Notice and Agenda of a Meeting of the Beaumont Basin Watermaster

Wednesday, June 3, 2020 at 10:00 a.m.

Meeting Location:

Beaumont Cherry Valley Water District
560 Magnolia Avenue
Beaumont, California 92223
(951) 845-9581

Watermaster Members:

City of Banning
City of Beaumont
Beaumont Cherry Valley Water District
South Mesa Water Company
Yucaipa Valley Water District

This meeting is available by calling (888) 475-4499 using passcode 997-7493-5433#

View live presentation material at https://zoom.us/j/99774935433

There will be no public physical location for attending this meeting in person.

I. Call to Order

II. Roll Call

City of Banning: Arturo Vela (Alternate: Luis Cardenas)

City of Beaumont: _____ (Alternate: Kyle Warsinski)

Beaumont Cherry Valley Water District: Daniel Jaggers (Alternate: Mark Swanson)

South Mesa Water Company: George Jorritsma (Alternate: Dave Armstrong)

Yucaipa Valley Water District: Joseph Zoba (Alternate: Jennifer Ares)

III. Pledge of Allegiance

IV. Public Comments At this time, members of the public may address the Beaumont Basin Watermaster on matters within its jurisdiction; however, no action or discussion may take place on any item not on the agenda. To provide comments on specific agenda items, please complete a Request to Speak form and provide that form to the Secretary prior to the commencement of the meeting.

V. Reports

A. Report from Engineering Consultant - Hannibal Blandon, ALDA Engineering

B. Report from Hydrogeological Consultant - Thomas Harder, Thomas Harder & Co.

C. Report from Legal Counsel - Thierry Montoya/Keith McCullough, Alvarado Smith

VI. Discussion Items

A. Status Report on Water Level Monitoring throughout the Beaumont Basin through May 18, 2020 [Memorandum No. 20-08, Page 3 of 22]

Recommendation: No recommendation.

B. A Comparison of Production and Allowable Extractions through April 2020 [Memorandum No. 20-09, Page 13 of 22]

Recommendation: No recommendation - For informational purposes only.

C. Updated 2018 Consolidated Annual Report and Engineering Report – Delivery of Final Report [Memorandum No. 20-10, Page 14 of 22]

Recommendation: For Information Purposes only.

D. Consideration of Change Order No. 2 for Task Order No. 17 for the Development of a Return Flow Methodology for the Beaumont Basin [Memorandum No. 20-11, Page 15 of 22]

Recommendation: That the Watermaster Committee consider the approval of basic tasks 1 through 6 and optional tasks 7 and 8 as presented under Change Order No. 2. The estimate to complete the basic tasks 1 through 6 is $25,510.00 while the estimated cost to complete optional tasks 7 and 8 is an additional $43,750.00. If approved, the Watermaster Committee should direct the Treasurer to invoice specific Appropriators based on anticipated benefits.

VII. Topics for Future Meetings

A. Development of a methodology and policy to account for groundwater storage losses in the basin resulting from the artificial recharge of water resources.

B. Development of a methodology and policy to account for recycled water recharge.

VIII. Comments from the Watermaster Committee Members

IX. Announcements

A. The next regular meeting of the Beaumont Basin Watermaster is scheduled for Wednesday, August 5, 2020 at 10:00 a.m.

B. Future Meeting Dates:

i. Wednesday, October 7, 2020 at 10:00 a.m.

ii. Wednesday, December 2, 2020 at 10:00 a.m.

iii. Wednesday, February 3, 2021 at 10:00 a.m.

X. Adjournment

BEAUMONT BASIN WATERMASTER
MEMORANDUM NO. 20-08

Date: June 3, 2020

From: Hannibal Blandon, ALDA Inc.

Subject: Status Report on Water Level Monitoring throughout the Beaumont Basin through May 18, 2020

Recommendation: No recommendation.

At the present time, there are 16 monitoring wells collecting water level information on an hourly basis at various locations throughout the basin. In addition, there are two monitoring probes collecting barometric pressures at opposite ends of the Beaumont Basin. The location of active monitoring wells is depicted in the attached Figure No. 1.

Water levels at selected locations are depicted in Figures 2 through 7 and are described as follows:

- ✓ Figure No. 2 – Water levels at YVWD Well No. 34 and Oak Valley Well No. 5 are considered representative of basin conditions in the Northwest portion of the basin. Since the initial installation of a measuring probe, water level at YVWD was very stable ranging within a few fee; however, over the last year a five-foot drop in levels has been recorded. Similar drop has been observed at Oak Valley No. 5; a drop of nine feet was recorded between April and November 2019; more recent information is not available since the communications cable has not been accessed since January 2020.

- ✓ Figure No. 3 – Two of the Noble Creek observation wells are presented in this figure representing the shallow and deep aquifers. In the shallow aquifer, the water level has increased close to 90 feet over the last two years from a low of 2,337 ft. to 2,424 ft.; however, over the last year it has been fairly steady with minor fluctuations in recent months. In the deep aquifer, water level has increased by 60 ft since the summer of 2016.

- ✓ Figure No. 4 – Southern Portion of the Basin. Water level at the Summit Cemetery well is highly influenced by a nearby pumping well that is used to irrigate the cemetery grounds. The water level at this well continues to fluctuate over a 20-foot band. Conversely, the water level at the Sun Lakes well has fluctuated minimally over the same period and it is currently at the same level as when monitoring began in the summer of 2015.

- ✓ Figure No. 5 illustrates levels at three wells owned by the City of Banning in the Southeast portion of the basin. While water level at the Old Well No. 15

(Chevron Well) has been fairly flat over the last two years, a somewhat significant and steady decline, close to 23 feet, was recorded at Banning M-8 between the summer of 2015 and the winter of 2017. The probe at Banning M-8 was removed in late January 2018 and was reinstalled in May 2019; since, the water level declined and additional 10 ft. hitting bottom at an elevation of 2,047 ft; a minor recovery of 4 ft has been recorded over the last six months. Water level at Banning M-9 has fluctuated in a 17-foot range, between 2,130 ft and 2,147 ft. since monitoring began in the summer of 2015. Water level at this location could not be downloaded during our visit due to problems with the communications cable. This cable needs to be replaced due to consistently failing to communication with the probe.

- ✓ Figure No. 6 illustrate recorded water level at BCVWD No. 2 and BCVWD No. 25. Water levels at these two wells follow seasonal pumping patterns; however, . During the summer of 2019, the water level at BCVWD No. 2 declined 10 feet between May and November to an elevation of 2,218 ft, but then quickly recover over the late fall and 2019/20 winter. During this later period, a 14 feet gain was recorded. A decline in level at this well begun again this past April. Similar patten is

- ✓ Over the last two years, water levels are overall in an uptrend; however, they experience seasonal declines following production patterns. At the end of the summer pumping season, water levels at these wells declined by approximately seven feet but seem to quickly recover in the last three months.

- ✓ Figure No. 7 depicts the recorded water level at the two newest observation wells, BCVWD No. 29 and Tukwet Canyon Well “B”. BCVWD No. 29 is a pumping well that is now more actively used to meet peak summer demands. Water level at this well experienced a slight decline of 4 ft in the summer, but it is recovering now that this well is in winter-mode operation. Tukwet B is a dedicated monitoring well in the southern portion of the basin; water level at this well has been fairly stable over the last 10 months.

New Monitoring Wells

During the last reporting period, no additional monitoring wells have been added.

New Equipment Installation

None during the reporting period.

Troubleshooting Issues

The following malfunctioning issues were encountered during our May 19, 2020 field visit:

- ✓ Banning M-9 – Communications cable continues not to communicate with water level probe. Data continues to be stored, but it cannot be retrieved. A new communications cable needs to be ordered for this well.

- ✓ Oak Valley No. 5 – Communications cable has not been restored and a new communications cable is needed. Several attempts have been made to fix the problem without success. Data continues to be stored, but it cannot be retrieved.

- ✓ Tukwet Golf Course Well B – For the first time since installed, the communications cable is not working. Cable may need to be replaced in the future. Data continues to be stored.

- ✓ The water level meter broke again and needs to be repaired and/or replaced.

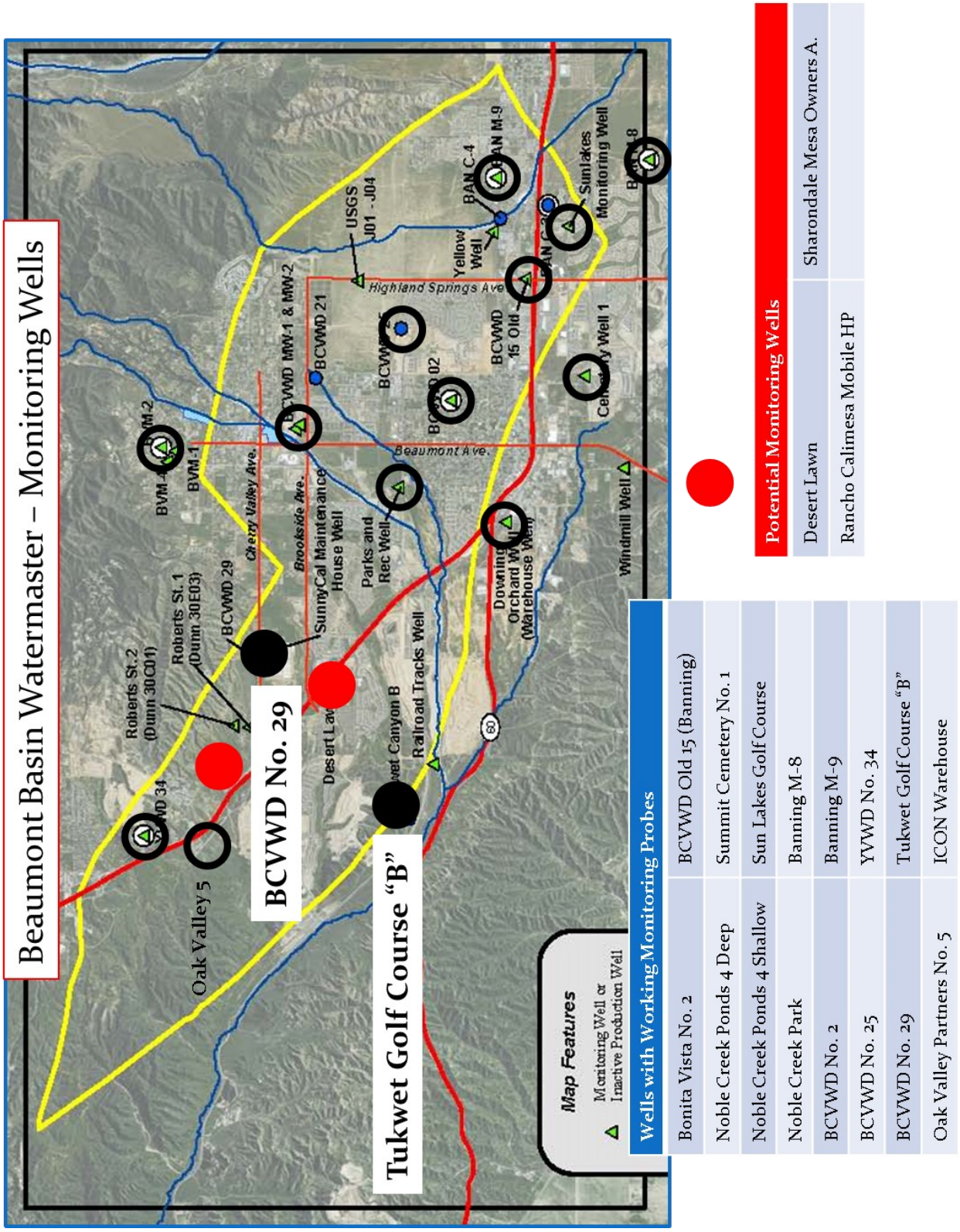
New Monitoring Sites

Due to the current pandemic, all communications with owners of potential well sites have stalled. We will restart communications in the future as the country gradually goes back to normal. The following sites are being considered:

- ✓ Catholic Dioceses of San Bernardino-Riverside counties, near Rancho Calimesa Mobile Home Park has three abandoned wells. Two of these wells cannot be used at this time because the probe could not be lowered; however, the third site has great potential. This well is approximately 400 ft deep and the water level is at approximately 160 feet below ground.

- ✓ Sharondale Well No. 1 – This well is operated by Clearwater Operations. We initiated contact with this company to install a water level probe at this well, but progress has not been made.

- ✓ At Plantation by the Lake, another potential monitoring well site, communications with owner have not be reestablished.


Beaumont Basin Watermaster – Monitoring Wells
BCVWD No. 29
Tukwet Golf Course "B"
Oak Valley 5
Roberts St. 2 (Dunn 30C01)
Roberts St. 1 (Dunn 30E03)
BCVWD 29
SunnyCal Maintenance House Well
Parks and Rec Well
Railroad Tracks Well
Desert Lawn
Windmill Well
BCVWD MW-1 & MW-2
BCVWD 21
USGS J01 - J04
Yellow Well
BCVWD 15 Old
Sunlakes Monitoring Well
Highland Springs Ave.
Beaumont Ave.
Cherry Valley Ave.
Brookside Ave.
Map Features
Monitoring Well or Inactive Production Well
Wells with Working Monitoring Probes
Bonita Vista No. 2
Noble Creek Ponds 4 Deep
Noble Creek Ponds 4 Shallow
Noble Creek Park
BCVWD No. 2
BCVWD No. 25
BCVWD No. 29
Oak Valley Partners No. 5
BCVWD Old 15 (Banning)
Summit Cemetery No. 1
Sun Lakes Golf Course
Banning M-8
Banning M-9
YVWD No. 34
Tukwet Golf Course "B"
ICON Warehouse
Potential Monitoring Wells
Desert Lawn
Rancho Calimesa Mobile HP
Sharondale Mesa Owners A.

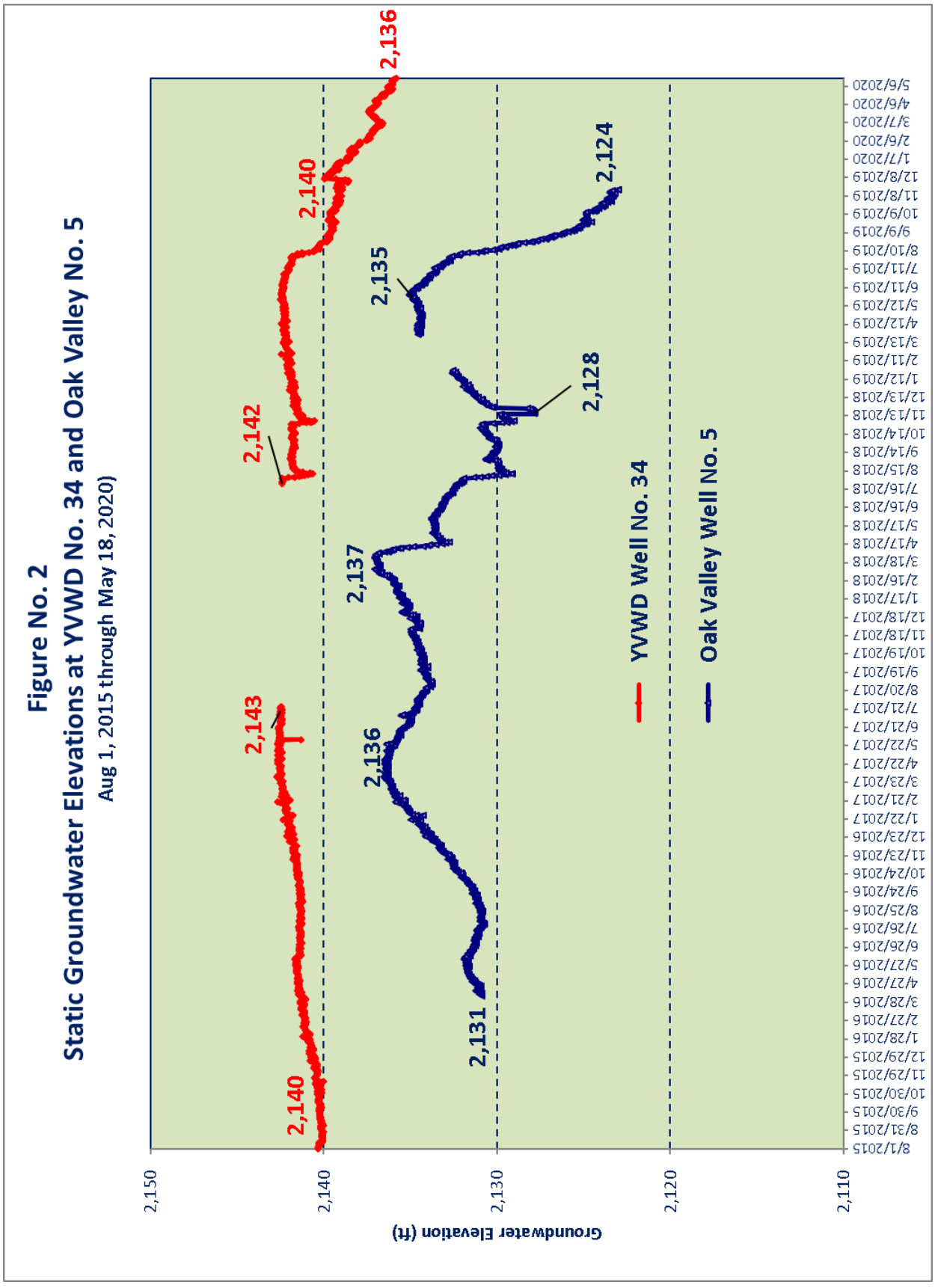


Figure No. 2
Static Groundwater Elevations at YVWD No. 34 and Oak Valley No. 5
Aug 1, 2015 through May 18, 2020)
Groundwater Elevation (ft)
2,150
2,140
2,130
2,120
2,110
YVWD Well No. 34
Oak Valley Well No. 5
2,136
2,140
2,142
2,143
2,140
2,135
2,124
2,128
2,137
2,136
2,131

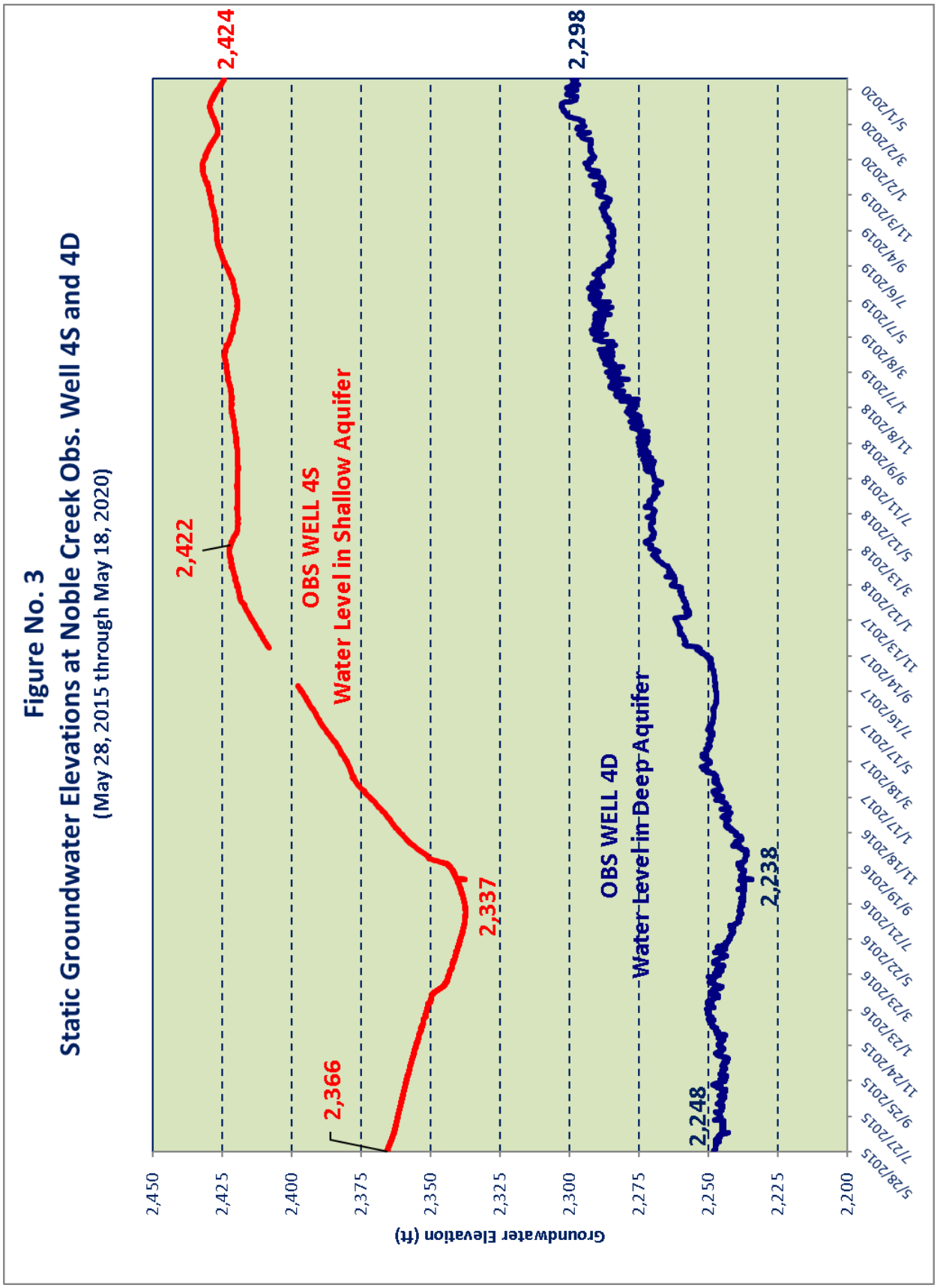


Figure No. 3
Static Groundwater Elevations at Noble Creek Obs. Well 4S and 4D
(May 28, 2015 through May 18, 2020)
2,424
2,422
2,366
2,337
2,298
2,248
2,238
OBS WELL 4S
Water Level in Shallow Aquifer
OBS WELL 4D
Water Level in Deep Aquifer
Groundwater Elevation (ft)
2,450
2,425
2,400
2,375
2,350
2,325
2,300
2,275
2,250
2,225
2,200
5/28/2015
7/27/2015
9/25/2015
11/24/2015
1/23/2016
3/23/2016
5/22/2016
7/21/2016
9/19/2016
11/18/2016
1/17/2017
3/18/2017
5/17/2017
7/16/2017
9/14/2017
11/13/2017
1/12/2018
3/13/2018
5/12/2018
7/11/2018
9/9/2018
11/8/2018
1/7/2019
3/8/2019
5/7/2019
7/6/2019
9/4/2019
11/3/2019
1/2/2020
3/2/2020
5/1/2020

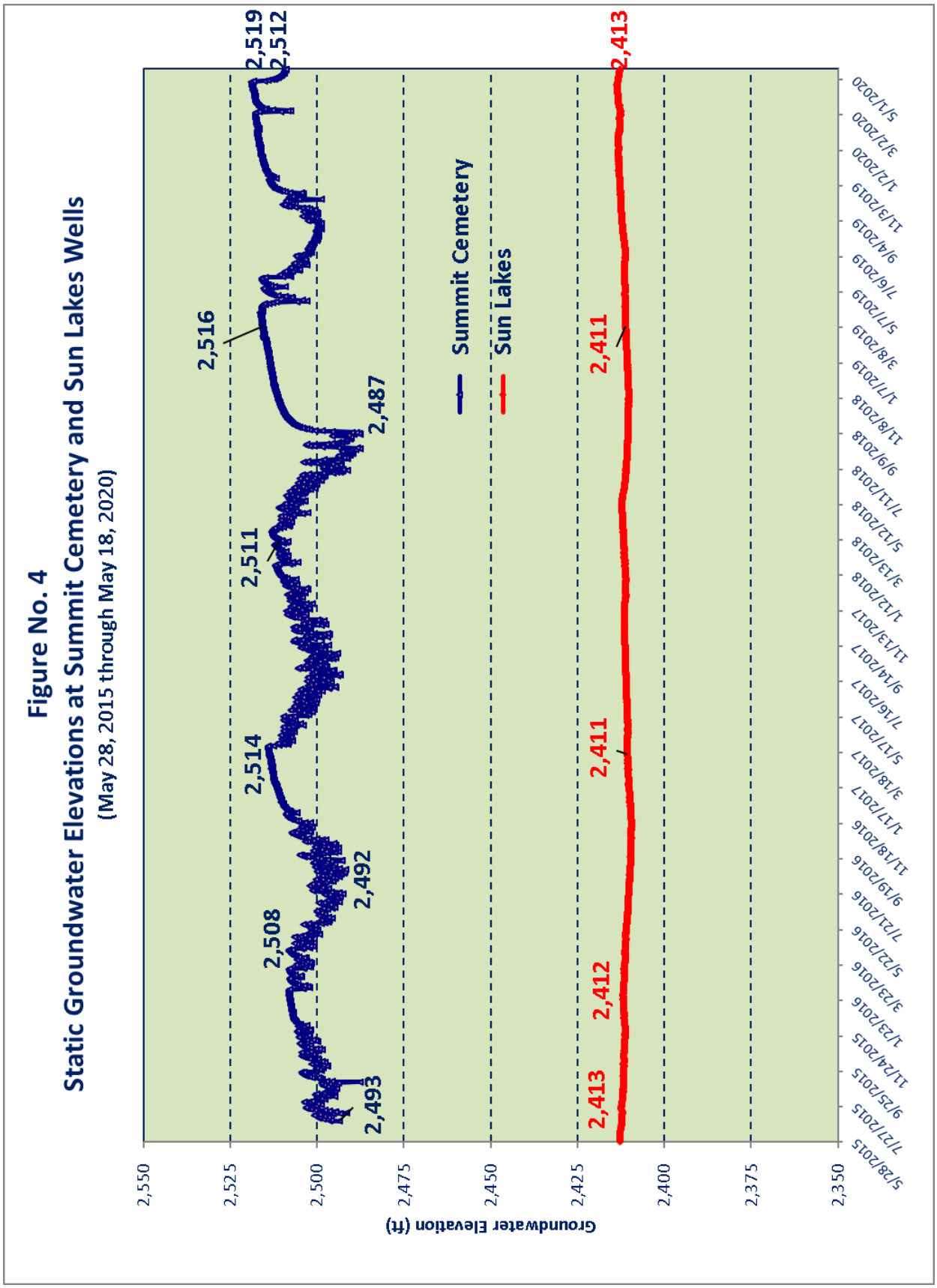


Figure No. 4
Static Groundwater Elevations at Summit Cemetery and Sun Lakes Wells
(May 28, 2015 through May 18, 2020)
Summit Cemetery
Sun Lakes
Groundwater Elevation (ft)
2,550
2,525
2,500
2,475
2,450
2,425
2,400
2,375
2,350
2,519
2,512
2,516
2,487
2,511
2,514
2,492
2,508
2,493
2,413
2,411
2,411
2,412
2,413
5/28/2015
7/27/2015
9/25/2015
11/24/2015
1/23/2016
3/23/2016
5/22/2016
7/21/2016
9/19/2016
11/18/2016
1/17/2017
3/18/2017
5/17/2017
7/16/2017
9/14/2017
11/13/2017
1/12/2018
3/13/2018
5/12/2018
7/11/2018
9/9/2018
11/8/2018
1/7/2019
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1/2/2020
3/2/2020
5/1/2020

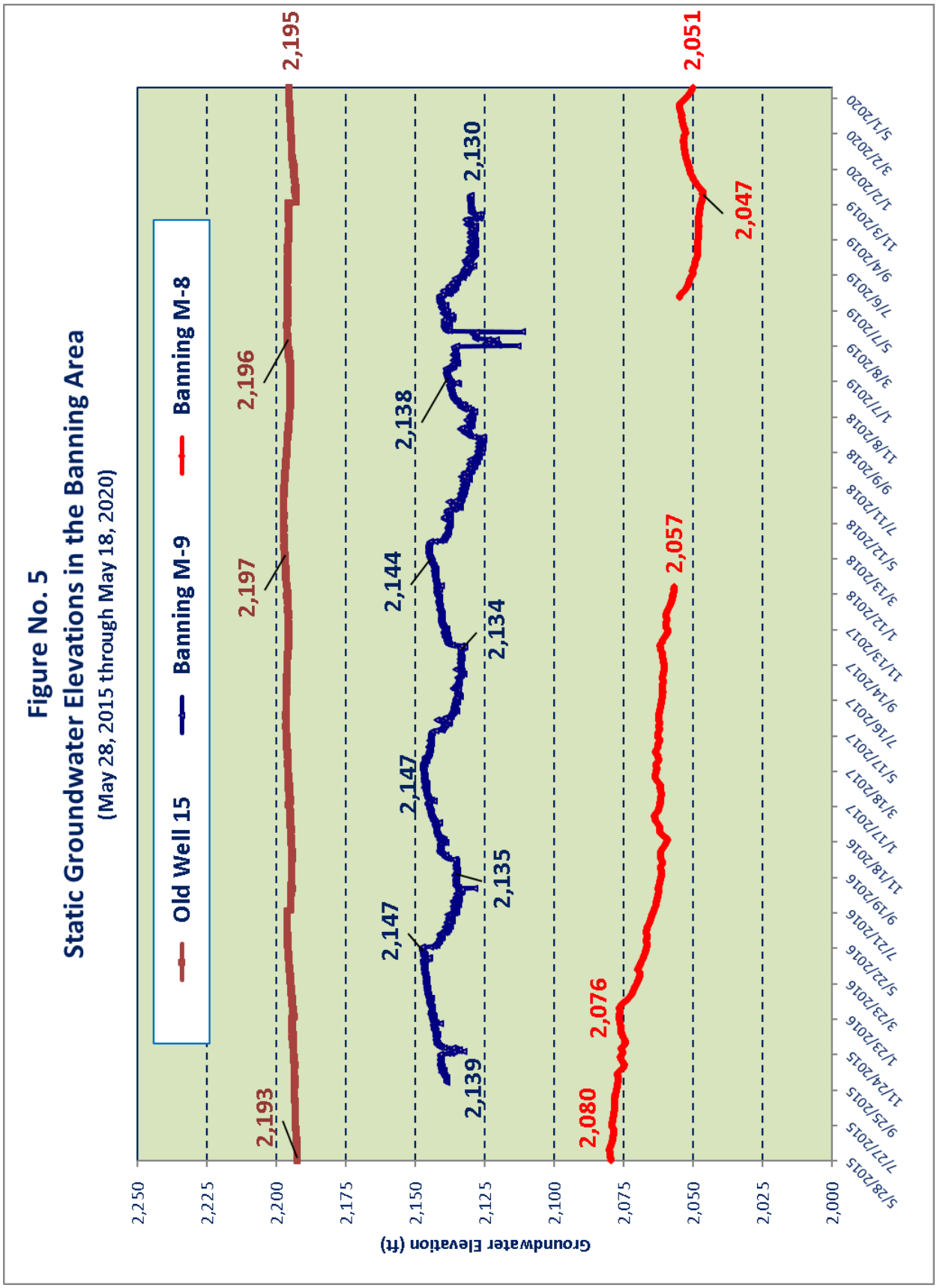
Figure No. 5
Static Groundwater Elevations in the Banning Area
(May 28, 2015 through May 18, 2020)
Old Well 15
Banning M-9
Banning M-8
Groundwater Elevation (ft)
2,250
2,225
2,200
2,175
2,150
2,125
2,100
2,075
2,050
2,025
2,000
2,195
2,196
2,197
2,193
2,144
2,138
2,130
2,134
2,147
2,147
2,135
2,139
2,051
2,047
2,057
2,076
2,080
5/28/2015
7/27/2015
9/25/2015
11/24/2015
1/23/2016
3/23/2016
5/22/2016
7/21/2016
9/19/2016
11/18/2016
1/17/2017
3/18/2017
5/17/2017
7/16/2017
9/14/2017
11/13/2017
1/12/2018
3/13/2018
5/12/2018
7/11/2018
9/9/2018
11/8/2018
1/7/2019
3/8/2019
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1/2/2020
3/2/2020
5/1/2020

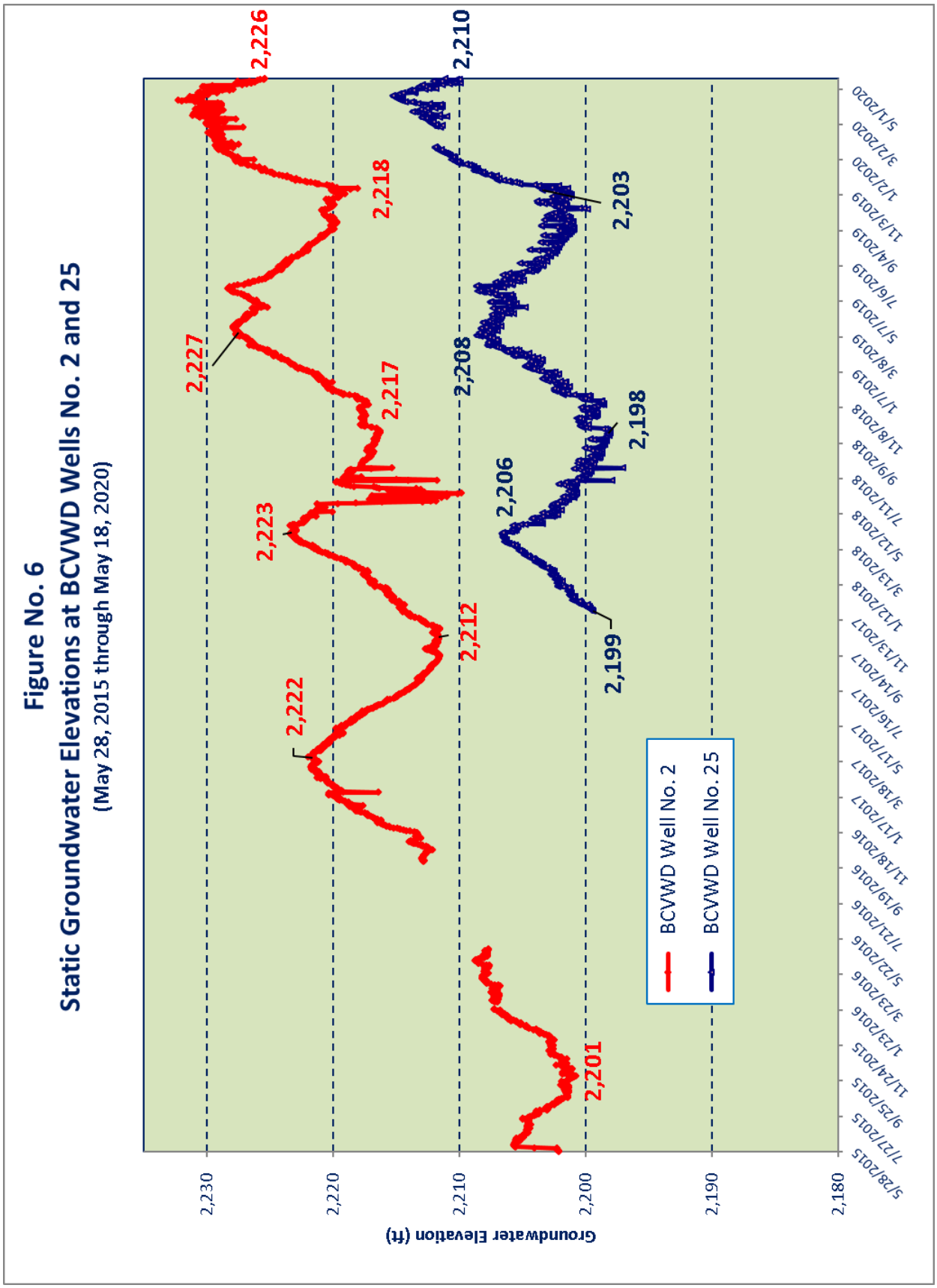
Figure No. 6
Static Groundwater Elevations at BCVWD Wells No. 2 and 25
(May 28, 2015 through May 18, 2020)
Groundwater Elevation (ft)
2,230
2,220
2,210
2,200
2,190
2,180
BCVWD Well No. 2
BCVWD Well No. 25
2,226
2,227
2,223
2,222
2,218
2,217
2,212
2,201
2,210
2,208
2,206
2,203
2,198
2,199

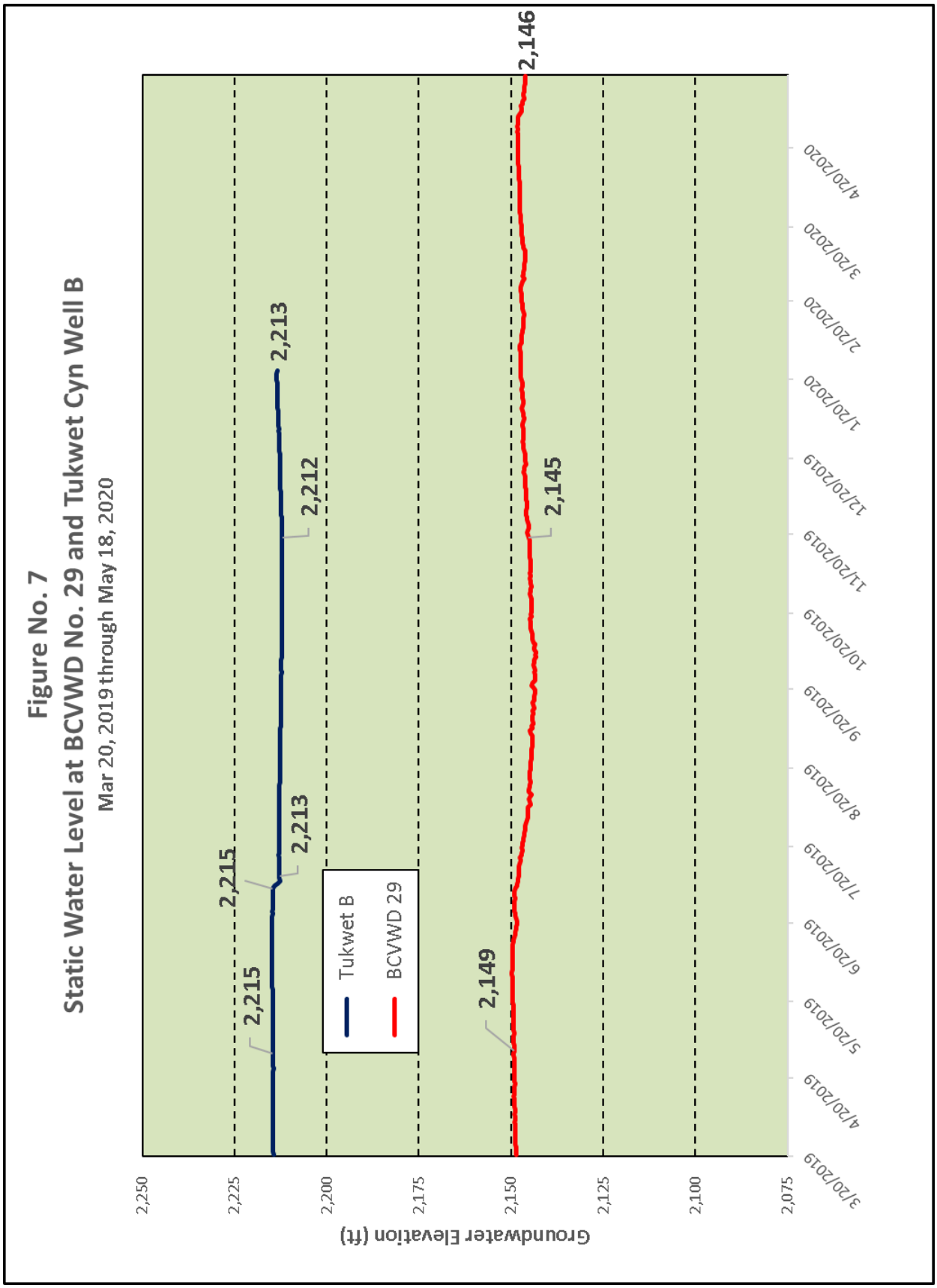
Figure No. 7
Static Water Level at BCVWD No. 29 and Tukwet Cyn Well B
Mar 20, 2019 through May 18, 2020
Groundwater Elevation (ft)
2,250
2,225
2,200
2,175
2,150
2,125
2,100
2,075
3/20/2019
4/20/2019
5/20/2019
6/20/2019
7/20/2019
8/20/2019
9/20/2019
10/20/2019
11/20/2019
12/20/2019
1/20/2020
2/20/2020
3/20/2020
4/20/2020
Tukwet B
BCVWD 29
2,215
2,215
2,213
2,213
2,212
2,149
2,145
2,146

BEAUMONT BASIN WATERMASTER
MEMORANDUM NO. 20-09

Date: June 3, 2020

From: Hannibal Blandon, ALDA Inc.

Subject: A Comparison of Production and Allowable Extractions through April 2020

Recommendation: No recommendation - For informational purposes only.

The purpose of this Technical Memorandum is to present a comparison of production rights from the basin against actual production by Appropriators. Production rights consist of the sum of a) unused production by overlying users from 2015 transferred to appropriators for 2020, b) transfers of overlying water rights from Oak Valley Partners to YVWD to serve certain parcels within the basin, and c) imported water spreading. This sum is compared against actual production through April 2020.

Total production by Appropriators for the first four months of the year was 3,442 ac-ft; imported water spreading for the same period was reported at 3,119 ac-ft. Allowable production for the reporting period was estimated at 9,133 ac-ft. The table below presents the above comparison for all Appropriators in ac-ft.

	City of Banning	Beaumont Cherry Valley Water District	South Mesa Mutual Water Company	Yucaipa Valley Water District	Total
Transfer of Overlying Rights from 2015	1,450	1,962	576	627	**4,614**
Transfer of Overlying Rights from OVP to YVWD	0	0	0	1,399	**1,399**
Imported Water	0	3,119	0	0	**3,119**
Total	**1,450**	**5,081**	**576**	**2,026**	**9,133**
Production	432	2,447	62	501	**3,442**
% of Total	29.8%	48.2%	10.8%	24.7%	**37.7%**

BEAUMONT BASIN WATERMASTER
MEMORANDUM NO. 20-10

Date: June 3, 2020

From: Hannibal Blandon, ALDA Inc.

Subject: Updated 2018 Consolidated Annual Report and Engineering Report – Delivery of Final Report

Recommendation: For Information Purposes only.

During the February 2019 regular meeting a formal presentation of the 2018 Draft report was made. That presentation addressed groundwater production, spreading of imported water, operating safe yield, wastewater discharges as well as water quality and storage accounts.

At the February 2020 regular meeting a formal presentation of the Final report was made. This presentation addressed a) comments received from the draft report, b) a revised Section 3.4.2 Transfers of Overlying Rights for Service by an Appropriator and c) revised storage accounts. The final version of the report was approved by the Watermaster Committee during this meeting provided that a few additional comments be incorporated and that the report be limited to document activities that took place during Calendar Year 2018 only.

We have incorporated the additional comments and removed any language from the report that was not pertinent to 2018. The revised version of the final report, dated June 3rd, 2020, supersedes the February 5th version of the same report.

A hard copy of the report will be distributed to members of the Watermaster Committee at the August 2020 regular meeting, should public meetings be allowed by then.

The Final 2018 Consolidated Annual Report is available online from the “Documents & Publications” section of the Beaumont Basin Watermaster website. (www.beaumontbasinwatermaster.org).

View the updated 2018 Annual Report at
http://documents.yvwd.dst.ca.us/bbwm/documents/2018/2018annualreport-final200603.pdf

BEAUMONT BASIN WATERMASTER
MEMORANDUM NO. 20-11

Date: June 3, 2020

From: Hannibal Blandon, ALDA Inc.

Subject: Consideration of Change Order No. 2 for Task Order No. 17 for the Development of a Return Flow Methodology for the Beaumont Basin.

Recommendation: That the Watermaster Committee consider the approval of basic tasks 1 through 6 and optional tasks 7 and 8 as presented under Change Order No. 2. The estimate to complete the basic tasks 1 through 6 is $25,510.00 while the estimated cost to complete optional tasks 7 and 8 is an additional $43,750.00. If approved, the Watermaster Committee should direct the Treasurer to invoice specific Appropriators based on anticipated benefits.

On October 3, 2018, the Watermaster Committee approved Task Order No. 17 for the Development of a Return Flow Methodology for the Beaumont Basin (See TM 18-21). Task Order No. 17 was approved for the sum not to exceed $40,140.00. The expenses associated with the initial task order were to be divided equally between Appropriators anticipated to receive a benefit from the development of this methodology.

On October 2, 2019, the Watermaster Committee approve Change Order No. 1 for the amount of $4,780.00 bringing the contract amount under this task to $44,920.00 (See TM 19-22). At that meeting, members of the Watermaster Committee provided both written and verbal comments; the comments were grouped into the following general categories:

1. Indoor/Outdoor Water Use Estimates
2. Landscape Irrigation Efficiency Assumptions
3. Need for Additional Water Delivery Account Types
4. Accounting for Pipeline Losses in both Sewer and Water Pipelines

At the February 5, 2020 Watermaster Committee meeting, a presentation was made on the additional scope of services included under Task Order No. 2. Committee members asked that the scope of services be modified to include additional and optional tasks for their consideration.

The attached scope of services addresses those areas identified at the October 2, 2019 and February 5, 2020 meetings. The estimated cost to complete the basic tasks 1 through 6 is $25,510.00. Approval of this change order will bring the upper limit on the contract to $70,430.00. The estimated cost to complete optional task 7 and 8 is $43,750.00. Approval of these optional tasks will bring the upper limit on the contract to $114,180.00.

ALDA Inc.
5928 Vineyard Avenue
Alta Loma, CA 91701
Tel: (909) 587-9916
Fax: (909) 498-0423

June 3rd, 2020

Joseph B. Zoba, General Manager
Yucaipa Valley Water District
12770 Second Street
Yucaipa, California 92399

Subject: **Beaumont Basin Watermaster – Task Order No. 17 – Change Order 2**
Development of a Return Flow Accounting Methodology

Dear Mr. Zoba:

As per the Watermaster Committee request, ALDA Inc., in association with Thomas Harder & Company (TH&Co), has prepared this request for additional budget to address comments to our draft Technical Memorandum (TM) entitled "Return Flow Accounting Methodology for the Beaumont Basin Adjudicated Area," dated July 29, 2019. This work is being conducted per Task Order No. 17. Members of the Beaumont Basin Watermaster Committee provided both written and verbal comments regarding the TM at the October 2nd, 2019 meeting. The comments were grouped into the following general categories:

1. Indoor/Outdoor Water Use Estimates
2. Landscape Irrigation Efficiency Assumptions
3. Need for Additional Water Delivery Account Types
4. Accounting for Pipeline Losses in both Sewer and Water Pipelines

At the February 5th, 2020 meeting, a presentation was made to the Watermaster Committee on the proposed scope of services and additional optional tasks identified. Our revised scope of services describe the basic services under tasks 1 through 6; optional services are listed under tasks 7 and 8.

We welcome your thorough review of our proposed scope services. Should you have any questions, please contact us at 909-587-9916 during normal business hours.

Very truly yours

ALDA Inc.

F. Anibal Blandon, P.E.
Principal

Beaumont Basin Watermaster – Task Order No. 17
Development of Return Flow Accounting Methodology – Change Order No. 2 Jun 3rd, 2020

SCOPE OF SERVICES

Task 1 – Modifications to Indoor/Outdoor Water Use Estimates

The methodology to estimate the percentage of indoor versus outdoor water use, as outlined in the draft report, is based on a comparison of wastewater influent at the City of Beaumont wastewater treatment plant with total delivered water within the City's sewered area. Inflows to the treatment plant were assumed to be analogous to indoor water use. The proportion of indoor vs. outdoor water use identified for the City of Beaumont sewered area was also applied to the Banning and Yucaipa Valley Water District (YVWD) areas.

In order to address Board member comments, the following changes in the methodology will be analyzed and incorporated:

- ✓ In the last 15 years, the percentage of outdoor water use across the Beaumont Basin has decreased as newer homes were built with smaller landscape footprints and as conservation ordinances were initiated. This trend is predicted to continue. The method proposed in the draft report should address this through the assumption that, as conservation through reduced outdoor water use occurs, the difference between the total delivered water and inflow to the wastewater treatment plant will decrease. TH&Co will incorporate this analysis to be done on an annual basis to address increased outdoor water conservation.

- ✓ The draft report assigned outdoor water use estimates to all sewered water accounts equally. TH&Co will evaluate the potential benefits of applying different proportions of indoor/outdoor water use to individual areas of any given Appropriator based on differences in landscape footprint.

- ✓ TH&Co will apply different proportions of indoor/outdoor water use to the City of Banning and YVWD based on differences between their respective wastewater treatment plant inflows and total delivered water. For YVWD, TH&Co will use dual-metered water services to help delineate indoor vs. outdoor water use.

Estimated Hours: 45 Hours

Estimated Cost: $4,830.00

Task 2 – Further Evaluation of Landscape Irrigation Efficiency

The current return flow methodology assumes that 25 percent of applied water will become return flow. It has been noted that irrigation efficiency has increased with the incorporation of drought tolerant landscaping, new spray sprinkler regulations and conservation. TH&Co will further evaluate the 25 percent return flow factor (75 percent

irrigation efficiency) assumption. As needed, different return flow factors may be applied to different areas within each Appropriator service area.

Estimated Hours: 48 Hours

Estimated Cost: $5,640.00

Task 3 – Incorporation of Additional Water Delivery Account Types

The current methodology includes four water delivery account types: sewered, unsewered, landscape, and construction. The Board has requested that TH&Co include commercial property as an additional category, or account type, for assigning return flow. For budget purposes, we will incorporate the top 20 industrial water users into this new account type. In addition, TH&Co will also evaluate the feasibility and benefit of dividing the sewered category into newer developments and older developments in order to link revised return flow factors from Task 2.

Estimated Hours: 33 Hours

Estimated Cost: $3,540.00

Task 4 – Other Changes

Other comments to be addressed in the draft report will include:

- ✓ Potential revisions to the return flow lag time schedule table to adjust for changing water level fluctuations over time.
- ✓ Adjustments to return flow methodology for the City of Banning to account for water delivered to the Banning Golf Course from outside the Beaumont Basin adjudicated area.

Estimated Hours: 18 Hours

Estimated Cost: $2,320.00

Task 5 – Application of Refined Methodology to Recent Data

Using the refined return flow methodology developed based on comments from the Board, TH&Co will estimate the return flow, by Appropriator, for the most recent calendar year that data are available. The return flow will be estimated for the portions of each Appropriators' service areas that overlie the Beaumont Basin adjudicated area.

Estimated Hours: 46 Hours

Estimated Cost: $5,280.00

Task 6 – Finalize Return Flow Methodology Technical Memorandum

TH&Co will revise the draft Technical Memorandum describing the Beaumont Basin return flow accounting methodology to incorporate refinements based on Board comments. The cost estimate for this task includes submittal of one draft-final version of the TM for review and comment and one final version upon incorporation of comments.

Estimated Hours: 32 Hours

Estimated Cost: $3,900.00

OPTIONAL TASKS

Task 7 – Accounting for Pipeline Losses and Infiltration and Inflow

TH&Co will conduct an analysis to assess pipeline losses in both the sewer and the water distribution system. Losses from either pipeline system would contribute to return flow. Sewer line losses would also impact the calculation of indoor vs. outdoor water use. TH&Co will solicit pipeline loss information from the Appropriators to make adjustments to the indoor/outdoor water use estimates and account for return flow from pipeline losses. TH&Co will also evaluate the impacts of treatment plant inflow and infiltration not associated with public wastewater generation on the treatment plant inflow used in the estimate of indoor vs. outdoor water use.

Estimated Hours: 20 Hours

Estimated Cost: $2,340.00

Task 8 – Analyze Potential Changes in TDS Concentration in Groundwater Associated with Return Flow

The concentration of total dissolved solids (TDS; i.e. salt) in return flow waters is typically higher than that in the underlying groundwater. As such, over time return flow can produce an increase in the salt concentration of the groundwater. In addition to the salt concentration of the return flow water, the resultant salt concentration in the groundwater depends on the rate at which water moves through - and the salt concentrations within - both the unsaturated and saturated zone. The depth to the water table (unsaturated zone thickness) also plays an important role as it governs the storage volume for salts within the unsaturated zone.

TH&Co will use the existing groundwater flow model of the Beaumont Basin, coupled with a solute transport model, to forecast potential changes in TDS concentration in the groundwater associated with return flow. The sources of this information are (or assumed to be) as follows:

- ✓ Data from the initial return flow evaluation[1] will be used to estimate the rate at which return flow moves through the unsaturated zone. Specifically, the initial evaluation provides estimates of the volumetric annualized return flow for the three appropriators within the Beaumont Basin Adjudication Area: the Beaumont-Cherry Valley Water District (BCVWD), the City of Banning (COB), and the Yucaipa Valley Water District (YVWD). It is noted that the annualized return flows are for the entire service area for these appropriators, which will dictate the scale of the TDS concentration evaluation.
- ✓ TDS/salt concentrations in the return flow ('source concentrations') will be assumed from literature values.
- ✓ The basin-wide groundwater flow model maintained and updated annually by TH&Co will be used as the primary source for providing the rate at which groundwater moves through the saturated zone as well as the depth to groundwater.
- ✓ Initial TDS/salt concentrations in groundwater throughout the basin (i.e., 'saturated zone initial concentration conditions') will be assessed based on data in the Beaumont Basin Watermaster water quality database.

The above data sources will provide the framework through which TH&Co will develop a Fate and Transport model of the Beaumont Basin to forecast TDS/salt concentrations in groundwater. Given the assumptions listed above and our overall understanding of the problem, an unsaturated zone model will not be required. The recharge package within the model will be configured to act as an areal source term for the solute transport model. TH&Co proposes to use MT3D for the solute transport model code. This code is a widely used and critically peer reviewed solute transport code that works seamlessly with MODFLOW – the numerical code on which the Beaumont Basin groundwater flow model is based. The output from MT3D will be used to generate TDS/salt concentration versus time charts at selected production and/or monitoring wells and plan-view salt concentrations maps of the Beaumont Basin.

The results of the analysis of potential future changes in TDS/salt concentrations in groundwater associated with return flow will be incorporated into the TM in Task 6. The additional information to be provided in the TM will include:

- ✓ Background and purpose for the solute transport analysis.
- ✓ Sources of data for the analysis.
- ✓ The methodology used to assess projected changes in TDS/salt concentrations.

[1] TH&Co, 2019. Technical Memorandum - Return Flow Accounting Methodology for the Beaumont Basin Adjudicated Area. Dated July 29, 2019

- ✓ Results of the analysis including projected salt concentrations.

The report will include graphics and charts showing model analysis results. Supporting data and information will be provided in appendices as appropriate.

Estimated Hours: 334 Hours

Estimated Cost: $41,410.00

COST ESTIMATE

The estimated cost to perform the scope of work as outlined herein for Tasks 1 through 6 is $25,510.00 (Twenty-Five Thousand Five Hundred Ten Dollars and 00/100); this estimate is based on 222 technical and administrative hours. The additional cost to conduct the optional tasks 7 and 8 is $43,750.00 (Forty-Three Thousand Seven Hundred and Fifty Dollars and 00/100). This additional estimate is based on 354 technical and administrative hours. Services will be billed on a time and material basis up to the approved limit and according to the billing rates below.

Billing Rates for ALDA Inc. / Thomas Harder and Company for Task Order No. 17

Position	Hourly Rate
Project Manager	$180.00
Principal Hydrogeologist	$180.00
Project Hydrogeologist	$120.00
Staff Hydrogeologist	$ 95.00
Graphics / Designer Drafter	$ 85.00
Clerical	$ 65.00