Final Environmental Impact Statement

Thacker Pass Lithium Mine Project

Appendix P, Part 3 of 8

Water Information

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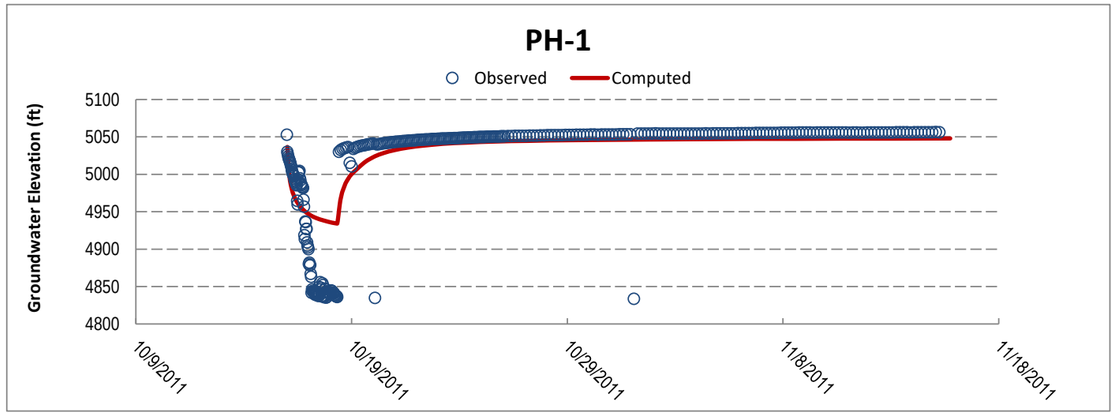

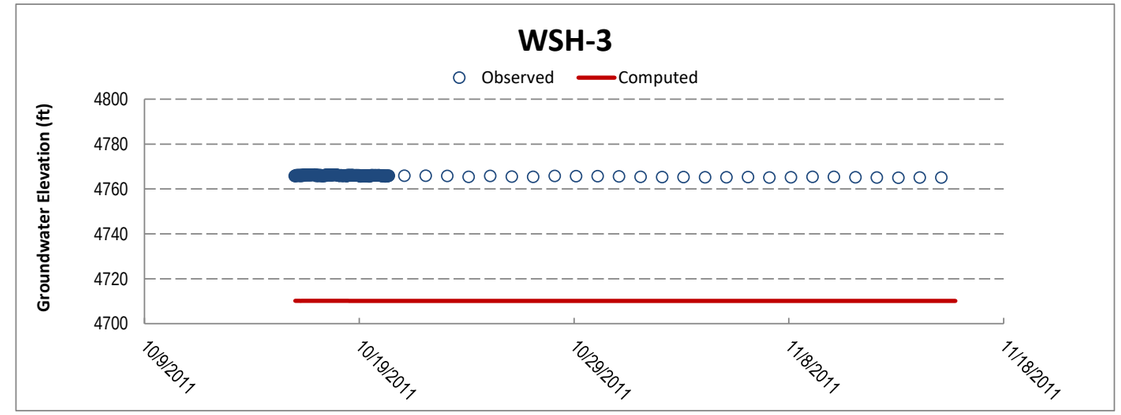

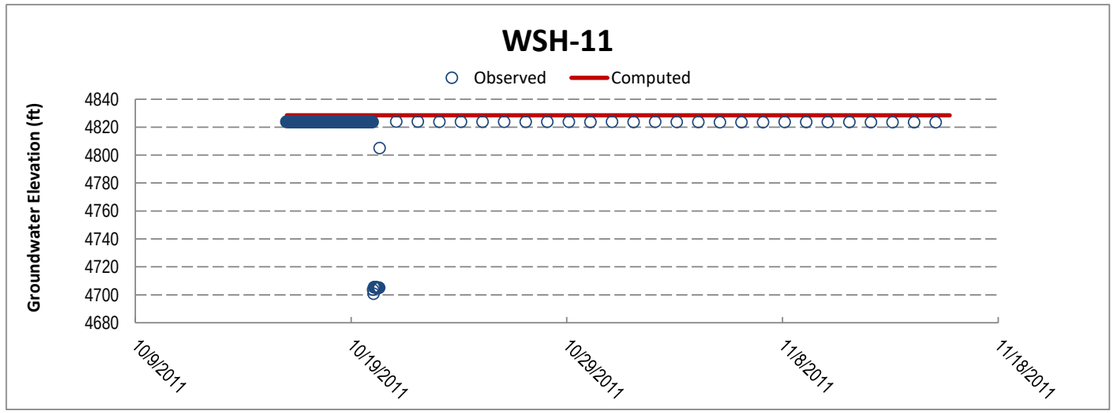

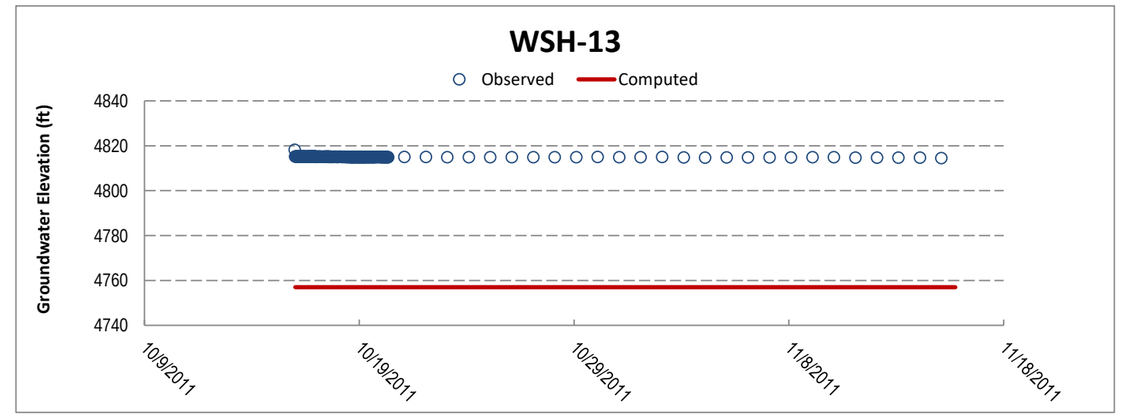

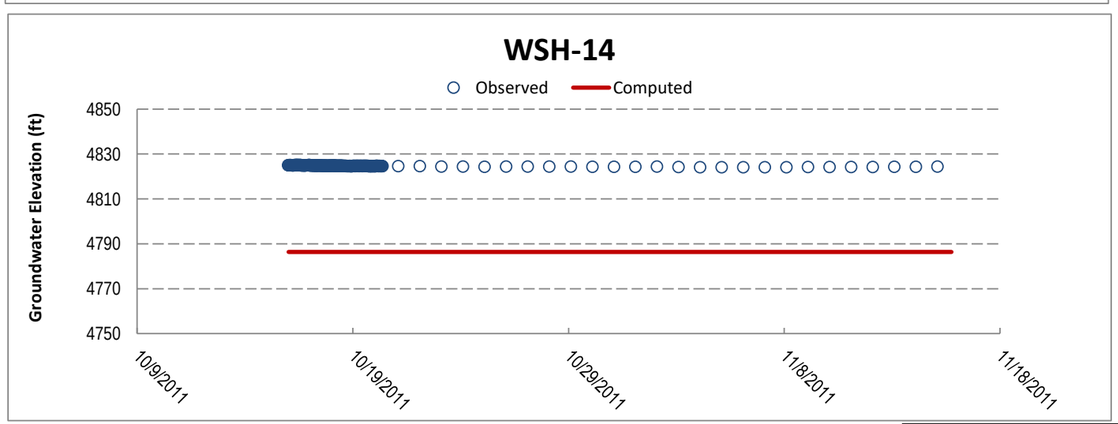

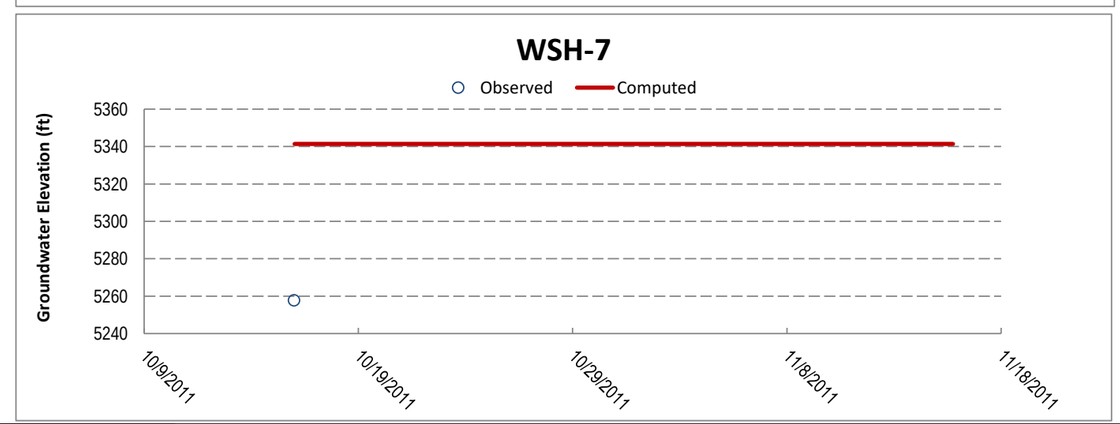

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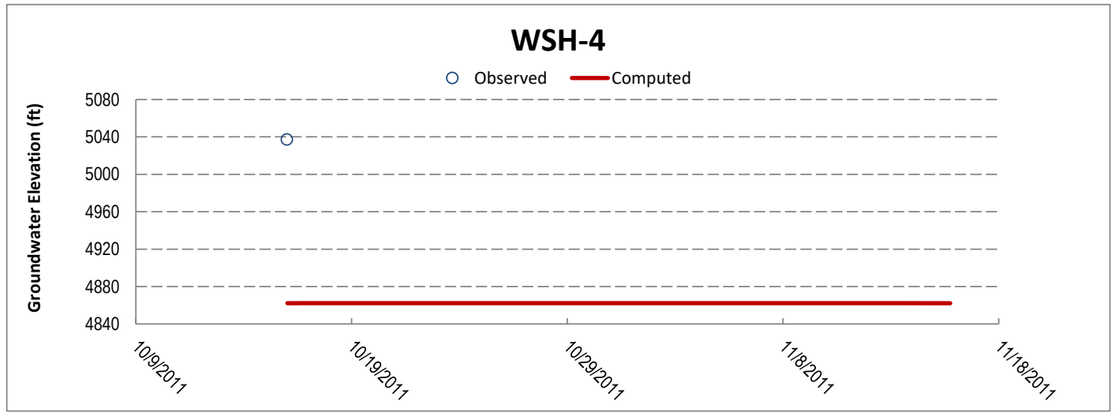
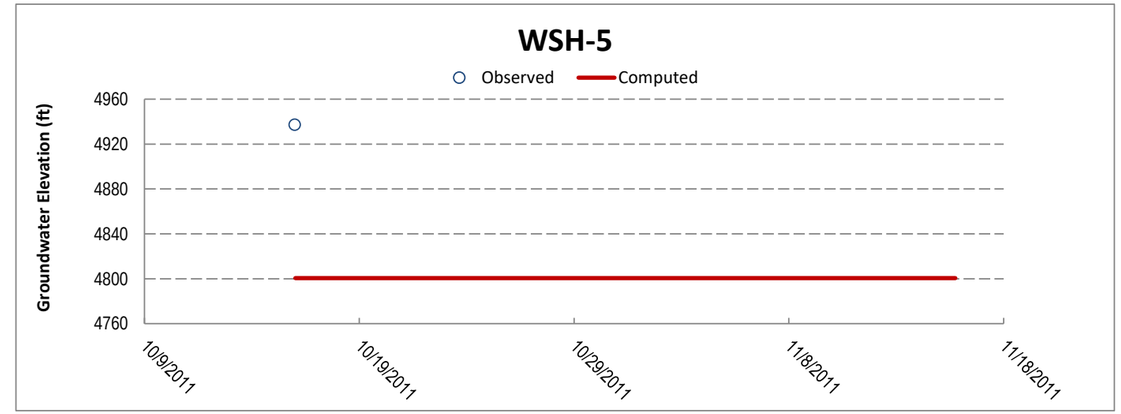
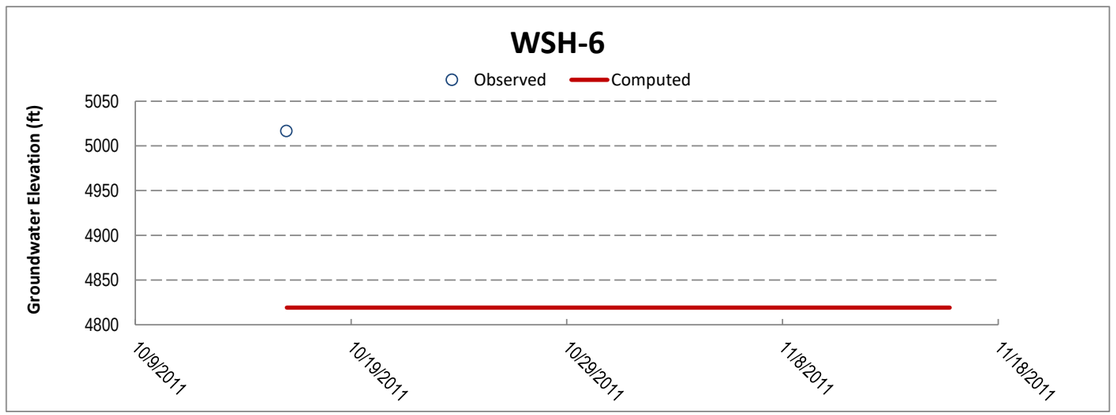
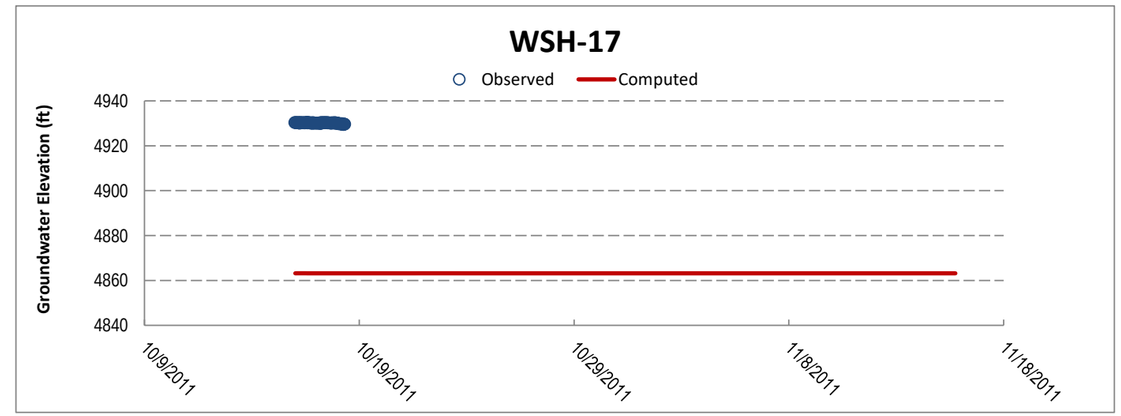
PH-1 Transient Calibration Hydrographs	
CLIENT: LNC	PROJECT: Thacker Pass Project EIS
JOB: 3898	DRAWN: LH CHECKED: TC
DATE: May 2020	FIGURE: 3.45a









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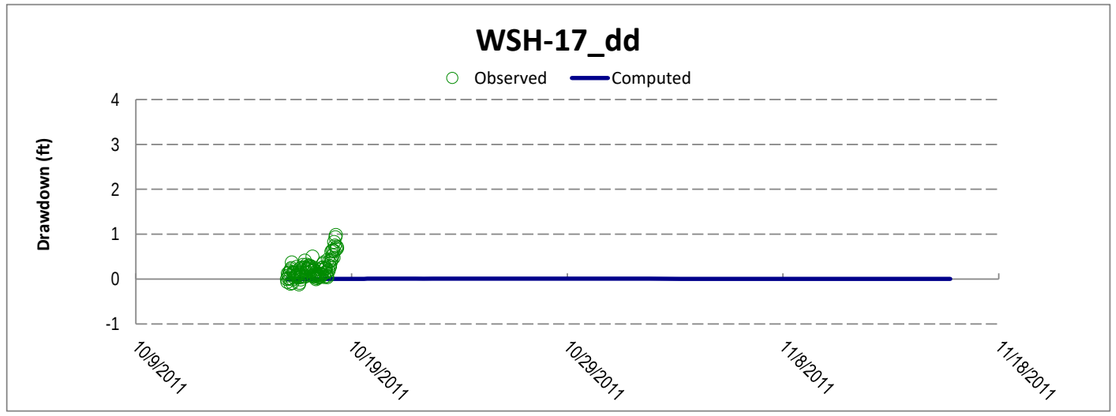
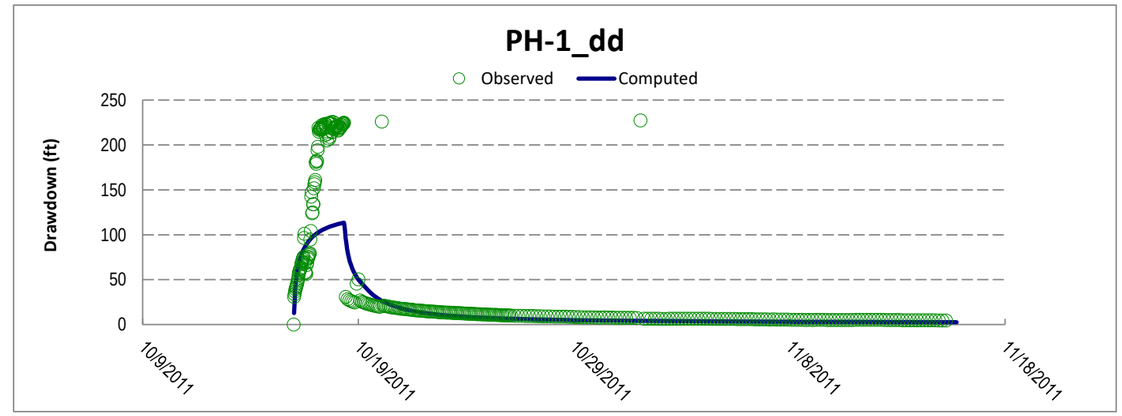
PH-1 Transient Calibration Hydrographs

CLIENT: LNC	PROJECT: Thacker Pass Project EIS
JOB: 3898	DRAWN: LH CHECKED: TC
DATE: May 2020	FIGURE: 3.45b





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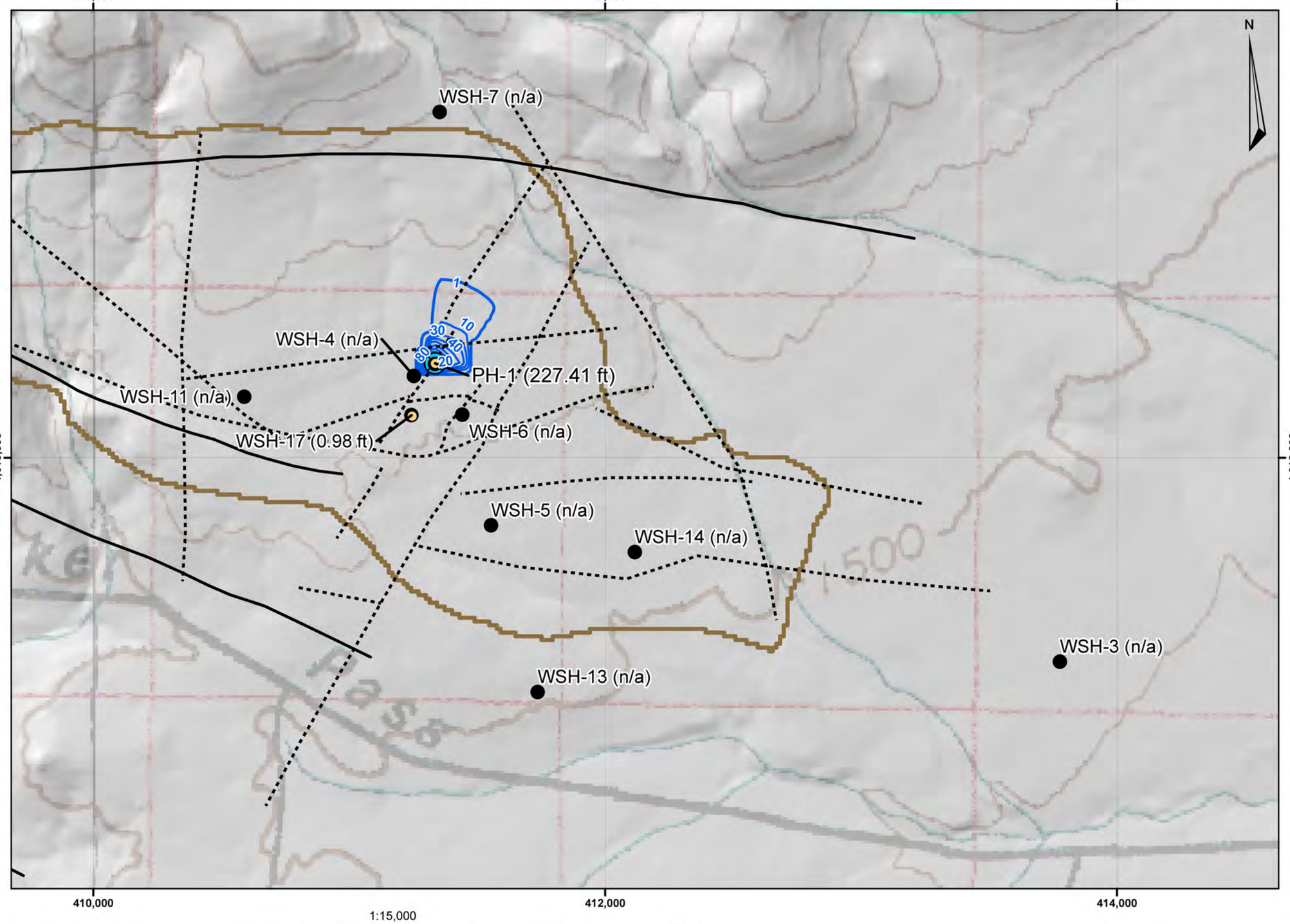
PH-1 Transient Calibration Drawdown

CLIENT: LNC	PROJECT: Thacker Pass Project EIS
JOB: 3898	DRAWN: LH CHECKED: TC
DATE: May 2020	FIGURE: 3.45c

H:\Project\3898\GIS\Kings Valley EIS\Mxds\Modeling Report\Figure 3.46 PH-1 aquifer test drawdown.mxd



PREPARED SOLELY FOR THE USE OF OUR CLIENT AND NO REPRESENTATION OF ANY KIND IS MADE TO OTHER PARTIES WITH WHICH PITEAU ASSOCIATES ENGINEERING LTD. HAS NOT ENTERED INTO A CONTRACT.

- Thacker Pass Project AOI
- Proposed pit outline
- Simulated drawdown at aquifer test end
- Range front fault
- Caldera rim fault
- Radial vent fault
- Minor fault
- PH-1 pumping well
- Water level target
- Drawdown target

PH-1 simulated aquifer test drawdown

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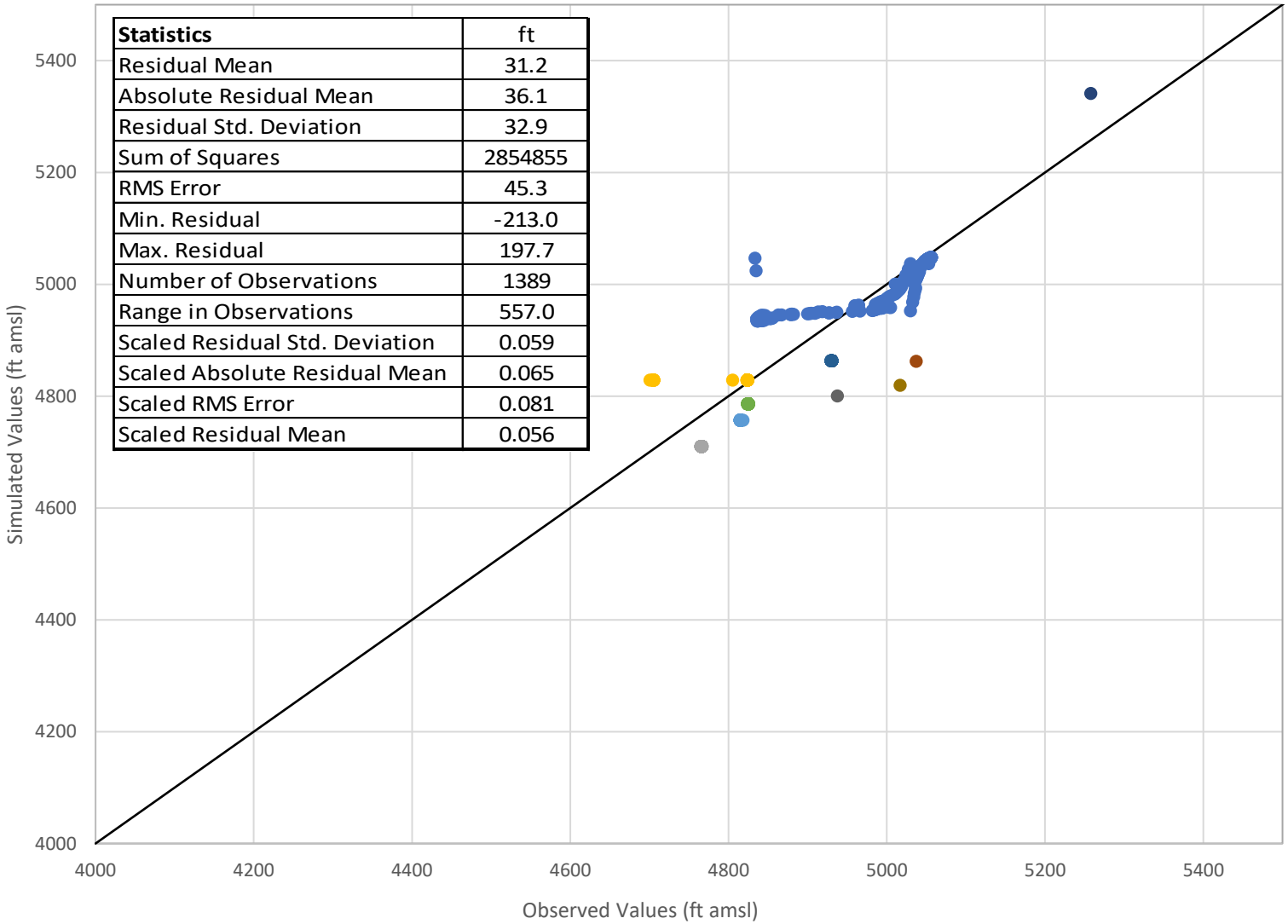
CLIENT:	LNC
PROJECT:	Thacker Pass Project EIS
JOB:	3898
DRAWN: LH	CHECKED: TC
DATE:	May 2020
FIGURE:	3.46



Statistics	ft
Residual Mean	31.2
Absolute Residual Mean	36.1
Residual Std. Deviation	32.9
Sum of Squares	2854855
RMS Error	45.3
Min. Residual	-213.0
Max. Residual	197.7
Number of Observations	1389
Range in Observations	557.0
Scaled Residual Std. Deviation	0.059
Scaled Absolute Residual Mean	0.065
Scaled RMS Error	0.081
Scaled Residual Mean	0.056

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PH-1 transient calibration: observed vs. simulated water levels

CLIENT: LNC

PROJECT: Thacker Pass Project EIS

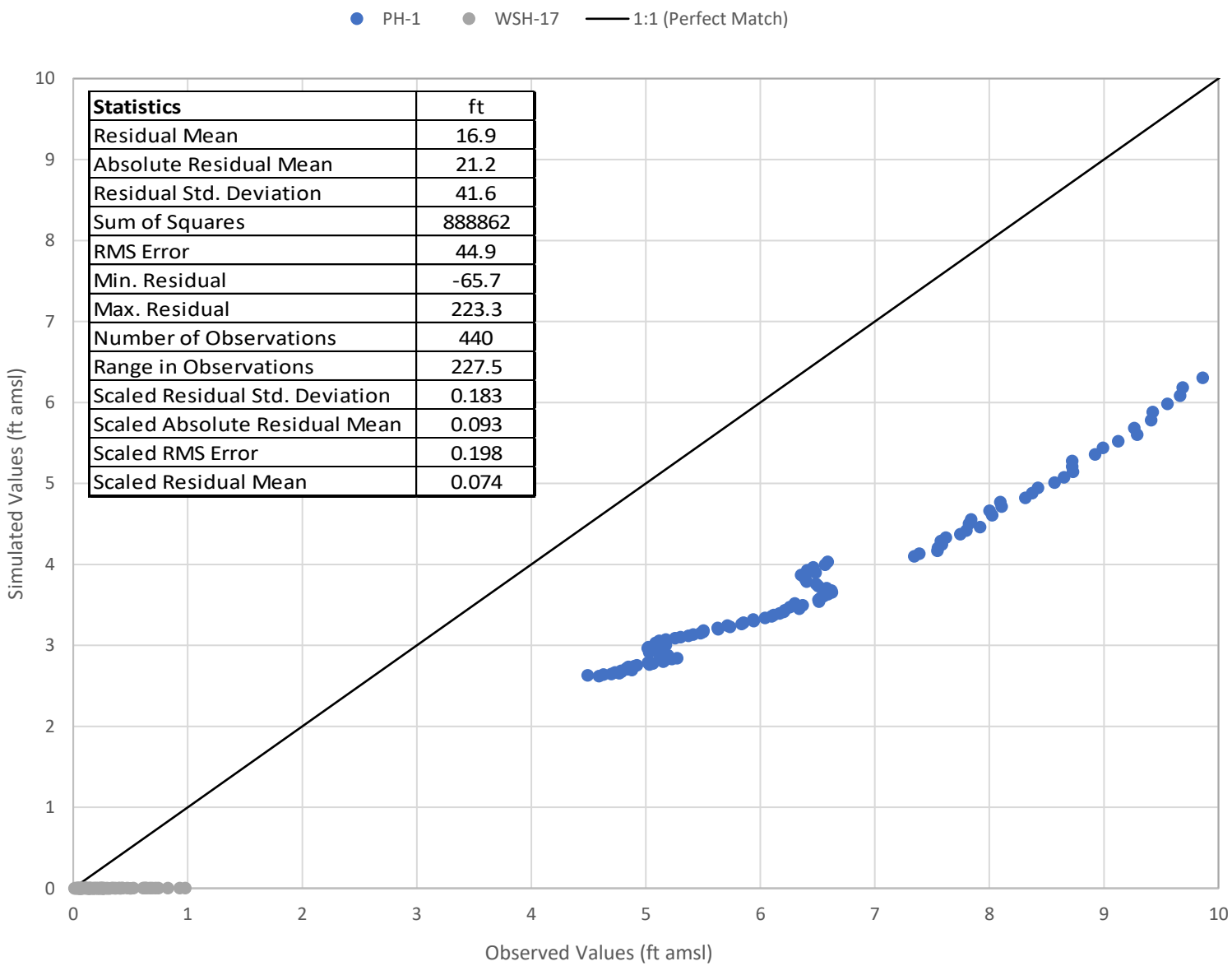
JOB #: 3898

DRAWN: LH

CHECKED: TC

DATE: May 2020

FIGURE: 3.47



Statistics	ft
Residual Mean	16.9
Absolute Residual Mean	21.2
Residual Std. Deviation	41.6
Sum of Squares	888862
RMS Error	44.9
Min. Residual	-65.7
Max. Residual	223.3
Number of Observations	440
Range in Observations	227.5
Scaled Residual Std. Deviation	0.183
Scaled Absolute Residual Mean	0.093
Scaled RMS Error	0.198
Scaled Residual Mean	0.074

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PH-1 transient calibration: observed vs. simulated drawdown

CLIENT: LNC

PROJECT: Thacker Pass Project EIS

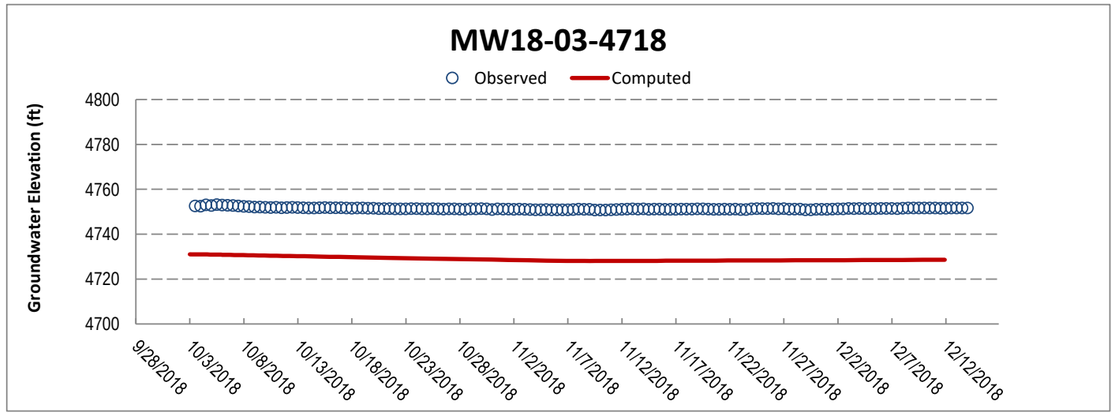
JOB #: 3898

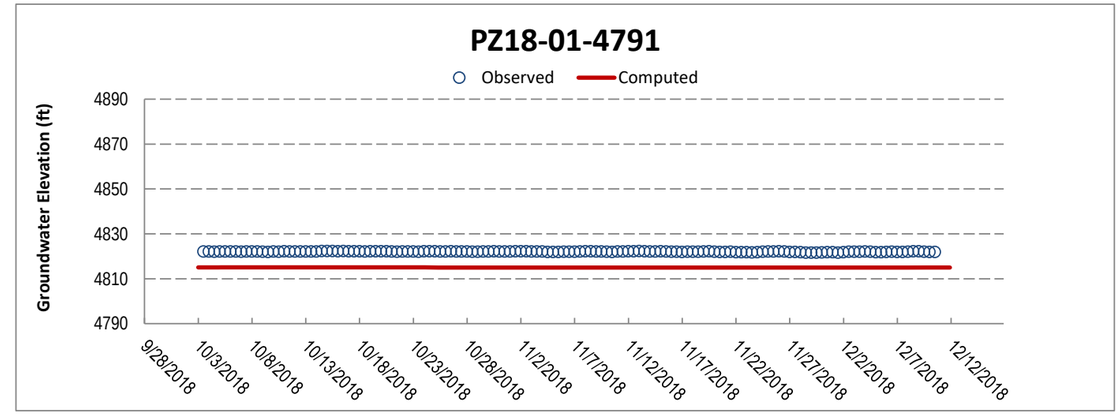
DRAWN: LH

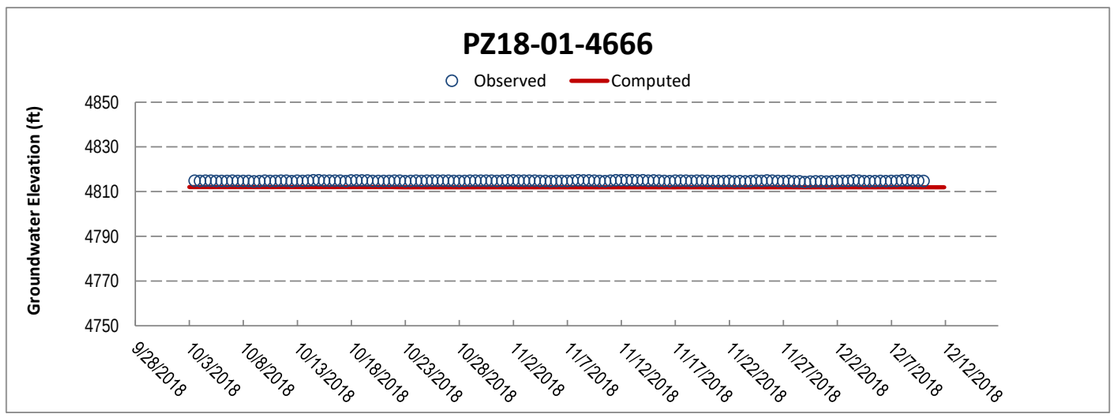
CHECKED: TC

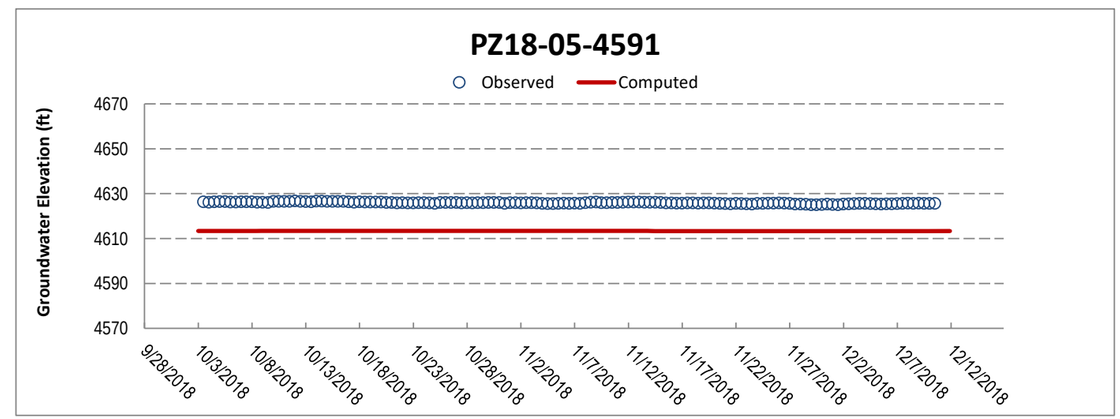
DATE: May 2020

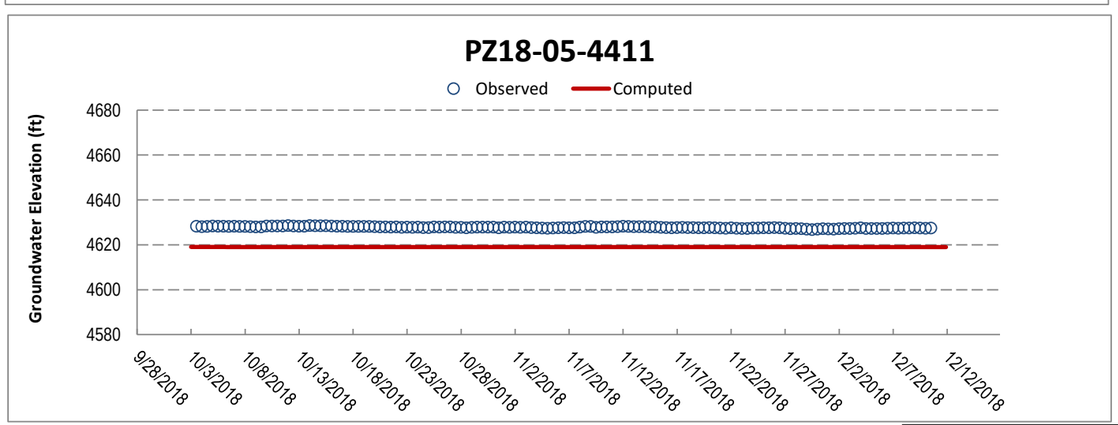
FIGURE: 3.48

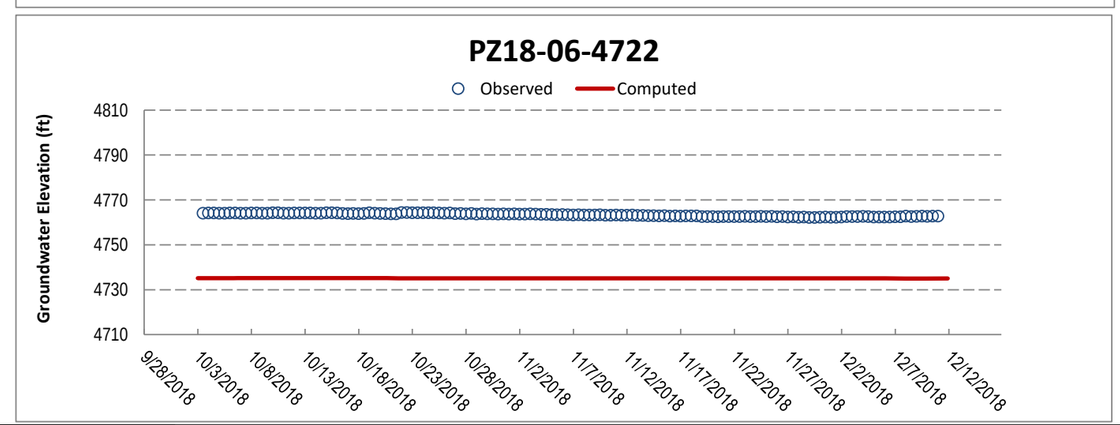












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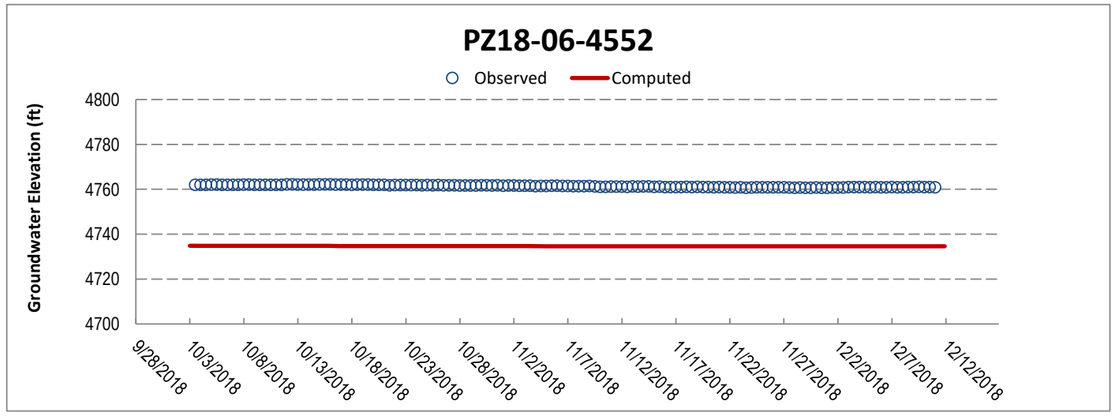
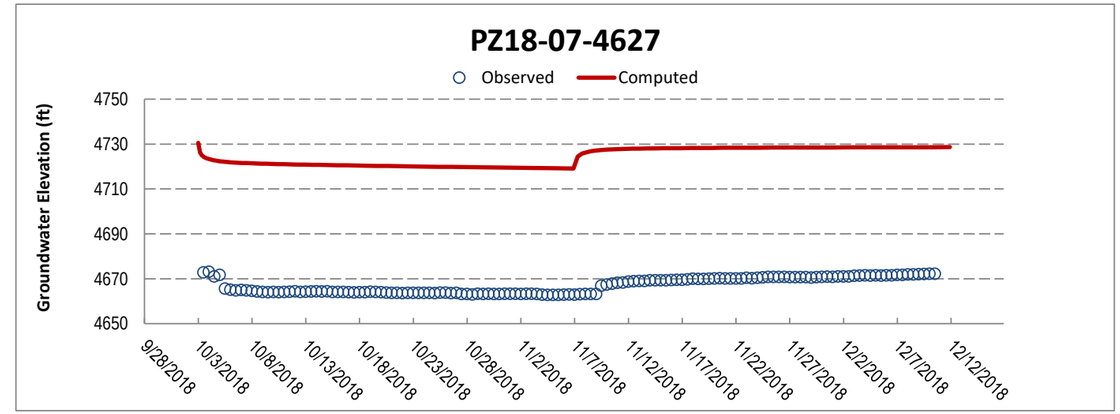
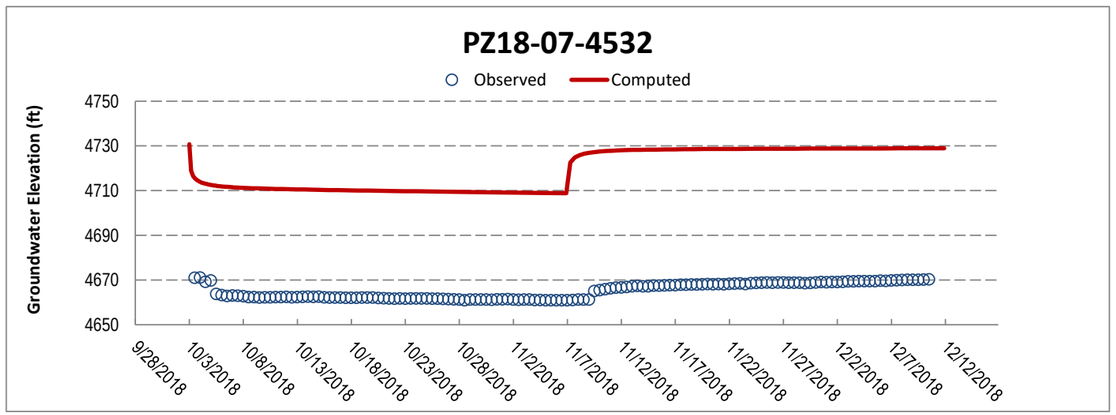
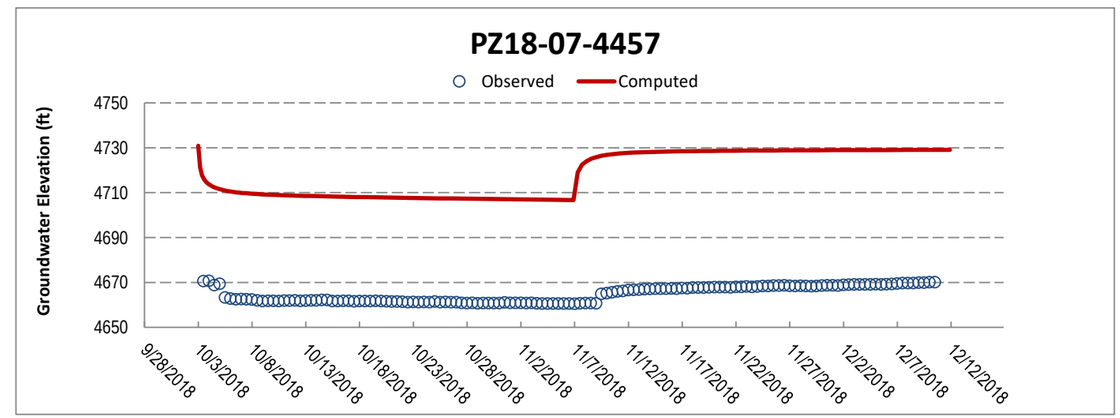
2018 Pumping tests transient calibration hydrographs

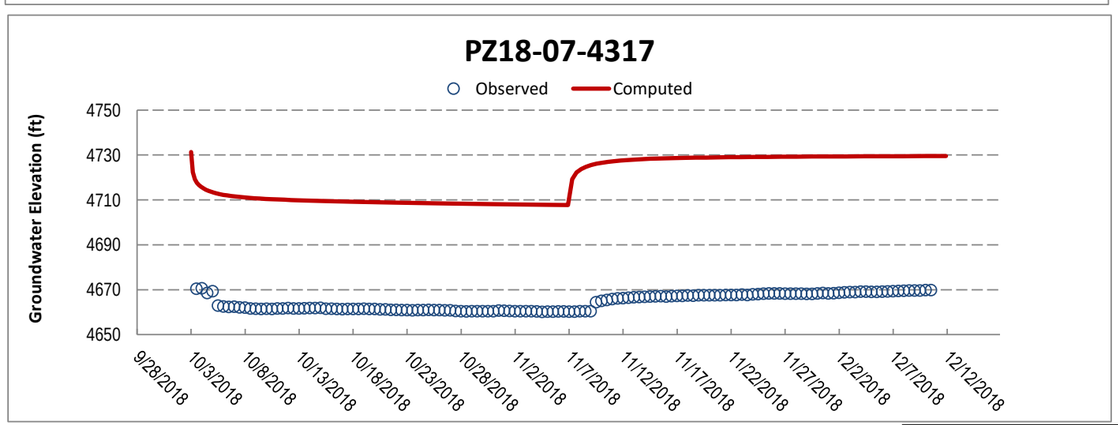
CLIENT: LNC	PROJECT: Thacker Pass Project EIS
JOB: 3898	DRAWN: LH CHECKED: TC
DATE: May 2020	FIGURE: 3.49a

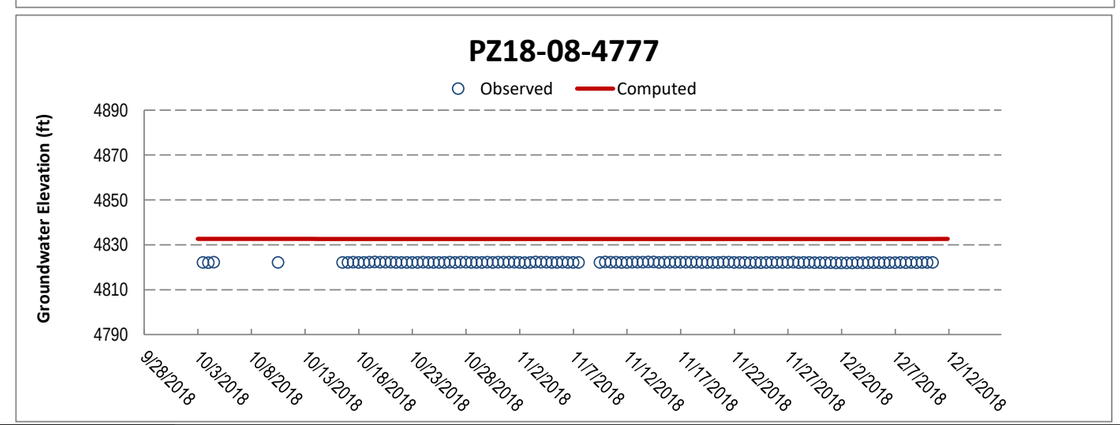












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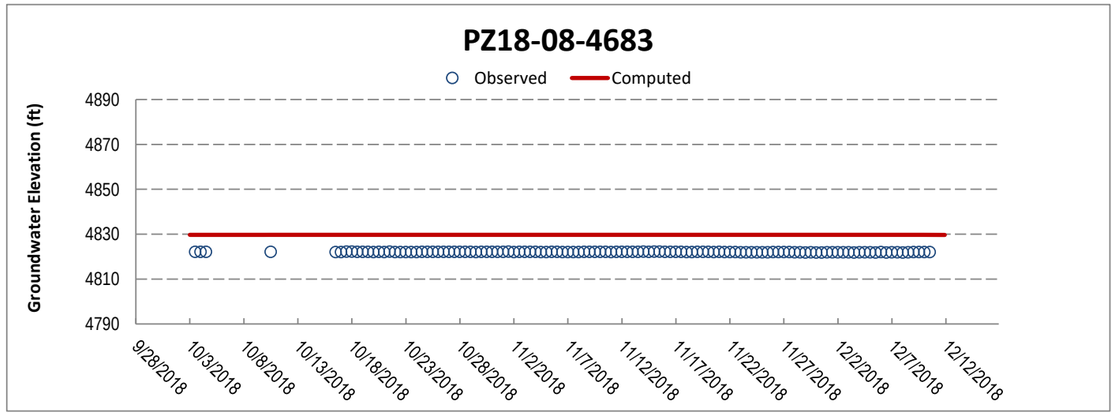
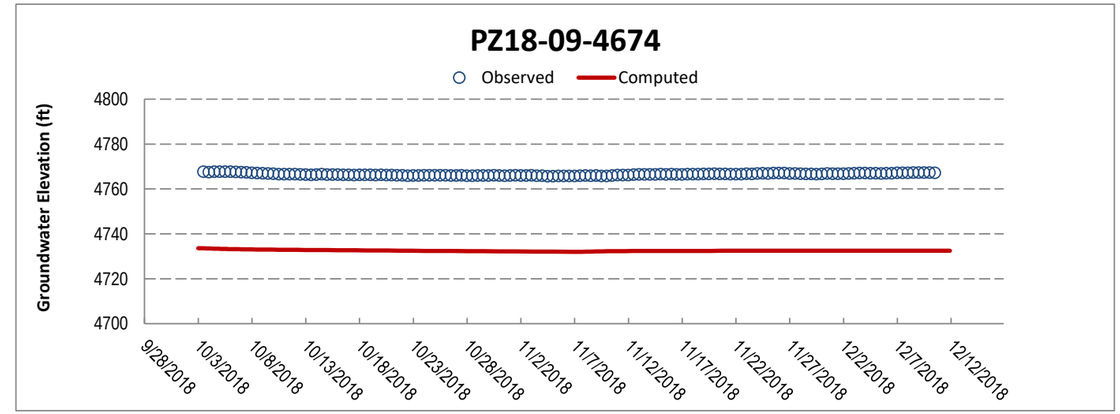
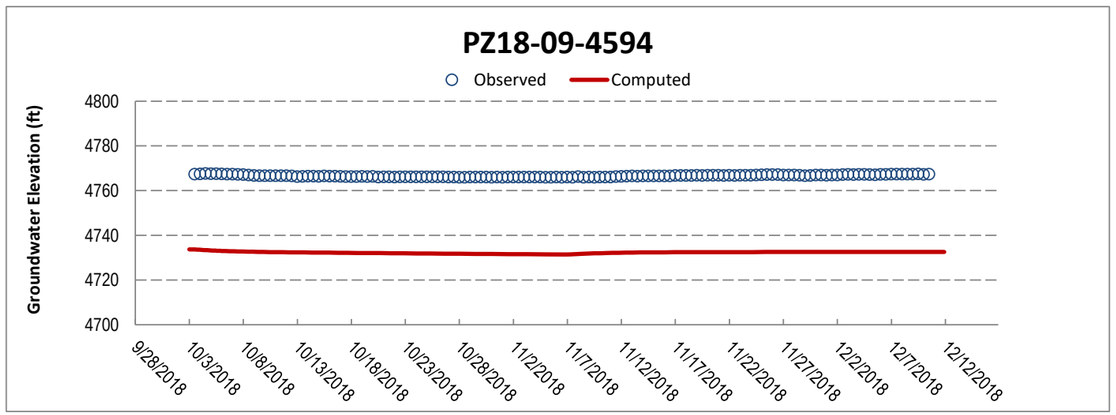
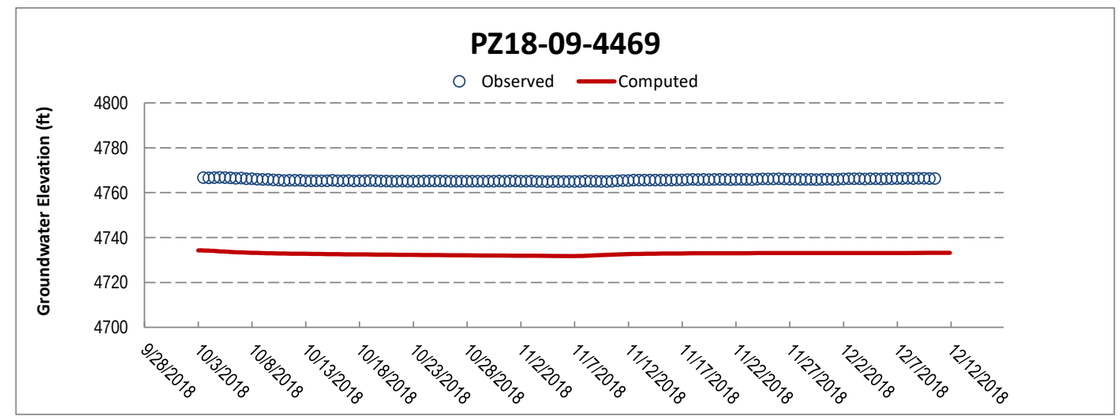
2018 Pumping tests transient calibration hydrographs

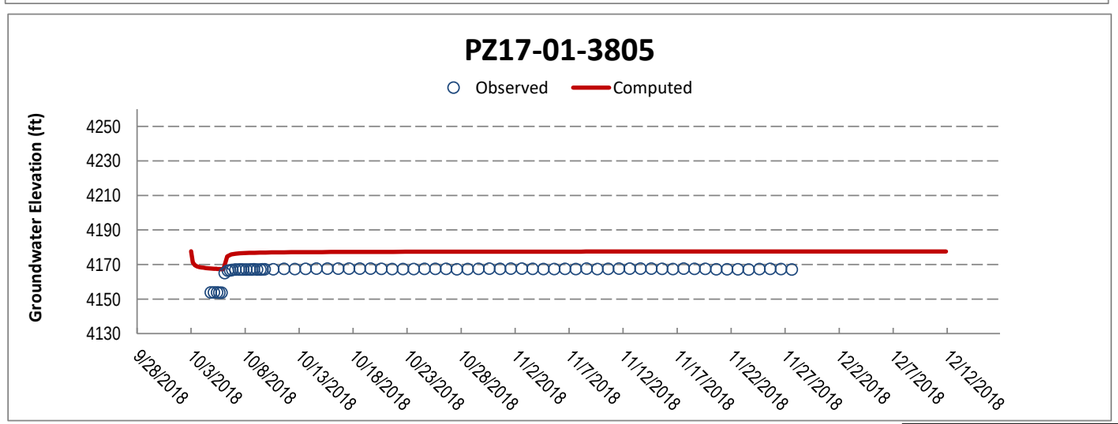
CLIENT: LNC	PROJECT: Thacker Pass Project EIS
JOB: 3898	DRAWN: LH CHECKED: TC
DATE: May 2020	FIGURE: 3.49b

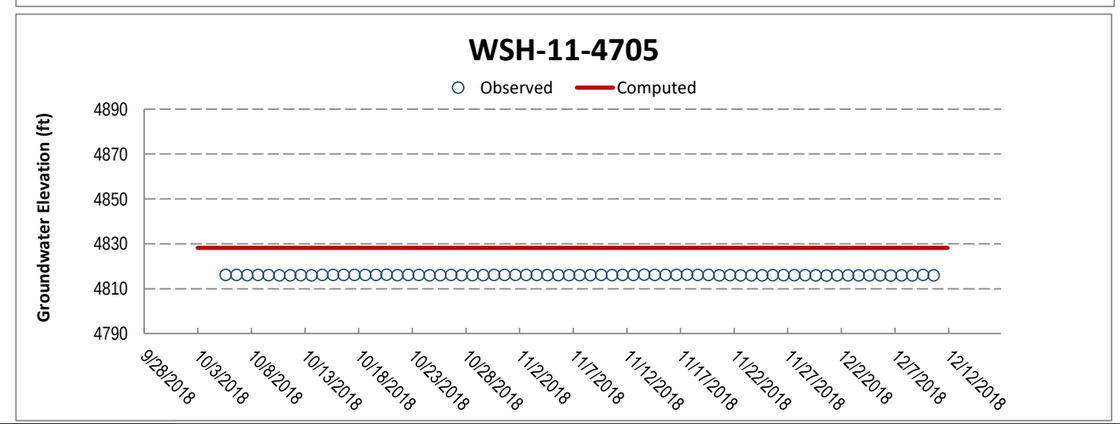












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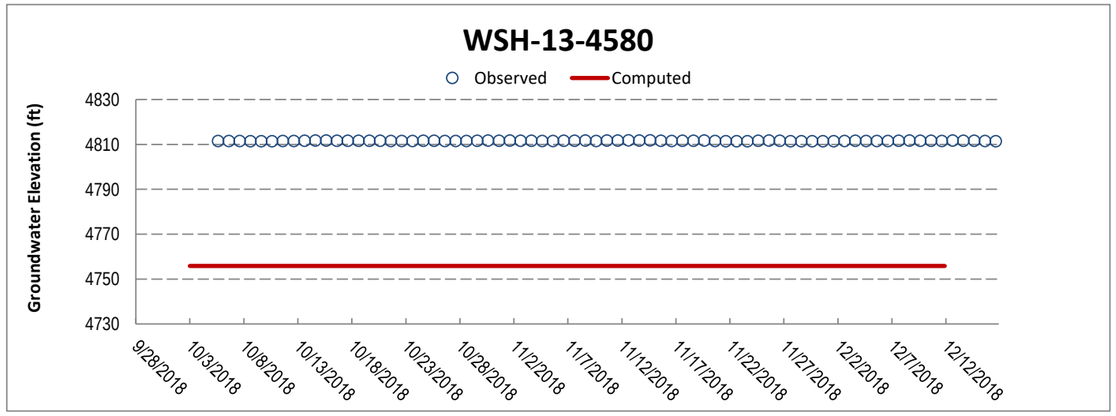
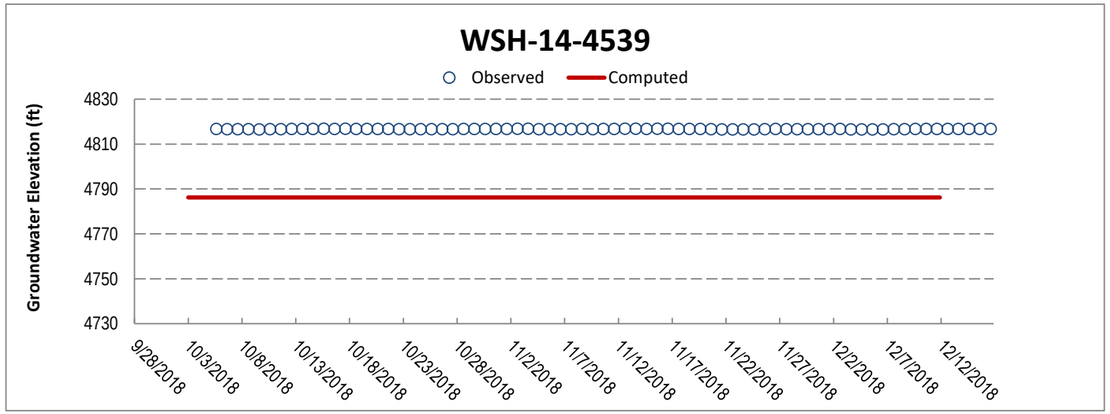
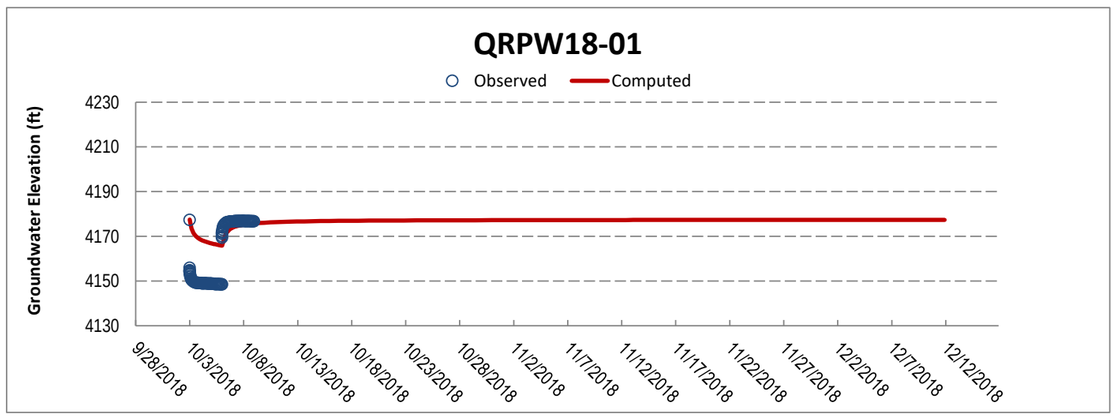
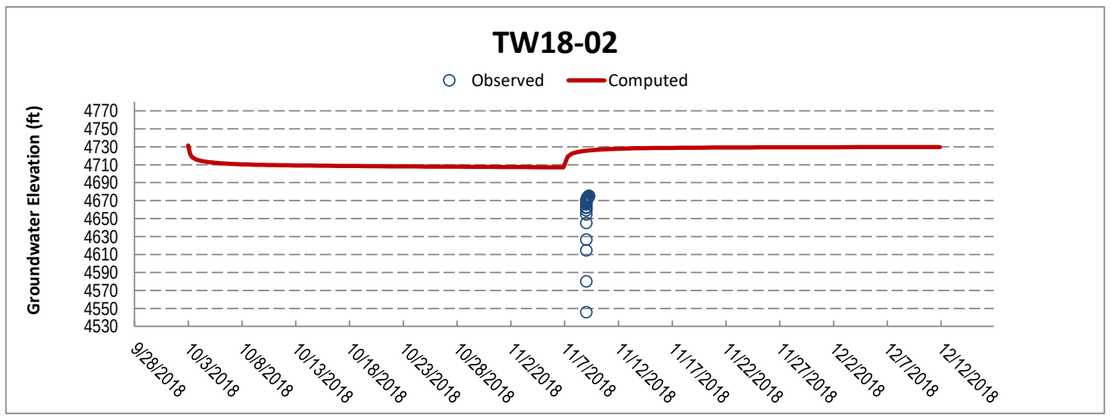
2018 Pumping tests transient calibration hydrographs

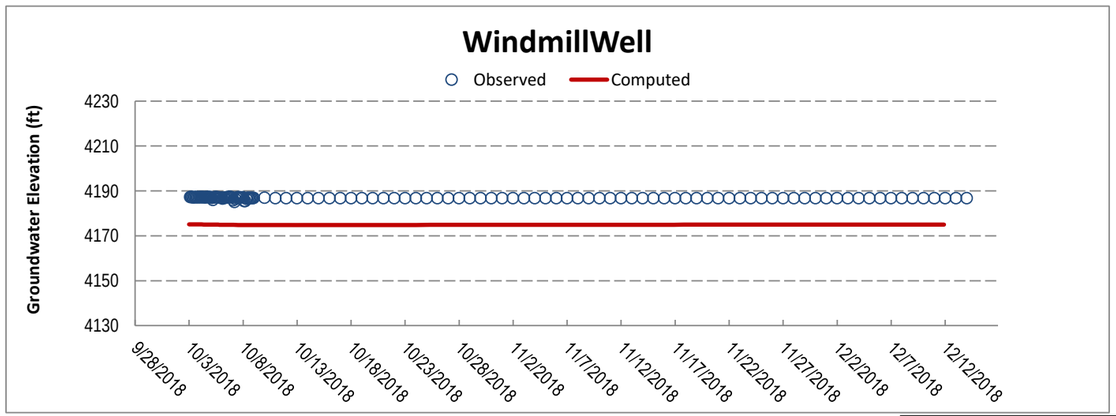
CLIENT: LNC	PROJECT: Thacker Pass Project EIS
JOB: 3898	DRAWN: LH CHECKED: TC
DATE: May 2020	FIGURE: 3.49c











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2018 Pumping tests transient calibration hydrographs

CLIENT: LNC	PROJECT: Thacker Pass Project EIS
JOB: 3898	DRAWN: LH CHECKED: TC
DATE: May 2020	FIGURE: 3.49d

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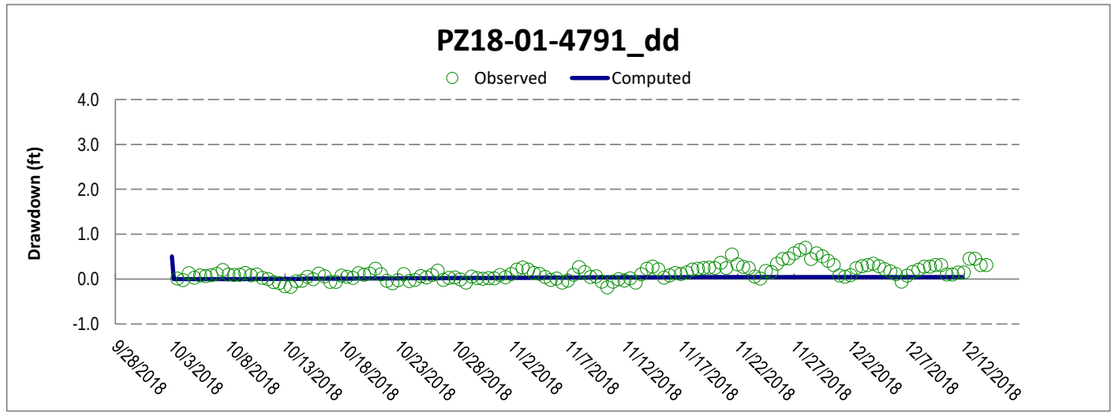

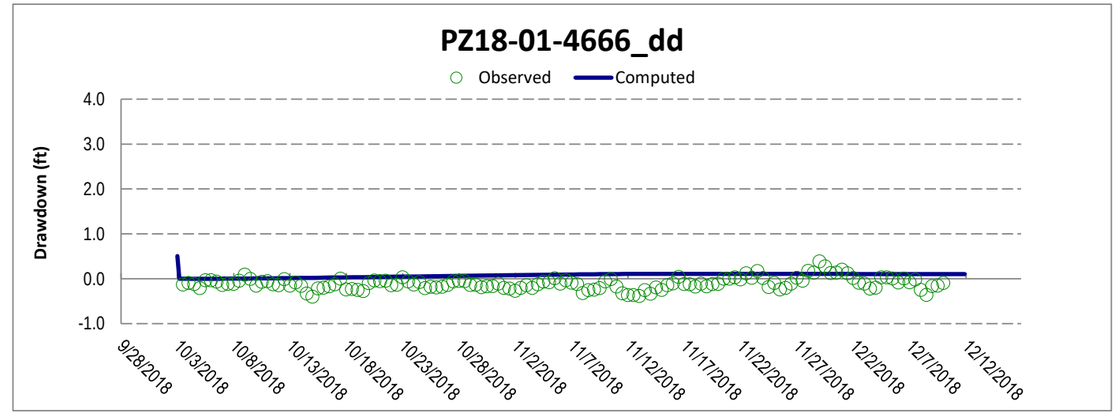

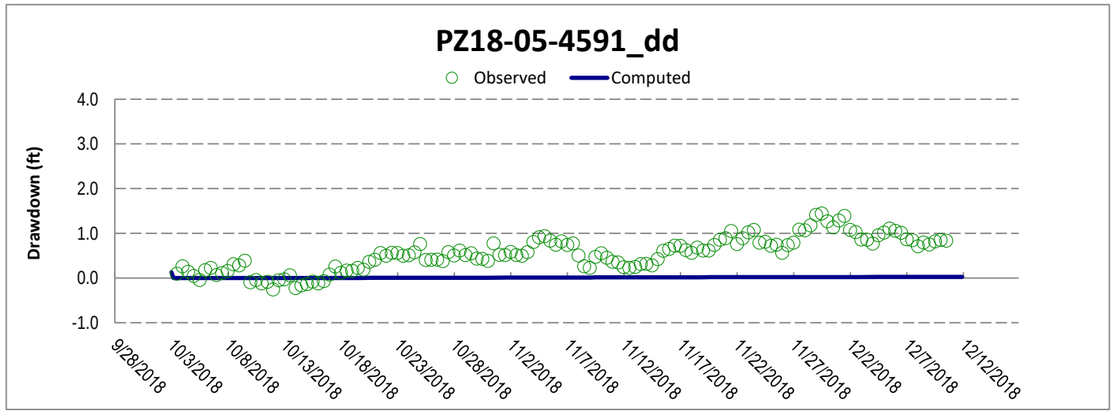

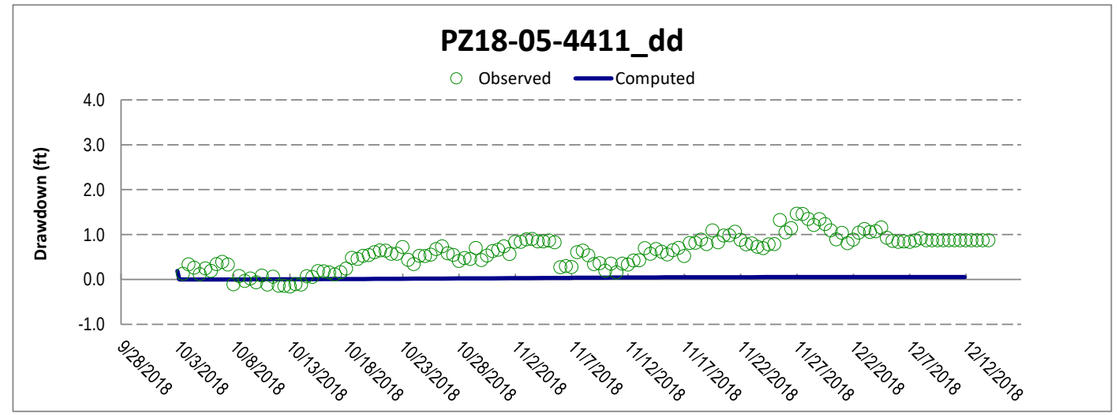

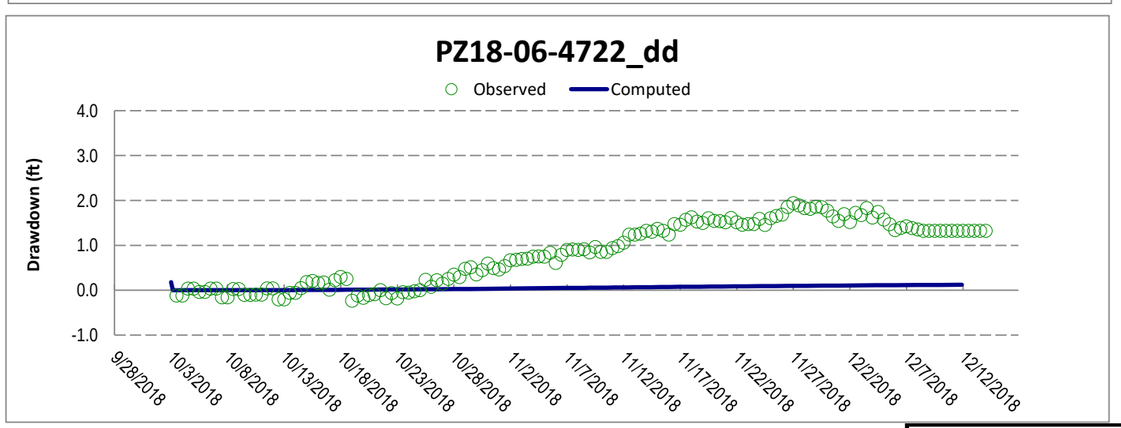

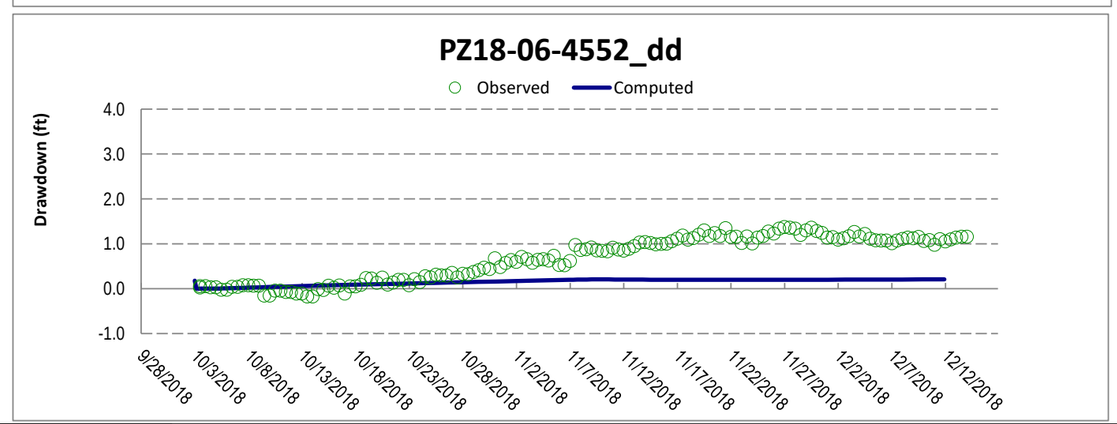

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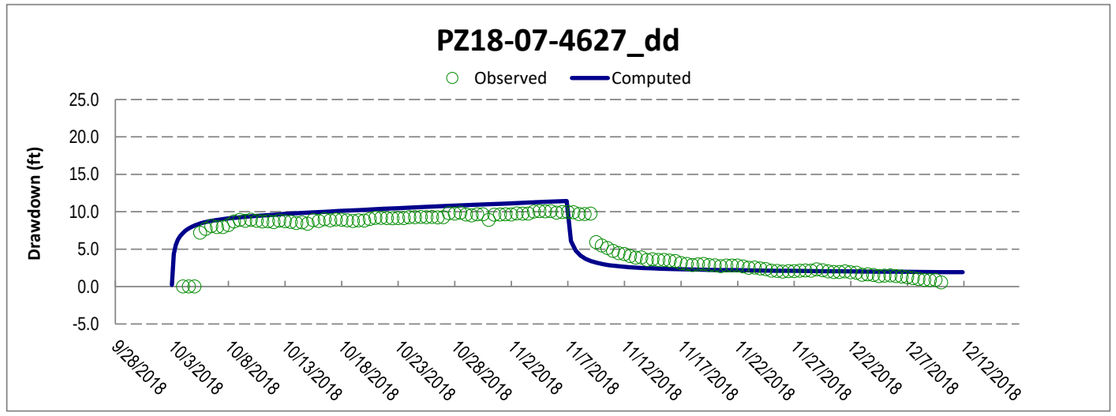
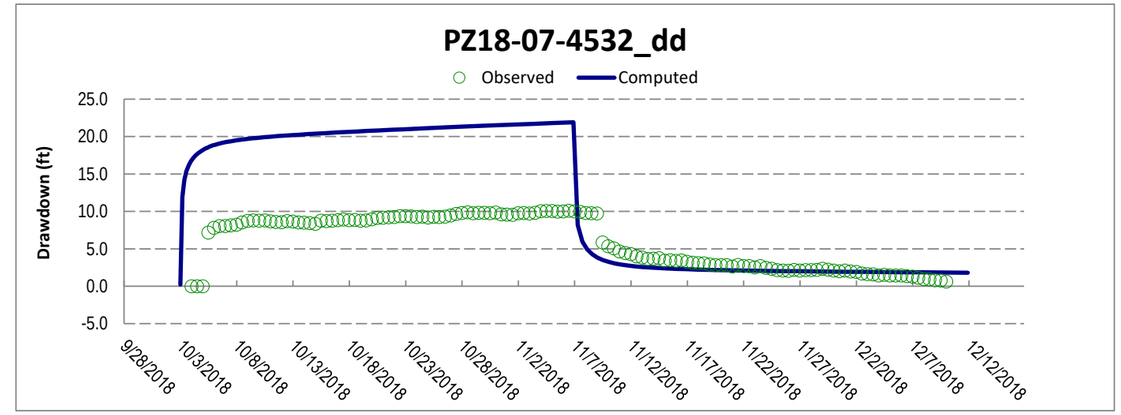
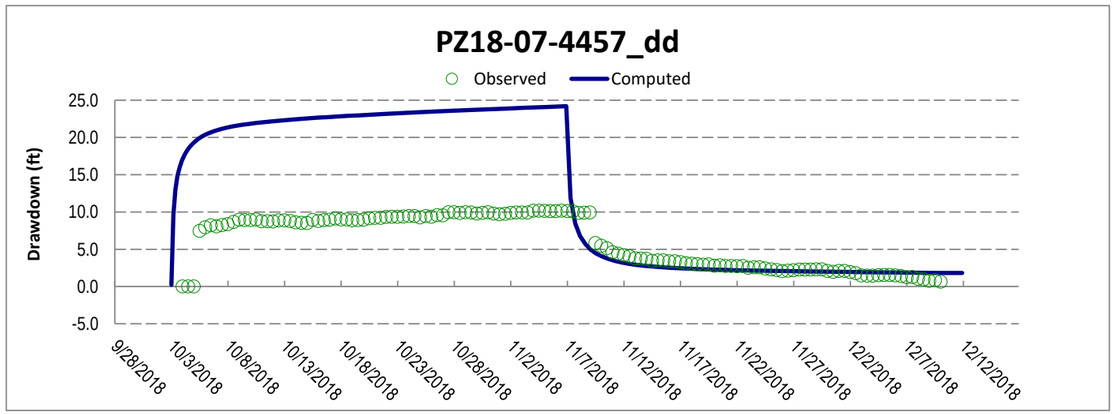
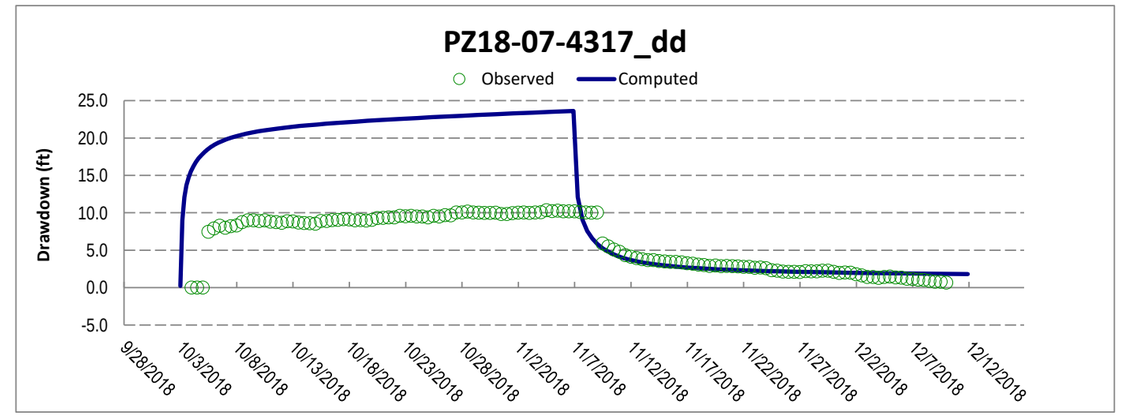
2018 Pumping tests transient calibration drawdown

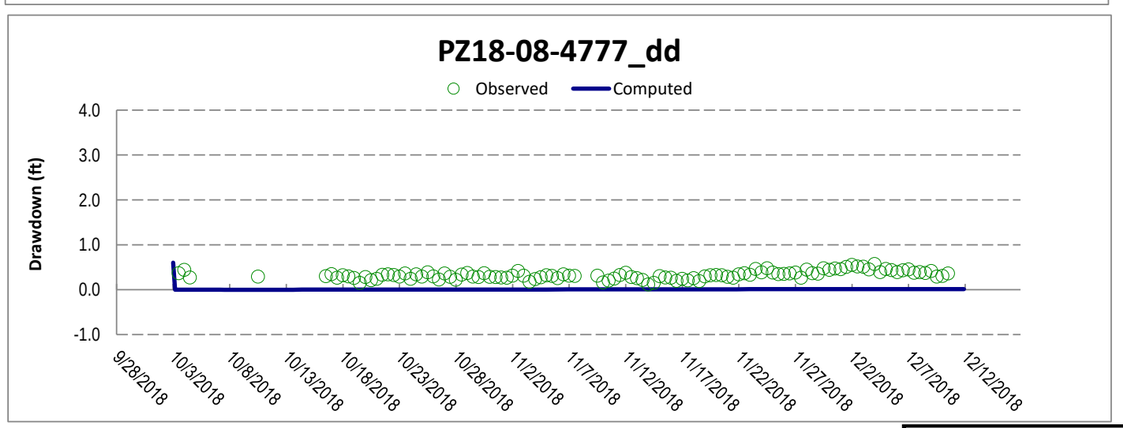
CLIENT: LNC	PROJECT: Thacker Pass Project EIS
JOB: 3898	DRAWN: LH CHECKED: TC
DATE: May 2020	FIGURE: 3.49e

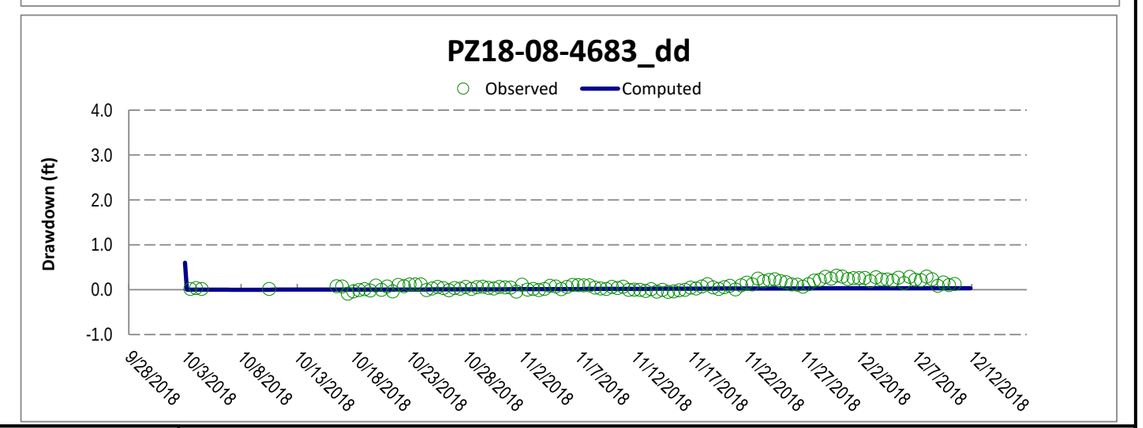












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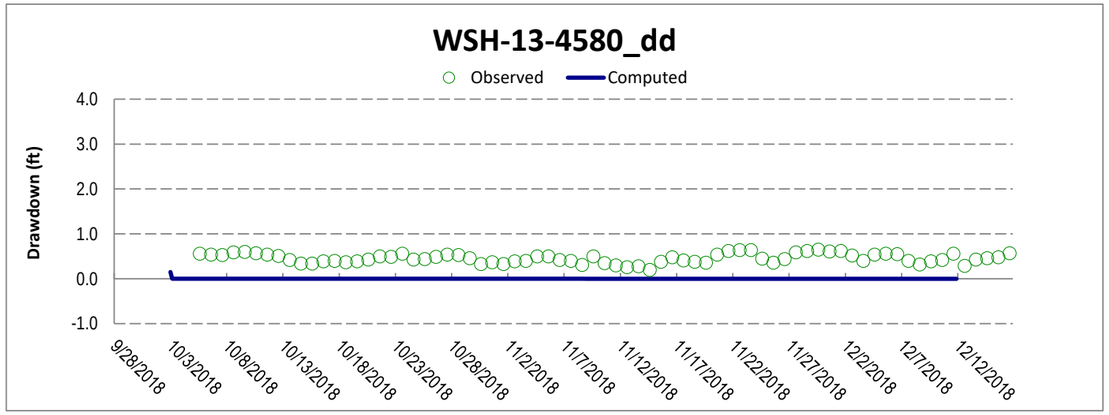
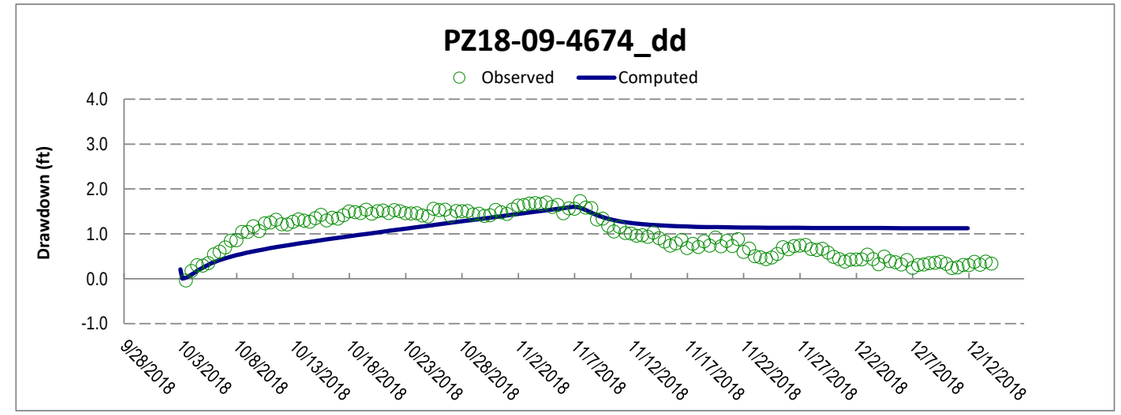
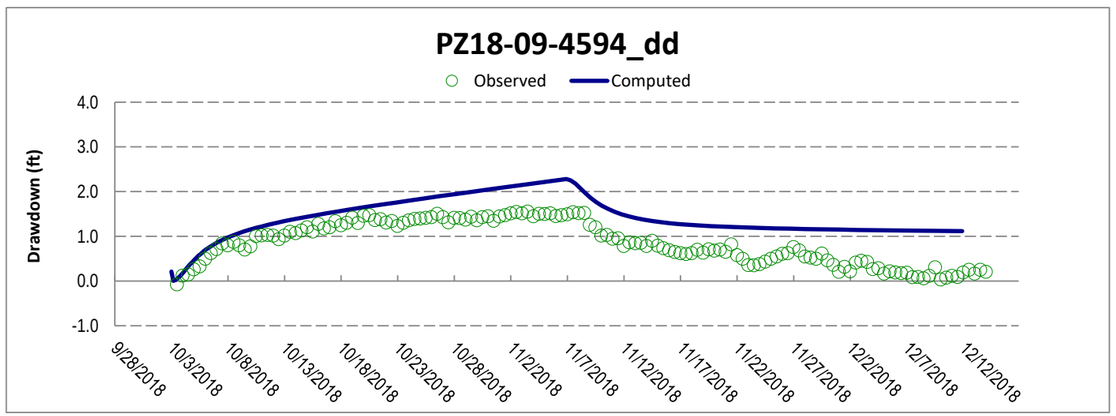
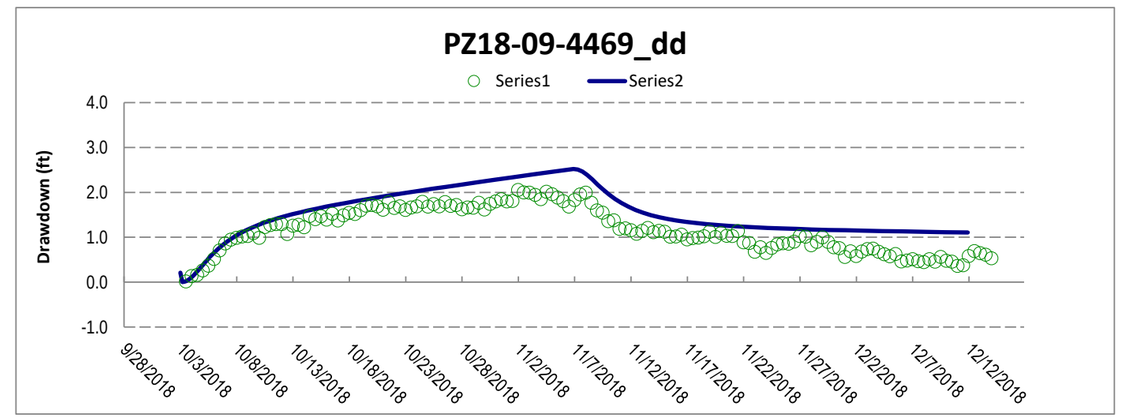
2018 Pumping tests transient calibration drawdown

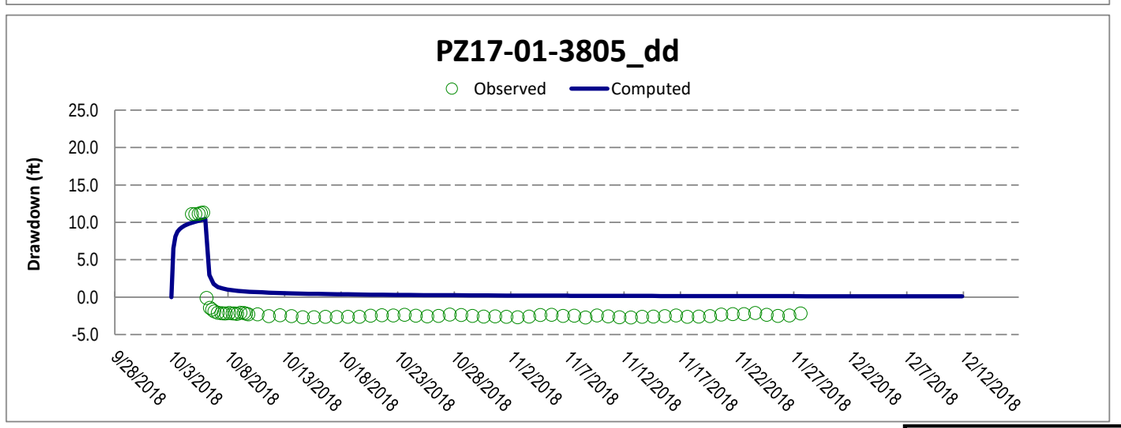
CLIENT: LNC	PROJECT: Thacker Pass Project EIS
JOB: 3898	DRAWN: LH CHECKED: TC
DATE: May 2020	FIGURE: 3.49f

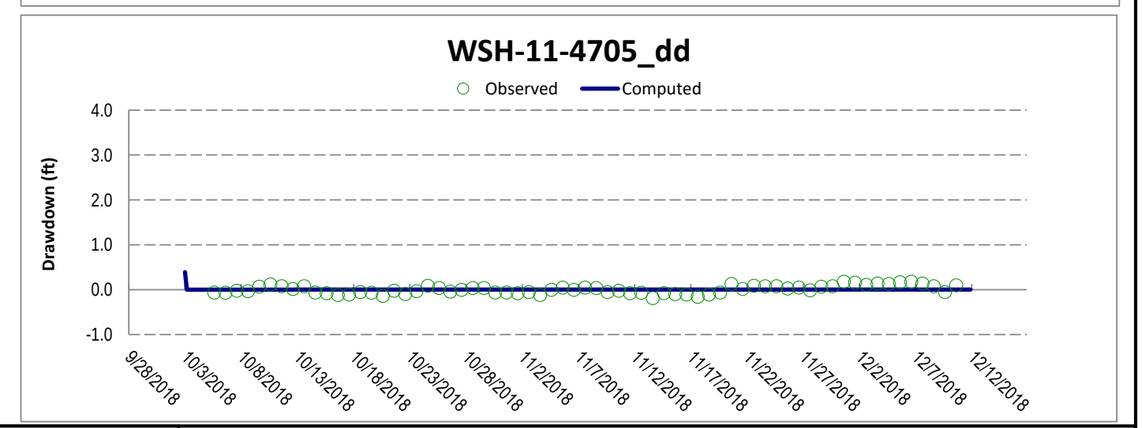












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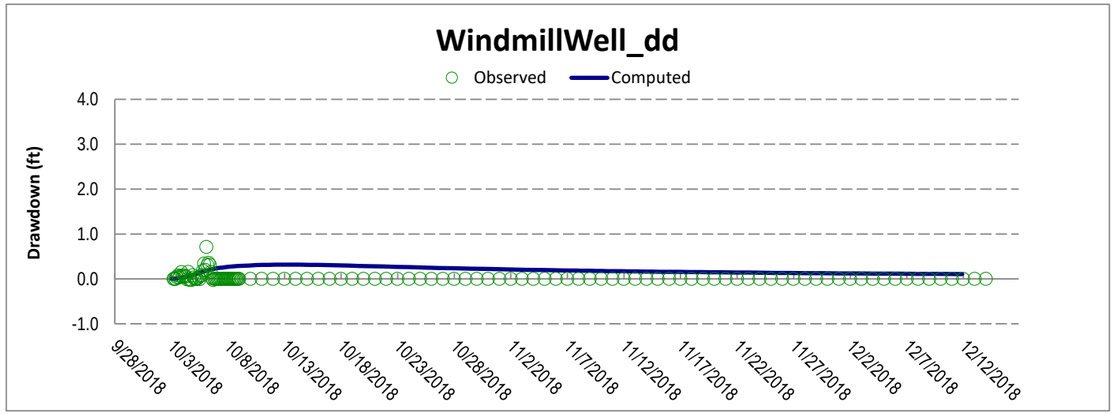
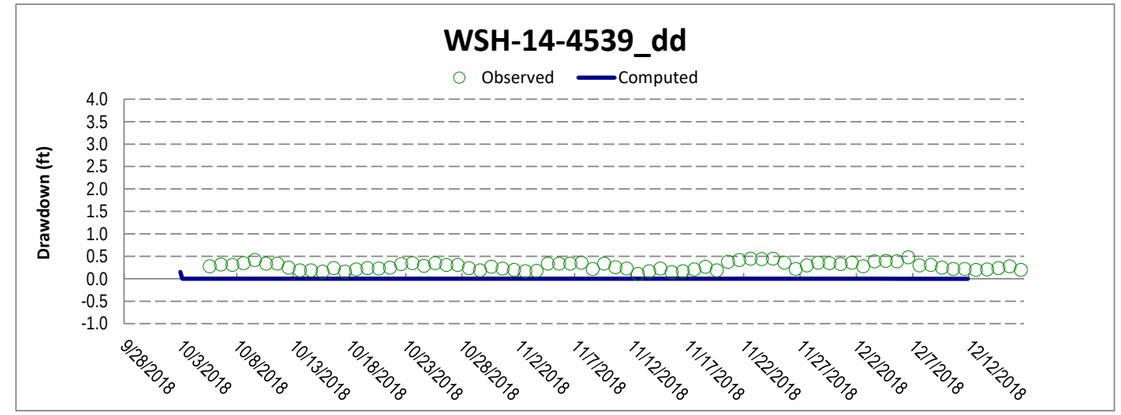
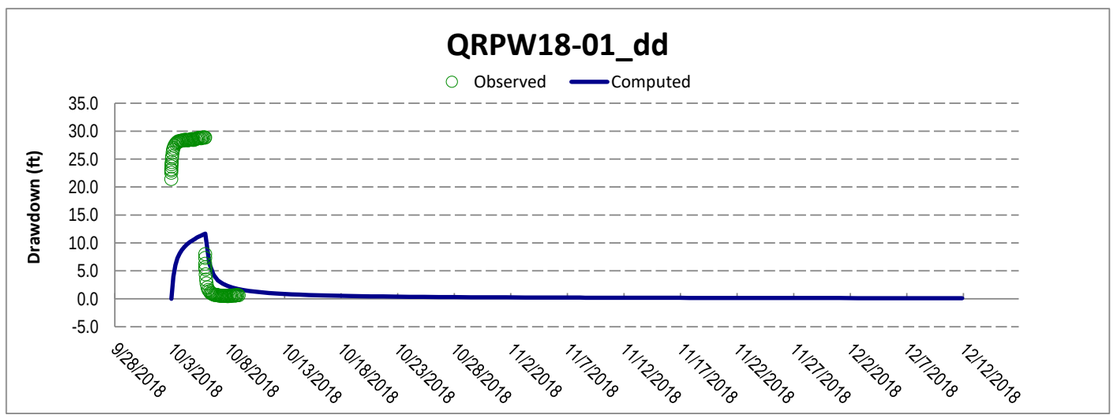
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

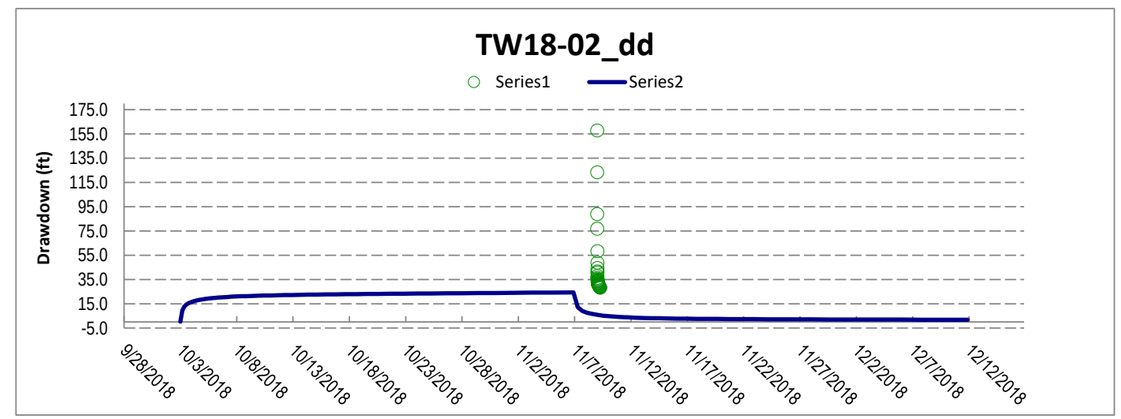
2018 Pumping tests transient calibration drawdown

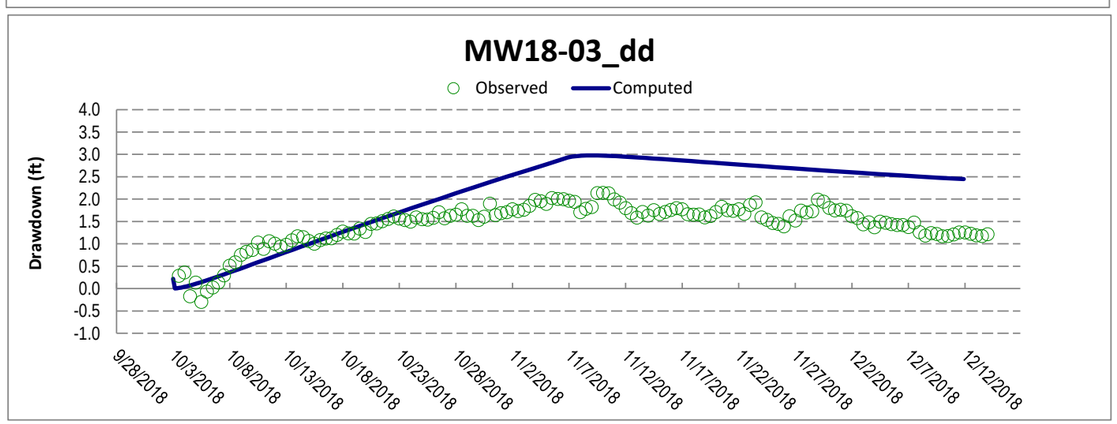
CLIENT: LNC	PROJECT: Thacker Pass Project EIS
JOB: 3898	DRAWN: LH CHECKED: TC
DATE: May 2020	FIGURE: 3.49g











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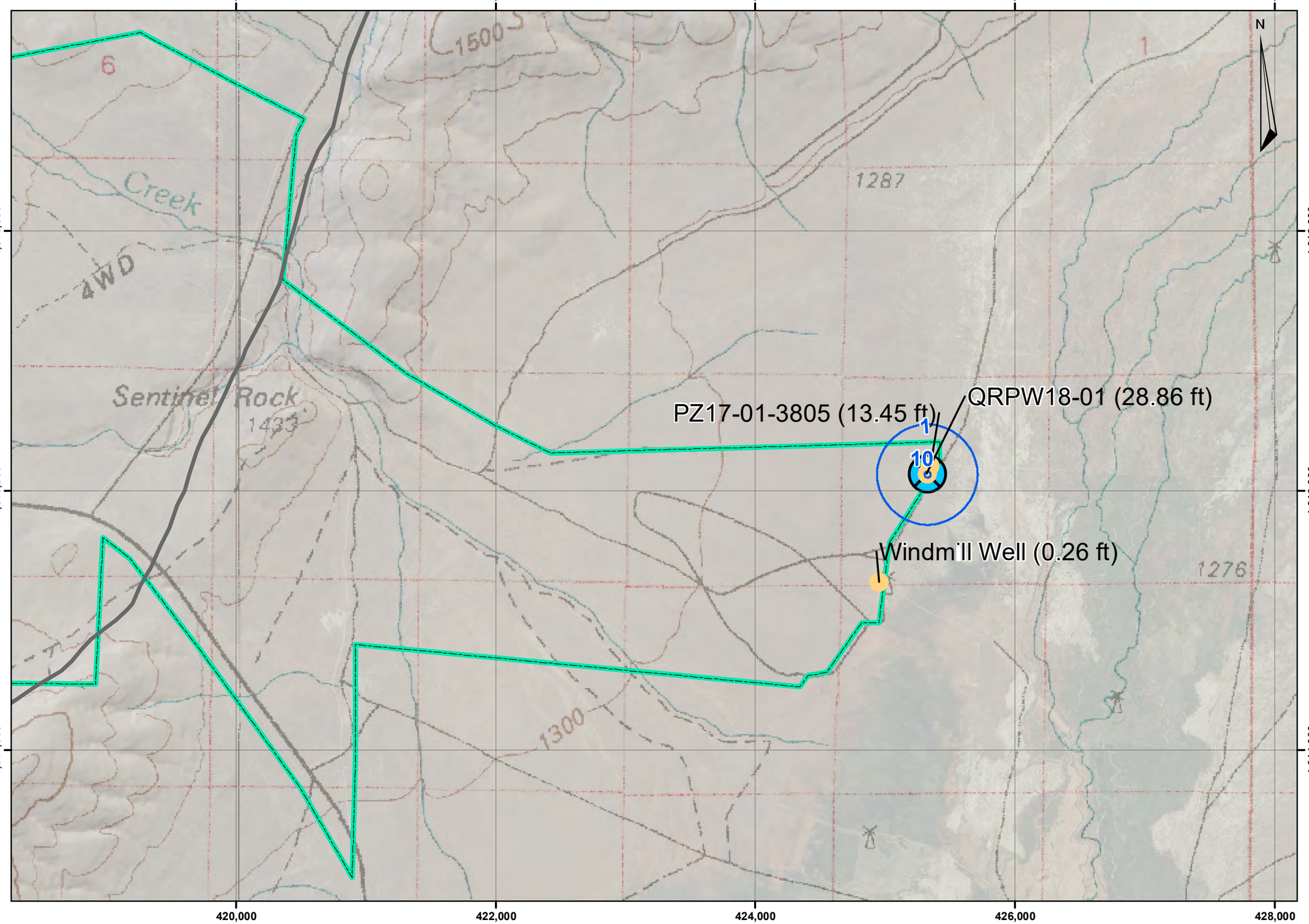
2018 Pumping tests transient calibration drawdown		
CLIENT: LNC	PROJECT: Thacker Pass Project EIS	
JOB: 3898	DRAWN: LH	CHECKED: TC
DATE: May 2020	FIGURE: 3.49g	



Model boundary
Thacker Pass Project AOI
Simulated drawdown (ft)
Pumping well
Water level target
Drawdown target

QRPW18-01 simulated 72-hour aquifer test drawdown

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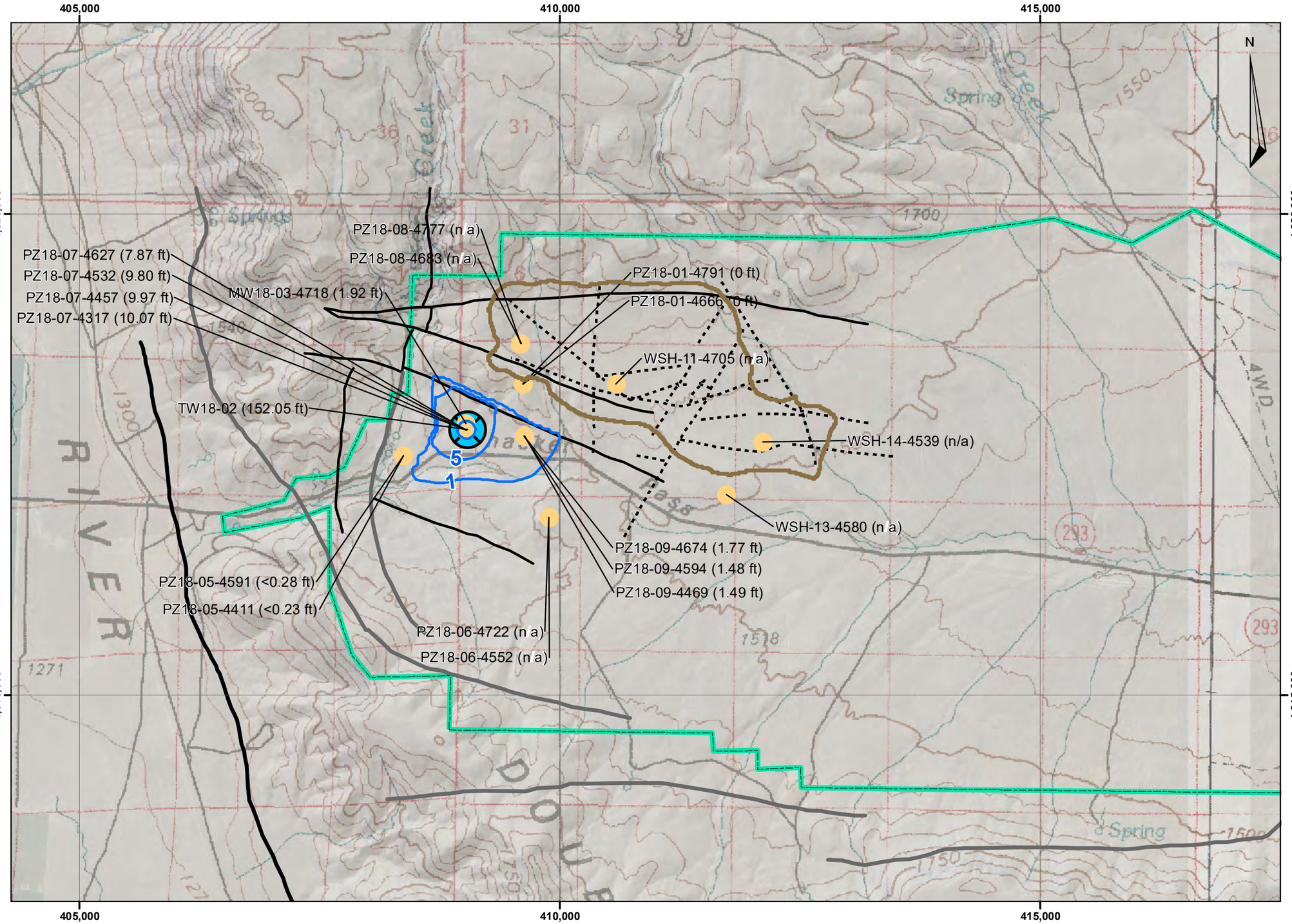
CLIENT:	LNC
PROJECT:	Thacker Pass Project EIS
JOB:	3898
DRAWN: LH	CHECKED: TC
DATE:	May 2020
FIGURE:	3.50

H:\Project\3898\GIS\Kings Valley EIS\Mxds\Modeling Report\Figure 3.50 QRPW18-01 simulated aquifer test drawdown.mxd



1:40,000

0 0.25 0.5 1 1.5 2 Miles

Model boundary
Thacker Pass Project AOI
Proposed pit outline
Range front fault
Caldera rim fault
Radial vent fault
Minor fault
Simulated drawdown (ft)
Pumping well
Water level target
Drawdown target

TW18-02 simulated 35-day aquifer test drawdown

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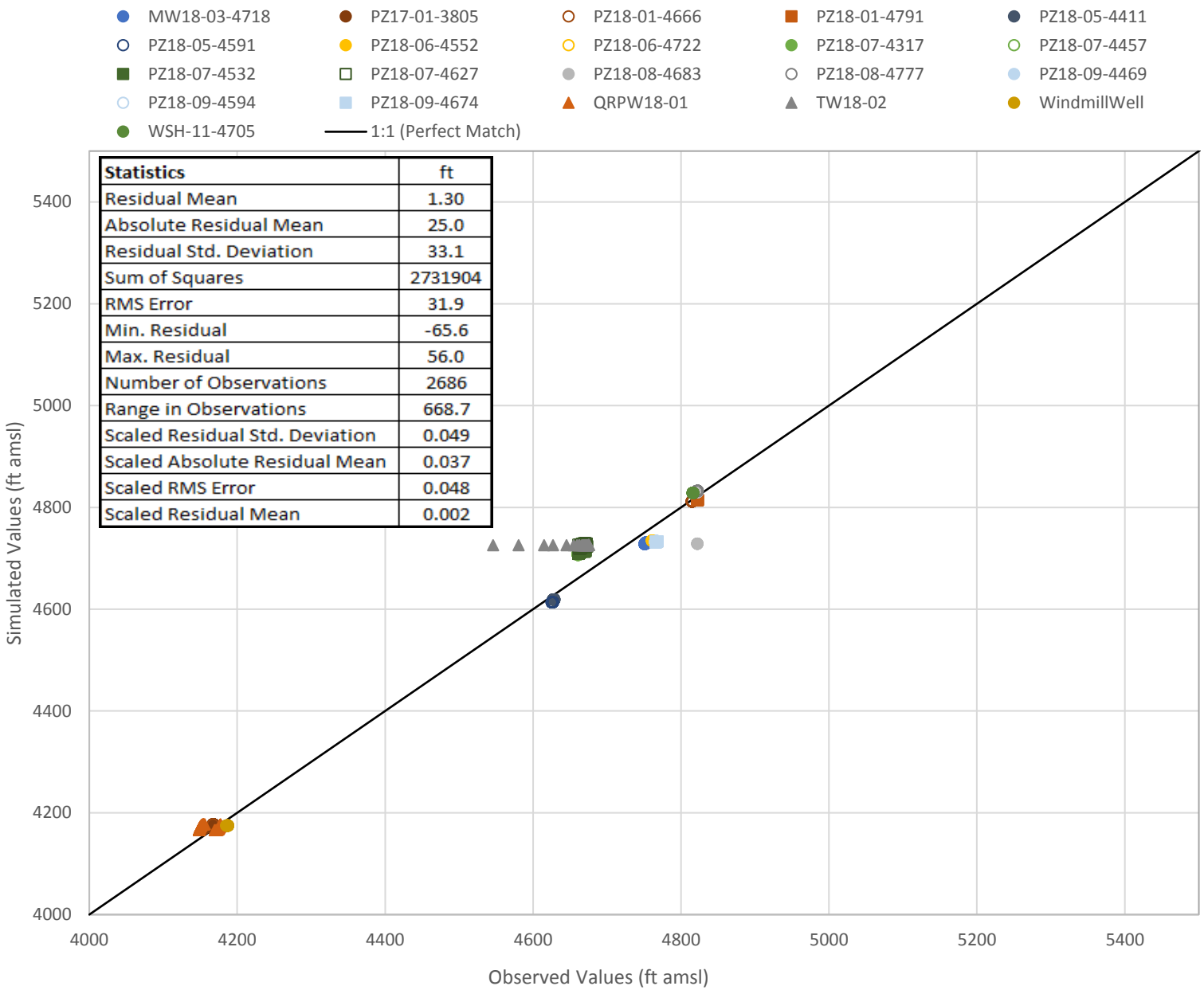
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

CLIENT:	LNC
PROJECT:	Thacker Pass Project EIS
JOB:	3898
DRAWN: LH	CHECKED: TC
DATE:	May 2020
FIGURE:	3.51

H:\Project\3898\GIS\Kings Valley EIS\Mxds\Modeling Report\Figure 3.51 TW18-02 simulated aquifer test drawdown.mxd

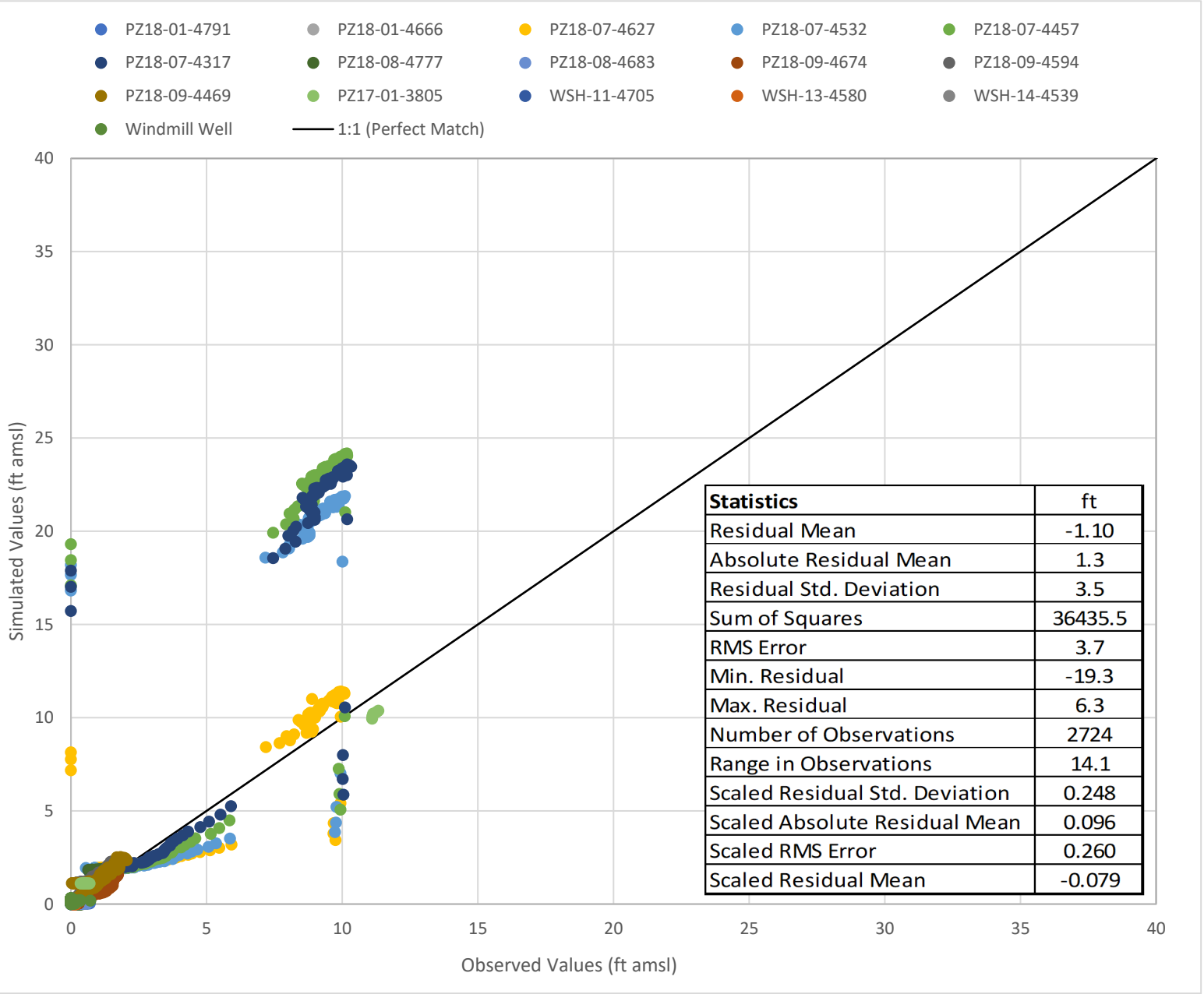


Statistics	ft
Residual Mean	1.30
Absolute Residual Mean	25.0
Residual Std. Deviation	33.1
Sum of Squares	2731904
RMS Error	31.9
Min. Residual	-65.6
Max. Residual	56.0
Number of Observations	2686
Range in Observations	668.7
Scaled Residual Std. Deviation	0.049
Scaled Absolute Residual Mean	0.037
Scaled RMS Error	0.048
Scaled Residual Mean	0.002

2018 pumping tests transient calibration: observed vs. simulated water levels

PITEAU ASSOCIATES

CLIENT:	LNC
PROJECT:	Thacker Pass Project EIS
JOB #:	3898
DRAWN:	LH
CHECKED:	TC
DATE:	May 2020
FIGURE:	3.52



Statistics	ft
Residual Mean	-1.10
Absolute Residual Mean	1.3
Residual Std. Deviation	3.5
Sum of Squares	36435.5
RMS Error	3.7
Min. Residual	-19.3
Max. Residual	6.3
Number of Observations	2724
Range in Observations	14.1
Scaled Residual Std. Deviation	0.248
Scaled Absolute Residual Mean	0.096
Scaled RMS Error	0.260
Scaled Residual Mean	-0.079

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2018 pumping tests transient calibration: observed vs. simulated drawdown

CLIENT: LNC

PROJECT: Thacker Pass Project EIS

JOB #: 3898

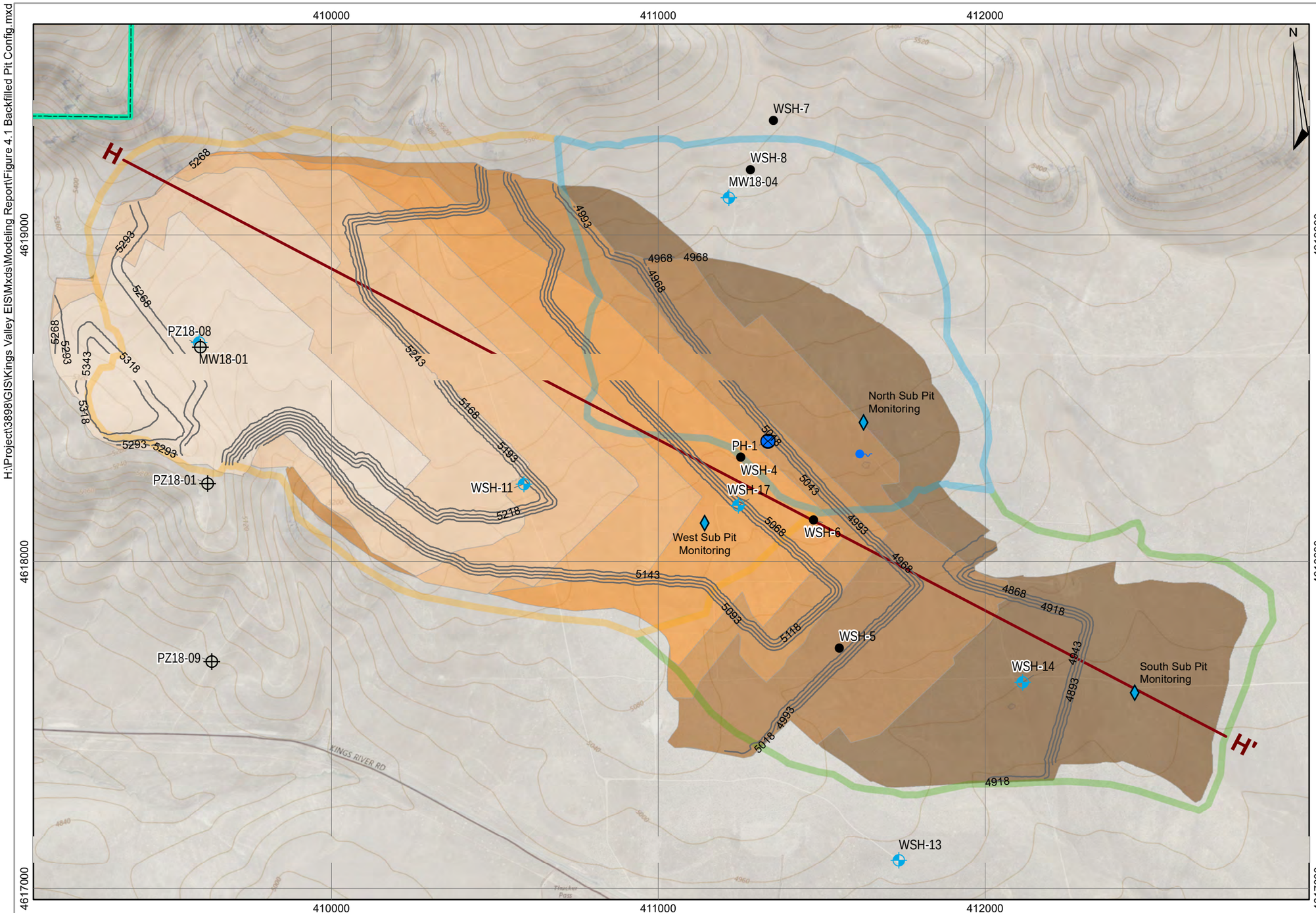
DRAWN: LH

CHECKED: TC

DATE: May 2020

FIGURE: 3.53

H:\Project\3898\GIS\Kings Valley EIS\Mxds\Modeling Report\Figure 4.1 Backfilled Pit Config.mxd



Wells

- Abandoned
- Monitoring well
- Piezometer
- Production well
- Test pumping well
- Backfilled Pit Contours
- H - H' Cross section
- Springs
- North sub-pit
- West sub-pit
- South sub-pit
- 2030 Backfill
- 2035 Backfill
- 2040 Backfill
- 2045 Backfill
- 2050 Backfill
- 2055 Backfill
- 2060 Backfill
- 2065 Backfill
- Thacker Pass Project AOI
- Simulated Sub-Pit Monitoring Locations

1:12,000

0 0.1 0.2 0.4 0.6 0.8 Miles

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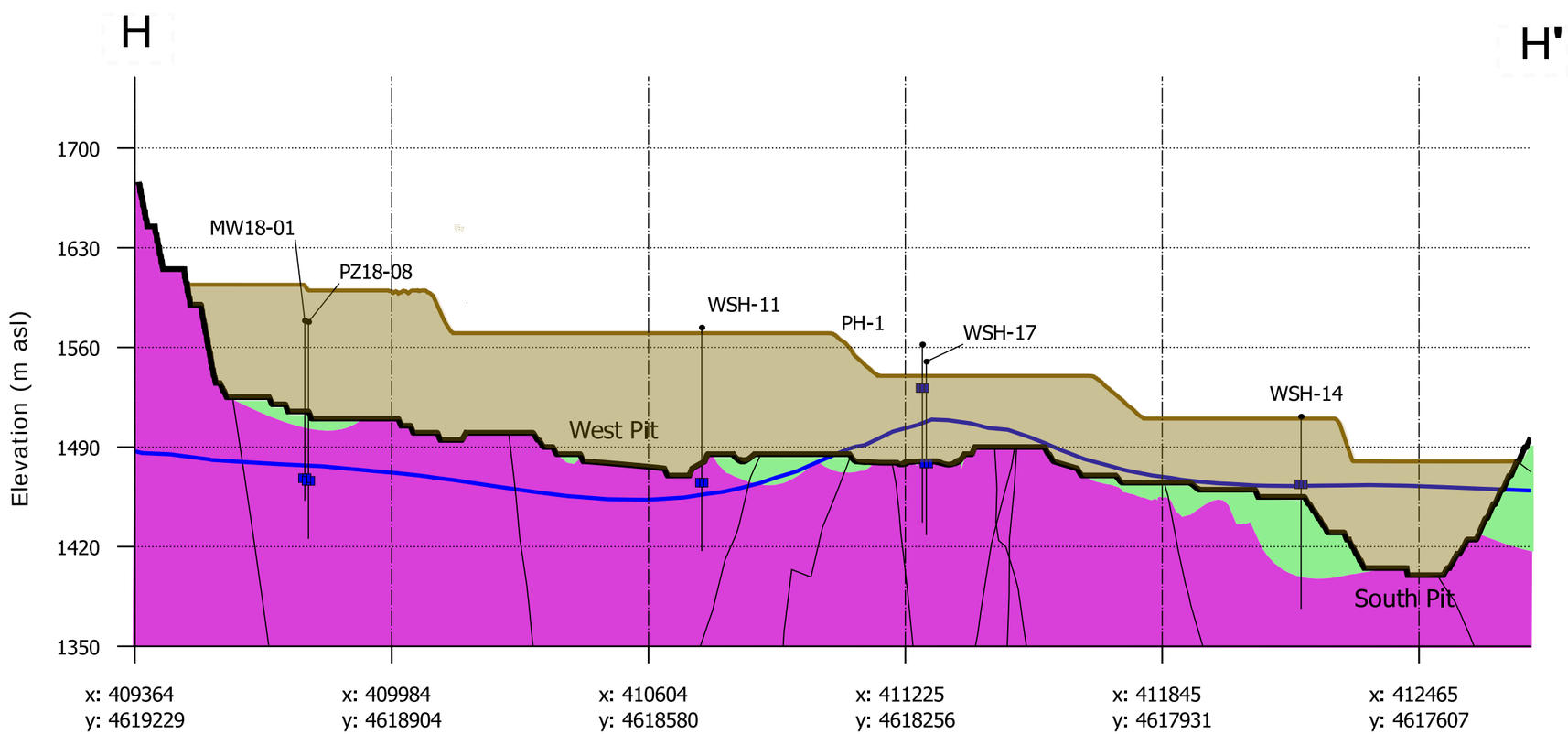
Backfilled Pit Proposed Action configuration

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

CLIENT:	LNC
PROJECT:	Thacker Pass Project EIS
JOB:	3898
DRAWN: LH	CHECKED: TC
DATE:	May 2020
FIGURE:	4.1



Surfaces

- Backfill
- Water Table
- Open Pit
- Fault
- Sediments
- Tuff of Long Ridge
- Backfill

Scale: 1:16,000

Vertical exaggeration: 4x

0m 1000m

Location

A: 409364, 4619229

A': 412737, 4617465

Backfilled Pit Proposed Action configuration cross section

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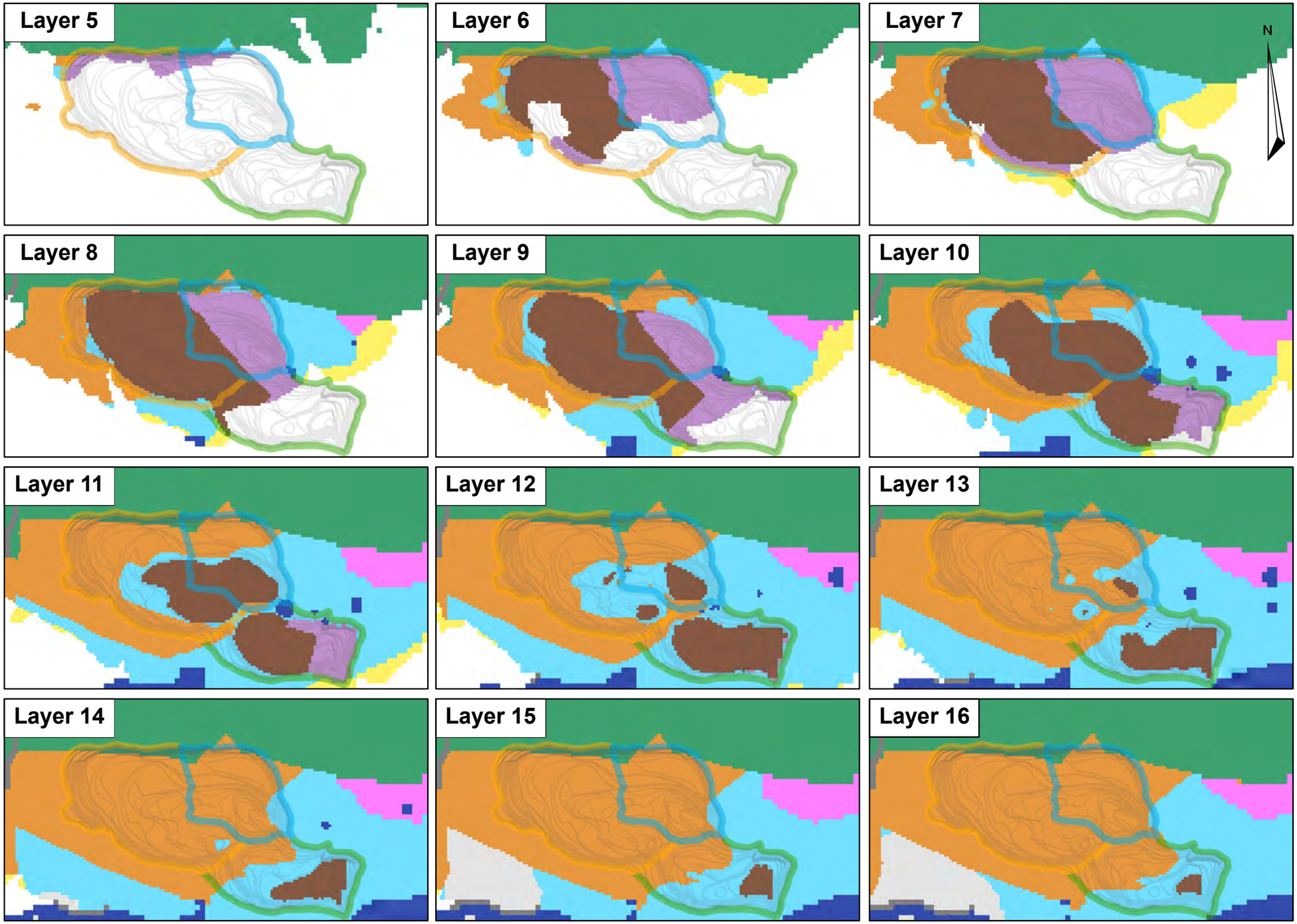
CLIENT: LNC	
PROJECT: 3898	
JOB: Thacker Pass Project EIS	
DRAWN: LH	CHECKED: TC
DATE: May 2020	
FIGURE: 4.2	

H:\Project\3898\GIS\Kings Valley EIS\Mxds\Modeling Report\Figure 4.3 Backfill & Pit Cells.mxd



Pit contours

North sub-pit

West sub-pit

South sub-pit

Lithologic Unit

- Basement Volcanic Tuff
- Thacker Pass Alluvium
- Claystone
- Rock / Pole Shear Zones
- Silicified Claystone (East)
- Thacker Pass Tuff
- Thacker Pass Basalts
- Open Pit
- Backfill

1:48,000

0 0.25 0.5 1 1.5 2 Miles

Backfilled Pit Proposed Action: conductivity and storage zones

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CLIENT:	LNC
PROJECT:	Thacker Pass Project EIS
JOB:	3898
DRAWN: LH	CHECKED: TC
DATE:	May 2020
FIGURE:	4.3

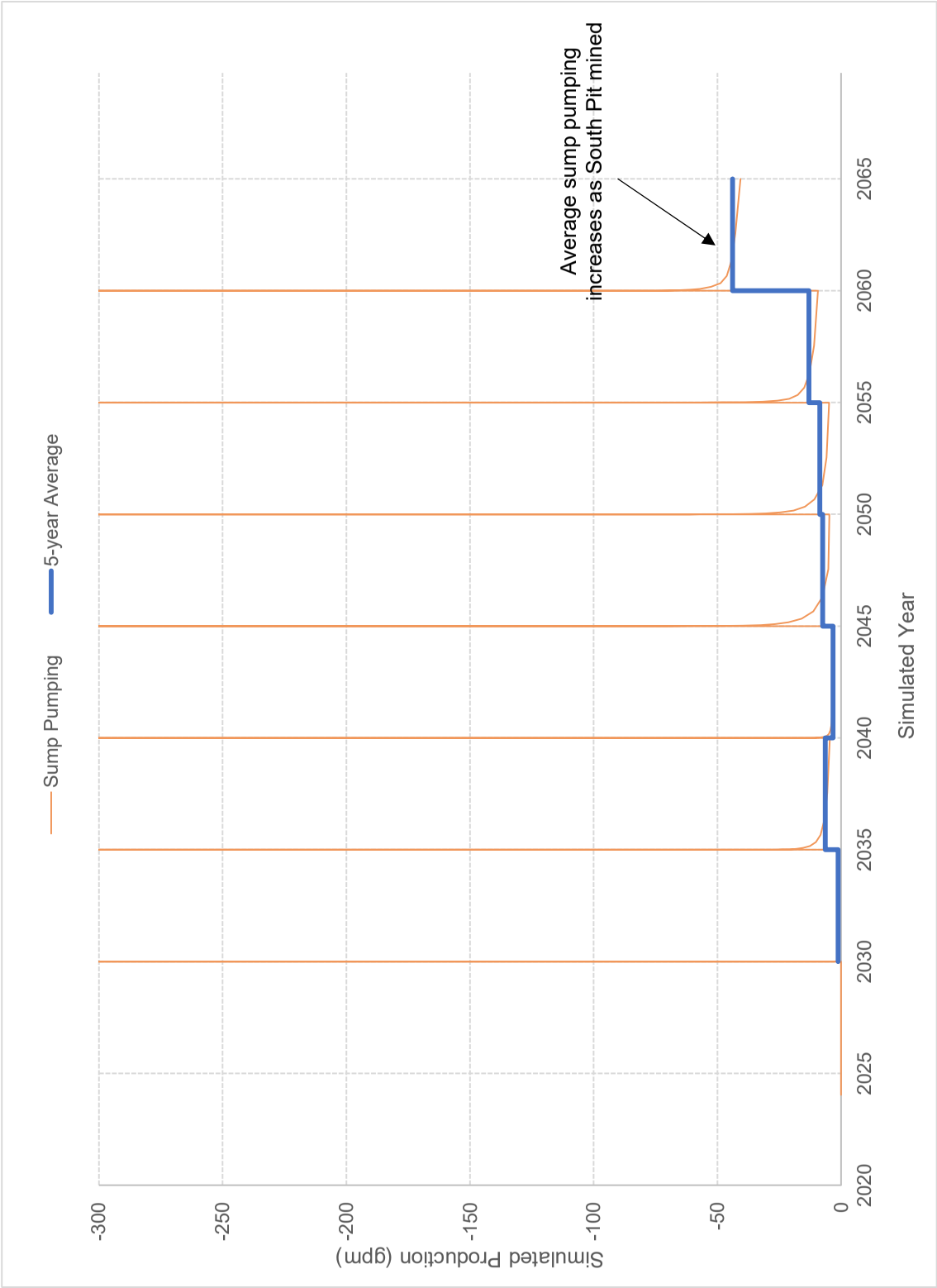
(After Kampf, 2002)

Nevada Measured Infiltration Through Vegetated Covers

PITEAU ASSOCIATES

CLIENT: LNC		PROJECT: Thacker Pass Project EIS	
JOB #: 3898	DRAWN: TC		CHECKED: TC
DATE: May 2020	FIGURE: 4.4		

H:\Project\3898\3898-2 Kings Valley EIS\500_Deliverables\530_Reports\Water Quantity & Quality Impacts\Excel\[Fig 5.9 Tyler et al



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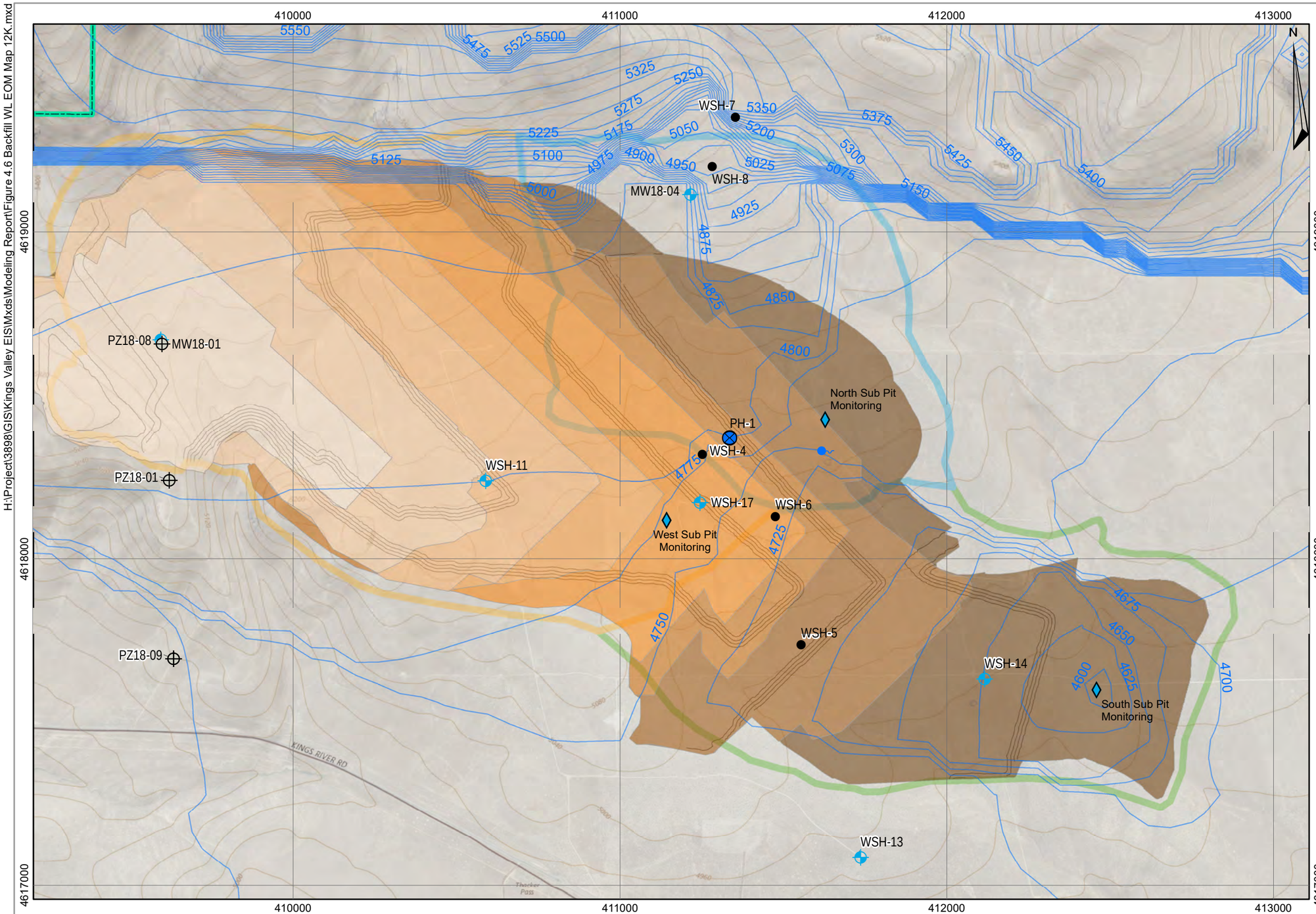
Backfilled Pit Proposed Action: simulated flow rates through time			
CLIENT: LNC	PROJECT: Thacker Pass Project EIS		
JOB #: 3898	DRAWN: BA	CHECKED: TC	
DATE: May 2020	FIGURE: 4.5		

H:\Project\3898\3898-2 Kings Valley EIS\400_WIP\440_Modeling\2019_Model\Model Results\Predictive\[DWBackfill&BFRecoveryResults.xlsx]

H:\Project\3898\GIS\Kings Valley EIS\Mxds\Modeling Report\Figure 4.6 Backfill WL EOM Map 12K.mxd



1:12,000

0 0.1 0.2 0.4 0.6 0.8 Miles

PREPARED SOLELY FOR THE USE OF OUR CLIENT AND NO REPRESENTATION OF ANY KIND IS MADE TO OTHER PARTIES WITH WHICH PITEAU ASSOCIATES ENGINEERING LTD. HAS NOT ENTERED INTO A CONTRACT.

Wells

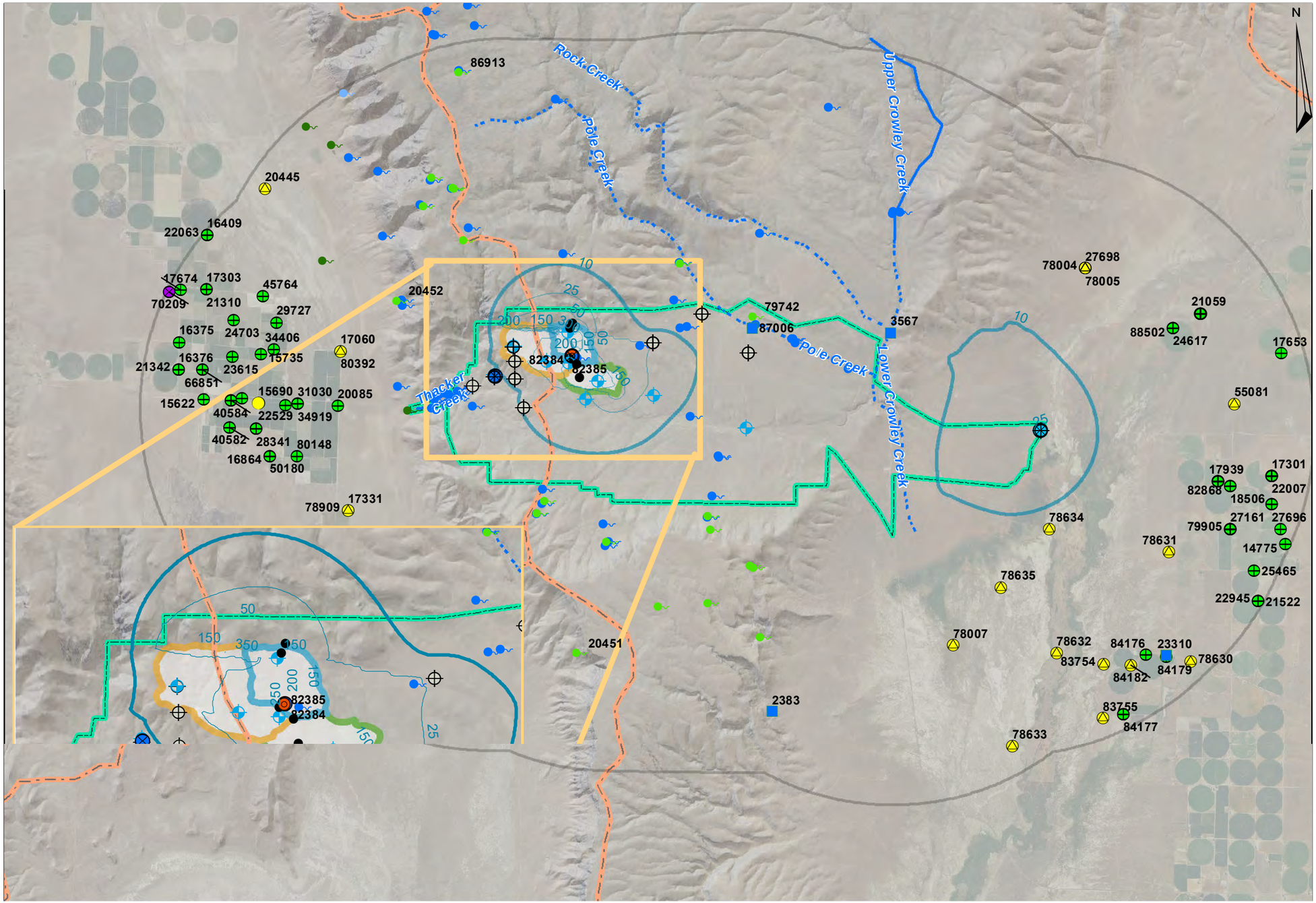
- Abandoned
- Monitoring well
- Piezometer
- Production well
- Test pumping well
- Springs
- 2065 Backfill water level
- 2030 Backfill
- 2035 Backfill
- 2040 Backfill
- 2045 Backfill
- 2050 Backfill
- 2055 Backfill
- 2060 Backfill
- Backfill Footprints
- North sub-pit
- West sub-pit
- South sub-pit
- Pit backfill contours
- Thacker Pass Project AOI
- Simulated Sub-Pit Monitoring Locations

Backfilled Pit Proposed Action: simulated water levels 2065 (end of mining)

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

CLIENT:	LNC
PROJECT:	Thacker Pass Project EIS
JOB:	3898
DRAWN: BA	CHECKED: TC
DATE:	May 2020
FIGURE:	4.6

H:\Project\3898\GIS\Kings Valley EIS\Mxds\Modeling Report\Figure 4.7 Backfill EOM DDN Map 120k.mxd



PREPARED SOLELY FOR THE USE OF OUR CLIENT AND NO REPRESENTATION OF ANY KIND IS MADE TO OTHER PARTIES WITH WHICH PITEAU ASSOCIATES ENGINEERING LTD. HAS NOT ENTERED INTO A CONTRACT.

Water Rights: Source - Type

- Spring - Irrigation
- Spring - Stock watering
- Spring - Other
- Stream - Irrigation
- Well - Irrigation
- Well - Mining
- Well - Quasi-municipal
- Well - Stock watering

Wells

- Abandoned
- Monitoring well
- Piezometer
- Production well
- Test pumping well
- Springs

2065_LNC_EOM_B...

- Drawdown contours

ZLEVEL

- 10 ft Drawdown isopleth
- 5 mile buffer (from AOI)
- Hydrographic basin boundary
- North sub-pit
- West sub-pit
- South Sub-pit
- Thacker Pass Project AOI

Proposed Action Backfilled Pit: simulated drawdown at end of mining (2065)

PITEAU ASSOCIATES
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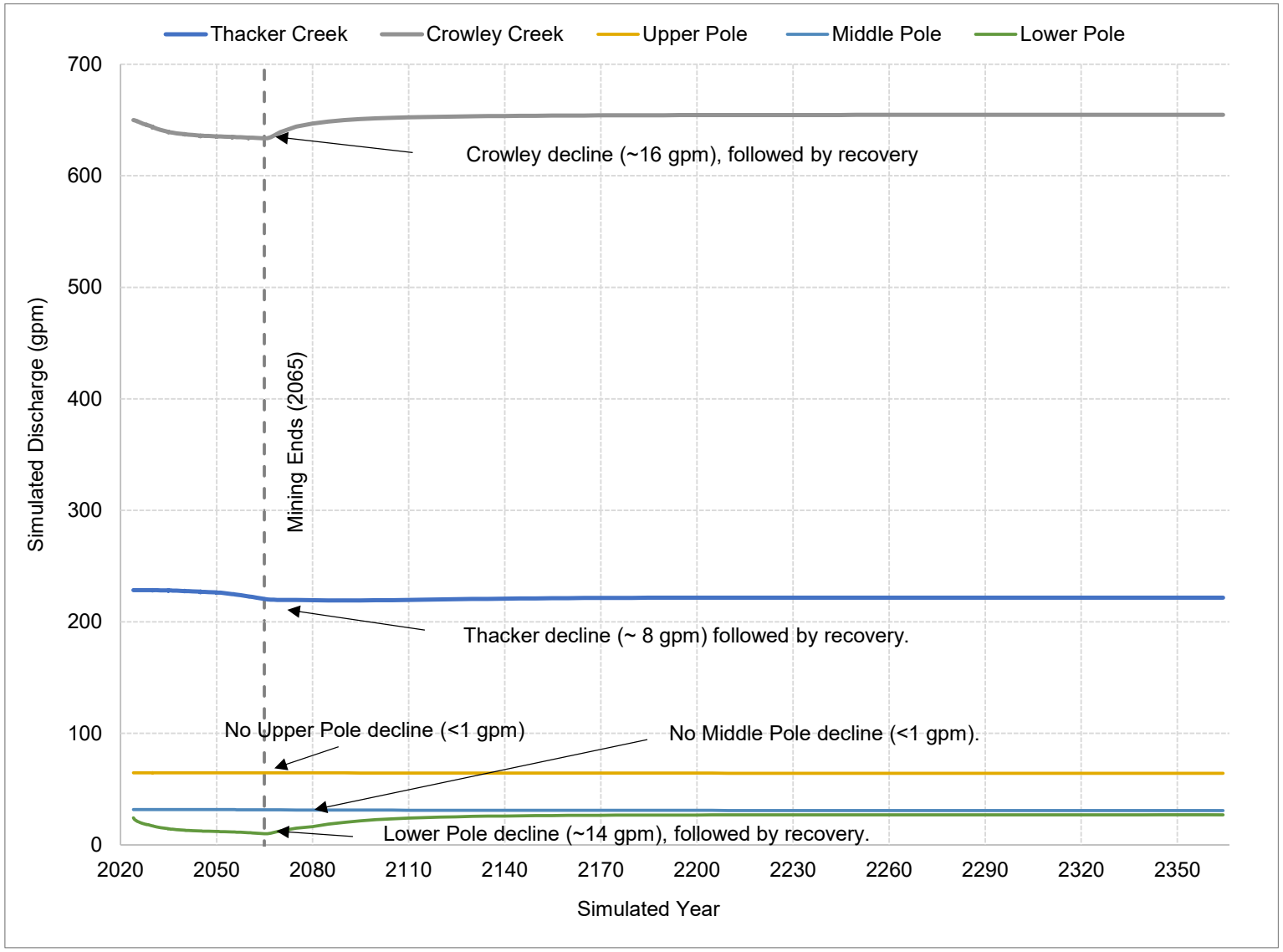
CLIENT:	LNC		
PROJECT:	Thacker Pass Project EIS		
JOB:	3898		
DRAWN:	BA	CHECKED:	TC
DATE:	May 2020		
FIGURE:	4.7		



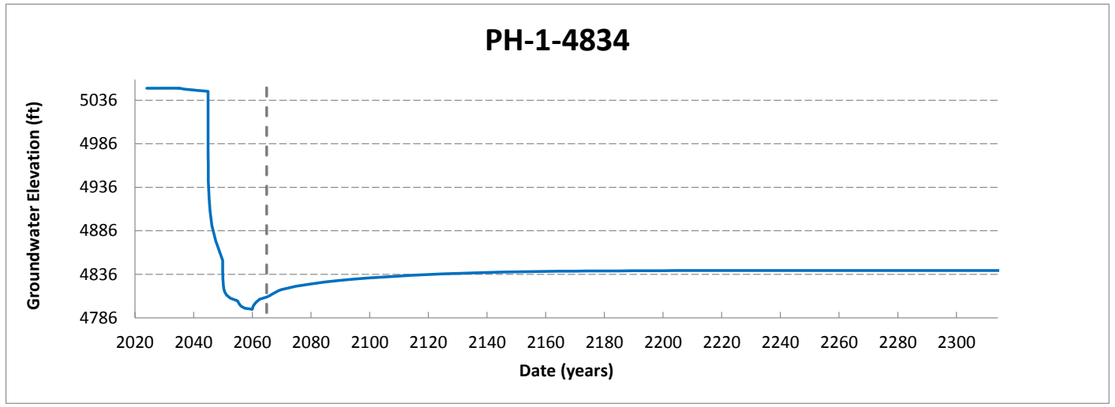
Note, Lower Pole is ephemeral. Model overestimated flow.

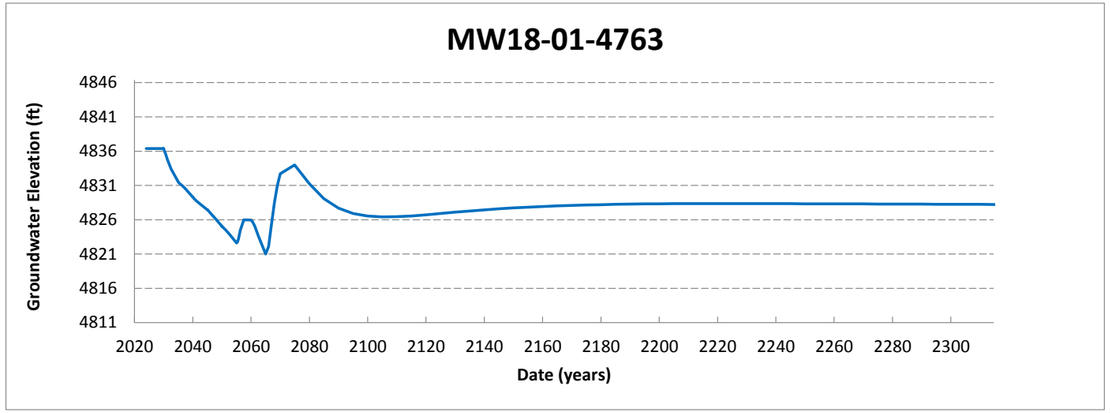
Backfilled pit proposed action: simulated groundwater flow to streams

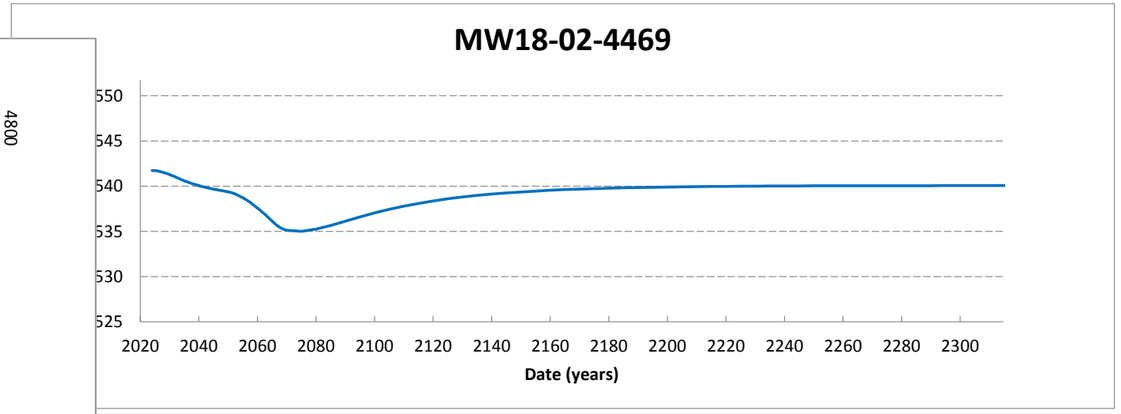
PITEAU ASSOCIATES

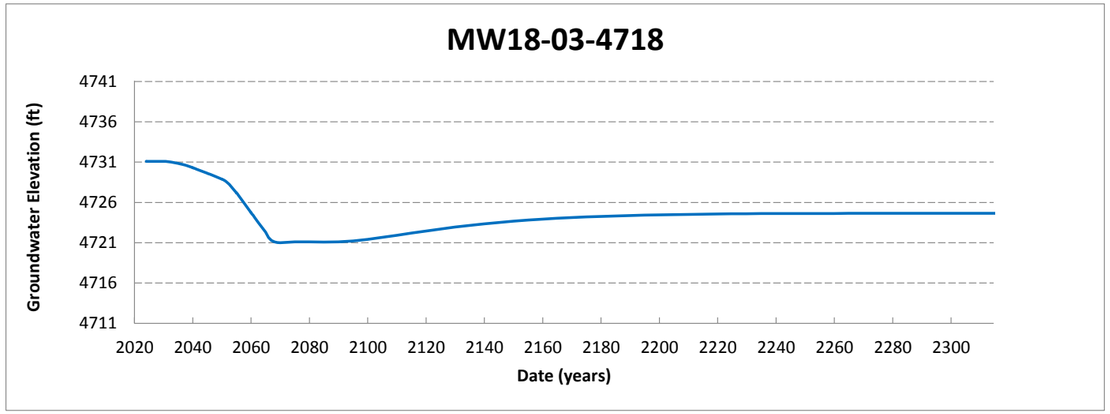
CLIENT: LNC		PROJECT: Thacker Pass Project EIS	
JOB #: 3898		DRAWN: BA	CHECKED: TC
DATE: May 2020		FIGURE: 4.8	

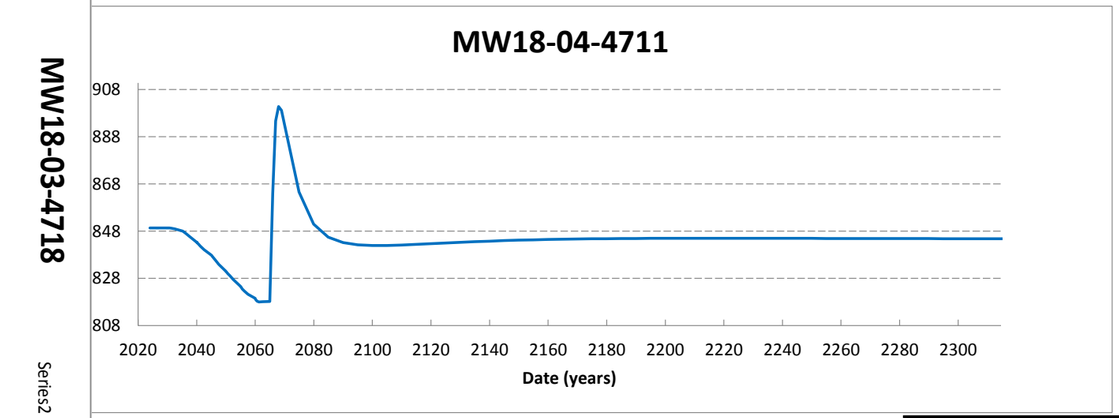
H:\Project\3898\3898-2 Kings Valley EIS\400_WIP\440_Modeling\2019_Model\[Boundary Reach Reports 20200514.xlsx]

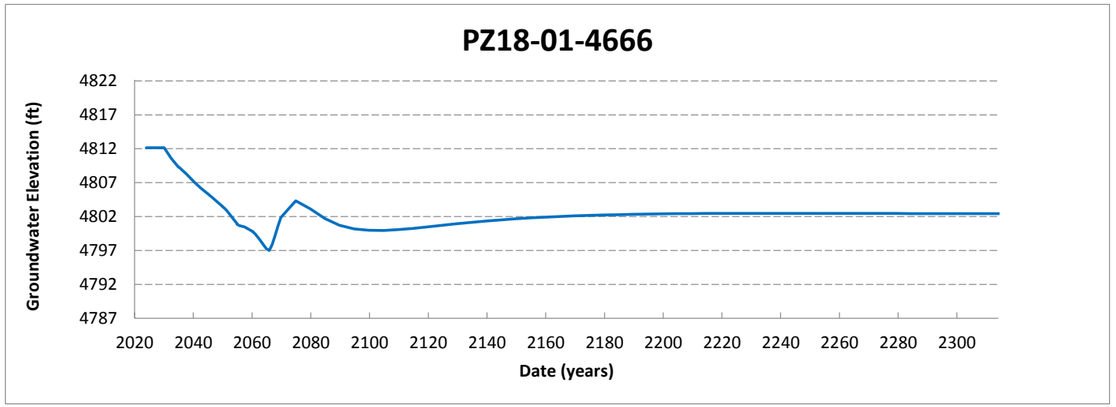












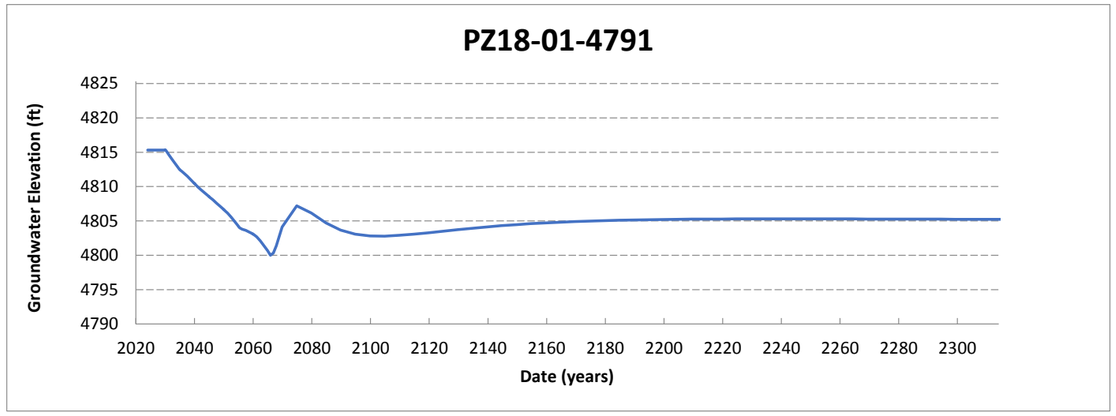
End of Mining

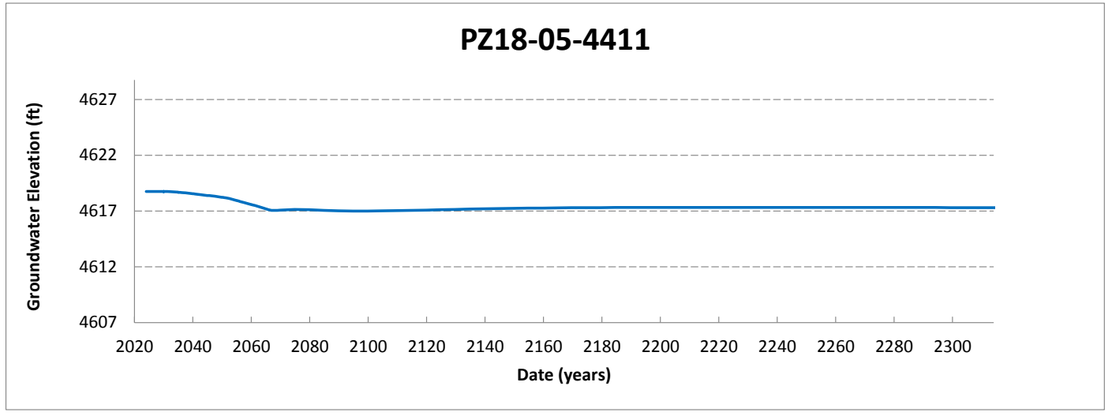
Simulated water level

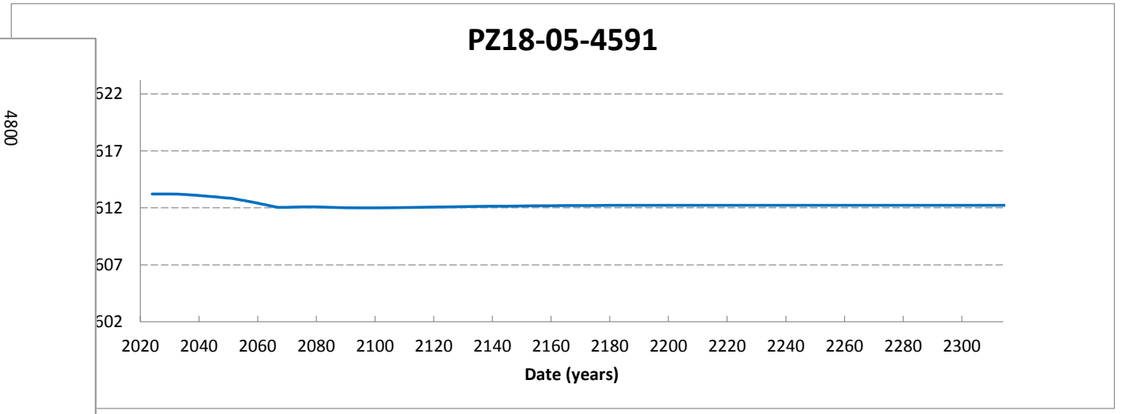
PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

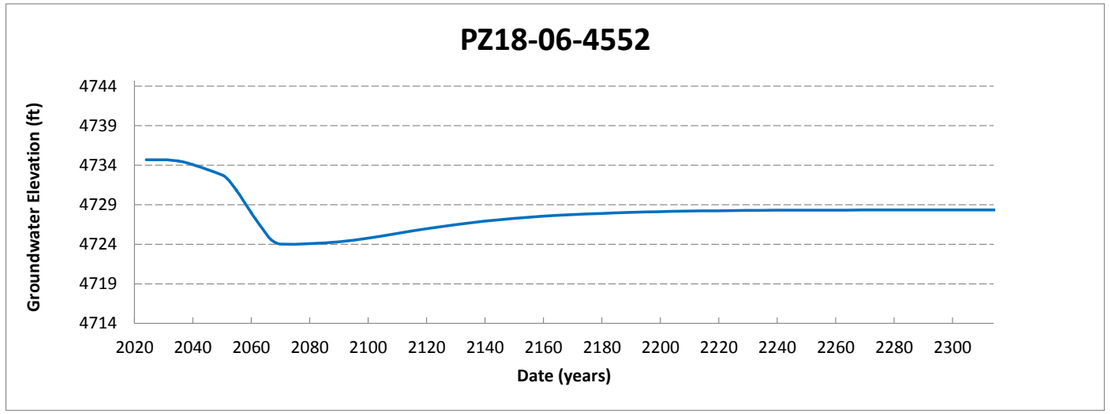
Backfilled pit proposed action: simulated water level hydrographs

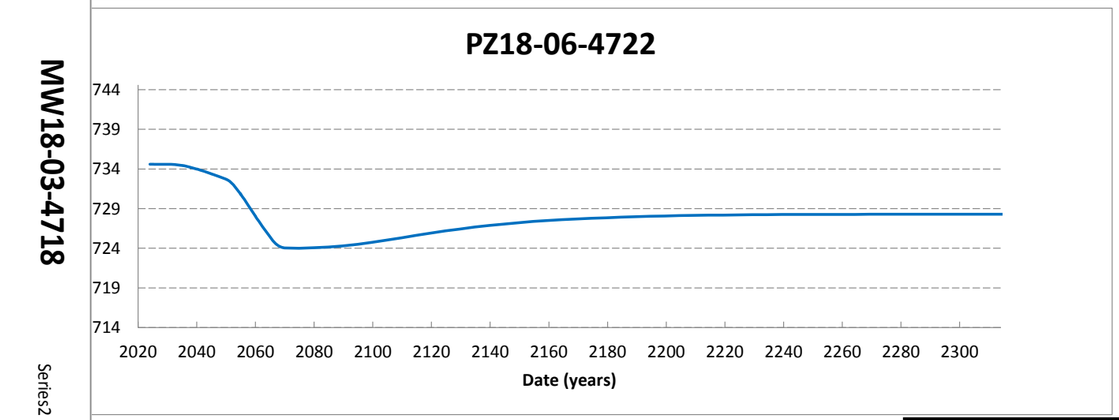
CLIENT: LNC	PROJECT: Thacker Pass Project EIS
JOB: 3898	DRAWN: BA CHECKED: TC
DATE: May 2020	FIGURE: 4.9a

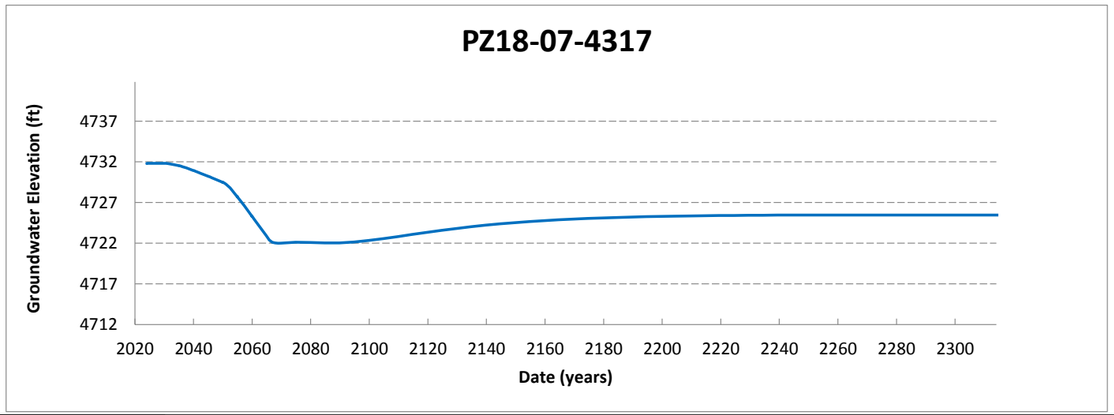


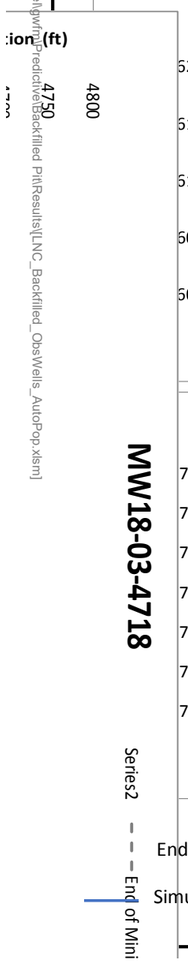












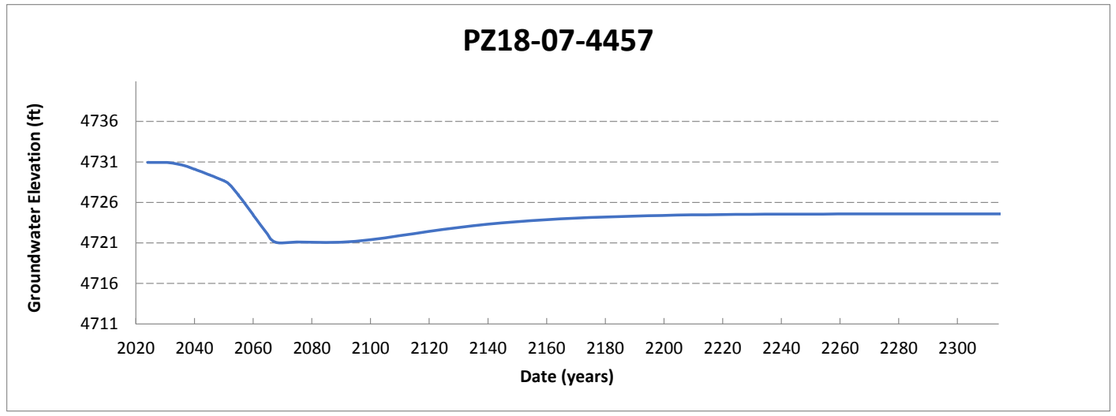
End of Mining

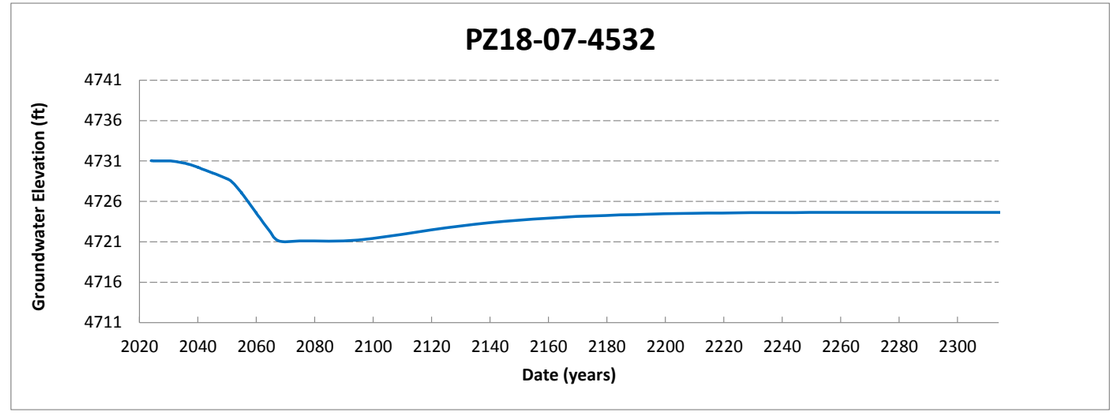
Simulated water level

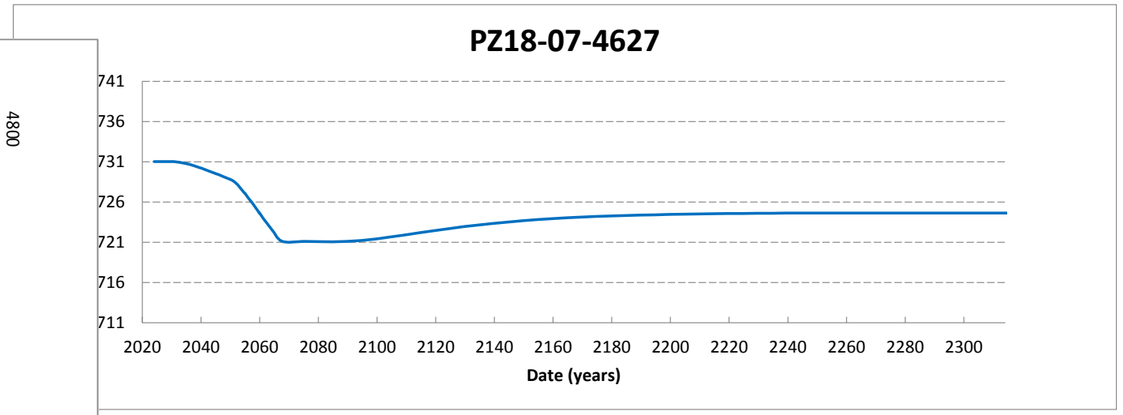
PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

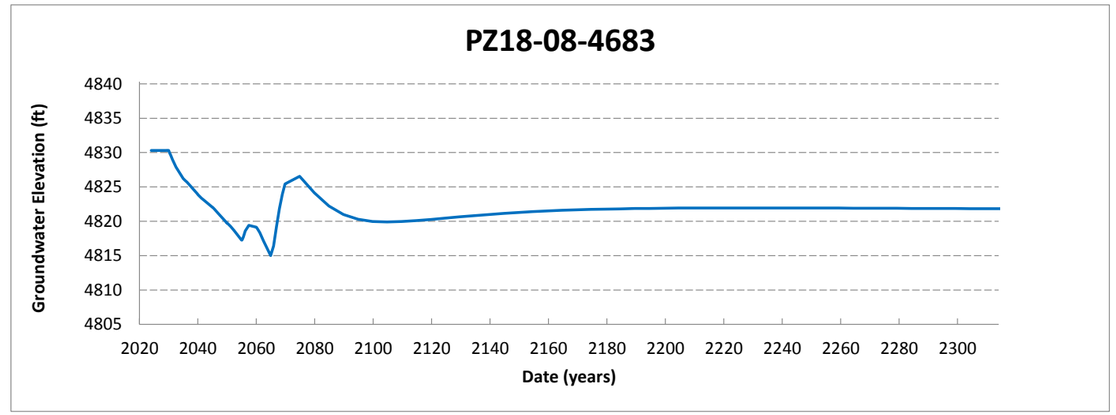
Backfilled pit proposed action: simulated water level hydrographs

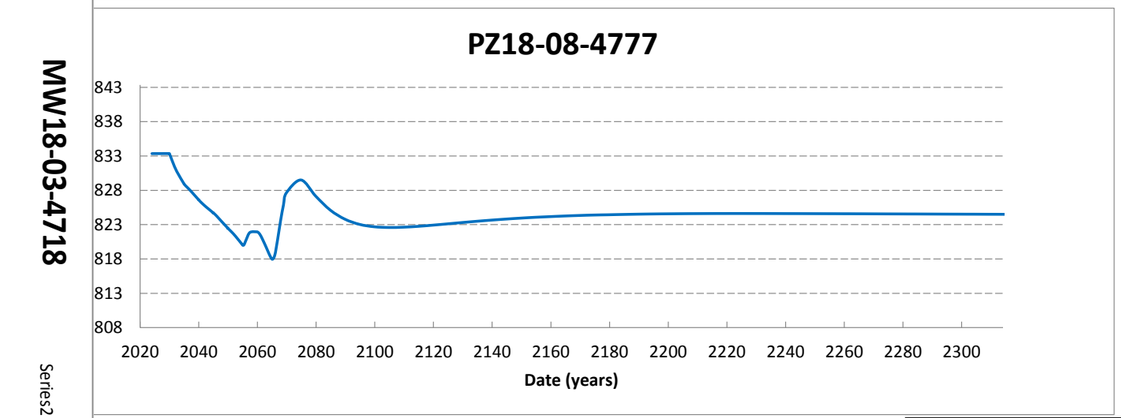
CLIENT: LNC	PROJECT: Thacker Pass Project EIS
JOB: 3898	DRAWN: BA CHECKED: TC
DATE: May 2020	FIGURE: 4.9b

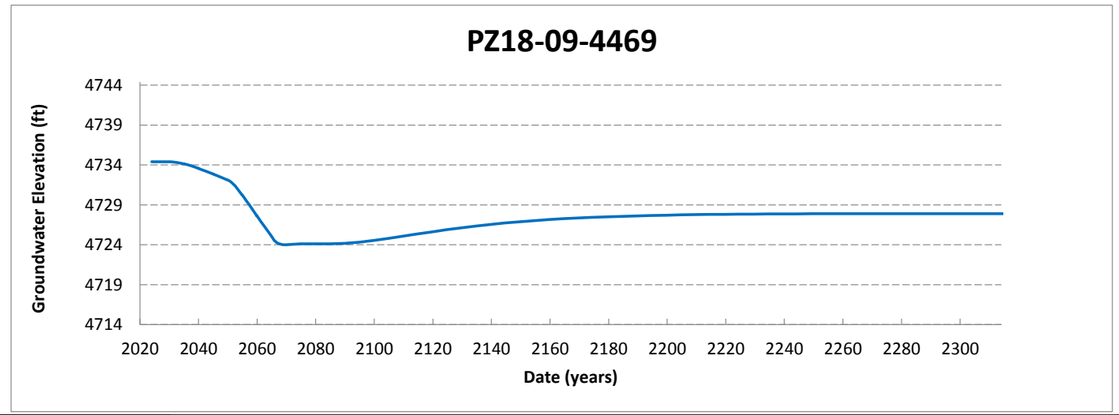












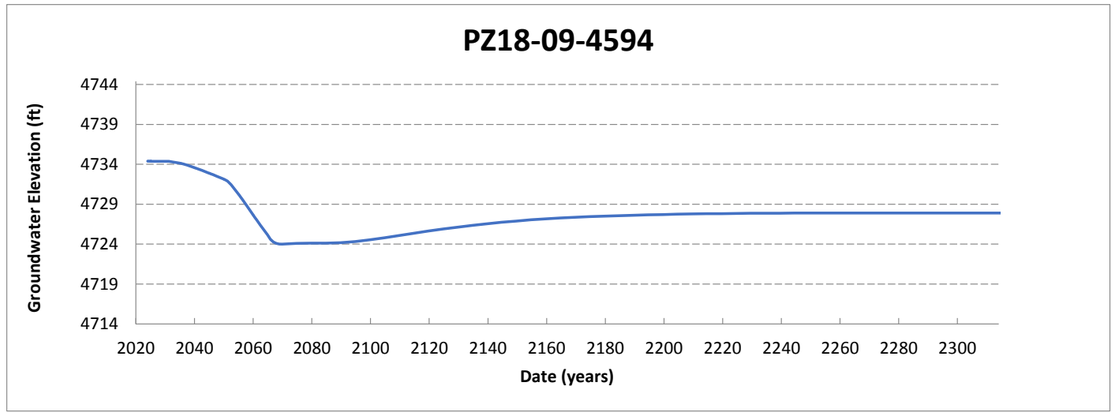
End of Mining

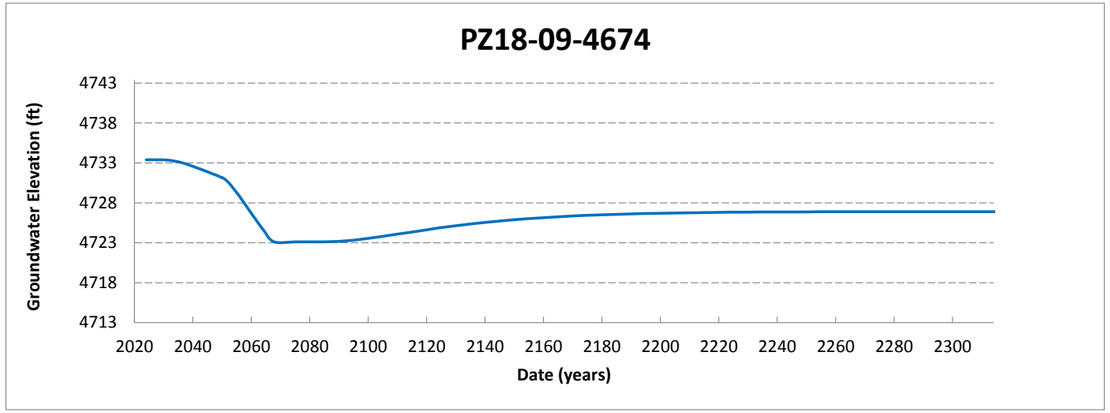
Simulated water level

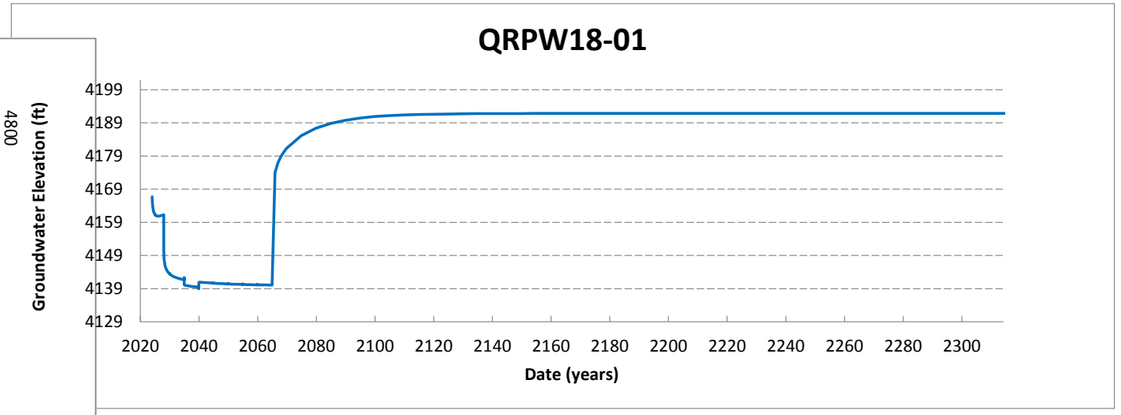
PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

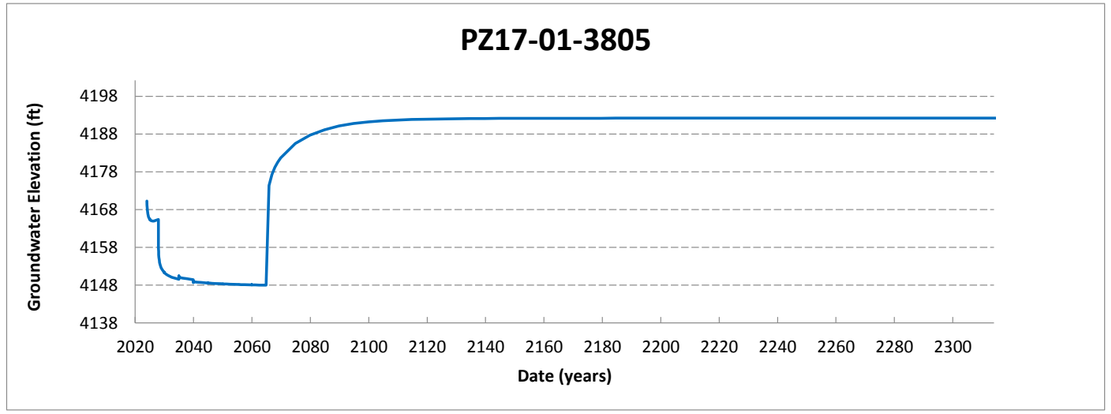
Backfilled pit proposed action: simulated water level hydrographs

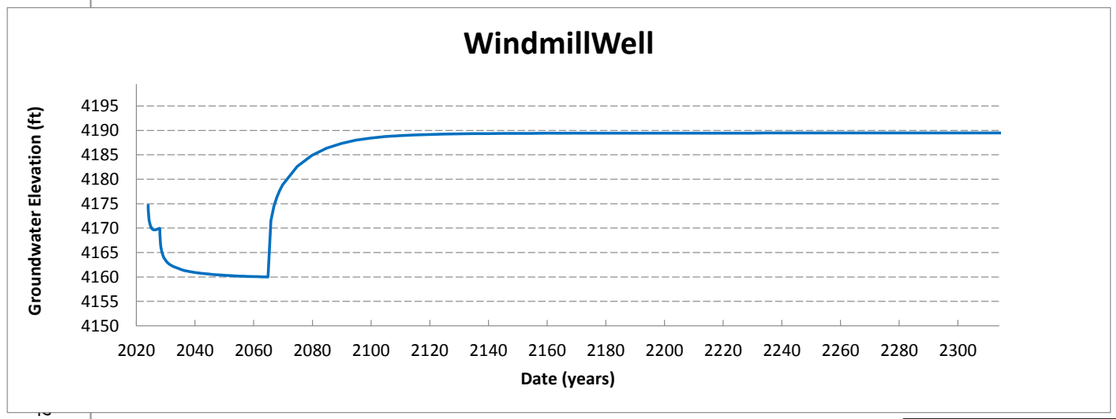
CLIENT: LNC	PROJECT: Thacker Pass Project EIS
JOB: 3898	DRAWN: BA CHECKED: TC
DATE: May 2020	FIGURE: 4.9c

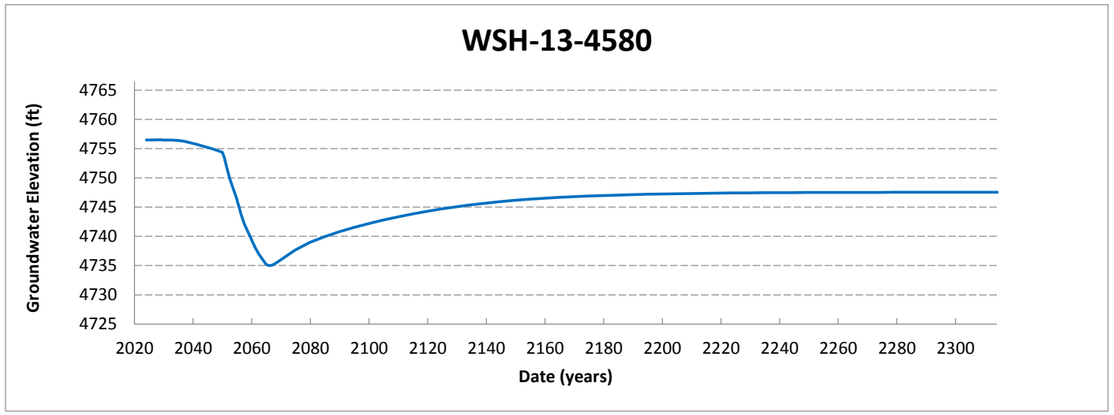












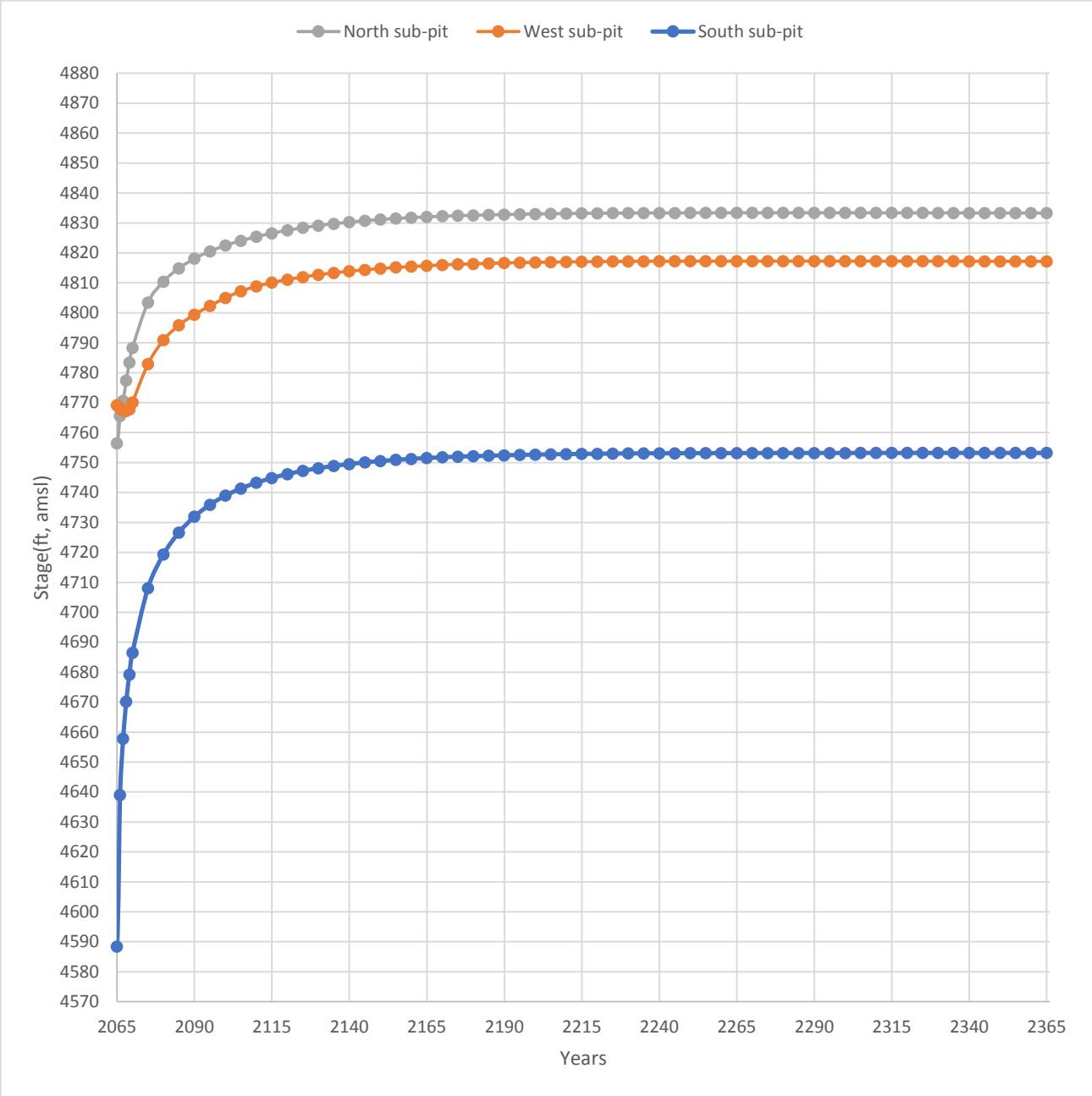
End of Mining

Simulated water level

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

Backfilled pit proposed action: simulated water level hydrographs

CLIENT: LNC	PROJECT: Thacker Pass Project EIS
JOB: 3898	DRAWN: BA CHECKED: TC
DATE: May 2020	FIGURE: 4.9d

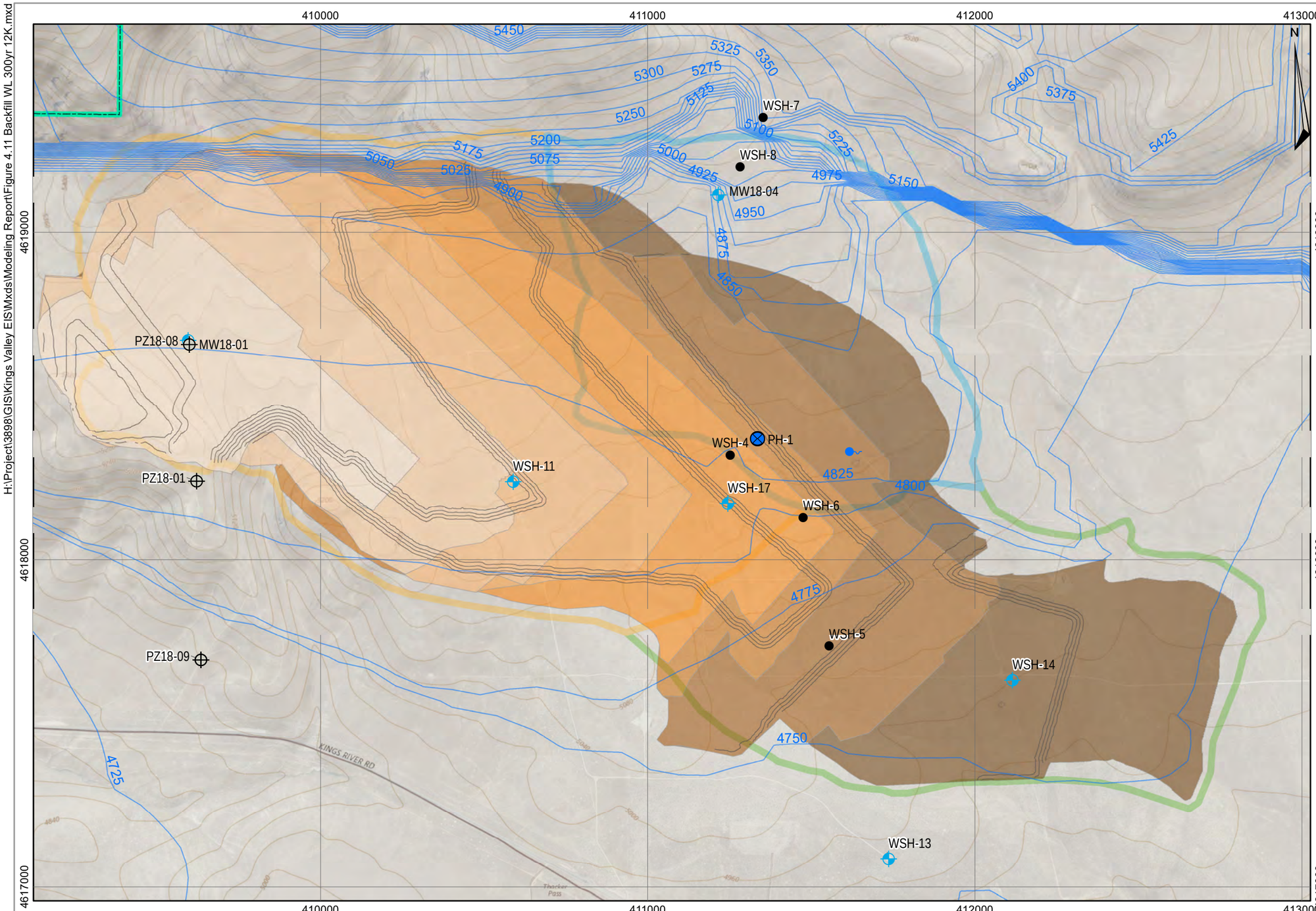


*Hypothetical monitoring locations shown in Figure 4.1

PITEAU ASSOCIATES	Backfilled Pit Proposed Action: simulated backfill recovery			
	CLIENT: LNC	PROJECT: Thacker Pass Project EIS		
	JOB #: 3898	DRAWN: LH	CHECKED: TC	
	DATE: May 2020	FIGURE: 4.10		

H:\Project\3898\3898-2 Kings Valley EIS\400_WIP\440_Modeling\2019_Model\gwfm\Predictive\Backfilled Pit\Results\[LNC_Backfilled_ObsWells_AutoPop.xlsm]

H:\Project\3898\GIS\Kings Valley EIS\Mxds\Modeling Report\Figure 4.11 Backfill WL 300yr 12K.mxd



Wells

- Abandoned
- Monitoring well
- Piezometer
- Production well
- Test pumping well
- Springs
- 2365 Backfill water level contours
- Pit backfill contours
- 2030 Backfill
- 2035 Backfill
- 2040 Backfill
- 2045 Backfill
- 2050 Backfill
- 2055 Backfill
- 2060 Backfill
- 2065 Backfill
- North sub-pit
- West sub-pit
- South sub-pit
- Thacker Pass Project AOI

1:12,000

0 0.1 0.2 0.4 0.6 0.8 Miles

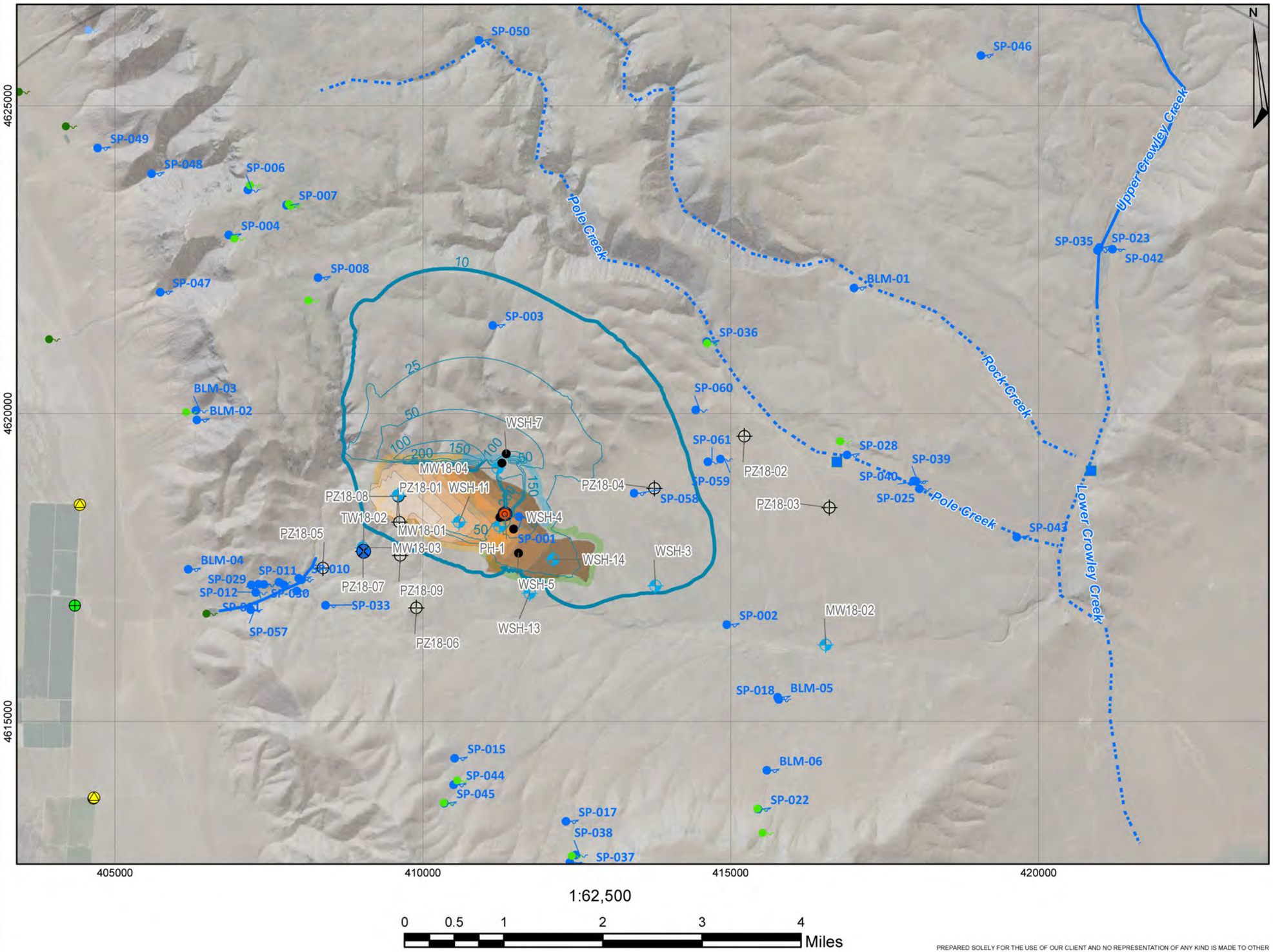
PREPARED SOLELY FOR THE USE OF OUR CLIENT AND NO REPRESENTATION OF ANY KIND IS MADE TO OTHER PARTIES WITH WHICH PITEAU ASSOCIATES ENGINEERING LTD. HAS NOT ENTERED INTO A CONTRACT.

Backfilled Pit Proposed Action: simulated water levels 300 years post-closure

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

CLIENT:	LNC
PROJECT:	Thacker Pass Project EIS
JOB:	3898
DRAWN: BA	CHECKED: TC
DATE:	May 2020
FIGURE:	4.11

H:\Project\3898\GIS\Kings Valley EIS\Mxds\Modeling Report\Figure 4.12 Backfill 300yr DDN Map 65k.mxd



PREPARED SOLELY FOR THE USE OF OUR CLIENT AND NO REPRESENTATION OF ANY KIND IS MADE TO OTHER PARTIES WITH WHICH PITEAU ASSOCIATES ENGINEERING LTD. HAS NOT ENTERED INTO A CONTRACT.

Water Rights: Source - Type

- Spring - Irrigation
- Spring - Stock watering
- Spring - Other
- Stream - Irrigation
- Well - Irrigation
- Well - Mining
- Well - Quasi-municipal
- Well - Stock watering

Wells

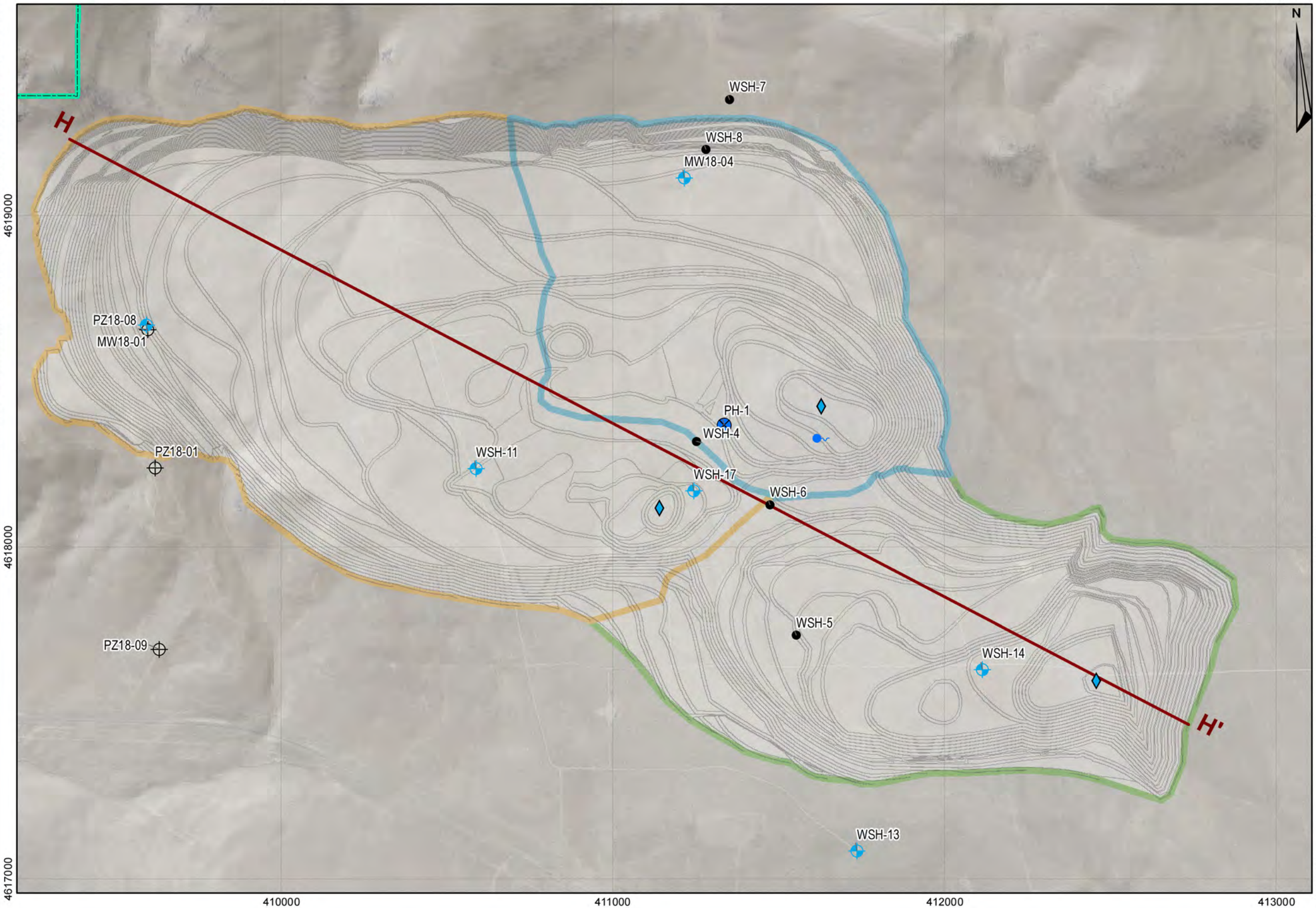
- Abandoned
- Monitoring well
- Piezometer
- Production well
- Test pumping well
- Springs
- Drawdown contours
- 10 ft Drawdown isopleth
- 5 mile buffer (from AOI)
- Backfill footprints
- North sub-pit
- West sub-pit
- South sub-pit

Backfilled Pit Proposed Action: simulated drawdown 300-yrs post-closure (2365)

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

CLIENT:	LNC
PROJECT:	Thacker Pass Project EIS
JOB:	3898
DRAWN: LH	CHECKED: TC
DATE:	May 2020
FIGURE:	4.12

H:\Project\3898\GIS\Kings Valley EIS\Mxds\Modeling Report\Figure 4.13 Open Pit Config.mxd



1:12,000

0 0.1 0.2 0.4 0.6 0.8 Miles

PREPARED SOLELY FOR THE USE OF OUR CLIENT AND NO REPRESENTATION OF ANY KIND IS MADE TO OTHER PARTIES WITH WHICH PITEAU ASSOCIATES ENGINEERING LTD. HAS NOT ENTERED INTO A CONTRACT.

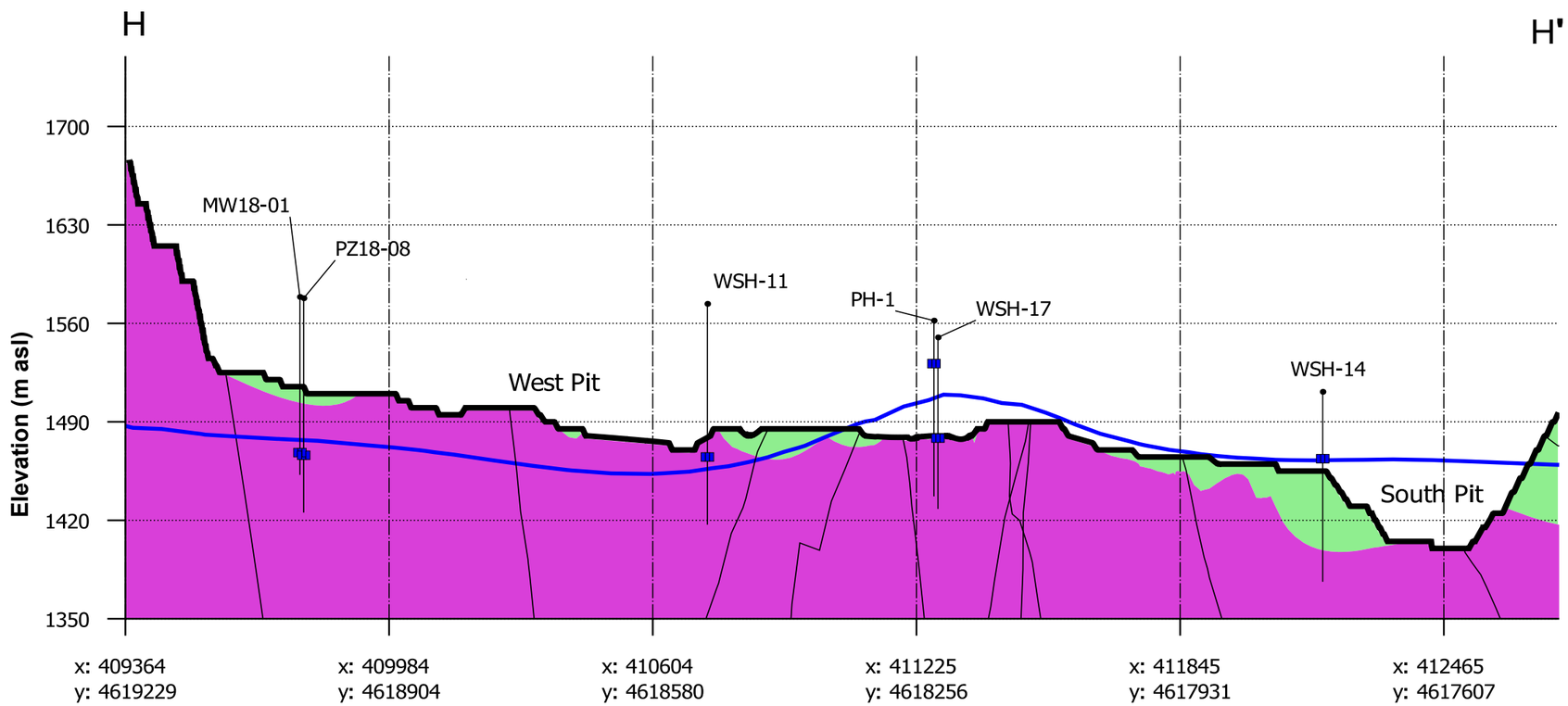
Wells

- Abandoned
- Monitoring well
- Piezometer
- Production well
- Test pumping well
- Springs
- Simulated Sub-Pit Monitoring Locations
- H-H' Cross section
- Pit contours
- North sub-pit
- West sub-pit
- South sub-pit
- Thacker Pass Project AOI

Open Pit Alternative configuration

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

CLIENT:	LNC
PROJECT:	Thacker Pass Project EIS
JOB:	3898
DRAWN: LH	CHECKED: TC
DATE:	May 2020
FIGURE:	4.13



Surfaces

- Water Table
- Open Pit
- Fault
- Sediments
- Tuff of Long Ridge

Scale: 1:16,000

Vertical exaggeration: 4x

0m 1000m

Location

A: 409364, 4619229

A': 412737, 4617465

Open Pit Alternative configuration cross section

PITEAU ASSOCIATES
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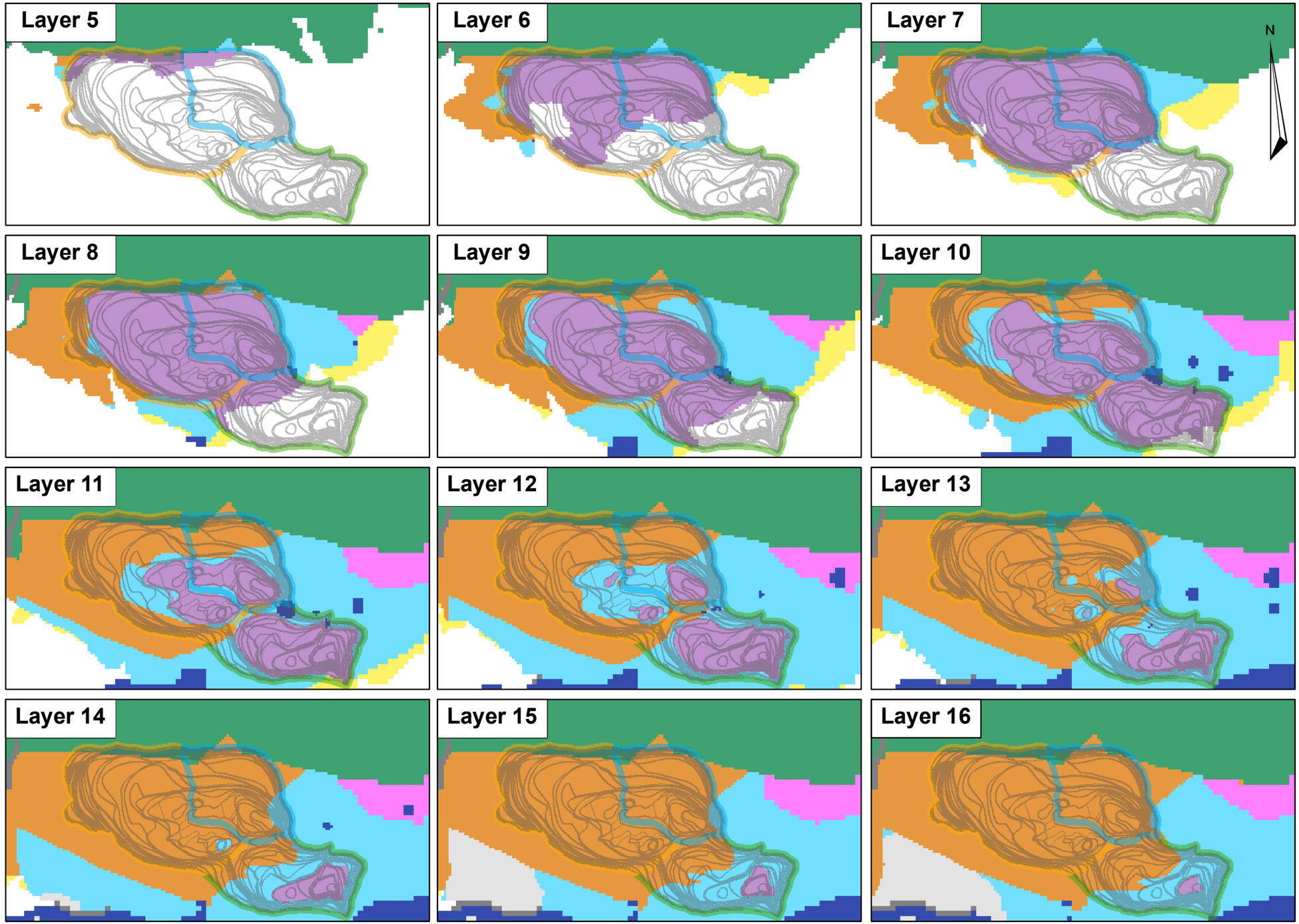
CLIENT: LNC	
PROJECT: 3898	
JOB: Thacker Pass Project EIS	
DRAWN: LH	CHECKED: TC
DATE: May 2020	
FIGURE: 4.14	

H:\Project\3898\GIS\Kings Valley EIS\Mxds\Modeling Report\Figure 4.15 Pit Lake Cells.mxd



Pit contours
North sub-pit
West sub-pit
South sub-pit

Lithologic Unit
Basement Volcanic Tuff
Thacker Pass Alluvium
Claystone
Rock / Pole Shear Zones
Silicified Claystone (East)
Thacker Pass Tuff
Thacker Pass Basalts
Open Pit

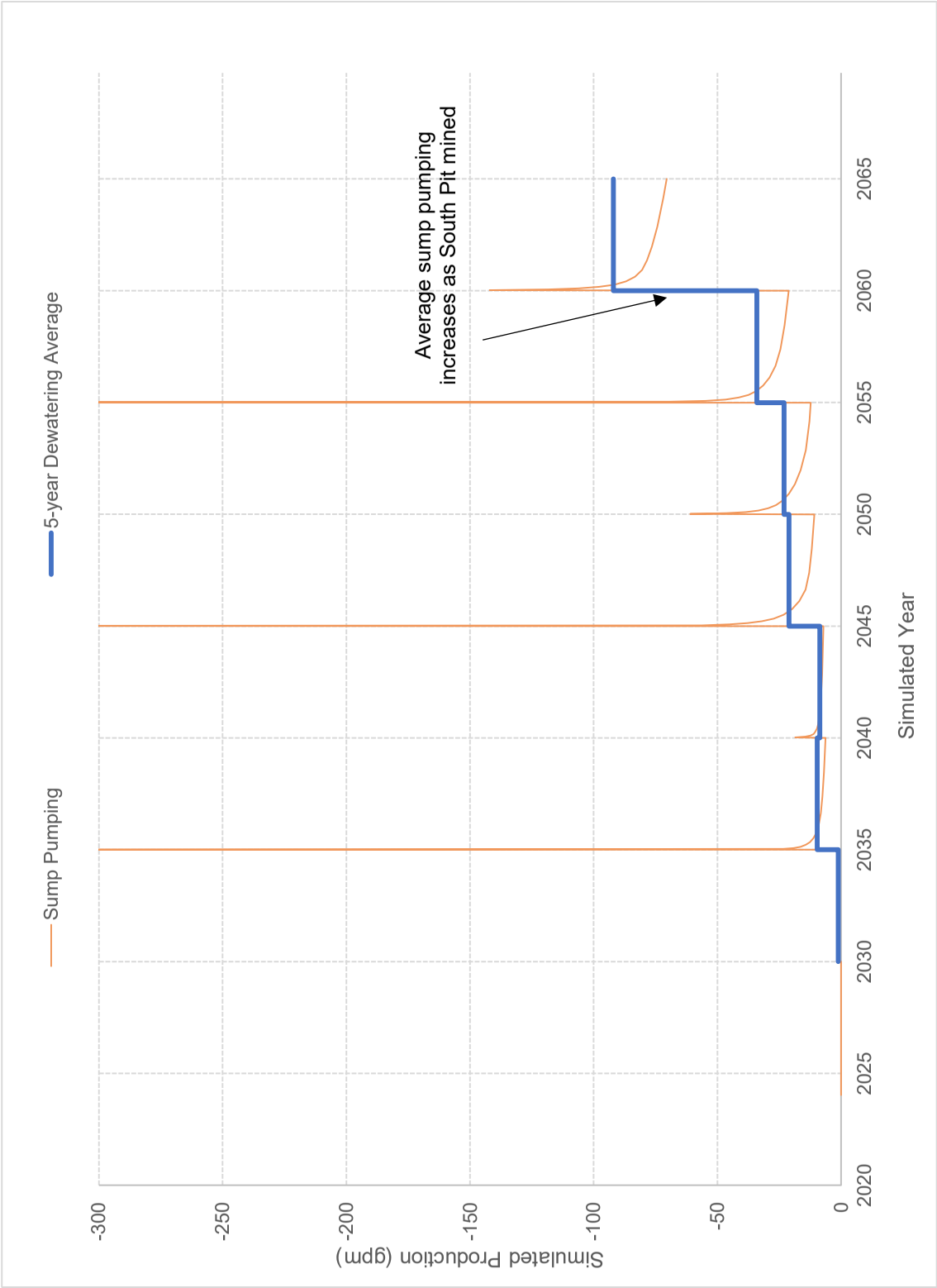
1:48,000

0 0.25 0.5 1 1.5 2 Miles

Open Pit Allternative: conductivity and storage zones

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

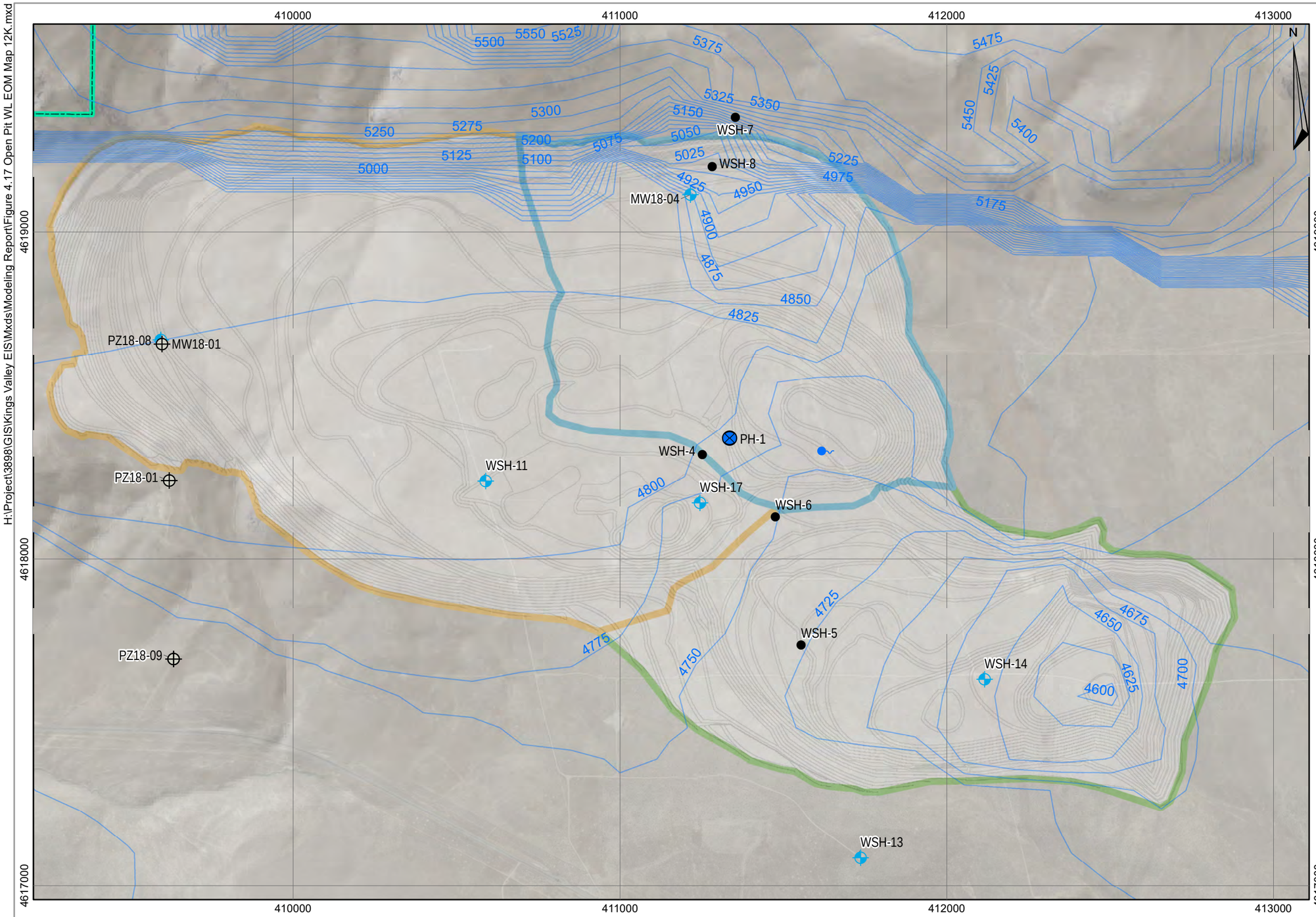
CLIENT:	LNC
PROJECT:	Thacker Pass Project EIS
JOB:	3898
DRAWN: LH	CHECKED: TC
DATE:	May 2020
FIGURE:	4.15



PITEAU ASSOCIATES GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS	Open Pit Alternative: simulated flow rates through time		
	CLIENT: LNC	PROJECT: Thacker Pass Project EIS	
	JOB #: 3898	DRAWN: BA	CHECKED: TC
	DATE: May 2020	FIGURE: 4.16	

H:\Project\3898\3898-2 Kings Valley EIS\400_WIP\440_Modeling\2019_Model\Model Results\Predictive\[LNC Open_Pit_DW&RecoveryResults_BRRs.xlsx]

H:\Project\3898\GIS\Kings Valley EIS\Mxds\Modeling Report\Figure 4.17 Open Pit WL EOM Map 12K.mxd



1:12,000

0 0.1 0.2 0.4 0.6 0.8 Miles

PREPARED SOLELY FOR THE USE OF OUR CLIENT AND NO REPRESENTATION OF ANY KIND IS MADE TO OTHER PARTIES WITH WHICH PITEAU ASSOCIATES ENGINEERING LTD. HAS NOT ENTERED INTO A CONTRACT.

Wells

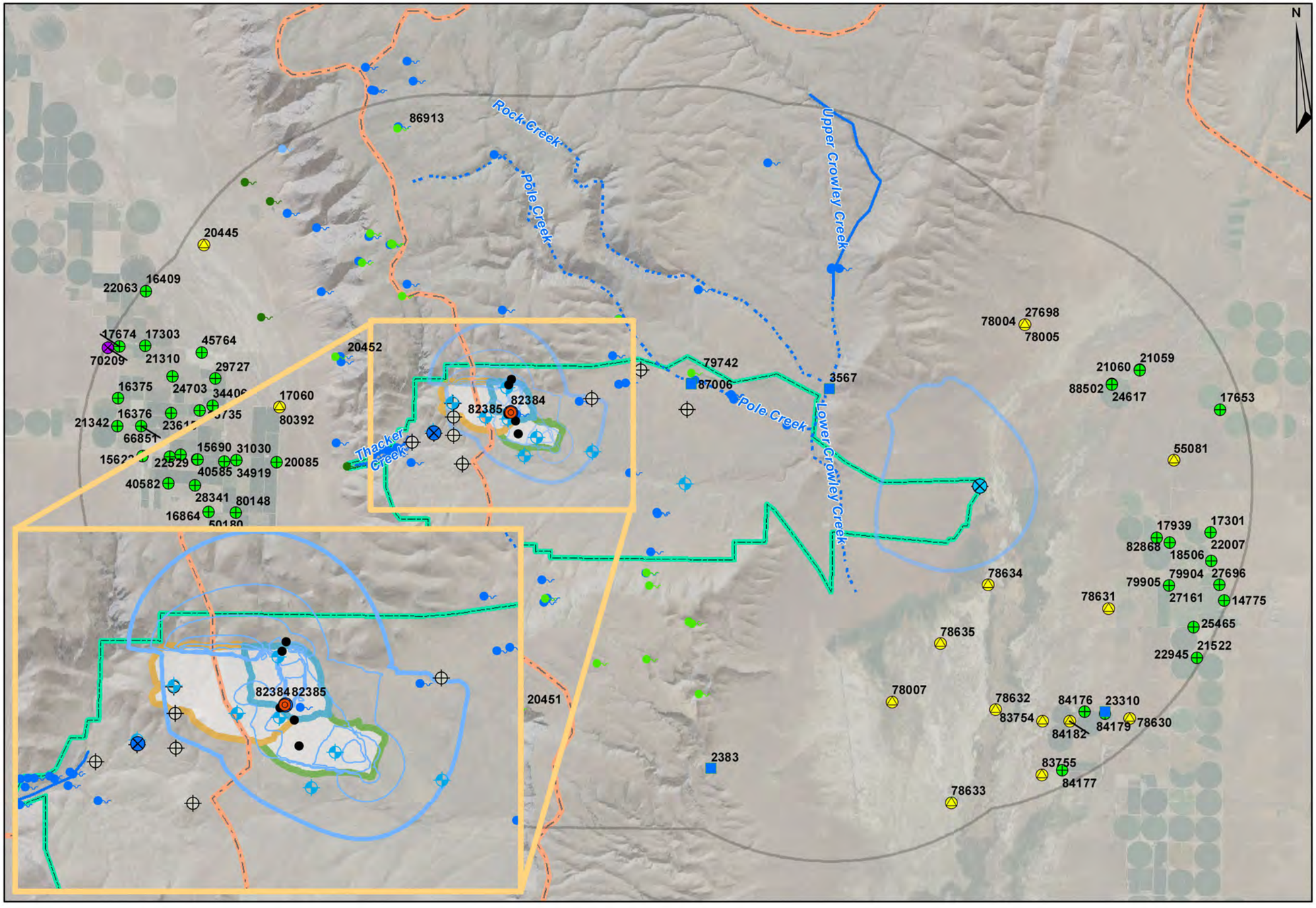
- Abandoned
- Monitoring well
- Piezometer
- Production well
- Test pumping well
- Springs
- 2065 Open pit water level
- North sub-pit
- West sub-pit
- South Sub-pit
- Thacker Pass Project AOI
- Pit Contours

Open Pit Alternative: simulated water levels at end of mining (2065)

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

CLIENT:	LNC		
PROJECT:	Thacker Pass Project EIS		
JOB:	3898		
DRAWN:	BA	CHECKED:	TC
DATE:	May 2020		
FIGURE:	4.17		

H:\Project\3898\GIS\Kings Valley EIS\Mxds\Modeling Report\Figure 4.18 Open Pit DDN EOM Map 120K.mxd



1:120,000

0 1 2 4 6 8 Miles

PREPARED SOLELY FOR THE USE OF OUR CLIENT AND NO REPRESENTATION OF ANY KIND IS MADE TO OTHER PARTIES WITH WHICH PITEAU ASSOCIATES ENGINEERING LTD. HAS NOT ENTERED INTO A CONTRACT.

Water Rights: Source - Type

- Spring - Irrigation
- Spring - Stock watering
- Spring - Other
- Stream - Irrigation
- Well - Irrigation
- Well - Mining
- Well - Quasi-municipal
- Well - Stock watering

Wells

- Abandoned
- Monitoring well
- Piezometer
- Production well
- Test pumping well
- Springs

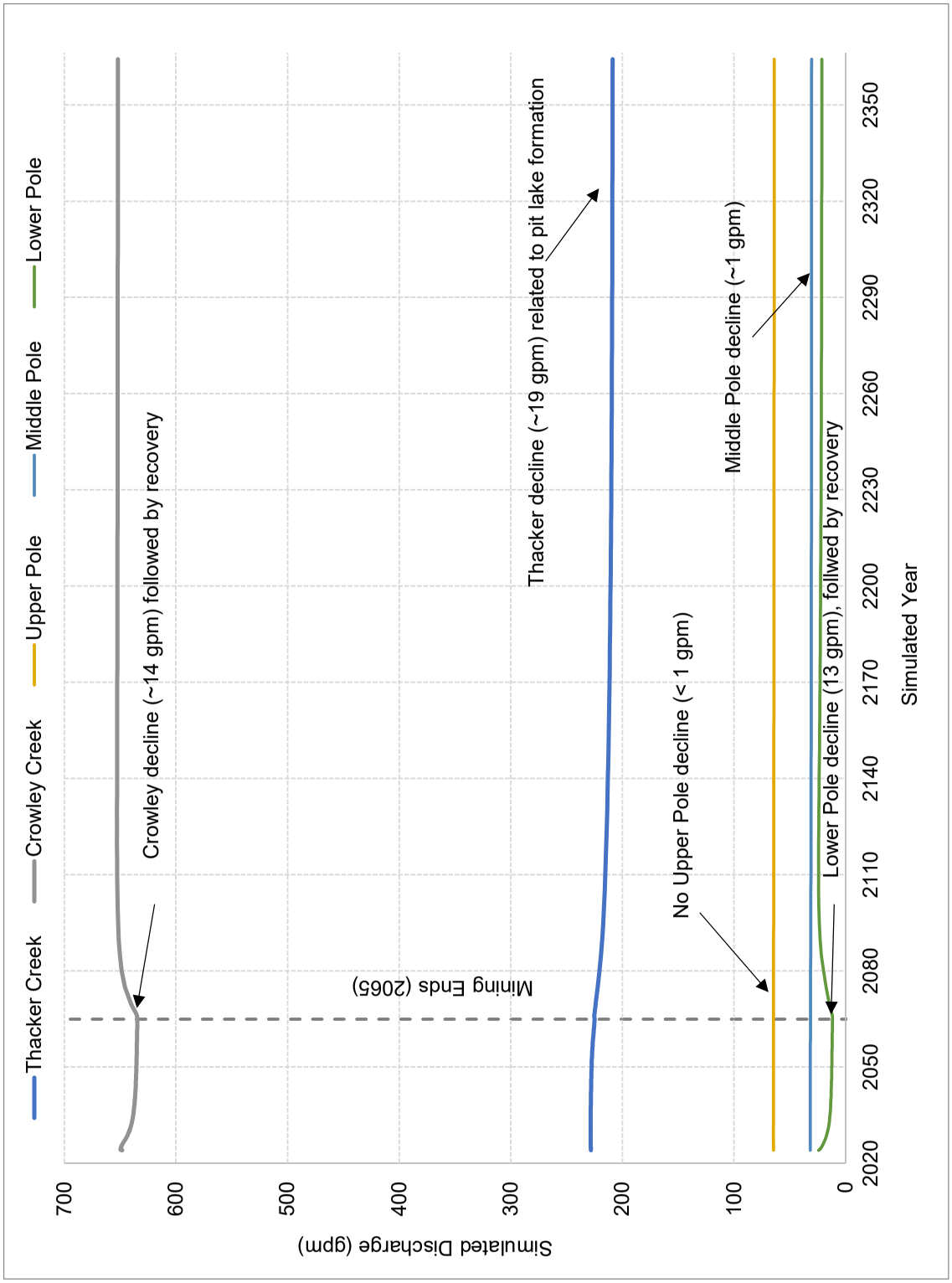
EOM Drawdown

- 10 ft Drawdown Isopleth
- Drawdown Contours
- 5 mile buffer (from AOI)
- Hydrographic basin boundary
- North sub-pit
- West sub-pit
- South Sub-pit
- Thacker Pass Project AOI

Open Pit Alternative: simulated drawdown at end of mining (2065)

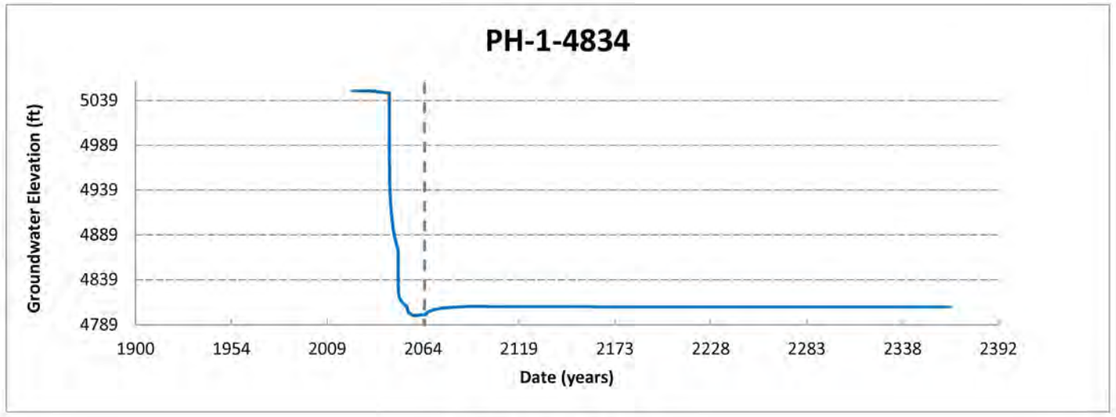
PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

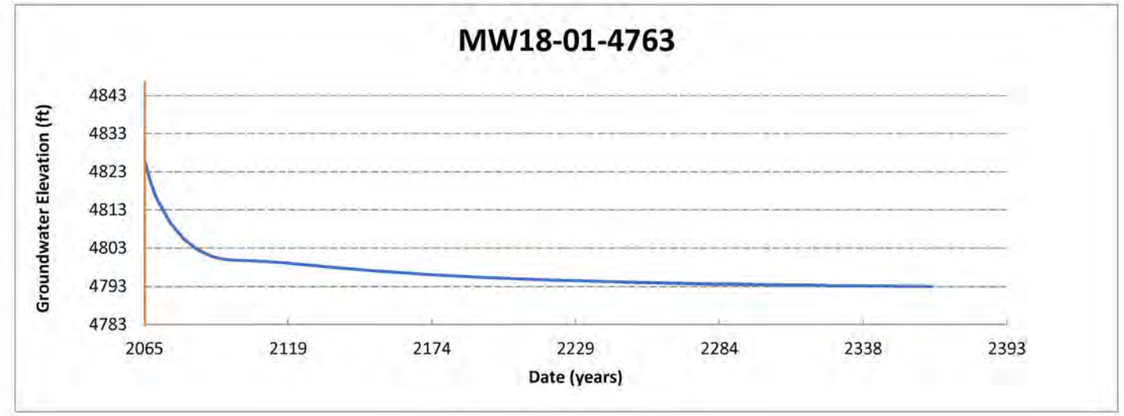
CLIENT:	LNC		
PROJECT:	Thacker Pass Project EIS		
JOB:	3898		
DRAWN:	BA	CHECKED:	TC
DATE:	May 2020		
FIGURE:	4.18		

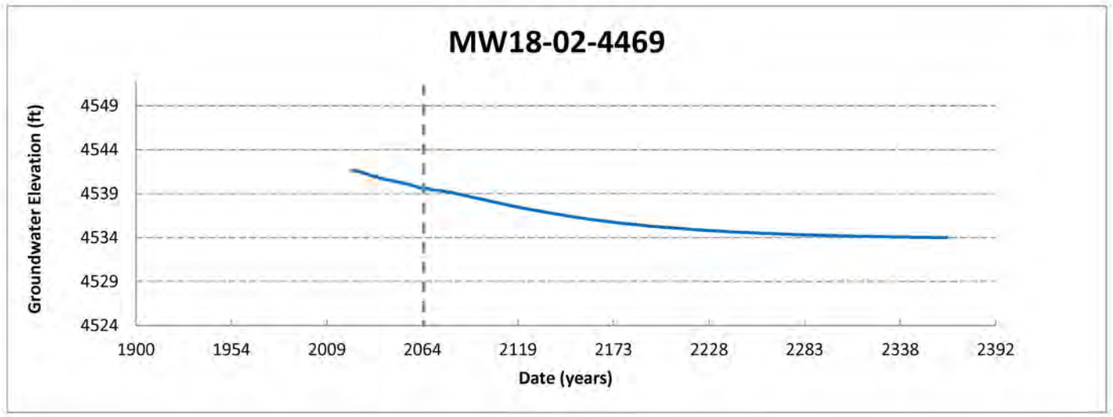


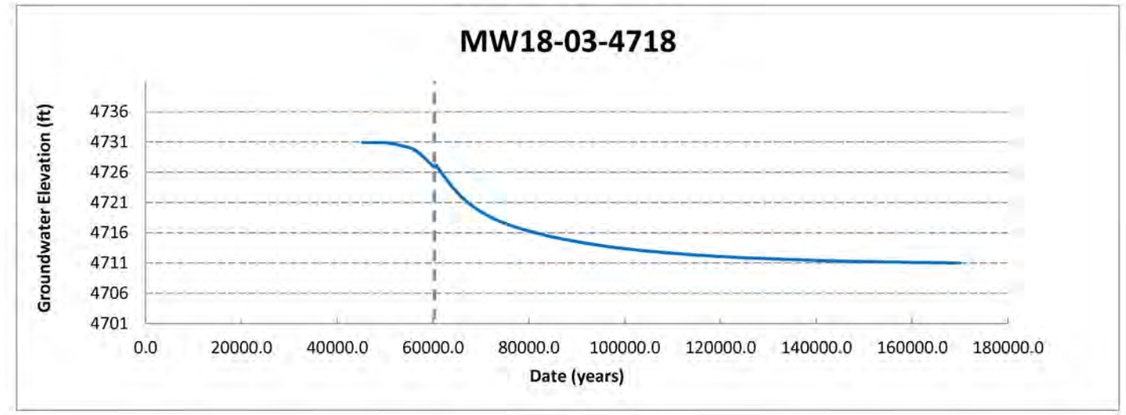
PITEAU ASSOCIATES GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS	Open Pit Alternative: simulated groundwaer flow to streams		
	CLIENT: LNC	PROJECT: Thacker Pass Project EIS	
	JOB #: 3898	DRAWN: BA	CHECKED: TC
	DATE: May 2020	FIGURE: 4.19	

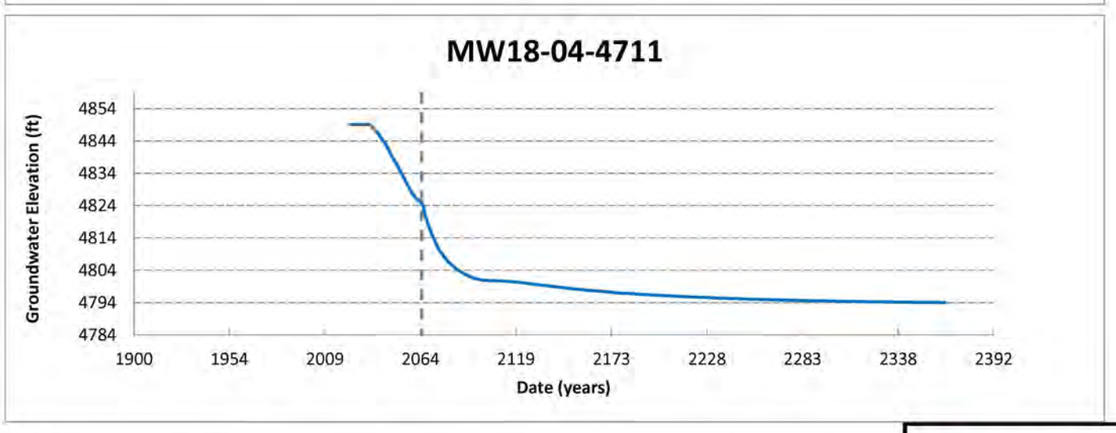
H:\Project\3898\3898-2 Kings Valley EIS\400_WIP\440_Modeling\2019_Model\Model Results\Predictive\[LNC Open_Pit_DW&RecoveryResults_BRRs.xlsx]

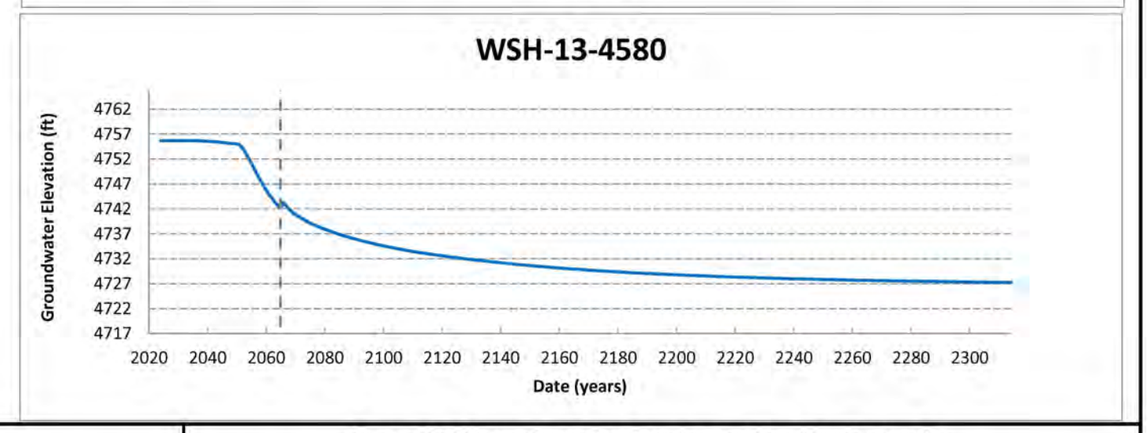












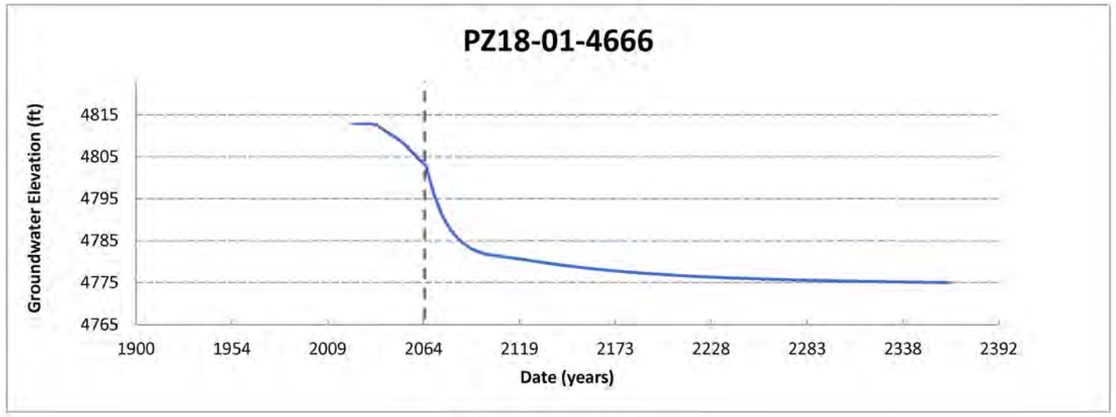
End of Mining

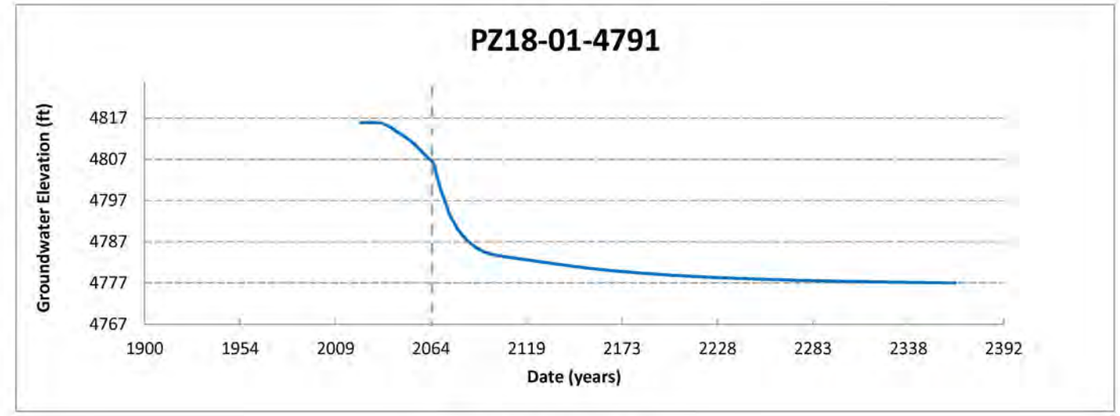
Simulated water level

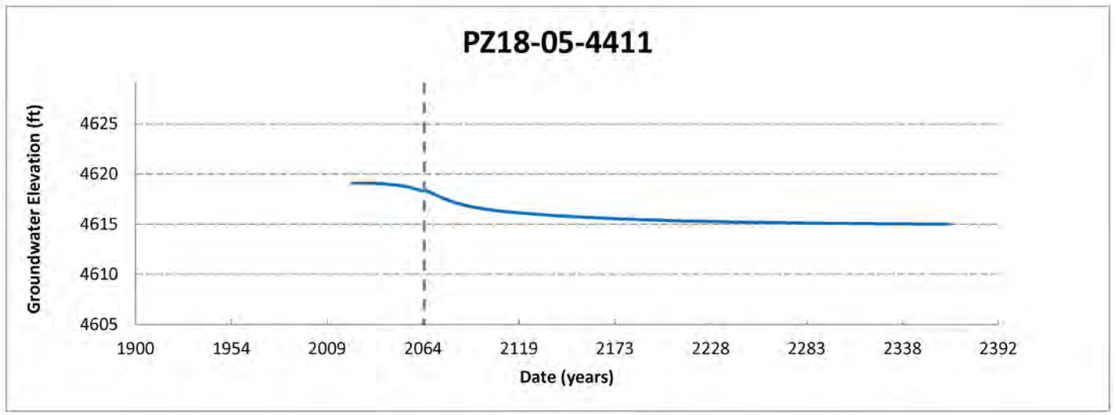
PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

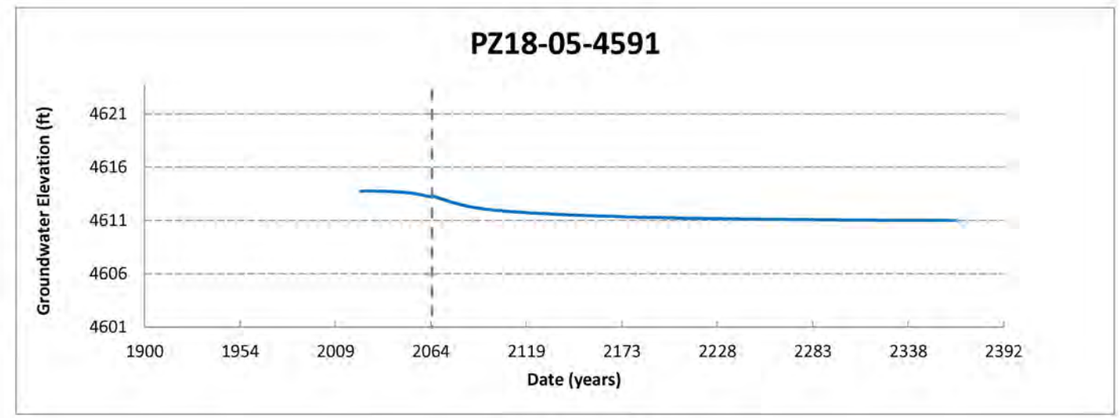
Open Pit Alternative: simulated water level hydrographs

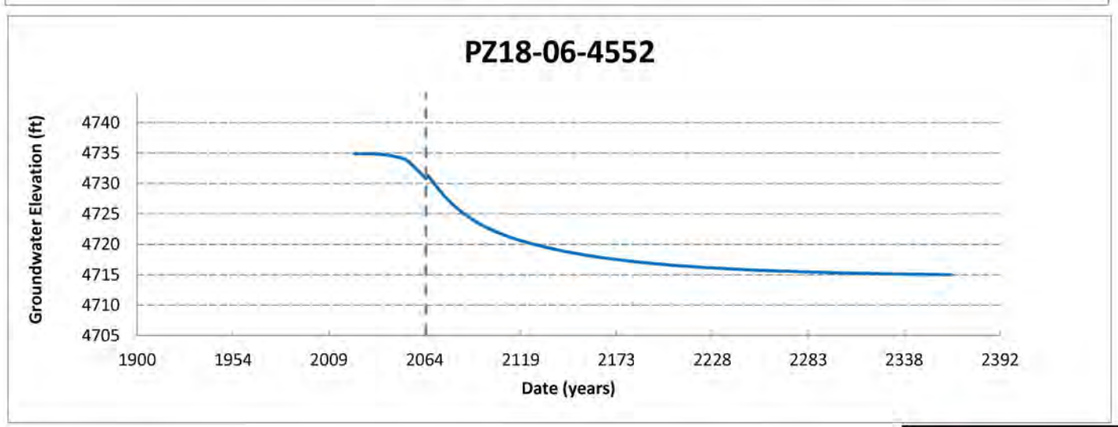
CLIENT: LNC	PROJECT: Thacker Pass Project EIS
JOB: 3898	DRAWN: BA CHECKED: TC
DATE: May 2020	FIGURE: 4.20a

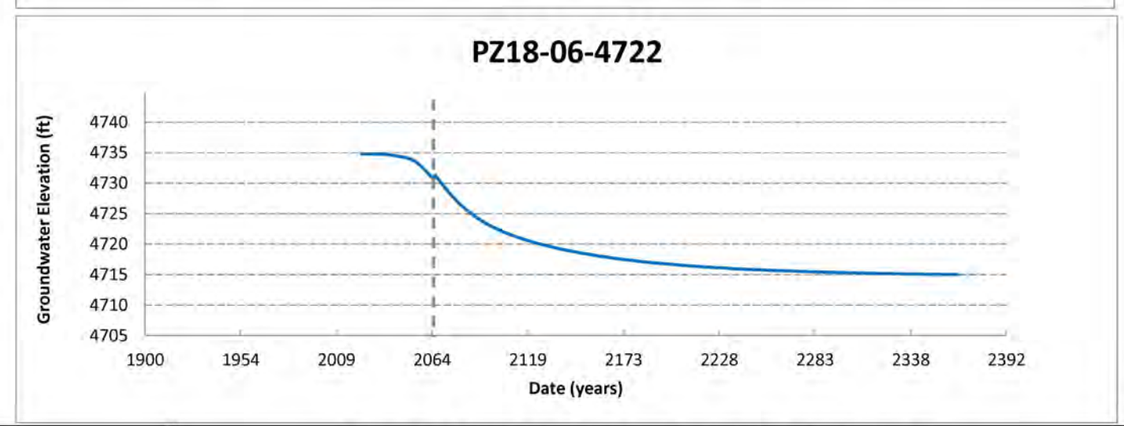












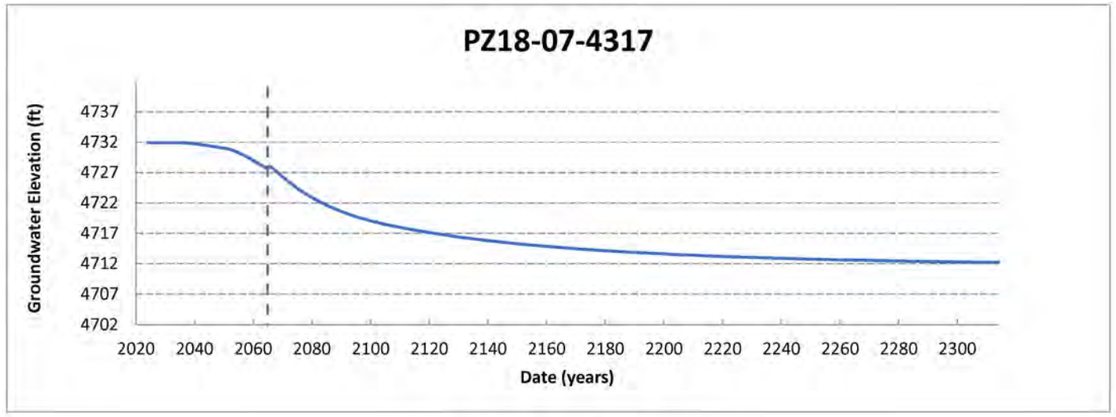
End of Mining

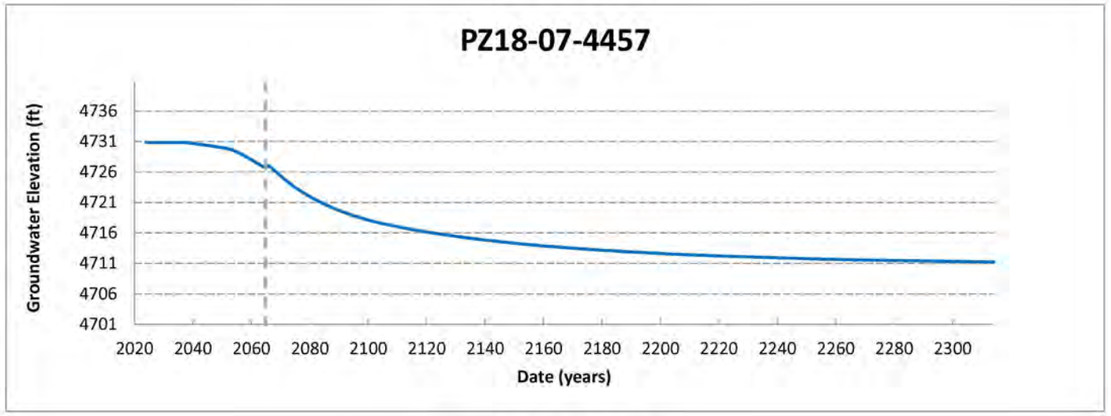
Simulated water level

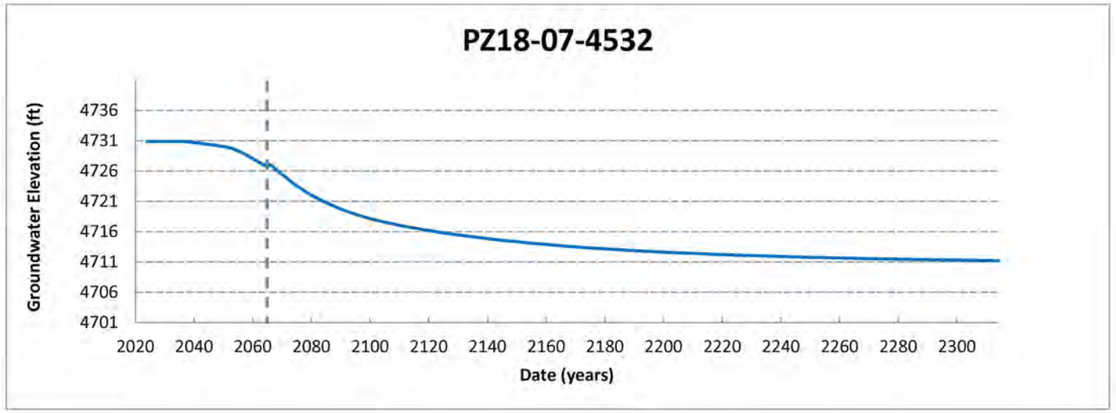
PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

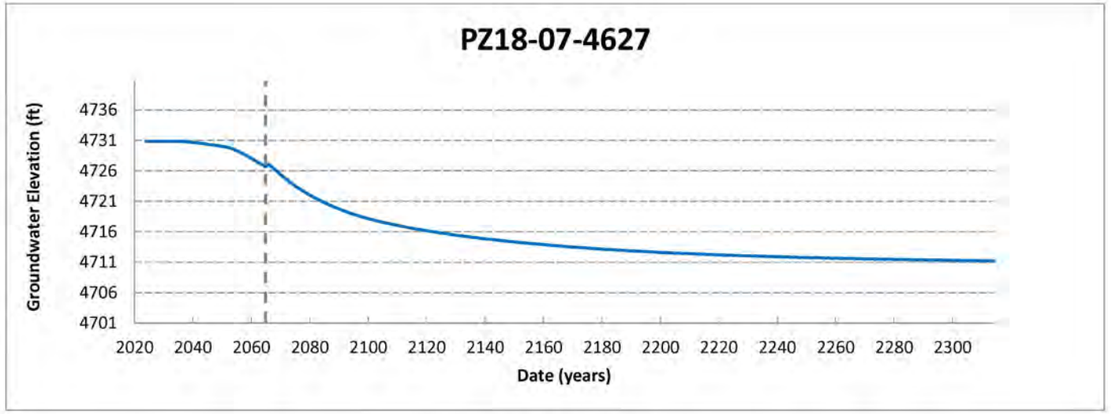
Open Pit Alternative: simulated water level hydrographs

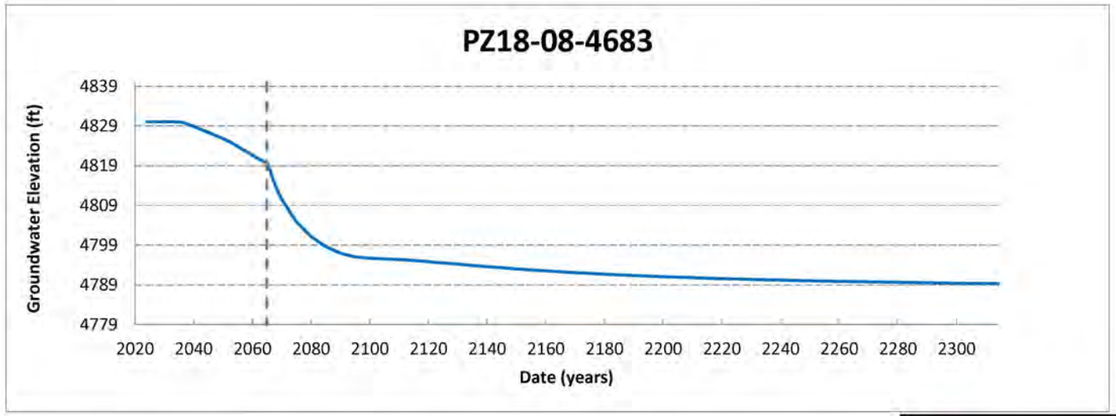
CLIENT: LNC	PROJECT: Thacker Pass Project EIS
JOB: 3898	DRAWN: BA CHECKED: TC
DATE: May 2020	FIGURE: 4.20b

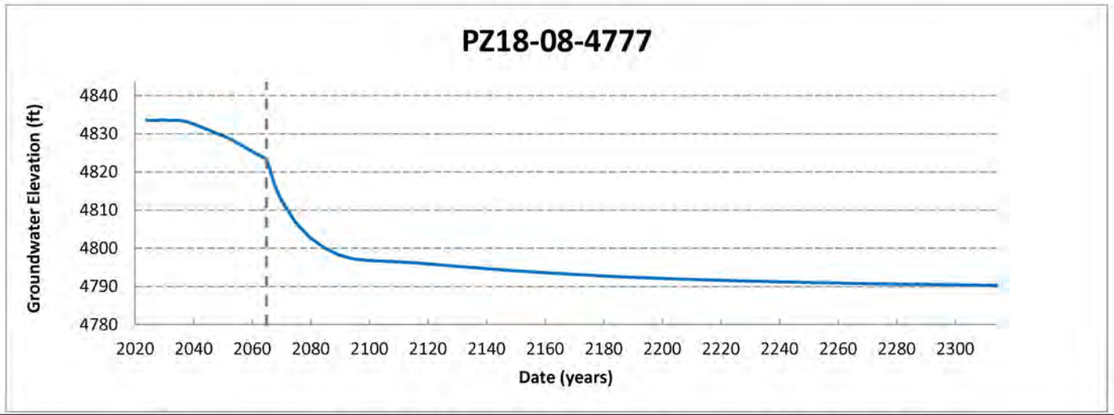












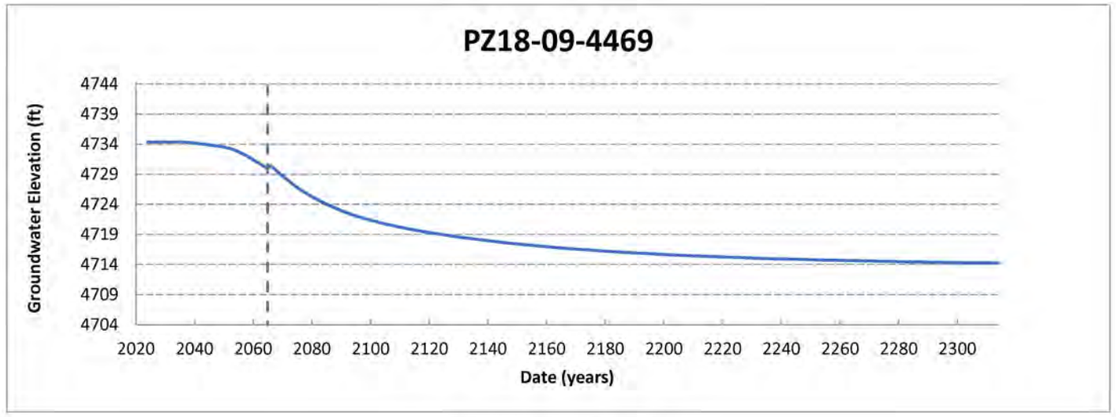
End of Mining

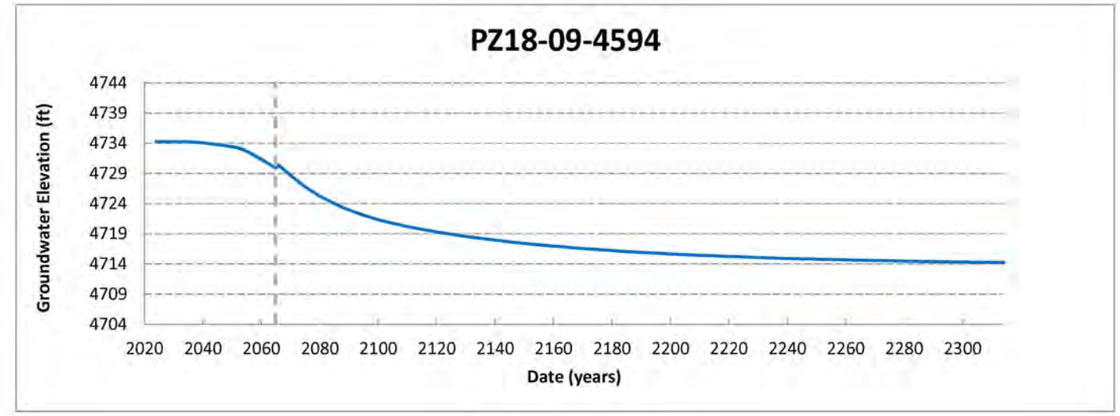
Simulated water level

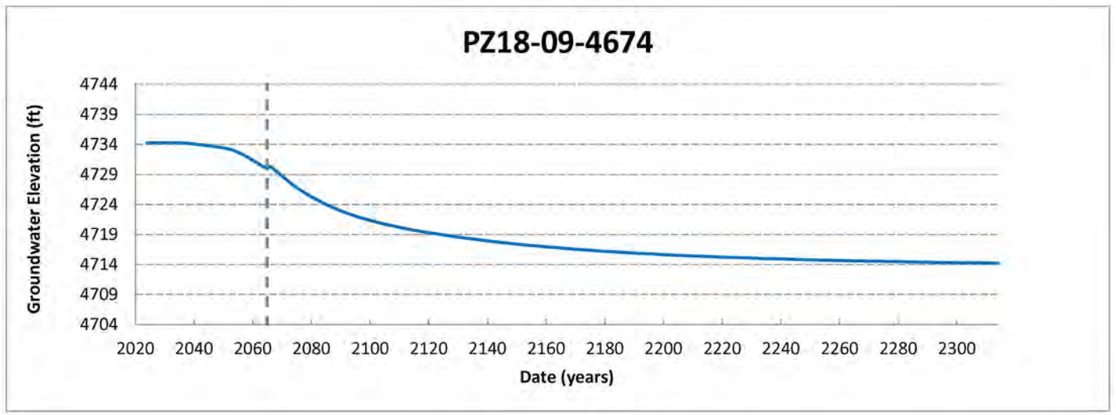
PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

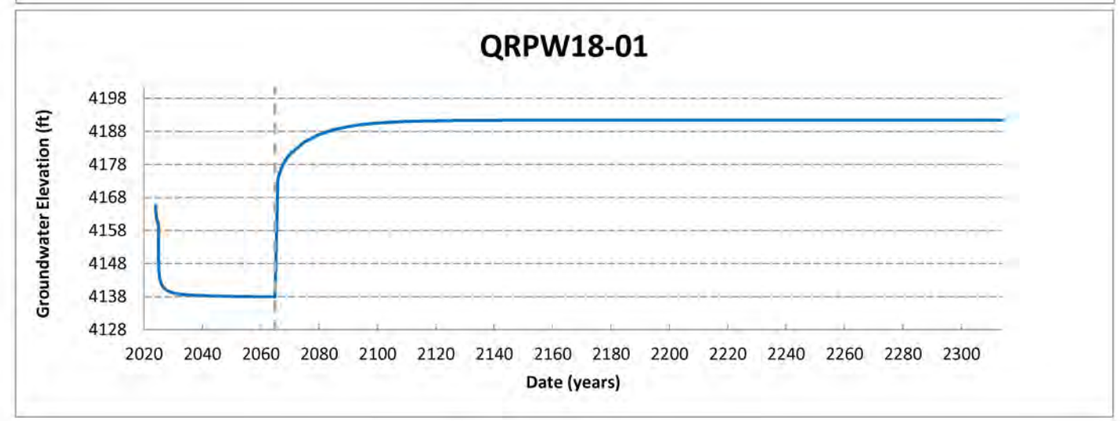
Open Pit Alternative: simulated water level hydrographs

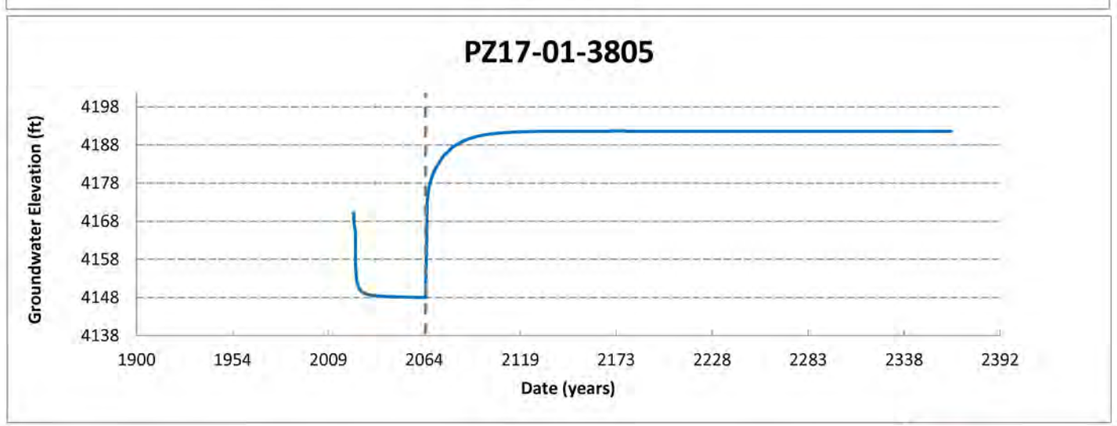
CLIENT: LNC	PROJECT: Thacker Pass Project EIS
JOB: 3898	DRAWN: BA CHECKED: TC
DATE: May 2020	FIGURE: 4.20c

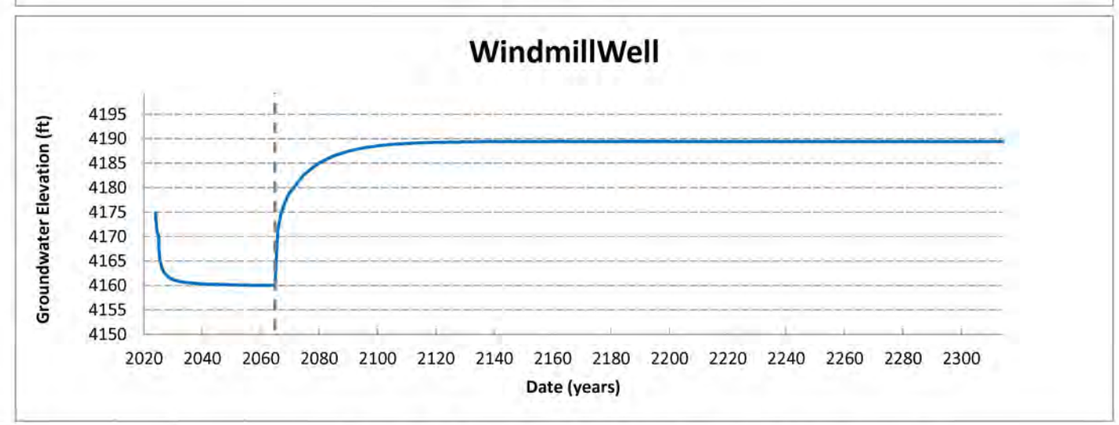












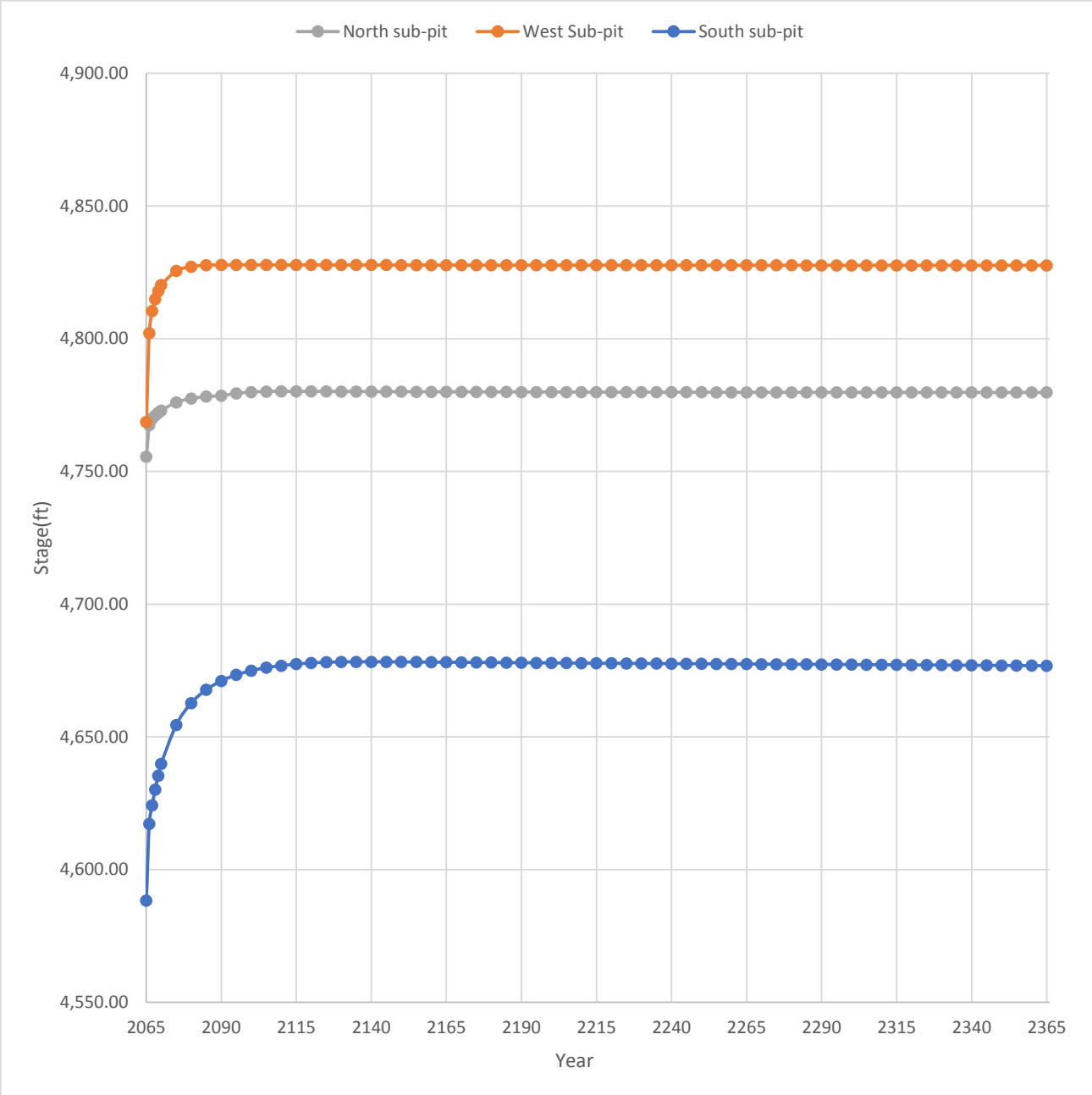
End of Mining

Simulated water level

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

Open Pit Alternative: simulated water level hydrographs

CLIENT: LNC	PROJECT: Thacker Pass Project EIS
JOB: 3898	DRAWN: BA CHECKED: TC
DATE: May 2020	FIGURE: 4.20d

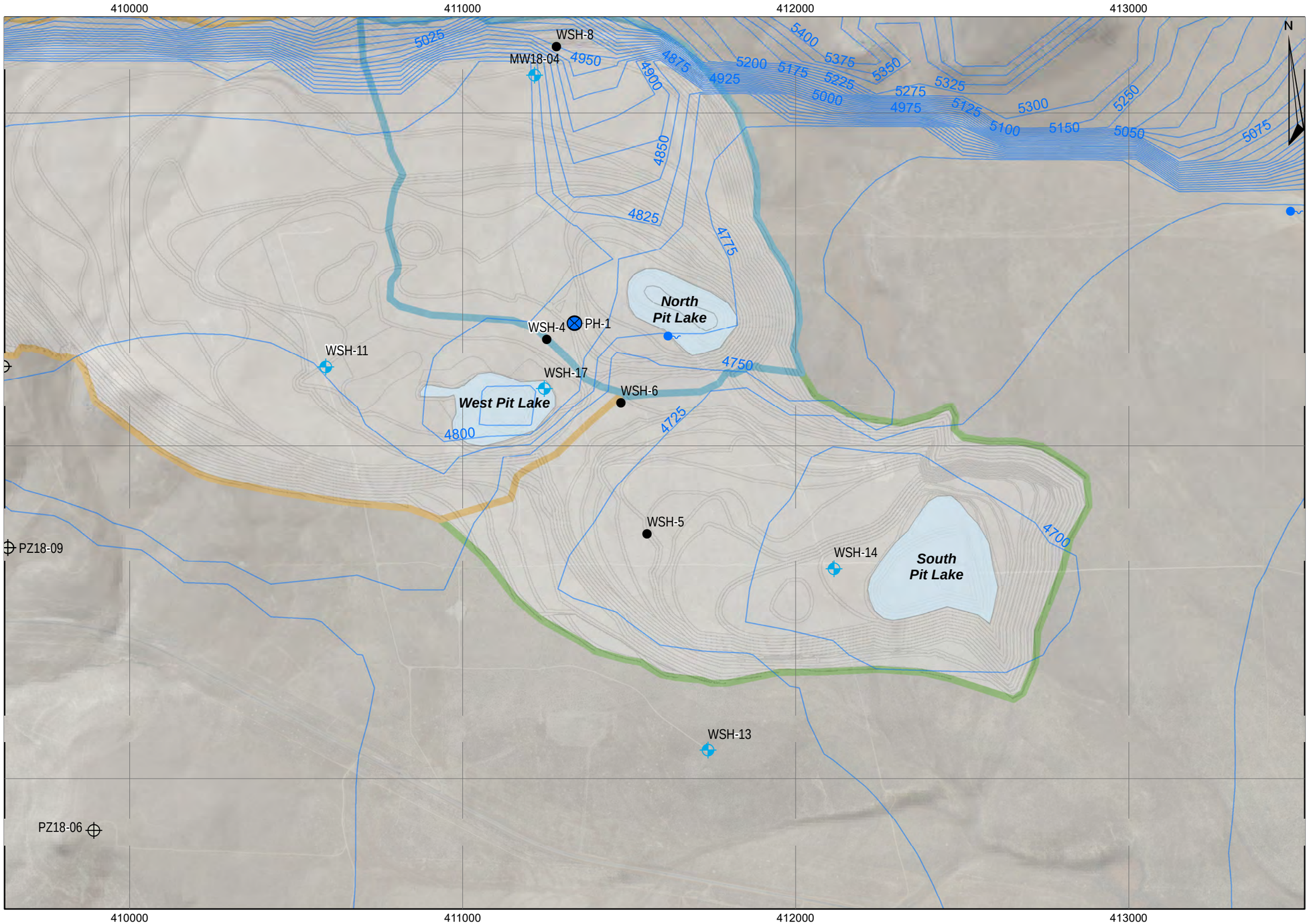


*Hypothetical monitoring locations shown in Figure 4.1

PITEAU ASSOCIATES	Open Pit Alternative: simulated open pit lake recovery (3 sub-pits)			
	CLIENT: LNC	PROJECT: Thacker Pass Project EIS		
	JOB #: 3898	DRAWN: LH	CHECKED: TC	
	DATE: May 2020	FIGURE: 4.21		

H:\Project\3898\3898-2 Kings Valley EIS\400_WIP\440_Modeling\2019_Model\Model Results\Predictive\[LNC_OpenPit_ObsWells_AutoPop.xlsm]

H:\Project\3898\GIS\Kings Valley EIS\Mxds\Modeling Report\Figure 4.22 Pit Lake WL 300yr 12K.mxd



1:12,000

0 0.1 0.2 0.4 0.6 0.8 Miles

PREPARED SOLELY FOR THE USE OF OUR CLIENT AND NO REPRESENTATION OF ANY KIND IS MADE TO OTHER PARTIES WITH WHICH PITEAU ASSOCIATES ENGINEERING LTD. HAS NOT ENTERED INTO A CONTRACT.

Wells

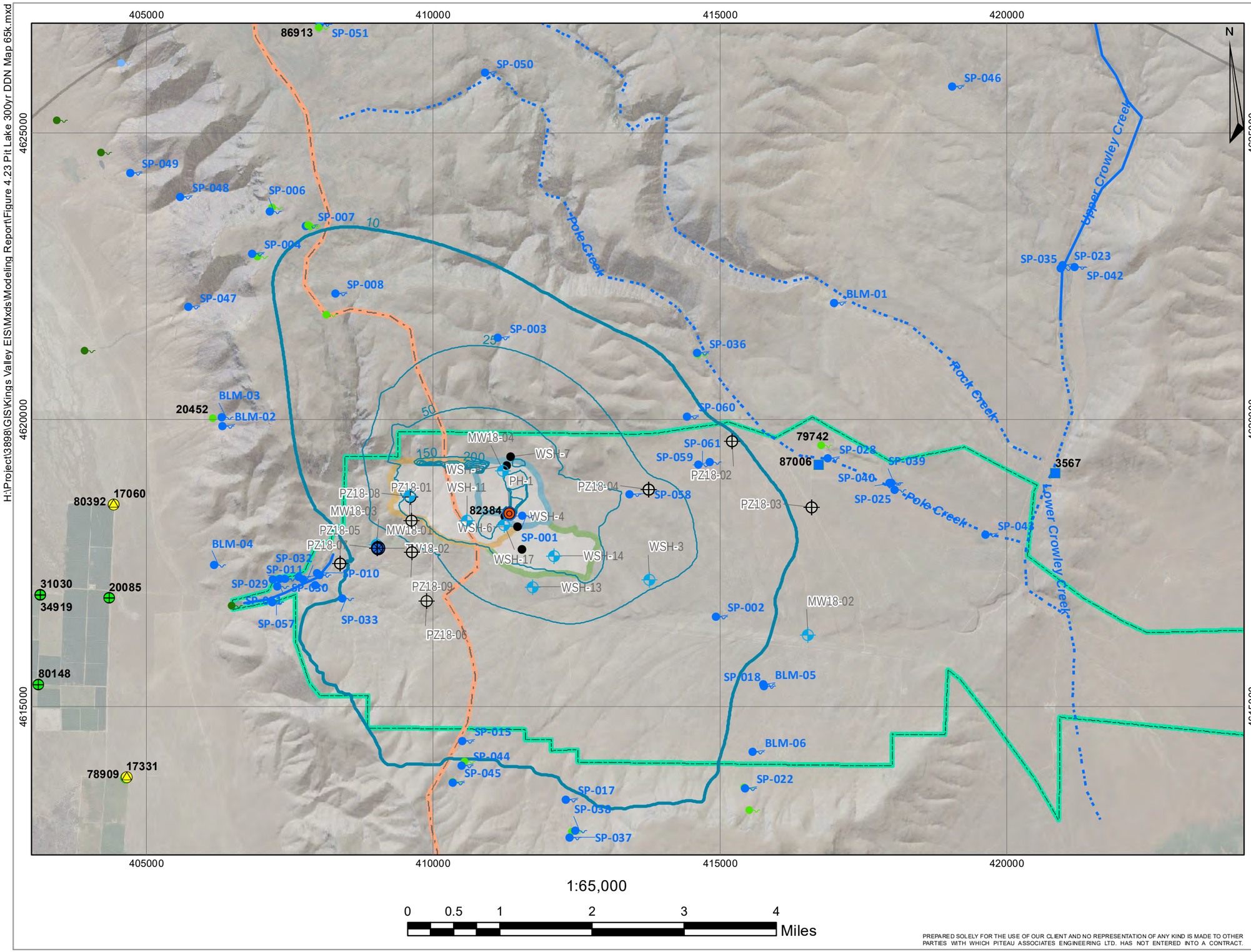
- Abandoned
- Monitoring well
- Piezometer
- Production well
- Test pumping well
- Springs
- 2365 Open pit water level
- Predicted pit lake area
- North sub-pit
- West sub-pit
- South sub-pit
- Thacker Pass Project
- Pit contours

Open Pit Alternative: simulated water levels 300 years post-closure (2365)

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

CLIENT:	LNC
PROJECT:	Thacker Pass Project EIS
JOB:	3898
DRAWN:	BA
CHECKED:	TC
DATE:	May 2020
FIGURE:	4.22

H:\Project\3898\GIS\Kings Valley EIS\Mxds\Modeling Report\Figure 4.23 Pit Lake 300yr DDN Map 65k.mxd



1:65,000

0 0.5 1 2 3 4 Miles

PREPARED SOLELY FOR THE USE OF OUR CLIENT AND NO REPRESENTATION OF ANY KIND IS MADE TO OTHER PARTIES WITH WHICH PITEAU ASSOCIATES ENGINEERING LTD. HAS NOT ENTERED INTO A CONTRACT.

Water Rights: Source - Type

- Spring - Irrigation
- Spring - Stock watering
- Spring - Other
- Stream - Irrigation
- Well - Irrigation
- Well - Mining
- Well - Quasi-municipal
- Well - Stock watering

Wells

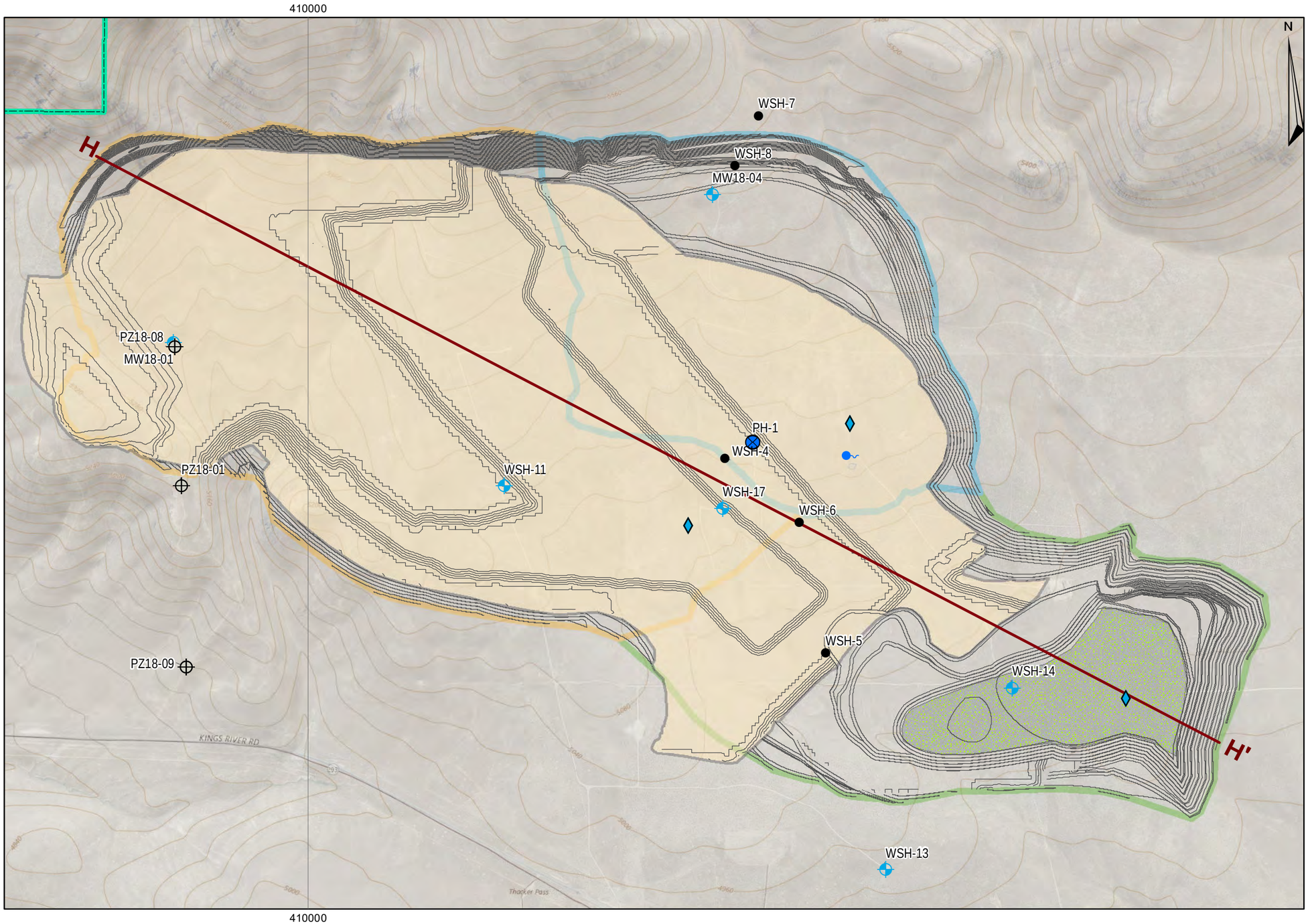
- Abandoned
- Monitoring well
- Piezometer
- Production well
- Test pumping well
- Springs
- Drawdown contours
- 10 ft Drawdown isopleth
- 5 mile buffer (from AOI)
- Hydrographic basin boundary
- North sub-pit
- West sub-pit
- South sub-pit
- Thacker Pass Project AOI

Open Pit Alternative: simulated drawdown 300 years post-closure (2365)

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

CLIENT:	LNC
PROJECT:	Thacker Pass Project EIS
JOB:	3898
DRAWN: LH	CHECKED: TC
DATE:	May 2020
FIGURE:	4.23

H:\Project\3898\GIS\Kings Valley EIS\Mxds\Modeling Report\Figure 4.24 Partial Backfill South Pit Config.mxd



1:12,000

0 0.1 0.2 0.4 0.6 0.8 Miles

PREPARED SOLELY FOR THE USE OF OUR CLIENT AND NO REPRESENTATION OF ANY KIND IS MADE TO OTHER PARTIES WITH WHICH PITEAU ASSOCIATES ENGINEERING LTD. HAS NOT ENTERED INTO A CONTRACT.

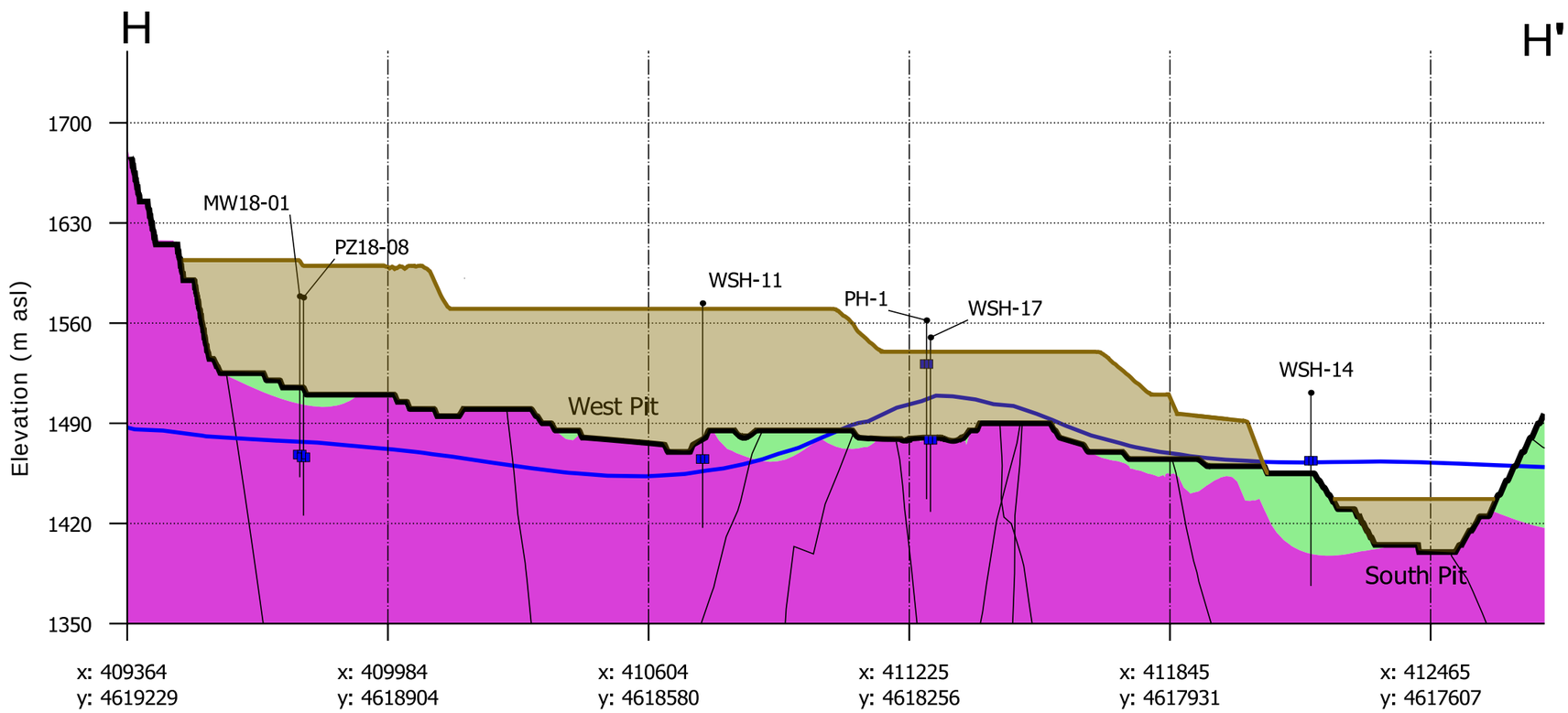
Wells

- Abandoned
- Monitoring well
- Piezometer
- Production well
- Test pumping well
- Simulated Sub-Pit Monitoring Locations
- H-H' Cross section
- Pit contours
- Springs
- 2065 backfill footprint
- Partial backfill (4709 ft)
- North sub-pit
- West sub-pit
- South sub-pit
- Thacker Pass Project AOI

Partially Backfilled South Sub-pit Alternative configuration

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

CLIENT:	LNC		
PROJECT:	Thacker Pass Project EIS		
JOB:	3898		
DRAWN:	LH	CHECKED:	TC
DATE:	May 2020		
FIGURE:	4.24		



Surfaces

- Water Table
- Open Pit
- Partial Backfill South Pit
- Fault
- Sediments
- Tuff of Long Ridge
- Backfill

Scale: 1:16,000

Vertical exaggeration: 4x

0m 1000m

Location

A: 409364, 4619229

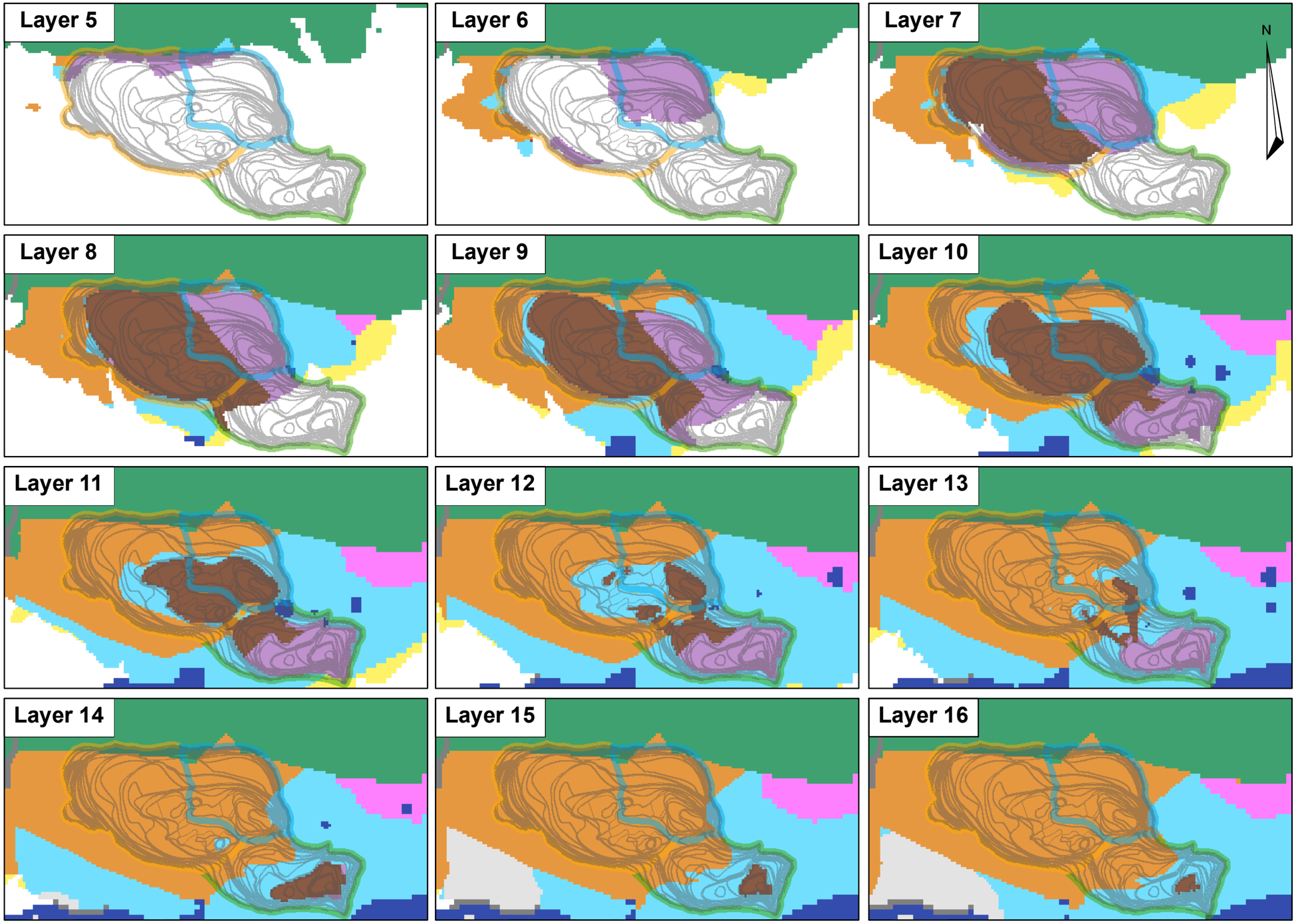
A': 412737, 4617465

Partially Backfilled South Sub-pit Alternative configuration cross section

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

CLIENT: LNC	
PROJECT: 3898	
JOB: Thacker Pass Project EIS	
DRAWN: LH	CHECKED: TC
DATE: May 2020	
FIGURE: 4.25	

H:\Project\3898\GIS\Kings Valley EIS\Mxds\Modeling Report\Figure 4.26 Partial Backfill & Pit Cells.mxd



Pit contours

North sub-pit

West sub-pit

South sub-pit

Lithologic Unit

- Basement Volcanic Tuff
- Thacker Pass Alluvium
- Claystone
- Rock / Pole Shear Zones
- Silicified Claystone (East)
- Thacker Pass Tuff
- Thacker Pass Basalts
- Open Pit

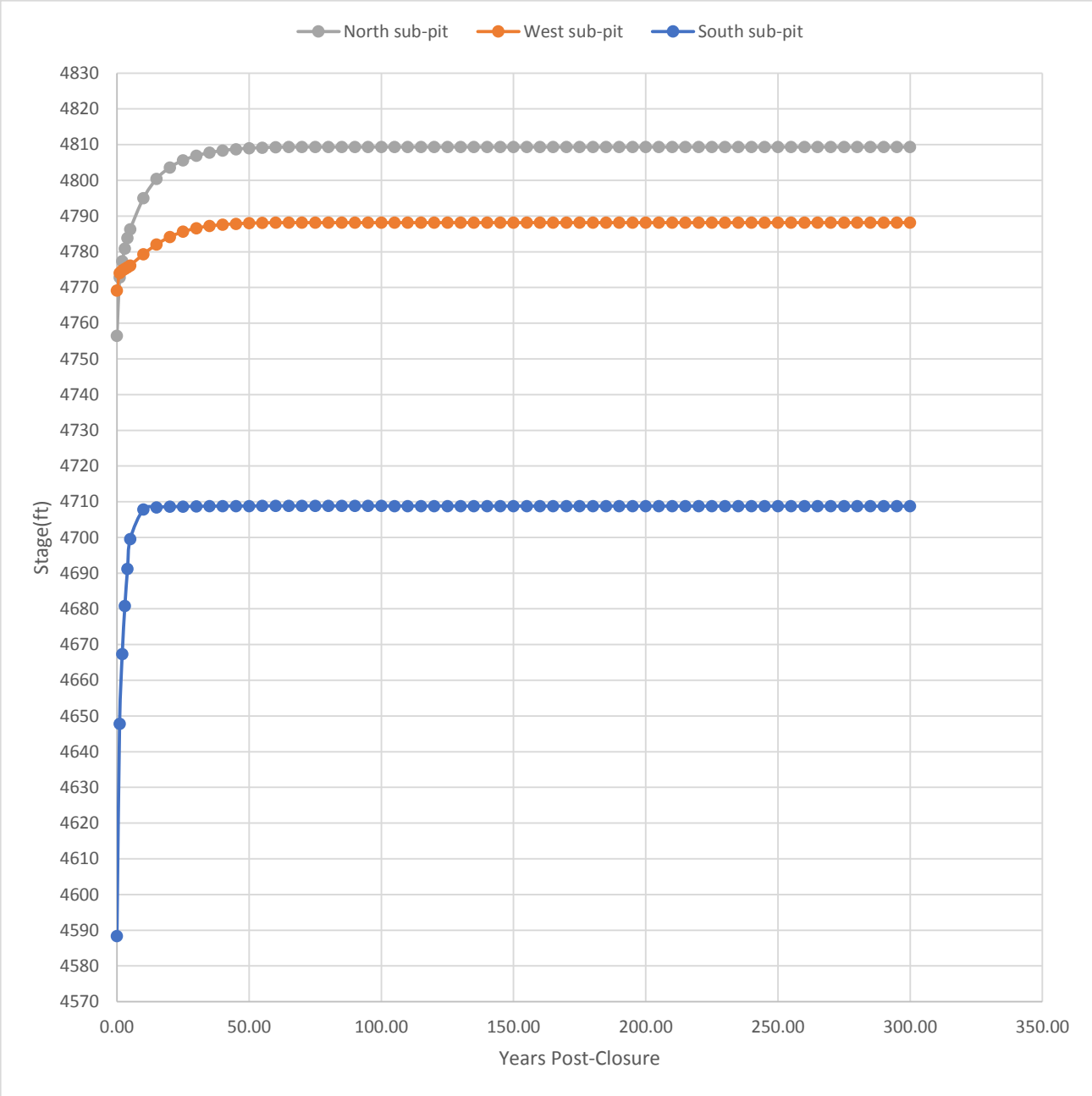
1:48,000

0 0.25 0.5 1 1.5 2 Miles

Partially Backfilled South Sub-pit Alternative: conductivity and storage zones

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

CLIENT:	LNC
PROJECT:	Thacker Pass Project EIS
JOB:	3898
DRAWN: LH	CHECKED: TC
DATE:	May 2020
FIGURE:	4.26

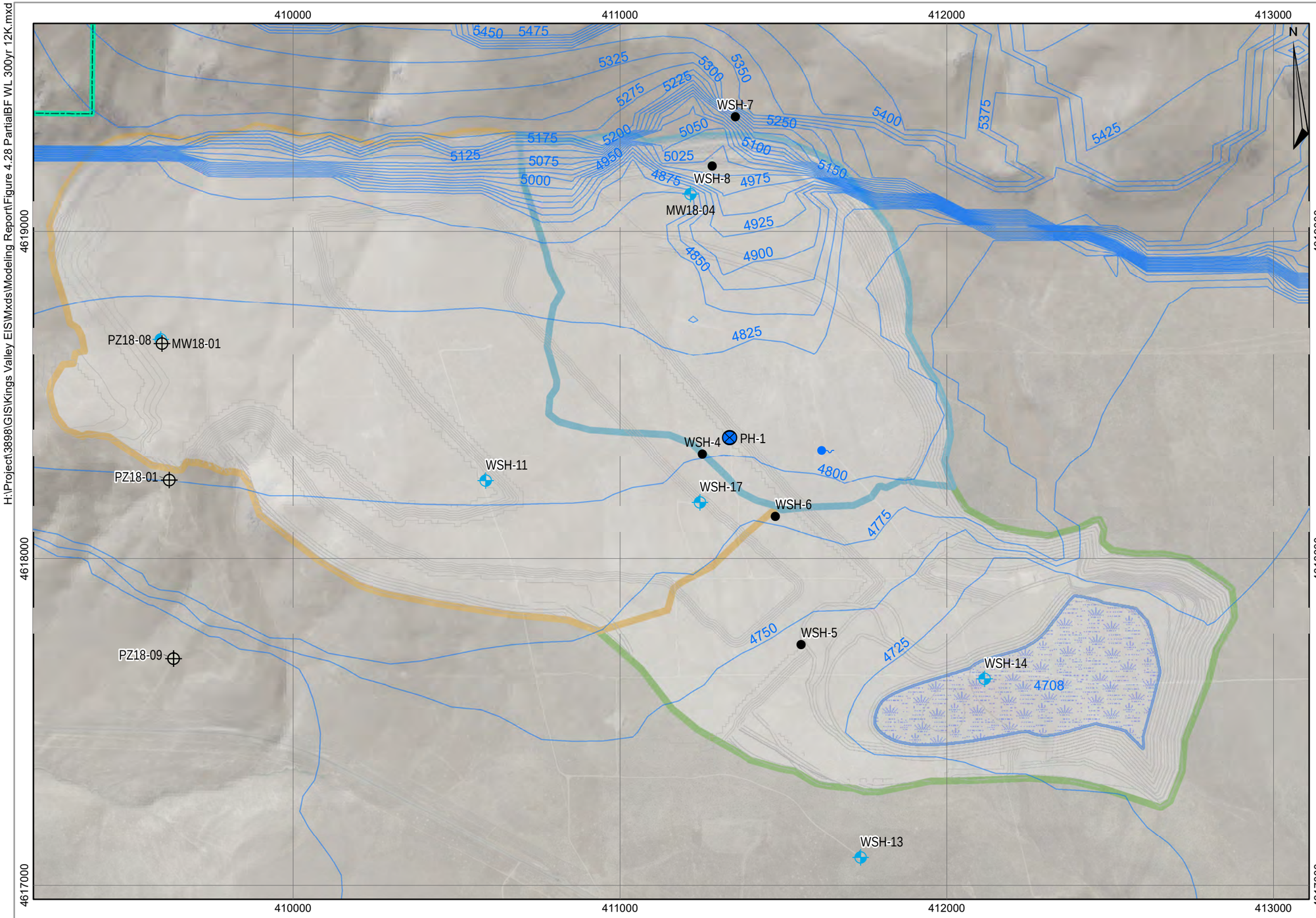


*Hypothetical monitoring locations shown in Figure 4.1

PITEAU ASSOCIATES	Partial Backfilled South Sub-Pit Alternative: simulated water level recovery			
	CLIENT: LNC	PROJECT: Thacker Pass Project EIS		
	JOB #: 3898	DRAWN: LH	CHECKED: TC	
	DATE: May 2020	FIGURE: 4.27		

H:\Project\3898\3898-2 Kings Valley EIS\400_WIP\440_Modeling\2019_Model\Model Results\Predictive\[LNC_PartialBF_ObsWells_AutoPop.xlsm]

H:\Project\3898\GIS\Kings Valley EIS\Mxds\Modeling Report\Figure 4.28 PartialBF WL 300yr 12K.mxd



1:12,000

0 0.1 0.2 0.4 0.6 0.8 Miles

PREPARED SOLELY FOR THE USE OF OUR CLIENT AND NO REPRESENTATION OF ANY KIND IS MADE TO OTHER PARTIES WITH WHICH PITEAU ASSOCIATES ENGINEERING LTD. HAS NOT ENTERED INTO A CONTRACT.

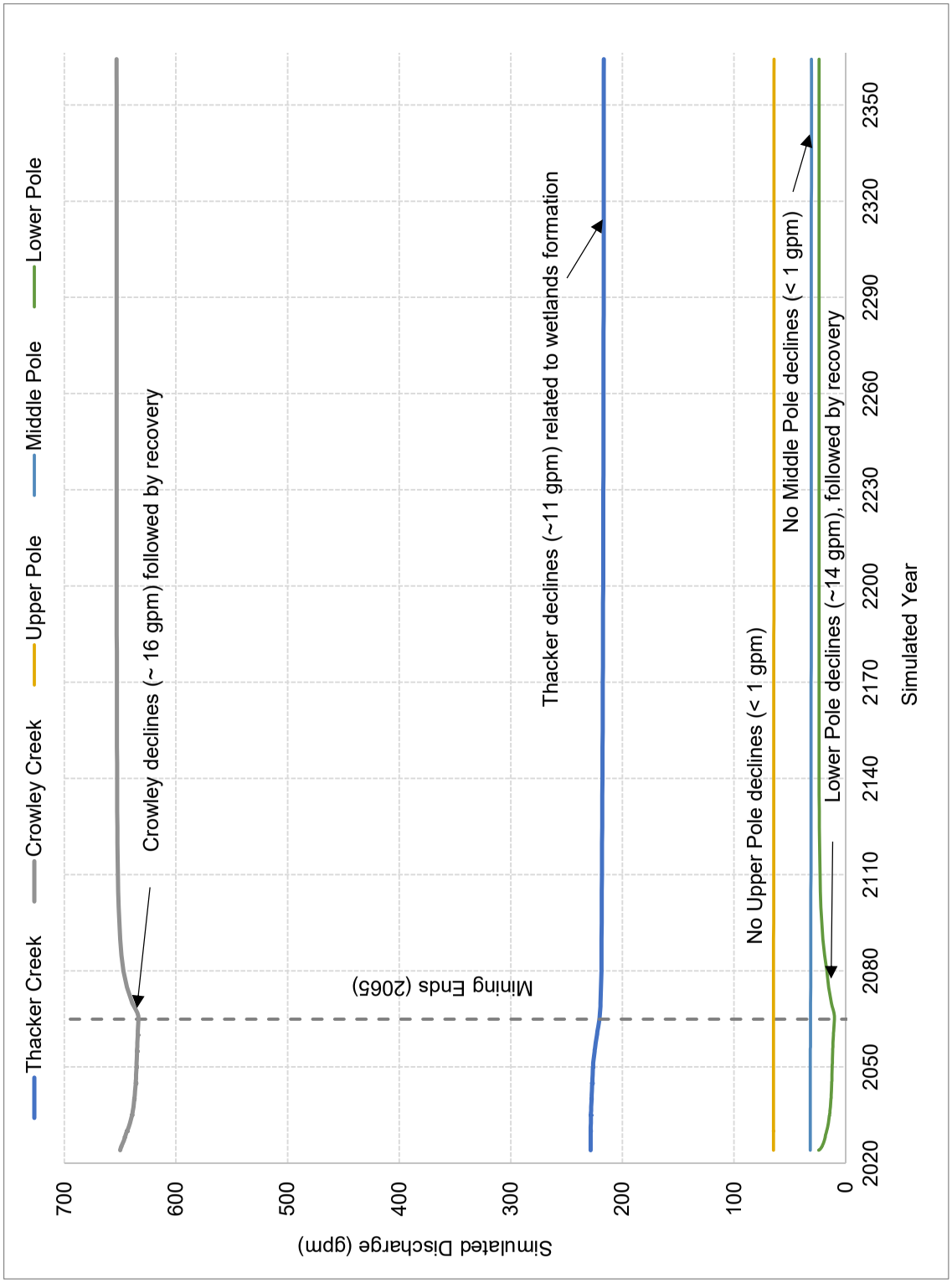
Wells

- Abandoned
- Monitoring well
- Piezometer
- Production well
- Test pumping well
- Springs
- Partial backfill water level contours
- North sub-pit
- West sub-pit
- South sub-pit
- Thacker Pass Project AOI
- Simulated Partial Backfill Wetlands
- Partial Backfill Pit Contours

Partial Backfilled South Sub-pit Alternative: simulated water levels 300 years postclosure (2365)

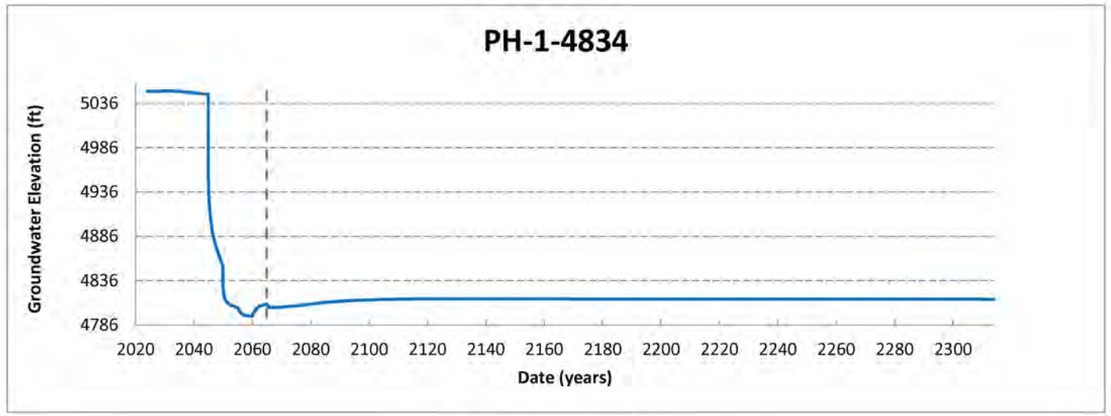
PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

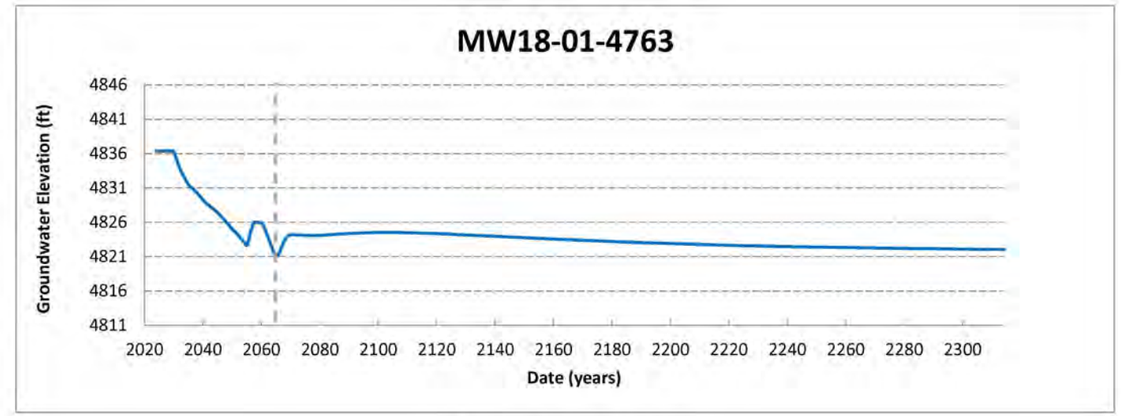
CLIENT:	LNC
PROJECT:	Thacker Pass Project EIS
JOB:	3898
DRAWN:	BA
CHECKED:	TC
DATE:	May 2020
FIGURE:	4.28

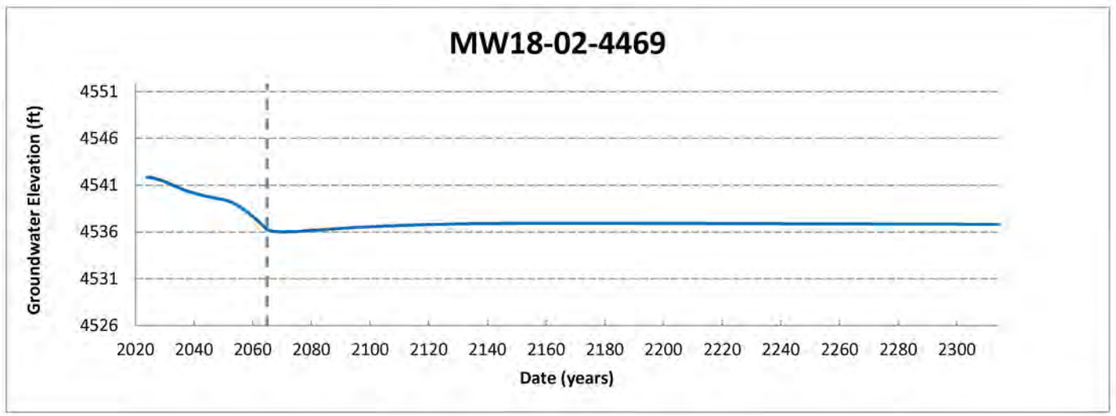


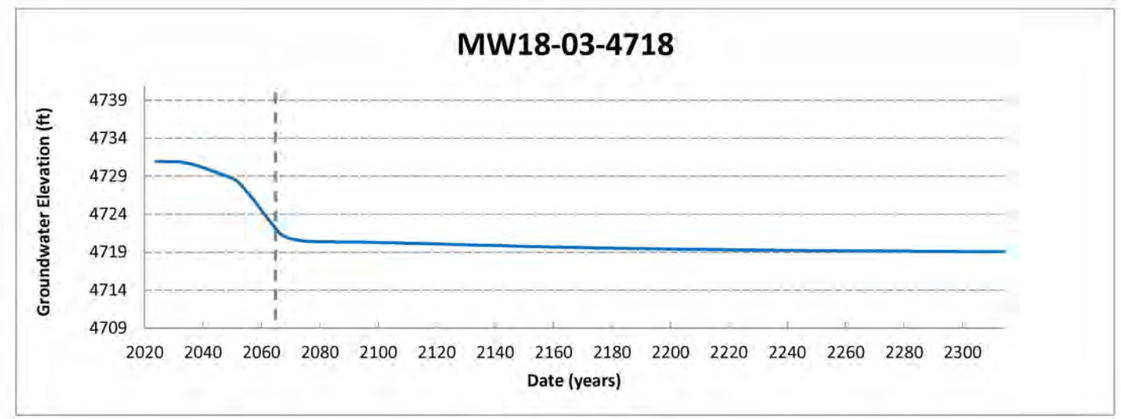
PITEAU ASSOCIATES GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS	Partially Backfilled South Sub-pit Alternative: simulated groundwater flow to streams		
	CLIENT: LNC	PROJECT: Thacker Pass Project EIS	
	JOB #: 3898	DRAWN: BA	CHECKED: TC
	DATE: May 2020	FIGURE: 4.29	

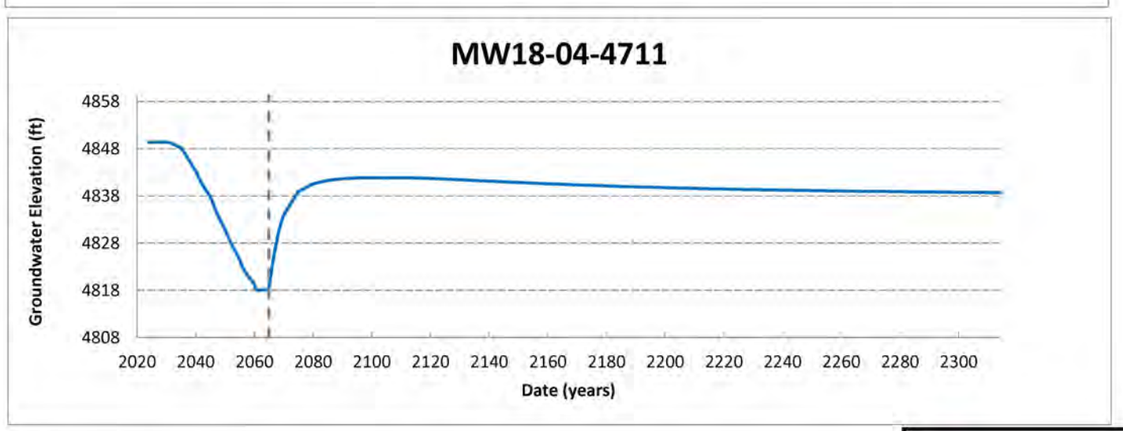
H:\Project\3898\3898-2 Kings Valley EIS\400_WIP\440_Modeling\2019_Model\Model Results\Predictive\[LNC Open_Pit_DW&RecoveryResults_BRRs.xlsx]

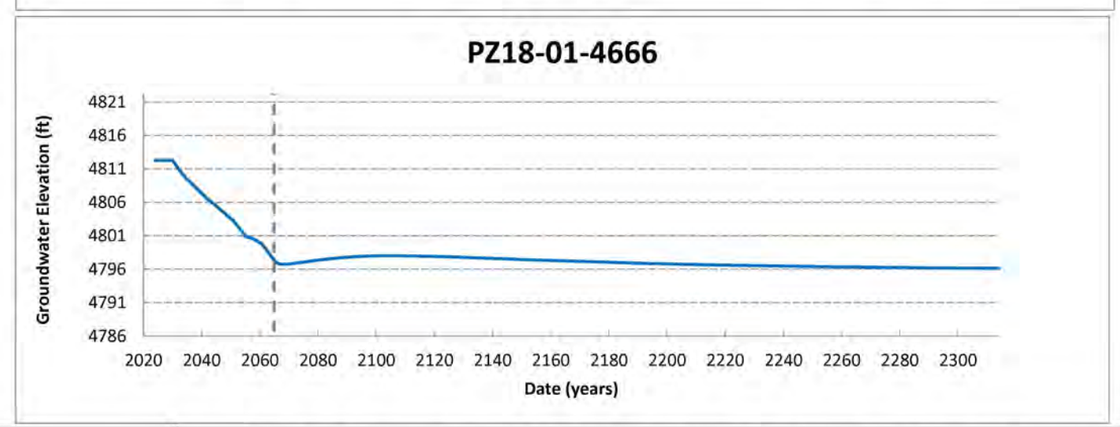












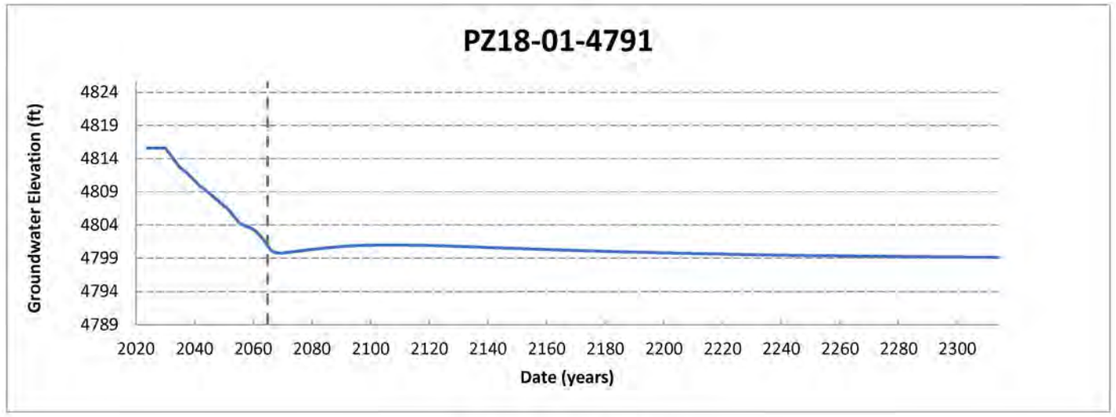
End of Mining

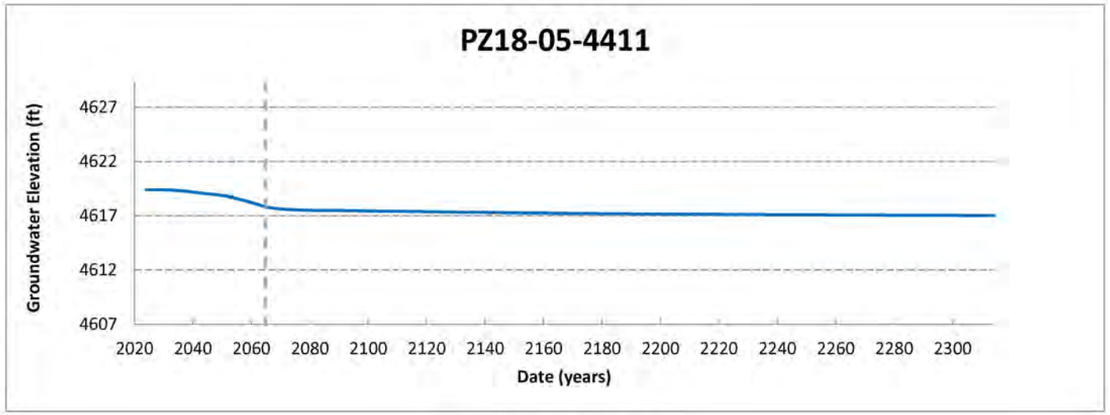
Simulated water level

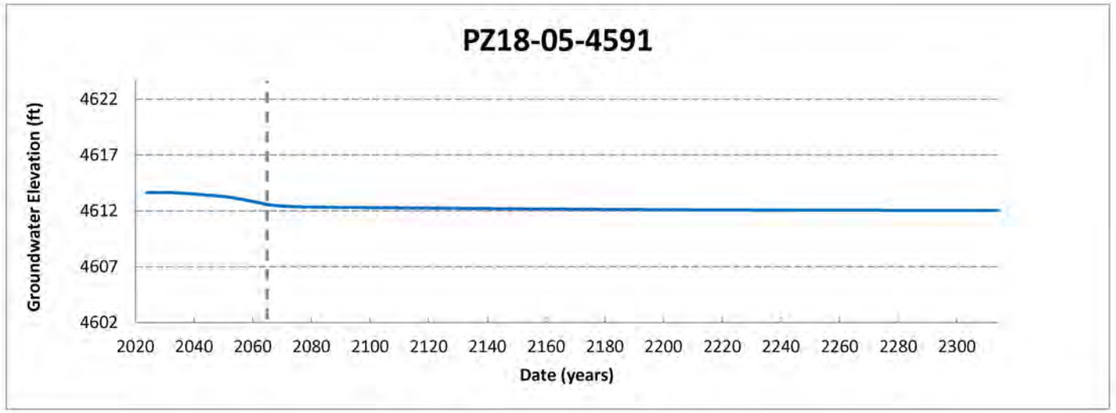
PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

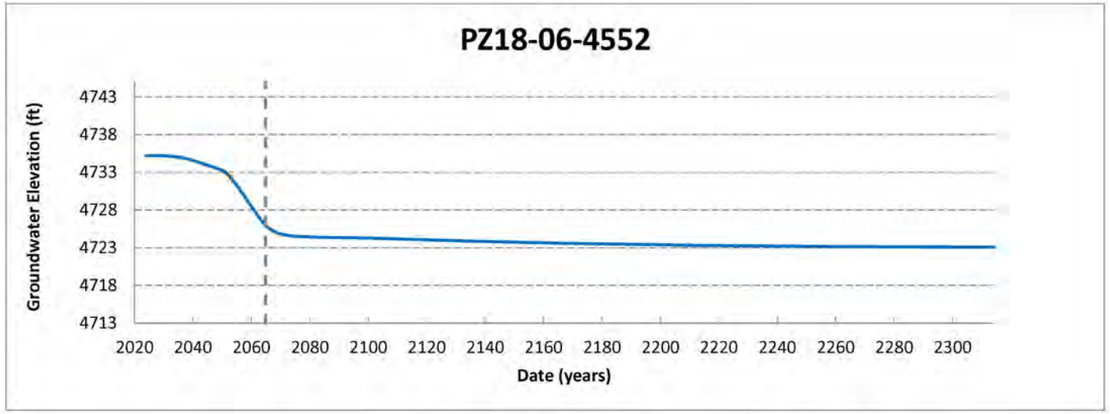
Partially Backfilled South Sub-pit Alternative: simulated water level hydrographs

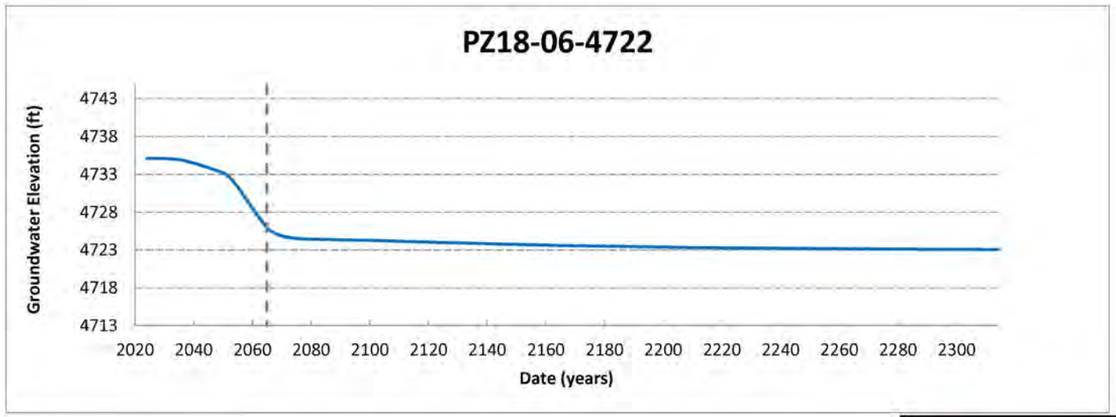
CLIENT: LNC	PROJECT: Thacker Pass Project EIS
JOB: 3898	DRAWN: BA CHECKED: TC
DATE: May 2020	FIGURE: 4.30a

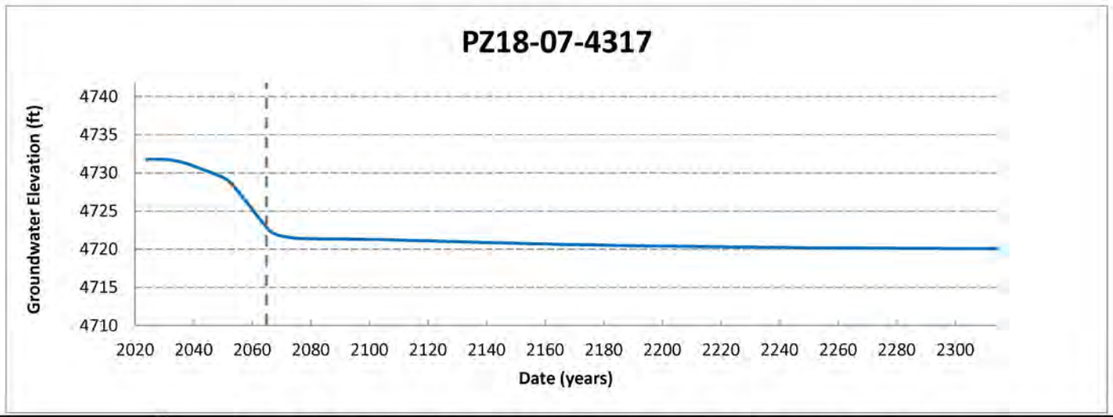












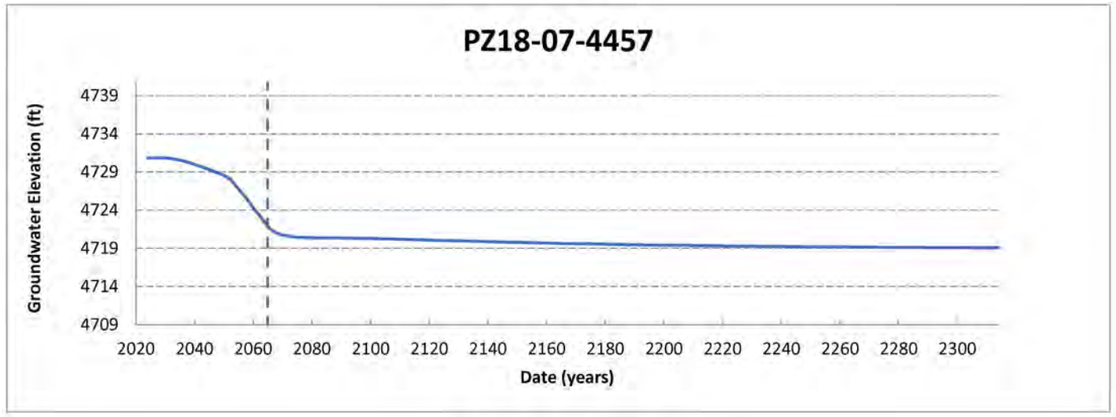
End of Mining

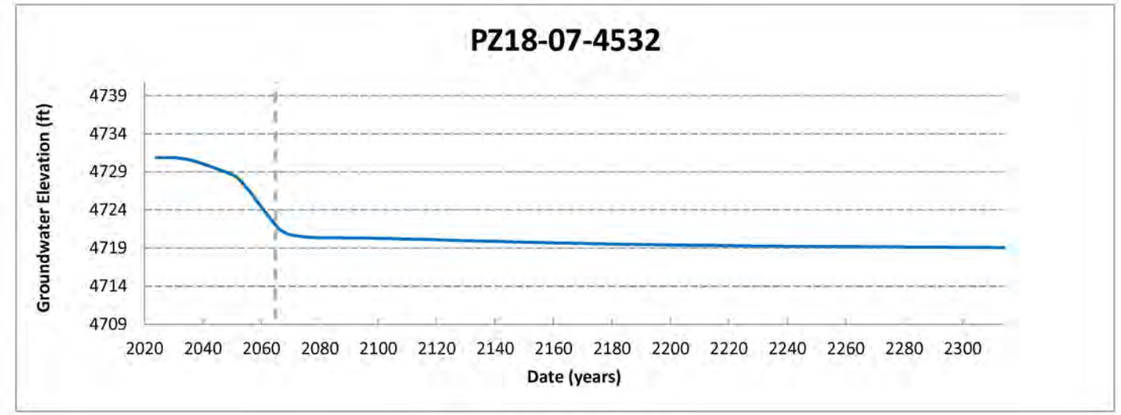
Simulated water level

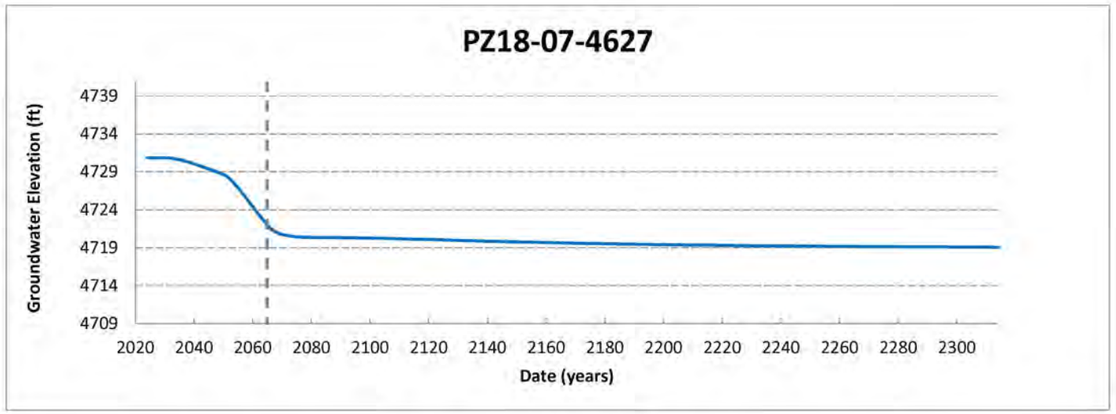
PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

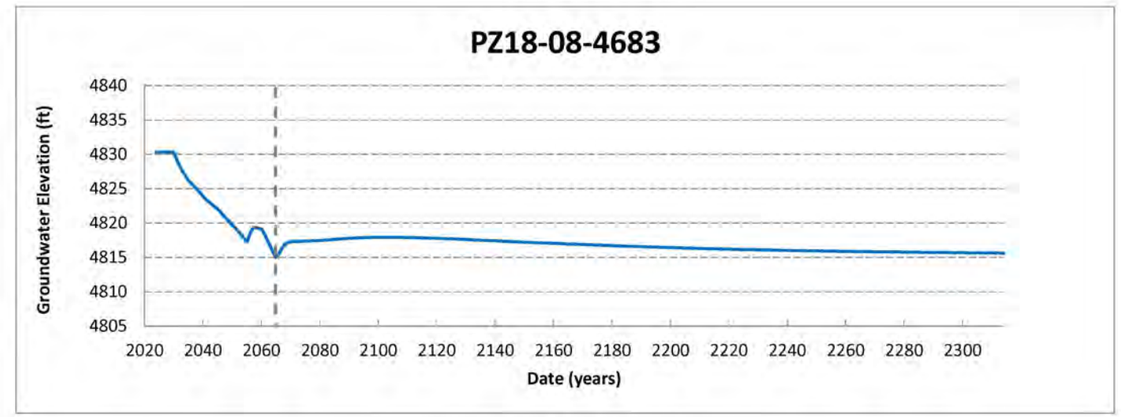
Partially Backfilled South Sub-pit Alternative: simulated water level hydrographs

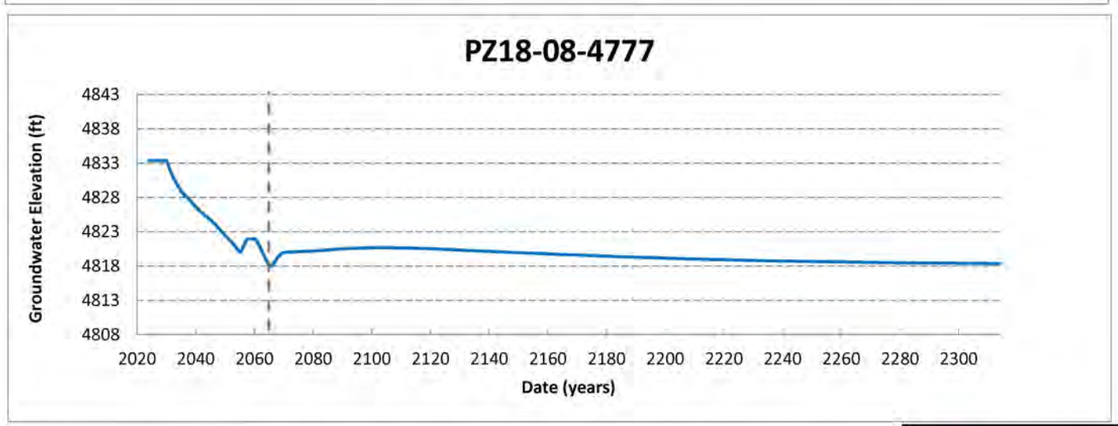
CLIENT: LNC	PROJECT: Thacker Pass Project EIS
JOB: 3898	DRAWN: BA CHECKED: TC
DATE: May 2020	FIGURE: 4.30b

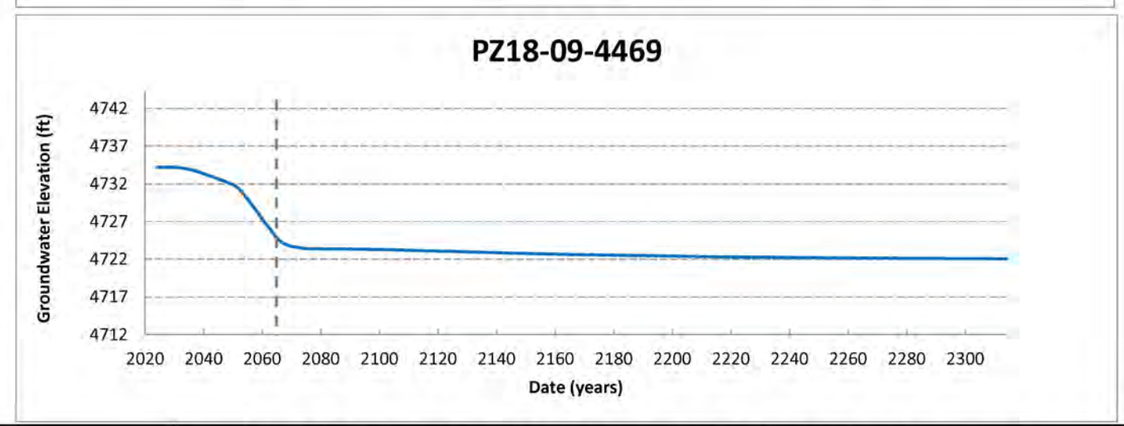












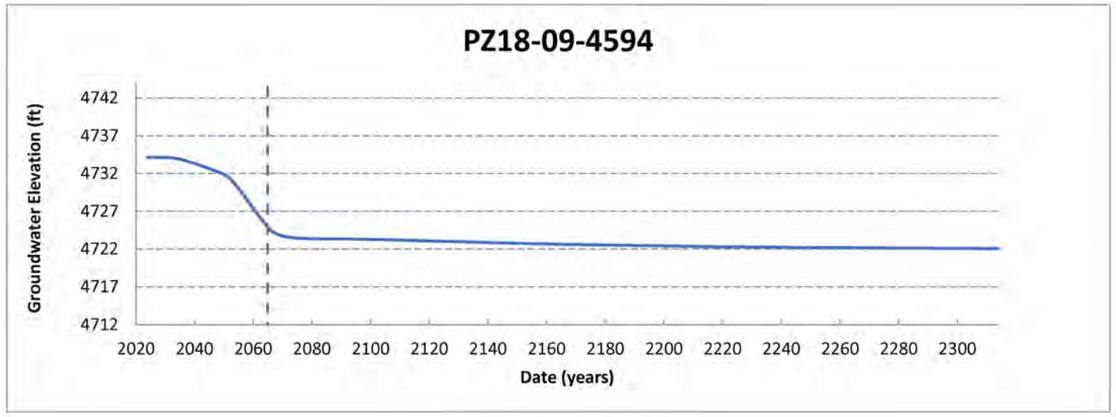
End of Mining

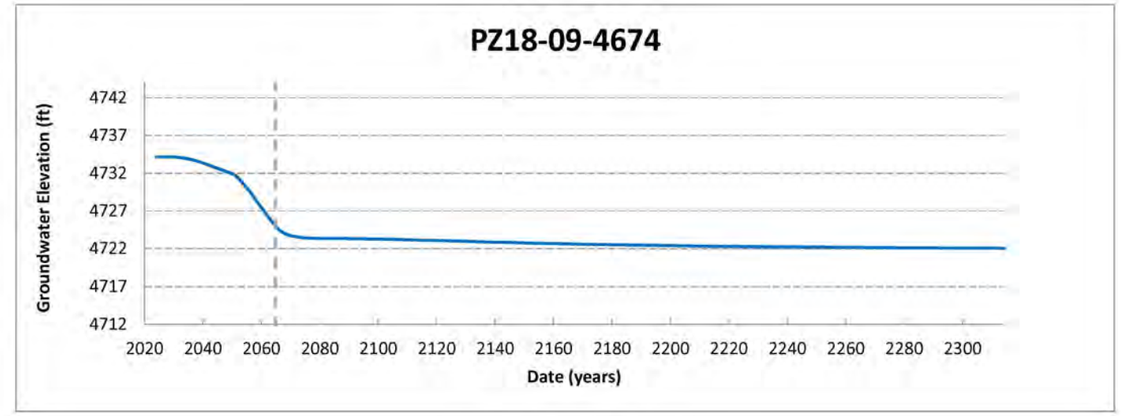
Simulated water level

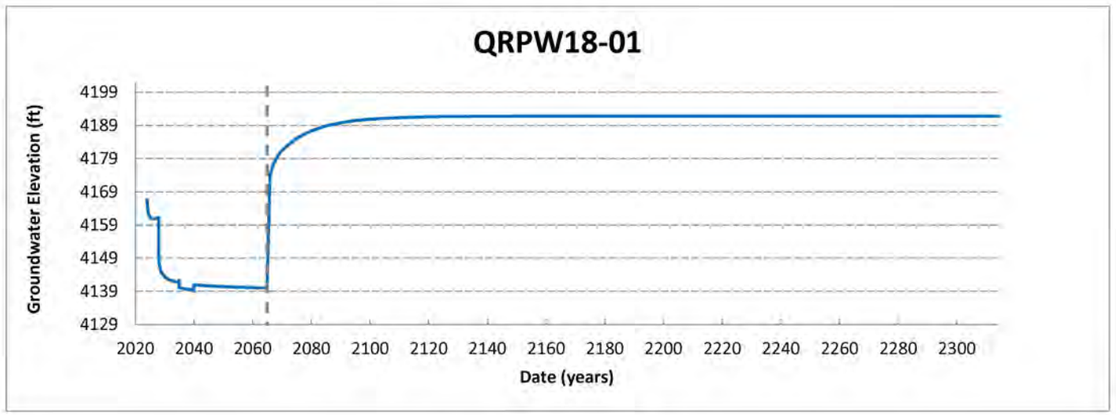
PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

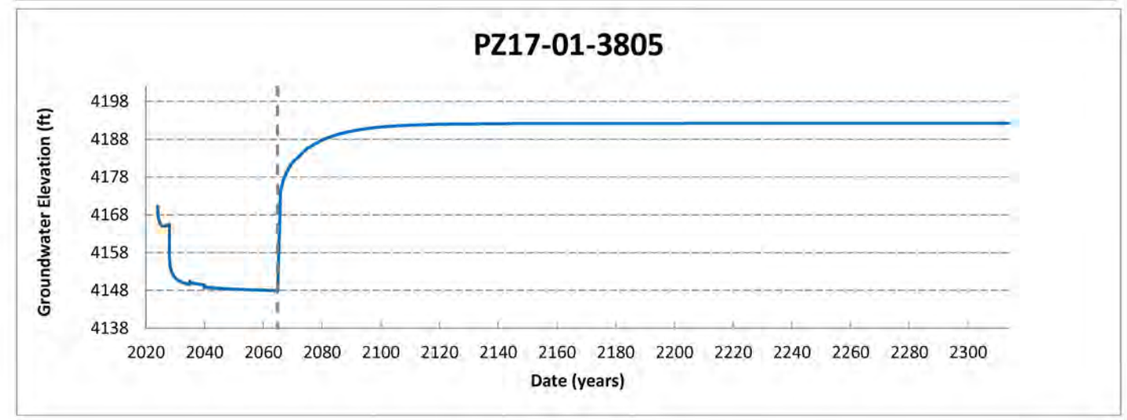
Partially Backfilled South Sub-pit Alternative: simulated water level hydrographs

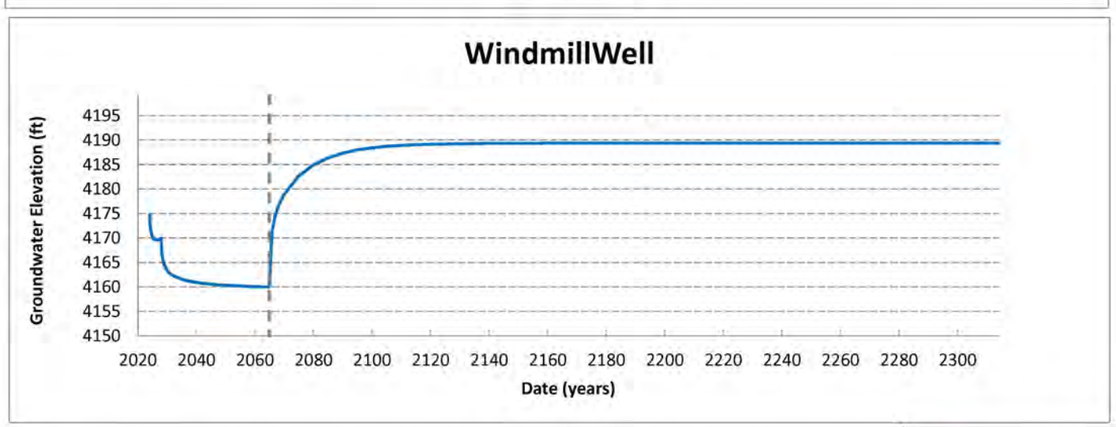
CLIENT: LNC	PROJECT: Thacker Pass Project EIS
JOB: 3898	DRAWN: BA CHECKED: TC
DATE: May 2020	FIGURE: 4.30c

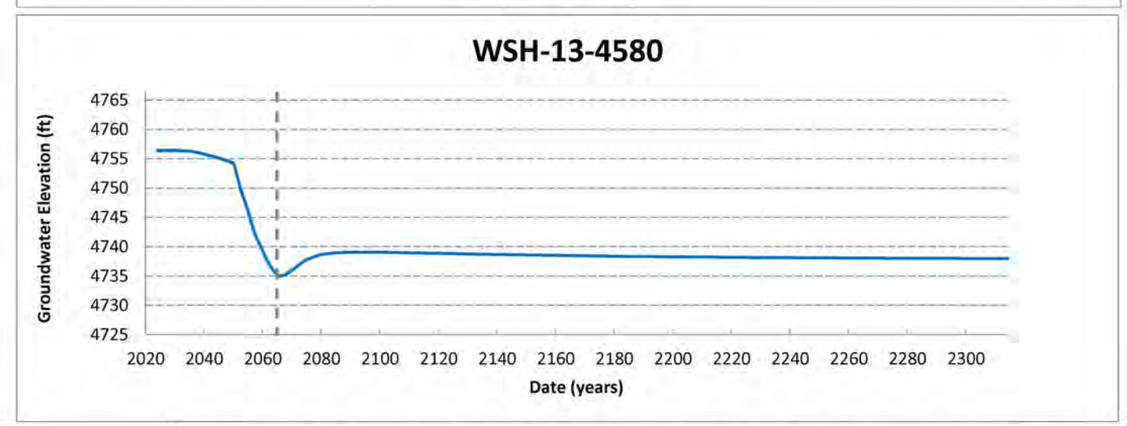












End of Mining

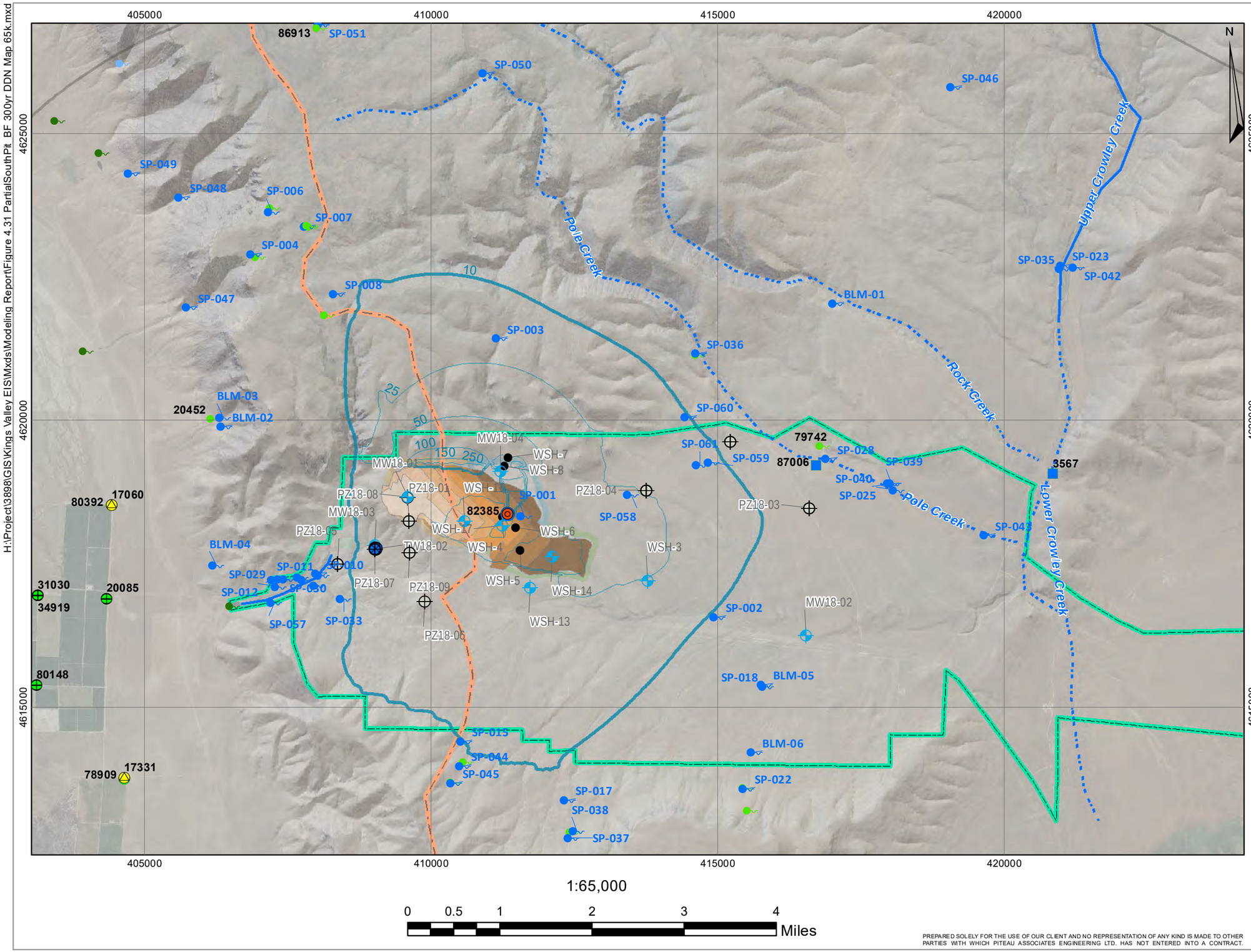
Simulated water level

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

Partially Backfilled South Sub-pit Alternative: simulated water level hydrographs

CLIENT: LNC	PROJECT: Thacker Pass Project EIS
JOB: 3898	DRAWN: BA CHECKED: TC
DATE: May 2020	FIGURE: 4.30d

H:\Project\3898\GIS\Kings Valley EIS\Mxds\Modeling Report\Figure 4.31 PartialSouthPit_BF 300yr DDN Map 65k.mxd



1:65,000

0 0.5 1 2 3 4 Miles

PREPARED SOLELY FOR THE USE OF OUR CLIENT AND NO REPRESENTATION OF ANY KIND IS MADE TO OTHER PARTIES WITH WHICH PITEAU ASSOCIATES ENGINEERING LTD. HAS NOT ENTERED INTO A CONTRACT.

Water Rights: Source - Type

- Spring - Irrigation
- Spring - Stock watering
- Spring - Other
- Stream - Irrigation
- Well - Irrigation
- Well - Mining
- Well - Quasi-municipal
- Well - Stock watering

Wells

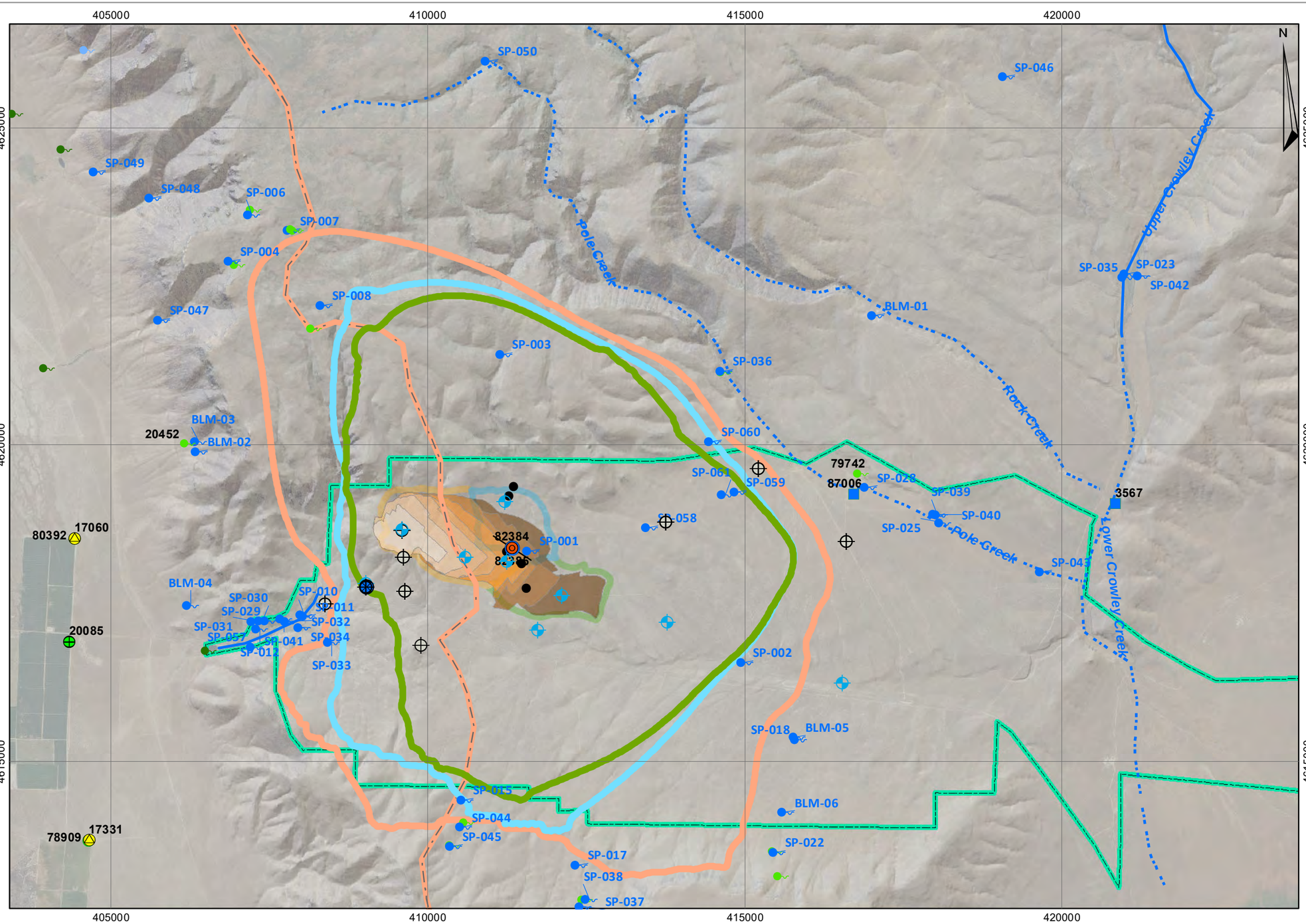
- Abandoned
- Monitoring Well
- Piezometer
- Production Well
- Test Pumping Well
- Springs
- Drawdown contours
- 10 ft Drawdown isopleth
- 5 mile buffer (from AOI)
- Hydrographic basin boundary
- Backfill footprints
- North sub-pit
- West sub-pit
- South sub-pit
- Thacker Pass Project AOI

Partially Backfilled South Sub-pit Alternative: simulated drawdown (300 years post-closure)

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

CLIENT:	LNC
PROJECT:	Thacker Pass Project EIS
JOB:	3898
DRAWN: BA	CHECKED: TC
DATE:	May 2020
FIGURE:	4.31

H:\Project\3898\GIS\Kings Valley EIS\Mxds\Modeling Report\Figure 4.32 Maximum Extent DDN Comparison.mxd



1:62,500

0 0.5 1 2 3 4 Miles

* Maximum Extent drawdown is calculated by identifying the maximum drawdown across all simulated times. The maximum extent may not physically exist at any point in time.Equilibrium drawdown is represented by the 300-yr post-closure isopleths.

Water Rights: Source - Type

- Spring - Irrigation
- Spring - Stock watering
- Spring - Other
- Stream - Irrigation
- Well - Irrigation
- Well - Mining
- Well - Quasi-municipal
- Well - Stock watering

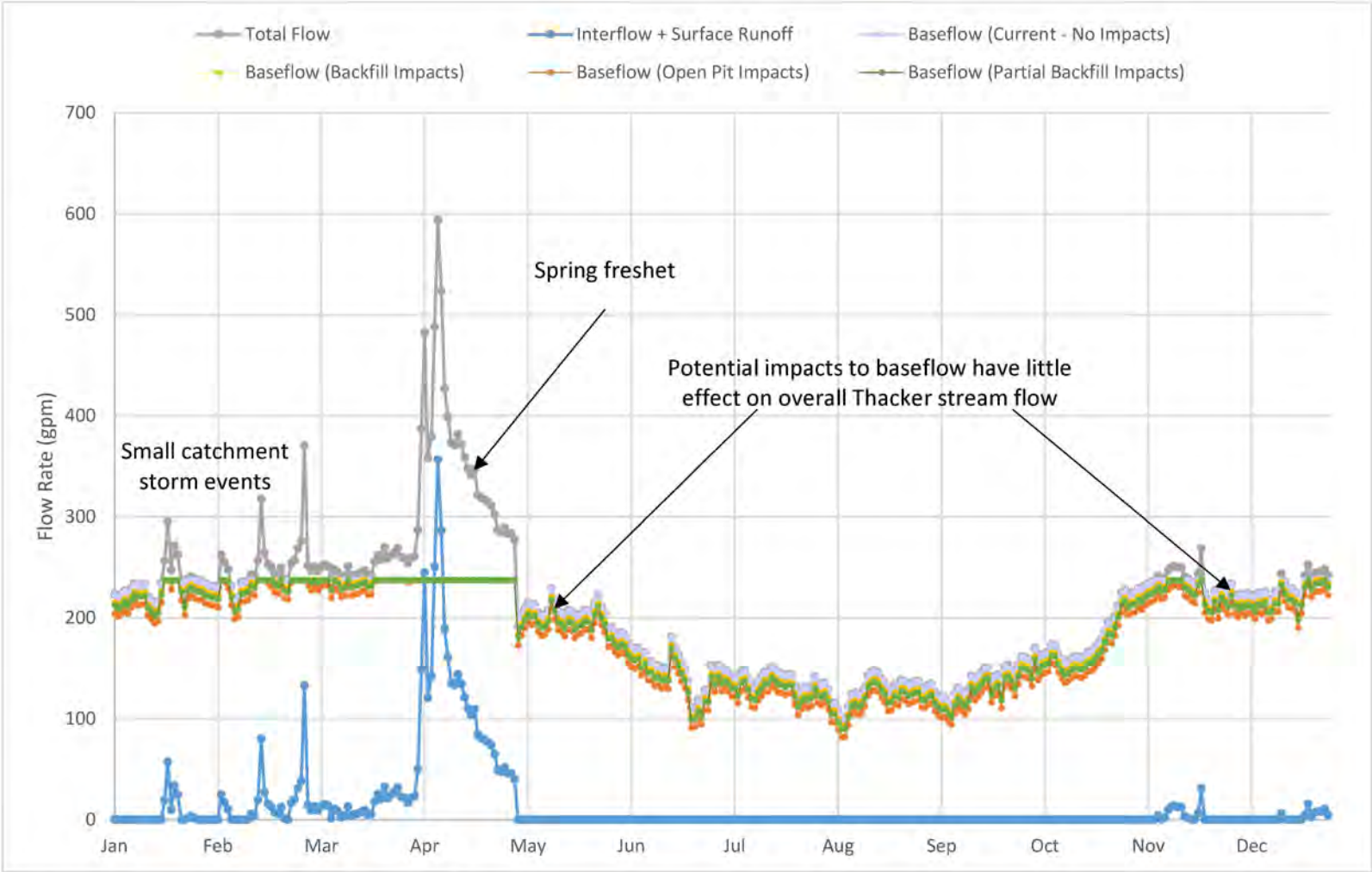
Wells

- Abandoned
- Monitoring Well
- Piezometer
- Production Well
- Test Pumping Well
- Springs
- Backfill 10 ft Maximum Extent Isopleth
- Partial Backfill 10 ft Maximum Extent Isopleth
- Open Pit 10 ft Maximum Extent Isopleth
- Hydrographic basin boundary
- Backfill Footprints
- Thacker Pass Project AOI
- North Sub-pit
- West Sub-pit
- South Sub-pit

Comparison of 10ft drawdown isopleth maximum extent - Thacker Pass*

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

CLIENT:	LNC
PROJECT:	Thacker Pass Project EIS
JOB:	3898
DRAWN: BA	CHECKED: TC
DATE:	May 2020
FIGURE:	4.32



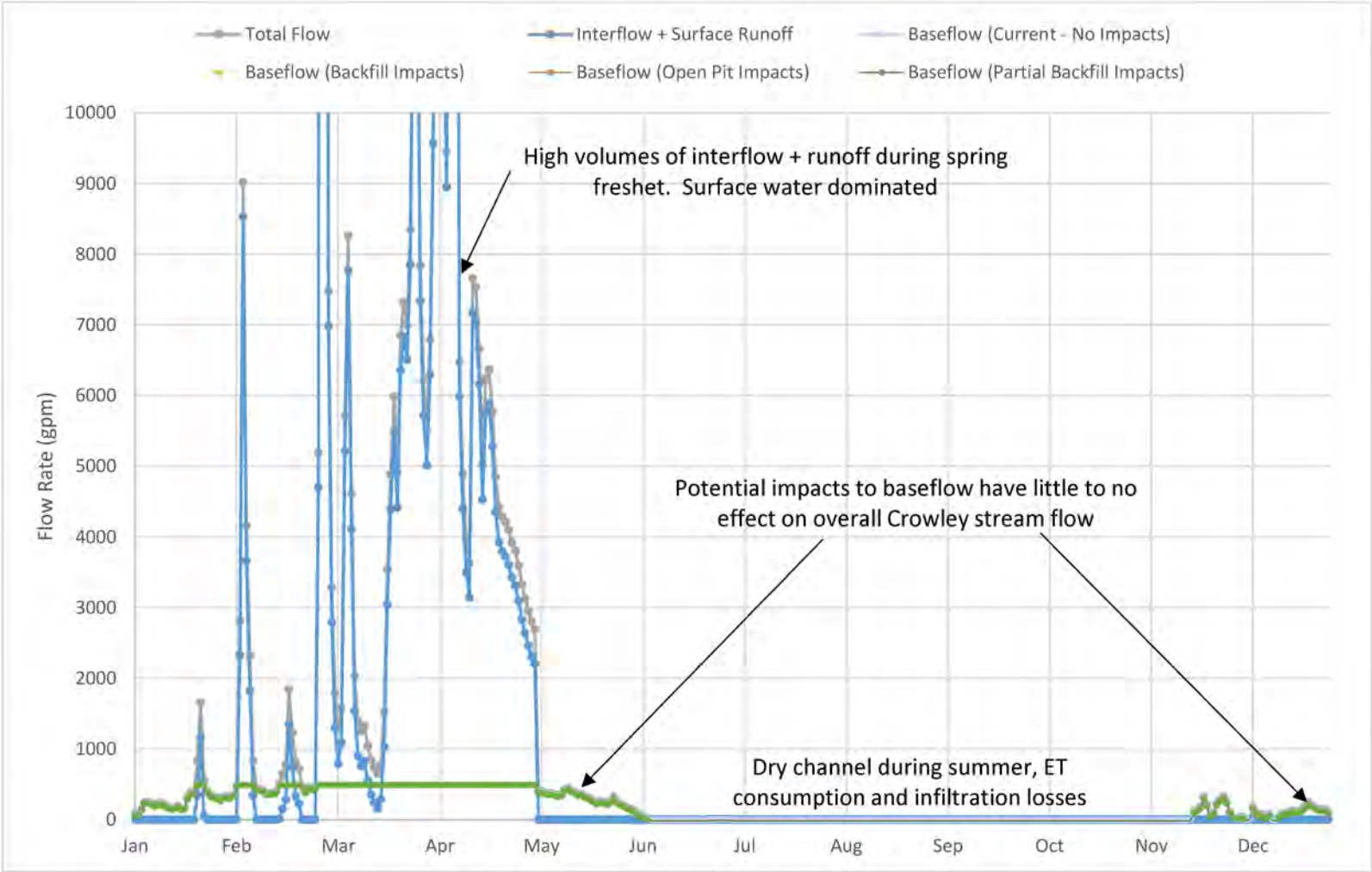
Flow Data	Rate	Units
Annual Average	220	gpm
Baseflow (Dec - Mar)	234	gpm
ET (Jun-Sep)	94.0	gpm

Thacker Creek Flow Hydrograph Impacts Analysis

PITEAU ASSOCIATES

CLIENT: LNC
PROJECT: Thacker Pass Project EIS
JOB #: 3898
DRAWN: TC
CHECKE TC
DATE: May, 2020
FIGURE: 4.34

H:\Project\3898\3898-2 Kings Valley EIS\500_Deliverables\530_Reports\Water Quantity & Quality



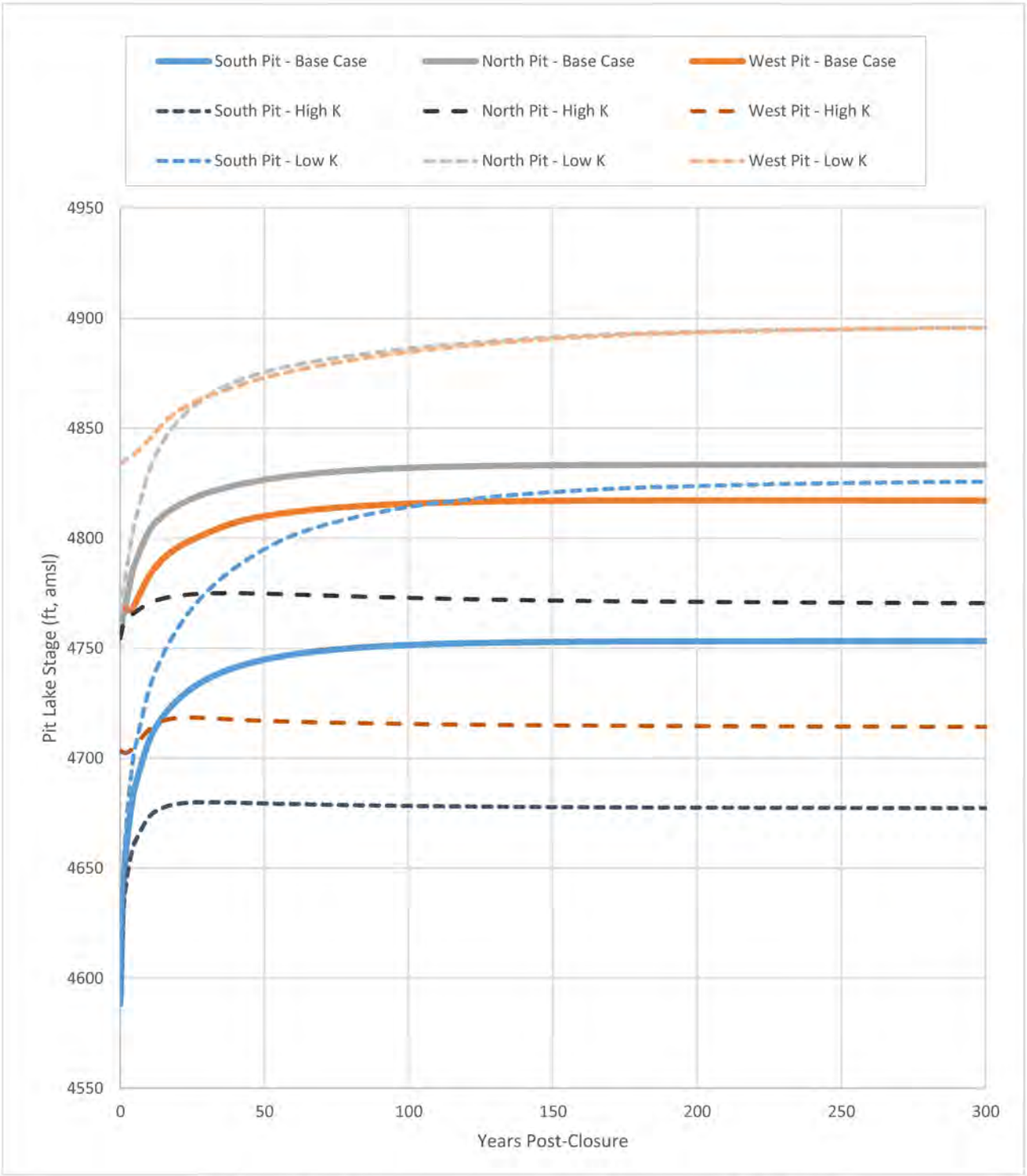
Flow Data	Rate	Units
Annual Average	1289	gpm
Baseflow (Dec - Mar)	492	gpm
ET (Jun-Sep)	-492	gpm

PITEAU ASSOCIATES

Crowley Creek Flow Hydrograph Impacts Analysis

CLIENT: LNC
PROJECT: Thacker Pass Project EIS
JOB #: 3898
DRAWN: TC
CHECKE TC
DATE: May, 2020
FIGURE: 4.33

H:\Project\3898\3898-2 Kings Valley EIS\500_Deliverables\530_Reports\Water Quantity & Quality



PITEAU ASSOCIATES	Sensitivity Analysis: Simulated Backfill Recovery (3 Sub-Pits)		
	CLIENT: LNC	PROJECT: Thacker Pass Project EIS	
	JOB #: 3898	DRAWN: LH	CHECKED: TC
	DATE: May 2020	FIGURE: 4.35	

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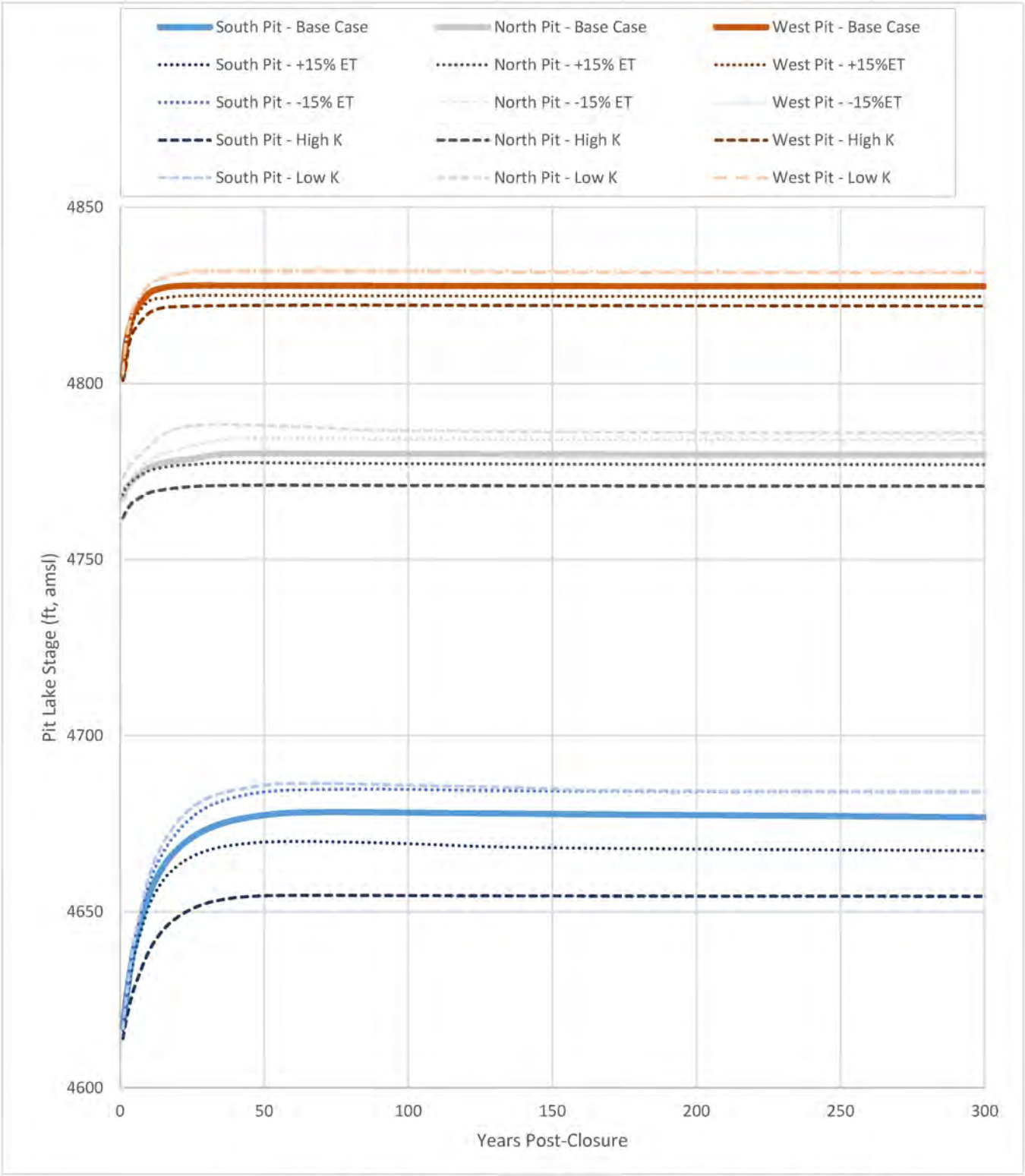

PITEAU ASSOCIATES	Sensitivity Analysis: Simulated Open Pit Lake Recovery (3 Sub-Pits)		
	CLIENT: LNC	PROJECT: Thacker Pass Project EIS	
	JOB #: 3898	DRAWN: BA	CHECKED: TC
	DATE: May 2020	FIGURE: 4.36	

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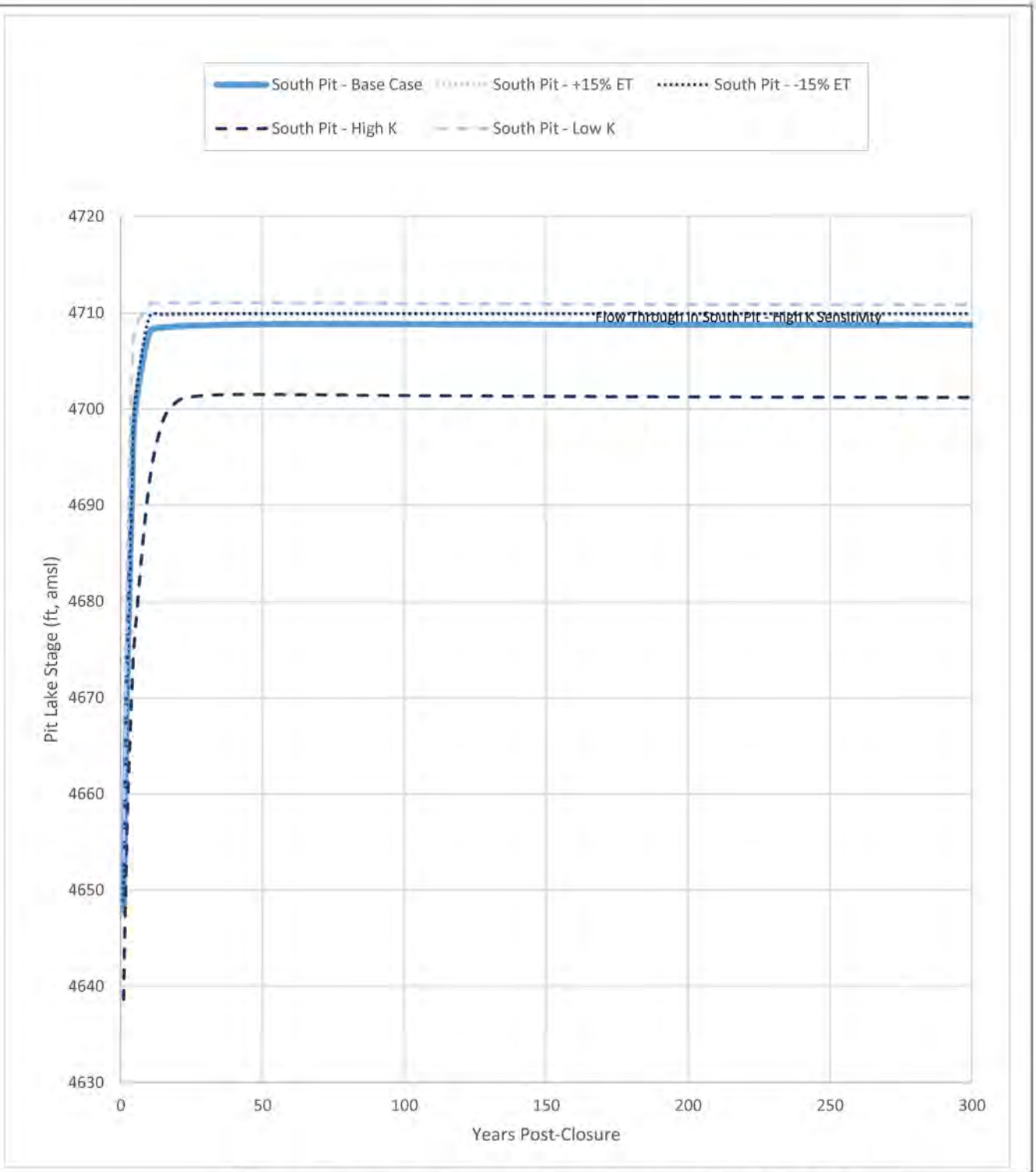

PITEAU ASSOCIATES	Sensitivity Analysis: Simulated Partial Backfilled South Sub-Pit Recovery		
	CLIENT: LNC	PROJECT: Thacker Pass Project EIS	
	JOB #: 3898	DRAWN: LH	CHECKED: TC
	DATE: May 2020	FIGURE: 4.37	

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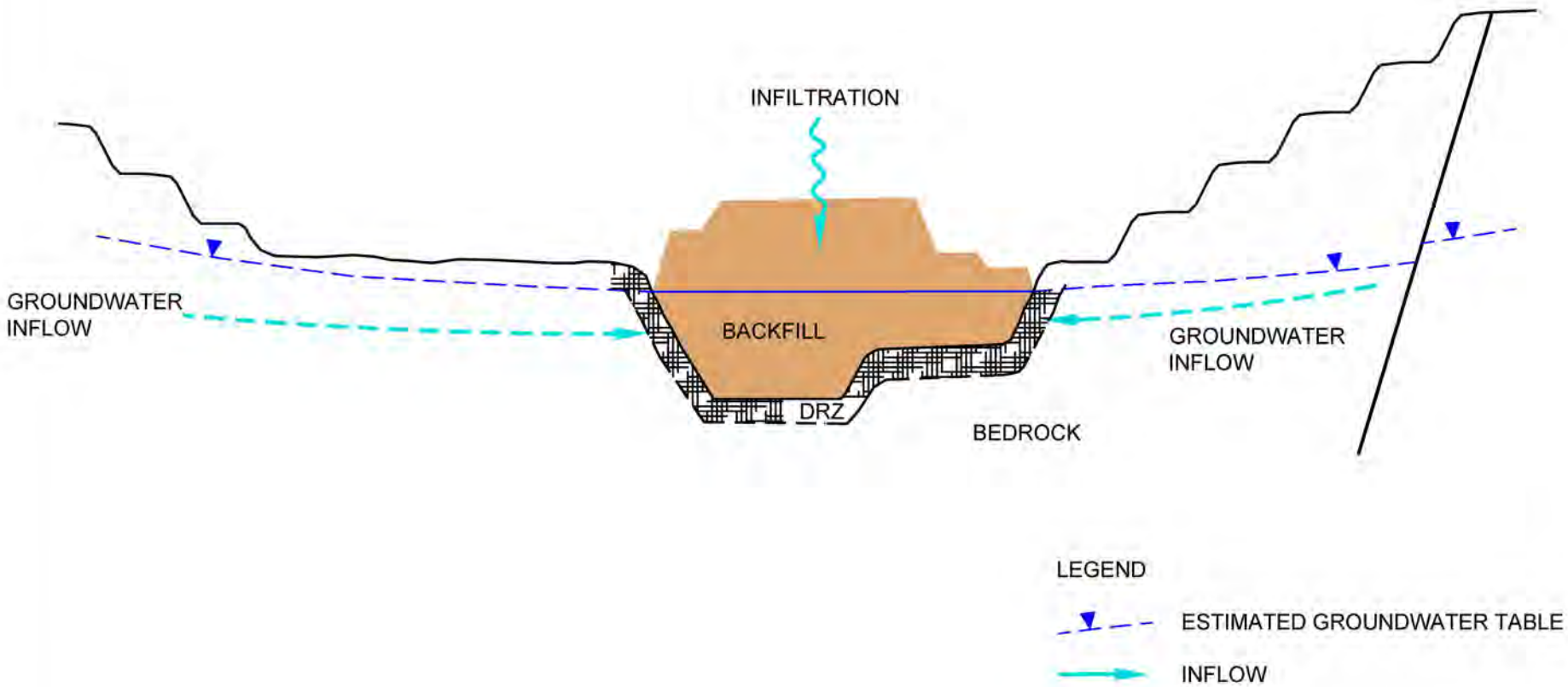
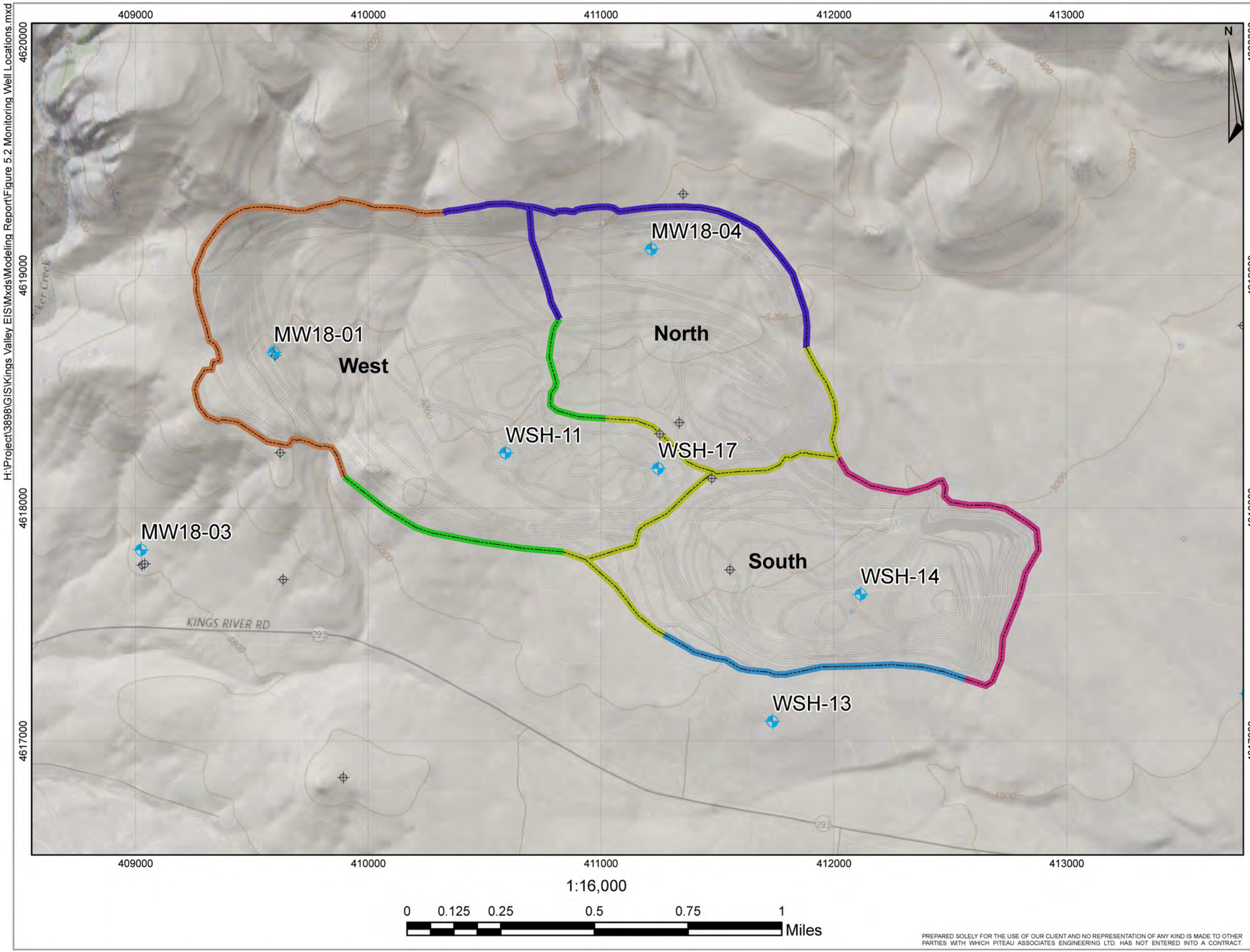


Not to scale

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

Conceptual pit lake schematic			
CLIENT: LNC		PROJECT: Thacker Pass Project EIS	
JOB: 3898		DRAWN: LH	CHECKED: TC
DATE: May 2020		FIGURE: 5.1	

H:\Project\3898\GIS\Kings Valley EIS\Mxds\Modeling Report\Figure 5.2 Monitoring Well Locations.mxd



PREPARED SOLELY FOR THE USE OF OUR CLIENT AND NO REPRESENTATION OF ANY KIND IS MADE TO OTHER PARTIES WITH WHICH PITEAU ASSOCIATES ENGINEERING LTD. HAS NOT ENTERED INTO A CONTRACT.

Assigned Well Chemistry

- MW18-01
- MW18-04
- WSH-11
- WSH-13
- WSH-14
- WSH-17
- Sub Pit Boundaries
- Pit Contours

Groundwater chemistry well assignments

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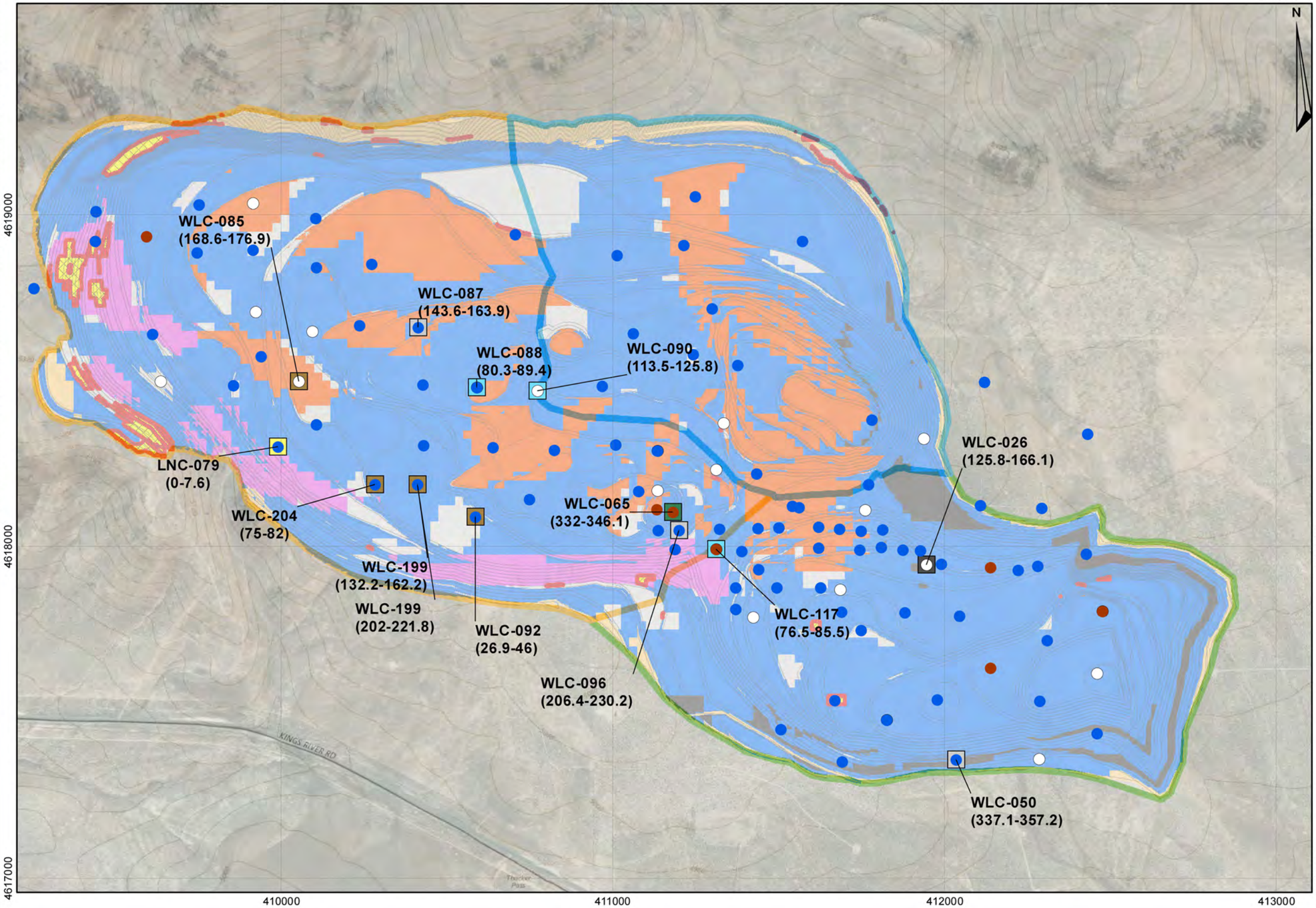
CLIENT:	LNC
PROJECT:	Thacker Pass Project EIS
JOB:	3898
DRAWN: BA	CHECKED: TC
DATE:	May 2020
FIGURE:	5.2

H:\Project\3898\GIS\Kings Valley EIS\Mxds\Modeling Report\Figure 5.3 Geochemical Sample Locations.mxd



1:12,000

0 0.1 0.2 0.4 0.6 0.8 Miles

PREPARED SOLELY FOR THE USE OF OUR CLIENT AND NO REPRESENTATION OF ANY KIND IS MADE TO OTHER PARTIES WITH WHICH PITEAU ASSOCIATES ENGINEERING LTD. HAS NOT ENTERED INTO A CONTRACT.

ABA Samples (NPR)

- <1.2
- 1.2 - 3.0
- > 3.0

HCT Lithology

- Alluvium
- Ash
- Basalt
- Claystone
- Claystone/Ash
- HPZ
- North Sub-Pit
- West Sub-Pit
- South Sub-Pit
- Pit contours

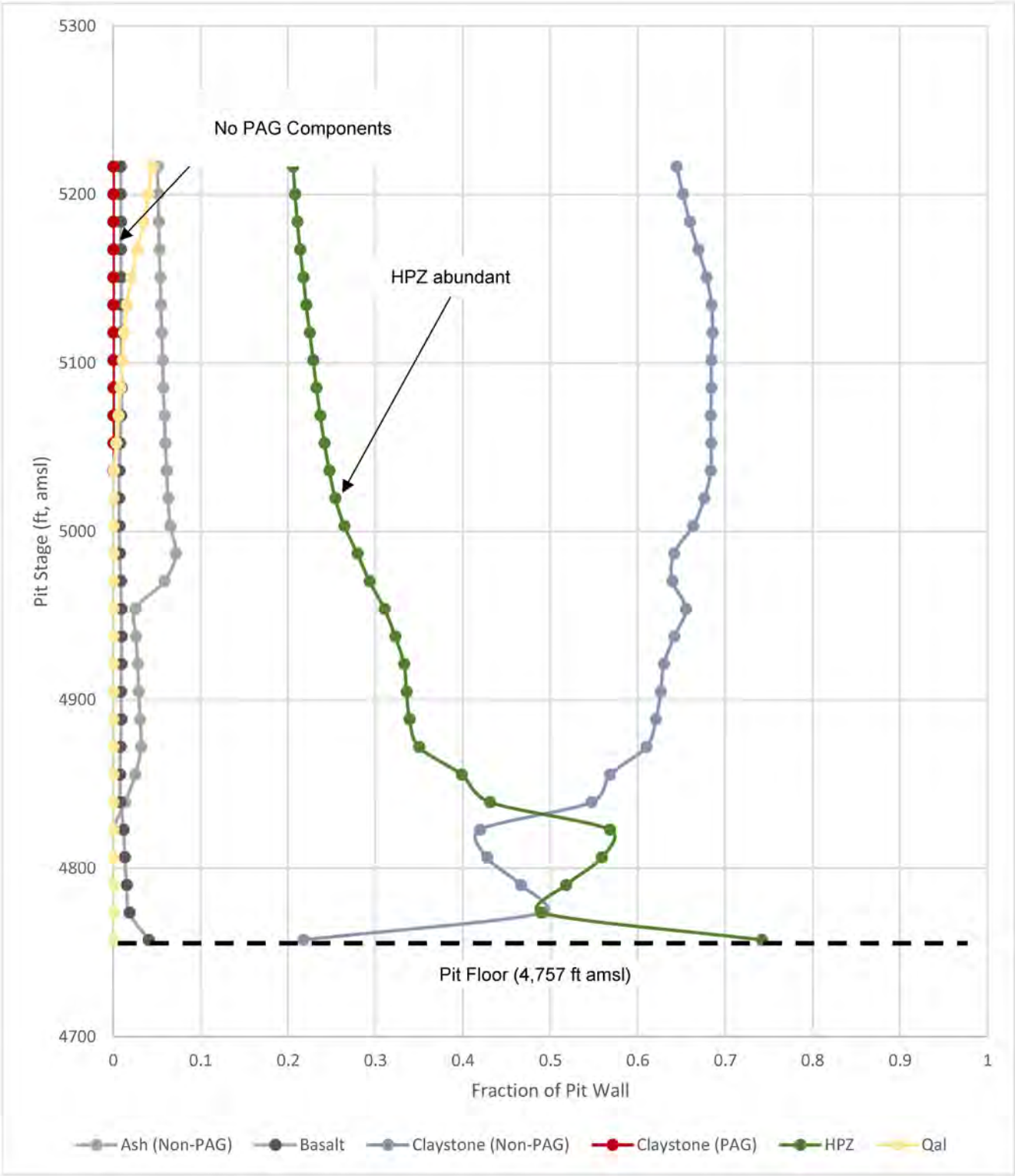
Pit Shell Lithology

- Ash
- Basalt
- Claystone
- HPZ
- PAG
- Qal
- Tuff

Wall rock lithology and HCT location map

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

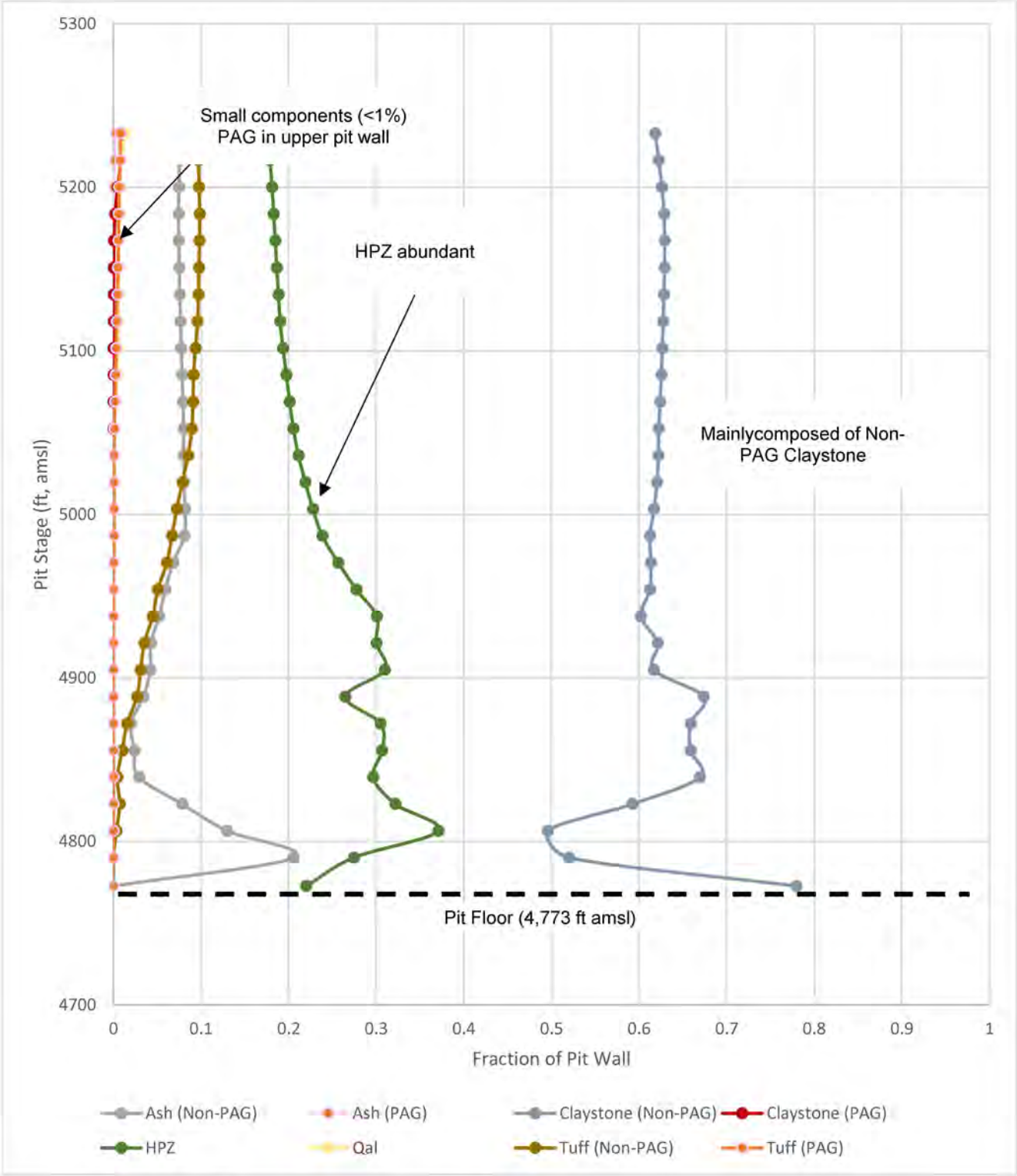
CLIENT:	LNC
PROJECT:	Thacker Pass Project EIS
JOB:	3898
DRAWN: BA	CHECKED: TC
DATE:	May 2020
FIGURE:	5.3



PITEAU ASSOCIATES

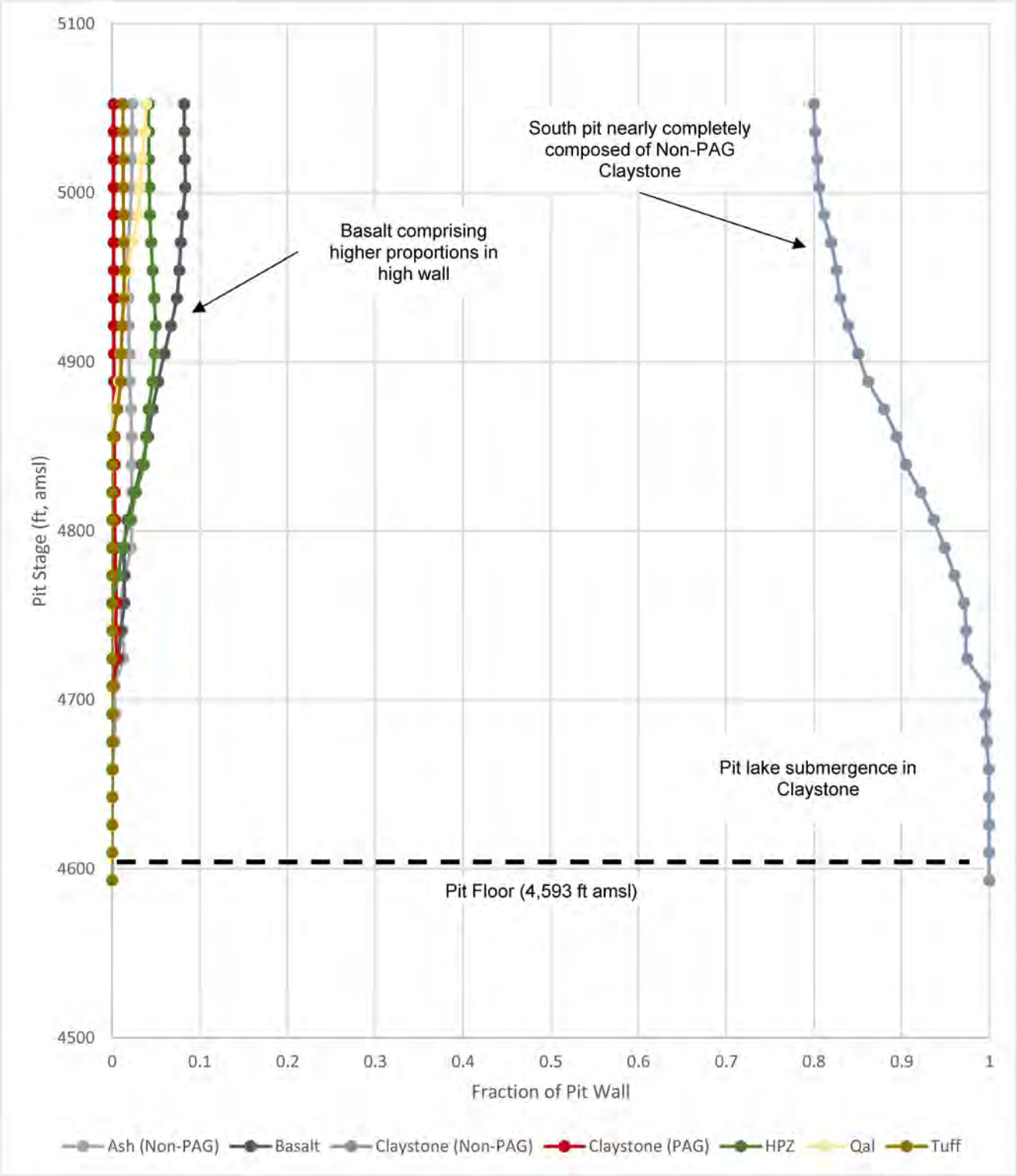
North Sub-Pit Wall Rock Abundance			
CLIENT: LNC	PROJECT: Thacker Pass Project EIS		
JOB #: 3898	DRAWN: TC	CHECKED: TC	
DATE: May 2020	FIGURE: 5.4		

H:\Project\3898\3898-2 Kings Valley EIS\500_Deliverables\530_Reports\Water Quantity & Quality Impacts\Excel\[Figure 5.4-5.6 Pit Wall



PITEAU ASSOCIATES	West Sub-Pit Wall Rock Abundance		
	CLIENT: LNC	PROJECT: Thacker Pass Project EIS	
	JOB #: 3898	DRAWN: TC	CHECKED: TC
	DATE: May 2020	FIGURE: 5.5	

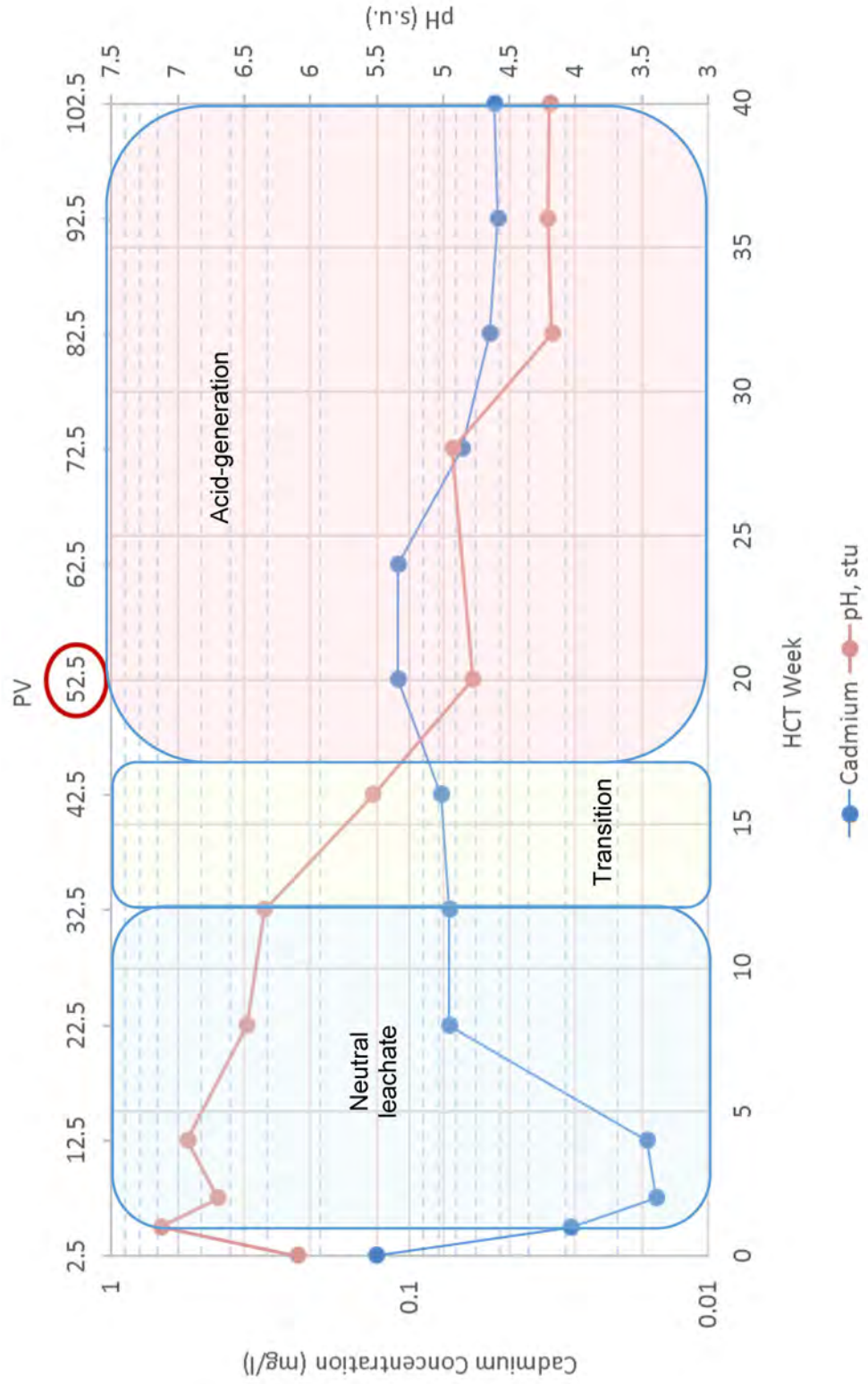
H:\Project\3898\3898-2 Kings Valley EIS\500_Deliverables\530_Reports\Water Quantity & Quality Impacts\Excel\[Figure 5.4-5.6 Pit Wall



PITEAU ASSOCIATES

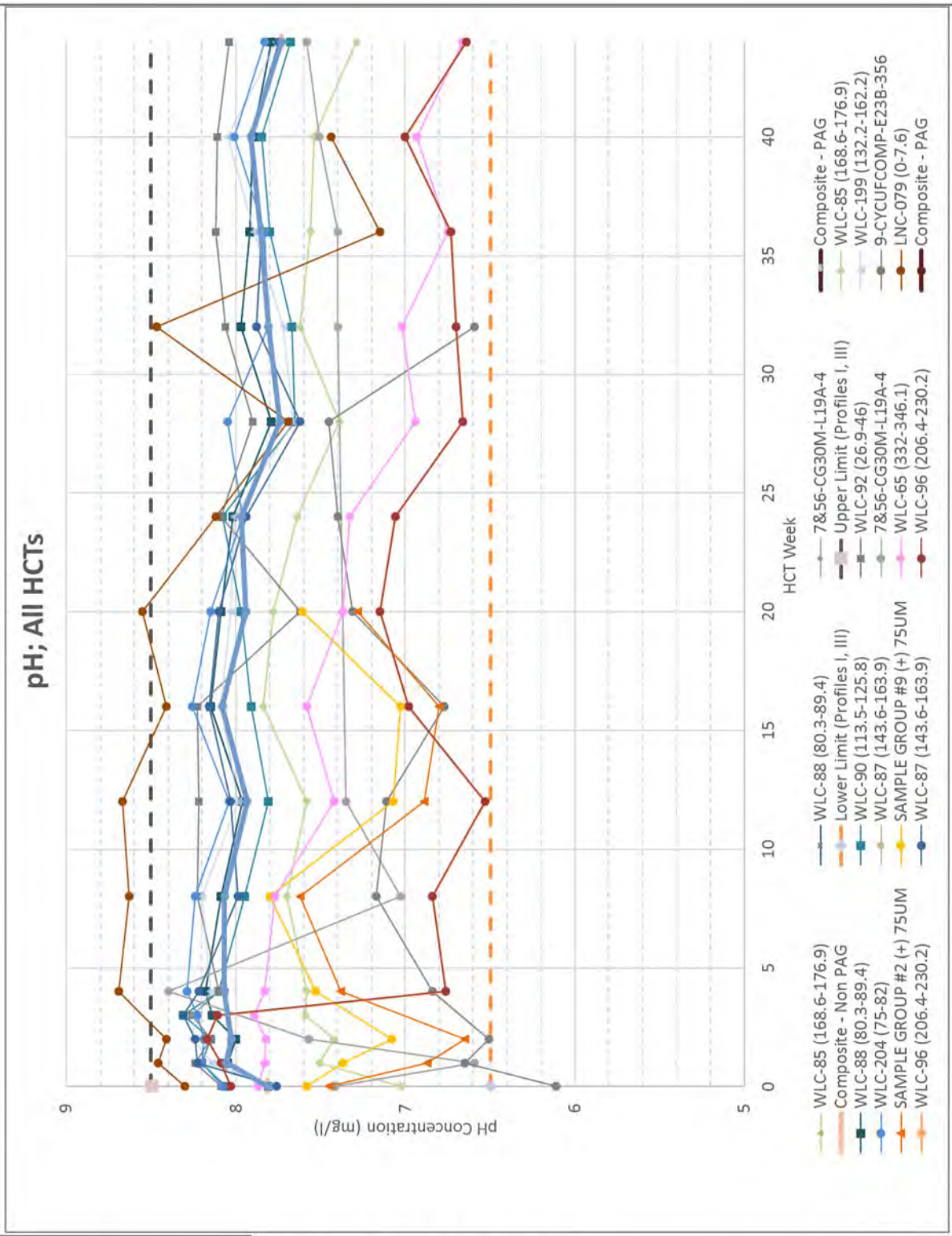
South Sub-Pit Wall Rock Abundance			
CLIENT: LNC	PROJECT: Thacker Pass Project EIS		
JOB #: 3898	DRAWN: TC	CHECKED: TC	
DATE: May 2020	FIGURE: 5.6		

H:\Project\3898\3898-2 Kings Valley EIS\500_Deliverables\530_Reports\Water Quantity & Quality Impacts\Excel\[Figure 5.4-5.6 Pit Wall



PITEAU ASSOCIATES	HCT Chemical Release Function Derivation			
	CLIENT: LNC	PROJECT:	Thacker Pass Impacts Report	
	JOB #: 3898	DRAWN:	TC	CHECKED: TC
	DATE: May 2020	FIGURE:	5.7	

D:\Projects\Lithium Nevada\3898-2 Kings Valley EIS\500_Deliverables\530_Reports\Impacts Report\[Figure 5.7.xlsx]



PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

Weekly pH Release for All HCTs

CLIENT:	LNC	PROJECT:	Thacker Pass Project EIS		
JOB #:	3898	DRAWN:	TC	CHECKED:	TC
DATE:	May, 2020	FIGURE:	5.8a		

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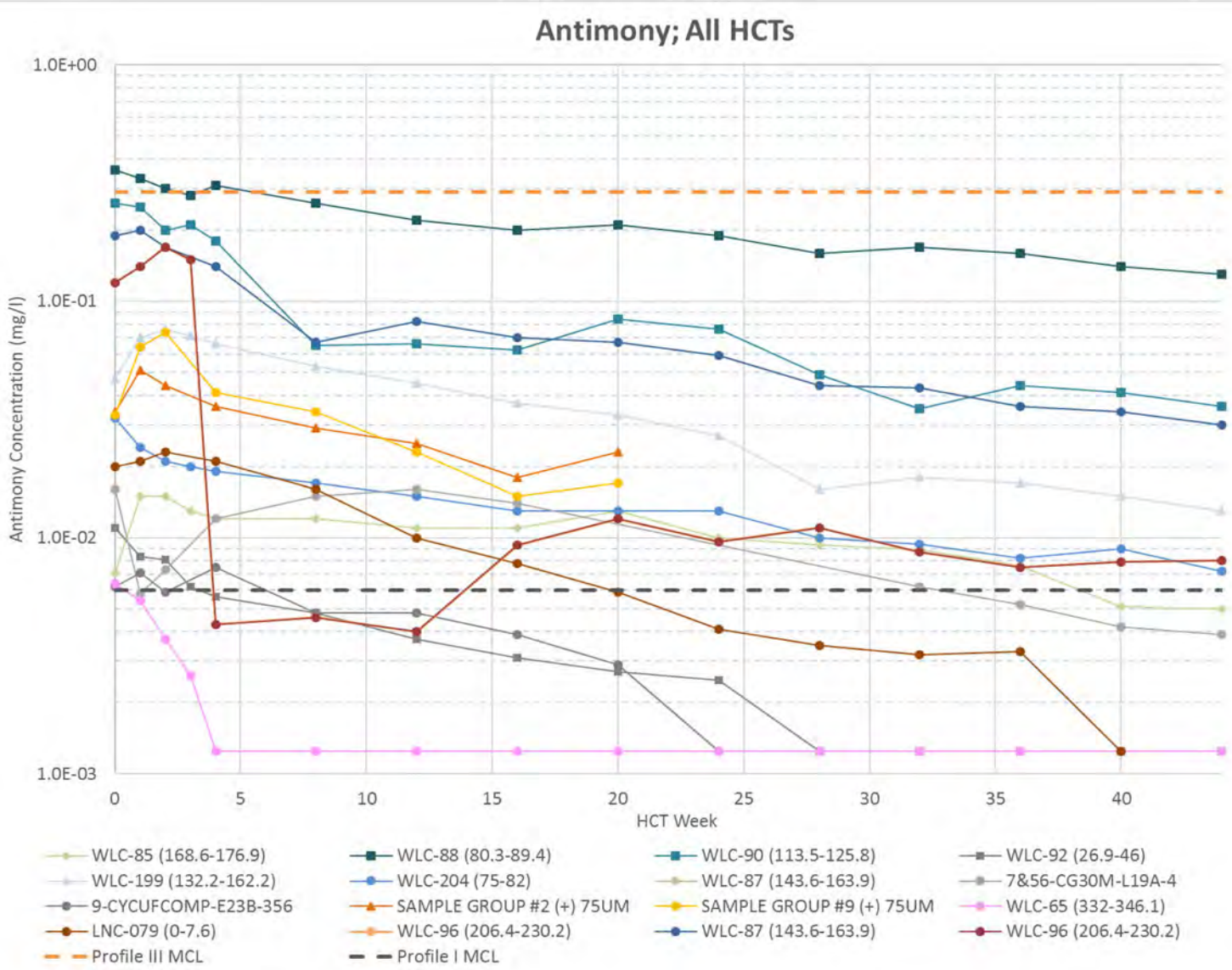
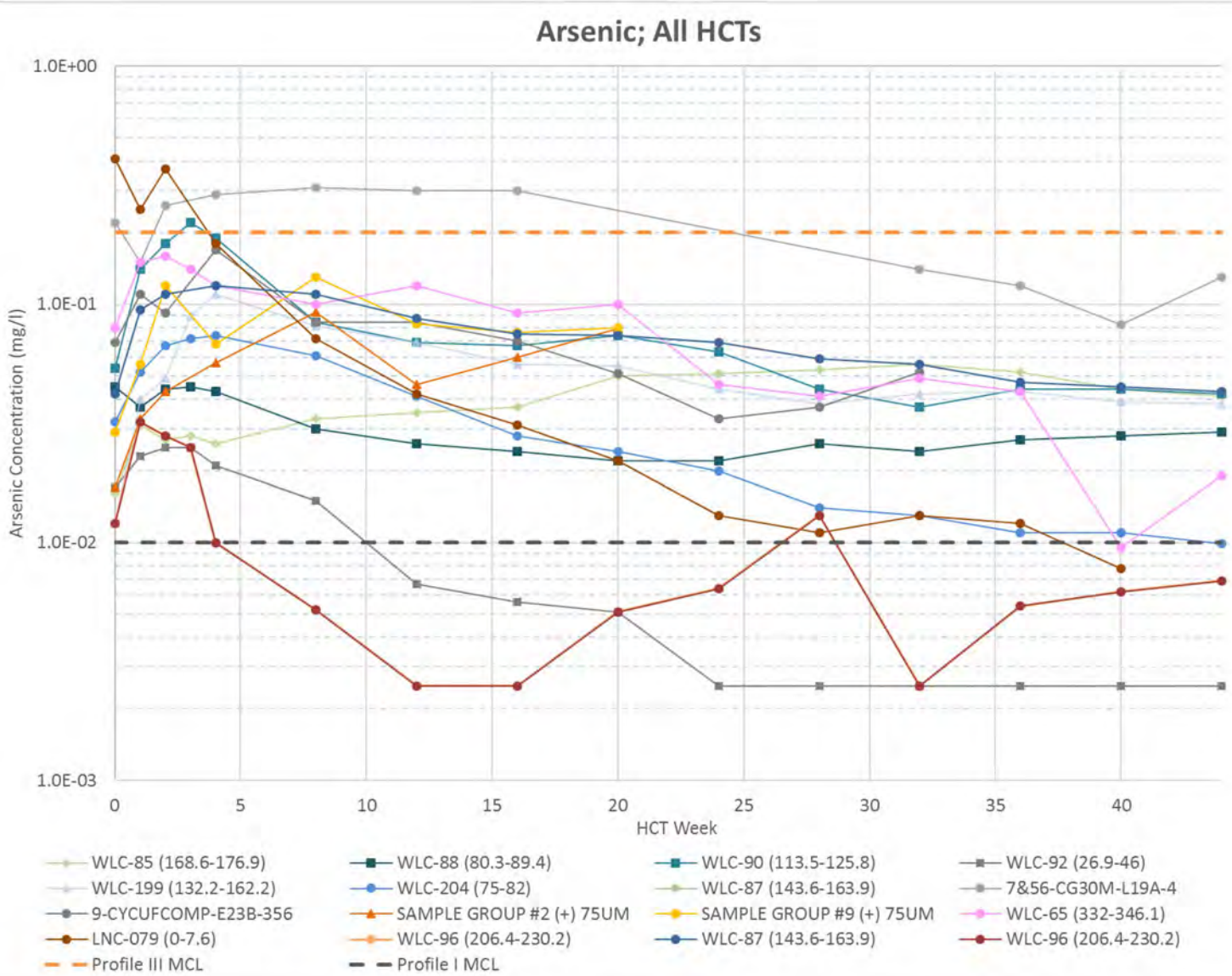


Weekly Sb Release for All HCTs

PITEAU ASSOCIATES

CLIENT: LNC		PROJECT: Thacker Pass Project EIS	
JOB #: 3898		DRAWN: TC	CHECKED: TC
DATE: May, 2020		FIGURE: 5.8b	

D:\Projects\Lithium Nevada\3898-2 Kings Valley EIS\400_WIP\440_Modeling\2019 Geochem\[HCT_Master-20200504.xlsm]

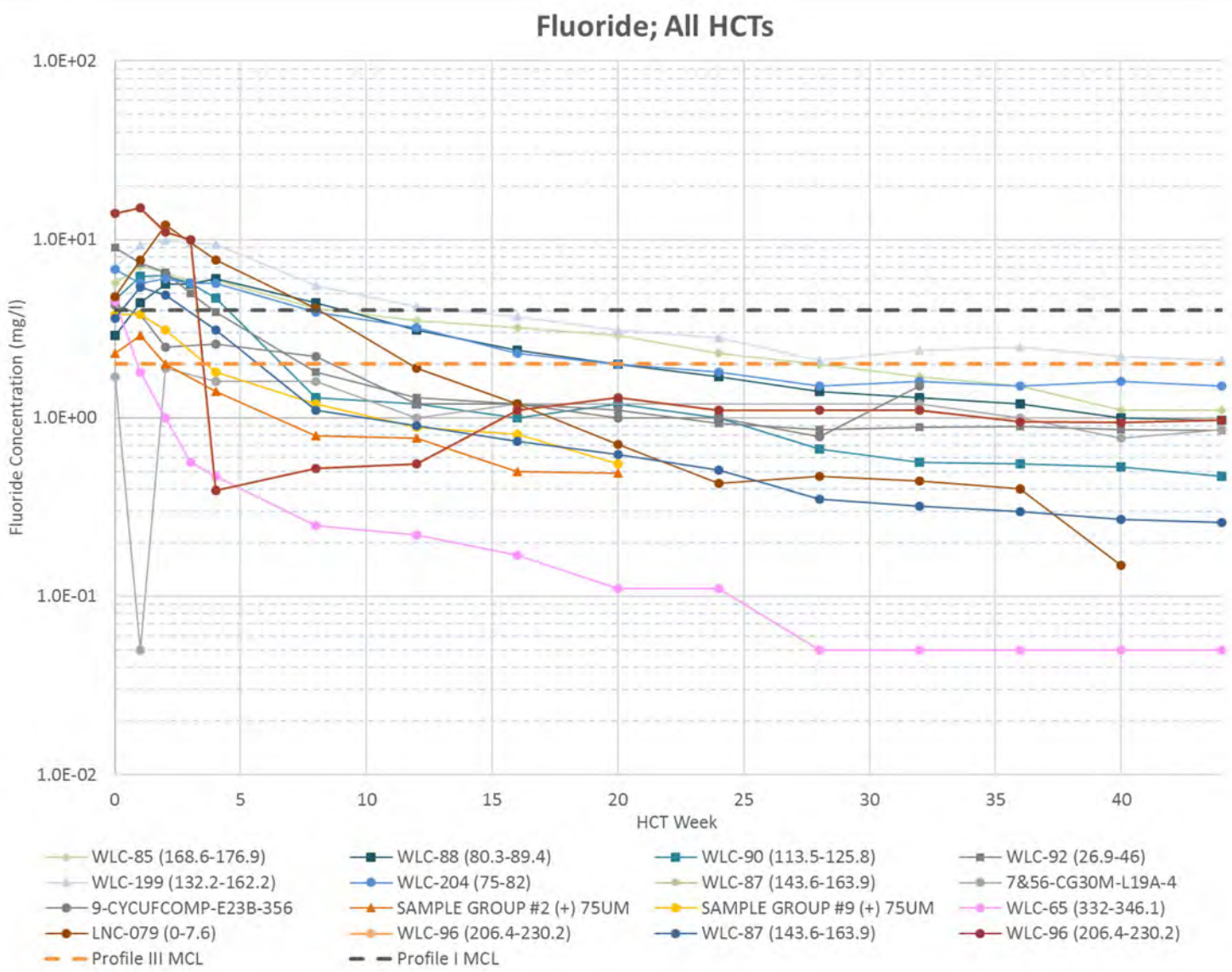


Weekly As Release for All HCTs

PITEAU ASSOCIATES

CLIENT: LNC		PROJECT: Thacker Pass Project EIS	
JOB #: 3898		DRAWN: TC	CHECKED: TC
DATE: May, 2020		FIGURE: 5.8c	

D:\Projects\Lithium Nevada\3898-2 Kings Valley EIS\400_WIP\440_Modeling\2019 Geochem\[HCT_Master-20200504.xlsm]

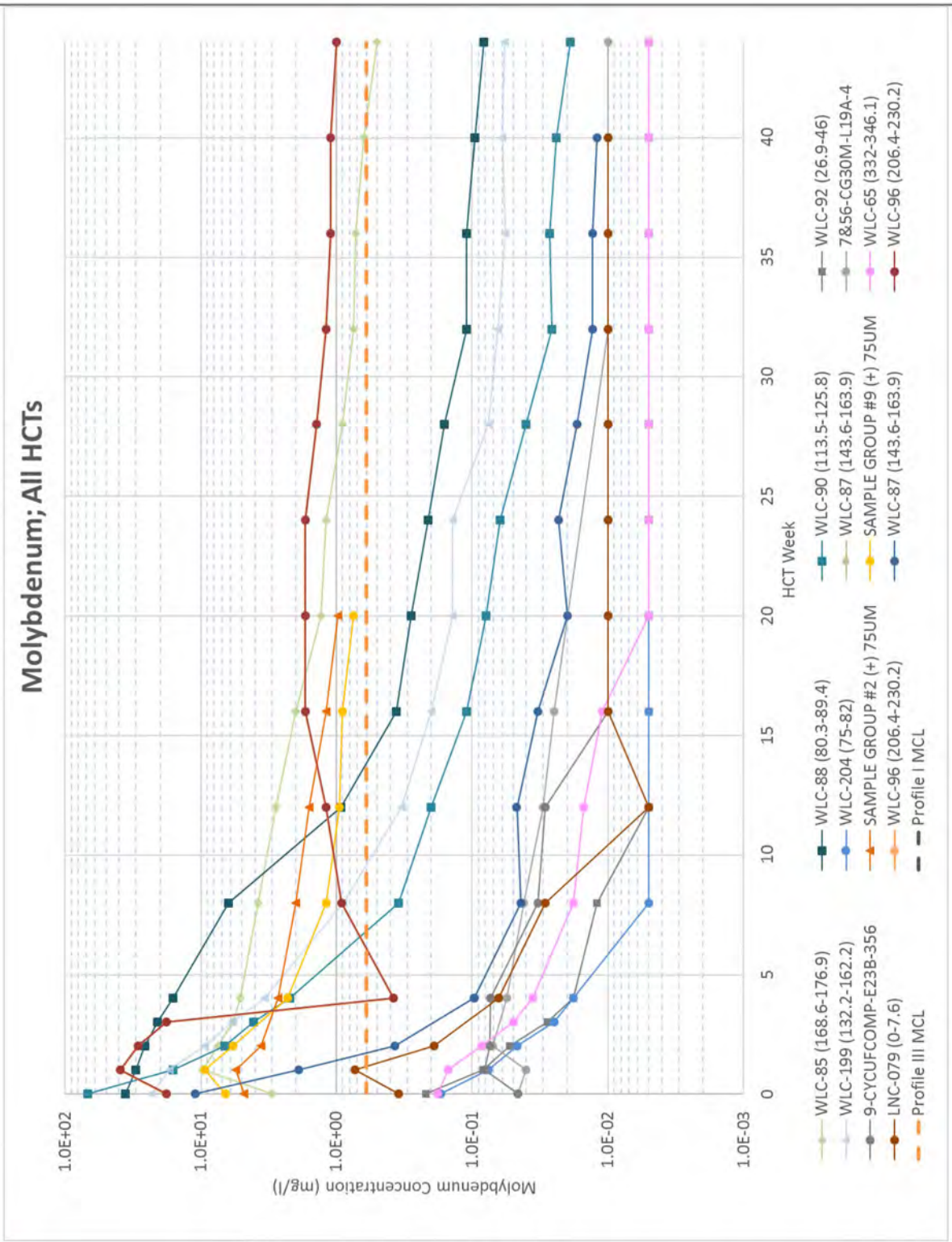


Weekly F Release for All HCTs

PITEAU ASSOCIATES

CLIENT: LNC		PROJECT: Thacker Pass Project EIS	
JOB #: 3898		DRAWN: TC	CHECKED: TC
DATE: May, 2020		FIGURE: 5.8d	

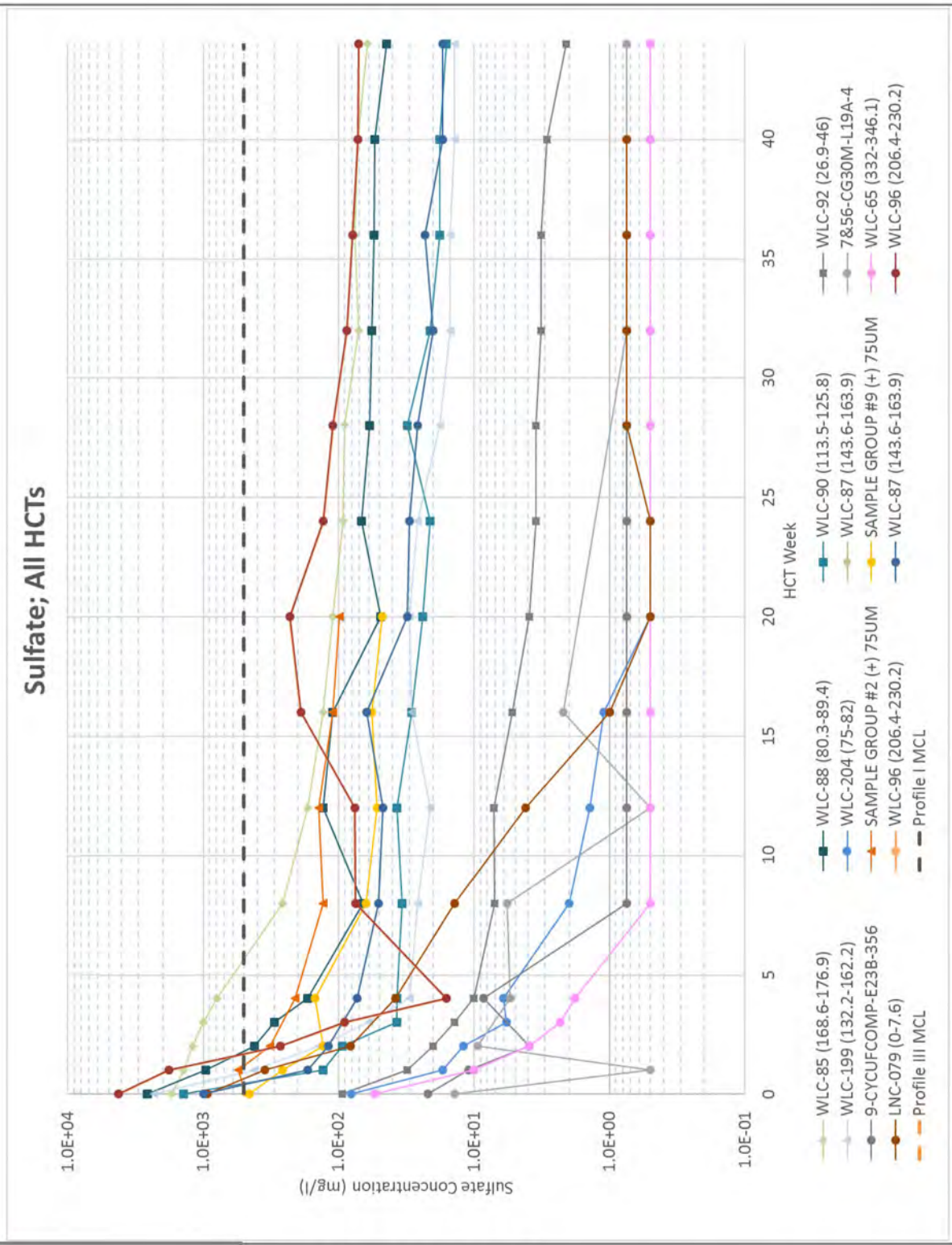
D:\Projects\Lithium Nevada\3898-2 Kings Valley EIS\400_WIP\440_Modeling\2019 Geochem\[HCT_Master-20200504.xlsm]



PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

Weekly Mo Release for All HCTs					
CLIENT:	LNC	PROJECT:	Thacker Pass Project EIS		
JOB #:	3898	DRAWN:	TC	CHECKED:	TC
DATE:	May, 2020	FIGURE:	5.8e		

D:\Projects\Lithium Nevada\3898-2 Kings Valley EIS\400_WIP\440_Modeling\2019 Geochem\[HCT_Master-20200504.xlsm]



PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

Weekly SO4 Release for All HCTs					
CLIENT:	LNC	PROJECT:	Thacker Pass Project EIS		
JOB #:	3898	DRAWN:	TC	CHECKED:	TC
DATE:	May, 2020	FIGURE:	5.8f		

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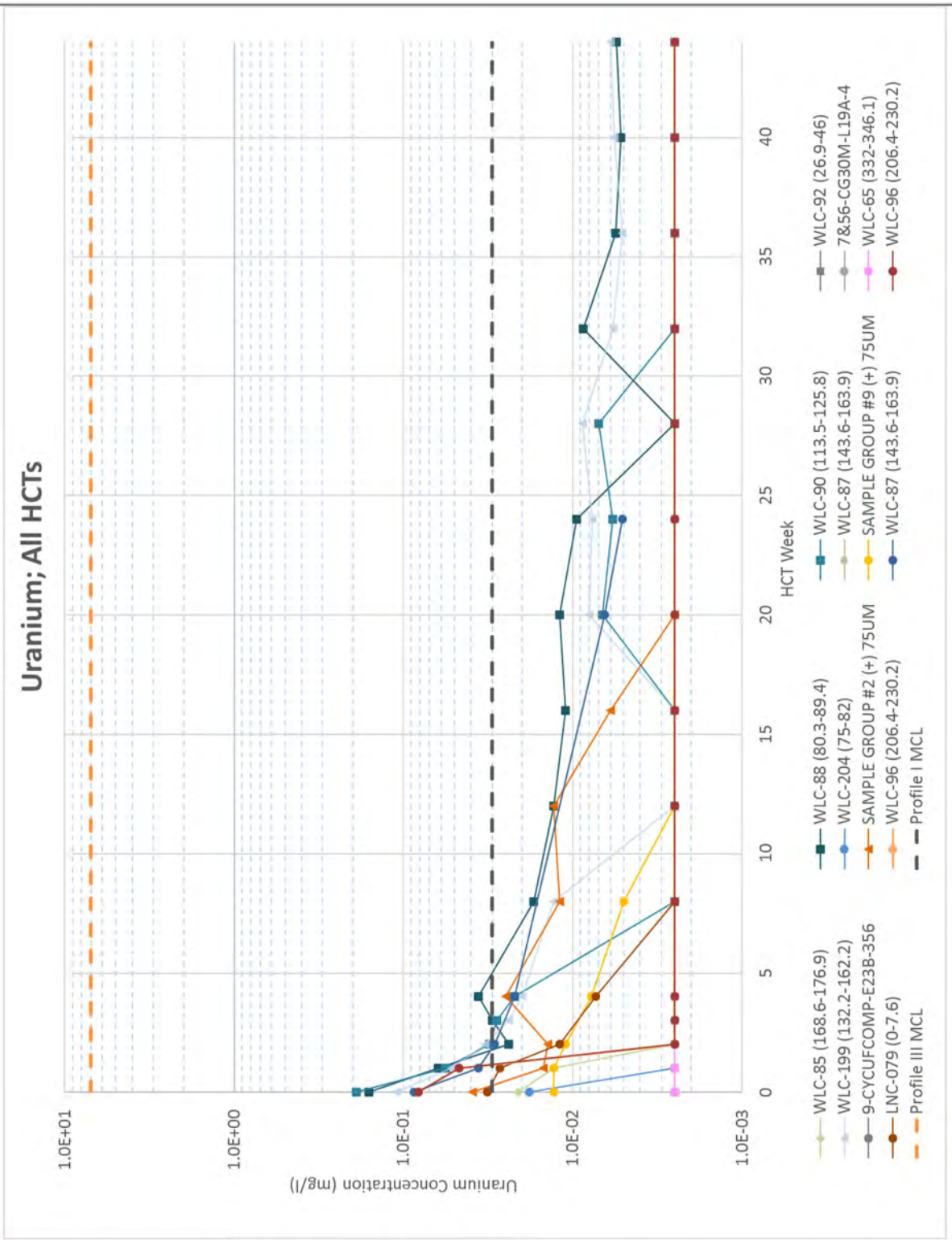
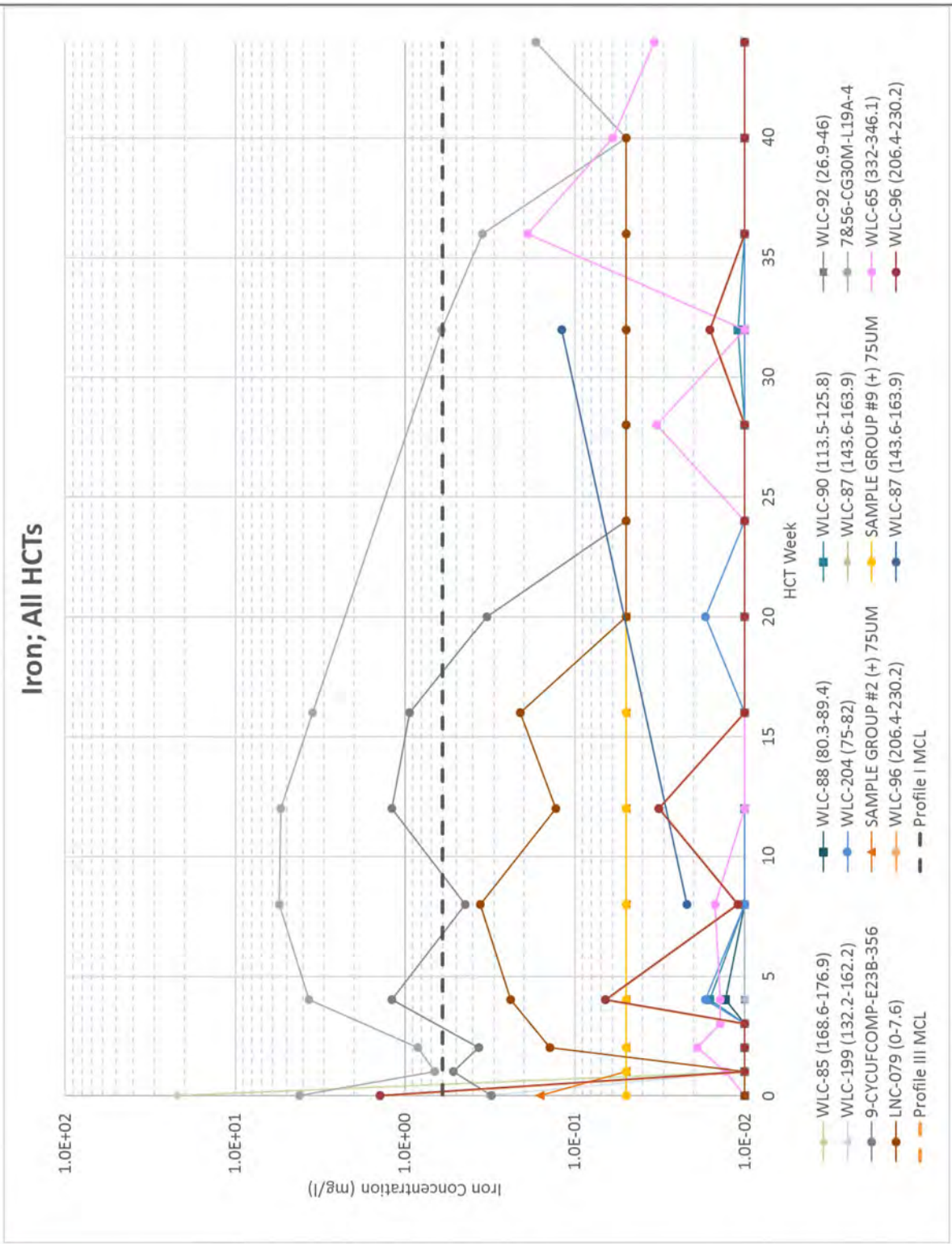


PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

Weekly U Release for All HCTs					
CLIENT:	LNC	PROJECT:	Thacker Pass Project EIS		
JOB #:	3898	DRAWN:	TC	CHECKED:	TC
DATE:	May, 2020	FIGURE:	5.8g		

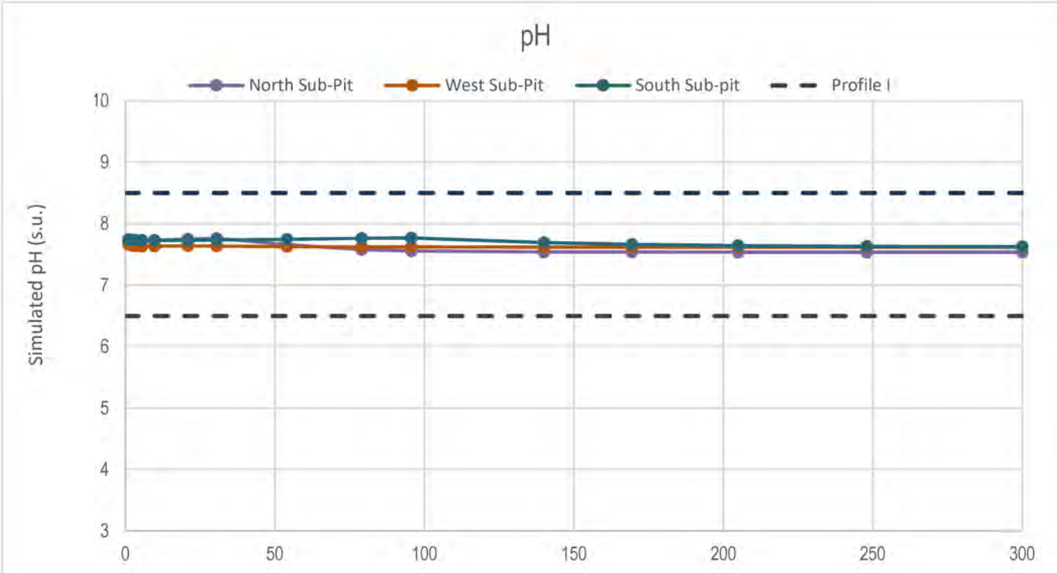
D:\Projects\Lithium Nevada\3898-2 Kings Valley EIS\400_WIP\440_Modeling\2019 Geochem\[HCT_Master-20200504.xlsm]

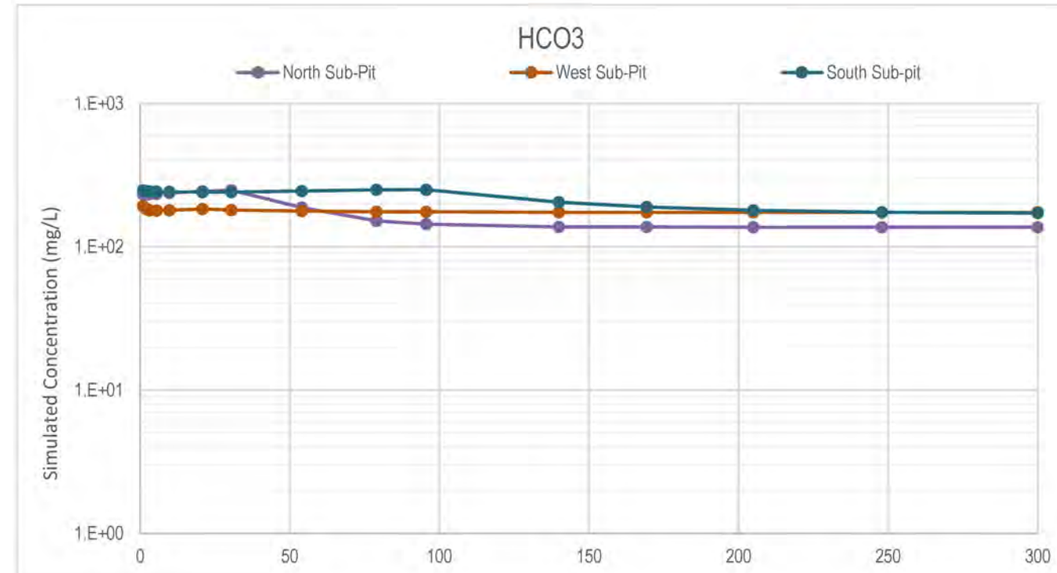


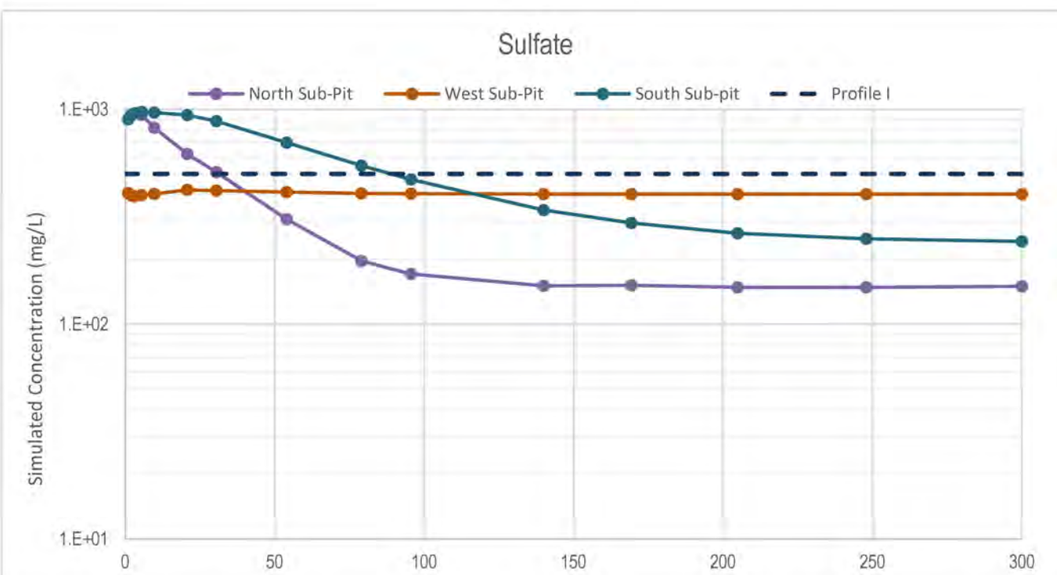
PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

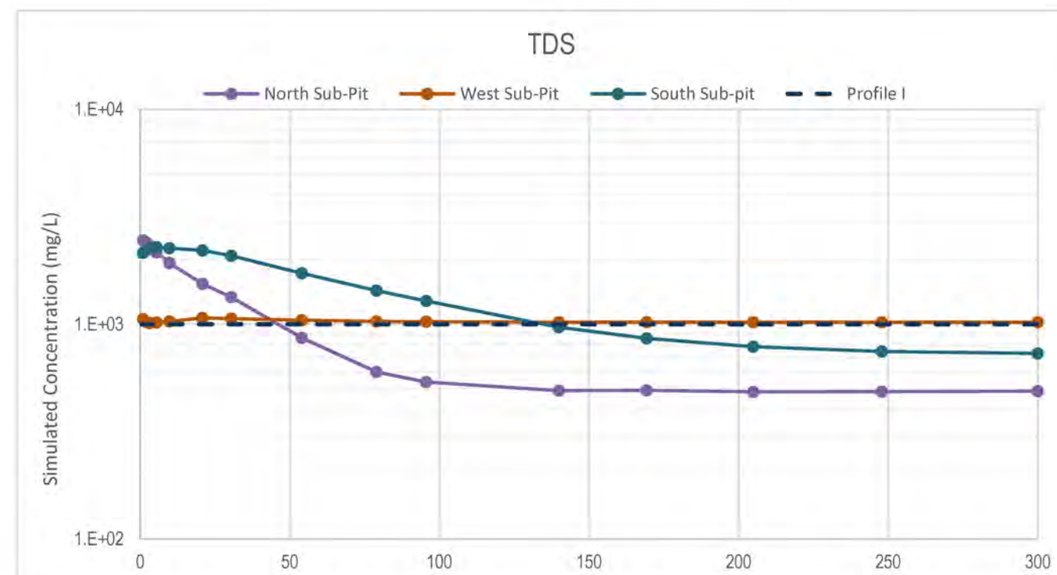
Weekly Fe Release for All HCTs					
CLIENT:	LNC	PROJECT:	Thacker Pass Project EIS		
JOB #:	3898	DRAWN:	TC	CHECKED:	TC
DATE:	May, 2020	FIGURE:	5.8h		

D:\Projects\Lithium Nevada\3898-2 Kings Valley EIS\400_WIP\440_Modeling\2019 Geochem\[HCT_Master-20200504.xlsm]



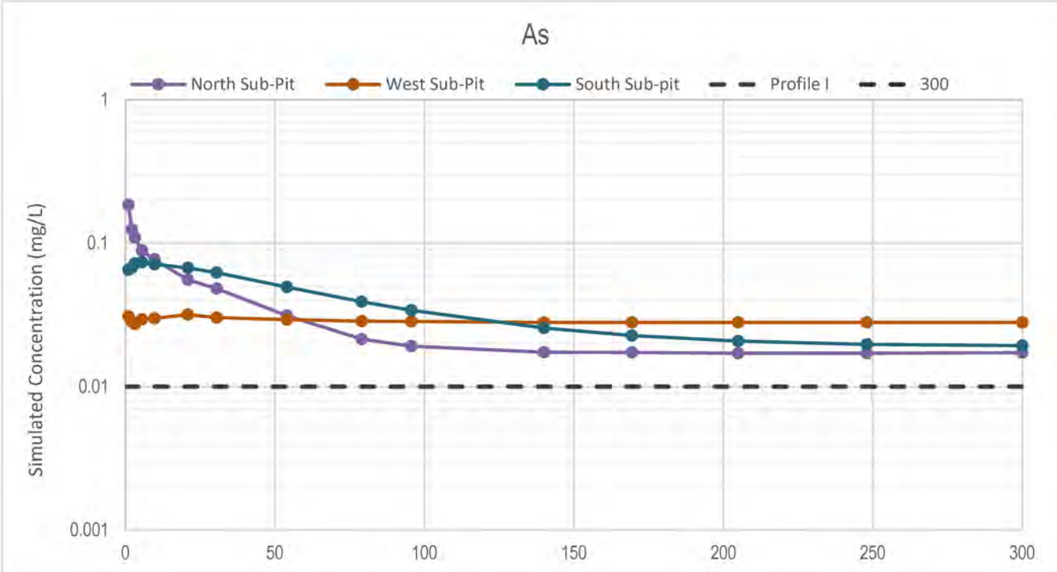


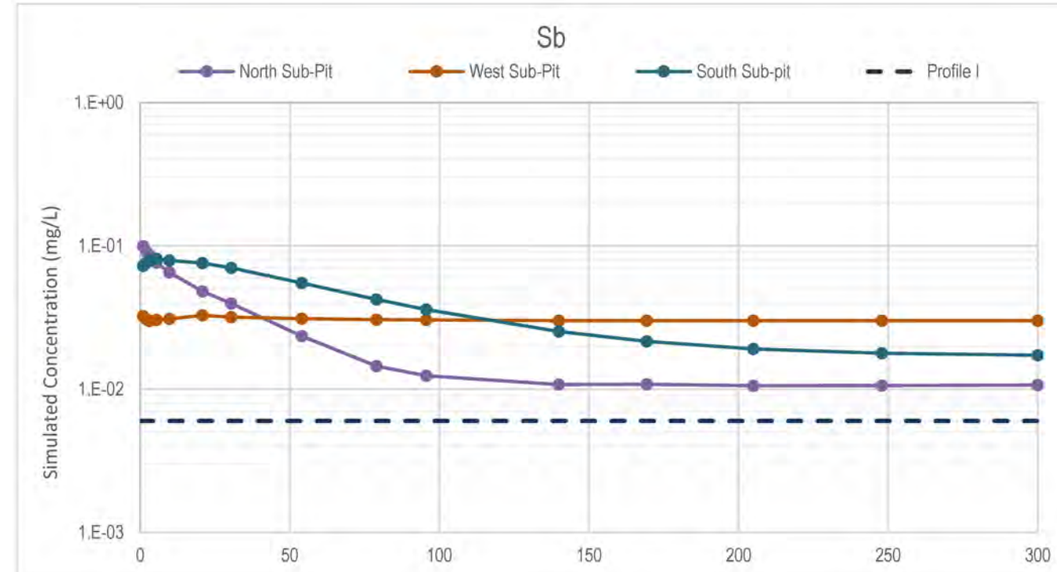


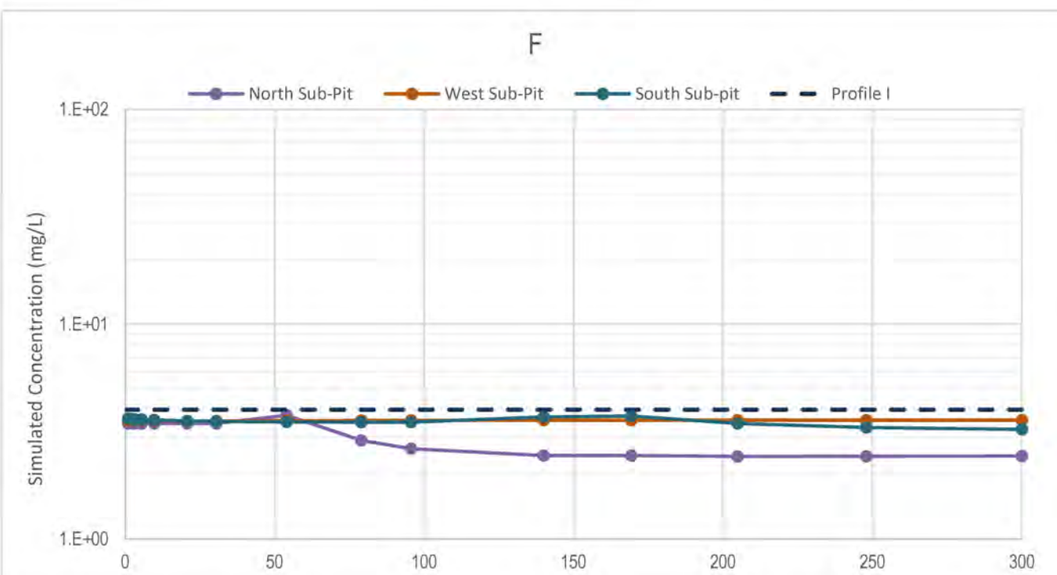


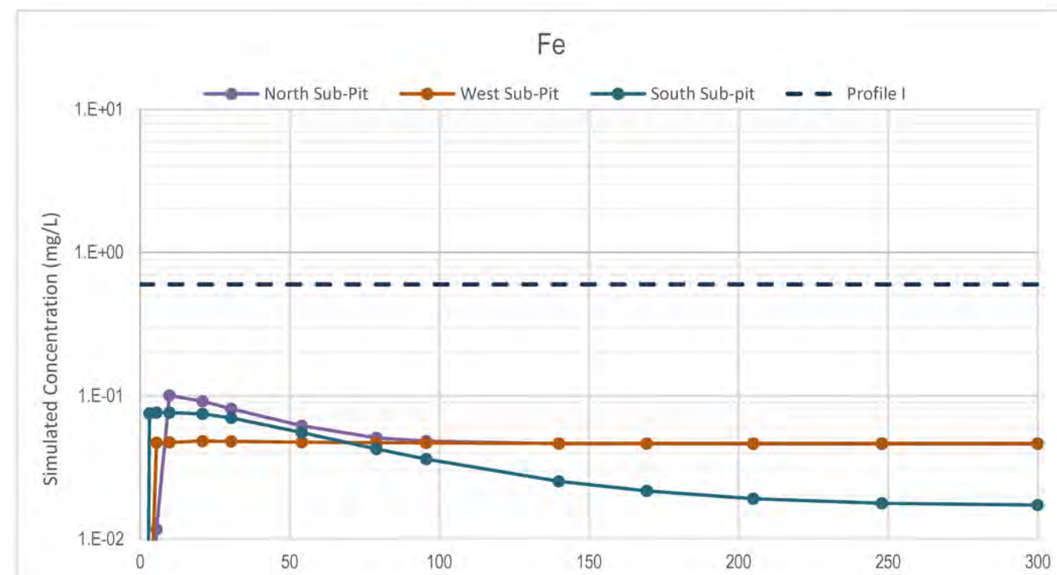
PITEAU ASSOCIATES GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS	Backfilled pit proposed action: pH, HCO3, SO4 and TDS plots through time			
	CLIENT: Lithium Nevada Corporation	PROJECT: Thacker Pass Project EIS		
	JOB #: 3898	DRAWN: TC	CHECKED: TC	
	DATE: May 2020	FIGURE: 5.9a		

H:\Project\3898\3898-2 Kings Valley EIS\500_Deliverables\530_Reports\Water Quantity & Quality Impacts\Excel\[Fig 5.9a-c Backfilled Pit Chemistry Plots 20200513.xlsx]





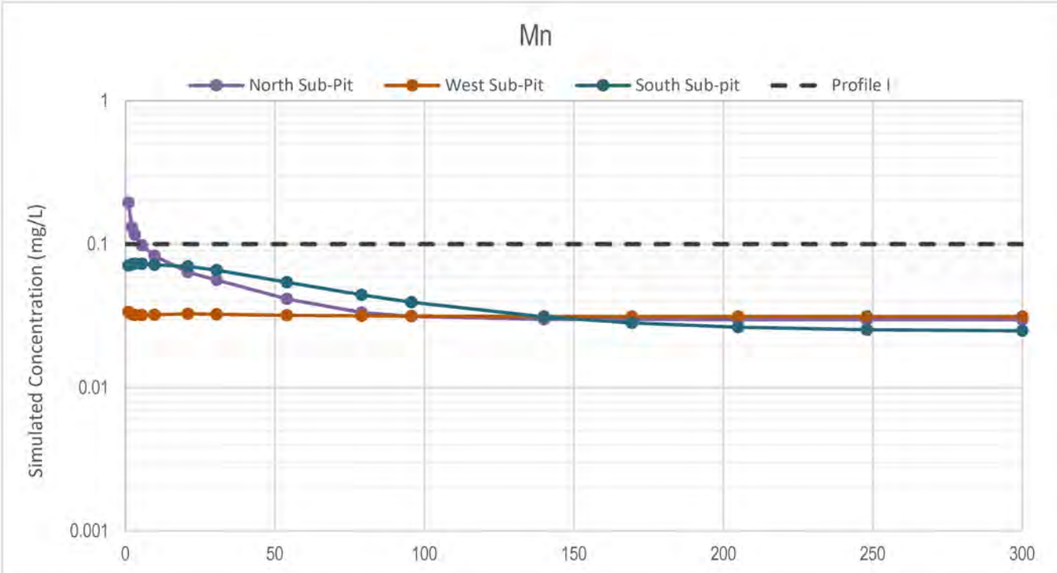


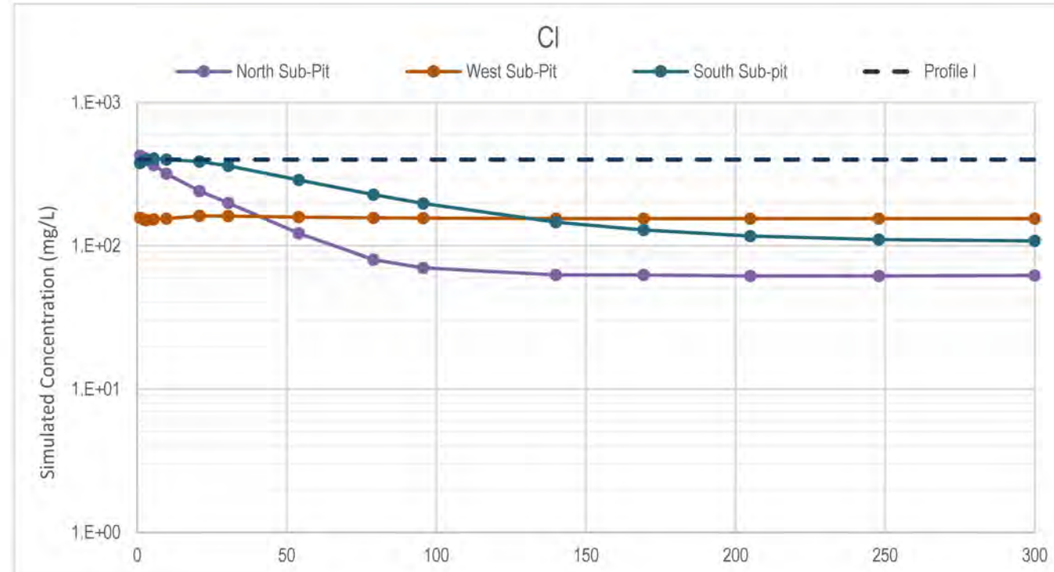


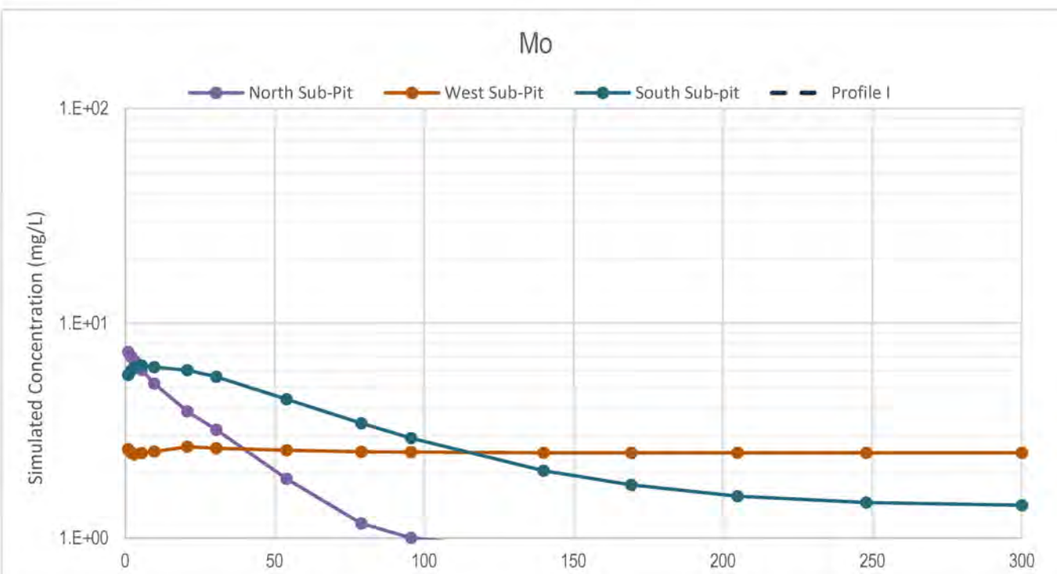
PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

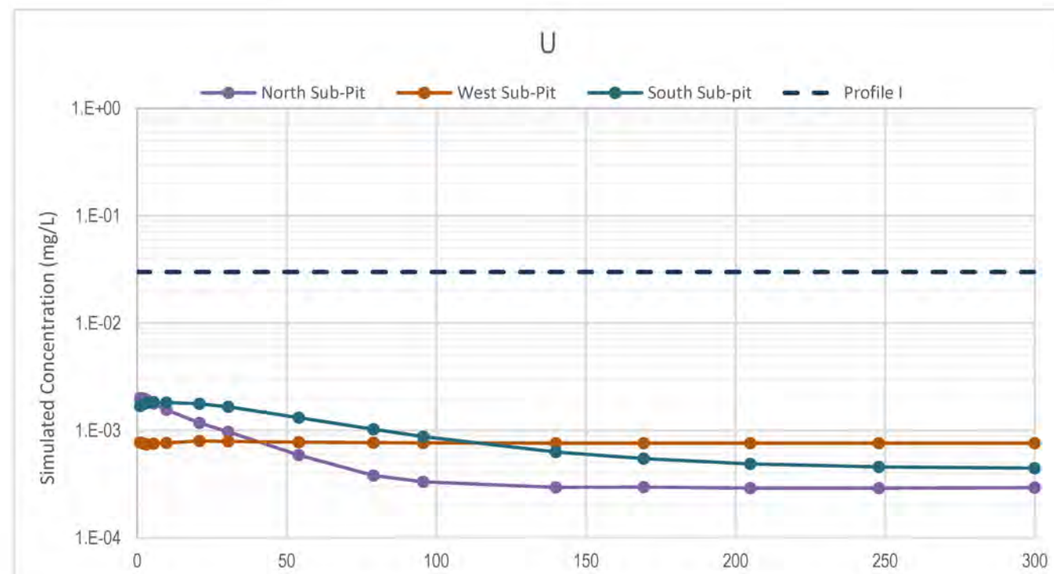
Backfilled pit proposed action: As, Sb, F, Fe plots through time

CLIENT:	Lithium Nevada Corporation	PROJECT:	Thacker Pass Project EIS		
JOB #:	3898	DRAWN:	TC	CHECKED:	TC
DATE:	May 2020	FIGURE:	5.9b		







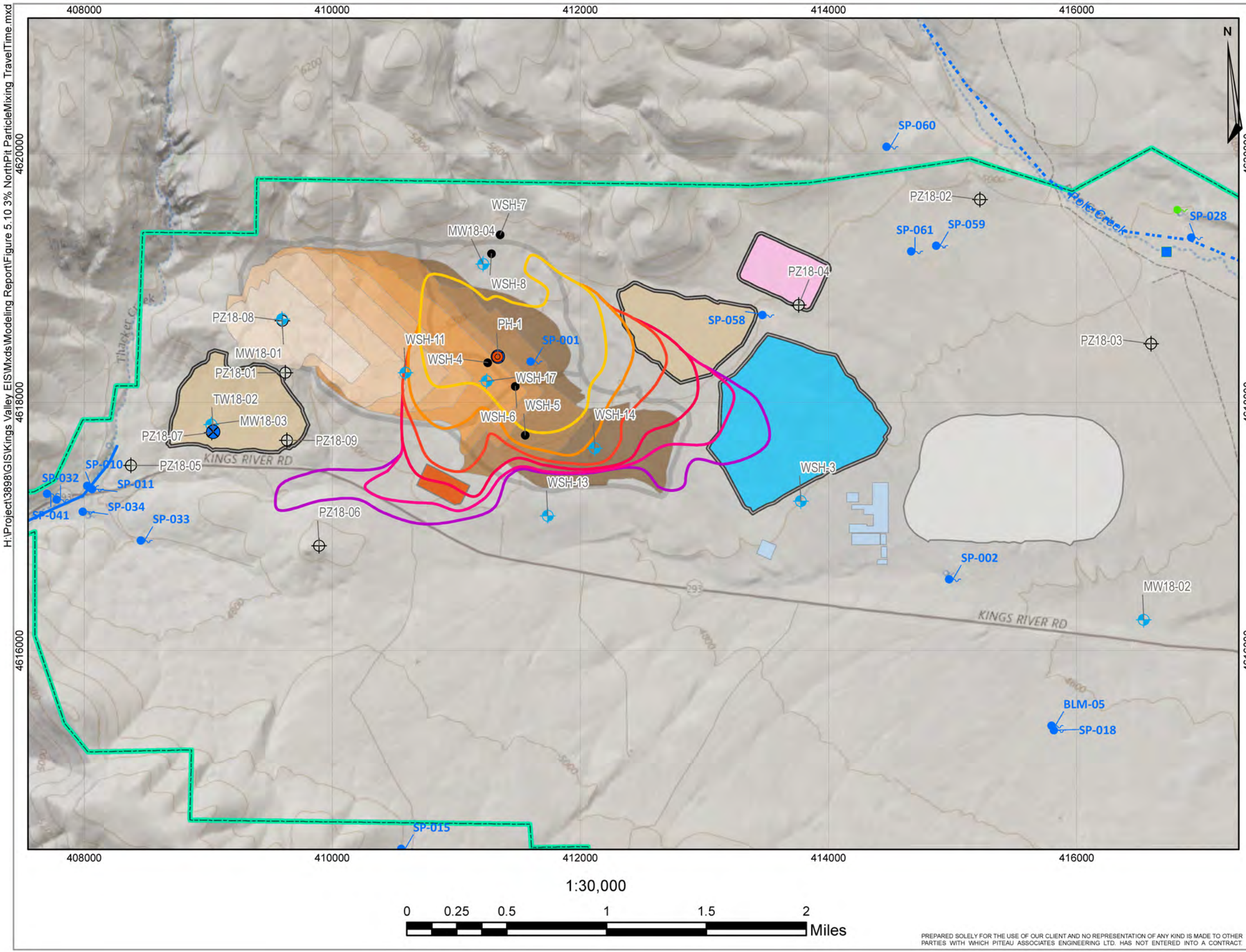


Back

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

Backfilled pit proposed action: Mn, Cl, Mo, U plots through time			
CLIENT:	Lithium Nevada Corporation	PROJECT:	Thacker Pass Project EIS
JOB #:	3898	DRAWN:	TC
DATE:	May 2020	FIGURE:	5.9c
		CHECKED:	TC

H:\Project\3898\3898-2 Kings Valley EIS\500_Deliverables\530_Reports\Water Quantity & Quality Impacts\Excel\[Fig 5.9a-c Backfilled Pit Chemistry Plots 20200513.xlsx]



PREPARED SOLELY FOR THE USE OF OUR CLIENT AND NO REPRESENTATION OF ANY KIND IS MADE TO OTHER PARTIES WITH WHICH PITEAU ASSOCIATES ENGINEERING LTD. HAS NOT ENTERED INTO A CONTRACT.

H:\Project\3898\GIS\Kings Valley EIS\Mxds\Modeling Report\Figure 5.10 3% NorthPit ParticleMixing TravelTime.mxd

Wells

- Abandoned
- Monitoring well
- Piezometer
- Production well
- Test pumping well
- Springs

N Pit GW Travel time

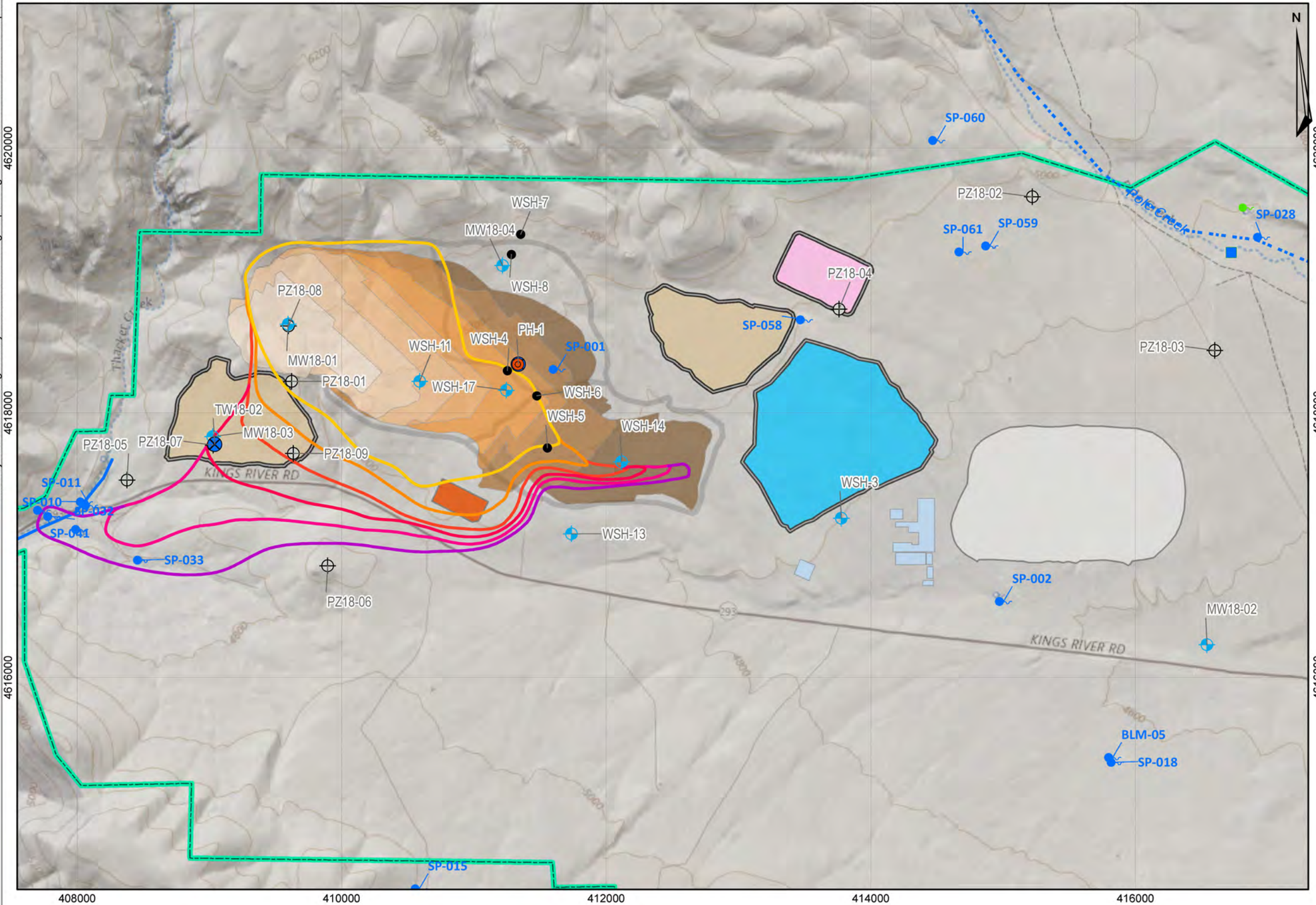
- 0-50 yrs
- 50-100 yrs
- 100-150 yrs
- 150-200 yrs
- 200-250 yrs
- 250-300 yrs
- Sub Pits
- Mine Facilities
- Process Plant
- Tailings Facility
- Gangue Stockpile
- WRFs
- Growth Media Stockpile
- Thacker Pass Project AOI

Backfilled pit proposed action: North Sub-Pit Screening Level Time Groups

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

CLIENT:	LNC
PROJECT:	Thacker Pass Project EIS
JOB:	3898
DRAWN:	BA
CHECKED:	TC
DATE:	May 2020
FIGURE:	5.10

H:\Project\3898\GIS\Kings Valley EIS\Mxds\Modeling Report\Figure 5.11 3% West Pit Time Group.mxd



1:30,000

0 0.25 0.5 1 1.5 2 Miles

PREPARED SOLELY FOR THE USE OF OUR CLIENT AND NO REPRESENTATION OF ANY KIND IS MADE TO OTHER PARTIES WITH WHICH PITEAU ASSOCIATES ENGINEERING LTD. HAS NOT ENTERED INTO A CONTRACT.

Wells

- Abandoned
- Monitoring well
- Piezometer
- Production well
- Test pumping well
- Springs

West Pit GW Travel time

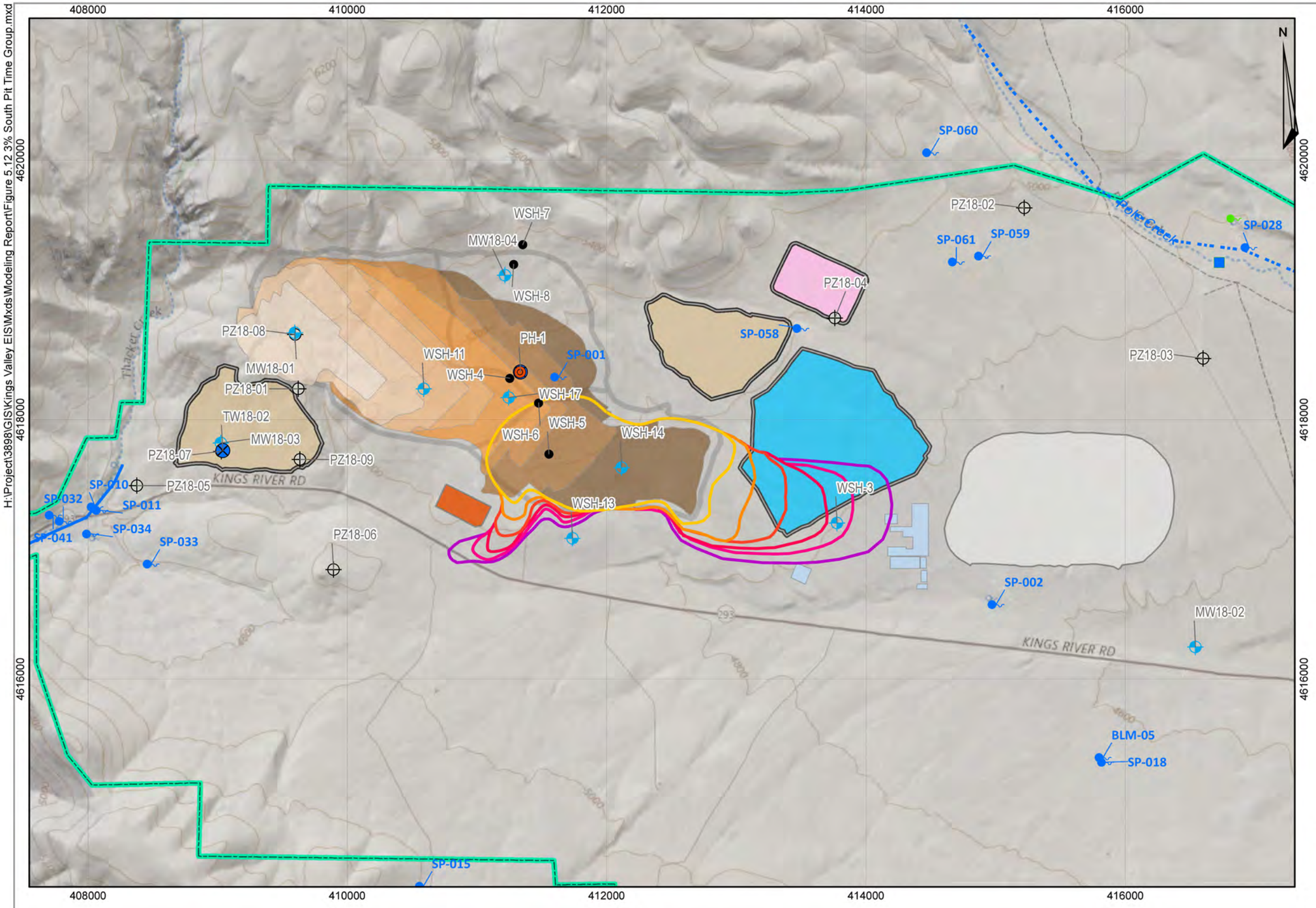
- 0-50 yrs
- 50-100 yrs
- 100-150 yrs
- 150-200 yrs
- 200-250 yrs
- 250-300 yrs
- Sub Pits
- Mine Facilities
- Process Plant
- Tailings Facility
- Gangue Stockpile
- WRFs
- Growth Media Stockpile
- Thacker Pass Project AOI

Backfilled pit proposed action: West Sub-Pit Screening Level Time Groups

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

CLIENT:	LNC
PROJECT:	Thacker Pass Project EIS
JOB:	3898
DRAWN:	BA
CHECKED:	TC
DATE:	May 2020
FIGURE:	5.11

H:\Project\3898\GIS\Kings Valley EIS\Mxds\Modeling Report\Figure 5.12 3% South Pit Time Group.mxd



1:30,000

0 0.25 0.5 1 1.5 2 Miles

PREPARED SOLELY FOR THE USE OF OUR CLIENT AND NO REPRESENTATION OF ANY KIND IS MADE TO OTHER PARTIES WITH WHICH PITEAU ASSOCIATES ENGINEERING LTD. HAS NOT ENTERED INTO A CONTRACT.

Wells

- Abandoned
- Monitoring well
- Piezometer
- Production well
- Test pumping well
- Springs

South Pit GW Travel time

- 0-50 yrs
- 50-100 yrs
- 100-150 yrs
- 150-200 yrs
- 200-250 yrs
- 250-300 yrs
- Sub Pits
- Mine Facilities
- Process Plant
- Tailings Facility
- Gangue Stockpile
- WRFs
- Growth Media Stockpile
- Thacker Pass Project AOI

Backfilled pit proposed action: South Sub-Pit Screening Level Time Groups

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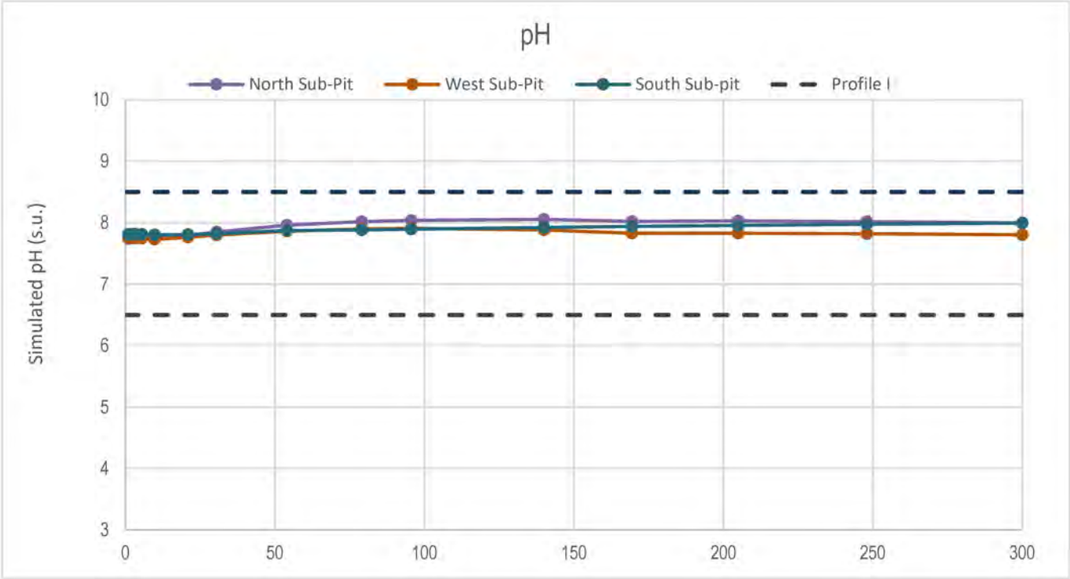
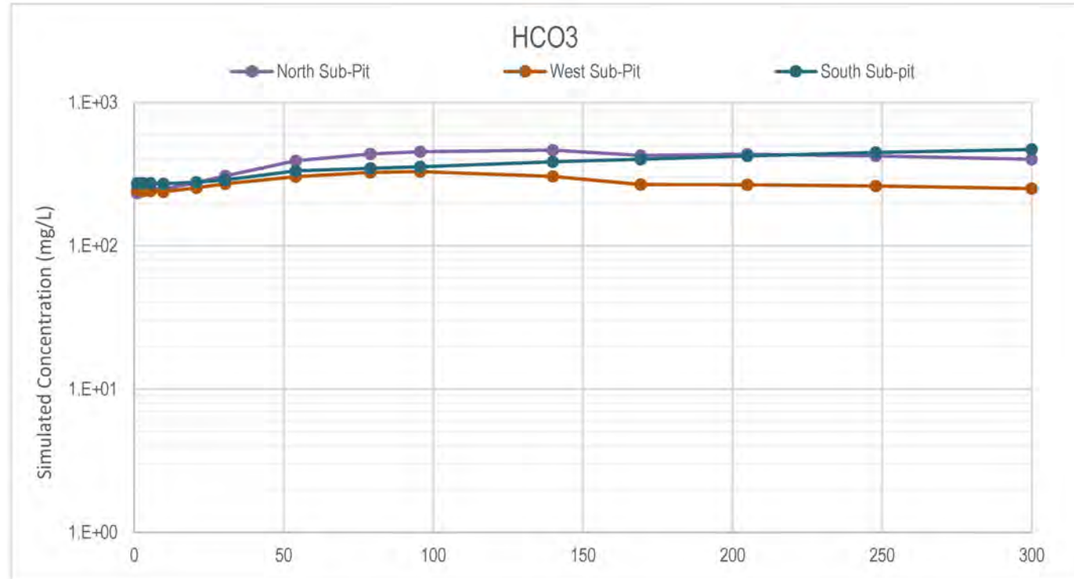
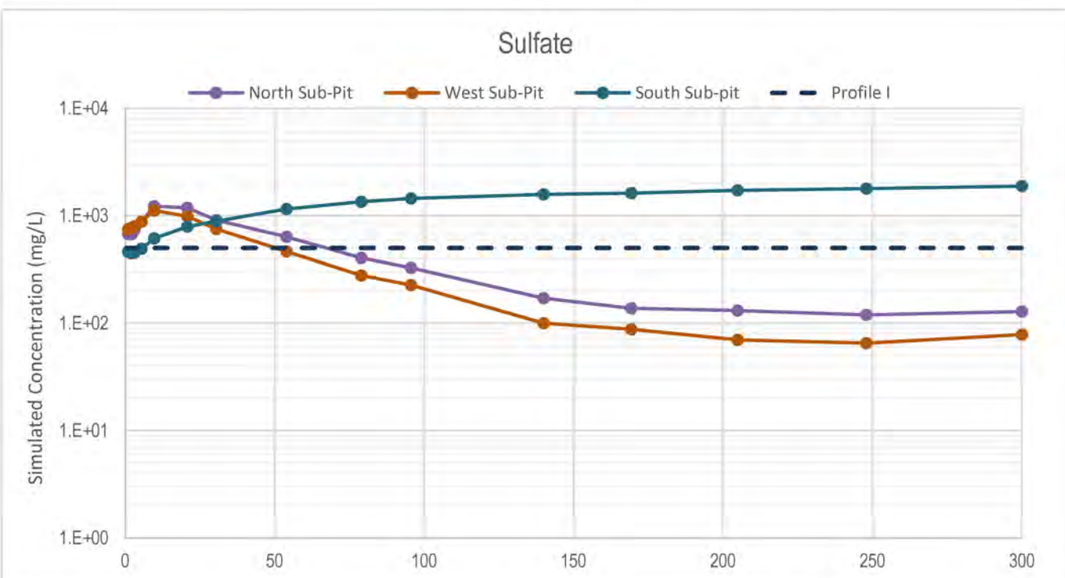
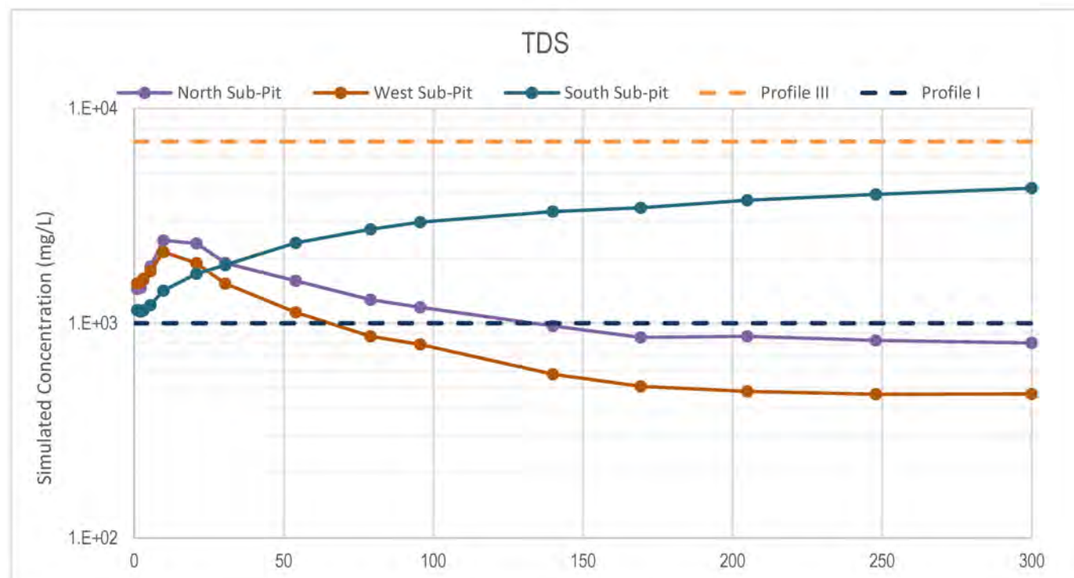
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

CLIENT:	LNC
PROJECT:	Thacker Pass Project EIS
JOB:	3898
DRAWN: BA	CHECKED: TC
DATE:	May 2020
FIGURE:	5.12







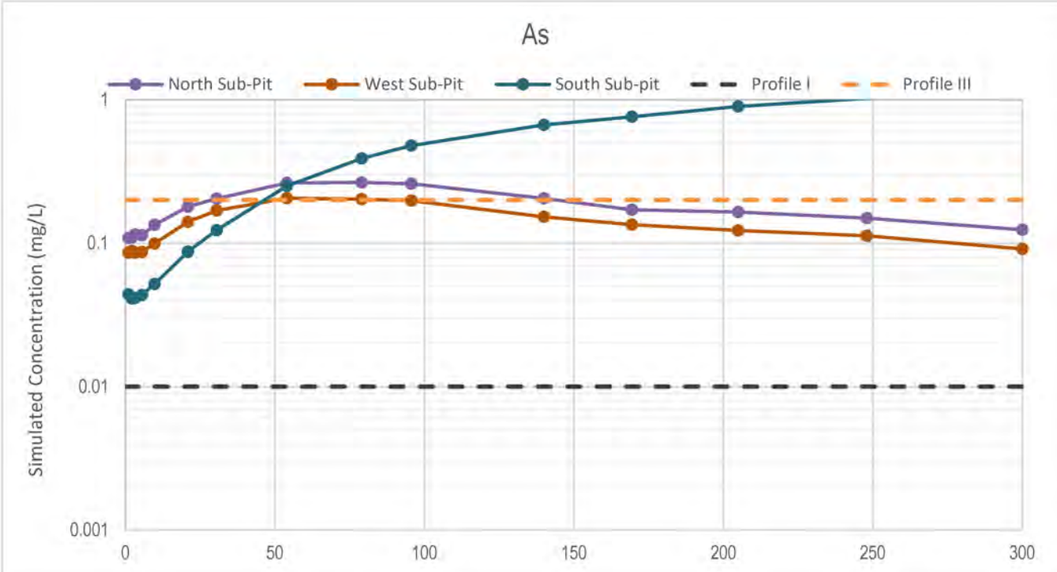


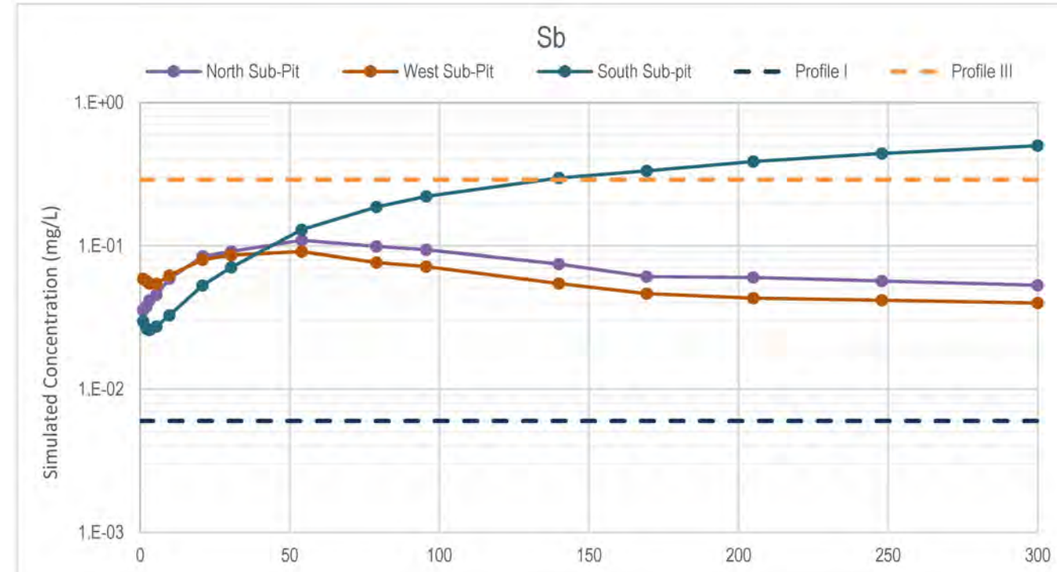
PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

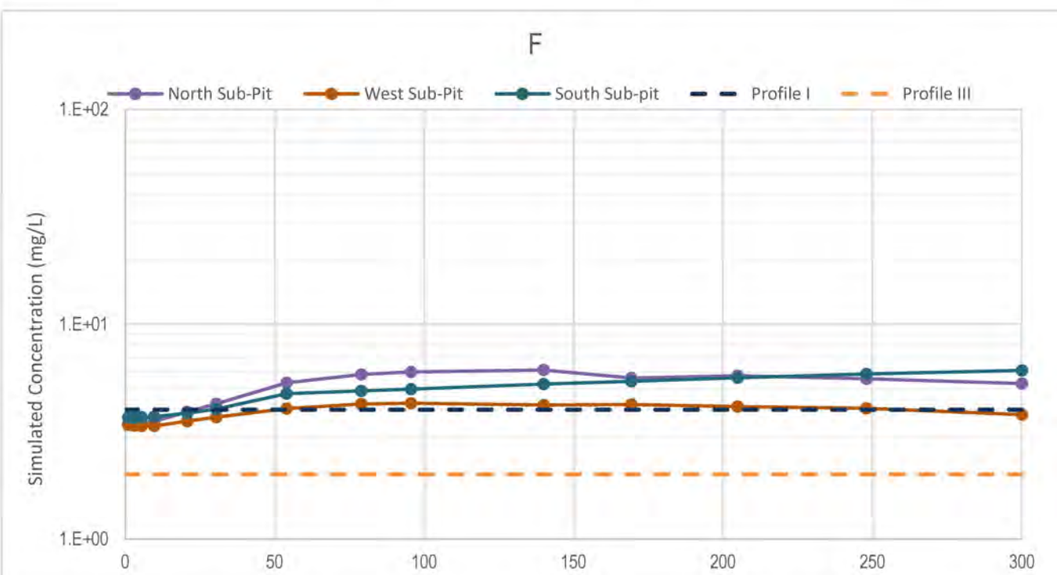
Open pit alternative: pH, HCO3, SO4 and TDS plots through time			
CLIENT:	Lithium Nevada Corporation	PROJECT:	Thacker Pass Project EIS
JOB #:	3898	DRAWN:	TC
DATE:	May 2020	FIGURE:	5.13a

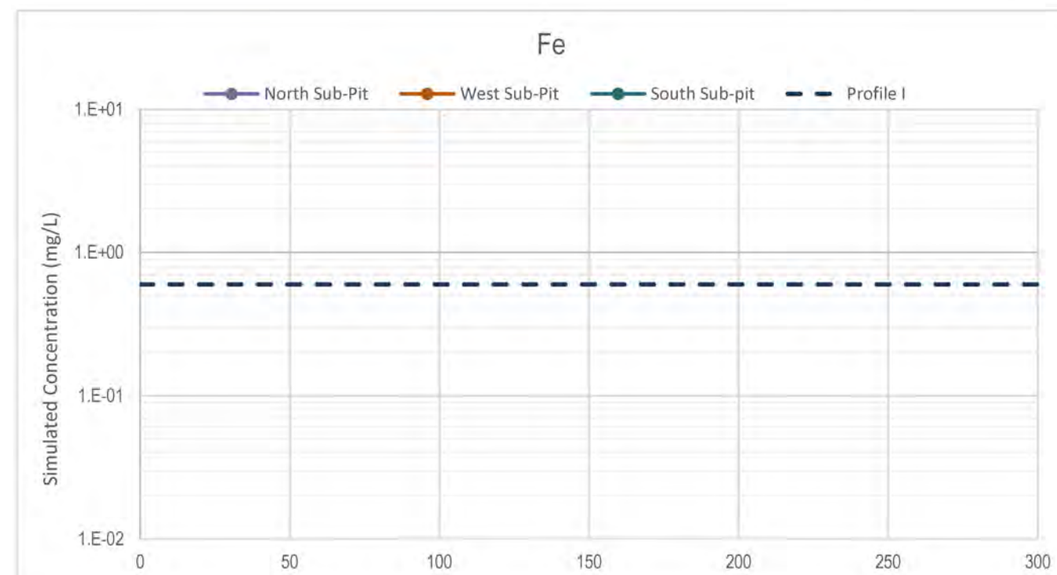
CHECKED: TC

H:\Project\3898\3898-2 Kings Valley EIS\500_Deliverables\530_Reports\Water Quantity & Quality Impacts\Excel\[Fig 5.13a-b Open Pit Chemistry Plots 20200513.xlsx]







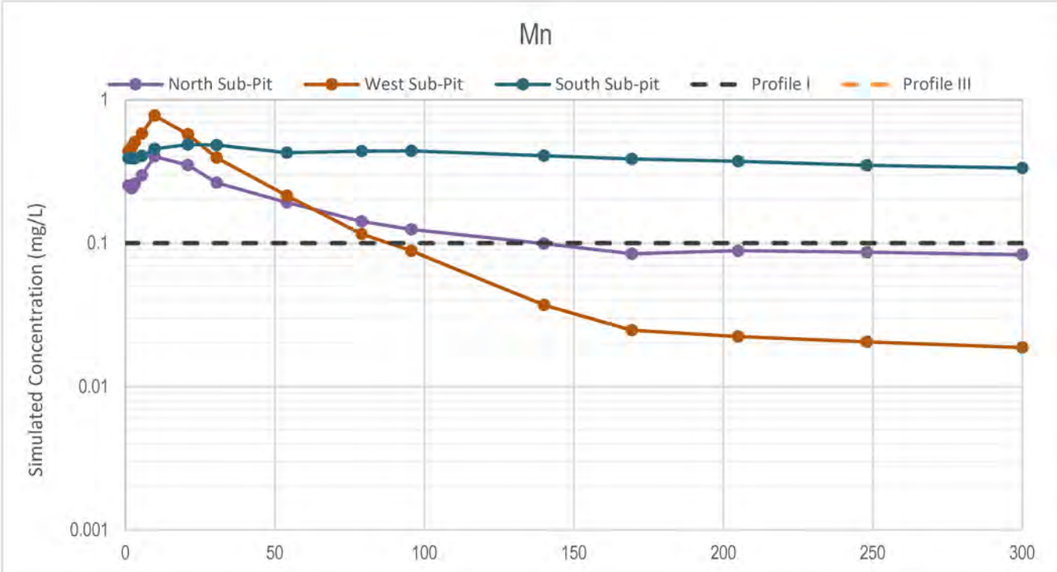


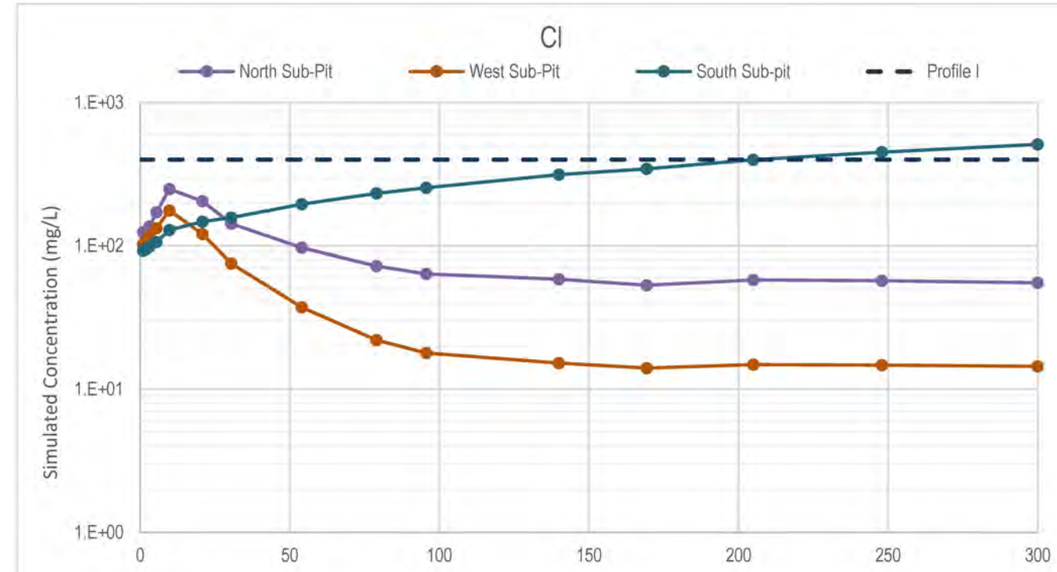
PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

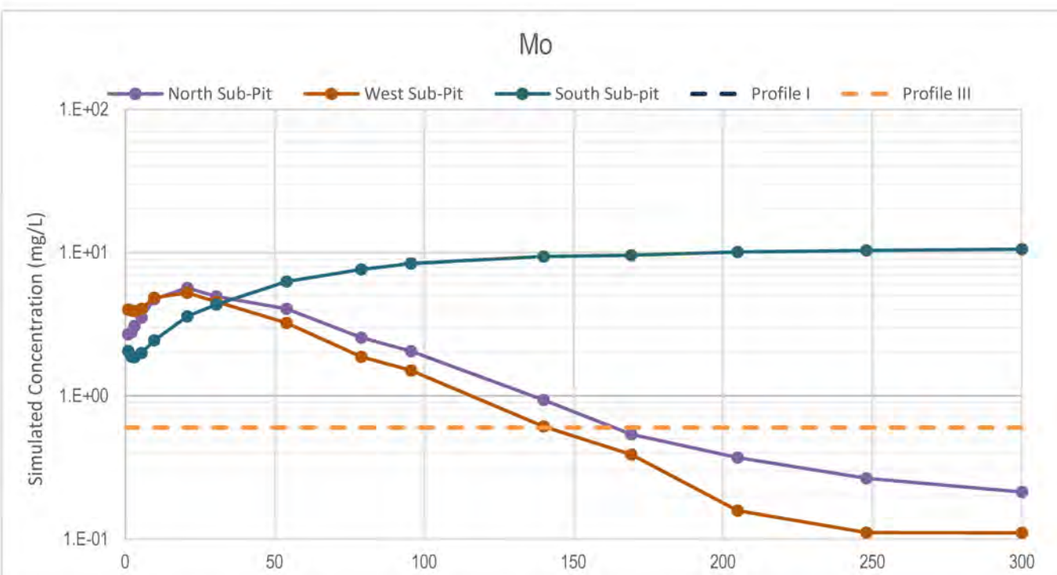
Open pit alternative: As, Sb, F, Fe plots through time

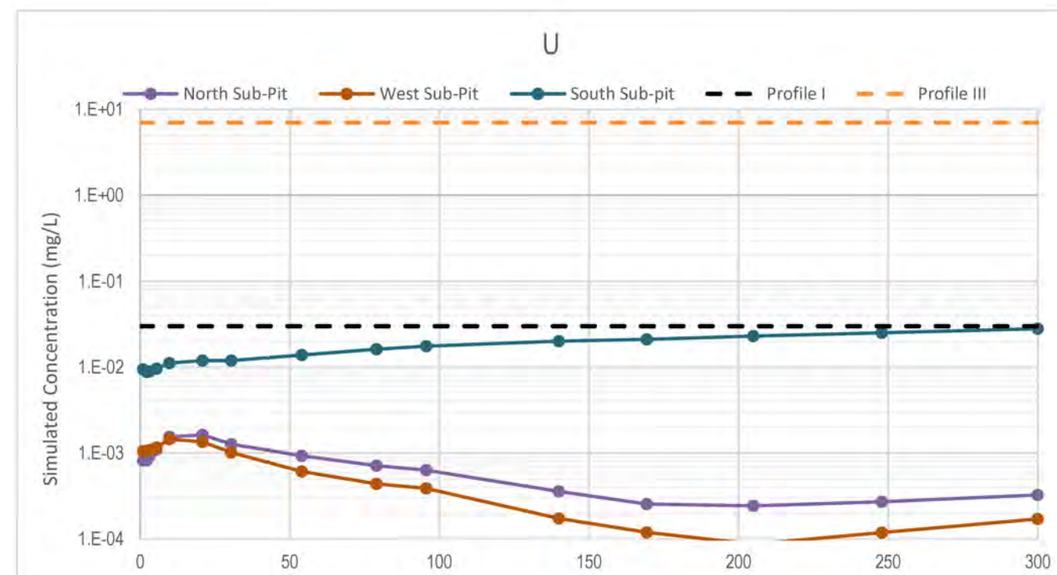
CLIENT:	Lithium Nevada Corporation	PROJECT:	Thacker Pass Project EIS		
JOB #:	3898	DRAWN:	TC	CHECKED:	TC
DATE:	May 2020	FIGURE:	5.13b		

H:\Project\3898\3898-2 Kings Valley EIS\600_Deliverables\530_Reports\Water Quantity & Quality Impacts\Excel\[Fig 5-13a-b Open Pit Chemistry Plots 20200513.xlsx]









Back

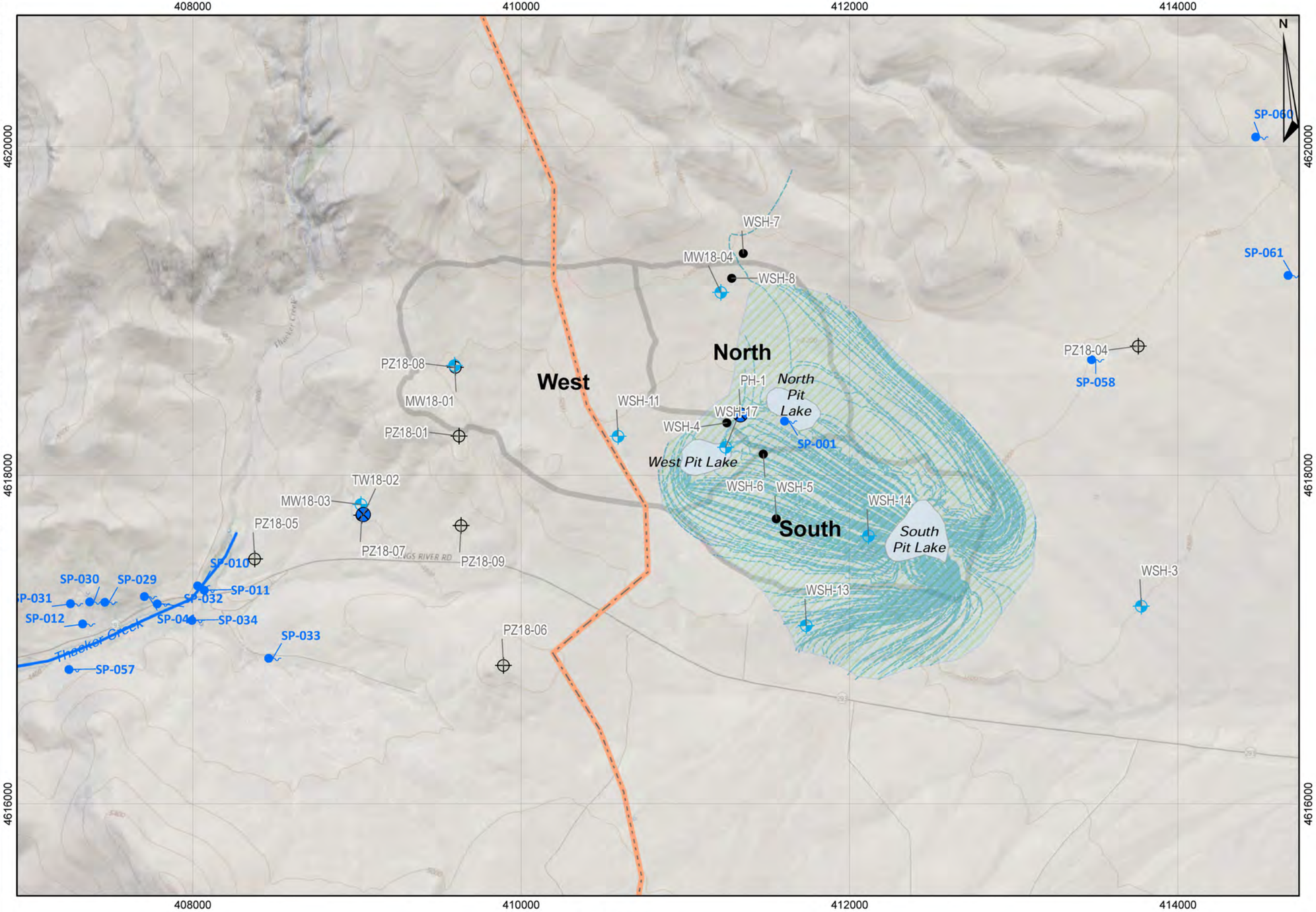
PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

Open pit alternative: Mn, Cl, Mo, U plots through time			
CLIENT:	Lithium Nevada Corporation	PROJECT:	Thacker Pass Project EIS
JOB #:	3898	DRAWN:	TC
DATE:	May 2020	FIGURE:	5.13c

CHECKED: TC

H:\Project\3898\3898-2 Kings Valley EIS\500_Deliverables\630_Reports\Water Quantity & Quality Impacts\Excel\[Fig 5.13a-c Open Pit Chemistry Plots 20200513.xlsx]

H:\Project\3898\GIS\Kings Valley EIS\Mxds\Modeling Report\Figure 5.18 Open Pit Pit Lake Capture Zone Map.mxd



1:24,000

0 0.2 0.4 0.8 1.2 1.6 Miles

PREPARED SOLELY FOR THE USE OF OUR CLIENT AND NO REPRESENTATION OF ANY KIND IS MADE TO OTHER PARTIES WITH WHICH PITEAU ASSOCIATES ENGINEERING LTD. HAS NOT ENTERED INTO A CONTRACT.

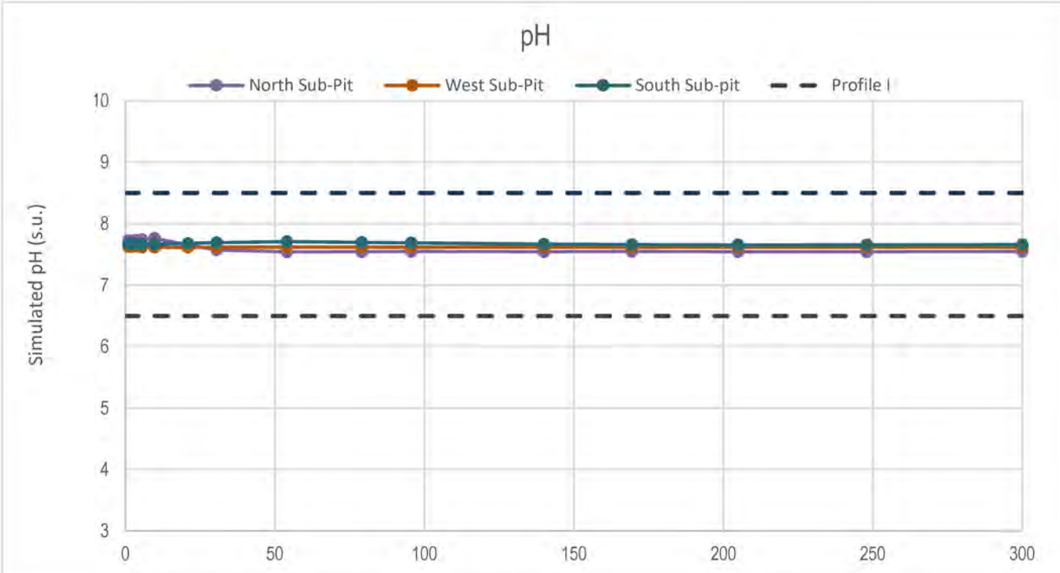
Wells

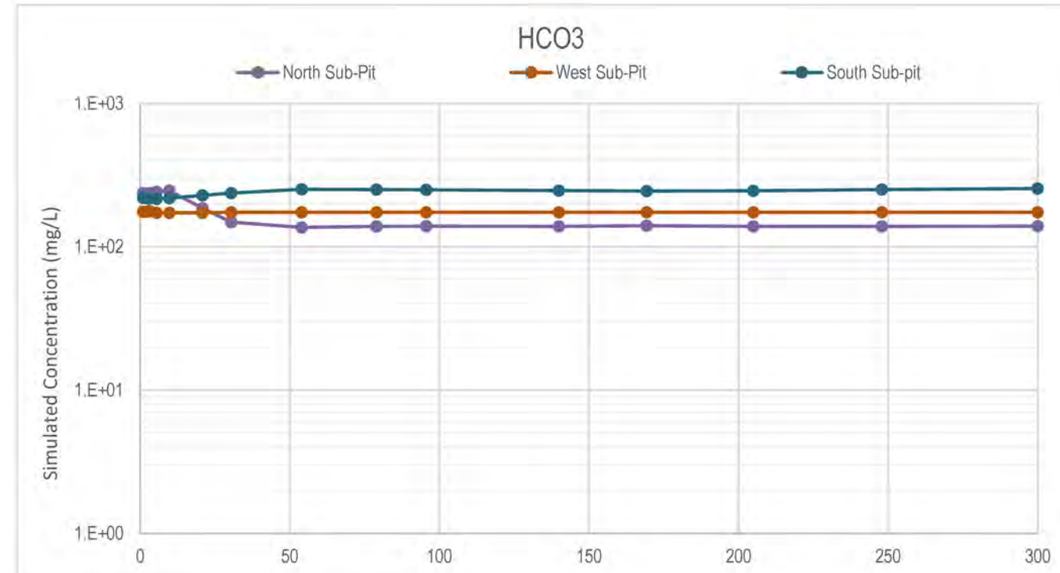
- Abandoned
- Monitoring well
- Piezometer
- Production well
- Test pumping well
- Springs
- Predicted pit lake area
- Simulated 300 year south pit capture zone
- South pit reverse particle traces
- Hydrographic basin boundary
- Sub-pits

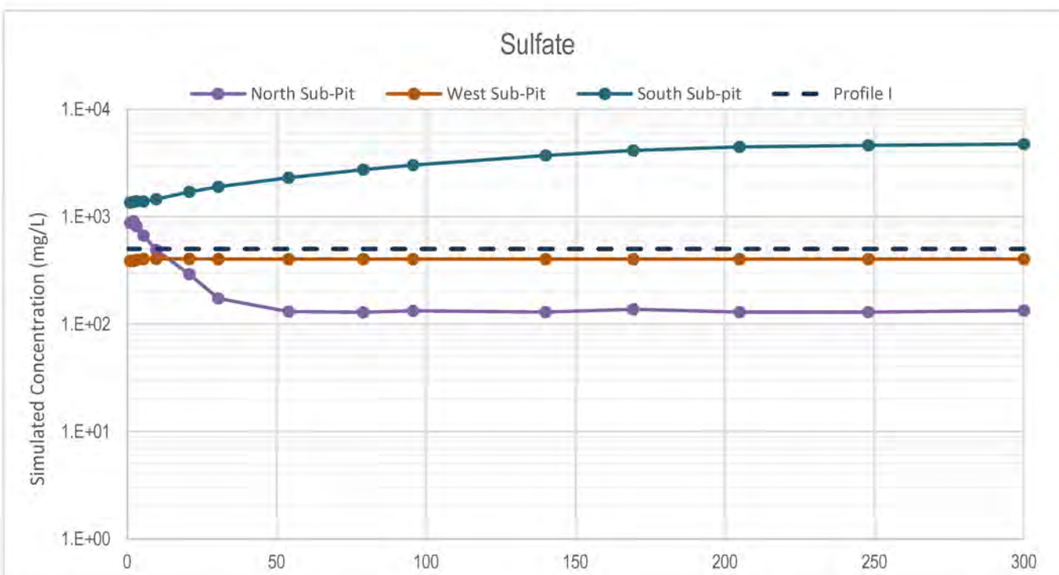
Open pit capture zone (all pits open)

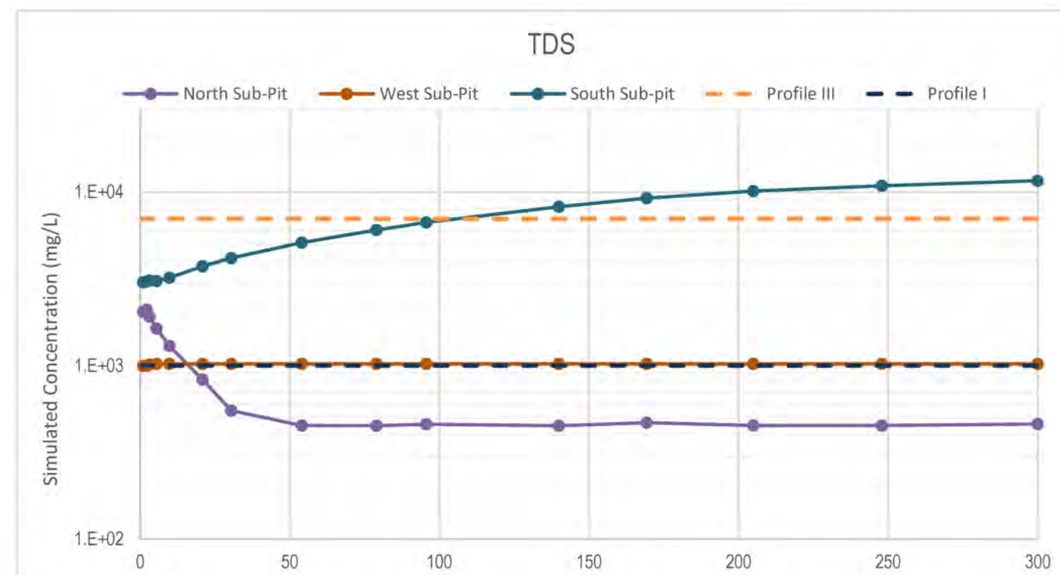
PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

CLIENT:	LNC
PROJECT:	Thacker Pass Project EIS
JOB:	3898
DRAWN:	BA
CHECKED:	TC
DATE:	May 2020
FIGURE:	5.14



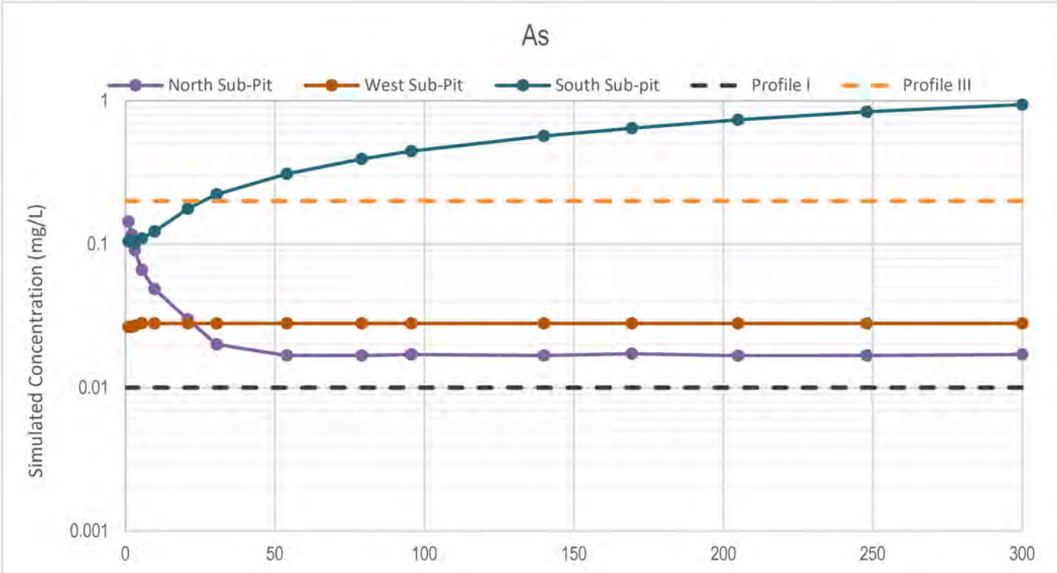


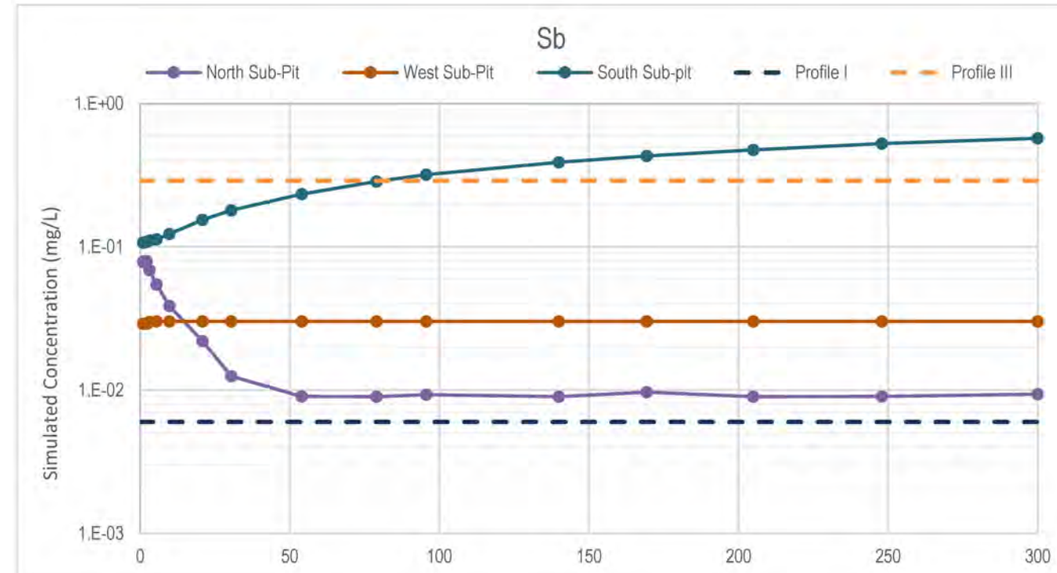


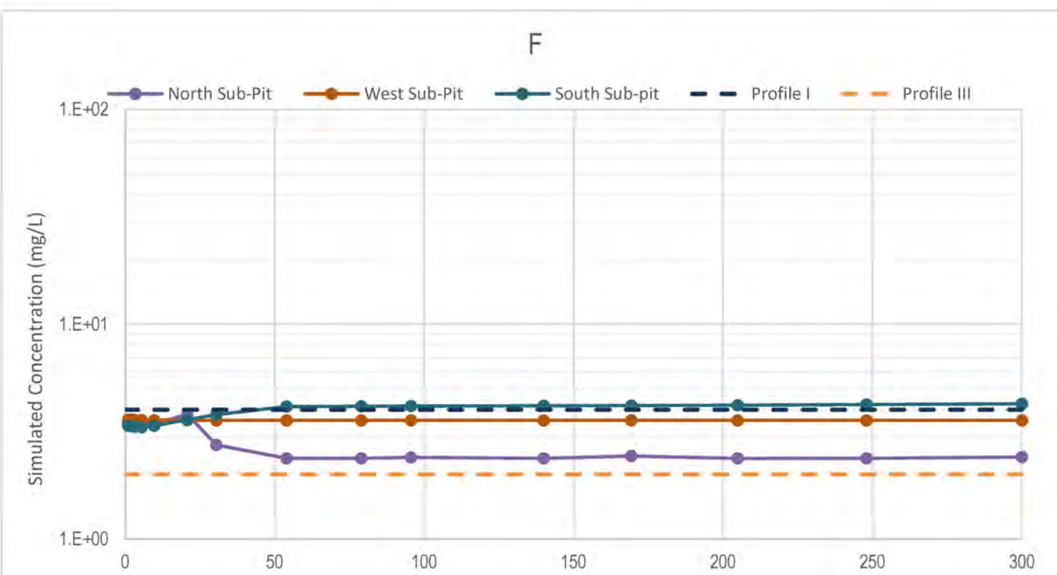


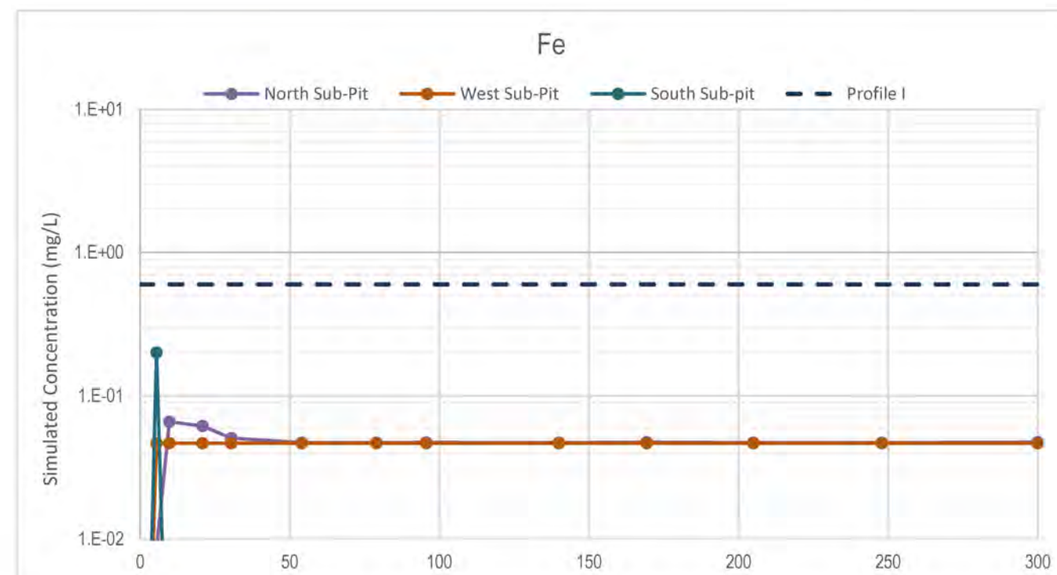
PITEAU ASSOCIATES GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS	Partially backfilled south sub-pit alternative: pH, HCO3, SO4 and TDS plots through time			
	CLIENT: Lithium Nevada Corporation	PROJECT:	Thacker Pass Project EIS	
	JOB #: 3898	DRAWN:	TC	CHECKED: TC
	DATE: May 2020	FIGURE:	5.15a	

H:\Project\3898\3898-2 Kings Valley EIS\500_Deliverables\530_Reports\Water Quantity & Quality Impacts\Excel\[Fig 5.15a-c Partial Pit Chemistry Plots 20200513.xls]





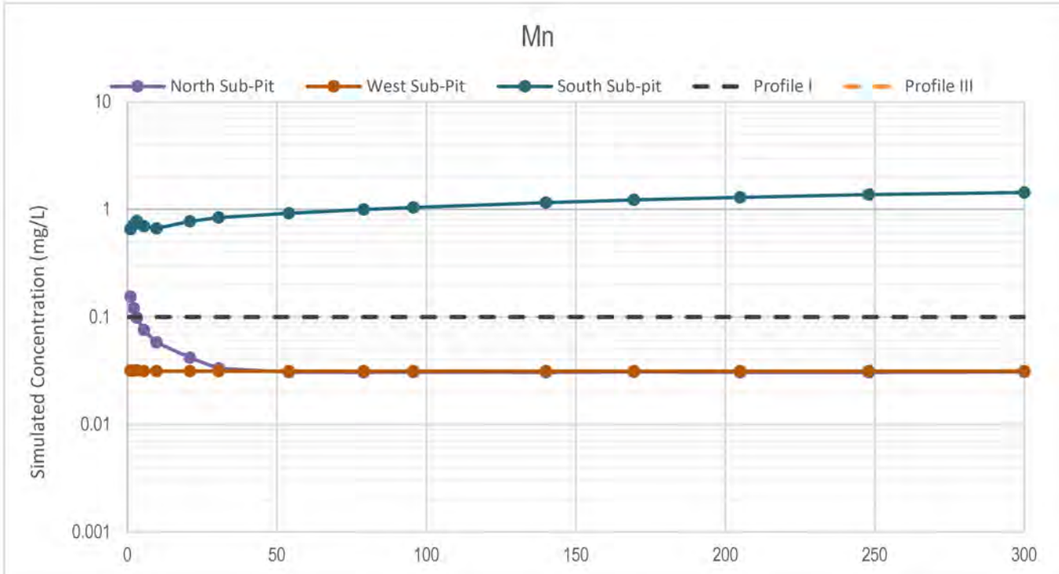


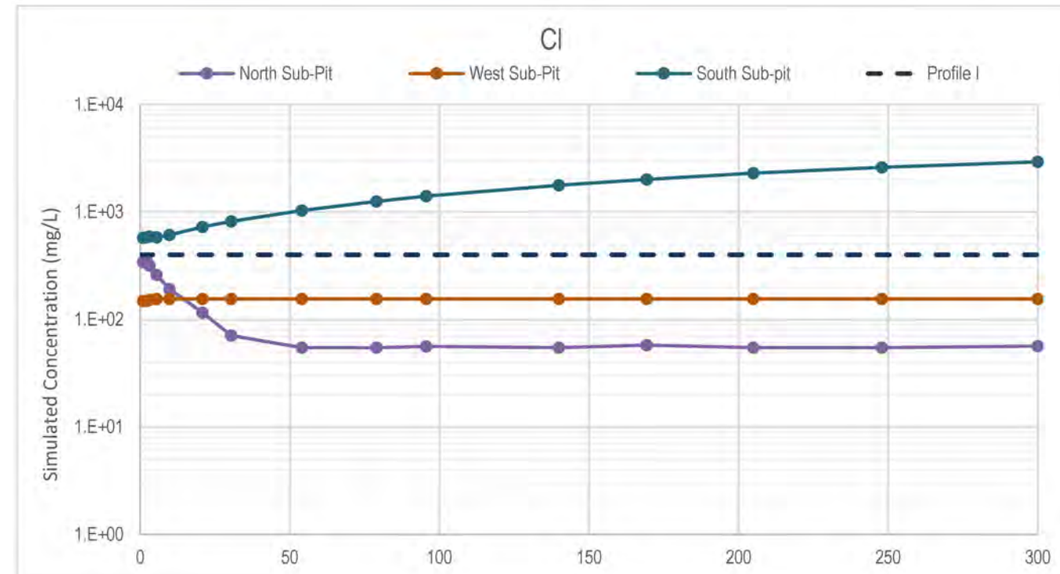


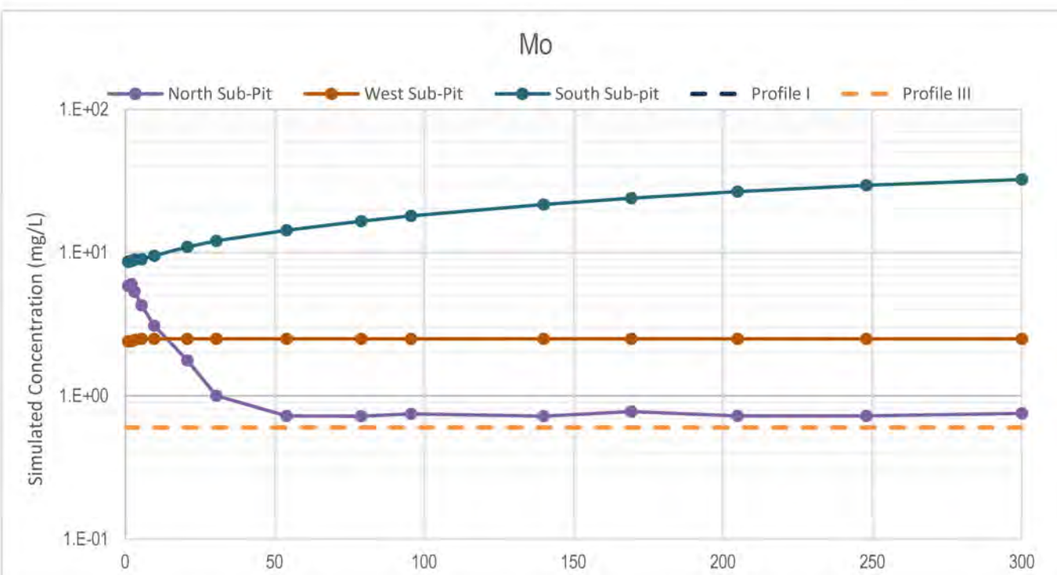
PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

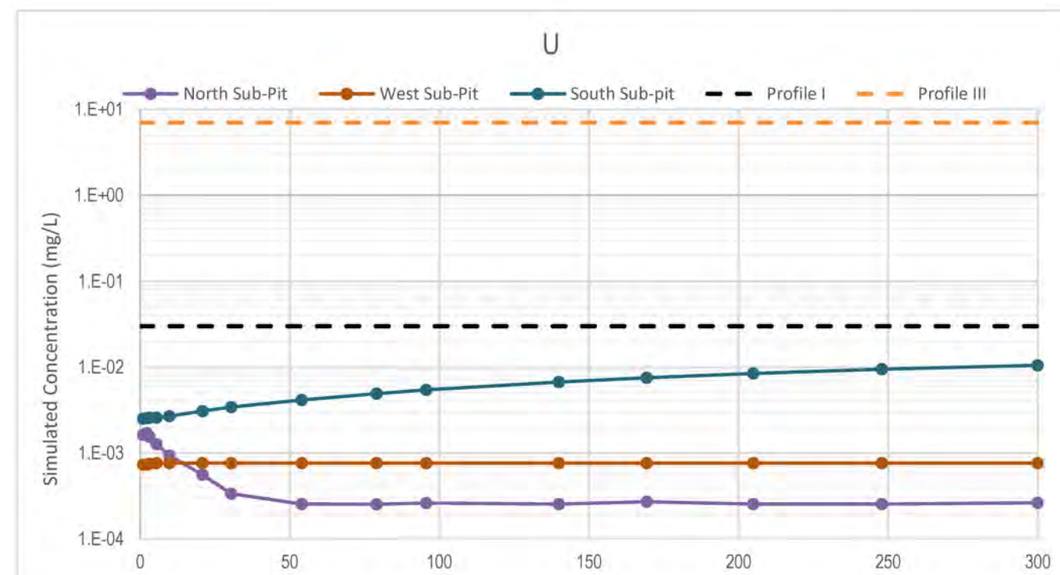
Partially backfilled south sub-pit alternative: As, Sb, F, Fe plots through time			
CLIENT:	Lithium Nevada Corporation	PROJECT:	Thacker Pass Project EIS
JOB #:	3898	DRAWN:	TC
DATE:	May 2020	FIGURE:	5.15b
		CHECKED:	TC

H:\Project\3898\3898-2 Kings Valley EIS\500_Deliverables\530_Reports\Water Quantity & Quality Impacts\Excel\[Fig 5.15a-c Partial Pit Chemistry Plots 20200513.xls]









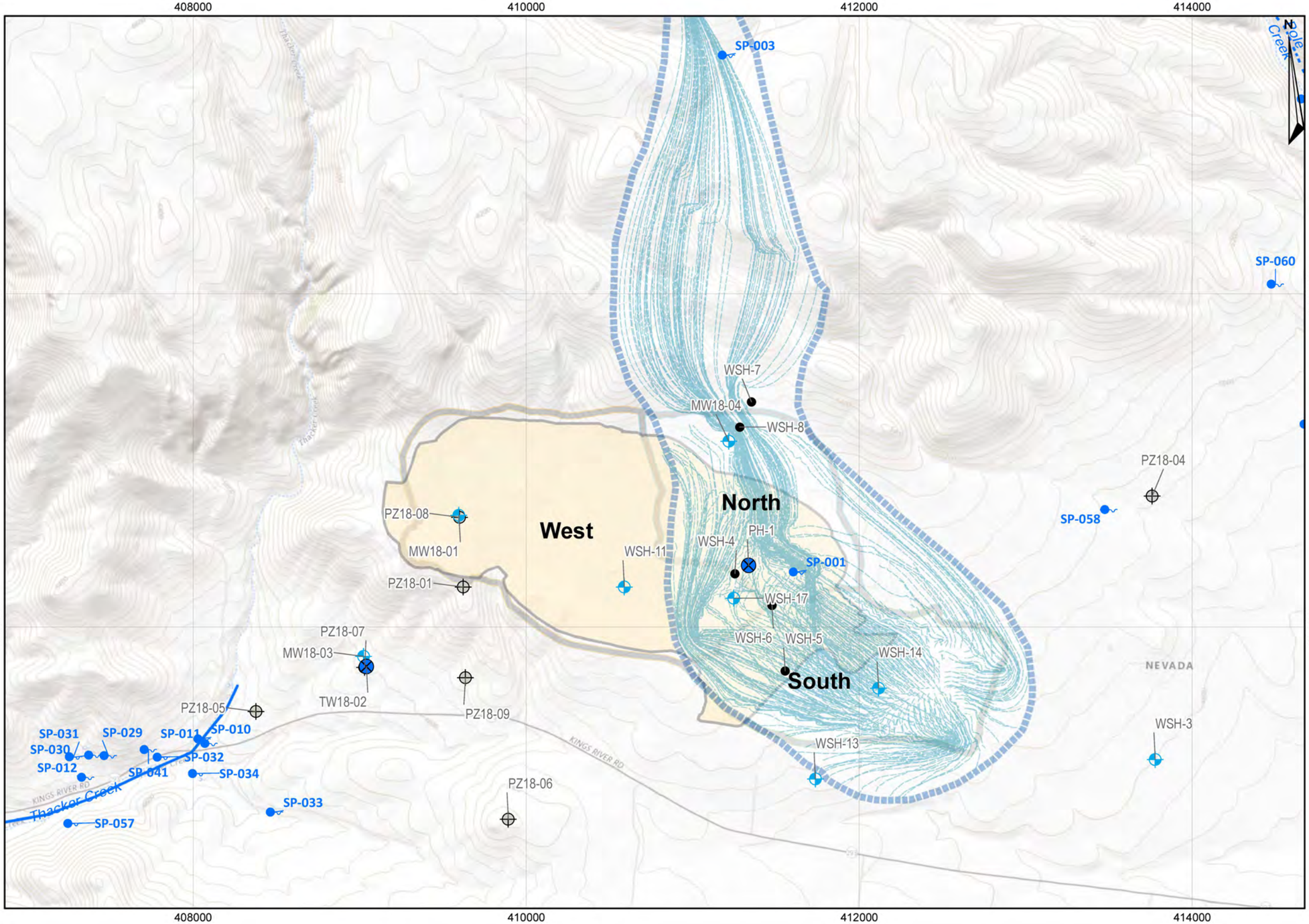
PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

Partially backfilled south sub-pit alternative: Mn, Cl, Mo, U plots through time			
CLIENT:	Lithium Nevada Corporation	PROJECT:	Thacker Pass Project EIS
JOB #:	3898	DRAWN:	TC
DATE:	May 2020	FIGURE:	5.15c

CHECKED: TC

H:\Project\3898\3898-2 Kings Valley EIS\500_Deliverables\530_Reports\Water Quantity & Quality Impacts\Excel\[Fig 5.15a-c Partial Pit Chemistry Plots 20200513.xlsx]

H:\Project\3898\GIS\Kings Valley EIS\Mxds\Modeling Report\Figure 5.20 Partial SPit Pit Lake Capture Zone Map.mxd



Wells

- Abandoned
- Monitoring well
- Piezometer
- Production well
- Test pumping well
- Springs
- South pit reverse particle traces
- Backfill, partially filled south pit capture zone
- 2065 backfill footprint with open south pit
- Simulated Partial Backfill Wetlands

1:24,000

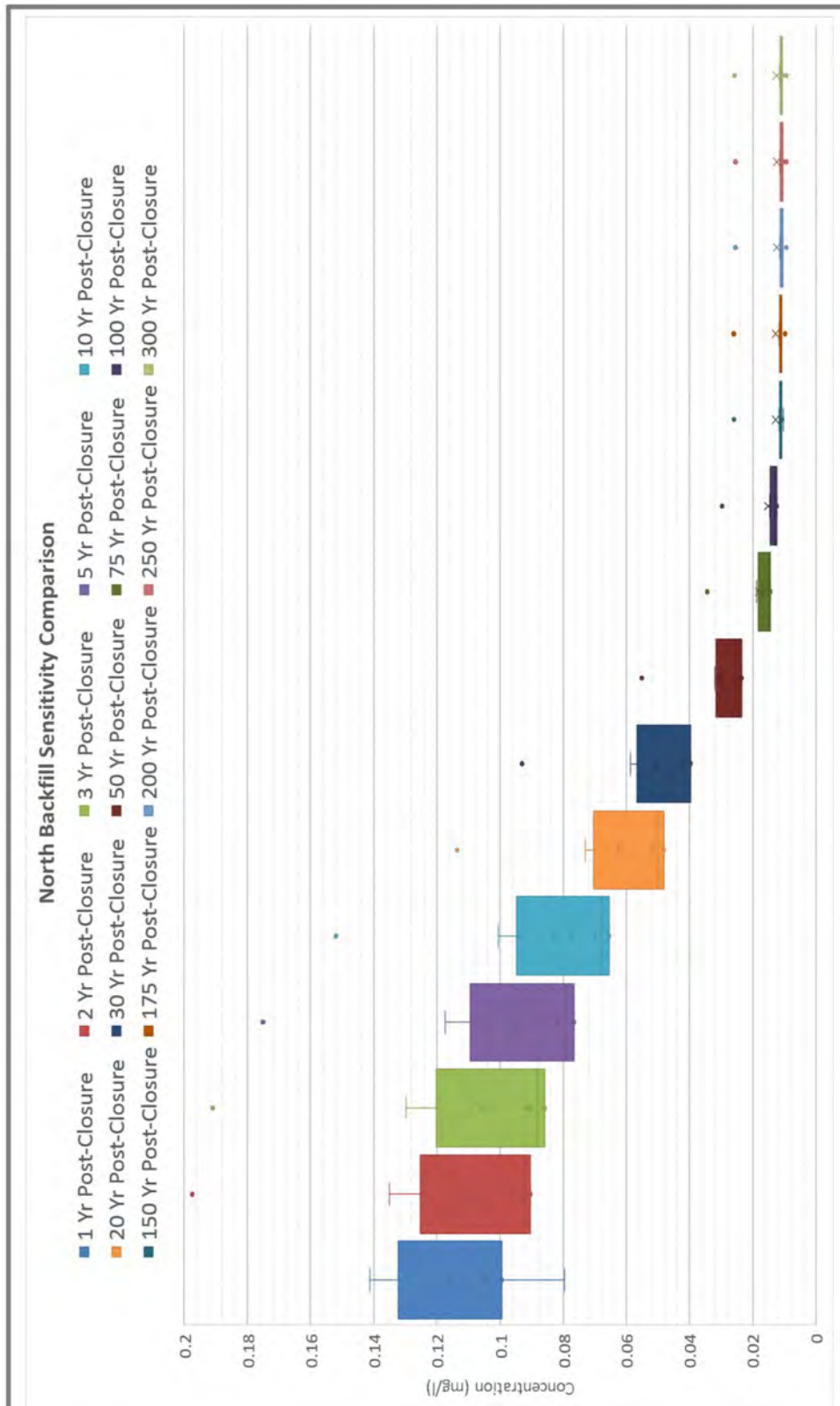
0 0.2 0.4 0.8 1.2 1.6 Miles

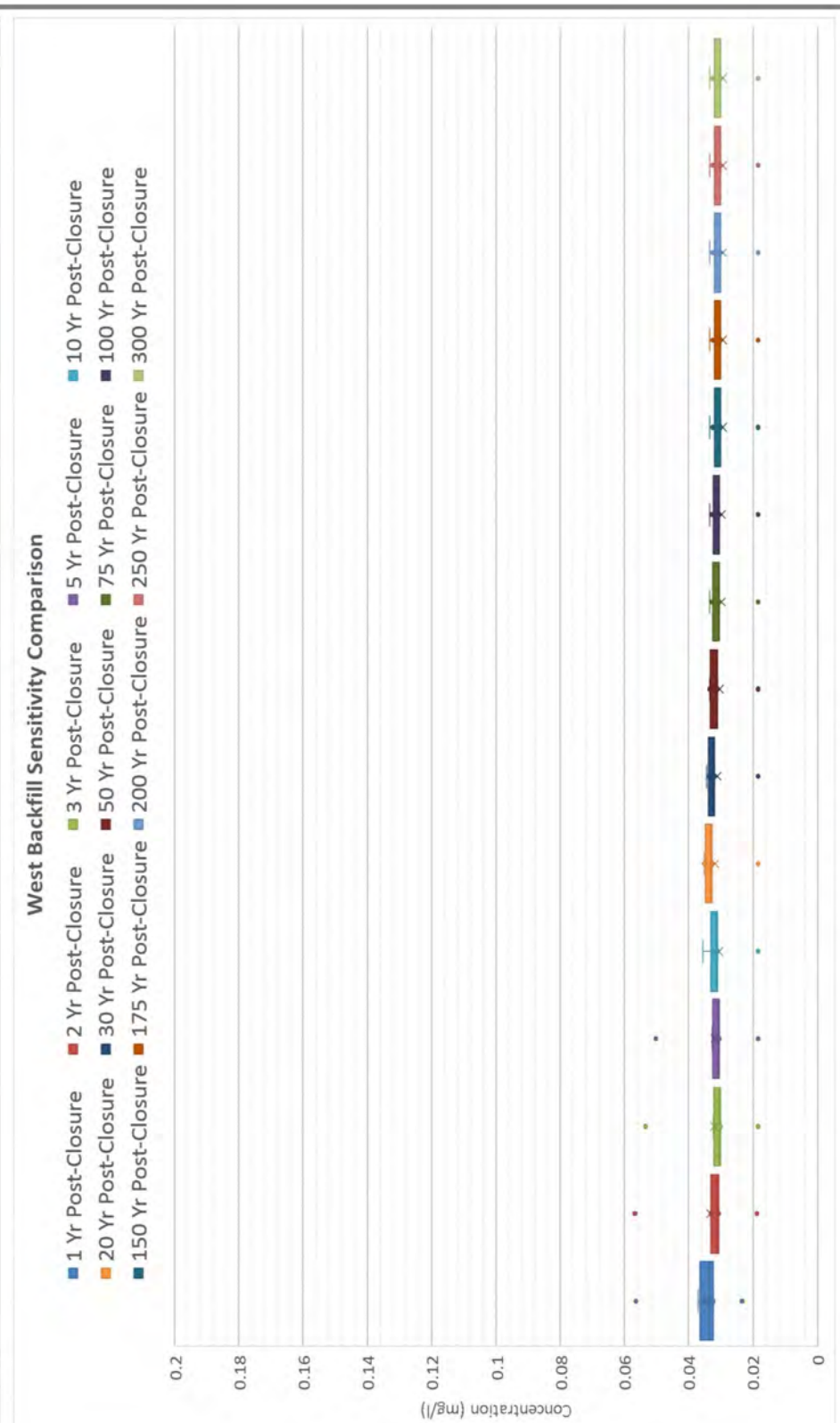
PREPARED SOLELY FOR THE USE OF OUR CLIENT AND NO REPRESENTATION OF ANY KIND IS MADE TO OTHER PARTIES WITH WHICH PITEAU ASSOCIATES ENGINEERING LTD. HAS NOT ENTERED INTO A CONTRACT.

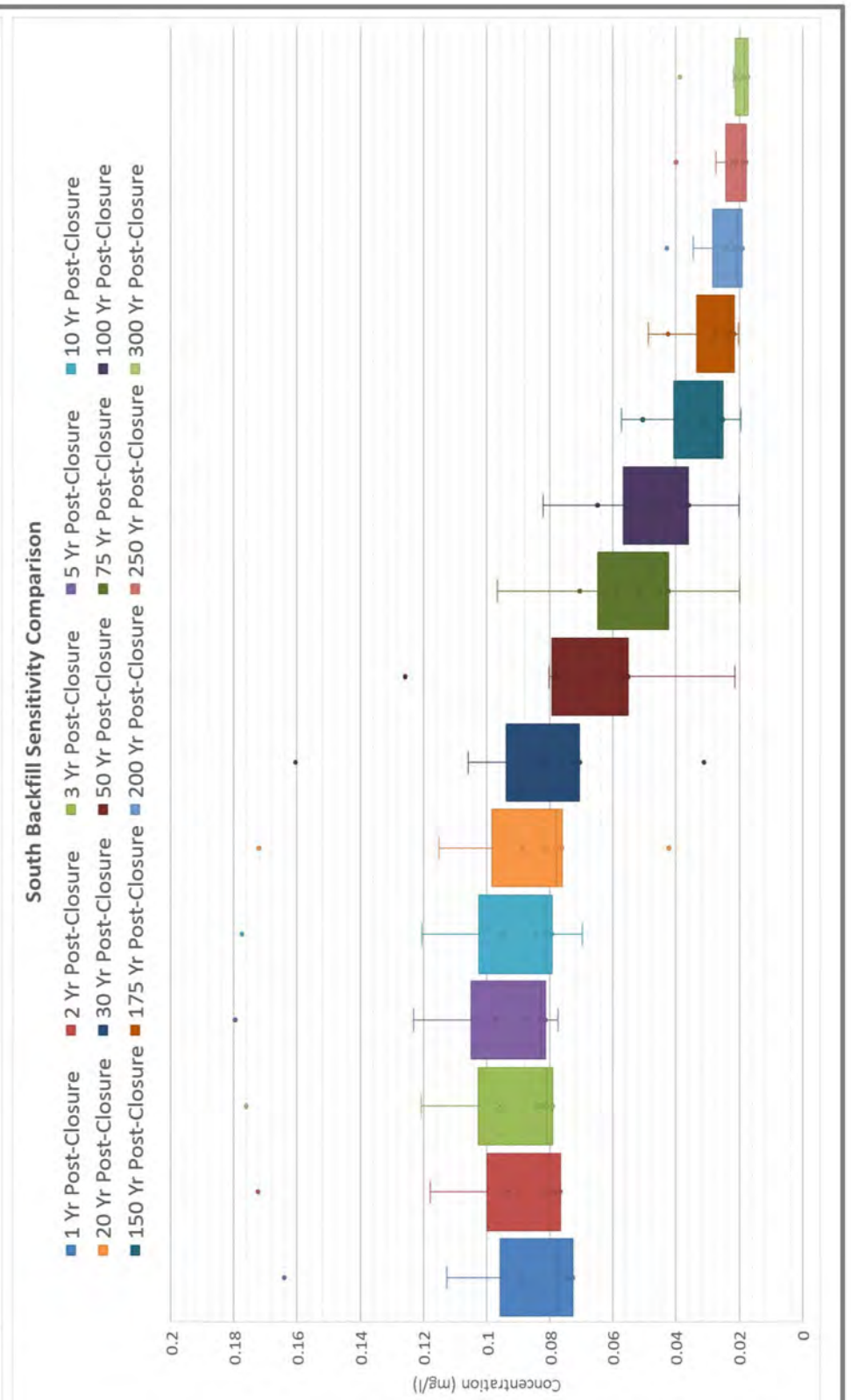
Partially backfilled south sub-pit capture zone

PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

CLIENT:	LNC
PROJECT:	Thacker Pass Project EIS
JOB:	3898
DRAWN: BA	CHECKED: TC
DATE:	May 2020
FIGURE:	5.16



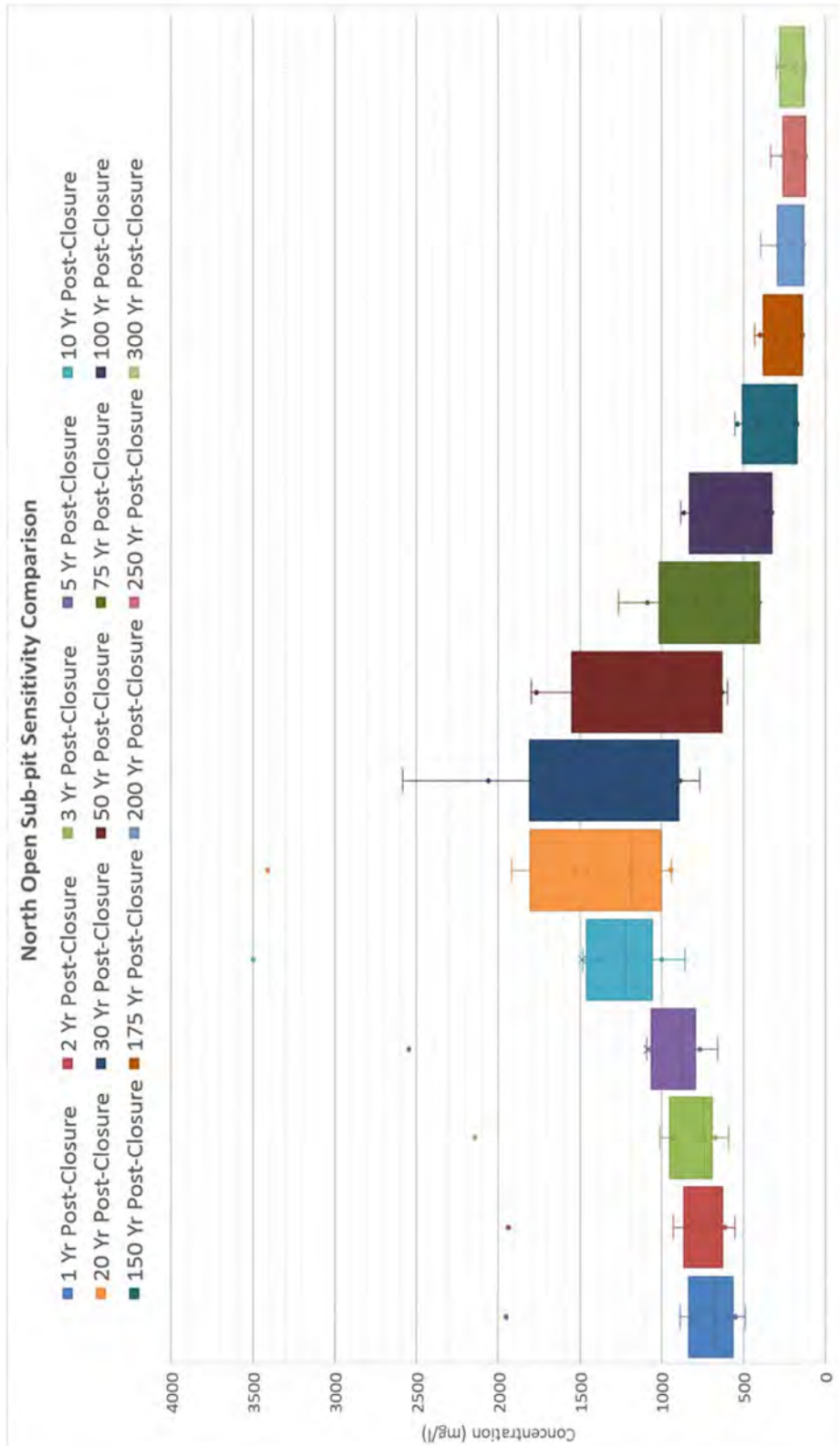


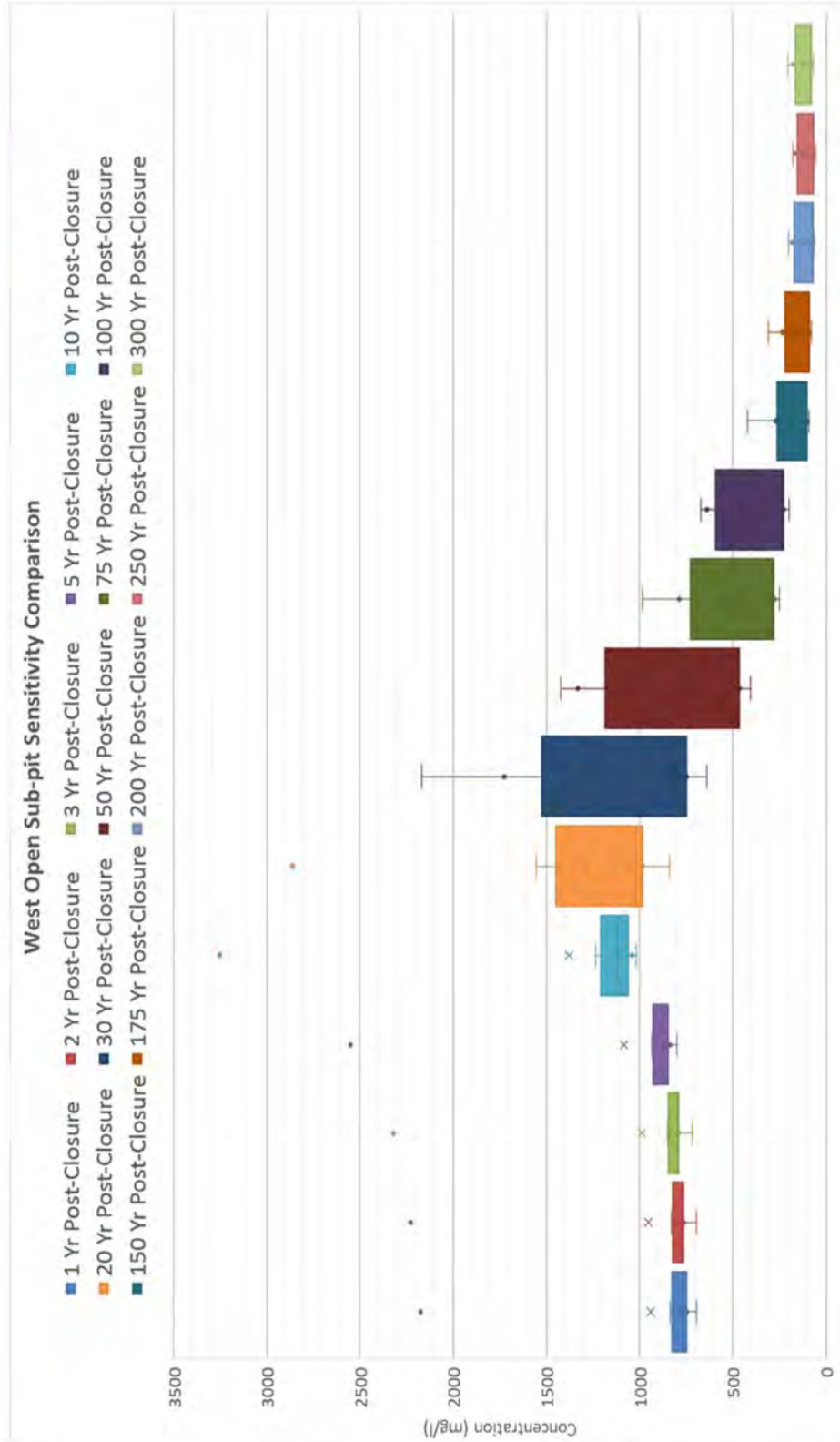


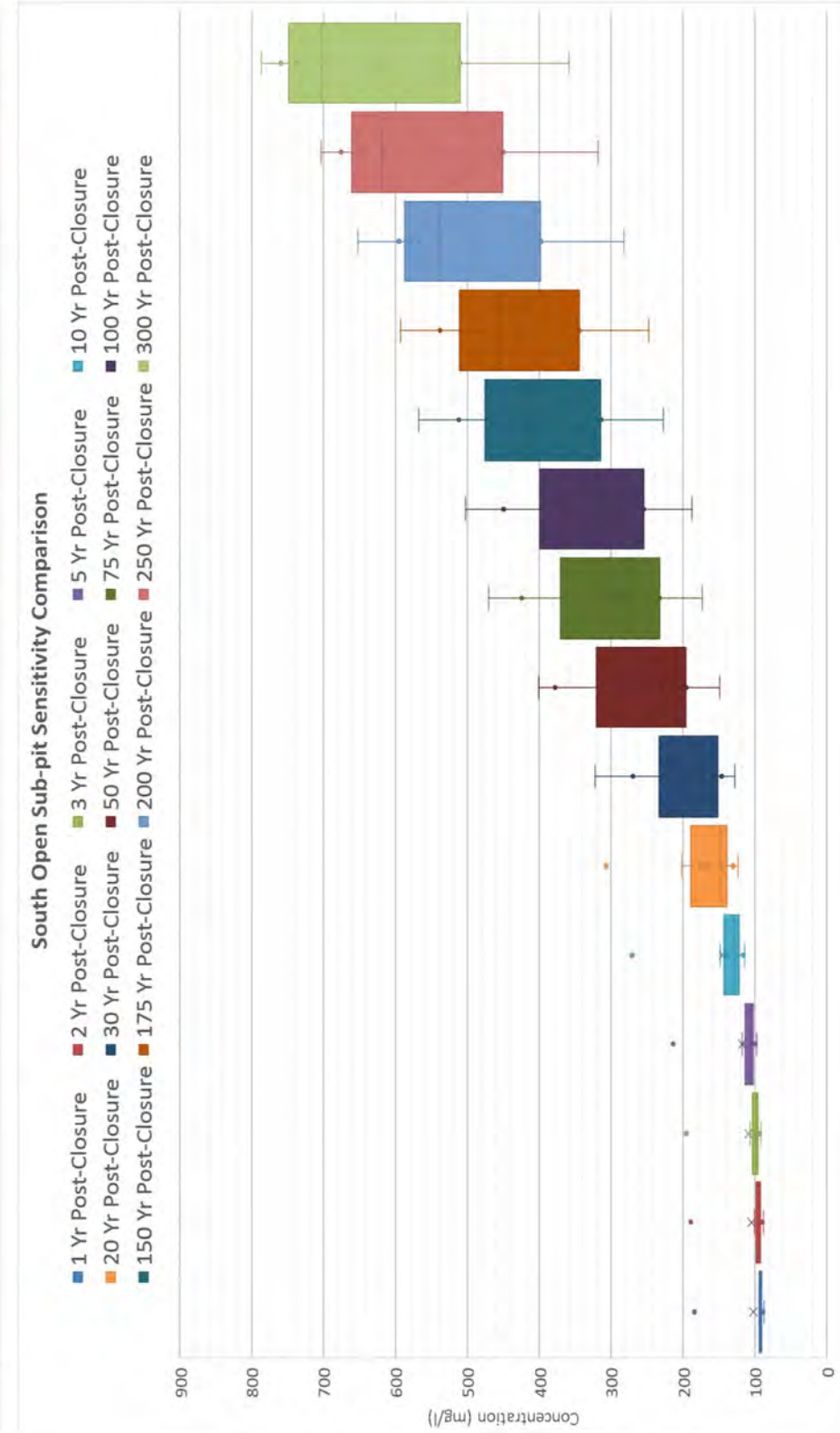
PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

Backfilled pit proposed action senstivity box diagram (Sb)			
CLIENT: LNC	PROJECT: Thacker Pass Project		
JOB 3898	DRAWN: TC	CHECKE TC	
DATE: May 2020	FIGURE: 5.17		

D:\Projects\Lithium Nevada\3898-2 Kings Valley EIS\400_WIP\440_Modeling\2019 Geochem\Backfill-3%\[Appendix - Backfill Sensitivity Analyses.xlsx]







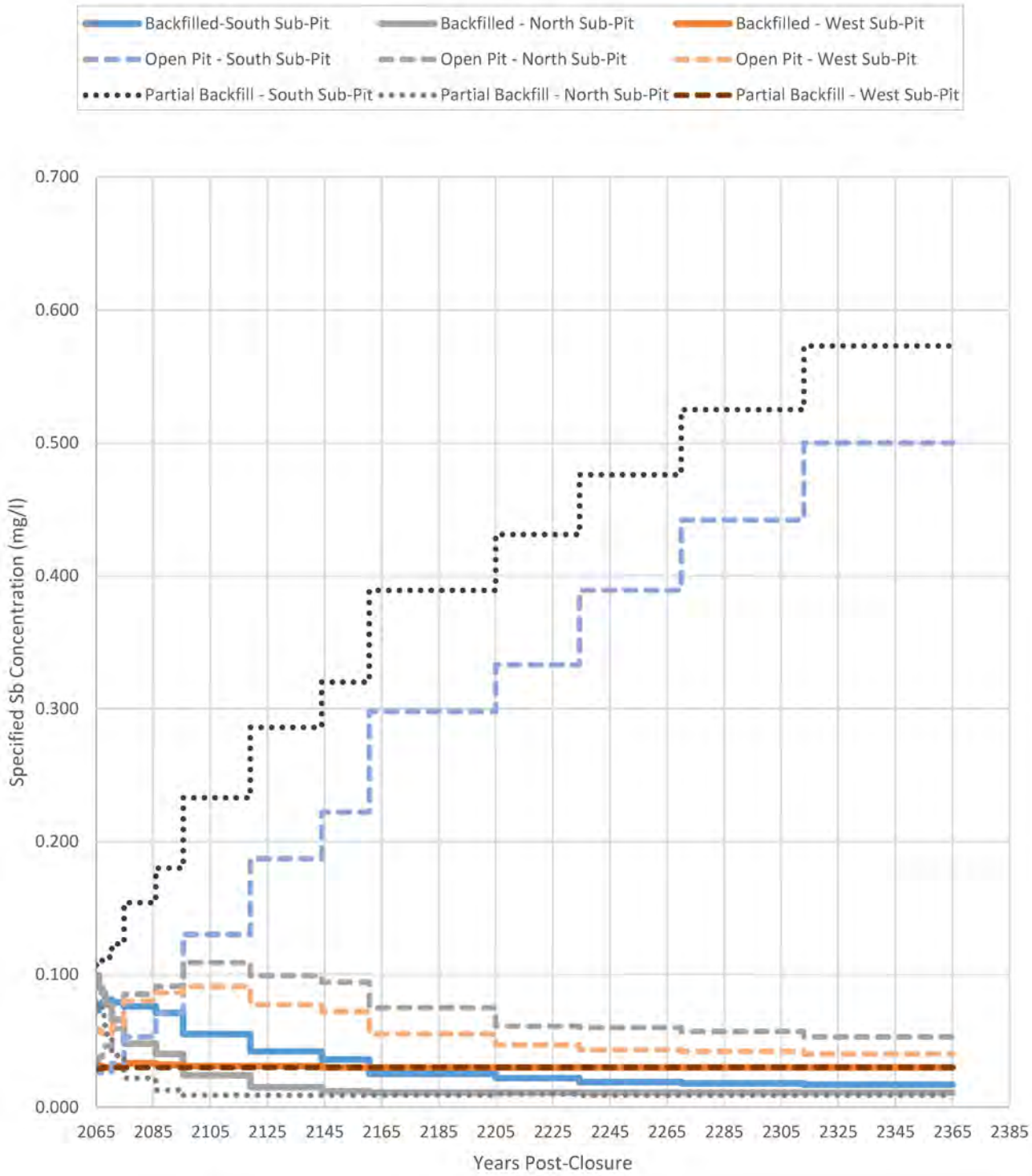
PITEAU ASSOCIATES
GEOTECHNICAL AND WATER MANAGEMENT CONSULTANTS

Open Pit Alternative Senstivity Box Diagram (SO_4)

LNC		Thacker Pass Project	
CLIENT: 3898	PROJECT: TC		CHECKE TC
DATE: May, 2020	DRAWN: 5.18		

FIGURE:

D:\Work\Templates\Excel\[Title Block templates2014.xlsx]



PITEAU ASSOCIATES	Specified Sb Concentration Through Time		
	CLIENT: LNC	PROJECT: Thacker Pass Project EIS	
	JOB #: 3898	DRAWN: LH	CHECKED: TC
	DATE: May 2020	FIGURE: 6.1	

H:\Project\3898\3898-2 Kings Valley EIS\500_Deliverables\530_Reports\Water Quantity & Quality Impacts\Excel\[Fig 6.1 Sb specified conc through time.xlsx]