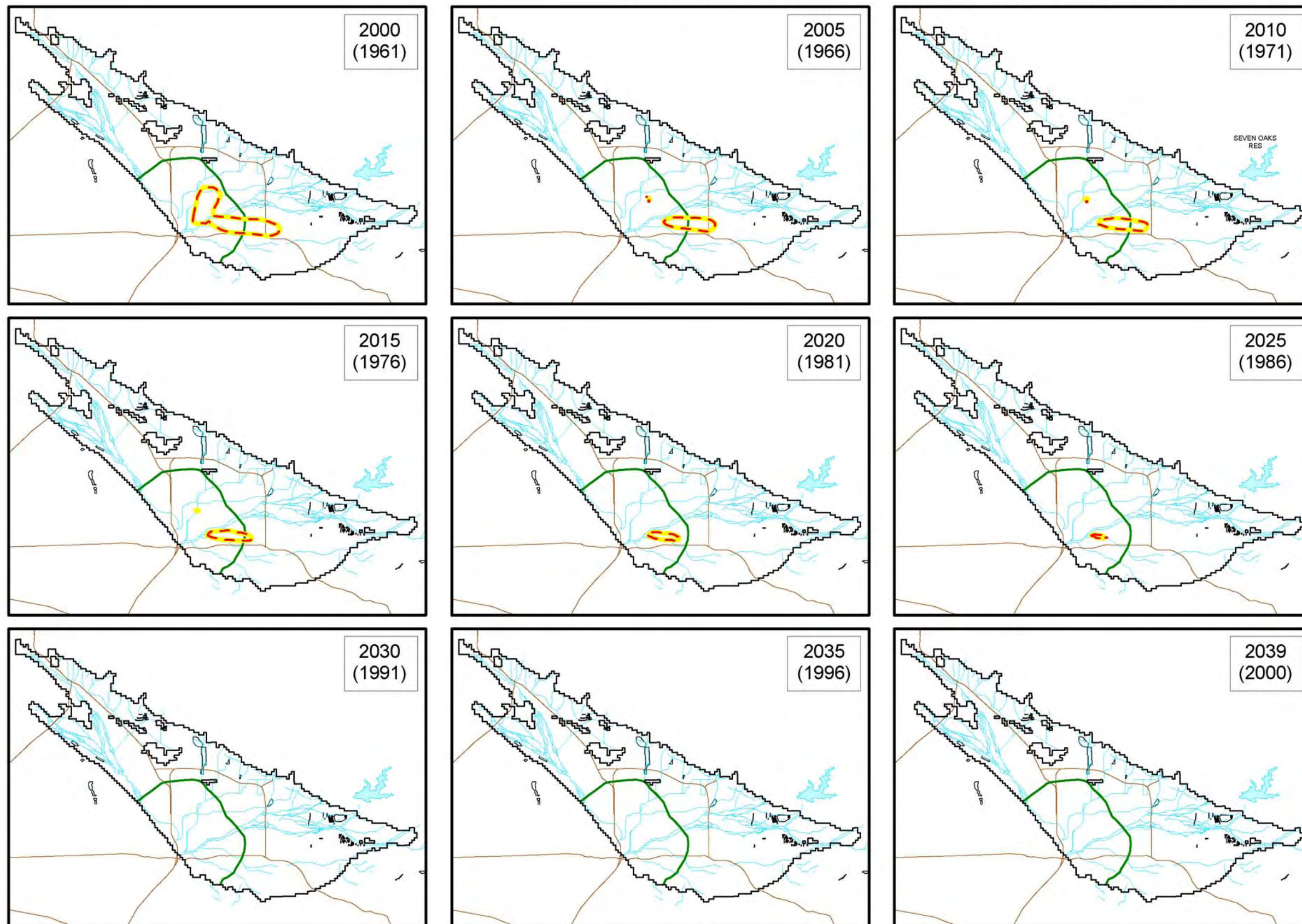


**Figure B 68**



SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR

**TCE PLUME BOUNDARY  
LAYER 2  
NO PROJECT CONDITION  
VERSUS SCENARIO D**



EXPLANATION

Yellow Line TCE Plume Boundary (5 ug/L)  
Layer 2, No Project Condition

--- TCE Plume Boundary (5 ug/L)  
Layer 2, Scenario D

2000 (1961) Model Year  
(Assumed Hydrological Year)

— Pressure Zone

□ Model Grid of the San Bernardino  
Basin Area Groundwater Model

— Streams or Rivers Within  
Groundwater Basin Boundary

○ Spreading Grounds or Basins

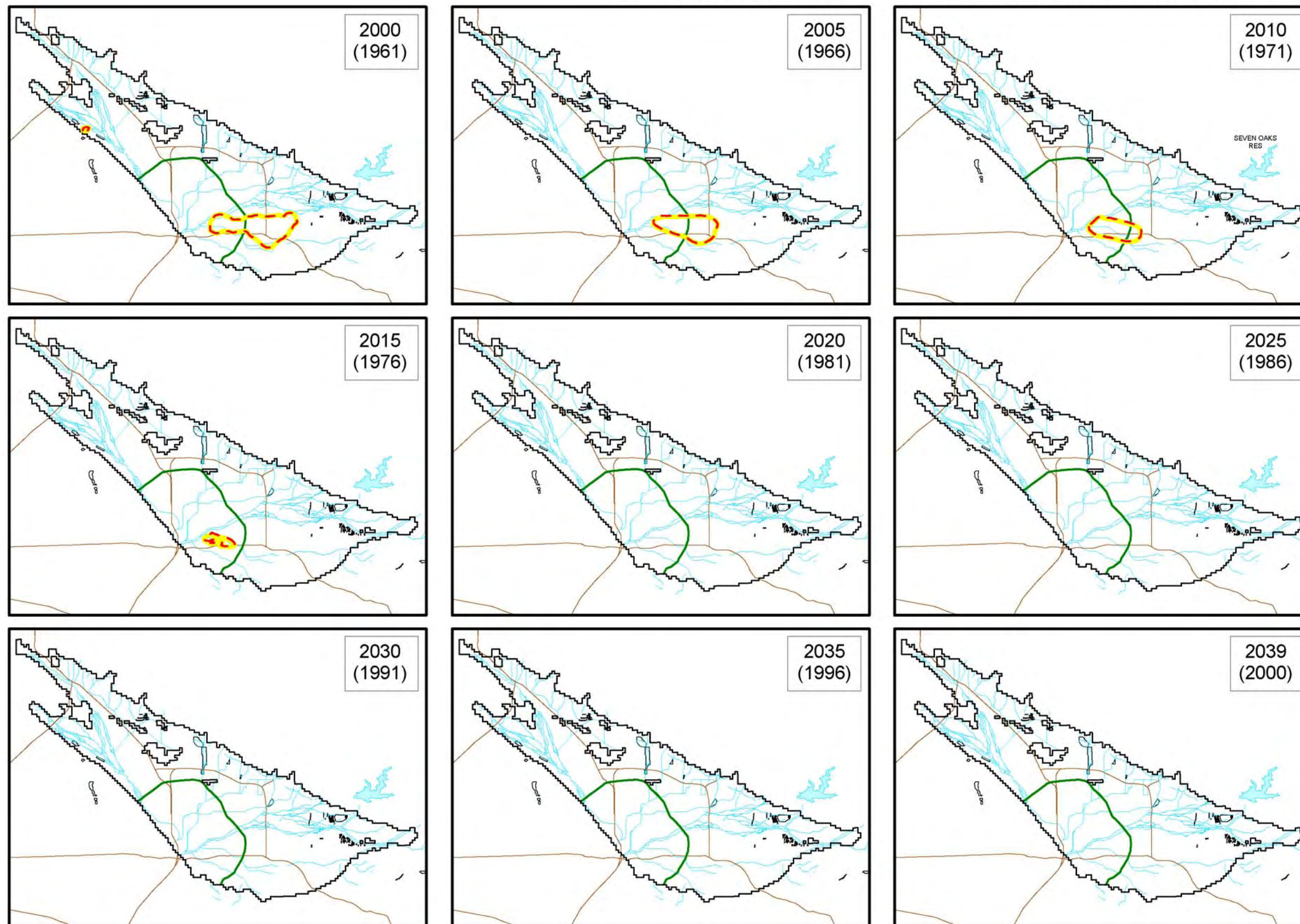
— Freeway

Map Projection:  
State Plane 1927 (California Zone V)



**Figure B 69**

SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR



**PERCHLORATE PLUME BOUNDARY  
LAYER 1  
NO PROJECT CONDITION  
VERSUS SCENARIO D**

EXPLANATION

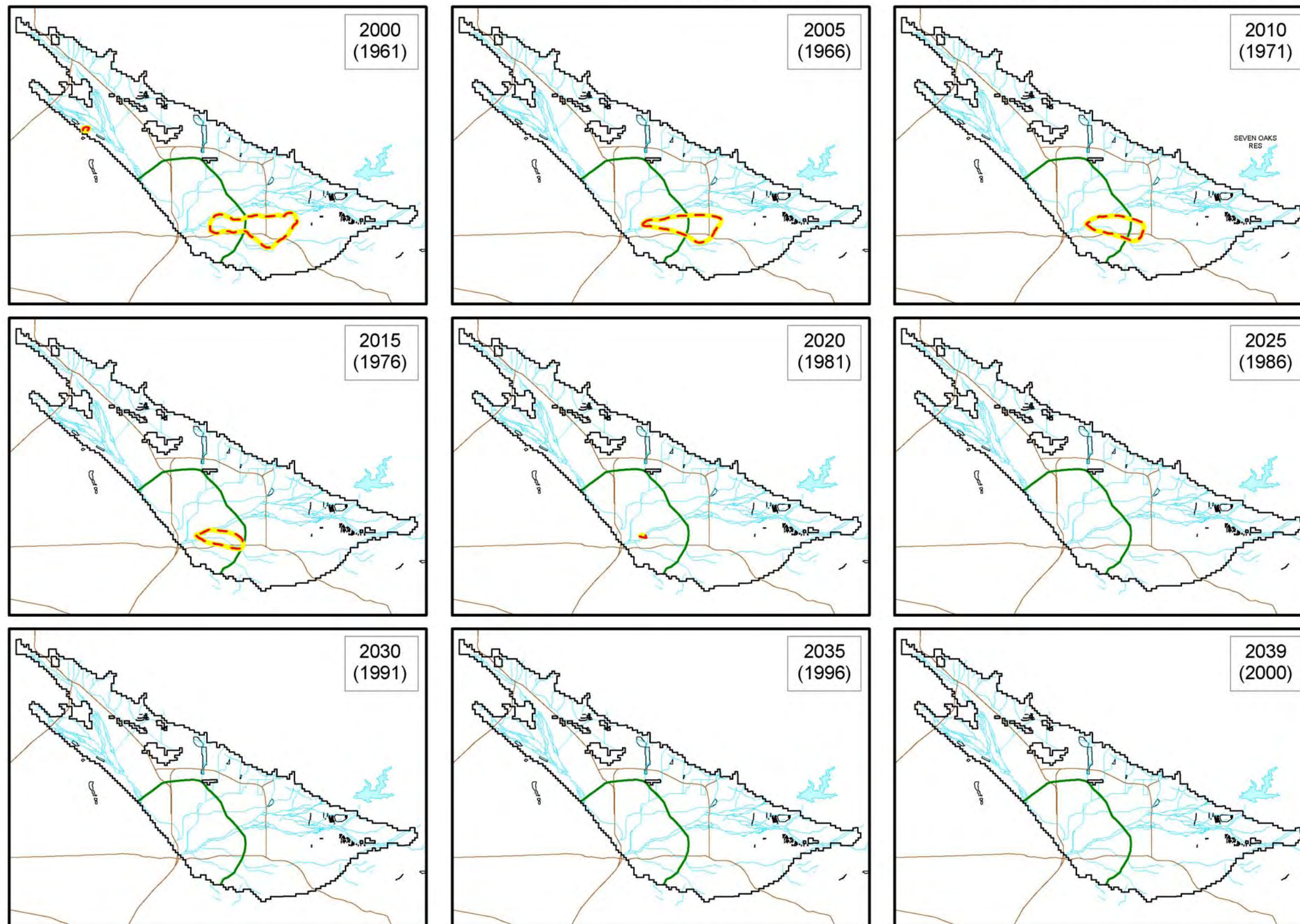
- Yellow Line Perchlorate Plume Boundary (6 ug/L) Layer 1, No Project Condition
- Perchlorate Plume Boundary (6 ug/L) Layer 1, Scenario D
- 2000 (1961) Model Year (Assumed Hydrological Year)
- Pressure Zone
- Model Grid of the San Bernardino Basin Area Groundwater Model
- Streams or Rivers Within Groundwater Basin Boundary
- Spreading Grounds or Basins
- Freeway

Map Projection:  
State Plane 1927 (California Zone V)



**Figure B 78**

SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR



**PERCHLORATE PLUME BOUNDARY  
LAYER 2  
NO PROJECT CONDITION  
VERSUS SCENARIO D**

EXPLANATION

- Yellow Line Perchlorate Plume Boundary (6 ug/L) Layer 2, No Project Condition
- - - Perchlorate Plume Boundary (6 ug/L) Layer 2, Scenario D
- 2000  
(1961) Model Year (Assumed Hydrological Year)
- Pressure Zone
- Model Grid of the San Bernardino Basin Area Groundwater Model
- Streams or Rivers Within Groundwater Basin Boundary
- Spreading Grounds or Basins
- Freeway

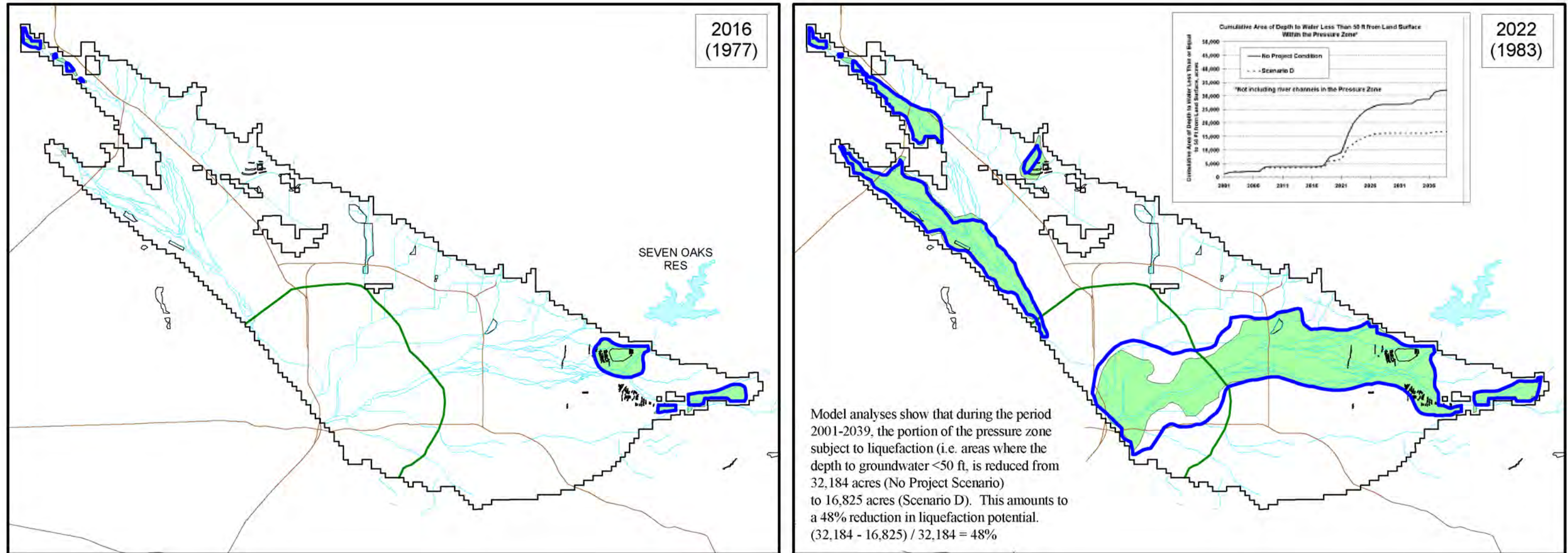
Map Projection:  
State Plane 1927 (California Zone V)



**Figure B 79**

**GROUNDWATER TECHNICAL APPENDIX  
SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR**

**DEPTH TO GROUNDWATER  
LESS THAN 50 FT FROM LAND SURFACE  
FOR NO PROJECT CONDITION  
AND SCENARIO D  
YEARS 2016 AND 2022**









**EXPLANATION**

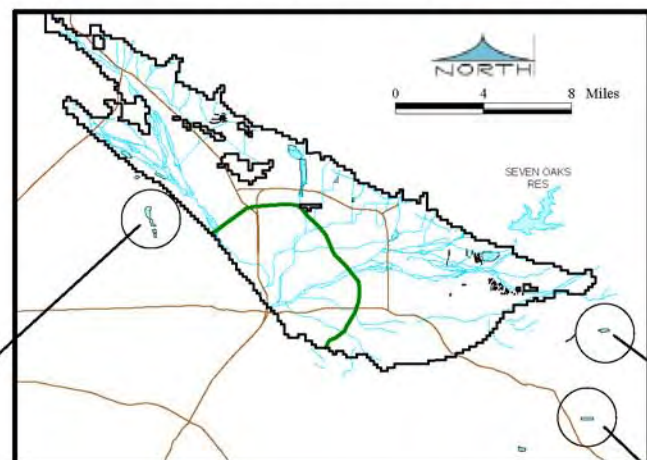
- No Project Condition Depth to Water Less Than 50 ft From Land Surface
- Scenario D Depth to Water Less Than 50 ft From Land Surface
- Model Year (Hydrological Year)
- Pressure Zone
- Model Grid of the San Bernardino Basin Area Groundwater Model
- Streams or Rivers Within Groundwater Basin Boundary
- Spreading Grounds or Basins
- Freeway



0 3 6 Miles

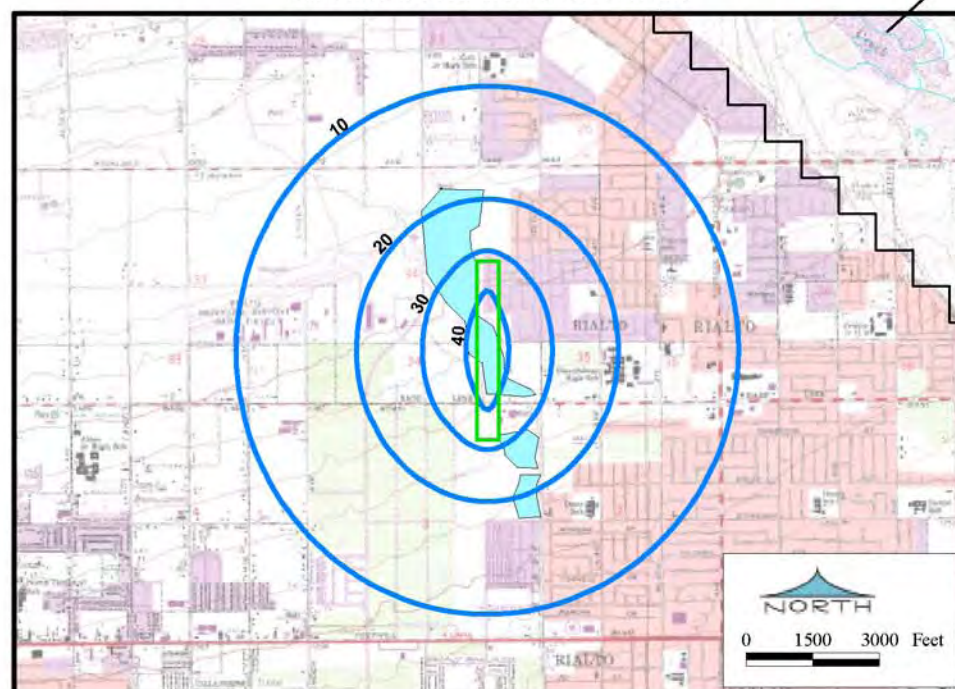
**GROUNDWATER TECHNICAL APPENDIX  
SAR WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY EIR**

- EXPLANATION**
-  20 Calculated Groundwater Mound Height, ft
  -  Equivalent Rectangular Spreading Basin Used by Hantush Equation
  -  Model Grid of the San Bernardino Basin Area Groundwater Model
  -  Streams or Rivers Within Groundwater Basin Boundary
  -  Spreading Grounds or Basins
  -  Freeway



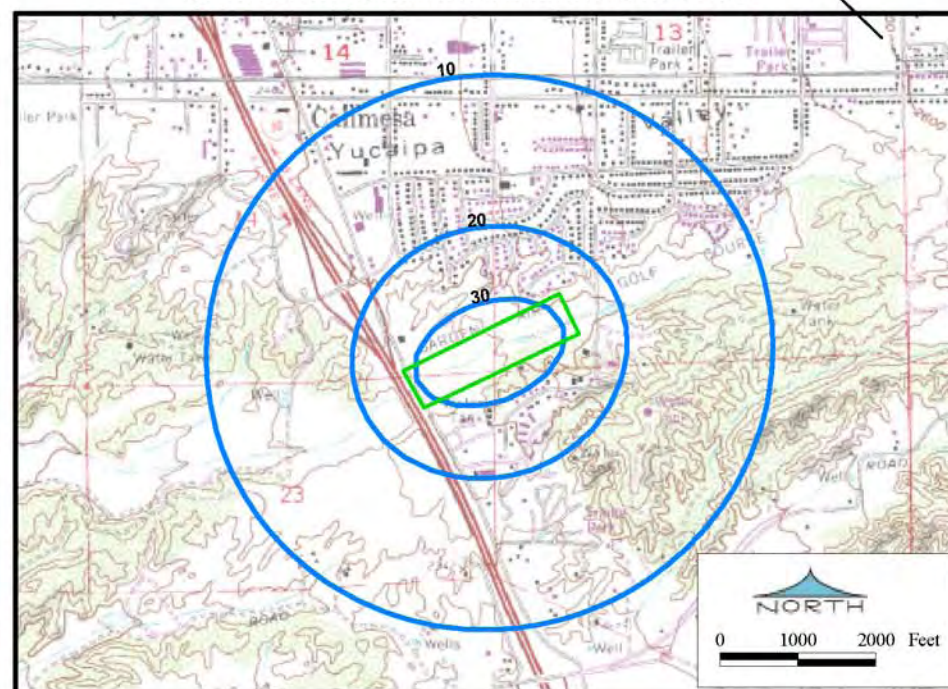
**GROUNDWATER MOUNDS  
RESULTING FROM  
ARTIFICIAL RECHARGE  
AT CACTUS,  
GARDEN AIR CREEK AND  
WILSON SPREADING GROUNDS  
SCENARIO D**

**CACTUS SPREADING GROUNDS**



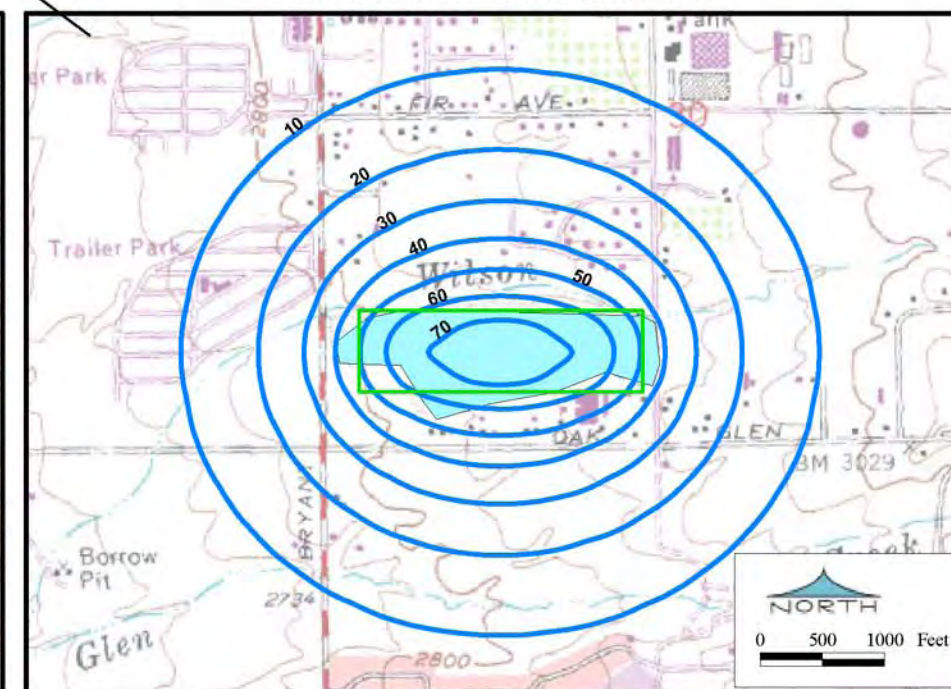
Total Recharge Volume = 13,217 acre-ft  
 Maximum Groundwater Elevation = 1,245 ft amsl  
 Length = 4,000 ft  
 Width = 500 ft  
 Total Area = 46 acres  
 Land Surface Elevation = 1,400 ft amsl  
 Basement Complex Elevation = 550 ft amsl  
 Initial Groundwater Elevation = 1,200 ft amsl  
 Effective Porosity = 0.15  
 Hydraulic Conductivity = 374 gpd/ft<sup>2</sup>  
 Recharge Rate = 2 ft/day

**GARDEN AIR CREEK SPREADING GROUNDS**



Total Recharge Volume = 5,745 acre-ft  
 Maximum Groundwater Elevation = 2,238 ft amsl  
 Length = 2,000 ft  
 Width = 566 ft  
 Total Area = 26 acres  
 Land Surface Elevation = 2,360 ft amsl  
 Basement Complex Elevation = 1,800 ft amsl  
 Initial Groundwater Elevation = 2,200 ft amsl  
 Effective Porosity = 0.15  
 Hydraulic Conductivity = 224 gpd/ft<sup>2</sup>  
 Recharge Rate = 1 ft/day

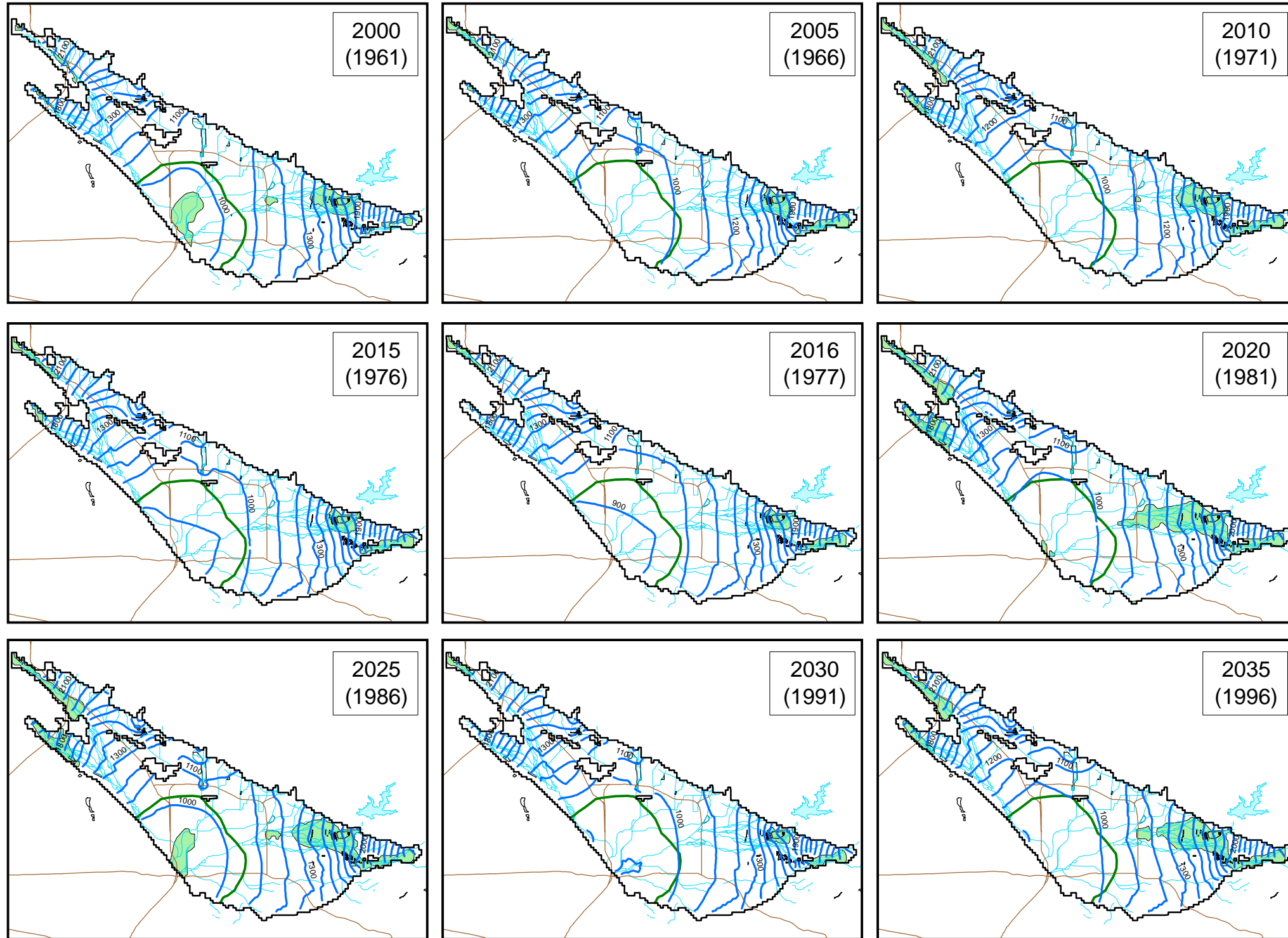
**WILSON SPREADING GROUNDS**



Total Recharge Volume = 2,154 acre-ft  
 Maximum Groundwater Elevation = 2,776 ft amsl  
 Length = 2,275 ft  
 Width = 650 ft  
 Total Area = 34 acres  
 Land Surface Elevation = 2,850 ft amsl  
 Basement Complex Elevation = 2,250 ft amsl  
 Initial Groundwater Elevation = 2,700 ft amsl  
 Effective Porosity = 0.15  
 Hydraulic Conductivity = 66 gpd/ft<sup>2</sup>  
 Recharge Rate = 1 ft/day

SANTA ANA RIVER WATER RIGHTS HEARING  
TESTIMONY OF DENNIS E. WILLIAMS

GROUNDWATER ELEVATIONS  
AND AREAS OF DEPTH TO WATER LESS  
THAN 50 FT FROM LAND SURFACE  
LAYER 1  
MOST LIKELY SCENARIO



**EXPLANATION**

- Depth to Water Less Than 50 ft From Land Surface
- 1000 Groundwater Contour (100 ft interval) (ft above mean sea level)
- Model Grid of the San Bernardino Basin Area Groundwater Model
- Streams or Rivers Within Groundwater Basin Boundary
- Spreading Grounds or Basins
- Freeway
- Pressure Zone
- Model Year (Hydrological Year)

Area with Depth to Water less than 50 ft from land surface (acres)

Year	SBBA	PZ*
2001	7,301	1,204
2002	4,168	648
2003	2,640	154
2004	2,547	0
2005	3,334	0
2006	6,421	0
2007	4,832	0
2008	13,954	1,003
2009	7,101	62
2010	5,217	0
2011	3,936	0
2012	4,970	0
2013	4,554	0
2014	3,396	0
2015	3,025	0
2016	2,454	0
2017	9,833	0
2018	11,207	0
2019	18,740	988
2020	10,543	93
2021	10,080	108
2022	21,148	1,868
2023	14,757	1,312
2024	10,142	1,019
2025	10,080	988
2026	6,900	741
2027	4,399	386
2028	2,917	46
2029	1,667	0
2030	1,899	0
2031	2,115	0
2032	10,558	0
2033	6,005	0
2034	12,905	0
2035	8,197	0
2036	6,684	0
2037	13,676	108
2038	7,317	0
2039	4,476	0
<b>Total</b>	<b>286,094</b>	<b>10,728</b>

SBBA = San Bernardino Basin Area  
PZ = Pressure Zone, not including river channels

16-Apr-07

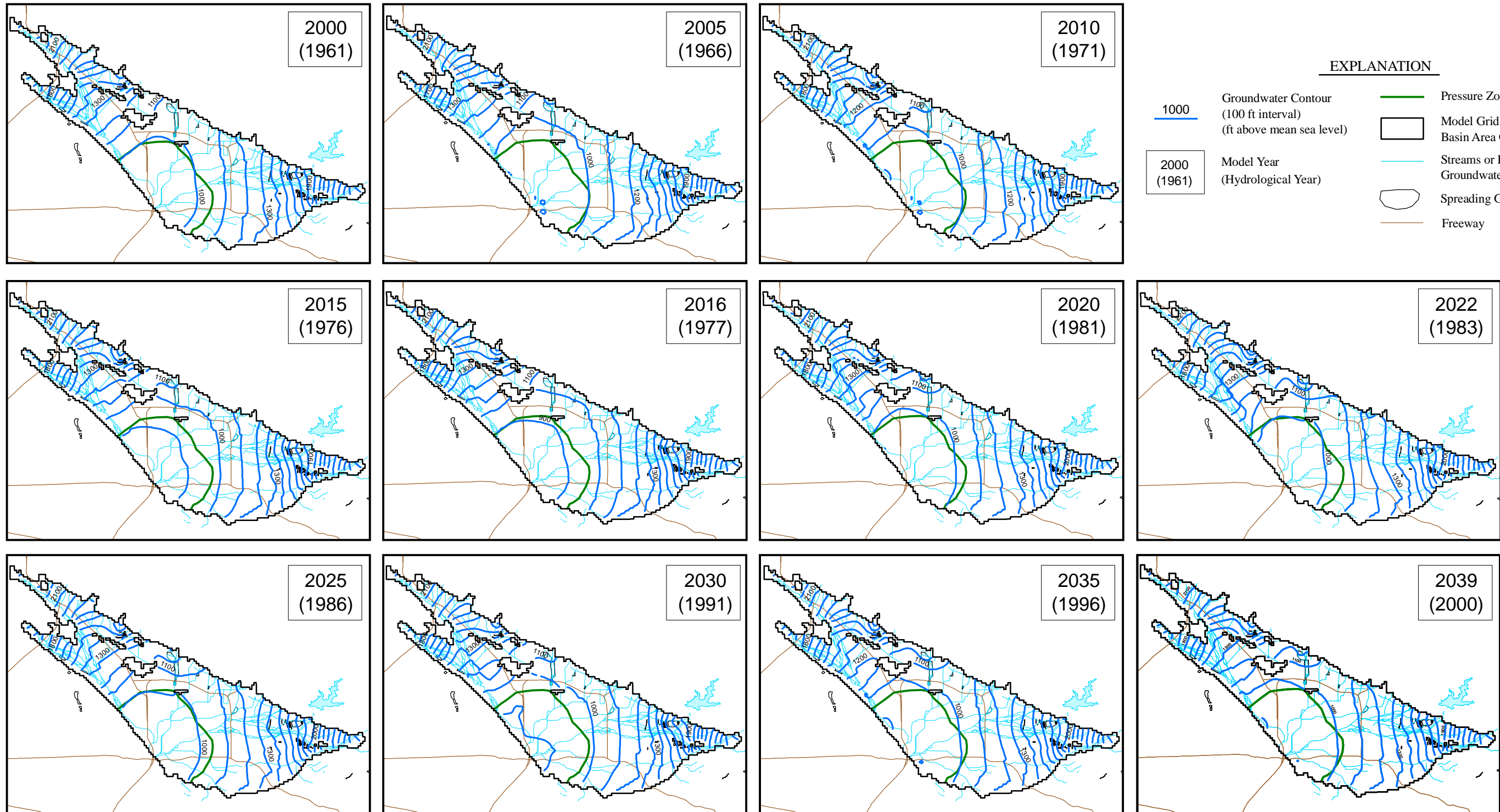


Map Projection:  
State Plane 1927 (California Zone V)

Muni/Western Ex. 6-366

**SANTA ANA RIVER WATER RIGHTS HEARING  
TESTIMONY OF DENNIS E. WILLIAMS**

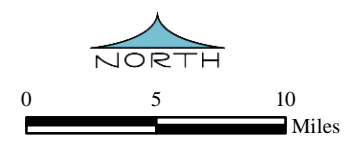
**GROUNDWATER ELEVATIONS  
LAYER 2  
MOST LIKELY SCENARIO**



**EXPLANATION**

- 1000 Groundwater Contour (100 ft interval) (ft above mean sea level)
- Pressure Zone
- Model Grid of the San Bernardino Basin Area Groundwater Model
- Streams or Rivers Within Groundwater Basin Boundary
- Spreading Grounds or Basins
- Freeway
- 2000 (1961) Model Year (Hydrological Year)

16-Apr-07



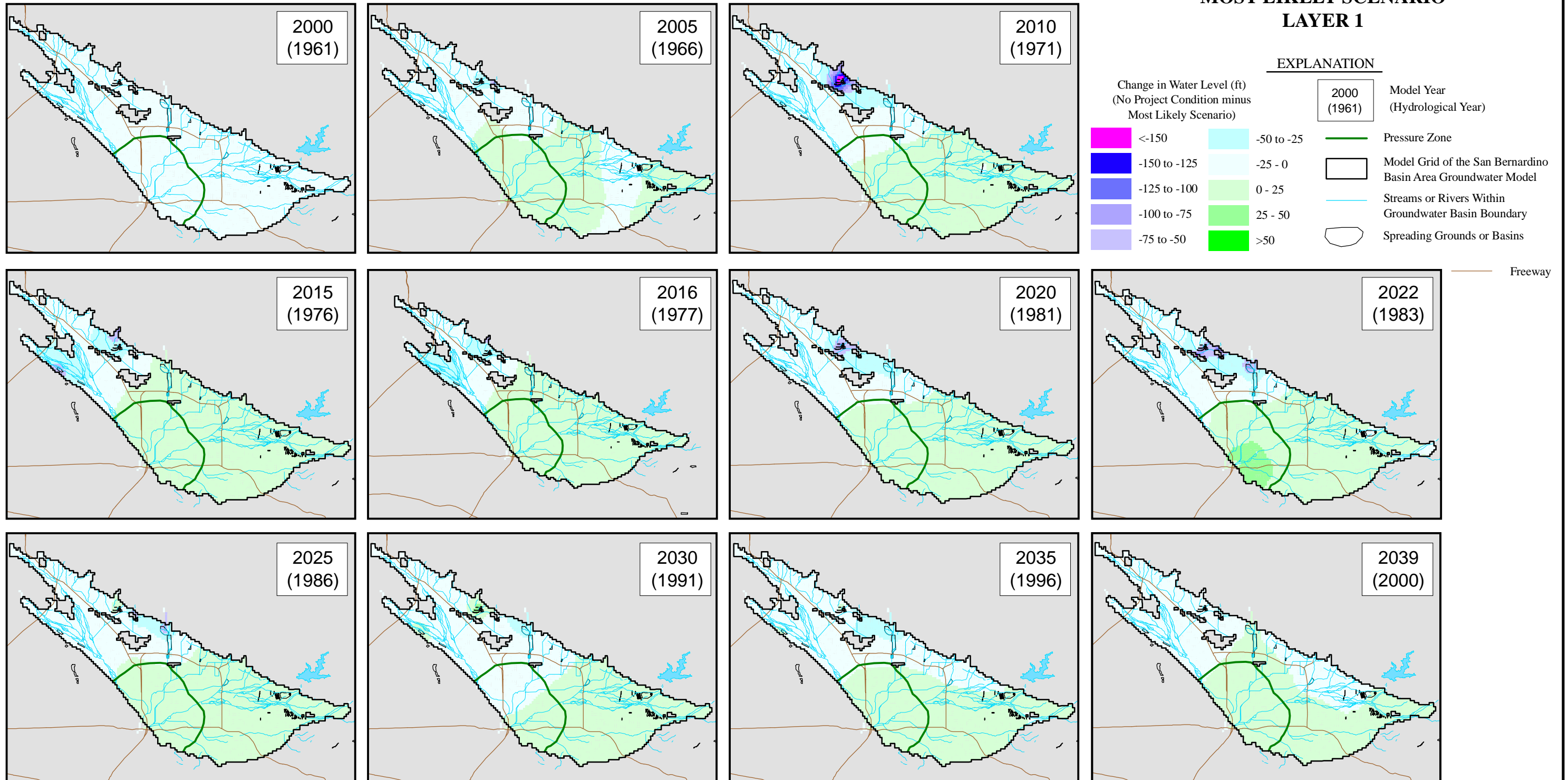
Map Projection:  
State Plane 1927 (California Zone V)

**Muni/Western Ex. 6-367**

**SANTA ANA RIVER WATER RIGHTS HEARING  
TESTIMONY OF DENNIS E. WILLIAMS**

**DIFFERENCES IN GROUNDWATER LEVEL  
BETWEEN NO PROJECT CONDITION AND  
MOST LIKELY SCENARIO**

**LAYER 1**



16-Apr-07



Map Projection:  
State Plane 1927 (California Zone V)

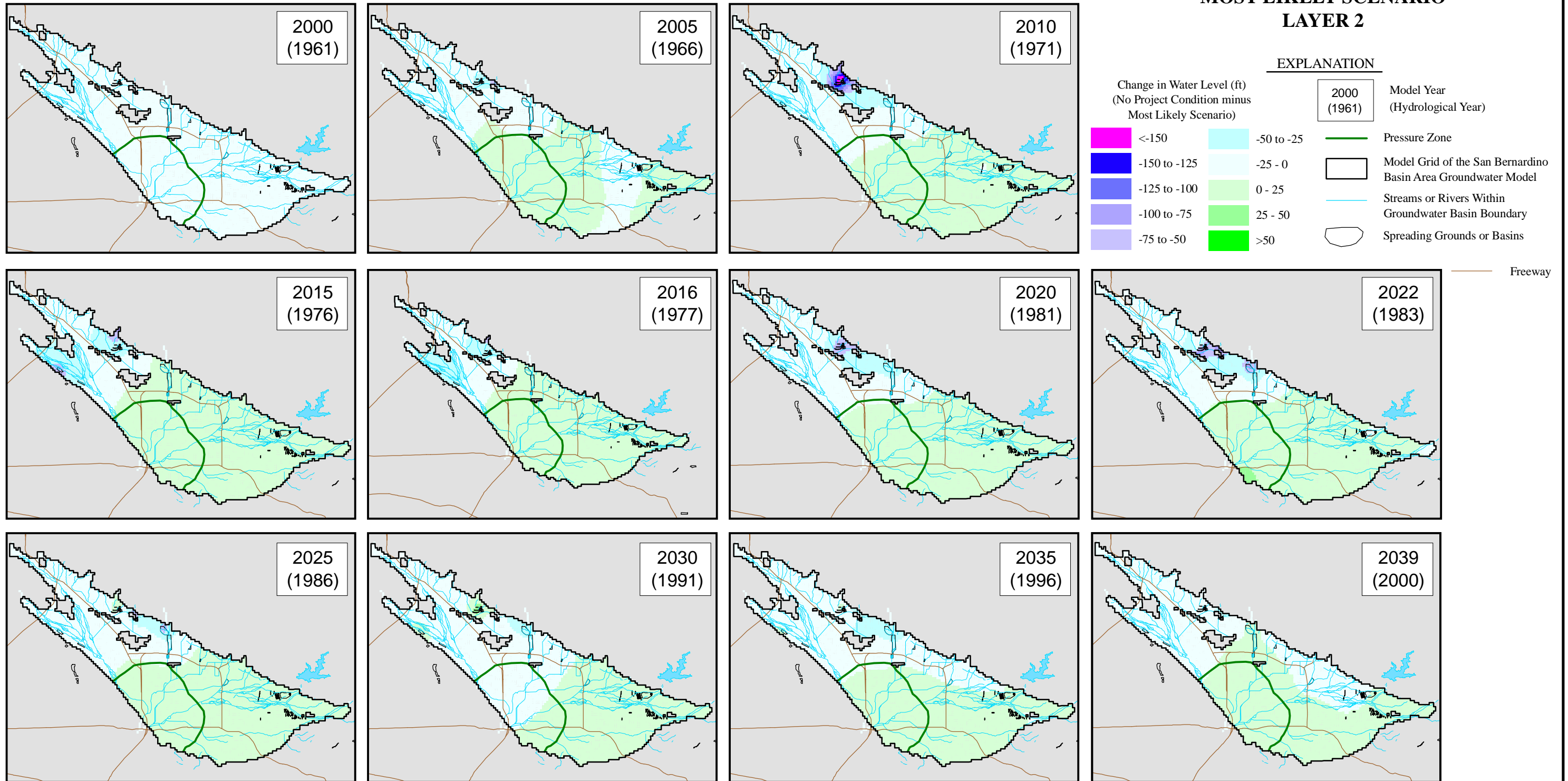
**Muni/Western Ex. 6-368**



**SANTA ANA RIVER WATER RIGHTS HEARING  
TESTIMONY OF DENNIS E. WILLIAMS**

**DIFFERENCES IN GROUNDWATER LEVEL  
BETWEEN NO PROJECT CONDITION AND  
MOST LIKELY SCENARIO**

**LAYER 2**

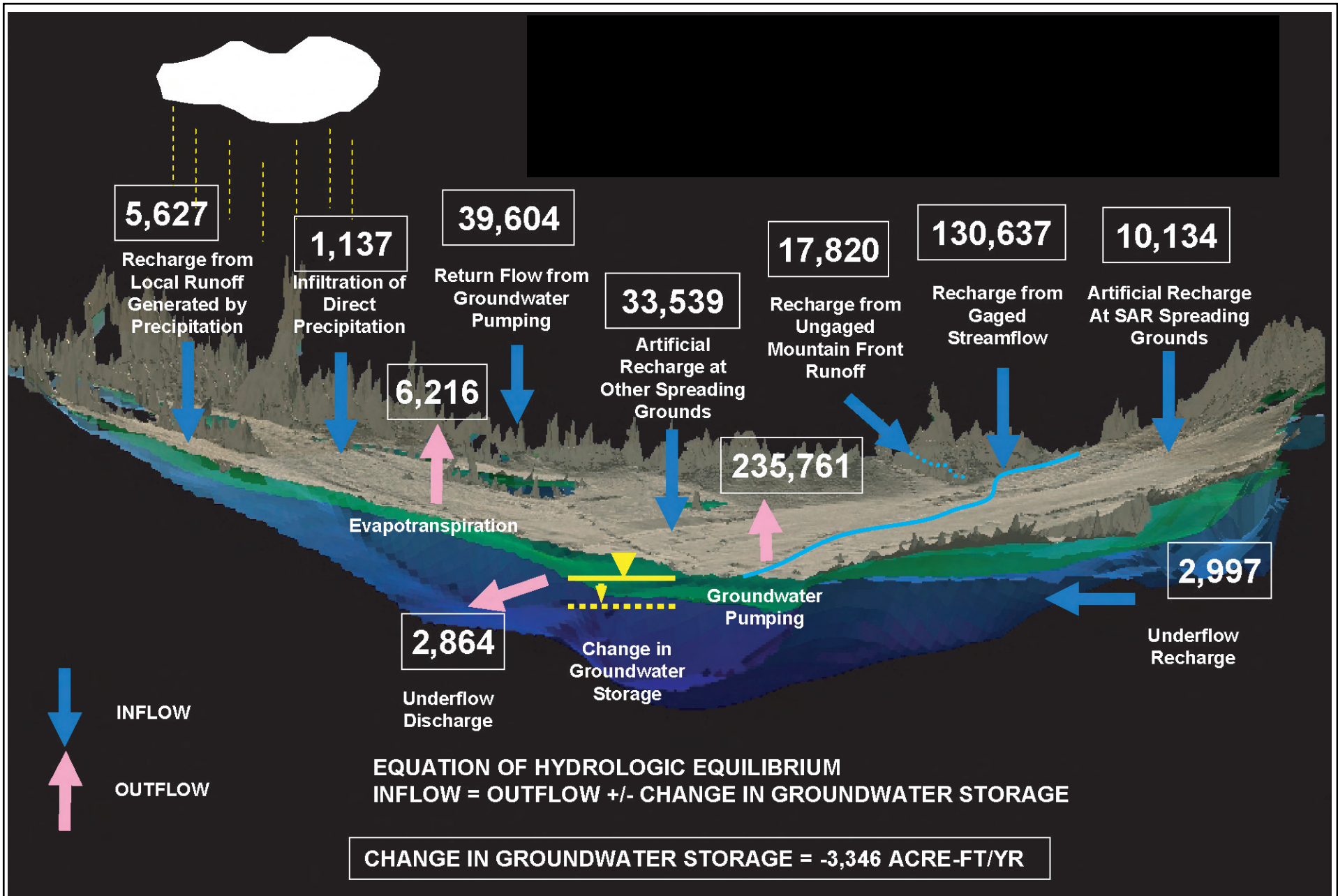


16-Apr-07



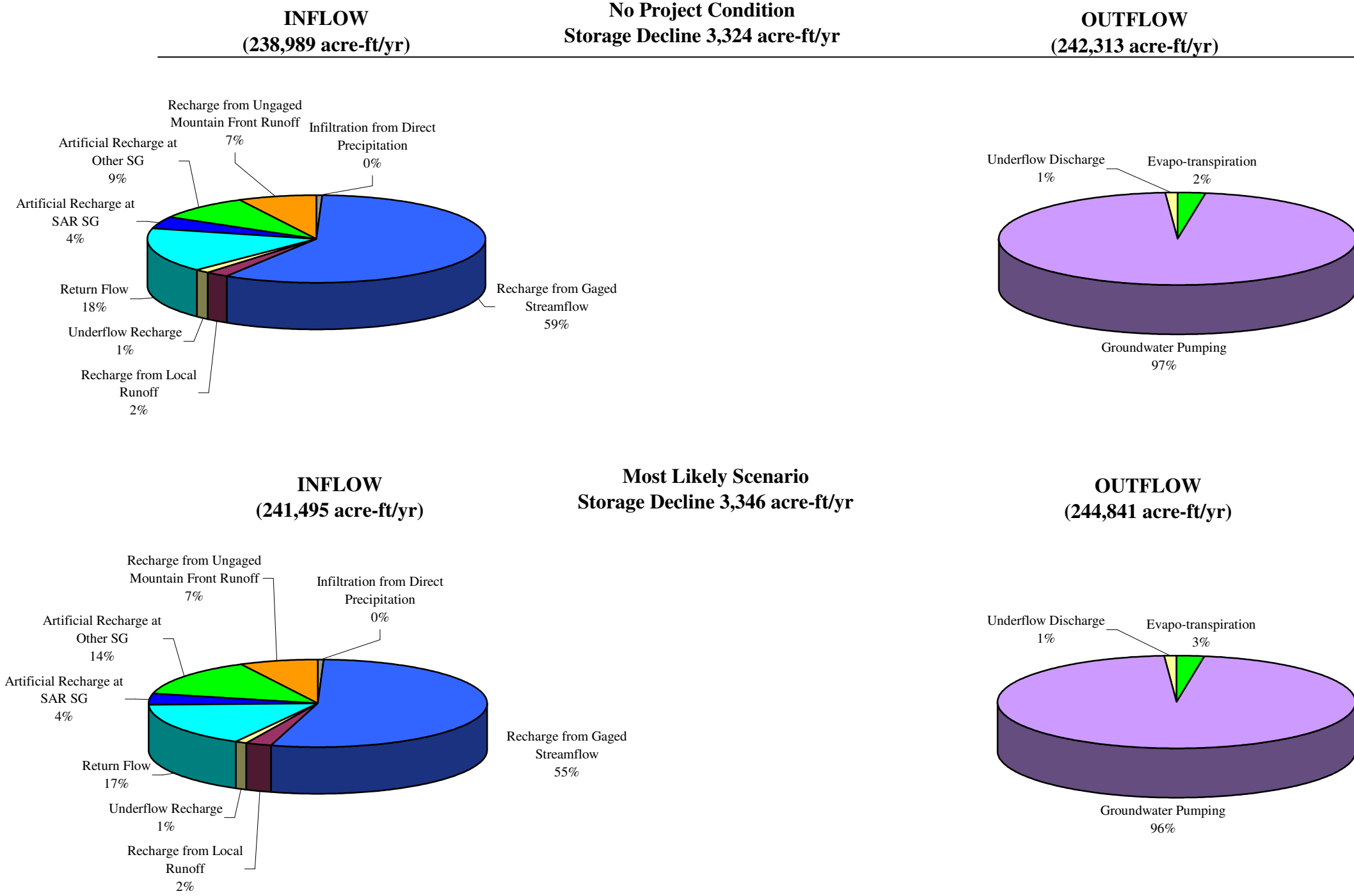
Map Projection:  
State Plane 1927 (California Zone V)

**Muni/Western Ex. 6-369**



Muni/Western Ex. 6-370	Drawn: DEW	SANTA ANA RIVER WATER RIGHTS HEARING - TESTIMONY OF DENNIS E. WILLIAMS	<b>HYDROLOGIC BUDGET FOR MOST LIKELY SCENARIO</b> 2001-2039 (UNITS IN ACRE-FT/YR)	 GEOSCIENCE Support Services, Incorporated P.O. Box 220, Claremont, CA 91711 Tel: (909)920-0707 Fax: (909)920-0403 www.gssiwater.com
	Checked:			
	Approved:			
	Date: 16-APR-07			

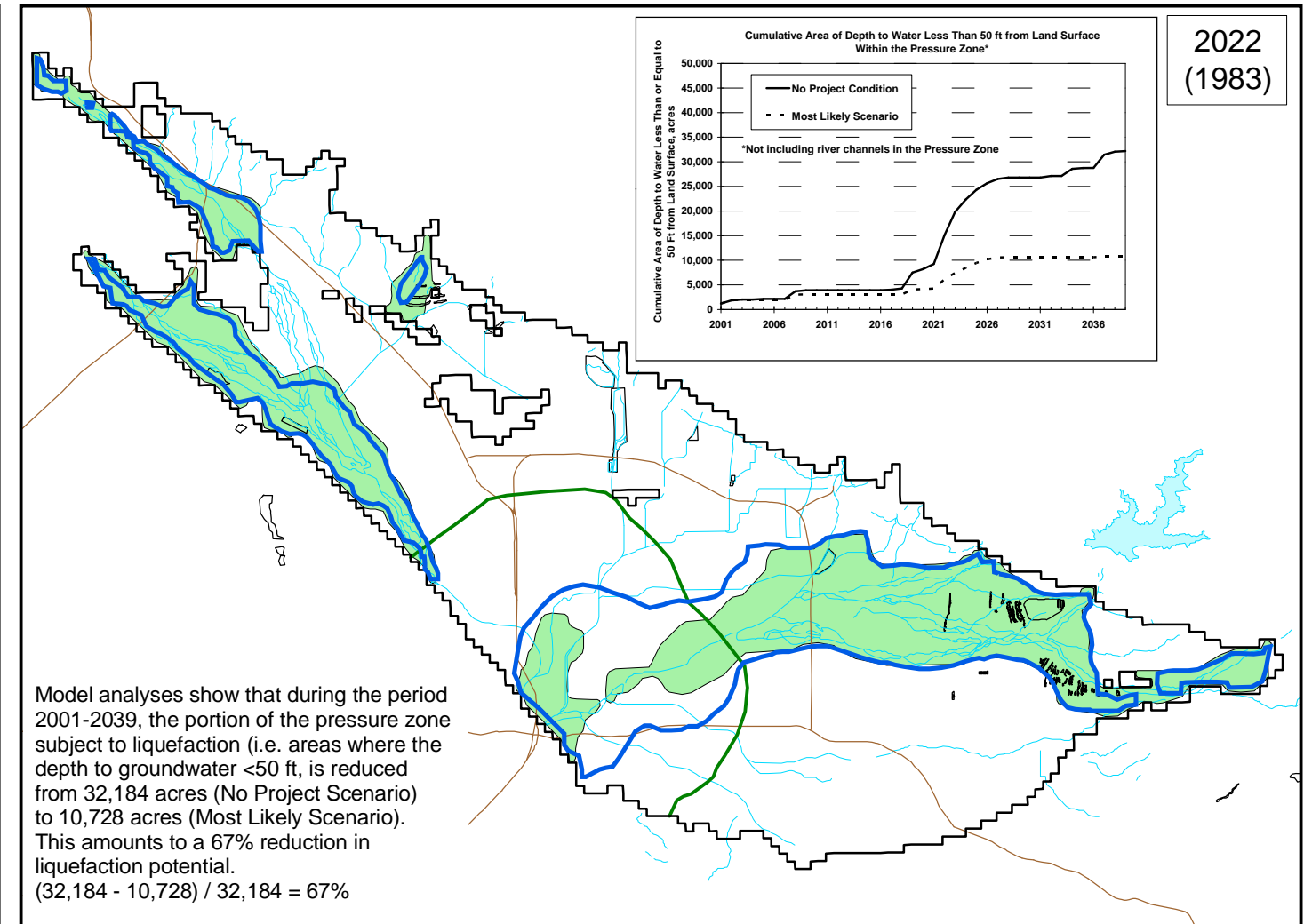
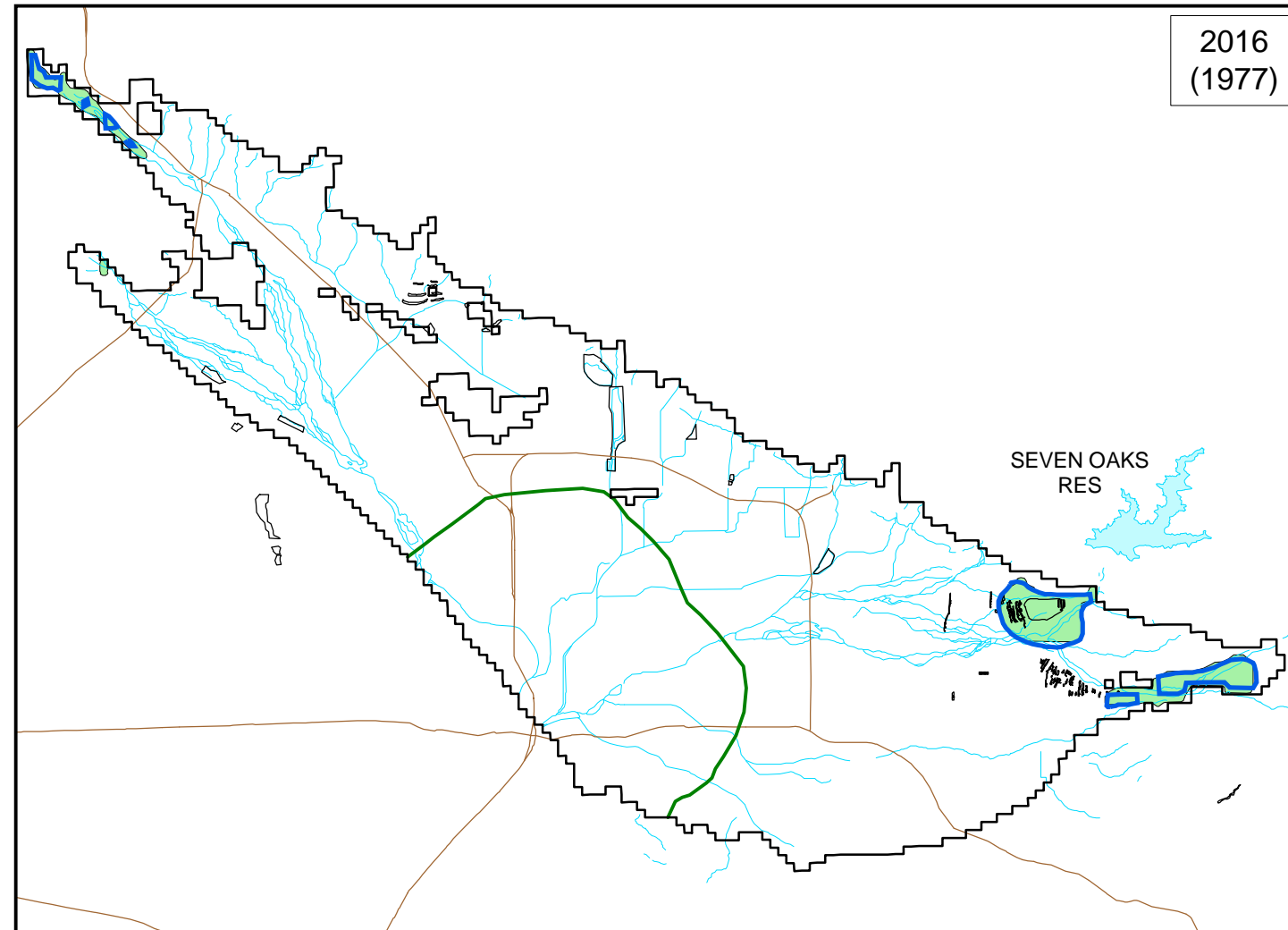
Comparisons of Groundwater Budgets for SBBA Between No Project Condition and Most Likely Scenario - 2001 to 2039



Muni/Western Ex. 6-371









SANTA ANA RIVER WATER RIGHTS HEARING  
TESTIMONY OF DENNIS E. WILLIAMS

DEPTH TO GROUNDWATER  
LESS THAN 50 FT FROM LAND SURFACE  
FOR NO PROJECT CONDITION  
AND MOST LIKELY SCENARIO  
YEARS 2016 AND 2022



16-Apr-07

EXPLANATION

-  No Project Condition  
Depth to Water Less Than 50 ft From Land Surface
-  Most Likely Scenario  
Depth to Water Less Than 50 ft From Land Surface
-  2016 (1977)  
Model Year (Hydrological Year)
-  Pressure Zone
-  Model Grid of the San Bernardino Basin Area Groundwater Model
-  Streams or Rivers Within Groundwater Basin Boundary
-  Spreading Grounds or Basins
-  Freeway



Map Projection:  
State Plane 1927 (California Zone V)

Muni/Western Ex. 6-372

**Table 3.0-2. Project Simulations and Project Scenarios**

<i>Parameter</i>	<i>Parameter Value</i>															
	User-Specified Diversion Rate of up to 88 cfs						Historical Diversions									
1. Senior Water Rights Claimants	Historical Diversions			Licensed Right Diversions (up to 10,400 afy)			Historical Diversions			Licensed Right Diversions (up to 10,400 afy)						
	1,000 cfs for 2 days	Other Habitat Treatment	Other Habitat Treatment	1,000 cfs for 2 days	Yes	No	1,000 cfs for 2 days	Yes	No	Other Habitat Treatment	Other Habitat Treatment	Other Habitat Treatment				
2. Conservation District																
3. Environmental Habitat Releases	Yes	No	3	4	5	6	7	8	9	10	11	12	13	14	15	16
4. Seasonal Water Conservation Storage within Seven Oaks Reservoir																
Simulation Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Project Scenario		C or D													A or B	

**Table 3.0-3. Estimates of Unappropriated SAR Water Available for Capture by Muni/Western for Base Period WY 1961-62 through WY 1999-2000**  
**Project Diversion Capacity of 1,500 cfs**  
 (Values in Acre-Feet)

Scenario	Project Scenario C										Project Scenario A									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16				
	Historical Diversions			User-Specified Rate of up to 88 cfs			Licensed Right (up to 10,400 afy)			Historical Diversions			Licensed Right (up to 10,400 afy)							
Conservation District Diversion			Other Habitat Treatment			1,000 cfs / 2 days			Yes			No			Yes			No		
Environmental Habitat Release			Yes			No			Yes			No			Yes			No		
Seasonal Storage			Yes			No			Yes			No			Yes			No		
<b>Cumulative Total</b>																				
Senior Claimant Diversions	1,416,607	1,416,607	1,416,607	1,416,607	1,416,607	1,416,607	1,416,607	1,416,607	1,416,607	1,038,135	1,038,135	1,038,135	1,038,135	1,038,135	1,038,135	1,038,135				
Reservoir Evaporation	3,196	3,196	3,196	3,196	3,196	3,196	3,196	3,196	3,196	5,608	5,608	5,608	5,608	5,608	5,608	5,608				
Conservation District Diversion	398,466	398,466	398,466	398,466	107,060	107,060	107,060	107,060	107,060	404,980	404,980	404,980	404,980	404,980	404,980	404,980				
Environmental Habitat Release	27,769	27,769	-	-	35,703	35,703	-	-	35,703	35,703	-	-	35,703	35,703	-	-				
Total Muni/Western Potential Capture	445,836	445,836	473,605	473,605	729,308	729,308	765,011	765,011	807,448	807,448	843,151	843,151	1,018,945	1,018,945	1,054,648	1,054,648				
Undiverted from SAR*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
<b>Total</b>	<b>2,291,874</b>	<b>2,291,874</b>	<b>2,291,874</b>	<b>2,291,874</b>	<b>2,291,874</b>	<b>2,291,874</b>	<b>2,291,874</b>	<b>2,291,874</b>	<b>2,291,874</b>	<b>2,291,874</b>	<b>2,291,874</b>	<b>2,291,874</b>	<b>2,291,874</b>	<b>2,291,874</b>	<b>2,291,874</b>	<b>2,291,874</b>				
<b>Average Annual</b>																				
Senior Claimant Diversions	36,323	36,323	36,323	36,323	36,323	36,323	36,323	36,323	36,323	26,619	26,619	26,619	26,619	26,619	26,619	26,619				
Reservoir Evaporation	82	82	82	82	82	82	82	82	82	144	144	144	144	144	144	144				
Conservation District Diversion	10,217	10,217	10,217	10,217	2,745	2,745	2,745	2,745	2,745	10,384	10,384	10,384	10,384	10,384	10,384	10,384				
Environmental Habitat Release	712	712	-	-	915	915	-	-	915	915	-	-	915	915	-	-				
Total Muni/Western Potential Capture	11,432	11,432	12,144	12,144	18,700	18,700	19,616	19,616	20,704	20,704	21,619	21,619	26,127	26,127	27,042	27,042				
Undiverted from SAR*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
<b>Total</b>	<b>58,528</b>	<b>58,528</b>	<b>58,528</b>	<b>58,528</b>	<b>58,528</b>	<b>58,528</b>	<b>58,528</b>	<b>58,528</b>	<b>58,528</b>	<b>45,245</b>	<b>45,245</b>	<b>45,245</b>	<b>45,245</b>	<b>45,245</b>	<b>45,245</b>	<b>45,245</b>				
Reservoir Evaporation	273	273	273	273	273	273	273	273	273	368	368	368	368	368	368	368				
Conservation District Diversion	56,953	56,953	56,953	56,953	10,400	10,400	10,400	10,400	10,400	48,132	48,132	48,132	48,132	48,132	48,132	48,132				
Environmental Habitat Release	3,967	3,967	-	-	3,967	3,967	-	-	3,967	3,967	-	-	3,967	3,967	-	-				
Total Muni/Western Potential Capture	121,026	121,026	124,933	124,933	147,468	147,468	151,435	151,435	171,389	171,389	175,356	175,356	194,350	194,350	198,317	198,317				
Undiverted from SAR*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				

\* Estimate (on a monthly basis) of the quantity of water remaining in the channel below Cattle Weir after all diversions have occurred .

Model input variables that are common to all scenarios include the following (variables described in OPMODEL documentation):

- a) Values shown in table for Total Potential Capture and Undiverted from SAR are estimated using OPMODEL and Allocation Model
- b) Synthesized hydrology based on re-operated Bear Valley Dam
- c) Release of continual 3 cfs from dam to account for groundwater interruption by the dam foundation
- d) USGS gage differences and rounding accounted for in senior water claimant diversions
- e) Conservation District diversion capacity = 300 cfs
- f) Release frequency for environmental releases is no more than every 6 months for 8 scenarios with environmental releases
- g) Maximum number of environmental releases = 100% of potential releases for 6 of the scenarios with environmental releases
- h) Maximum annual diversion by Muni/Western = 200,000 afy
- i) Percent of available dam release un-divertable through Plunge Pool Pipeline = 0%
- j) Flood/Conservation target storages from USACE Feasibility Report and Interim Water Control Plan
- k) Evaporation rates from USACE Feasibility Report

**Table 3.0-4. Estimates of Unappropriated SAR Water Available for Capture by Muni/Western for Base Period WY 1961-62 through WY 1999-2000**  
**Project Diversion Capacity of 500 cfs**  
 (Values in Acre-Feet)

Scenario	Project Scenario D										Project Scenario B									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16				
	Senior Claimant Diversions																			
	User-Specified Rate of up to 88 cfs																			
Conservation District Diversion	Historical Diversions										Historical Diversions									
	Licensed Right (up to 10,400 afy)										Licensed Right (up to 10,400 afy)									
Environmental Habitat Release	1,000 cfs / 2 days		Other Habitat Treatment		Yes		No		Yes		No		Yes		No					
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No				
Seasonal Storage	Cumulative Total																			
	(39-Year Base Period)																			
Senior Claimant Diversions	1,416,606	1,416,607	1,416,608	1,416,608	1,416,605	1,416,608	1,416,610	1,416,610	1,088,137	1,088,139	1,088,139	1,088,138	1,088,128	1,088,132	1,088,131	1,088,134				
Reservoir Evaporation	3,218	3,196	3,234	3,196	3,328	3,196	3,380	3,196	5,734	5,608	5,783	5,608	6,029	5,608	6,081	5,608				
Conservation District Diversion	398,466	398,466	398,466	398,466	107,060	107,060	107,060	107,060	404,980	404,980	404,980	404,980	193,483	193,483	193,483	193,483				
Environmental Habitat Release	27,769	27,769	-	-	35,703	35,703	-	-	35,703	35,703	-	-	39,670	35,703	-	-				
Total Muni/Western Potential Capture	407,312	400,599	431,097	420,165	680,406	663,260	712,085	688,520	748,045	727,788	768,762	740,623	954,556	916,718	981,931	936,212				
Undiverted from SAR*	38,503	45,237	42,470	53,439	48,772	66,047	52,739	76,488	59,275	79,656	74,210	102,525	60,008	102,230	72,248	118,437				
Total	2,291,874	2,291,874	2,291,874	2,291,874	2,291,874	2,291,874	2,291,874	2,291,874	2,291,874	2,291,874	2,291,874	2,291,874	2,291,874	2,291,874	2,291,874	2,291,874				
Average Annual																				
Senior Claimant Diversions	36,323	36,323	36,323	36,323	36,323	36,323	36,323	36,323	26,619	26,619	26,619	26,619	26,619	26,619	26,619	26,619				
Reservoir Evaporation	83	82	83	82	85	82	87	82	147	144	148	144	155	144	156	144				
Conservation District Diversion	10,217	10,217	10,217	10,217	2,745	2,745	2,745	2,745	10,384	10,384	10,384	10,384	4,961	4,961	4,961	4,961				
Environmental Habitat Release	712	712	-	-	915	915	-	-	915	915	-	-	1,017	915	-	-				
Total Muni/Western Potential Capture	10,444	10,272	11,054	10,773	17,446	17,007	18,259	17,654	19,181	18,661	19,712	18,990	24,476	23,506	25,178	24,005				
Undiverted from SAR*	987	1,160	1,089	1,370	1,251	1,694	1,352	1,961	1,520	2,042	1,903	2,629	1,539	2,621	1,853	3,037				
Maximum Annual																				
Senior Claimant Diversions	58,528	58,528	58,528	58,528	58,528	58,528	58,528	58,528	45,245	45,245	45,245	45,245	45,245	45,245	45,245	45,245				
Reservoir Evaporation	278	273	278	273	343	273	343	273	410	368	410	368	551	368	573	368				
Conservation District Diversion	56,953	56,953	56,953	56,953	10,400	10,400	10,400	10,400	48,152	48,152	48,152	48,152	10,400	10,400	10,400	10,400				
Environmental Habitat Release	3,967	3,967	-	-	3,967	3,967	-	-	3,967	3,967	-	-	7,934	3,967	-	-				
Total Muni/Western Potential Capture	104,294	104,294	108,261	108,261	128,351	126,721	132,318	130,688	145,880	144,520	145,880	144,520	166,402	158,831	173,580	162,064				
Undiverted from SAR*	22,101	28,505	26,068	32,472	30,024	41,347	33,991	45,314	34,538	41,841	40,703	47,971	34,745	56,408	38,382	61,109				

\* Estimate (on a monthly basis) of the quantity of water remaining in the channel below Cuttle Weir after all diversions have occurred.

Model input variables that are common to all scenarios include the following (variables described in OPMODEL documentation):

- a) Values shown in table for Total Potential Capture and Undiverted from SAR are estimated using OPMODEL and Allocation Model
- b) Synthesized hydrology based on re-operated Bear Valley Dam
- c) Release of continual 3 cfs from dam to account for groundwater interruption by the dam foundation
- d) USGS gage differences and rounding accounted for in senior water claimant diversions
- e) Conservation District diversion capacity = 300 cfs
- f) Release frequency for environmental releases is no more than every 6 months for 8 scenarios with environmental releases
- g) Maximum number of environmental releases = 100% of potential releases for 6 of the scenarios with environmental releases
- h) Maximum annual diversion by Muni/Western = 200,000 afy
- i) Percent of available dam release un-divertable through Plunge Pool Pipeline = 0%
- j) Flood/Conservation target storages from USACE Feasibility Report and Interim Water Control Plan
- k) Evaporation rates from USACE Feasibility Report

Annual Releases to SAR from the Seven Oaks Reservoir for Model Scenarios - 2001 to 2039 (Units in acre-ft)

Water Years	No Project Condition				Scenario A				Scenario B				Scenario C				Scenario D			
	Undiverted	Habitat Release	Turnback to SAR	Total	Undiverted	Habitat Release	Turnback to SAR	Total	Undiverted	Habitat Release	Turnback to SAR	Total	Undiverted	Habitat Release	Turnback to SAR	Total	Undiverted	Habitat Release	Turnback to SAR	Total
2001	4,127	0	0	4,127	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2002	573	0	0	573	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2003	111	0	0	111	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2004	249	0	0	249	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2005	24,756	0	0	24,756	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2006	55,436	3,967	0	59,403	0	0	0	0	0	0	3,572	3,572	0	3,967	0	3,967	0	3,967	0	3,967
2007	1,175	0	0	1,175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2008	171,389	3,967	0	175,356	0	0	0	0	18,216	0	6,317	24,533	0	3,967	0	3,967	11,149	3,967	5,583	20,699
2009	17,846	0	0	17,846	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2010	13,001	0	0	13,001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2011	8,888	0	0	8,888	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2012	13,480	0	0	13,480	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2013	535	0	0	535	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2014	642	0	0	642	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2015	2,581	0	0	2,581	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2016	575	0	0	575	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	25,157	3,967	0	29,124	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	24,803	3,967	0	28,770	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2019	141,416	3,967	0	145,383	0	0	0	0	33,129	0	5,253	38,382	0	3,967	0	3,967	17,469	3,967	11,036	32,472
2020	252	0	0	252	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2021	5,001	0	0	5,001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	94,456	3,967	0	98,423	0	0	0	0	0	0	0	0	0	3,967	0	3,967	0	3,967	0	3,967
2023	5,082	0	0	5,082	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2024	4,944	0	0	4,944	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2025	5,596	0	0	5,596	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2026	1,428	0	0	1,428	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2027	183	0	0	183	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2028	902	0	0	902	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2030	87	0	0	87	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2031	628	0	0	628	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2032	82,618	3,967	0	86,585	0	0	0	0	0	0	5,761	5,761	0	3,967	0	3,967	0	3,967	0	3,967
2033	103	0	0	103	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2034	63,262	3,967	0	67,229	0	0	0	0	0	0	0	0	0	3,967	0	3,967	0	3,967	0	3,967
2035	2,296	0	0	2,296	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2036	1,967	0	0	1,967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2037	30,895	3,967	0	34,862	0	0	0	0	0	0	0	0	0	3,967	0	3,967	0	3,967	0	3,967
2038	1,008	0	0	1,008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2039	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Average</b>	<b>20,704</b>	<b>915</b>	<b>0</b>	<b>21,619</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,317</b>	<b>0</b>	<b>536</b>	<b>1,853</b>	<b>0</b>	<b>712</b>	<b>0</b>	<b>712</b>	<b>734</b>	<b>712</b>	<b>426</b>	<b>1,872</b>

Source: SAIC (2004)

SAR: Santa Ana River



Annual Artificial Recharge for No Project Condition - 2001 to 2039 (Units in acre-ft)

Water Years	Mill Creek SG (Airport)		Santa Ana River SG		Devil Canyon/Sweetwater SG		Lytle Creek SG		City Creek SG		Patton SG		Waterman SG		East Twin Creek SG		Badger SG		Mill Creek SG		Total
	Includes Senior Deliveries SAR	SWP	Includes Senior & WCD Deliveries SAR	SWP	SAR	SWP	SAR	SWP	SAR	SWP	SAR	SWP	SAR	SWP	SAR	SWP	SAR	SWP	Includes Senior Deliveries SAR	SWP	
2001	0	0	3,922	0	0	571	0	516	0	0	0	73	0	1,720	0	1,284	0	314	0	0	8,399
2002	0	0	412	0	0	606	0	547	0	0	0	77	0	1,825	0	1,362	0	334	0	0	5,163
2003	0	0	407	0	0	650	0	587	0	0	0	83	0	1,957	0	1,461	0	358	0	0	5,503
2004	0	0	1,754	0	0	833	0	753	0	0	0	107	0	2,511	0	1,874	0	459	0	0	8,291
2005	0	0	5,766	0	0	762	0	689	0	0	0	97	0	2,296	0	1,715	0	420	0	0	11,745
2006	0	0	9,406	0	0	592	0	535	0	0	0	76	0	1,784	0	1,332	0	326	0	0	14,050
2007	0	0	4,232	0	0	553	0	500	0	0	0	71	0	1,668	0	1,245	0	305	0	0	8,574
2008	0	0	31,262	0	0	229	0	207	0	0	0	29	0	691	0	516	0	126	0	0	33,062
2009	0	0	10,330	0	0	1,885	0	1,704	0	0	0	241	0	5,682	0	4,242	0	1,039	0	0	25,124
2010	0	0	5,587	0	0	3,373	0	3,048	0	0	0	431	0	10,165	0	7,589	0	1,859	0	0	32,053
2011	0	0	2,192	0	0	4,500	0	3,800	0	0	0	473	0	11,141	0	8,318	0	2,038	0	0	32,461
2012	0	0	18,169	0	0	3,900	0	4,200	0	0	0	339	0	13,000	0	11,000	0	1,462	0	0	52,070
2013	0	0	5,310	0	0	7,500	0	6,000	0	0	0	700	0	16,000	0	13,500	0	2,890	0	0	51,900
2014	0	0	3,834	0	0	8,000	0	6,800	0	0	0	523	0	18,000	0	13,000	0	2,890	0	0	53,047
2015	0	0	3,771	0	0	4,105	0	3,710	0	0	0	525	0	12,371	0	9,236	0	2,143	0	0	35,861
2016	0	0	1,918	0	0	934	0	934	0	0	0	0	0	934	0	934	0	373	0	0	6,026
2017	0	0	48,152	0	0	4,100	0	2,600	0	0	0	254	0	7,500	0	5,800	0	1,600	0	0	70,006
2018	0	0	34,614	0	0	2,000	0	931	0	0	0	500	0	5,000	0	4,500	0	1,200	0	0	48,745
2019	0	0	33,310	0	0	1,500	0	800	0	0	0	650	0	2,500	0	2,300	0	1,300	0	0	42,360
2020	0	0	6,426	0	0	2,400	0	2,553	0	0	0	600	0	8,513	0	6,356	0	2,500	0	0	29,347
2021	0	0	9,963	0	0	4,200	0	2,256	0	0	0	319	0	8,600	0	6,500	0	2,500	0	0	34,339
2022	0	0	11,516	0	0	0	0	0	0	0	0	152	0	3,590	0	2,680	0	657	0	0	18,595
2023	0	0	6,381	0	0	5,500	0	2,320	0	0	0	650	0	14,700	0	12,500	0	2,800	0	0	44,851
2024	0	0	186	0	0	6,367	0	3,624	0	0	0	686	0	14,203	0	11,264	0	2,155	0	0	38,484
2025	0	0	6,755	0	0	3,940	0	4,641	0	0	0	689	0	12,312	0	7,880	0	1,333	0	0	37,551
2026	0	0	0	0	0	3,088	0	4,747	0	0	0	399	0	9,400	0	7,018	0	1,719	0	0	26,372
2027	0	0	1,402	0	0	1,942	0	1,942	0	0	0	486	0	1,942	0	1,942	0	1,457	0	0	11,113
2028	0	0	2,096	0	0	5,675	0	5,675	0	0	0	386	0	7,785	0	5,813	0	1,424	0	0	28,854
2029	0	0	357	0	0	2,455	0	2,160	0	0	0	491	0	2,062	0	1,964	0	1,375	0	0	10,863
2030	0	0	5,321	0	0	2,612	0	2,177	0	0	0	348	0	1,306	0	1,306	0	784	0	0	13,853
2031	0	0	7,941	0	0	1,770	0	1,573	0	0	0	295	0	1,475	0	1,475	0	983	0	0	15,513
2032	0	0	38,877	0	0	3,904	0	3,528	0	0	0	200	0	7,300	0	6,400	0	1,000	0	0	61,209
2033	0	0	5,493	0	0	2,672	0	2,415	0	0	0	275	0	12,668	0	10,134	0	1,098	0	0	34,755
2034	0	0	17,369	0	0	3,246	0	2,933	0	0	0	415	0	9,500	0	8,400	0	700	0	0	42,563
2035	0	0	8,265	0	0	6,200	0	6,800	0	0	0	720	0	14,800	0	13,200	0	2,850	0	0	52,835
2036	0	0	9,061	0	0	6,900	0	5,428	0	0	0	720	0	16,300	0	14,600	0	2,700	0	0	55,709
2037	0	0	35,337	0	0	2,242	0	2,003	0	0	0	287	0	8,400	0	8,000	0	792	0	0	57,060
2038	0	0	3,736	0	0	7,269	0	6,771	0	0	0	697	0	17,425	0	15,334	0	2,688	0	0	53,921
2039	0	0	4,150	0	0	6,878	0	6,190	0	0	0	441	0	15,699	0	12,989	0	1,765	0	0	48,113
<b>Average</b>	<b>0</b>	<b>0</b>	<b>10,384</b>	<b>0</b>	<b>0</b>	<b>3,227</b>	<b>0</b>	<b>2,785</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>372</b>	<b>0</b>	<b>7,813</b>	<b>0</b>	<b>6,332</b>	<b>0</b>	<b>1,403</b>	<b>0</b>	<b>0</b>	<b>32,316</b>

Source: SAIC (2004)  
SAR: Santa Ana River Water

SWP: State Water Project Water  
SG: Spreading Ground

Annual Artificial Recharge for Scenario A - 2001 to 2039 (Units in acre-ft)

Water Years	Mill Creek SG (Airport)		Santa Ana River SG		Devil Canyon/Sweetwater SG		Lytle Creek SG		City Creek SG		Patton SG		Waterman SG		East Twin Creek SG		Badger SG		Mill Creek SG		Total
	Includes Senior Deliveries SAR	SWP	Includes Senior & WCD Deliveries SAR	SWP	SAR	SWP	SAR	SWP	SAR	SWP	SAR	SWP	SAR	SWP	SAR	SWP	SAR	SWP	Includes Senior Deliveries SAR	SWP	
2001	0	0	5,121	0	0	2,000	0	1,600	0	0	0	76	0	2,276	0	1,821	0	800	0	0	13,695
2002	0	0	0	0	37	2,163	47	1,713	0	0	0	80	0	2,416	0	1,933	0	800	0	0	9,189
2003	0	0	0	0	0	2,300	0	1,840	0	0	0	86	0	2,591	0	2,073	0	800	0	0	9,691
2004	0	0	0	0	0	3,000	0	2,500	0	0	0	94	0	2,815	0	2,252	0	800	0	0	11,462
2005	0	0	9,911	0	2,000	0	1,600	0	0	0	0	94	0	6,663	0	7,000	0	2,890	0	0	30,158
2006	0	0	10,400	0	4,592	1,273	5,278	363	5,274	3,018	93	627	2,775	18,225	2,221	14,779	369	2,521	1,413	213	73,434
2007	0	0	2,332	0	0	6,500	0	5,200	0	0	0	112	0	2,000	0	2,000	0	600	0	0	18,745
2008	0	0	8,301	0	1,200	0	700	0	0	0	0	0	800	0	800	0	400	0	0	0	12,201
2009	0	0	10,400	0	2,844	3,156	3,354	646	0	0	58	363	1,733	10,904	1,387	8,723	231	1,454	0	0	45,253
2010	0	0	10,400	0	1,188	8,032	1,553	3,972	0	0	0	422	0	11,050	0	7,650	0	1,690	0	0	45,957
2011	0	0	4,539	0	892	8,908	1,166	7,634	0	0	0	497	0	14,903	0	10,260	0	1,988	0	0	50,786
2012	0	0	8,479	0	2,817	5,983	3,683	6,036	0	0	123	453	3,674	6,326	2,938	7,062	490	1,812	0	0	49,875
2013	0	0	2,783	0	0	7,200	0	10,000	0	0	0	521	0	12,000	0	12,000	0	2,890	0	0	47,394
2014	0	0	1,061	0	0	6,900	0	9,000	0	0	0	590	0	15,000	0	15,000	0	2,890	0	0	50,441
2015	0	0	371	0	717	5,583	938	8,616	0	0	0	529	0	19,719	0	15,775	0	2,624	0	0	54,872
2016	0	0	204	0	0	2,185	0	2,039	0	1,200	0	720	0	2,327	0	2,466	0	2,889	0	0	14,029
2017	0	0	8,300	0	5,045	0	3,784	1	11,345	19,833	200	524	5,972	15,747	4,776	12,599	796	2,100	1,354	0	92,375
2018	0	0	8,637	0	4,197	1,450	4,144	0	10,402	9,598	182	542	5,475	16,244	4,380	12,995	730	2,166	0	0	81,142
2019	0	0	10,126	0	2,600	0	1,260	0	0	0	251	123	7,556	1,264	6,045	2,145	1,007	1,889	0	0	34,266
2020	0	0	3,470	0	0	5,324	0	4,867	0	0	0	720	0	10,000	0	10,000	0	2,890	0	0	37,271
2021	0	0	8,322	0	227	4,477	297	5,482	0	0	10	710	296	4,704	237	4,763	39	2,851	0	0	32,415
2022	0	0	10,261	0	2,600	0	1,430	0	0	0	261	459	7,825	6,684	6,260	6,740	1,043	1,457	0	0	45,020
2023	0	0	4,674	0	762	2,338	996	3,204	0	0	0	720	0	10,000	0	10,000	0	2,890	0	0	35,584
2024	0	0	2,285	0	0	4,500	0	6,700	0	0	0	720	0	21,719	0	17,375	0	2,890	0	0	56,189
2025	0	0	8,300	0	0	3,726	0	6,148	0	0	0	456	0	20,231	0	16,185	0	2,692	0	0	57,737
2026	0	0	1	0	0	4,736	0	6,705	0	0	0	631	0	18,915	0	15,132	0	2,517	0	0	48,636
2027	0	0	214	0	0	2,417	0	2,071	0	0	0	345	0	6,974	0	5,978	0	1,236	0	0	19,235
2028	0	0	162	0	0	4,933	0	5,117	0	0	0	589	0	17,686	0	14,149	0	2,358	0	0	44,994
2029	0	0	0	0	0	2,904	0	2,447	0	0	0	184	0	2,447	0	2,500	0	2,466	0	0	12,947
2030	0	0	2,368	0	0	0	0	0	0	0	0	200	0	3,999	0	3,909	0	0	0	0	10,476
2031	0	0	5,304	0	0	2,916	0	2,366	0	0	0	139	0	2,506	0	2,227	0	718	0	0	16,177
2032	0	0	8,501	0	5,919	126	8,593	407	10,206	24,794	179	545	5,371	16,348	4,296	13,079	716	2,180	3,292	3,884	108,436
2033	0	0	2,548	0	0	5,000	0	5,000	0	0	0	724	0	21,719	0	17,375	0	2,896	0	0	55,262
2034	0	0	8,387	0	4,267	762	5,580	904	7,412	18,588	129	595	3,901	17,818	3,121	14,254	520	2,376	2,600	1,544	92,757
2035	0	0	7,685	0	0	5,200	0	6,000	0	0	0	724	0	20,356	0	16,618	0	2,896	0	0	59,479
2036	0	0	8,115	0	0	5,100	0	6,000	0	0	0	655	0	19,650	0	15,850	0	2,890	0	0	58,260
2037	0	0	8,316	0	4,217	4	5,069	0	8,664	15,336	152	572	4,561	17,158	3,648	13,727	607	2,289	2,598	1,270	88,188
2038	0	0	1,848	0	0	6,545	0	8,676	0	3,600	0	696	0	16,000	0	16,000	0	2,777	0	0	56,142
2039	0	0	1,357	0	0	6,468	0	6,348	0	5,000	0	388	0	13,200	0	6,200	0	1,994	0	68	41,024
<b>Average</b>	<b>0</b>	<b>0</b>	<b>4,961</b>	<b>0</b>	<b>1,183</b>	<b>3,439</b>	<b>1,269</b>	<b>3,580</b>	<b>1,367</b>	<b>2,589</b>	<b>42</b>	<b>442</b>	<b>1,280</b>	<b>11,041</b>	<b>1,028</b>	<b>9,246</b>	<b>178</b>	<b>2,022</b>	<b>289</b>	<b>179</b>	<b>44,133</b>

Source: SAIC (2004)

SWP: State Water Project Water

SAR: Santa Ana River Water

SG: Spreading Ground

Annual Artificial Recharge for Scenario B - 2001 to 2039 (Units in acre-ft)

Water Years	Mill Creek SG (Airport)		Santa Ana River SG		Devil Canyon/Sweetwater SG		Lytle Creek SG		City Creek SG		Patton SG		Waterman SG		East Twin Creek SG		Badger SG		Mill Creek SG		Total
	Includes Senior Deliveries SAR	SWP	Includes Senior & WCD Deliveries SAR	SWP	SAR	SWP	SAR	SWP	SAR	SWP	SAR	SWP	SAR	SWP	SAR	SWP	SAR	SWP	Includes Senior Deliveries SAR	SWP	
2001	0	0	5,121	0	0	2,000	0	1,600	0	0	0	76	0	2,276	0	1,821	0	800	0	0	13,695
2002	0	0	0	0	37	2,163	47	1,713	0	0	0	80	0	2,416	0	1,933	0	800	0	0	9,189
2003	0	0	0	0	0	2,300	0	1,840	0	0	0	86	0	2,591	0	2,073	0	800	0	0	9,691
2004	0	0	0	0	0	2,500	0	2,000	0	0	0	94	0	2,815	0	2,252	0	800	0	0	10,462
2005	0	0	9,911	0	2,000	0	1,600	0	0	0	0	500	0	10,000	0	6,000	0	900	0	0	30,911
2006	0	0	13,474	0	5,984	516	6,075	75	1,292	0	143	577	4,263	15,737	3,411	13,589	569	1,431	0	0	67,136
2007	0	0	2,332	0	0	0	0	4,000	0	0	0	112	0	2,000	0	2,000	0	600	0	0	11,045
2008	0	0	14,152	0	0	0	700	0	0	0	0	0	0	0	0	0	1,000	0	0	0	15,852
2009	0	0	10,400	0	2,844	3,156	3,354	646	0	0	58	363	1,733	10,904	1,387	8,723	231	1,454	0	0	45,253
2010	0	0	10,400	0	1,188	8,032	1,553	3,972	0	0	0	422	0	11,050	0	7,650	0	1,690	0	0	45,957
2011	0	0	4,539	0	892	4,108	1,166	7,634	0	0	0	497	0	14,903	0	10,260	0	1,988	0	0	45,986
2012	0	0	8,479	0	2,817	5,183	3,683	6,036	0	0	123	453	3,674	12,785	2,938	10,876	490	1,812	0	0	59,348
2013	0	0	2,783	0	0	7,200	0	9,000	0	0	0	521	0	8,000	0	7,195	0	2,084	0	0	36,783
2014	0	0	1,061	0	0	6,900	0	8,000	0	0	0	590	0	11,871	0	11,000	0	2,364	0	0	41,786
2015	0	0	371	0	717	4,979	938	9,046	0	0	0	497	0	20,998	0	16,999	0	2,890	0	0	57,434
2016	0	0	204	0	0	938	0	938	0	0	0	477	0	2,353	0	1,557	0	625	0	0	7,092
2017	0	0	8,300	0	5,962	598	5,999	1	7,802	0	211	513	6,322	15,395	5,056	12,319	843	2,053	3,514	486	75,374
2018	0	0	8,637	0	4,197	103	3,533	0	10,402	1,598	182	542	5,475	16,240	4,380	12,995	730	2,166	0	0	71,180
2019	0	0	12,903	0	2,600	0	1,260	0	0	0	303	71	9,105	5,895	7,284	4,716	1,214	1,682	0	0	47,033
2020	0	0	3,470	0	0	5,324	0	4,867	0	0	0	652	0	21,000	0	17,375	0	2,890	0	0	55,577
2021	0	0	8,322	0	227	1,685	297	2,063	0	0	10	214	296	3,652	237	3,674	39	1,073	0	0	21,787
2022	0	0	10,261	0	2,250	0	1,446	0	118	0	253	26	7,829	13,888	6,263	10,737	1,044	1,846	0	0	55,961
2023	0	0	4,674	0	762	2,783	996	3,202	0	0	0	121	0	16,000	0	15,000	0	2,896	0	2,000	48,434
2024	0	0	2,285	0	0	4,040	0	5,281	0	0	0	720	0	20,000	0	16,000	0	2,890	0	0	51,216
2025	0	0	8,300	0	0	899	0	0	0	0	0	720	0	19,000	0	15,000	0	2,890	0	0	46,809
2026	0	0	1	0	0	172	0	0	0	0	0	720	0	18,000	0	17,000	0	2,890	0	0	38,783
2027	0	0	214	0	0	0	0	0	0	0	0	720	0	8,000	0	6,822	0	252	0	0	16,008
2028	0	0	162	0	0	209	0	252	0	0	0	199	0	13,720	0	13,720	0	1,495	0	0	29,756
2029	0	0	0	0	0	260	0	260	0	0	0	187	0	4,297	0	4,512	0	750	0	0	10,265
2030	0	0	2,368	0	0	458	0	0	0	0	0	700	0	8,000	0	7,138	0	978	0	0	19,641
2031	0	0	5,304	0	0	0	0	0	0	0	0	357	0	10,421	0	7,148	0	1,434	0	0	24,665
2032	0	0	14,352	0	3,999	1	4,000	0	11,006	3,994	193	529	5,792	15,673	4,634	12,549	773	2,120	3,543	474	83,632
2033	0	0	2,548	0	0	4,000	0	4,000	0	4,000	0	720	0	21,000	0	17,000	0	2,890	0	3,000	59,158
2034	0	0	8,387	0	5,430	0	5,000	0	10,402	3,598	182	538	5,475	15,525	4,380	12,620	730	2,160	3,650	2,350	80,427
2035	0	0	7,685	0	0	5,139	0	4,362	0	8,600	0	720	0	21,500	0	17,000	0	2,890	0	3,000	70,896
2036	0	0	8,115	0	0	3,859	0	3,900	0	3,600	0	679	0	21,500	0	17,000	0	2,717	0	0	61,369
2037	0	0	8,316	0	5,330	670	5,910	90	8,156	144	180	540	5,412	15,588	4,329	12,671	721	1,997	2,598	2,302	74,954
2038	0	0	1,848	0	0	4,761	0	4,761	0	6,000	0	695	0	21,000	0	17,000	0	2,890	0	1,077	60,032
2039	0	0	1,357	0	0	4,887	0	4,887	0	1,800	0	720	0	17,105	0	15,000	0	2,354	0	0	48,110
<b>Average</b>	<b>0</b>	<b>0</b>	<b>5,411</b>	<b>0</b>	<b>1,211</b>	<b>2,303</b>	<b>1,219</b>	<b>2,421</b>	<b>1,261</b>	<b>855</b>	<b>47</b>	<b>435</b>	<b>1,420</b>	<b>12,131</b>	<b>1,136</b>	<b>9,972</b>	<b>215</b>	<b>1,775</b>	<b>341</b>	<b>377</b>	<b>42,530</b>

Source: SAIC (2004)

SWP: State Water Project Water

SAR: Santa Ana River Water

SG: Spreading Ground

Annual Artificial Recharge for Scenario C - 2001 to 2039 (Units in acre-ft)

Water Years	Mill Creek SG (Airport)		Santa Ana River SG		Devil Canyon/Sweetwater SG		Lytle Creek SG		City Creek SG		Patton SG		Waterman SG		East Twin Creek SG		Badger SG		Mill Creek SG		Total
	Includes Senior Deliveries SAR	SWP	Includes Senior & WCD Deliveries SAR	SWP	SAR	SWP	SAR	SWP	SAR	SWP	SAR	SWP	SAR	SWP	SAR	SWP	SAR	SWP	Includes Senior Deliveries SAR	SWP	
2001	1,114	0	5,842	0	0	342	0	302	0	0	0	63	0	1,837	0	1,464	0	265	1,114	0	12,345
2002	0	0	0	0	0	363	0	321	0	0	0	67	0	1,950	0	1,554	0	282	0	0	4,536
2003	0	0	0	0	0	390	0	344	0	0	0	71	0	2,092	0	1,667	0	302	0	0	4,866
2004	0	0	24	0	0	500	0	441	0	0	0	84	0	2,454	0	1,955	0	357	0	0	5,815
2005	0	0	17,769	0	1,266	0	1,223	0	0	0	0	650	0	2,400	0	2,100	0	900	0	0	26,308
2006	0	0	27,137	0	1,605	1,932	1,849	942	0	0	16	436	468	14,532	374	8,326	62	784	0	0	58,463
2007	0	0	5,540	0	0	5,202	0	4,405	0	0	0	78	0	1,689	0	1,525	0	327	0	0	18,766
2008	259	0	58,149	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	259	0	58,667
2009	1,604	0	12,176	0	0	6,000	0	5,700	0	0	0	523	0	6,000	0	5,000	0	1,500	1,604	0	40,107
2010	795	0	4,262	0	0	8,700	0	7,200	0	0	0	533	0	9,450	0	5,400	0	2,214	795	0	39,350
2011	263	0	3,172	0	0	3,000	0	3,000	0	0	0	433	0	4,000	0	2,000	0	1,788	263	0	17,920
2012	0	0	24,490	0	0	7,600	0	7,900	0	0	0	280	0	13,000	0	12,000	0	2,800	0	0	68,070
2013	0	0	5,978	0	0	7,900	0	9,800	0	0	0	359	0	12,600	0	10,800	0	2,800	0	0	50,237
2014	0	0	4,605	0	0	7,335	0	11,678	0	0	0	720	0	15,000	0	13,500	0	2,800	0	0	55,638
2015	1,299	0	3,923	0	0	6,243	0	9,074	0	0	0	306	0	8,324	0	6,581	0	1,561	1,299	0	38,611
2016	0	0	0	0	0	1,558	0	1,348	0	0	0	481	0	1,444	0	1,444	0	481	0	0	6,756
2017	0	0	77,260	0	0	546	0	315	0	0	0	151	0	5,322	0	6,000	0	1,500	0	0	91,094
2018	0	0	62,537	0	0	883	0	353	0	0	0	157	0	3,300	0	2,880	0	780	0	0	70,891
2019	0	0	63,571	0	156	0	63	0	0	0	19	0	1,050	0	1,200	0	181	0	0	0	66,240
2020	0	0	6,819	0	0	4,300	0	3,144	0	0	0	362	0	17,000	0	13,000	0	1,448	0	0	46,073
2021	0	0	14,903	0	0	3,075	0	2,863	0	0	0	237	0	18,000	0	15,000	0	1,407	0	0	55,485
2022	0	0	31,259	0	806	0	500	0	0	0	141	0	6,470	530	5,380	620	443	0	0	0	46,149
2023	0	0	10,694	0	0	5,200	0	4,000	0	0	0	720	0	21,719	0	17,375	0	2,890	0	0	62,598
2024	507	0	2,662	0	0	5,656	0	3,828	0	0	0	626	0	18,898	0	15,118	0	2,515	507	0	50,317
2025	0	0	12,381	0	0	3,230	0	3,784	0	0	0	471	0	11,852	0	9,572	0	1,886	0	0	43,177
2026	762	0	0	0	0	3,400	0	5,015	0	0	0	279	0	8,329	0	7,649	0	1,700	762	0	27,895
2027	0	0	0	0	0	2,942	0	2,447	0	0	0	489	0	2,547	0	2,153	0	979	0	0	11,556
2028	0	0	0	0	0	2,908	0	3,042	0	0	0	324	0	13,892	0	9,377	0	1,360	0	0	30,905
2029	0	0	0	0	0	6,196	0	6,885	0	0	0	334	0	9,294	0	8,881	0	1,928	0	0	33,517
2030	0	0	1,319	0	0	3,739	0	3,739	0	0	0	216	0	6,076	0	5,819	0	648	0	0	21,557
2031	0	0	8,295	0	0	8	0	8	0	0	0	1	0	62	0	65	0	4	0	0	8,443
2032	0	0	68,884	0	2,550	0	2,550	0	0	0	140	291	4,209	10,791	3,367	10,333	561	1,896	0	0	105,571
2033	0	0	5,682	0	0	5,000	0	5,000	0	0	0	390	0	15,000	0	14,000	0	2,246	0	0	47,319
2034	0	0	34,591	0	3,968	1,032	4,873	127	1,750	0	172	548	5,176	16,543	4,141	13,234	690	2,200	0	0	89,045
2035	0	0	10,611	0	0	4,000	0	4,000	0	0	0	709	0	20,000	0	17,375	0	2,844	0	0	59,539
2036	0	0	11,049	0	0	5,591	0	7,897	0	0	0	576	0	12,000	0	14,000	0	2,890	0	0	54,003
2037	0	0	53,078	0	1,414	1,086	1,849	1,373	0	0	61	439	1,845	12,155	1,476	10,824	246	1,386	0	0	87,232
2038	1,307	0	2,277	0	0	7,439	0	7,427	0	0	0	714	0	16,000	0	15,000	0	2,866	1,307	0	54,337
2039	0	0	0	0	0	7,570	0	8,566	0	0	0	392	0	14,190	0	11,352	0	1,892	0	0	43,963
<b>Average</b>	<b>203</b>	<b>0</b>	<b>16,691</b>	<b>0</b>	<b>302</b>	<b>3,356</b>	<b>331</b>	<b>3,494</b>	<b>45</b>	<b>0</b>	<b>14</b>	<b>347</b>	<b>493</b>	<b>8,981</b>	<b>409</b>	<b>7,563</b>	<b>56</b>	<b>1,447</b>	<b>203</b>	<b>0</b>	<b>43,933</b>

Source: SAIC (2004)  
SAR: Santa Ana River Water

SWP: State Water Project Water  
SG: Spreading Ground

Annual Artificial Recharge for Scenario D - 2001 to 2039 (Units in acre-ft)

Water Years	Mill Creek SG (Airport)		Santa Ana River SG		Devil Canyon/Sweetwater SG		Lytle Creek SG		City Creek SG		Patton SG		Waterman SG		East Twin Creek SG		Badger SG		Mill Creek SG		Total
	Includes Senior Deliveries SAR	SWP	Includes Senior & WCD Deliveries SAR	SWP	SAR	SWP	SAR	SWP	SAR	SWP	SAR	SWP	SAR	SWP	SAR	SWP	SAR	SWP	Includes Senior Deliveries SAR	SWP	
2001	1,114	0	5,842	0	0	297	0	310	0	0	0	40	0	1,797	0	1,435	0	195	1,114	0	12,144
2002	0	0	0	0	0	322	0	354	0	0	0	40	0	2,071	0	1,655	0	210	0	0	4,653
2003	0	0	0	0	0	298	0	265	0	0	0	44	0	2,229	0	1,781	0	364	0	0	4,981
2004	0	0	24	0	0	502	0	538	0	0	0	57	0	2,801	0	2,239	0	359	0	0	6,519
2005	0	0	17,769	0	1,215	165	1,441	197	0	0	0	228	0	2,357	0	1,934	0	520	0	0	25,825
2006	0	0	27,137	0	1,563	1,783	1,849	1,651	0	0	16	381	489	11,787	391	10,550	65	1,596	0	0	59,258
2007	0	0	5,540	0	0	284	0	360	0	0	0	47	0	1,485	0	1,273	0	214	0	0	9,203
2008	259	0	60,926	0	229	0	207	0	0	0	0	0	0	0	0	0	0	0	259	0	61,880
2009	1,604	0	12,176	0	0	2,800	0	2,900	0	0	0	303	0	9,123	0	7,284	0	1,214	1,604	0	39,007
2010	795	0	4,262	0	0	3,329	0	3,329	0	0	0	333	0	3,995	0	3,329	0	1,665	795	0	21,832
2011	263	0	3,172	0	0	7,796	0	7,338	0	0	0	607	0	9,283	0	8,794	0	2,568	263	0	40,085
2012	0	0	24,490	0	0	8,486	0	8,958	0	0	0	566	0	9,712	0	9,316	0	2,640	0	0	64,168
2013	0	0	5,978	0	0	8,239	0	8,724	0	0	0	285	0	15,489	0	12,635	0	2,132	0	0	53,482
2014	0	0	4,605	0	0	9,158	0	10,604	0	0	0	653	0	12,532	0	11,444	0	2,786	0	0	51,783
2015	1,299	0	3,923	0	0	6,178	0	6,565	0	0	0	319	0	7,723	0	7,337	0	2,600	1,299	0	37,243
2016	0	0	0	0	0	420	0	480	0	0	0	68	0	1,512	0	1,225	0	264	0	0	3,970
2017	0	0	77,260	0	0	2,545	0	2,121	0	0	0	597	0	7,755	0	6,959	0	2,873	0	0	100,109
2018	0	0	62,537	0	0	2,841	0	1,420	0	0	0	213	0	4,617	0	4,261	0	2,695	0	0	78,585
2019	0	0	69,422	0	1,500	0	800	0	0	0	182	0	4,000	0	4,300	0	730	0	0	0	80,934
2020	0	0	6,819	0	0	6,395	0	4,573	0	0	0	589	0	8,306	0	7,362	0	2,735	0	0	36,779
2021	0	0	14,903	0	0	6,795	0	5,339	0	0	0	582	0	8,376	0	7,280	0	2,882	0	0	46,157
2022	0	0	31,259	0	2,800	0	2,000	0	0	0	240	309	6,121	237	5,440	408	961	1,799	0	0	51,575
2023	0	0	10,694	0	0	4,469	0	3,977	0	0	0	709	0	20,295	0	17,200	0	2,830	0	0	60,174
2024	507	0	2,662	0	0	5,479	0	6,460	0	0	0	511	0	16,437	0	14,943	0	2,879	507	0	50,385
2025	0	0	12,381	0	0	4,974	0	6,422	0	0	0	465	0	11,450	0	9,947	0	2,875	0	0	48,513
2026	762	0	0	0	0	3,707	0	4,118	0	0	0	304	0	11,142	0	9,410	0	2,306	762	0	32,511
2027	0	0	0	0	0	1,272	0	1,653	0	0	0	96	0	4,400	0	3,520	0	490	0	0	11,430
2028	0	0	0	0	0	4,072	0	4,072	0	0	0	136	0	9,505	0	7,412	0	1,435	0	0	26,632
2029	0	0	0	0	0	1,522	0	1,522	0	0	0	97	0	3,727	0	3,065	0	609	0	0	10,542
2030	0	0	1,319	0	0	1,003	0	1,003	0	0	0	65	0	3,070	0	2,456	0	511	0	0	9,426
2031	0	0	8,295	0	0	652	0	696	0	0	0	67	0	2,778	0	2,268	0	587	0	0	15,342
2032	0	0	68,884	0	5,482	18	5,600	0	0	0	140	546	4,204	13,505	3,364	10,992	561	2,200	0	0	115,497
2033	0	0	5,682	0	0	7,414	0	8,585	0	0	0	356	0	6,631	0	6,966	0	1,994	0	0	37,628
2034	0	0	37,077	0	2,901	1,795	3,702	798	7,190	2,726	125	599	3,784	17,935	3,027	14,348	505	2,385	2,523	1,116	102,535
2035	0	0	10,611	0	0	5,378	0	8,605	0	0	0	655	0	16,041	0	15,156	0	2,826	0	0	59,271
2036	0	0	11,049	0	0	5,303	0	8,533	0	0	0	546	0	18,607	0	14,462	0	2,786	0	0	61,286
2037	0	0	53,078	0	1,414	1,729	1,849	921	0	0	61	450	1,845	7,895	1,476	7,672	246	2,560	0	0	81,195
2038	1,307	0	2,277	0	0	7,098	0	8,252	0	0	0	689	0	17,475	0	15,534	0	2,889	1,307	0	56,829
2039	0	0	0	0	0	7,374	0	9,487	0	0	0	598	0	13,640	0	11,958	0	2,880	0	0	45,937
<b>Average</b>	<b>203</b>	<b>0</b>	<b>16,976</b>	<b>0</b>	<b>439</b>	<b>3,382</b>	<b>447</b>	<b>3,619</b>	<b>184</b>	<b>70</b>	<b>20</b>	<b>337</b>	<b>524</b>	<b>8,147</b>	<b>461</b>	<b>7,072</b>	<b>79</b>	<b>1,727</b>	<b>268</b>	<b>29</b>	<b>43,982</b>

Source: SAIC (2004)  
SAR: Santa Ana River Water

SWP: State Water Project Water  
SG: Spreading Ground

Annual Groundwater Pumping for Model Scenarios - 2001 to 2039 (Units in acre-ft)

Water Years	No Project Condition			Scenario A			Scenario B			Scenario C			Scenario D		
	Non-Plaintiffs	Plaintiffs	Total	Non-Plaintiffs	Plaintiffs	Total	Non-Plaintiffs	Plaintiffs	Total	Non-Plaintiffs	Plaintiffs	Total	Non-Plaintiffs	Plaintiffs	Total
2001	150,176	63,401	213,577	150,176	63,441	213,617	150,176	63,441	213,617	150,176	63,342	213,518	150,176	63,342	213,518
2002	162,949	63,249	226,198	162,949	63,275	226,224	162,949	63,275	226,224	161,964	63,121	225,085	161,964	63,121	225,085
2003	160,444	63,097	223,541	160,444	63,110	223,554	160,444	63,110	223,554	159,926	62,926	222,853	159,926	62,926	222,853
2004	156,257	62,990	219,247	156,257	62,944	219,201	156,257	62,944	219,201	154,213	62,651	216,864	154,213	62,651	216,864
2005	143,328	63,018	206,346	143,328	63,283	206,612	143,328	63,283	206,612	134,397	62,756	197,153	134,397	62,756	197,153
2006	156,172	63,202	219,373	156,172	62,530	218,702	156,172	62,882	219,054	142,091	62,808	204,899	142,091	62,808	204,899
2007	153,738	63,330	217,068	153,738	63,728	217,466	153,738	63,710	217,448	153,738	63,049	216,787	153,738	63,049	216,787
2008	153,128	64,365	217,493	153,128	66,861	219,990	153,128	67,047	220,176	131,287	67,055	198,342	131,287	67,359	198,646
2009	157,592	64,652	222,244	157,592	67,299	224,891	157,592	67,487	225,079	144,640	70,267	214,906	144,640	70,536	215,175
2010	168,946	64,646	233,592	168,946	67,371	236,317	168,946	67,557	236,503	156,072	70,501	226,573	156,072	69,690	225,762
2011	172,055	64,404	236,459	172,055	69,603	241,657	172,055	69,437	241,491	164,655	70,041	234,696	164,655	69,231	233,886
2012	156,903	64,872	221,775	156,903	68,939	225,842	156,903	69,144	226,047	149,719	70,277	219,996	149,719	69,466	219,185
2013	164,284	64,001	228,285	164,284	67,481	231,764	164,284	67,481	231,764	164,284	66,501	230,784	164,284	65,385	229,669
2014	169,657	63,783	233,440	169,657	68,676	238,333	169,657	68,676	238,333	169,657	63,553	233,210	169,657	62,472	232,129
2015	173,381	63,722	237,104	173,381	70,497	243,878	173,381	69,525	242,906	173,381	63,043	236,425	173,381	63,042	236,424
2016	179,649	63,713	243,362	179,649	69,467	249,116	179,649	67,881	247,529	177,083	63,239	240,322	177,083	63,236	240,319
2017	172,577	64,719	237,296	172,577	69,501	242,079	172,577	68,043	240,621	172,577	65,218	237,796	172,577	65,210	237,787
2018	160,551	65,702	226,252	160,551	68,020	228,571	160,551	66,563	227,113	160,551	67,083	227,634	160,551	67,068	227,619
2019	163,379	66,690	230,070	163,379	70,001	233,380	163,379	69,152	232,531	163,379	71,087	234,466	163,379	72,140	235,519
2020	171,026	66,779	237,805	171,026	69,459	240,485	171,026	69,571	240,596	171,026	75,199	246,224	171,026	74,160	245,185
2021	168,673	67,049	235,723	168,673	69,587	238,261	168,673	70,326	238,999	168,673	76,161	244,834	168,673	74,801	243,474
2022	165,902	65,820	231,722	165,902	71,395	237,297	165,902	72,062	237,964	165,902	77,319	243,221	165,902	76,313	242,215
2023	166,437	64,874	231,310	166,437	73,109	239,545	166,437	73,882	240,318	166,437	77,088	243,525	166,437	75,877	242,314
2024	174,109	63,763	237,872	174,109	72,513	246,623	174,109	71,926	246,035	174,109	72,866	246,976	174,109	70,599	244,709
2025	161,230	63,774	225,004	161,230	71,343	232,573	161,230	70,374	231,604	161,230	69,175	230,405	161,230	69,000	230,230
2026	180,137	63,439	243,576	180,137	72,395	252,531	180,137	69,609	249,745	180,137	68,265	248,401	180,137	68,426	248,563
2027	178,662	63,100	241,762	178,662	70,023	248,684	178,662	67,183	245,844	176,978	64,630	241,607	176,978	64,431	241,408
2028	187,764	62,957	250,721	187,764	68,113	255,877	187,764	65,168	252,932	184,660	62,616	247,276	184,660	62,628	247,289
2029	196,976	62,962	259,938	196,976	65,101	262,077	196,976	62,907	259,883	196,630	62,666	259,296	196,630	62,667	259,297
2030	184,343	62,914	247,257	184,343	64,498	248,841	184,343	62,686	247,029	179,760	62,065	241,824	179,760	62,065	241,825
2031	174,341	63,180	237,522	174,341	62,865	237,207	174,341	62,871	237,213	174,341	62,405	236,746	174,341	62,405	236,746
2032	171,384	64,437	235,822	171,384	64,109	235,493	171,384	64,207	235,592	171,384	66,387	237,771	171,384	66,707	238,091
2033	172,663	64,551	237,214	172,663	66,594	239,257	172,663	66,373	239,035	172,663	66,946	239,609	172,663	67,068	239,730
2034	171,257	65,122	236,378	171,257	66,618	237,874	171,257	66,910	238,166	171,257	68,390	239,646	171,257	68,743	239,999
2035	178,698	65,221	243,919	178,698	68,336	247,034	178,698	68,033	246,732	178,698	69,156	247,854	178,698	69,285	247,984
2036	178,984	65,258	244,242	178,984	68,444	247,428	178,984	68,132	247,116	178,984	69,272	248,256	178,984	69,390	248,374
2037	171,677	65,140	236,816	171,677	67,503	239,180	171,677	67,247	238,924	171,677	67,604	239,280	171,677	67,460	239,137
2038	182,251	65,081	247,332	182,251	65,575	247,826	182,251	65,482	247,734	182,251	67,166	249,417	182,251	67,225	249,476
2039	184,788	66,587	251,375	184,788	66,613	251,401	184,788	65,848	250,636	180,552	67,538	248,090	180,552	67,534	248,086
<b>Average</b>	<b>169,140</b>	<b>64,348</b>	<b>233,488</b>	<b>169,140</b>	<b>67,442</b>	<b>236,582</b>	<b>169,140</b>	<b>66,960</b>	<b>236,100</b>	<b>166,439</b>	<b>67,216</b>	<b>233,655</b>	<b>166,439</b>	<b>66,981</b>	<b>233,420</b>

Source: SAIC (2004)

Groundwater Budgets for No Project Condition - 2001 to 2039 (Units in acre-ft)

Water Years	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]
	INFLOW									OUTFLOW				CHANGE IN GROUNDWATER STORAGE
	Recharge from Gaged Streamflow	Artificial Recharge at SAR Spreading Grounds	Artificial Recharge at Other Spreading Grounds	Recharge from Local Runoff Generated by Precipitation	Infiltration from Direct Precipitation	Return Flow from Groundwater Pumping	Recharge from Ungaged Mountain Front Runoff	Underflow Recharge	Total Inflow	Evapo-transpiration	Groundwater Pumping	Underflow Discharge	Total Outflow	
2001	85,964	3,922	4,477	3,611	1,137	34,131	10,291	3,780	147,312	2,929	213,577	3,687	220,193	-72,881
2002	46,333	412	4,751	5,948	1,137	36,833	5,348	3,726	104,488	2,314	226,198	3,350	231,861	-127,374
2003	42,718	407	5,096	3,388	1,137	37,795	5,467	3,690	99,699	1,845	223,541	3,015	228,401	-128,702
2004	114,427	1,754	6,537	7,446	1,137	36,908	12,653	3,654	184,516	1,947	219,247	2,801	223,994	-39,478
2005	152,284	5,766	5,979	5,060	1,137	34,171	20,139	3,609	228,145	2,919	206,346	2,742	212,007	16,139
2006	198,295	9,406	4,644	5,876	1,137	36,892	18,871	3,563	278,683	6,407	219,373	2,650	228,430	50,253
2007	80,503	4,232	4,342	2,572	1,137	36,379	9,173	3,534	141,871	4,583	217,068	2,538	224,189	-82,318
2008	403,245	31,262	1,800	10,958	1,137	36,263	66,749	3,482	554,895	9,532	217,493	2,699	229,725	325,171
2009	94,234	10,330	14,794	4,988	1,137	37,211	11,583	3,453	177,729	6,812	222,244	2,879	231,935	-54,206
2010	74,103	5,587	26,466	4,616	1,137	39,615	9,605	3,415	164,542	5,074	233,592	2,822	241,489	-76,947
2011	63,788	2,192	30,269	2,349	1,137	40,269	7,170	3,364	150,539	4,484	236,459	2,712	243,655	-93,116
2012	120,816	18,169	33,901	4,975	1,137	37,068	17,518	3,328	236,912	4,879	221,775	2,640	229,294	7,617
2013	92,732	5,310	46,590	5,163	1,137	38,619	11,448	3,292	204,291	5,270	228,285	2,592	236,147	-31,857
2014	73,218	3,834	49,213	4,091	1,137	39,754	9,605	3,238	184,090	4,970	233,440	2,538	240,948	-56,858
2015	76,009	3,771	32,090	5,167	1,137	40,542	9,480	3,211	171,406	4,029	237,104	2,473	243,606	-72,199
2016	61,392	1,918	4,108	5,114	1,137	41,868	7,170	3,166	125,872	2,125	243,362	2,384	247,871	-121,999
2017	425,220	48,152	21,854	10,573	1,137	40,384	33,981	3,121	584,422	7,548	237,296	2,430	247,275	337,147
2018	208,058	34,614	14,131	5,643	1,137	37,851	31,634	3,078	336,145	10,002	226,252	2,577	238,831	97,314
2019	338,405	33,310	9,050	9,110	1,137	38,462	67,712	3,049	500,234	13,531	230,070	2,936	246,536	253,698
2020	89,740	6,426	22,921	3,947	1,137	40,082	10,291	2,995	177,539	8,118	237,805	3,230	249,154	-71,614
2021	136,442	9,963	24,376	7,859	1,137	39,587	18,943	2,959	241,265	6,322	235,723	3,341	245,385	-4,120
2022	333,415	11,516	7,079	11,788	1,137	38,985	50,284	2,923	457,126	13,164	231,722	3,857	248,744	208,383
2023	106,962	6,381	38,470	3,062	1,137	39,086	11,986	2,871	209,954	9,789	231,310	4,314	245,413	-35,458
2024	82,778	186	38,298	3,738	1,137	40,696	9,480	2,833	179,146	6,603	237,872	4,281	248,756	-69,610
2025	114,260	6,755	30,796	5,324	1,137	37,970	13,304	2,805	212,351	5,817	225,004	4,129	234,949	-22,598
2026	64,199	0	26,372	4,469	1,137	41,968	7,495	2,745	148,384	4,636	243,576	3,853	252,065	-103,681
2027	59,562	1,402	9,711	4,177	1,137	41,651	6,474	2,716	126,829	2,735	241,762	3,512	248,009	-121,180
2028	47,528	2,096	26,758	2,479	1,137	43,576	5,467	2,671	131,712	3,055	250,721	3,151	256,927	-125,215
2029	36,353	357	10,506	2,808	1,137	45,526	3,977	2,627	103,292	1,721	259,938	2,833	264,493	-161,201
2030	75,505	5,321	8,532	6,118	1,137	42,852	8,175	2,590	150,230	1,609	247,257	2,609	251,475	-101,245
2031	111,338	7,941	7,572	6,894	1,137	40,738	12,181	2,553	190,354	1,728	237,522	2,472	241,723	-51,369
2032	434,599	38,877	22,332	9,016	1,137	40,128	52,483	2,501	601,072	7,402	235,822	2,529	245,753	355,319
2033	86,408	5,493	29,262	4,755	1,137	40,400	11,042	2,467	180,963	5,660	237,214	2,638	245,512	-64,549
2034	308,150	17,369	25,194	7,419	1,137	40,110	38,408	2,417	440,204	10,064	236,378	2,783	249,225	190,979
2035	111,526	8,265	44,570	6,414	1,137	41,686	14,265	2,372	230,236	8,055	243,919	2,906	254,880	-24,645
2036	95,677	9,061	46,648	5,952	1,137	41,747	11,042	2,329	213,593	6,274	244,242	2,885	253,401	-39,808
2037	278,042	35,337	21,723	9,945	1,137	40,199	35,918	2,300	424,600	10,880	236,816	3,057	250,753	173,848
2038	63,821	3,736	50,185	2,332	1,137	42,436	4,315	2,239	170,201	7,603	247,332	3,182	258,117	-87,916
2039	53,125	4,150	43,963	4,318	1,137	42,992	3,836	2,212	155,732	4,620	251,375	3,092	259,087	-103,356
<b>Average</b>	<b>139,517</b>	<b>10,384</b>	<b>21,932</b>	<b>5,627</b>	<b>1,137</b>	<b>39,575</b>	<b>17,820</b>	<b>2,997</b>	<b>238,989</b>	<b>5,822</b>	<b>233,488</b>	<b>3,003</b>	<b>242,313</b>	<b>-3,324</b>

Note:  
 [1] Model-Calculated  
 [2] Model input data from Allocation Model  
 [3] Model input data from Allocation Model  
 [4] Model input based on historical conditions  
 [5] Model input based on historical conditions  
 [6] Model input data from Allocation Model  
 [7] Model input based on historical conditions  
 [8] Model input based on historical conditions  
 [9] = sum of [1] through [8]  
 [10] Model-Calculated  
 [11] Model input data from Allocation Model  
 [12] Model input based on historical conditions  
 and model-calculated water level in Heap Well  
 [13] = sum of [10] through [12]  
 [14] = [9]-[13]

Groundwater Budgets for Scenario A - 2001 to 2039 (Units in acre-ft)

Water Years	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]
	INFLOW									OUTFLOW				CHANGE IN GROUNDWATER STORAGE
	Recharge from Gaged Streamflow	Artificial Recharge at SAR Spreading Grounds	Artificial Recharge at Other Spreading Grounds	Recharge from Local Runoff Generated by Precipitation	Infiltration from Direct Precipitation	Return Flow from Groundwater Pumping	Recharge from Ungaged Mountain Front Runoff	Underflow Recharge	Total Inflow	Evapo-transpiration	Groundwater Pumping	Underflow Discharge	Total Outflow	
2001	81,836	5,121	8,574	3,611	1,137	34,132	10,291	3,780	148,481	2,707	213,617	3,690	220,014	-71,533
2002	45,760	0	9,189	5,948	1,137	36,833	5,348	3,726	107,941	2,331	226,224	3,358	231,913	-123,972
2003	42,608	0	9,691	3,388	1,137	37,796	5,467	3,690	103,776	2,004	223,554	3,019	228,576	-124,800
2004	114,178	0	11,462	7,446	1,137	36,907	12,653	3,654	187,437	2,116	219,201	2,806	224,123	-36,687
2005	130,622	9,911	20,247	5,060	1,137	34,175	20,139	3,609	224,900	3,225	206,612	2,707	212,543	12,357
2006	138,883	10,400	63,034	5,876	1,137	36,884	18,871	3,563	278,647	8,561	218,702	2,647	229,909	48,738
2007	79,336	2,332	16,413	2,572	1,137	36,384	9,173	3,534	150,880	4,654	217,466	2,573	224,693	-73,814
2008	429,665	8,301	3,900	10,958	1,137	36,294	66,749	3,482	560,485	7,475	219,990	2,726	230,191	330,295
2009	76,623	10,400	34,853	4,988	1,137	37,245	11,583	3,453	180,281	7,046	224,891	2,903	234,839	-54,558
2010	61,078	10,400	35,557	4,616	1,137	39,649	9,605	3,415	165,457	5,040	236,317	2,840	244,197	-78,740
2011	54,908	4,539	46,247	2,349	1,137	40,335	7,170	3,364	160,049	4,620	241,657	2,707	248,984	-88,935
2012	107,341	8,479	41,396	4,975	1,137	37,120	17,518	3,328	221,292	4,641	225,842	2,620	233,103	-11,810
2013	92,185	2,783	44,611	5,163	1,137	38,663	11,448	3,292	199,281	4,648	231,764	2,547	238,959	-39,678
2014	72,587	1,061	49,380	4,091	1,137	39,816	9,605	3,238	180,915	4,496	238,333	2,470	245,300	-64,385
2015	73,421	371	54,501	5,167	1,137	40,627	9,480	3,211	187,916	4,532	243,878	2,399	250,809	-62,892
2016	60,829	204	13,825	5,114	1,137	41,941	7,170	3,166	133,385	2,250	249,116	2,321	253,688	-120,302
2017	408,654	8,300	84,075	10,573	1,137	40,444	33,981	3,121	590,284	10,023	242,079	2,309	254,411	335,873
2018	179,122	8,637	72,505	5,643	1,137	37,880	31,634	3,078	339,635	12,404	228,571	2,397	243,371	96,264
2019	358,283	10,126	24,140	9,110	1,137	38,504	67,712	3,049	512,060	13,803	233,380	2,611	249,795	262,266
2020	89,893	3,470	33,801	3,947	1,137	40,115	10,291	2,995	185,649	8,772	240,485	2,935	252,192	-66,543
2021	132,693	8,322	24,093	7,859	1,137	39,619	18,943	2,959	235,625	6,209	238,261	3,060	247,530	-11,905
2022	310,960	10,261	34,759	11,788	1,137	39,055	50,284	2,923	461,167	13,822	237,297	3,287	254,406	206,760
2023	104,047	4,674	30,910	3,062	1,137	39,190	11,986	2,871	197,877	9,029	239,545	3,677	252,252	-54,375
2024	77,779	2,285	53,904	3,738	1,137	40,807	9,480	2,833	191,963	7,163	246,623	3,708	257,493	-65,531
2025	108,456	8,300	49,437	5,324	1,137	38,066	13,304	2,805	226,829	6,496	232,573	3,695	242,764	-15,935
2026	62,931	1	48,635	4,469	1,137	42,081	7,495	2,745	169,493	5,402	252,531	3,553	261,487	-91,994
2027	59,178	214	19,021	4,177	1,137	41,739	6,474	2,716	134,654	2,983	248,684	3,332	254,999	-120,344
2028	46,714	162	44,832	2,479	1,137	43,641	5,467	2,671	147,103	3,736	255,877	3,072	262,685	-115,582
2029	36,263	0	12,947	2,808	1,137	45,553	3,977	2,627	105,312	1,754	262,077	2,824	266,655	-161,343
2030	75,711	2,368	8,108	6,118	1,137	42,872	8,175	2,590	147,078	1,507	248,841	2,621	252,969	-105,891
2031	110,541	5,304	10,873	6,894	1,137	40,734	12,181	2,553	190,217	1,813	237,207	2,496	241,516	-51,299
2032	379,323	8,501	99,935	9,016	1,137	40,124	52,483	2,501	593,019	10,786	235,493	2,469	248,749	344,270
2033	86,267	2,548	52,714	4,755	1,137	40,426	11,042	2,467	201,355	6,591	239,256	2,547	248,395	-47,040
2034	249,836	8,387	84,370	7,419	1,137	40,128	38,408	2,417	432,103	13,098	237,874	2,601	253,573	178,530
2035	109,344	7,685	51,794	6,414	1,137	41,725	14,265	2,372	234,737	8,430	247,034	2,680	258,144	-23,407
2036	93,905	8,115	50,145	5,952	1,137	41,787	11,042	2,329	214,412	6,086	247,428	2,729	256,244	-41,832
2037	252,228	8,316	79,872	9,945	1,137	40,229	35,918	2,300	429,944	13,796	239,180	2,796	255,773	174,171
2038	62,883	1,848	54,294	2,332	1,137	42,443	4,315	2,239	171,491	7,896	247,826	2,908	258,631	-87,140
2039	53,003	1,357	39,667	4,318	1,137	42,993	3,836	2,212	148,520	4,300	251,401	2,909	258,609	-110,089
<b>Average</b>	<b>131,022</b>	<b>4,961</b>	<b>39,172</b>	<b>5,627</b>	<b>1,137</b>	<b>39,614</b>	<b>17,820</b>	<b>2,997</b>	<b>242,350</b>	<b>6,314</b>	<b>236,582</b>	<b>2,860</b>	<b>245,756</b>	<b>-3,406</b>

Note:  
 [1] Model-Calculated  
 [2] Model input data from Allocation Model  
 [3] Model input data from Allocation Model  
 [4] Model input based on historical conditions  
 [5] Model input based on historical conditions  
 [6] Model input data from Allocation Model  
 [7] Model input based on historical conditions  
 [8] Model input based on historical conditions  
 [9] = sum of [1] through [8]  
 [10] Model-Calculated  
 [11] Model input data from Allocation Model  
 [12] Model input based on historical conditions and model-calculated water level in Heap Well  
 [13] = sum of [10] through [12]  
 [14] = [9]-[13]



Annual Artificial Recharge at Cactus, Garden Air Creek and Wilson Spreading Grounds for Model Scenarios (Years 2001 to 2039)  
(Units in acre-ft)

Water Years	No Project Condition			Scenario A			Scenario B			Scenario C			Scenario D		
	Cactus	Wilson	Garden Air Creek	Cactus	Wilson	Garden Air Creek	Cactus	Wilson	Garden Air Creek	Cactus	Wilson	Garden Air Creek	Cactus	Wilson	Garden Air Creek
2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2005	0	0	0	4,235	726	1,936	4,235	726	1,936	167	0	0	0	0	0
2006	0	0	0	2,152	369	984	2,431	369	984	4,235	726	1,233	4,132	369	984
2007	0	0	0	2,083	357	952	2,083	357	709	0	0	0	0	0	0
2008	0	0	0	18,953	2,154	5,745	18,953	2,154	5,745	13,217	2,154	5,745	13,217	2,154	5,745
2009	0	0	0	0	0	0	0	0	0	12,705	1,083	2,888	12,705	1,083	2,888
2010	0	0	0	0	0	0	0	0	0	2,083	357	952	0	0	0
2011	0	0	0	4,235	726	1,936	4,235	726	1,936	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2013	0	0	0	4,235	726	1,936	4,235	726	1,936	0	0	0	0	0	0
2014	0	0	0	4,235	726	1,936	4,235	726	1,936	0	0	0	0	0	0
2015	0	0	0	6,318	726	1,936	2,083	357	952	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	6,179	1,059	2,016	5,936	1,059	2,139	0	0	0	0	0	0
2018	0	0	0	5,215	726	1,936	5,827	726	1,936	0	0	0	0	0	0
2019	0	0	0	10,483	1,797	4,793	13,800	1,797	4,793	10,414	1,785	4,761	10,414	1,785	4,761
2020	0	0	0	4,235	726	1,936	4,235	726	1,936	12,705	1,083	2,888	4,235	726	1,936
2021	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	0	0	0	9,402	1,428	3,809	10,414	1,428	3,809	8,470	1,452	3,872	8,470	1,452	3,872
2023	0	0	0	4,235	726	1,936	4,235	726	1,376	2,083	357	952	2,083	357	952
2024	0	0	0	8,401	1,083	2,888	4,235	726	1,936	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2026	0	0	0	4,235	726	1,721	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	7,838	1,428	2,609	8,331	1,428	2,609	10,414	1,785	3,640	9,383	1,428	2,425
2033	0	0	0	6,318	1,083	2,442	2,520	357	183	0	0	0	0	0	0
2034	0	0	0	3,846	702	1,311	6,474	1,059	1,462	4,235	726	1,426	3,112	369	422
2035	0	0	0	2,083	357	952	0	0	0	0	0	0	0	0	0
2036	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2037	0	0	0	2,152	0	0	1,902	0	0	235	0	0	235	0	0
2038	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2039	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Average</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3,104</b>	<b>471</b>	<b>1,172</b>	<b>2,831</b>	<b>415</b>	<b>5,257</b>	<b>2,076</b>	<b>295</b>	<b>727</b>	<b>1,743</b>	<b>249</b>	<b>615</b>

Source: SAIC Allocation Model, 2004

Groundwater Budgets for Scenario D - 2001 to 2039 (Units in acre-ft)

Water Years	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]
	INFLOW									OUTFLOW				CHANGE IN GROUNDWATER STORAGE
	Recharge from Gaged Streamflow	Artificial Recharge at SAR Spreading Grounds	Artificial Recharge at Other Spreading Grounds	Recharge from Local Runoff Generated by Precipitation	Infiltration from Direct Precipitation	Return Flow from Groundwater Pumping	Recharge from Ungaged Mountain Front Runoff	Underflow Recharge	Total Inflow	Evapo-transpiration	Groundwater Pumping	Underflow Discharge	Total Outflow	
2001	81,836	5,842	6,302	3,611	1,137	34,130	10,291	3,780	146,929	2,625	213,518	3,688	219,831	-72,903
2002	45,760	0	4,653	5,948	1,137	36,623	5,348	3,726	103,194	2,157	225,085	3,357	230,600	-127,405
2003	42,607	0	4,981	3,388	1,137	37,684	5,467	3,690	98,953	1,790	222,853	3,018	227,661	-128,708
2004	114,182	24	6,495	7,446	1,137	36,471	12,653	3,654	182,061	1,887	216,864	2,809	221,560	-39,499
2005	130,615	17,769	8,056	5,060	1,137	32,278	20,139	3,609	218,663	2,678	197,153	2,713	202,544	16,119
2006	142,860	27,137	32,122	5,876	1,137	33,907	18,871	3,563	265,472	7,711	204,899	2,644	215,254	50,218
2007	79,327	5,540	3,663	2,572	1,137	36,375	9,173	3,534	141,320	4,308	216,787	2,551	223,645	-82,325
2008	379,807	60,926	954	10,958	1,137	31,677	66,749	3,482	555,690	9,323	198,646	2,732	210,701	344,989
2009	76,630	12,176	26,831	4,988	1,137	34,544	11,583	3,453	171,341	7,425	215,175	2,907	225,508	-54,166
2010	61,075	4,262	17,570	4,616	1,137	36,953	9,605	3,415	138,633	4,435	225,762	2,833	233,030	-94,397
2011	54,907	3,172	36,913	2,349	1,137	38,764	7,170	3,364	147,776	4,359	233,886	2,694	240,940	-93,164
2012	107,356	24,490	39,679	4,975	1,137	35,605	17,518	3,328	234,087	4,736	219,185	2,603	226,525	7,562
2013	92,174	5,978	47,504	5,163	1,137	38,637	11,448	3,292	205,333	5,001	229,669	2,542	237,212	-31,879
2014	72,590	4,605	47,178	4,091	1,137	39,738	9,605	3,238	182,181	4,567	232,129	2,488	239,184	-57,003
2015	73,419	3,923	33,320	5,167	1,137	40,533	9,480	3,211	170,190	3,599	236,424	2,421	242,443	-72,254
2016	60,833	0	3,970	5,114	1,137	41,319	7,170	3,166	122,708	1,904	240,319	2,339	244,562	-121,854
2017	393,989	77,260	22,849	10,573	1,137	40,390	33,981	3,121	583,299	7,283	237,787	2,376	247,446	335,853
2018	179,334	62,537	16,048	5,643	1,137	37,868	31,634	3,078	337,278	9,574	227,619	2,507	239,700	97,577
2019	304,995	69,422	11,512	9,110	1,137	38,531	67,712	3,049	505,467	13,558	235,519	2,810	251,887	253,580
2020	89,632	6,819	29,960	3,947	1,137	40,175	10,291	2,995	184,956	8,587	245,185	3,059	256,831	-71,875
2021	131,642	14,903	31,254	7,859	1,137	39,685	18,943	2,959	248,381	6,675	243,474	3,128	253,277	-4,895
2022	308,107	31,259	20,316	11,788	1,137	39,117	50,284	2,923	464,931	13,617	242,215	3,444	259,276	205,655
2023	102,244	10,694	49,480	3,062	1,137	39,225	11,986	2,871	220,699	10,158	242,314	3,887	256,358	-35,659
2024	77,797	2,662	47,723	3,738	1,137	40,783	9,480	2,833	186,152	6,991	244,709	3,929	255,629	-69,477
2025	108,643	12,381	36,132	5,324	1,137	38,036	13,304	2,805	217,762	6,012	230,230	3,850	240,092	-22,330
2026	62,865	0	32,511	4,469	1,137	42,031	7,495	2,745	153,252	4,667	248,563	3,635	256,865	-103,613
2027	59,157	0	11,430	4,177	1,137	41,312	6,474	2,716	126,403	2,684	241,408	3,380	247,472	-121,069
2028	46,637	0	26,632	2,479	1,137	42,915	5,467	2,671	127,938	2,870	247,289	3,097	253,256	-125,318
2029	36,256	0	10,542	2,808	1,137	45,449	3,977	2,627	102,796	1,654	259,297	2,818	263,769	-160,973
2030	75,607	1,319	8,107	6,118	1,137	41,871	8,175	2,590	144,924	1,521	241,825	2,618	245,964	-101,040
2031	110,757	8,295	7,047	6,894	1,137	40,728	12,181	2,553	189,592	1,638	236,746	2,488	240,872	-51,280
2032	383,237	68,884	46,613	9,016	1,137	40,157	52,483	2,501	604,027	8,375	238,091	2,486	248,953	355,074
2033	86,019	5,682	31,946	4,755	1,137	40,432	11,042	2,467	183,478	5,663	239,730	2,583	247,976	-64,498
2034	253,935	37,077	65,458	7,419	1,137	40,155	38,408	2,417	446,007	12,226	239,999	2,603	254,828	191,179
2035	109,061	10,611	48,660	6,414	1,137	41,737	14,265	2,372	234,258	8,298	247,984	2,700	258,982	-24,724
2036	93,678	11,049	50,237	5,952	1,137	41,799	11,042	2,329	217,223	6,153	248,374	2,727	257,254	-40,032
2037	256,254	53,078	28,117	9,945	1,137	40,228	35,918	2,300	426,976	10,954	239,137	2,841	252,932	174,044
2038	62,879	2,277	54,552	2,332	1,137	42,463	4,315	2,239	172,195	7,810	249,476	2,979	260,265	-88,071
2039	53,175	0	45,937	4,318	1,137	42,108	3,836	2,212	152,721	4,758	248,086	2,951	255,795	-103,074
<b>Average</b>	<b>128,253</b>	<b>16,976</b>	<b>27,006</b>	<b>5,627</b>	<b>1,137</b>	<b>39,037</b>	<b>17,820</b>	<b>2,997</b>	<b>238,853</b>	<b>5,903</b>	<b>233,420</b>	<b>2,904</b>	<b>242,227</b>	<b>-3,374</b>

Note:  
 [1] Model-Calculated  
 [2] Model input data from Allocation Model  
 [3] Model input data from Allocation Model  
 [4] Model input based on historical conditions  
 [5] Model input based on historical conditions  
 [6] Model input data from Allocation Model  
 [7] Model input based on historical conditions  
 [8] Model input based on historical conditions  
 [9] = sum of [1] through [8]  
 [10] Model-Calculated  
 [11] Model input data from Allocation Model  
 [12] Model input based on historical conditions  
 and model-calculated water level in Heap Well  
 [13] = sum of [10] through [12]  
 [14] = [9]-[13]

**Groundwater Budgets for Most Likely Scenario - 2001 to 2039 (Units in acre-ft)**

Water Years	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]
	INFLOW									OUTFLOW				CHANGE IN GROUNDWATER STORAGE
	Recharge from Gaged Streamflow	Artificial Recharge at SAR Spreading Grounds	Artificial Recharge at Other Spreading Grounds	Recharge from Local Runoff Generated by Precipitation	Infiltration from Direct Precipitation	Return Flow from Groundwater Pumping	Recharge from Ungaged Mountain Front Runoff	Underflow Recharge	Total Inflow	Evapo-transpiration	Groundwater Pumping	Underflow Discharge	Total Outflow	
2001	81,835	8,049	4,249	3,611	1,137	34,131	10,291	3,780	147,083	2,497	213,552	3,685	219,734	-72,651
2002	45,760	985	4,714	5,948	1,137	36,832	5,348	3,726	104,450	2,125	226,137	3,345	231,607	-127,157
2003	42,609	518	5,186	3,388	1,137	37,794	5,467	3,690	99,789	1,801	223,455	3,001	228,257	-128,468
2004	114,172	2,003	6,564	7,446	1,137	36,905	12,653	3,654	184,534	1,907	219,057	2,786	223,750	-39,215
2005	131,272	10,400	17,709	5,060	1,137	34,172	20,139	3,609	223,498	3,234	206,421	2,683	212,338	11,160
2006	143,516	10,400	60,630	5,876	1,137	36,887	18,871	3,563	280,879	8,835	218,973	2,617	230,426	50,454
2007	79,318	5,407	4,337	2,572	1,137	36,378	9,173	3,534	141,855	4,204	217,036	2,543	223,783	-81,928
2008	397,873	50,000	3,900	10,958	1,137	36,307	66,749	3,482	570,405	9,042	220,969	2,688	232,699	337,706
2009	77,203	12,645	34,853	4,988	1,137	37,268	11,583	3,453	183,130	7,569	226,732	2,849	237,151	-54,021
2010	61,612	13,572	35,557	4,616	1,137	39,672	9,605	3,415	169,185	5,260	238,137	2,786	246,183	-76,998
2011	55,013	10,400	39,648	2,349	1,137	40,381	7,170	3,364	159,463	4,471	245,339	2,648	252,457	-92,994
2012	107,793	11,355	42,236	4,975	1,137	37,179	17,518	3,328	225,520	4,885	230,565	2,550	238,000	-12,480
2013	92,206	5,845	35,589	5,163	1,137	38,684	11,448	3,292	193,364	4,364	233,440	2,482	240,286	-46,922
2014	72,588	4,476	42,356	4,091	1,137	39,806	9,605	3,238	177,296	4,264	237,517	2,416	244,197	-66,901
2015	73,402	6,352	35,487	5,167	1,137	40,586	9,480	3,211	174,822	3,641	240,611	2,355	246,607	-71,784
2016	60,829	2,493	3,645	5,114	1,137	41,863	7,170	3,166	125,416	1,824	242,926	2,291	247,041	-121,625
2017	416,531	10,400	80,433	10,573	1,137	40,362	33,981	3,121	596,537	10,257	235,562	2,293	248,112	348,425
2018	183,608	10,400	62,803	5,643	1,137	37,819	31,634	3,078	336,121	12,116	223,725	2,392	238,234	97,888
2019	333,871	50,000	18,588	9,110	1,137	38,475	67,712	3,049	521,941	13,753	231,137	2,686	247,576	274,365
2020	89,791	6,678	33,151	3,947	1,137	40,147	10,291	2,995	188,137	8,701	242,962	3,001	254,664	-66,527
2021	133,298	10,400	21,769	7,859	1,137	39,653	18,943	2,959	236,017	6,141	240,925	3,096	250,162	-14,145
2022	319,370	10,400	32,902	11,788	1,137	39,092	50,284	2,923	467,896	13,881	240,210	3,329	257,421	210,475
2023	102,653	10,400	28,307	3,062	1,137	39,226	11,986	2,871	199,642	8,915	242,417	3,748	255,081	-55,438
2024	77,861	5,130	45,391	3,738	1,137	40,793	9,480	2,833	186,364	6,703	245,554	3,752	256,009	-69,645
2025	108,654	10,400	46,483	5,324	1,137	38,019	13,304	2,805	226,126	6,390	228,855	3,730	238,975	-12,849
2026	63,058	1,428	40,149	4,469	1,137	42,017	7,495	2,745	162,496	5,003	247,455	3,602	256,061	-93,564
2027	59,182	1,585	11,843	4,177	1,137	41,671	6,474	2,716	128,784	2,661	243,337	3,377	249,375	-120,591
2028	46,630	2,998	42,093	2,479	1,137	43,573	5,467	2,671	147,049	3,663	250,485	3,119	257,268	-110,219
2029	36,362	357	10,535	2,808	1,137	45,523	3,977	2,627	103,327	1,672	259,692	2,857	264,221	-160,894
2030	75,425	5,408	7,734	6,118	1,137	42,846	8,175	2,590	149,434	1,539	246,835	2,645	251,019	-101,585
2031	110,717	8,569	7,288	6,894	1,137	40,731	12,181	2,553	190,070	1,678	236,964	2,509	241,150	-51,080
2032	384,433	20,900	90,734	9,016	1,137	40,144	52,483	2,501	601,347	10,907	237,070	2,478	250,455	350,891
2033	86,247	5,596	21,136	4,755	1,137	40,418	11,042	2,467	172,797	5,230	238,601	2,560	246,391	-73,594
2034	254,286	26,421	80,127	7,419	1,137	40,122	38,408	2,417	450,338	13,449	237,371	2,604	253,424	196,914
2035	109,058	10,400	43,124	6,414	1,137	41,712	14,265	2,372	228,483	8,081	246,000	2,724	256,805	-28,323
2036	93,930	10,400	43,925	5,952	1,137	41,774	11,042	2,329	210,489	5,888	246,409	2,764	255,061	-44,572
2037	256,825	10,400	69,683	9,945	1,137	40,192	35,918	2,300	426,399	13,693	236,310	2,829	252,832	173,567
2038	62,864	4,744	53,510	2,332	1,137	42,432	4,315	2,239	173,572	7,834	246,951	2,939	257,724	-84,152
2039	53,174	6,913	39,667	4,318	1,137	42,962	3,836	2,212	154,218	4,359	248,984	2,930	256,273	-102,055
<b>Average</b>	<b>130,637</b>	<b>10,134</b>	<b>33,539</b>	<b>5,627</b>	<b>1,137</b>	<b>39,604</b>	<b>17,820</b>	<b>2,997</b>	<b>241,495</b>	<b>6,216</b>	<b>235,761</b>	<b>2,864</b>	<b>244,841</b>	<b>-3,346</b>

Note:  
 [1] Model-Calculated  
 [2] Model input data from Allocation Model  
 [3] Model input data from Allocation Model  
 [4] Model input based on historical conditions  
 [5] Model input based on historical conditions  
 [6] Model input data from Allocation Model  
 [7] Model input based on historical conditions  
 [8] Model input based on historical conditions  
 [9] = sum of [1] through [8]  
 [10] Model-Calculated  
 [11] Model input data from Allocation Model  
 [12] Model input based on historical conditions  
 and model-calculated water level in Heap Well  
 [13] = sum of [10] through [12]  
 [14] = [9]-[13]

Summary of Spreading for Model Prediction Runs

Model Year	Hydrologic Year	Scenario A [acre-ft]			Scenario D [acre-ft]			Most Likely Scenario [acre-ft]		
		Inside SBBA	Outside SBBA	Total	Inside SBBA	Outside SBBA	Total	Inside SBBA	Outside SBBA	Total
2001	1961-62	13,695	0	<b>13,695</b>	12,144	0	<b>12,144</b>	12,298	0	<b>12,298</b>
2002	1962-63	9,189	0	<b>9,189</b>	4,653	0	<b>4,653</b>	5,699	0	<b>5,699</b>
2003	1963-64	9,691	0	<b>9,691</b>	4,981	0	<b>4,981</b>	5,704	0	<b>5,704</b>
2004	1964-65	11,462	0	<b>11,462</b>	6,519	0	<b>6,519</b>	8,567	0	<b>8,567</b>
2005	1965-66	30,158	6,897	<b>37,055</b>	25,825	0	<b>25,825</b>	28,109	7,935	<b>36,044</b>
2006	1966-67	73,434	3,505	<b>76,939</b>	59,258	5,485	<b>64,743</b>	71,030	6,399	<b>77,429</b>
2007	1967-68	18,745	3,392	<b>22,137</b>	9,203	0	<b>9,203</b>	9,744	0	<b>9,744</b>
2008	1968-69	12,201	26,852	<b>39,053</b>	61,880	21,116	<b>82,996</b>	53,900	26,852	<b>80,752</b>
2009	1969-70	45,253	0	<b>45,253</b>	39,007	16,676	<b>55,683</b>	47,498	2,083	<b>49,581</b>
2010	1970-71	45,957	0	<b>45,957</b>	21,832	0	<b>21,832</b>	49,129	0	<b>49,129</b>
2011	1971-72	50,786	6,897	<b>57,683</b>	40,085	0	<b>40,085</b>	50,048	13,284	<b>63,332</b>
2012	1972-73	49,875	0	<b>49,875</b>	64,168	0	<b>64,168</b>	53,591	2,594	<b>56,185</b>
2013	1973-74	47,394	6,897	<b>54,291</b>	53,482	0	<b>53,482</b>	41,434	0	<b>41,434</b>
2014	1974-75	50,441	6,897	<b>57,338</b>	51,783	0	<b>51,783</b>	46,832	0	<b>46,832</b>
2015	1975-76	54,872	8,980	<b>63,852</b>	37,243	0	<b>37,243</b>	41,839	0	<b>41,839</b>
2016	1976-77	14,029	0	<b>14,029</b>	3,970	0	<b>3,970</b>	6,138	0	<b>6,138</b>
2017	1977-78	92,375	9,254	<b>101,629</b>	100,109	0	<b>100,109</b>	90,833	8,148	<b>98,981</b>
2018	1978-79	81,142	7,877	<b>89,019</b>	78,585	0	<b>78,585</b>	73,203	7,041	<b>80,244</b>
2019	1979-80	34,266	17,073	<b>51,339</b>	80,934	16,960	<b>97,894</b>	68,588	13,891	<b>82,479</b>
2020	1980-81	37,271	6,897	<b>44,168</b>	36,779	6,897	<b>43,676</b>	39,829	15,682	<b>55,511</b>
2021	1981-82	32,415	0	<b>32,415</b>	46,157	0	<b>46,157</b>	32,169	0	<b>32,169</b>
2022	1982-83	45,020	14,639	<b>59,659</b>	51,575	13,794	<b>65,369</b>	43,302	14,573	<b>57,875</b>
2023	1983-84	35,584	6,897	<b>42,481</b>	60,174	3,392	<b>63,566</b>	38,707	7,265	<b>45,972</b>
2024	1984-85	56,189	12,372	<b>68,561</b>	50,385	0	<b>50,385</b>	50,521	0	<b>50,521</b>
2025	1985-86	57,737	0	<b>57,737</b>	48,513	0	<b>48,513</b>	56,883	0	<b>56,883</b>
2026	1986-87	48,636	6,682	<b>55,318</b>	32,511	0	<b>32,511</b>	41,577	0	<b>41,577</b>
2027	1987-88	19,235	0	<b>19,235</b>	11,430	0	<b>11,430</b>	13,428	0	<b>13,428</b>
2028	1988-89	44,994	0	<b>44,994</b>	26,632	0	<b>26,632</b>	45,091	0	<b>45,091</b>
2029	1989-90	12,947	0	<b>12,947</b>	10,542	0	<b>10,542</b>	10,892	0	<b>10,892</b>
2030	1990-91	10,476	0	<b>10,476</b>	9,426	0	<b>9,426</b>	13,142	0	<b>13,142</b>
2031	1991-92	16,177	0	<b>16,177</b>	15,342	0	<b>15,342</b>	15,857	0	<b>15,857</b>
2032	1992-93	108,436	11,875	<b>120,311</b>	115,497	13,236	<b>128,733</b>	111,634	19,189	<b>130,823</b>
2033	1993-94	55,262	9,843	<b>65,105</b>	37,628	0	<b>37,628</b>	26,732	0	<b>26,732</b>
2034	1994-95	92,757	5,859	<b>98,616</b>	102,535	3,903	<b>106,438</b>	106,548	5,859	<b>112,407</b>
2035	1995-96	59,479	3,392	<b>62,871</b>	59,271	0	<b>59,271</b>	53,524	0	<b>53,524</b>
2036	1996-97	58,260	0	<b>58,260</b>	61,286	0	<b>61,286</b>	54,325	0	<b>54,325</b>
2037	1997-98	88,188	2,152	<b>90,340</b>	81,195	235	<b>81,430</b>	80,083	1,902	<b>81,985</b>
2038	1998-99	56,142	0	<b>56,142</b>	56,829	0	<b>56,829</b>	58,254	0	<b>58,254</b>
2039	1999-00	41,024	0	<b>41,024</b>	45,937	0	<b>45,937</b>	46,580	0	<b>46,580</b>
Maximum		108,436	26,852	<b>120,311</b>	115,497	21,116	<b>128,733</b>	111,634	26,852	<b>130,823</b>
Minimum		9,189	0	<b>9,189</b>	3,970	0	<b>3,970</b>	5,699	0	<b>5,699</b>
Average		44,133	4,747	<b>48,880</b>	43,982	2,608	<b>46,590</b>	43,673	3,915	<b>47,589</b>

Source: SAIC