LAW OFFICES OF

McCARTHY & McCARTHY, L.L.P.

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December 7, 2022

Hays Trinity Groundwater Conservation District
Attn: Charlie Flatten, General Manager *via E-mail & U.S. Mail*
P.O. Box 1648
Austin, Texas 78620

Re: Clancy Utility Holdings, LLC – Supplemental Filing in Support of Application for a Municipal Groundwater Production Permit – Well Interference Analysis

Dear Charlie:

Introduction: As you will recall, by letter dated October 14, 2021, I filed supplemental documentation in support of the above referenced application. Included in that filing was a document identified as Addendum "1-A," which was the Report documenting the "Well Interference Study" prepared in conformance with the Rules of the Hays Trinity Groundwater Conservation District (Rule 11.8.3). That report was prepared by Clancy's consulting hydrogeologist, Rusty Tarver, P.G., of Tarver Geologic Services, LLC. This letter transmits a supplement to that Report in support of the Application described below (Appendix "A"). The supplement is a memorandum by Mr. Tarver entitled: "Reduced Production vs Well Interference – Mirasol Springs Project."

Background: Consistent with the requirements of the Hays Trinity Groundwater Conservation District and Southwest Travis County Groundwater Conservation District, in support of Clancy Utility Holdings LLC's (the "Applicant") separate permit applications to produce groundwater from a cumulative total of five proposed public water supply wells completed (or to be completed) in the Middle Trinity Aquifer on the 1400-acre Mirasol property, hydrogeologic analysis and modeling was conducted for various purposes. One of those purposes was to evaluate the potential for total well interference drawdown of production from the Clancy Wells on neighboring groundwater wells (both existing and hypothetical) within a 2,044-foot radius of the Mirasol Springs development property line as per HTGCD Rule 11.8.3.C.

The Initial Well Interference Study performed was reported as part of both the HTGCD Application and SWTCGCD Application as "Addendum 1-A." That study was completed in September 2021.

Pursuant to the groundwater district requirements, the Well Interference Study reported the predicted total interference drawdown based upon two fixed sets of assumptions:

a) Pumping 100% of the groundwater production permit request for 30 years, and
b) Pumping 100% of the groundwater production permit request for 10 years.

The Applicant requested that further well interference predictions be derived based upon the Applicant's plan to base-load Clancy Utility's water supply inventory using the 108 acre-foot surface water supply contracted from the existing LCRA Highland Lakes permits from the State of Texas. Tarver Geologic Services performed the additional well interference analysis for the same 10-year and 30-year time increments using reduced annualized volumes of produced groundwater at 70%, 50%, 25% and 10% of the requested permit volume. These groundwater production volumes are utilized to reflect Applicant's conjunctive use of LCRA surface water to ensure Clancy's ability to meet its statutory duties as a retail water utility.

Mirasol Springs and Clancy Utility's Water Conservation Measures: In addition to the modeled Well Interference Drawdown Impact results presented in Addendum 1-A to Clancy's Application for a groundwater production permit previously filed with the District, which modeling was conducted using the assumptions a) and b) required as part of the groundwater district's criteria, and (ii) the modeled Impacts using the variations on those district mandated assumptions which Clancy requested Mr. Tarver run and reported in Appendix "A" to this letter, there are other factors, including Clancy and the Mirasol Developer's aggressive conservation initiatives, that will affect the actual total interference drawdown (or impact) on neighboring wells caused by any real-world pumping of the five Clancy PWS Wells.

These, these other factors, and conservation initiatives, include the following:

i) The actual volumes of groundwater pumped in any given year from the Clancy Wells; and
ii) The actual amount of groundwater pumped from neighboring wells located outside of the Mirasol property, including existing wells and the hypothetical wells included in the modeling if/when they get drilled for possible future development within the 2,044-foot buffer zone; and
iii) The effects of Clancy's change of planned uses and sources of potable water:
    a) Prohibiting the drilling or operation of any individual private water wells within the Mirasol Development, including on private residential lots.
    b) Prohibiting the use of potable water from the Clancy system to be used for lawn and landscape irrigation:
    c) Mandating rainwater collection systems be installed and utilized for all occupied improvements;
    d) Connection of all improvements to a centralized wastewater collection system, having the dual benefit of (1) eliminating use of onsite sewage facility systems (*i.e.*, septic tanks), and (2) increasing the volume of highly treated Type-1 effluent available for nonpotable beneficial reuse;
    e) Requiring native and drought tolerant plants will be utilized in landscaping;
iv) Developer has announced the elimination of 17 residential units from the development plan. The result of which is a reduction in total water demand to be served by Clancy at Mirasol Springs.

Requested Permit Volumes: At the time of the original analysis reflected in Appendix 1-A, Clancy was requesting permits from HTGCD and SWTCGCD for authorization to produce a combined maximum annual volume of 90.76 acre-feet per year from the five wells (56.7 ac-ft from HTGCD and 34.06 ac-ft from SWTCGCD), or an average maximum daily production of 81,025 gallons per day. Since that analysis was completed and reported to the two groundwater districts, the Developer has modified its plans for the development of the Mirasol property, including the addition of more conservation initiative, which has reduced the total volume of groundwater sought to be permitted by Clancy to an average maximum daily production of 75,883 gpd or approximately 85 ac-ft/yr.

Conclusion: Please let me know if you, or Mr. Boghici, have any questions regarding the enclosed materials. Please also feel free to reach out directly to Rusty Tarver to discuss the information reflected in the attached Appendix. By copy of this letter, and the enclosed Appendix, are logged into the District's records as being a supplemental filing in support of the Application.

Thank you for your assistance with this matter.

Sincerely,

Edmond R. McCarthy, Jr.,
Attorney for Clancy Utility Holdings, LLC

ERM/tn
Encl.

cc: Radu Boghici, P.G., HTGCD

Rusty Tarver, P.G.

Clancy Utility Holdings, LLC
Attn: Jim Truitt, Executive Vice President

APPENDIX "A"

REDUCED VOLUME MEMORANDUM

TARVER GEOLOGIC SERVICES

4-November-2021, Revised 5-December-2022

Memo

To: Mr. Ed McCarthy

From: Rusty Tarver, P.G.

cc: File

Date: 4-November-2021, Revised 20-November-2022

Re: Reduced Production vs Well Interference – Mirasol Springs Project

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Note: The revisions to this document changed the name of "Roy Creek Spring" to "Crossing Spring" to avoid any confusion identifying other surface and discharge features that include "Roy Creek" in the name. Any reference to "Roy Creek Spring" in previous documents, figures or drawings are equal to and should be identified as "Crossing Spring. (R. Tarver, P.G., November 20, 2021)

This memorandum provides a survey of my analyses of the four alternative pumping scenarios based upon the Well Interference Report which documented modeled results assuming continuous 100% pumping capacity over the 10-year and 30-year time frames. The alternative pumping volume scenarios were modeled to approximate more likely pumping demand scenarios for groundwater usage within the Mirasol Springs subdivision based upon the commitment to utilize the 108 acre-foot of existing surface water rights contracted from LCRA to provide the base load demand for potable water within the planned development.

The results of the well interference maps under reduced groundwater production conditions for Mirasol Springs are attached as Appendix "A." Other than the reduced production percentage of volume for each of the four specified scenarios, the survey model inputs and assumptions in the original Well Interference Report were used to generate the results summarized in this memorandum. A brief discussion regarding the Hays & Travis County MAG and estimated Mirasol Springs recharge are included below. That is followed by a brief explanation and conclusions relating to the modeled pumping scenarios.

Modeled available groundwater (MAG) is *the amount of water that the Texas Water Development Board (TWDB) Executive Administrator determines may be produced on an average annual basis to achieve a desired future condition*. Restated, the MAG is the amount of groundwater production, on an average annual basis, that will achieve the desired future condition (DFC) for the aquifer. In the case of the HTGCD the DFC is no more than 19-feet of average aquifer drawdown by 2060.

To put the resulting modeled predictions in context with the TWDB calculated GMA 9 modeled available groundwater (MAG) for Hays and Travis Counties refer to the table below. The Hays County portion of the Trinity Aquifer MAG is subdivided into the Colorado River Basin portion of the aquifer as shown. The Guadalupe River Basin portion of the MAG estimate is not included here as it does not apply the groundwater hydrology at Mirasol Springs.

Modeled Available Groundwater GAM Run 16-23 February 28, 2017							
County	River Basin	Acre-Feet of MAG by Year					
		2010	**2020**	**2030**	**2040**	**2050**	**2060**
Hays	Colorado	4,721	4,710	4,707	4,706	4,706	4,706
Travis	Colorado	8,920	8,672	8,655	8,643	8,627	8,598

From: Jones,2017, GAM Run 16-023 MAG: Modeled Available Groundwater for the Aquifers in Groundwater Management Area 9, TWDB

Estimated Recharge: The recharge rate cited by the TWDB (Jones, 2004) for the Trinity Aquifer in the HTGCD is 32,900 ac-ft/yr. The TWDB also cites a rechange rate of 4.7 percent of the average annual rainfall. Applying this a step further we can estimate that the recharge at Mirasol Springs is approximately 165 ac-ft/yr (for approximately 1,400 acres).

REDUCED ANNUAL PUMPING VOLUME ESTIMATES

As discussed with you and Jim Truitt previously, Tarver Geologic Service, LLC produced additional well interference estimates for reductions in annual groundwater production volumes at the Mirasol development. Reductions of annualized pumping volumes were determined for 70%, 50%, 25% and 10% of the total estimated annual groundwater demand as calculated by Murfee Engineering, Inc.

The table below provides a summary of these annualized volume reductions in various units.

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Mirasol Annual Groundwater Production as Percentage of Maximum Demand Estimate					
Percent of Max Demand	**100%**	**70%**	**50%**	**25%**	**10%**
Acre-Feet/Year	89.6	62.7	44.8	22.4	9.0
Gallons per Year	29,200,000	20,440,000	14,600,000	7,300,000	2,920,000
Gallons per Day	80,000	56,000.0	40,000.0	20,000.0	8,000
Gallons per Minute	56	39	28	14	6

To be clear, the total volume reductions resulting from the Theis calculations for distance drawdown assume *continuous pumping for the 10-year and 30-year periods at reduced pumping rates,* not by reducing the period of time at a single pumping rate.

But for the modifications discussed above, the methodology for these well interference predictions are the same as the previous *Addendum 1-A, Well Interference Estimates* dated August 25, 2021. A partial list of the methods and assumptions are as follows:

Method & Assumptions

Off-Site Pumping By Others

1. The total annual pumping volume by others is estimated to be 72,124 gpd (50 gpm or 81 ac-ft/yr).
2. Off-site pumping by others is continuous for the periods indicated.

3. The off-site pumping by others was estimated by utilizing a 2,044-foot buffer around the approximate Mirasol property boundary. Within that boundary any existing tracts not within a assumed existing subdivision was split into multiple lots with a minimum 6-acre lot size.
4. Each individual off-site lot is assigned a pumping volume of 250 gpd as per HTGCD requirements. The exception to this is the Bentree RV park & the Travis County parklands within the buffer.
5. The Bentree RV park pumping volume was estimated using the Bentree demand calculations stated in the Bentree RV Park Groundwater Availability Report (25 ac-ft/yr).

Mirasol Pumping Volumes

1. Total drawdown (DD) estimates at reduced rates include only reductions in the Mirasol annual pumping volume over the stated 10-year and 30-year pumping periods, as indicated.
2. Pumping by others is assumed at the estimated off-site total pumping volume of 72,124 gpd.
3. The drawdown estimates assume that the aggregate production at Mirasol Springs is equally divided between the five (5) proposed Mirasol PWS Wells. Restated, the pumping rate and the pumping volumes at the on-site Mirasol PWS wells is the same (approx. 11 gpm for each well).

All drawdown estimates are calculated based upon the following assumptions: (i) ***no recharge***, (ii) continuous pumping, (iii) aquifer is homogenous and infinite included in assumptions (using the Theis formulation). Actual on-site geologic and hydrogeologic characteristics likely differ from the assumed characteristics due to the karst nature of the Middle Trinity Aquifer from which Mirasol pumping will occur.

Conclusions

- Drawdown estimates at reduced pumping volumes are formulated under "***worst case conditions***" that include the assumptions listed in this memo and the Addendum 1A – Well Interference Report, and the Mirasol Springs Groundwater Availability Report.
- Note that the largest total drawdown through time occurs in the northeastern portion of the study area within the 2,044-foot radius zone. One of the large contributing factors to this drawdown is the additional well interference by the offsite third-party Bentree RV Resort. The Bentree pumping volume is based upon the total demand estimate of 22,371 gpd (15.5 gpm). This production rate is taken from the Bentree groundwater availability report. Reduced Bentree pumping volumes would directly contribute to reduced localized total interference drawdown within the study area.
- With all Mirasol Wells pumping an at aggregate production of 80,000 gpd, the Mirasol PWS Wells would each pump 16,013 gpd (11.1 gpm). Note that (i) private *domestic* wells in the SWTCGCD are **exempt** if they produce under 10,000 gpd, and (ii) there will be no private domestic wells on the residential lots within Mirasol Springs.

- The Mirasol project public water supply wellfield is designed with a minimum well spacing of 1,000 feet and to provide on-site groundwater production with a high degree of flexibility for local Middle Trinity aquifer management, as needed.
- *Spring & Creek Flows*: Spring site discharge and Roy Creek flows can be monitored and managed by shifting well production as needed. Future monitoring efforts can be

utilized to document Mirasol Springs well production and manage well production as a tool to assist in protecting spring and creek flows.

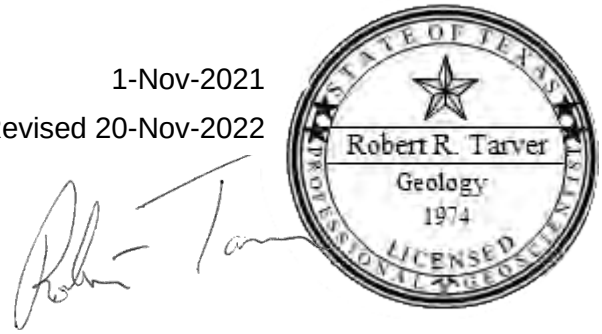
Attachments

The predicted drawdown for each modeled scenario is based upon the assumption of continuous pumping and no aquifer recharge for the time periods indicated. The following table presents a listing of the maps developed based upon the modeled scenarios by figure number, continuous pumping time period and the percentage of annual produced groundwater (as related the Murfee demand volume).
For convenience I have attached as Appendix “B” an Excel Worksheet summarizing the total estimated drawdown under these Case A & Case B scenarios at select sites and combined with them with the 100% pumping volume based on the groundwater demand estimates of 80,000 gpd.

I look forward to discussing this with you further.
RT

1-Nov-2021

Revised 20-Nov-2022



APPENDIX A

REDUCED ANNUALIZED MIRASOL SPRINGS PUMPING VOLUME TOTAL DRAWDOWN CONTOUR MAPS

INCLUDING MIRASOL SPRINGS

&

OFF-PROPERTY PUMPING

WITHIN

BUFFER AREA

(2,044 feet buffer radius or

4-lot deep buffer)

LIST OF FIGURES

Figure Number.	Time Period	Reduction (precent)
Figure 1	Data Location Map	
CASE A – Pumping By All		
Figure 2A	10-yr	70%
Figure 2B		50%
Figure 2C		25%
Figure 2D		10%
CASE B – Pumping By Mirasol Only		
Figure 3A	10-yr	70%
Figure 3B		50%
Figure 3C		25%
Figure 3D		10%
CASE A – Pumping By All		
Figure 4A	30-yrs	70%
Figure 4B		50%
Figure 4C		25%
Figure 4D		10%
CASE B – Pumping By Mirasol Only		
Figure 5A	30-yrs	70%
Figure 5B		50%
Figure 5C		25%
Figure 5D		10%

Block 7:
Hamilton Pool/
Preserve land;
total 250 GPD,
0.17 GPM

Block 7 IW

Hamilton Pool

Block 6:
Up to 58 lots @ 250 GPD;
total 14,500 GPD,
10.07 GPM

Block 6 IW

Block 8 IW

PWS-1

Block 8:
3 parcels (incl
Bentree RV Park);
est. total 22,371 GPD,
15.54 GPM

Site-B

PWS-3

Block 1 IW

Block 1:
27 lots @ 250 GPD;
total 6,750 GPD,
4.69 GPM

Block 2 IW

Block 2:
36 lots @ 250 GPD;
total 9,000 GPD,
6.25 GPM

Block 5 IW

Block 5:
Up to 21 lots @ 250 GPD;
total 5,250 GPD,
3.65 GPM

PWS-2

Site-D

Block 4 IW

Block 3 IW

Block 4:
Up to 20 lots @ 250 GPD;
total 5,000 GPD,
3.47 GPM

Block 3:
Up to 36 lots @ 250 GPD;
total 9,000 GPD,
6.25 GPM

Explanation

- Proposed PWS Wells
- Image Wells
- Site Boundary (Approx)
- 2,044-ft Site Boundary Buffer (Approx)
- Image Well Block Boundaries
- Parcel Boundaries (TNRIS)

STATE OF TEXAS
Robert R. Tarver
Geology
1974
LICENSED PROFESSIONAL GEOSCIENTIST

18-Sept-2021

N

0 3,000 Feet

1:18,000

Ref: USGS National Map, Hammetts Crossing Quad

MIRASOL SPRINGS, LLC

Figure 1

WELL INTERFERENCE MODEL
REDUCED PUMPING RATES
DATA LOCATION MAP

PROJECT: Mirasol	BY: RT	REVISIONS
DATE: Sep 2021	CHECKED: RT	

Tarver Geologic Services, LLC

Block 7:
Hamilton Pool/
Preserve land;
total 250 GPD,
0.17 GPM

Block 7 IW

Hamilton Pool

Block 6:
Up to 58 lots @ 250 GPD;
total 14,500 GPD,
10.07 GPM

Block 6 IW

Block 8 IW

PWS-1

Block 8:
3 parcels (incl
Bentree RV Park);
est. total 22,371 GPD,
15.54 GPM

Site-B

Block 1 IW

PWS-3

Block 1:
27 lots @ 250 GPD;
total 6,750 GPD,
4.69 GPM

Block 2 IW

Block 2:
36 lots @ 250 GPD;
total 9,000 GPD,
6.25 GPM

Block 5 IW

Block 5:
Up to 21 lots @ 250 GPD;
total 5,250 GPD,
3.65 GPM

PWS-2

Site-D

Block 4 IW

Block 3 IW

Block 4:
Up to 20 lots @ 250 GPD;
total 5,000 GPD,
3.47 GPM

Block 3:
Up to 36 lots @ 250 GPD;
total 9,000 GPD,
6.25 GPM

Explanation

- Proposed PWS Wells (Assumed 7.78 GPM each)
- Image Wells
- Site Boundary (Approx)
- 2,044-ft Site Boundary Buffer (Approx)
- Image Well Block Boundaries
- Parcel Boundaries (TNRIS)
- 5 — 10-year Simulated Drawdown Contour in Feet (Aqtesolv)

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18-Sept-2021

N

0 — 1:18,000 — 3,000 Feet

Ref: USGS National Map, Hammetts Crossing Quad

MIRASOL SPRINGS, LLC

Figure 2A

WELL INTERFERENCE MODEL
REDUCED PUMPING RATES (70%)
10-YEAR SIMULATED DRAWDOWN
(CASE A - PUMPING BY ALL)

PROJECT: Mirasol	BY: RT	REVISIONS
DATE: Sep 2021	CHECKED: RT	

Tarver Geologic Services, LLC

Block 7:
Hamilton Pool/
Preserve land;
total 250 GPD,
0.17 GPM

Block 7 IW

Hamilton Pool

Block 6:
Up to 58 lots @ 250 GPD;
total 14,500 GPD,
10.07 GPM

Block 6 IW

Block 8 IW

PWS-1

Block 8:
3 parcels (incl
Bentree RV Park);
est. total 22,371 GPD,
15.54 GPM

Site-B

PWS-3

Block 1 IW

Block 1:
27 lots @ 250 GPD;
total 6,750 GPD,
4.69 GPM

Block 2 IW

Block 2:
36 lots @ 250 GPD;
total 9,000 GPD,
6.25 GPM

Block 5 IW

Block 5:
Up to 21 lots @ 250 GPD;
total 5,250 GPD,
3.65 GPM

PWS-2

Site-D

Block 4 IW

Block 3 IW

Block 4:
Up to 20 lots @ 250 GPD;
total 5,000 GPD,
3.47 GPM

Block 3:
Up to 36 lots @ 250 GPD;
total 9,000 GPD,
6.25 GPM

Explanation

- Proposed PWS Wells (Assumed 3.89 GPM each)
- Image Wells
- Site Boundary (Approx)
- 2,044-ft Site Boundary Buffer (Approx)
- Image Well Block Boundaries
- Parcel Boundaries (TNRIS)
- 5 — 10-year Simulated Drawdown Contour in Feet (Aqtesolv)

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0 — 1:18,000 — 3,000 Feet

Ref: USGS National Map, Hammetts Crossing Quad

MIRASOL SPRINGS, LLC

Figure 2B

WELL INTERFERENCE MODEL
REDUCED PUMPING RATES (50%)
10-YEAR SIMULATED DRAWDOWN
(CASE A - PUMPING BY ALL)

PROJECT: Mirasol	BY: RT	REVISIONS
DATE: Sep 2021	CHECKED: RT	

Tarver Geologic Services, LLC

Block 7:
Hamilton Pool/
Preserve land;
total 250 GPD,
0.17 GPM

Block 7 IW

Hamilton Pool

Block 6:
Up to 58 lots @ 250 GPD;
total 14,500 GPD,
10.07 GPM

Block 6 IW

Block 8 IW

PWS-1

Block 8:
3 parcels (incl
Bentree RV Park);
est. total 22,371 GPD,
15.54 GPM

Site-B

PWS-3

Block 1 IW

Block 1:
27 lots @ 250 GPD;
total 6,750 GPD,
4.69 GPM

Block 2 IW

Block 2:
36 lots @ 250 GPD;
total 9,000 GPD,
6.25 GPM

Block 5 IW

Block 5:
Up to 21 lots @ 250 GPD;
total 5,250 GPD,
3.65 GPM

PWS-2

Site-D

Block 4 IW

Block 3 IW

Block 4:
Up to 20 lots @ 250 GPD;
total 5,000 GPD,
3.47 GPM

Block 3:
Up to 36 lots @ 250 GPD;
total 9,000 GPD,
6.25 GPM

Explanation

- Proposed PWS Wells (Assumed 0.97 GPM each)
- Image Wells
- Site Boundary (Approx)
- 2,044-ft Site Boundary Buffer (Approx)
- Image Well Block Boundaries
- Parcel Boundaries (TNRIS)
- 5 — 10-year Simulated Drawdown Contour in Feet (Aqtesolv)

18-Sept-2021

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N

0 1:18,000 3,000 Feet

Ref: USGS National Map, Hammetts Crossing Quad

MIRASOL SPRINGS, LLC

Figure 2C

WELL INTERFERENCE MODEL
REDUCED PUMPING RATES (25%)
10-YEAR SIMULATED DRAWDOWN
(CASE A - PUMPING BY ALL)

PROJECT: Mirasol	BY: RT	REVISIONS
DATE: Sep 2021	CHECKED: RT	

Tarver Geologic Services, LLC

Block 7:
Hamilton Pool/
Preserve land;
total 250 GPD,
0.17 GPM

Block 7 IW

Hamilton Pool

0.5

Block 6:
Up to 58 lots @ 250 GPD;
total 14,500 GPD,
10.07 GPM

Block 6 IW

1.5

1

Block 8 IW

PWS-1

2

1.5

Hamilton Creek

Block 8:
3 parcels (incl
Bentree RV Park);
est. total 22,371 GPD,
15.54 GPM

Site-B

PWS-3

Block 1 IW

1.5

Block 1:
27 lots @ 250 GPD;
total 6,750 GPD,
4.69 GPM

Block 2 IW

1.5

Block 2:
36 lots @ 250 GPD;
total 9,000 GPD,
6.25 GPM

Block 5 IW

1

Block 5:
Up to 21 lots @ 250 GPD;
total 5,250 GPD,
3.65 GPM

PWS-2

Site-D

Block 4 IW

Block 3 IW

1

Block 4:
Up to 20 lots @ 250 GPD;
total 5,000 GPD,
3.47 GPM

Block 3:
Up to 36 lots @ 250 GPD;
total 9,000 GPD,
6.25 GPM

Explanation

- Proposed PWS Wells (Assumed 0.1 GPM each)
- Image Wells
- Site Boundary (Approx)
- 2,044-ft Site Boundary Buffer (Approx)
- Image Well Block Boundaries
- Parcel Boundaries (TNRIS)
- 5 — 10-year Simulated Drawdown Contour in Feet (Aqtesolv)

18-Sept-2021

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0 — 1:18,000 — 3,000 Feet

Ref: USGS National Map, Hammetts Crossing Quad

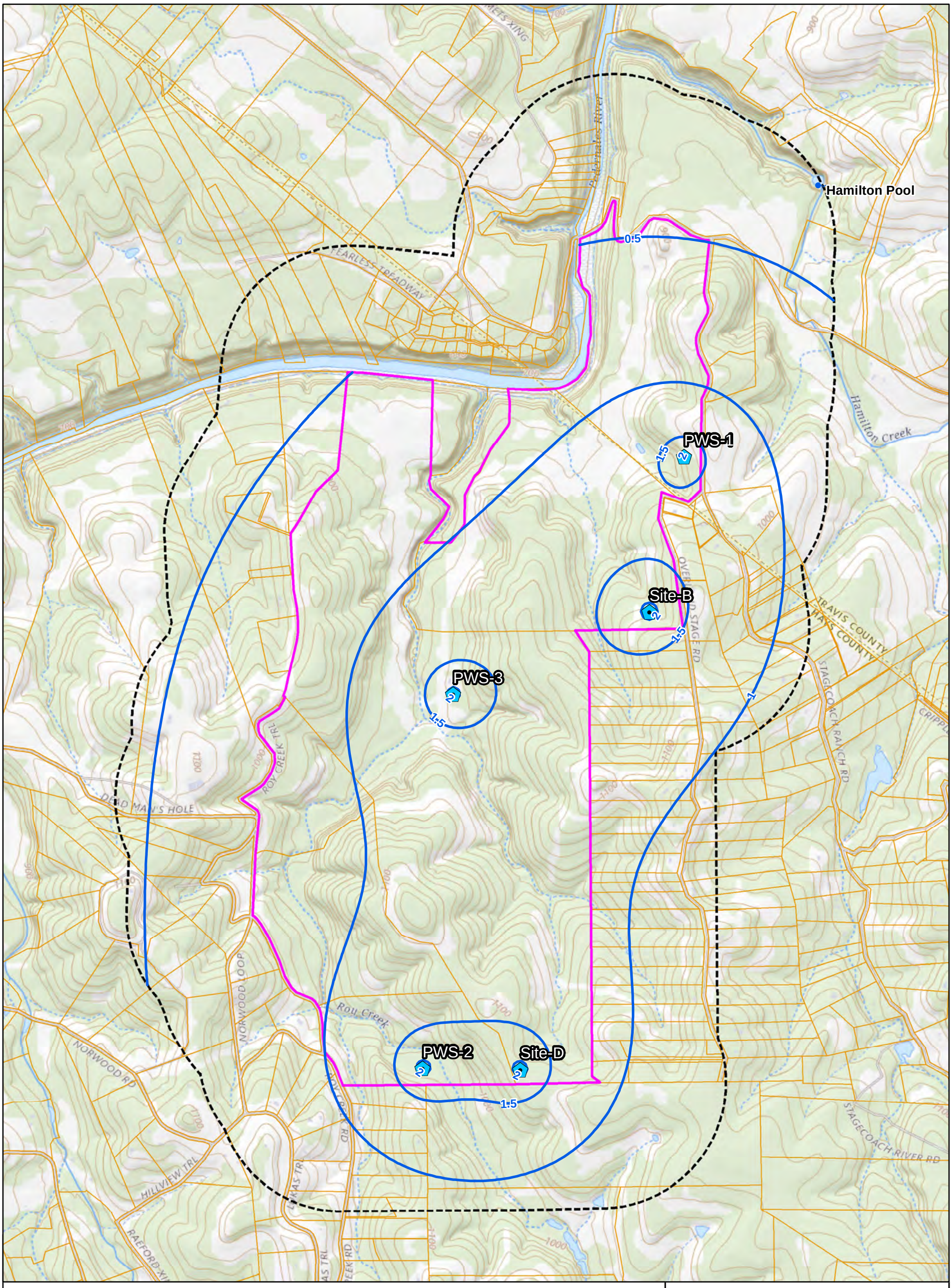
MIRASOL SPRINGS, LLC

Figure 2D

WELL INTERFERENCE MODEL
REDUCED PUMPING RATES (10%)
10-YEAR SIMULATED DRAWDOWN
(CASE A - PUMPING BY ALL)

PROJECT: Mirasol	BY: RT	REVISIONS
DATE: Sep 2021	CHECKED: RT	

Tarver Geologic Services, LLC



Explanation

- Proposed PWS Wells (Assumed 7.78 GPM each)
- Site Boundary (Approx)
- 2,044-ft Site Boundary Buffer (Approx)
- Parcel Boundaries (TNRIS)
- 5 — 10-year Simulated Drawdown Contour in Feet (Aqtesolv)

STATE OF TEXAS
Robert R. Tarver
Geology
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18-Sept-2021

N

0 — 1:18,000 — 3,000 Feet

Ref: USGS National Map, Hammetts Crossing Quad

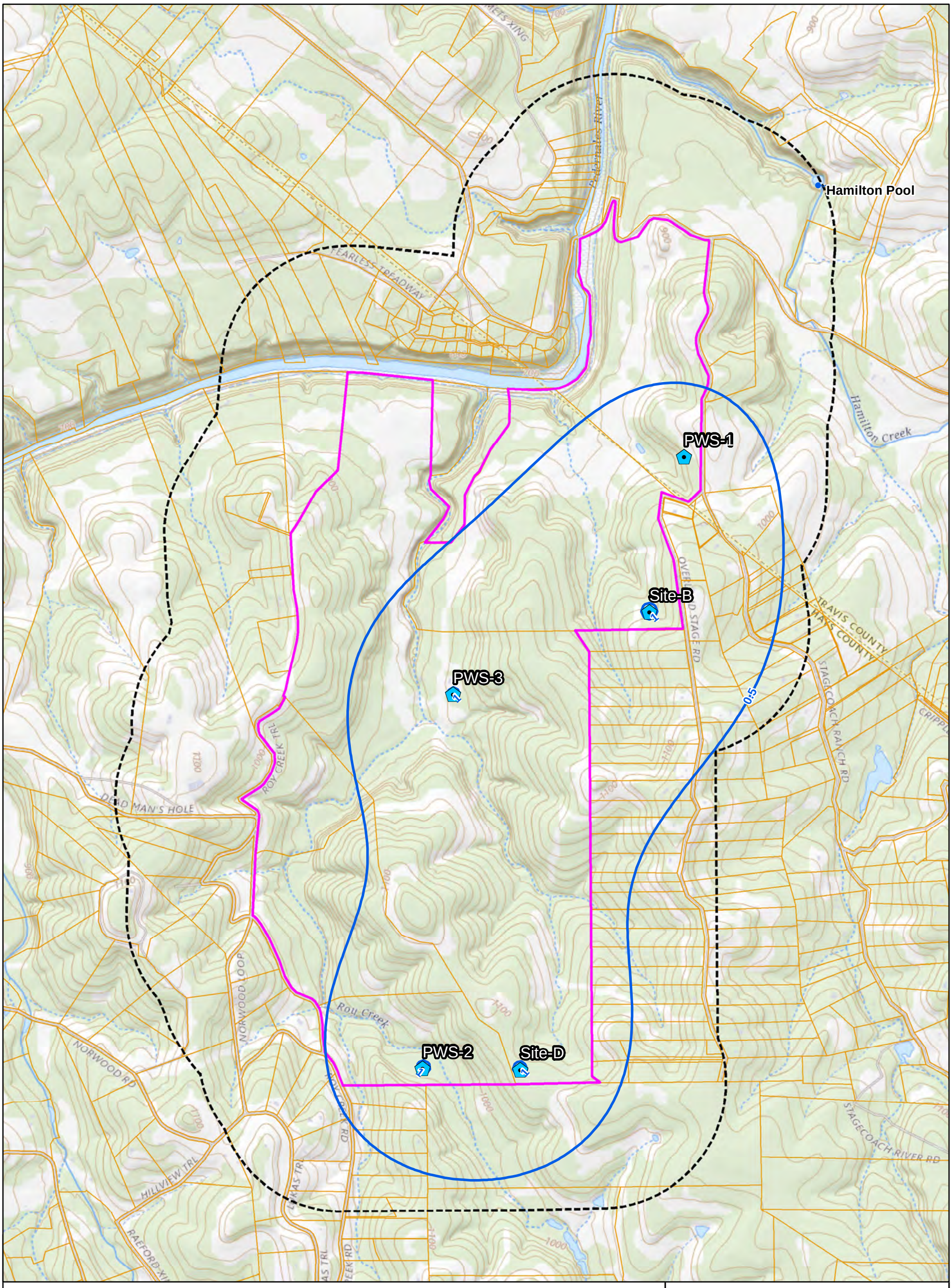
MIRASOL SPRINGS, LLC

Figure 3A

WELL INTERFERENCE MODEL
REDUCED PUMPING RATES (70%)
10-YEAR SIMULATED DRAWDOWN
(CASE B - MIRASOL PUMPING ONLY)

PROJECT: Mirasol	BY: RT	REVISIONS
DATE: July 2021	CHECKED: RT	

Tarver Geologic Services, LLC



Explanation

- Proposed PWS Wells (Assumed 3.89 GPM each)
- Site Boundary (Approx)
- 2,044-ft Site Boundary Buffer (Approx)
- Parcel Boundaries (TNRIS)
- 5 — 10-year Simulated Drawdown Contour in Feet (Aqtesolv)

18-Sept-2021

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STATE OF TEXAS

N

0 Feet 3,000

1:18,000

Ref: USGS National Map, Hammetts Crossing Quad

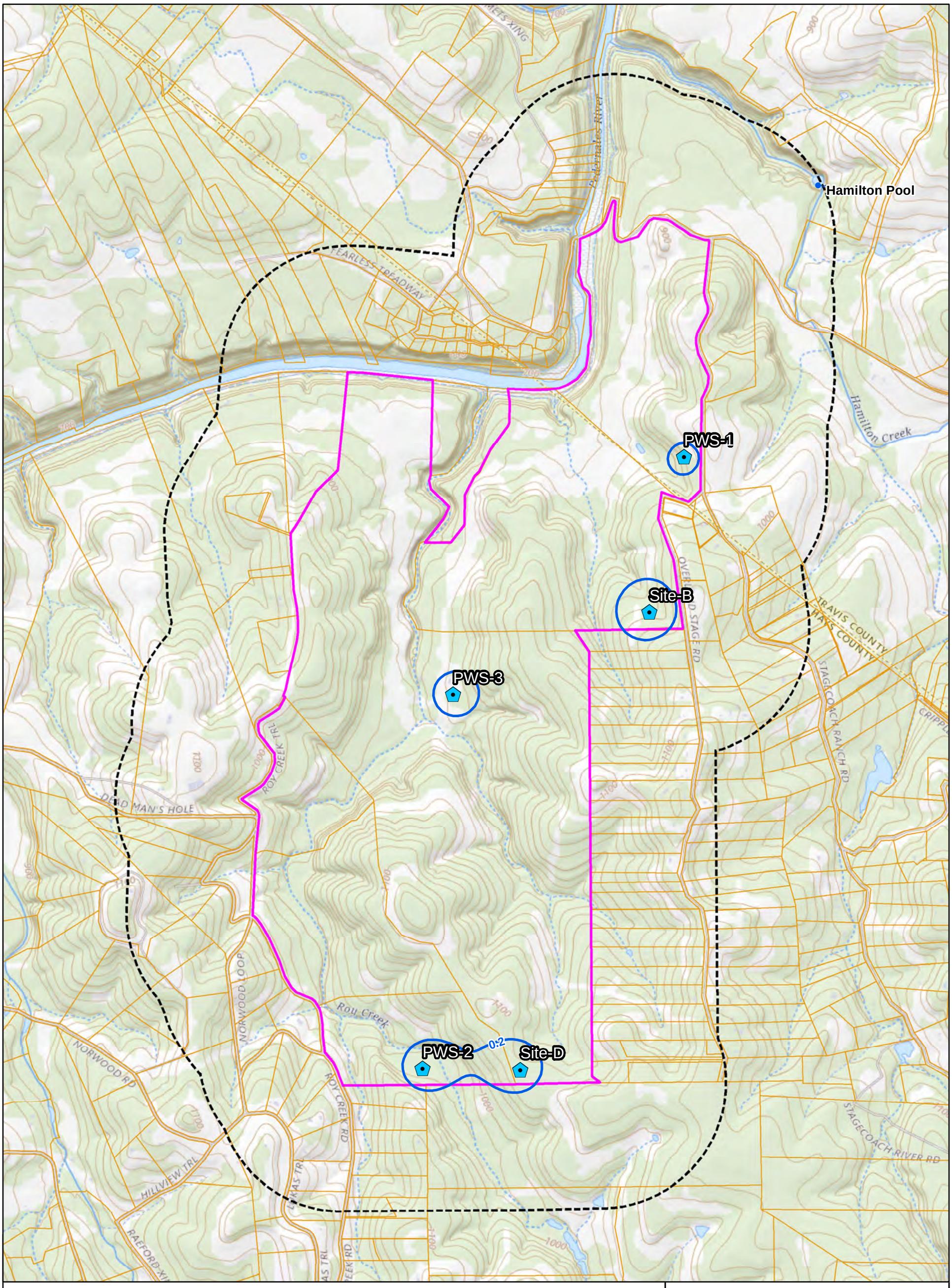
MIRASOL SPRINGS, LLC

Figure 3B

WELL INTERFERENCE MODEL
REDUCED PUMPING RATES (50%)
10-YEAR SIMULATED DRAWDOWN
(CASE B - MIRASOL PUMPING ONLY)

PROJECT: Mirasol	BY: RT	REVISIONS
DATE: Sep 2021	CHECKED: RT	

Tarver Geologic Services, LLC



Explanation

- Proposed PWS Wells (Assumed 0.97 GPM each)
- Site Boundary (Approx)
- 2,044-ft Site Boundary Buffer (Approx)
- Parcel Boundaries (TNRIS)
- 5 — 10-year Simulated Drawdown Contour in Feet (Aqtesolv)

18-Sept-2021

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N

0 — 1:18,000 — 3,000 Feet

Ref: USGS National Map, Hammetts Crossing Quad

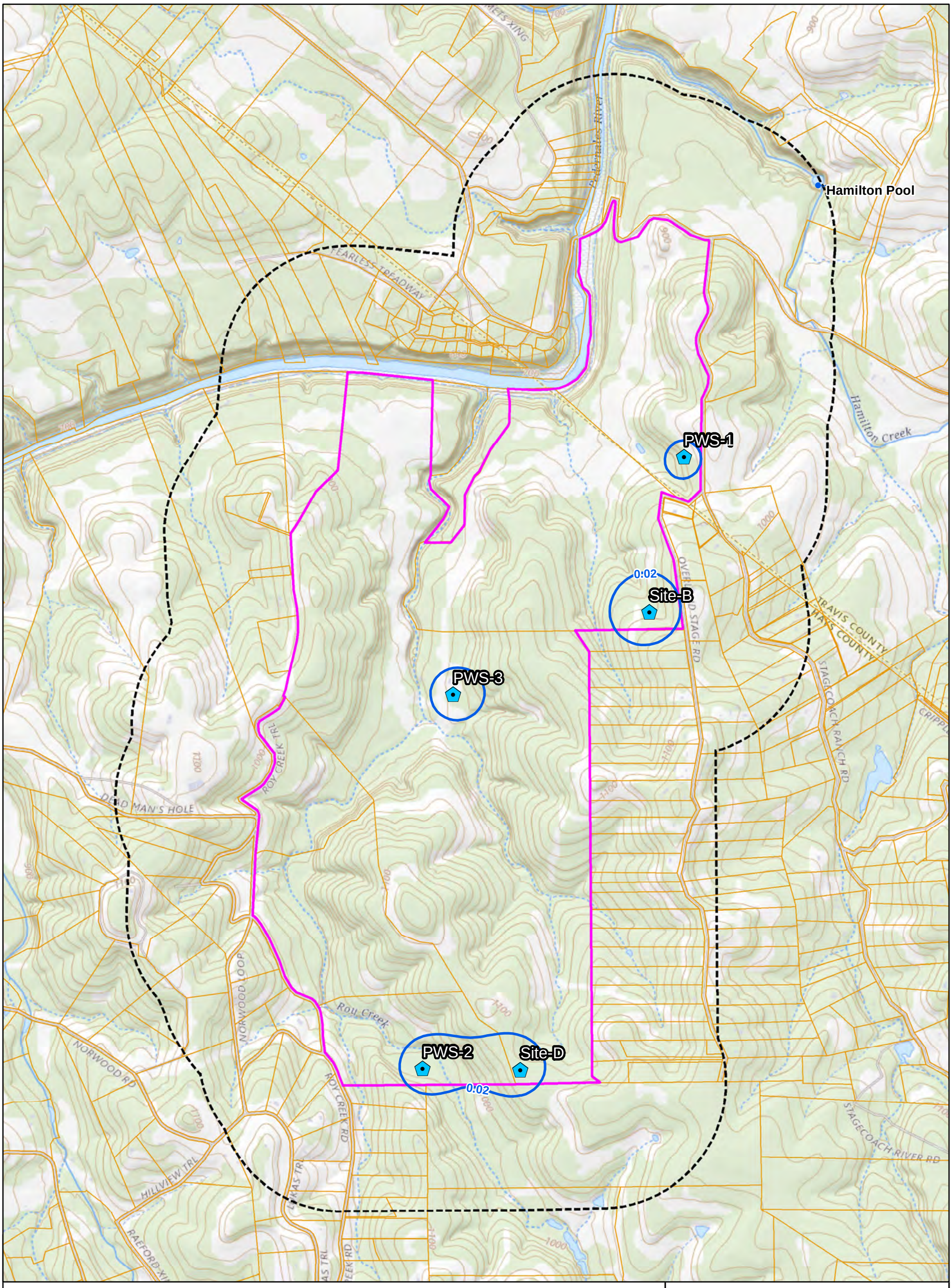
MIRASOL SPRINGS, LLC

Figure 3C

WELL INTERFERENCE MODEL
REDUCED PUMPING RATES (25%)
10-YEAR SIMULATED DRAWDOWN
(CASE B - MIRASOL PUMPING ONLY)

PROJECT: Mirasol	BY: RT	REVISIONS
DATE: Sep 2021	CHECKED: RT	

Tarver Geologic Services, LLC



Explanation

- Proposed PWS Wells (Assumed 0.1 GPM each)
- Site Boundary (Approx)
- 2,044-ft Site Boundary Buffer (Approx)
- Parcel Boundaries (TNRIS)
- 5 — 10-year Simulated Drawdown Contour in Feet (Aqtesolv)

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N

0 Feet 3,000

1:18,000

Ref: USGS National Map, Hammetts Crossing Quad

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Figure 3D

WELL INTERFERENCE MODEL
REDUCED PUMPING RATES (10%)
10-YEAR SIMULATED DRAWDOWN
(CASE B - MIRASOL PUMPING ONLY)

PROJECT: Mirasol	BY: RT	REVISIONS
DATE: Sep 2021	CHECKED: RT	

Tarver Geologic Services, LLC

Block 7:
Hamilton Pool/
Preserve land;
total 250 GPD,
0.17 GPM

Block 7 IW

Hamilton Pool

Block 6:
Up to 58 lots @ 250 GPD;
total 14,500 GPD,
10.07 GPM

Block 6 IW

Block 8 IW

PWS-1

Block 8:
3 parcels (incl
Bentree RV Park);
est. total 22,371 GPD,
15.54 GPM

Site-B

PWS-3

Block 1 IW

Block 1:
27 lots @ 250 GPD;
total 6,750 GPD,
4.69 GPM

Block 2 IW

Block 2:
36 lots @ 250 GPD;
total 9,000 GPD,
6.25 GPM

Block 5 IW

Block 5:
Up to 21 lots @ 250 GPD;
total 5,250 GPD,
3.65 GPM

PWS-2

Site-D

Block 4 IW

Block 3 IW

Block 4:
Up to 20 lots @ 250 GPD;
total 5,000 GPD,
3.47 GPM

Block 3:
Up to 36 lots @ 250 GPD;
total 9,000 GPD,
6.25 GPM

Explanation

- Proposed PWS Wells (Assumed 7.78 GPM each)
- Image Wells
- Site Boundary (Approx)
- 2,044-ft Site Boundary Buffer (Approx)
- Image Well Block Boundaries
- Parcel Boundaries (TNRIS)
- 30-year Simulated Drawdown Contour in Feet (Aqtesolv)

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N

0 3,000 Feet

1:18,000

Ref: USGS National Map, Hammetts Crossing Quad

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Figure 4A

WELL INTERFERENCE MODEL
REDUCED PUMPING RATES (70%)
30-YEAR SIMULATED DRAWDOWN
(CASE A - PUMPING BY ALL)

PROJECT: Mirasol	BY: RT	REVISIONS
DATE: Sep 2021	CHECKED: RT	

Tarver Geologic Services, LLC

Block 7:
Hamilton Pool/
Preserve land;
total 250 GPD,
0.17 GPM

Block 7 IW

Hamilton Pool

Block 6:
Up to 58 lots @ 250 GPD;
total 14,500 GPD,
10.07 GPM

Block 6 IW

Block 8 IW

PWS-1

Block 8:
3 parcels (incl
Bentree RV Park);
est. total 22,371 GPD,
15.54 GPM

Site-B

PWS-3

Block 1 IW

Block 1:
27 lots @ 250 GPD;
total 6,750 GPD,
4.69 GPM

Block 2 IW

Block 2:
36 lots @ 250 GPD;
total 9,000 GPD,
6.25 GPM

Block 5 IW

Block 5:
Up to 21 lots @ 250 GPD;
total 5,250 GPD,
3.65 GPM

PWS-2

Site-D

Block 4 IW

Block 3 IW

Block 4:
Up to 20 lots @ 250 GPD;
total 5,000 GPD,
3.47 GPM

Block 3:
Up to 36 lots @ 250 GPD;
total 9,000 GPD,
6.25 GPM

Explanation

- Proposed PWS Wells (Assumed 3.89 GPM each)
- Image Wells
- Site Boundary (Approx)
- 2,044-ft Site Boundary Buffer (Approx)
- Image Well Block Boundaries
- Parcel Boundaries (TNRIS)
- 30-year Simulated Drawdown Contour in Feet (Aqtesolv)

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N

0 3,000 Feet

1:18,000

Ref: USGS National Map, Hammetts Crossing Quad

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Figure 4B

WELL INTERFERENCE MODEL
REDUCED PUMPING RATES (50%)
30-YEAR SIMULATED DRAWDOWN
(CASE A - PUMPING BY ALL)

PROJECT: Mirasol	BY: RT	REVISIONS
DATE: Sep 2021	CHECKED: RT	

Tarver Geologic Services, LLC

Block 7:
Hamilton Pool/
Preserve land;
total 250 GPD,
0.17 GPM

Block 7 IW

Hamilton Pool

1.5

Block 6:
Up to 58 lots @ 250 GPD;
total 14,500 GPD,
10.07 GPM

Block 8 IW

PWS-1

Hamilton Creek

Block 8:
3 parcels (incl
Bentree RV Park);
est. total 22,371 GPD,
15.54 GPM

Block 6 IW

Site-B

PWS-3

Block 1 IW

Block 1:
27 lots @ 250 GPD;
total 6,750 GPD,
4.69 GPM

Block 2 IW

Block 2:
36 lots @ 250 GPD;
total 9,000 GPD,
6.25 GPM

Block 5 IW

Block 5:
Up to 21 lots @ 250 GPD;
total 5,250 GPD,
3.65 GPM

PWS-2

Site-D

Block 4 IW

Block 3 IW

Block 4:
Up to 20 lots @ 250 GPD;
total 5,000 GPD,
3.47 GPM

Block 3:
Up to 36 lots @ 250 GPD;
total 9,000 GPD,
6.25 GPM

Explanation

- Proposed PWS Wells (Assumed 0.97 GPM each)
- Image Wells
- Site Boundary (Approx)
- 2,044-ft Site Boundary Buffer (Approx)
- Image Well Block Boundaries
- Parcel Boundaries (TNRIS)
- 5 — 30-year Simulated Drawdown Contour in Feet (Aqtesolv)

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N

0 — 3,000 Feet

1:18,000

Ref: USGS National Map, Hammetts Crossing Quad

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Figure 4C

WELL INTERFERENCE MODEL
REDUCED PUMPING RATES (25%)
30-YEAR SIMULATED DRAWDOWN
(CASE A - PUMPING BY ALL)

PROJECT: Mirasol	BY: RT	REVISIONS
DATE: Sep 2021	CHECKED: RT	

Tarver Geologic Services, LLC

Block 7:
Hamilton Pool/
Preserve land;
total 250 GPD,
0.17 GPM

Block 7 IW

Hamilton Pool

Block 6:
Up to 58 lots @ 250 GPD;
total 14,500 GPD,
10.07 GPM

Block 6 IW

Block 8 IW

PWS-1

Block 8:
3 parcels (incl
Bentree RV Park);
est. total 22,371 GPD,
15.54 GPM

Site-B

PWS-3

Block 1 IW

Block 1:
27 lots @ 250 GPD;
total 6,750 GPD,
4.69 GPM

Block 2 IW

Block 2:
36 lots @ 250 GPD;
total 9,000 GPD,
6.25 GPM

Block 5 IW

Block 5:
Up to 21 lots @ 250 GPD;
total 5,250 GPD,
3.65 GPM

PWS-2

Site-D

Block 4 IW

Block 3 IW

Block 4:
Up to 20 lots @ 250 GPD;
total 5,000 GPD,
3.47 GPM

Block 3:
Up to 36 lots @ 250 GPD;
total 9,000 GPD,
6.25 GPM

Explanation

- Proposed PWS Wells (Assumed 0.1 GPM each)
- Image Wells
- Site Boundary (Approx)
- 2,044-ft Site Boundary Buffer (Approx)
- Image Well Block Boundaries
- Parcel Boundaries (TNRIS)
- 5 — 30-year Simulated Drawdown Contour in Feet (Aqtesolv)

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N

0 3,000 Feet

1:18,000

Ref: USGS National Map, Hammetts Crossing Quad

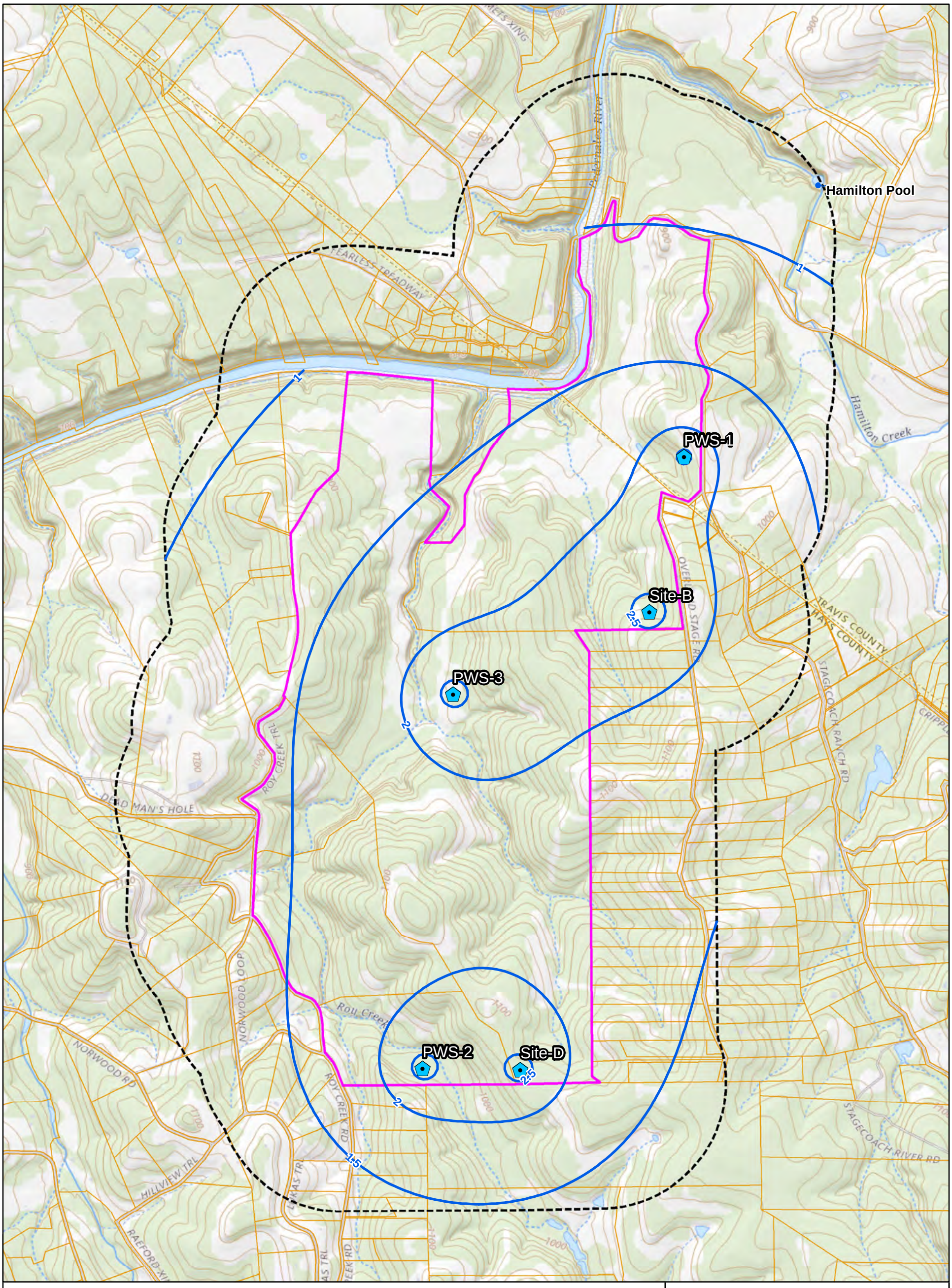
MIRASOL SPRINGS, LLC

Figure 4D

WELL INTERFERENCE MODEL
REDUCED PUMPING RATES (10%)
30-YEAR SIMULATED DRAWDOWN
(CASE A - PUMPING BY ALL)

PROJECT: Mirasol	BY: RT	REVISIONS
DATE: Sep 2021	CHECKED: RT	

Tarver Geologic Services, LLC



Explanation

- Proposed PWS Wells (Assumed 7.78 GPM each)
- Site Boundary (Approx)
- 2,044-ft Site Boundary Buffer (Approx
- Parcel Boundaries (TNRIS)
- 5 — 30-year Simulated Drawdown Contour in Feet (Aqtesolv)

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N

0 — Feet — 3,000

1:18,000

Ref: USGS National Map, Hammetts Crossing Quad

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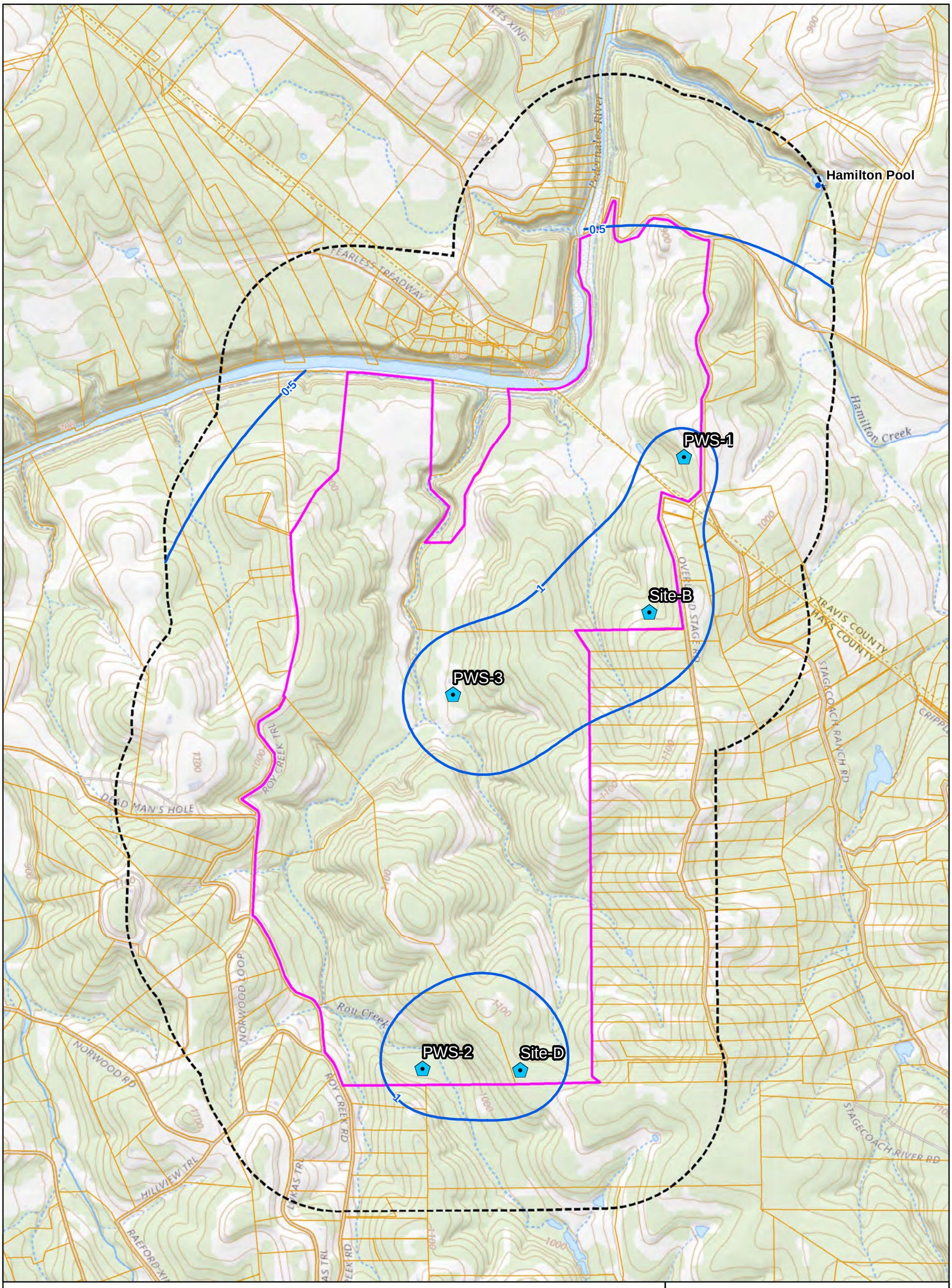
Figure 5A

WELL INTERFERENCE MODEL
REDUCED PUMPING RATES (70%)
30-YEAR SIMULATED DRAWDOWN
(CASE B - MIRASOL PUMPING ONLY)

PROJECT: Mirasol	BY: RT	REVISIONS
DATE: Sep 2021	CHECKED: RT	

Tarver Geologic Services, LLC



Explanation

- Proposed PWS Wells (Assumed 3.89 GPM each)
- Site Boundary (Approx)
- 2,044-ft Site Boundary Buffer (Approx)
- Parcel Boundaries (TNRIS)
- 5 — 30-year Simulated Drawdown Contour in Feet (Aqtesolv)

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N

0 — 3,000 Feet

1:18,000

Ref: USGS National Map, Hammetts Crossing Quad

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Figure 5B

WELL INTERFERENCE MODEL
REDUCED PUMPING RATES (50%)
30-YEAR SIMULATED DRAWDOWN
(CASE B - MIRASOL PUMPING ONLY)

PROJECT: Mirasol	BY: RT	REVISIONS
DATE: Sep 2021	CHECKED: RT	

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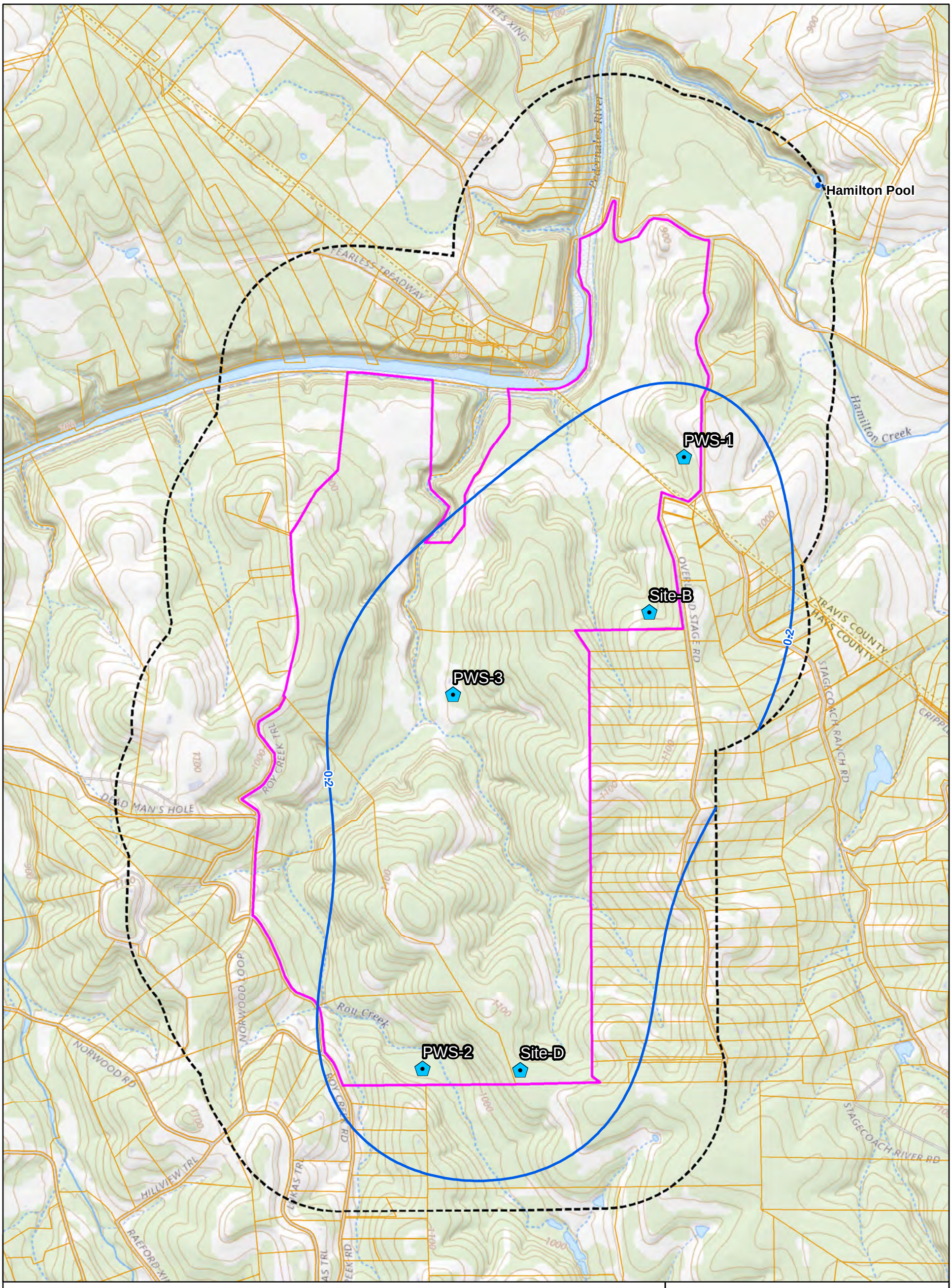

Explanation

- Proposed PWS Wells (Assumed 0.97 GPM each)
- Site Boundary (Approx)
- 2,044-ft Site Boundary Buffer (Approx)
- Parcel Boundaries (TNRIS)
- 5 — 30-year Simulated Drawdown Contour in Feet (Aqtesolv)

18-Sept-2021

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N

0 Feet 3,000

1:18,000

Ref: USGS National Map, Hammetts Crossing Quad

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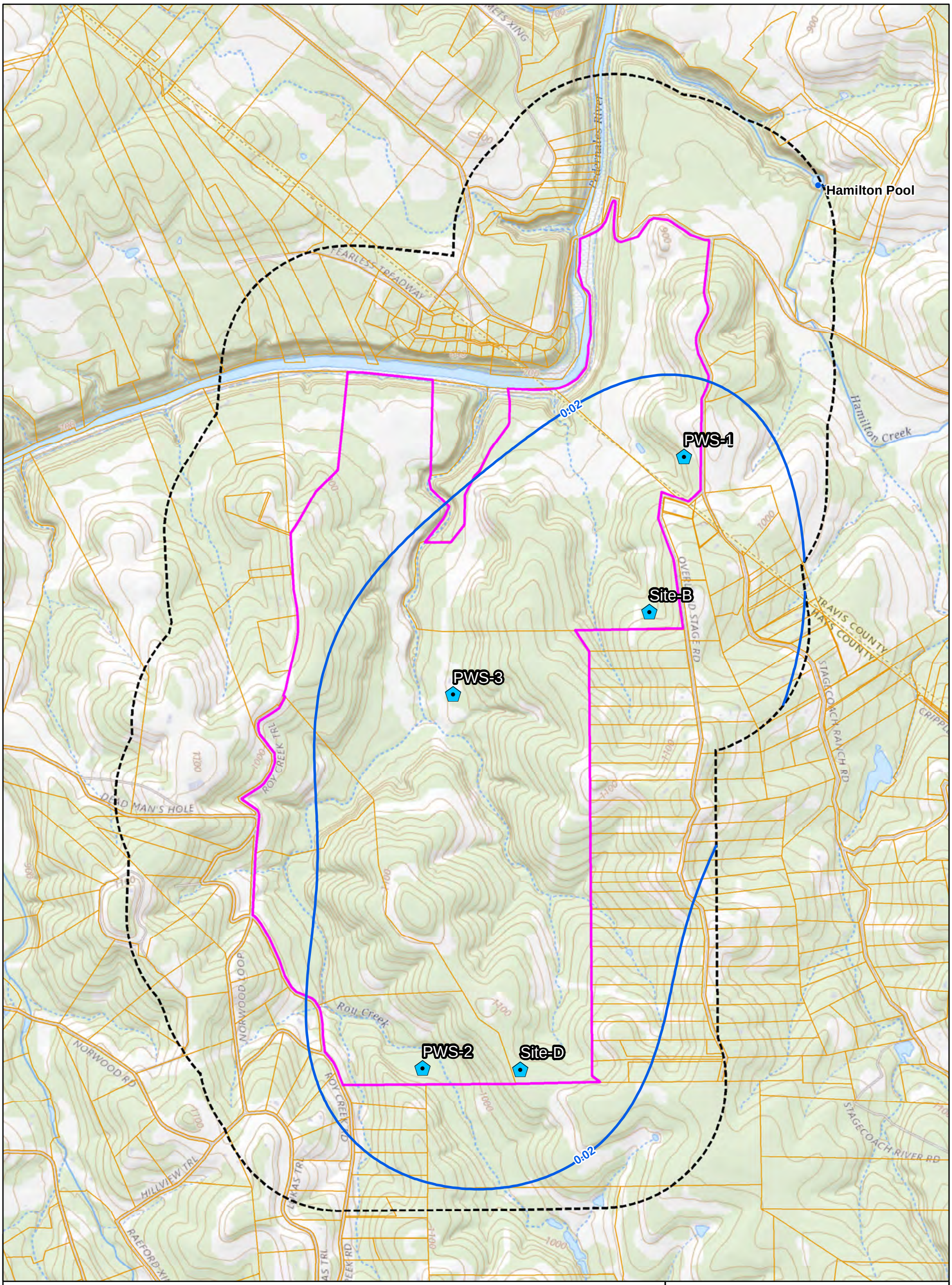
Figure 5C

WELL INTERFERENCE MODEL
REDUCED PUMPING RATES (25%)
30-YEAR SIMULATED DRAWDOWN
(CASE B - MIRASOL PUMPING ONLY)

PROJECT: Mirasol	BY: RT	REVISIONS
DATE: Sep 2021	CHECKED: RT	

Tarver Geologic Services, LLC



Explanation

- Proposed PWS Wells (Assumed 0.1 GPM each)
- Site Boundary (Approx)
- 2,044-ft Site Boundary Buffer (Approx)
- Parcel Boundaries (TNRIS)
- 5 — 30-year Simulated Drawdown Contour in Feet (Aqtesolv)

18-Sept-2021

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N

0 — 1:18,000 — 3,000 Feet

Ref: USGS National Map, Hammetts Crossing Quad

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Figure 5D

WELL INTERFERENCE MODEL
REDUCED PUMPING RATES (10%)
30-YEAR SIMULATED DRAWDOWN
(CASE B - MIRASOL PUMPING ONLY)

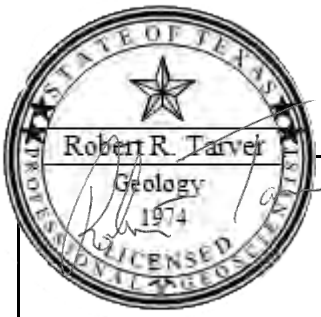
PROJECT: Mirasol	BY: RT	REVISIONS
DATE: Sep 2021	CHECKED: RT	

Tarver Geologic Services, LLC

APPENDIX B

SUMMARY TABLE
PREDICTED TOTAL DRAWDOWN
AT SELECT SITES
&
REDUCED ANNUALIZED PUMPING VOLUMES

INCLUDING MIRASOL SPRINGS
&
OFF-PROPERTY PUMPING
WITHIN
BUFFER AREA
(2,044 feet buffer radius or
4-lot deep buffer)



MAXIMUM TOTAL DRAWDOWN BROKEN OUT BY CASE & TIME

Mirasol Springs Development
Travis & Hays County, Texas

2-Nov-2021
Revised 20-Nov-2022

Location	30-year Estimated Drawdown			10-year Estimated Drawdown		
	Case A	Case B	Case C	Case A	Case B	Case C
	Mirasol & Pumping By Others	Mirasol Pumping Only	Pumping by Others Only	Mirasol & Pumping By Others	Mirasol Pumping Only	Pumping by Others Only
	(feet)	(feet)	(feet)	(feet)	(feet)	(feet)
30-year Max DD at Buffer Line	4.6	2.4	2.8	2.7	1.2	1.6
30-year Max DD at Mirasol Property Line	5.8	3.6	2.3	3.8	1.3	1.6
Crossing Spring	4.9	3.1	1.7	3	1.9	0.5
Farm Spring	4.3	2.4	1.7	2.4	4.6	1.0
Hammett Spring	2.9	1.5	1.4	1.4	0.3	0.7
Hamilton Pool	2.4	1.2	1.3	1.2	0.4	0.4

Notes – Max DD indicates maximum drawdown.

REDUCED ANNUALIZED VOLUMES

CASE A - PUMPING BY ALL

SUMMARY OF ESTIMATED TOTAL DRAWDOWN AT 30-YEARS

Percent of GW Total Demand (MEC)	100%	70%	50%	25%	10%
Aggregate GW Produced by Mirasol (gpm)	55.6	38.9	27.8	13.9	5.6
30-year Max DD at Buffer Line	4.6	3.7	3.3	2.5	1.8
30-year Max DD at Mirasol Property Line	5.8	4.7	3.9	2.6	2.2
Crossing Spring	4.9	4.0	3.3	2.2	1.5
Farm Spring	4.3	3.5	3.0	2.1	1.8
Hammett Spring	2.9	2.4	2.2	1.6	<1.0
Hamilton Pool	2.4	2.1	1.8	<1.5	<1.0

Notes – Max DD indicates maximum drawdown.

CASE B - MIRASOL PUMPING ONLY

SUMMARY OF ESTIMATED MIRASOL DRAWDOWN AT 30-YEARS

Percent of GW Total Demand (MEC)	100%	70%	50%	25%	10%
Aggregate GW Produced by Mirasol (gpm)	55.6	38.9	27.8	13.9	5.6
30-year Max DD at Buffer Line	2.5	1.7	1.0	0.6	0.3
30-year Max DD at Mirasol Property Line	3.4	2.5	1.7	0.9	0.4
Crossing Spring	3.1	2.3	1.5	0.4	0.3
Farm Spring	2.3	1.6	1.3	0.7	0.3
Hammett Spring	1.5	1.0	<1.0	< 0.5	<0.2
Hamilton Pool	1.1	<1.0	<1.0	< 0.5	<0.2

Notes – Max DD indicates maximum drawdown. *- N/A indicates not applicable.*