MEETING AGENDA
for
PLANNING, RESOURCES AND OPERATIONS COMMITTEE

May 28, 2019 @ 3 pm
At Company Office 139 N. Euclid Avenue, Upland, CA

- **Call to Order**

1. Recognitions and Presentations:
2. Additions-Deletions to the Agenda:
3. Public Comments
   This is the time for any shareholder or member of the public to address the committee members on any topic under the jurisdiction of the Company, which is on or not on the agenda. Please note, pursuant to the Brown Act the Committee is prohibited from taking actions on items not listed on the agenda. For any testimony, speakers are requested to keep their comments to no more than four (4) minutes, including the use of any visual aids, and to do so in a focused and orderly manner. Anyone wishing to speak is requested to voluntarily fill out and submit a speaker's form to the manager prior to speaking.
4. Approval of Committee Meeting Minutes
   A. Regular Committee Minutes of March 26, 2019
5. Planning and Operational Issues:
   A. Development of Five-Year Capital Improvement Program
      Discussion and possible action regarding future CIP
   B. Nuisance Vector Control at Spreading Basins
      Discussion and possible action regarding midge fly at Basin 6A and 15th Street
   C. Automatic Meter Reading (AMR)
      Discussion and possible action regarding potential implementation of AMR system
   D. Nitrate Study
      Discuss possible action regarding final report
   E. Ad hoc Office Relocation Committee
      Discussion and possible action regarding appointing member and alternate to Ad hoc Committee
6. Planning and Operational Updates:
   A. Project Status Report/Project List
      Report on on-going projects
7. Basin Issues and Updates:
   - San Antonio Canyon Watershed – Verbal report
   - Chino Basin - Verbal report
   - Six Basins - Verbal report
   - Cucamonga Basin – Verbal report
8. Closed Session: None.
9. Committee's Comments and Future Agenda Items:
   This is the time for the Committee to comment and consider future agenda items relative to planning, water resources and operations of the company and its shareholders.

Adjournment:
The next regular Committee Meeting will be on July 23, 2019 at 3pm unless otherwise noted.

NOTE: All agenda report items and back-up materials are available for review and/or acquisition at the Company Office (139 N. Euclid Avenue, Upland, CA.) during regular office hours, Monday through Friday [7:30 – 11:30 & 12:30 – 4:30]. Agenda materials are also available for review and copying at the Upland Public Library located at 450 N. Euclid Avenue.

POSTING STATEMENT: On May 23, 2019 a true and correct copy of this agenda was posted at the entry of the Company Office (139 No. Euclid Avenue), and on the public bulletin board at 450 N. Euclid Avenue (Upland Public Library), and on the Company Web Site.

MINUTES OF THE SAN ANTONIO WATER COMPANY
PLANNING, RESOURCES, and OPERATIONS COMMITTEE
March 26, 2019

An open meeting of the Planning, Resources, and Operations Committee (PROC) of the San Antonio Water Company (SAWCo) was called to order at 3:00 p.m. on the above date at the company office located at 139 N. Euclid Avenue, Upland, California. Committee members present were Gino Filippi and Tom Thomas. Also in attendance were Bob Bowcock representing CalMat Co. and SAWCo's General Manager Brian Lee, Assistant General Manager Teri Layton, and Senior Administrative Specialist Kelly Mitchell. Mr. Thomas presided.

1. Recognitions and Presentations – None.

2. Additions-Deletions to the Agenda – None.

3. Public Comments – None.

4. Approval of Committee Meeting Minutes:
   A. Regular Committee Minutes of November 27, 2018 – Typographical error corrections to information on page 3 of the minutes were noted. Mr. Filippi moved and Mr. Thomas seconded to approve the meeting minutes of November 27, 2018 as corrected. Motion carried.

5. Planning and Operational Issues:
   A. Article X of Company Bylaws; Right to Service, Classes of Service, Tolls or Charges and Basic and Extended Area – Mr. Lee brought to the Committee's attention to Article X of the Company Bylaws which covers the right to service, classes of service and tolls or charges, right-of-way for distributing system, and the basic area and extended area. He advised the Committee that he clarified with legal counsel how this article was meant to be interpreted. He then reviewed each category covered under Article X with the Committee.

   Mr. Lee explained the Bylaws state that all water shall be supplied at cost that is available for distribution. However, not all water sources are created equally and not all water that is held by SAWCo is available for distribution. Water is held back for a variety of reasons.

   The three classes of service recognized in the Bylaws are domestic, miscellaneous, and municipal. Domestic and miscellaneous are similar in that the water is directly delivered to the shareholders through SAWCo's distribution system. The Municipal class of service provides for water delivered to shareholders but does not have verbiage that the water is provided via SAWCo's distribution system.

   Tolls and charges incurred by shareholders may be different within and without each class where the cost of service is not uniform. The Bylaws assume shareholders have local use for the water and the means to receive the water from SAWCo's.

Mr. Thomas stated that SAWCo has sold unproduced water to shareholders in the past. Other than service agreements, the water sold by this means was done so outside of entitlement and was done at a negotiated price. Capital improvement projects over the course of 10 years were funded through the sale of stored water.

Mr. Bowcock stated SAWCo is a company of shareholders and each individual share represents a share in the water. He stated CalMat Co. stays current on their water availability charge which affords them the right to own the water shares, nothing else. He felt that paying the Tier 1 rate was subsidizing the domestic system and the City of Upland's shareholdings. He felt management makes a decision to store water based on good management practice but it does not release his interest in that accumulated share. He stated SAWCo has melded assets and charges a published melded rate and to do something different, he thinks, runs counter intuitive of that process.

Mr. Lee informed all present that when proposing annual water entitlements SAWCo considers groundwater production rights and canyon water but does not factor in storage water. The entitlements are based on water that is available assuming that the water is going to be put to use immediately.

Mr. Thomas stated that according to the Bylaws, miscellaneous shareholders do not have right to the water unless they can receive it directly from SAWCo's delivery system. Mr. Bowcock disagreed with Mr. Thomas' statement.

Mr. Thomas felt that to be willing to approve something it would have to be negotiated and because of the replenishment value of the water and other obligations SAWCo has in the Chino Basin the price should be something higher than the commodity rate. He stated the Board wanted to do what is fair and reasonable. In taking a closer look at the Bylaws SAWCo is trying to adhere to them and alter them if necessary. However, it did not appear this would be a case to warrant altering them. He reiterated that past practice has been to negotiate the price for the sale of stored water in Chino Basin.

Mr. Bowcock stated he cannot bring a negotiated rate to his employer because it is different from the published rate and he cannot justify the difference in pricing.

Mr. Lee stated he felt exceptions to the Bylaws weaken the Bylaws.

There was consensus on the Committee to have the General Manager take the information discussed in the meeting back to legal counsel and then bring it to the Board for possible action.

B. Development Will Serve Letters – Mr. Lee brought to the Committee's attention the San Bernardino County's request for proof of water service for a home in the San Antonio Heights currently going through a remodel. He felt it in the best interest of the Company and shareholders to revert back to requiring one share of water stock for a one acre parcel, one-half share of water stock for a half acre parcel and so forth, with a one-half share being the minimum required.

Mr. Thomas described the current process shareholders are required to take in order to receive a will serve letter to submit to the San Bernardino County.

There was consensus on the Committee to have staff issue will serve letters based upon the size of the parcel the building is being built on with a minimum of ½ share of water stock required. The item will not be brought to the full Board.

6. Planning and Operational Update -
   A. ***Project Status Report –***
      - ***Holly Drive Reservoir Phase I –*** The final environmental paperwork was recently received and the Notice to Proceed is expected shortly.
      - ***Reservoir 7 –*** Reroofing – Staff is currently working on the Notice to Proceed for this project.

7. Basin Issues and Updates
   - ***San Antonio Canyon Watershed –*** A committee meeting is scheduled for the following week. Mr. Lee expects to start outreach to the communities in this area to convey the importance of the health of the watershed.

   - ***Chino Basin*** – Nothing new to report.

   - ***Six Basins*** – The Board meeting is scheduled for the following day where they will be approving the Six Basins Annual Report.

   - ***Cucamonga Basin*** – A meeting with Cucamonga Valley Water District, West End Consolidated Water Company, and SAWCo to discuss modernizing the judgment is scheduled for April 2nd. Staff is building relationships and taking in everyone's comments on updating the judgment.

8. Closed session: – None.

9. Committee's Comments and Future Agenda Items: None.

Adjournment: – Mr. Filippi moved to adjourn the meeting at 3:50 p.m. Motion carried.

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Assistant Secretary
Brian Lee

Domestic System	Number		Per facility replacement cost	Facilities cost	Design Life	Cost per year
Wells	3	ea	$ 1,000,000	$ 3,000,000	25	$ 120,000
Reservoirs	7,560,000	gallons	$ 1.25	$ 9,450,000	80	$ 118,000
Booster Stations	6	ea	$ 400,000	$ 2,400,000	40	$ 60,000
Intakes	2	ea	$ 400,000	$ 800,000	40	$ 20,000
Pipelines	133,256	lf	$ 200	$ 26,651,200	80	$ 333,000
					TOTAL YEARLY CIP BUDGET	$ 651,000

Irrigation System	Number		Per facility replacement cost	Facilities cost	Design Life	Cost per year
Wells	7	ea	$ 1,000,000	$ 7,000,000	25	$ 280,000
Reservoirs	3,000,000	gallons	$ 1.25	$ 3,750,000	80	$ 47,000
Booster Stations	3	ea	$ 400,000	$ 1,200,000	40	$ 30,000
Intakes	2	ea	$ 400,000	$ 800,000	40	$ 20,000
Pipelines	112,967	lf	$ 200	$ 22,593,400	80	$ 282,000
					TOTAL YEARLY CIP BUDGET	$ 659,000

TOTAL COMPANY YEARLY CIP BUDGET	$ 1,310,000

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Proposed 2020 CIP

Domestic Water System

	Project	Justification	Priority	Project Cost Est	Design (12%)	2017 Construction Cost	2020 Construction (88%) adjusted for inflation	2020	2021	2022	2023	2024
1	New Well on Site 19	2017 Master Plan	High	$ 1,308,789	$ 157,055	$ 1,054,000	$ 1,151,734	$ 157,055	$ 222,602	$ 322,602	$ 614,196	
2	Glendale Road between Mountain and Park	2017 Master Plan	High	$ 41,822	$ 5,019	$ 33,680	$ 36,803	$ 41,822				
3	Cliff near Euclid Crescent and Cliff	2017 Master Plan	Med	$ 56,008	$ 6,721	$ 45,105	$ 49,287	$ 56,008				
4	Terrace Drive w/ Park	2017 Master Plan	Med	$ 7,761	$ 931	$ 6,250	$ 6,830	$ 7,761				
5	24-inch pipeline Electric Ave to Res9	2017 Master Plan	Med	$ 422,190	$ 50,663	$ 340,000	$ 371,527	$ 211,095	$ 211,095			
6	Edison Pond Expansion	2017 Master Plan	Med	$ 239,957	$ 28,795	$ 193,243	$ 211,162		$ 119,978	$ 119,978		
7	Well #15 Replacement	2017 Master Plan	Med	$ 785,273	$ 94,233	$ 632,400	$ 691,041					$ 392,637
8	W 25th Street, Electric to Mountain	2017 Master Plan	Low	$ 120,390	$ 14,447	$ 96,953	$ 105,943			$ 120,390		
9	Primrose, north of 25th	2017 Master Plan	Low	$ 11,548	$ 1,386	$ 9,300	$ 10,162				$ 10,230	
10	Linda, north 24th	2017 Master Plan	Low	$ 57,741	$ 6,929	$ 46,500	$ 50,812					$ 57,741
11	Sierra, Moutain to San Antonio Crest	2017 Master Plan	Low	$ 47,059	$ 5,647	$ 37,898	$ 41,412					$ 47,059
12	Master Plan/ Asset Mngmt Schd.	Timely	High		$ 140,000			$ 140,000				
13	UWMP	State	High		$ 50,000				$ 50,000			
14	Crosswall Enviro Mitigation	Permit	High	$ 310,434	$ 37,252	$ 250,000	$ 273,182	$ 62,087	$ 62,087	$ 62,087	$ 62,087	$ 62,087
								Yearly Total	$ 675,827	$ 665,762	$ 625,057	$ 686,513	$ 559,523

Five Year Average $ 642,537

3% Yearly Inflation	100%	103.0%	106.1%	109.3%	112.6%

Irrigation System

	Project	Justification	Priority	Project Cost Est	Design (12%)	2020 Construction (88%)	2020	2021	2022	2023	2024
1	N San Antonio, Berry Box to 10 Fwy., Phase 1			$ 450,000	$ 54,000	$ 396,000	$ 450,000				
	N San Antonio, Berry Box to 10 Fwy., Phase 2			$ 450,000	$ 54,000	$ 396,000		$ 450,000			
2	25th and Burt			$ 272,727	$ 32,727	$ 240,000		$ 100,000	$ 172,727		
3	23rd St / San Antonio to Campus			$ 1,073,864	$ 128,864	$ 945,000			$ 322,159	$ 322,159	$ 322,159
4	Campus Ave / 16th to 18th			$ 613,636	$ 73,636	$ 540,000				$ 306,818	$ 306,818
5	Master Plan/ Asset Mngmnt Schd.			$ 80,000	$ 80,000	$ -	$ 80,000				
							$ 530,000	$ 550,000	$ 494,886	$ 628,977	$ 628,977

Five Year Average $ 566,568

Company

	Project	Justification	Priority	Project Cost Est	Design (12%)	2020 Construction (88%)		2020	2021	2022	2023	2024
1	Consolidated Campus	Timely	Med	$ 4,375,000	$ 525,000	$ 3,500,000	$ 3,850,000	$ 262,500	$ 270,375	$ 2,042,233	$ 2,231,603	

HEALTH AND SAFETY CODE - HSC

DIVISION 3. PEST ABATEMENT [2000 - 2910] *(Heading of Division 3 amended by Stats. 1957, Ch. 205.)*

CHAPTER 1. Mosquito Abatement and Vector Control Districts [2000 - 2093] *(Chapter 1 added by Stats. 2002, Ch. 395, Sec. 6.)*

ARTICLE 5. Abatement [2060 - 2067] *(Article 5 added by Stats. 2002, Ch. 395, Sec. 6.)*

2060. (a) A district may abate a public nuisance pursuant to this article.

(b) The person or agency claiming ownership, title, or right to property or who controls the diversion, delivery, conveyance, or flow of water shall be responsible for the abatement of a public nuisance that is caused by, or as a result of, that property or the diversion, delivery, conveyance, or control of that water.

(Added by Stats. 2002, Ch. 395, Sec. 6. Effective January 1, 2003.)

2061. (a) Whenever a public nuisance exists on any property within a district or on any property that is located outside the district from which vectors may enter the district, the board of trustees may notify the owner of the property of the existence of the public nuisance.

(b) The notice required by subdivision (a) shall do all of the following:

(1) State that a public nuisance exists on the property, describe the public nuisance, and describe the location of the public nuisance on the property.

(2) Direct the owner of the property to abate the nuisance within a specified time.

(3) Direct the owner of the property to take any necessary action within a specified time to prevent the recurrence of the public nuisance.

(4) Inform the owner of the property that the failure to comply with the requirements of the notice within the specified times may result in the district taking the necessary actions, and that the owner shall be liable for paying the costs of the district's actions.

(5) Inform the owner of the property that the failure to comply with the requirements of the notice within the specified times may result in the imposition of civil penalties of up to one thousand dollars ($1,000) per day for each day that the public nuisance continues after the specified times.

(6) Inform the owner of the property that before complying with the requirements of the notice, the owner may appear at a hearing of the board of trustees at a time and place stated in the notice.

(c) The board of trustees shall cause the notice required by subdivision (a) to be served on the owner of the property in the same manner as a summons in a civil action. If, after a diligent search, the notice cannot be served on the owner of the property, the board of trustees shall cause the notice to be posted in a conspicuous place on the property for not less than 10 days before the hearing. Not less than 10 days before the hearing, the board of trustees shall also cause a copy of the notice to be mailed by certified mail to the owner of the property at the address shown on the most recent assessment roll of the county in which the property is located.

(d) At the hearing before the board of trustees at the time and place stated in the notice, the board of trustees shall accept written and oral testimony from the property owner and other persons. At the close of the hearing, the board of trustees shall find, based on substantial evidence in the record, whether a public nuisance exists on the property. If the board of trustees finds that a public nuisance exists, the board of trustees shall order the owner of the property to abate the public nuisance and to take other necessary actions to prevent the recurrence of the public nuisance. The board of trustees shall specify a reasonable time by which the owner of the property shall comply with these requirements.

(e) If the owner of the property does not abate the public nuisance and take the necessary actions to prevent the recurrence of the public nuisance within the time specified by the board of trustees, the district may abate the public nuisance and take the necessary actions to prevent the recurrence of the public nuisance. In addition, the board of trustees may impose civil penalties pursuant to Section 2063.

(Added by Stats. 2002, Ch. 395, Sec. 6. Effective January 1, 2003.)

2062. (a) A board of trustees shall not declare an agricultural operation to be a public nuisance because of the presence of immature flies if the board determines that the agricultural operation is designed and managed consistent with the accepted standards and practices for controlling fly development on similar agricultural operations.

(b) As used in this section, "accepted standards and practices" means those standards and practices determined by the University of California Cooperative Extension, the department, or local public health agencies. These standards and practices include, but are not limited to, all of the following:

(1) Property design and layout of the agricultural operation to minimize the opportunity for fly development.

(2) A comprehensive system for manure management to include storage, removal, and disposal.

(3) A comprehensive system for green waste management to include storage, removal, and disposal.

(4) An integrated pest management program to control the development and harborage of flies, including the components of surveillance, management, containment, and control.

(Added by Stats. 2002, Ch. 395, Sec. 6. Effective January 1, 2003.)

2063. In addition to abating the public nuisance and taking any necessary actions to prevent the recurrence of the public nuisance, a board of trustees may impose a civil penalty on the owner of the property for failure to comply with the requirements of Section 2061. The civil penalty may not exceed one thousand dollars ($1,000) per day for each day that the owner of the property fails to comply with the district's requirements.

(Added by Stats. 2002, Ch. 395, Sec. 6. Effective January 1, 2003.)

2064. A board of trustees may consider any recurrence of a public nuisance abated pursuant to Section 2061 to be a continuation of the original public nuisance.

(Added by Stats. 2002, Ch. 395, Sec. 6. Effective January 1, 2003.)

2065. (a) The owner of the property abated pursuant to Section 2061 shall pay the district for the cost of abating the public nuisance and the cost of any necessary actions to prevent the recurrence of the public nuisance. The owner shall also pay any civil penalty imposed pursuant to Section 2063.

(b) If the owner of the property fails to pay the district's costs within 60 days, the board of trustees may order the costs and any civil penalties charged and collected against the property. The charge shall be collected at the same time and in the same manner as ordinary county taxes are collected, and shall be subject to the same penalties and the same procedure and sale in case of delinquency as are provided for ordinary county taxes. All laws applicable to the levy, collection, and enforcement of county taxes are applicable to the costs and civil penalties charged and collected against the property.

(c) If the board of trustees charges the costs and any civil penalties against the parcel, the board of trustees may also cause the notice of abatement lien to be recorded. The notice shall, at a minimum, identify the record owner of the property, set forth the last known address of the record owner, set forth the date upon which the abatement of the public nuisance was ordered by the board of trustees, set forth the date upon which the abatement and any necessary actions to prevent the recurrence of the public nuisance was complete, and include a description of the real property subject to the lien and the amount of the cost and any civil penalties.

(d) However, if the board of trustees does not cause the recordation of a notice of abatement lien pursuant to subdivision (c), and any real property to which the costs and any civil penalties relate has been transferred or conveyed to a bona fide purchaser for value, or a lien on a bona fide encumbrancer for value has been created and attaches to that property, prior to the date on which the first installment of county taxes would become delinquent, then the cost and any civil penalties may not result in a lien against that real property but shall be transferred to the unsecured roll for collection.

(e) Recordation of a notice of abatement lien pursuant to subdivision (c) shall have the same effect as recordation of an abstract of a money judgment recorded pursuant to Article 2 (commencing with Section 697.310) of Chapter 2 of Division 2 of Title 9 of Part 2 of the Code of Civil Procedure. The lien created shall have the same priority as a

judgment lien on real property and shall continue in effect until released. Upon order of the board of trustees, an abatement lien created under this section may be released or subordinated in the same manner as a judgment lien on real property may be released or subordinated.

(Added by Stats. 2002, Ch. 395, Sec. 6. Effective January 1, 2003.)

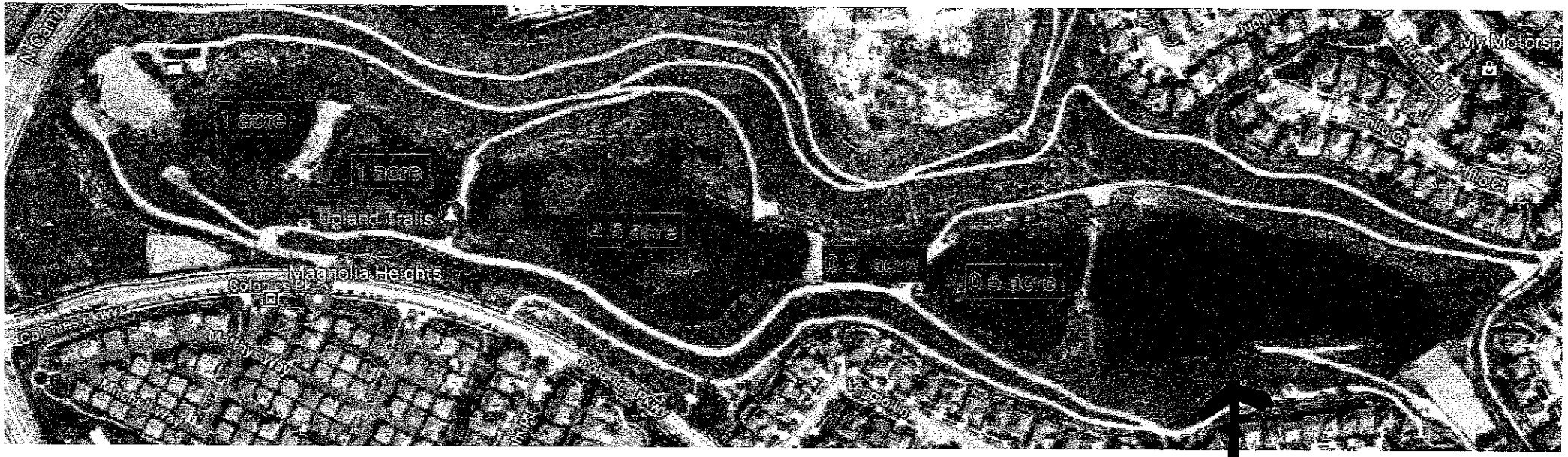
2066. The lien provisions of this article shall not apply to property owned by a public agency. Notwithstanding Section 6103 of the Government Code or any other provision of law, a public agency shall pay the district for the cost of abating the public nuisance, the cost of any necessary actions to prevent the recurrence of the public nuisance, and any civil penalties.

(Added by Stats. 2002, Ch. 395, Sec. 6. Effective January 1, 2003.)

2067. Any money collected by a county from a lien authorized pursuant to this article, other than the amounts authorized pursuant to Section 29304 of the Government Code, shall be paid to the district.

(Added by Stats. 2002, Ch. 395, Sec. 6. Effective January 1, 2003.)

Cucamonga #6



Midge: Bactimos PT (bti) = 26.8 lbs/acre → $23.97 ⇒ $3,211.98
NG30 (spinosad) = 20 lbs/acre → $16.45/lb ⇒ $1,645
Strike Pellet (methoprene) = 10 lb/acre → ~~$203.00~~ 40.70/lb ⇒ $2,039

5 acres

Labor:
$85/hr

Meters in the Heights		1,215	
iPerls Installed		382	
Remaining		833	
Install Cost per Meter	$	271	<- assumes $171 for material and $100 labor
Install Cost	$	329,265	

FlexNet hardware Investment	$	72,000
FlexNet Install Costs (year 1)	$	16,959
Flexnet Per Meter	$	73.22
20 year life cycle	$	3.66
per meter per month	$	0.31

Subscription Cost / year	$	19,390
Subscription Cost per Meter	$	15.96
per meter per month	$	1.33

Gross Meter Cost per Month	$	1.63

Current cost to read meters		
2 days per month	$	960.00
$60/hr fully burdened		
8 hours per day		
Sensus Software Subscription (mnth)	$	208.33
Subscription Cost per Meter	$	0.17
Current Meter Cost per Month	$	0.96

Delta	$	0.67

Total additional cost per year	$	9,817.95

2017 leak adjustments	$ 4,651.35
2018 leak adjustments	$ 5,724.73

Aqua Metric Sales Company *4050 Flat Rock Dr., Riverside CA 92505 • Phone: (951) 637-1400 Fax: (951) 637-1500*

May 13, 2019

Aqua-Metric Sales Company is pleased to propose the Sensus Flex-Net AMI system to the San Antonio Water Company. Aqua Metric and Sensus understand the intent of the District to deploy a proven, reliable, feature-rich AMI network that will provide the following:

- Enhanced customer service
- Increased revenue through more accurate metering
- Reduction of employee injuries
- Increased efficiency and reduced costs

Sensus Flex-Net is the industry's only solution for utilities that demand unmatched customer service and pinpoint-accurate reads. Only Flex-Net delivers Primary-Use licensing by the FCC, which guarantees an uncluttered, crystal clear path for transmissions. And that paves the way for an industry-leading two watts of power, making the Flex-Net system the only mass-deployed utility system with the highest level of protection, power and productivity in North America.

Flex-Net Advanced Metering Infrastructure (AMI) solution is offered exclusively from Sensus. It empowers water utilities with a proven means to increase meter reading efficiency, reduce overhead costs and enhance customer service simply, reliably, and with unlimited flexibility.

Sensus Flex-Net is composed of three main components the Flex-Net BaseStation, Sensus 520M SmartPoints, and Sensus Analytics software as a service.

Sensus Flex-Net BaseStation (M400) is a long-range radio transceiver that communicates with SmartPoints deployed throughout the water utility. With the BaseStation broadcasting on a primary licensed frequency at 8 watts, makes Sensus Flex-Net the most powerful and most reliable 2-way AMI network on the market.

The Flex-Net SmartPoint is a radio transceiver that provides water utilities inbound and outbound access to water measurement and ancillary device diagnostics via radio signal. The SmartPoint 520M is designed for submersible, pit-set environments. The SmartPoint broadcasts hourly meter data 6 times a day with 7 days of hourly historical data so no data will be lost on missed transmissions. Available in a 2-port option, that allows the utility to connect two meters to a single SmartPoint.

The Sensus Analytic software is a user-friendly interface that allows the utility to use numerous reports that can be automatically distributed to staff through e-mail. Analytics offers easy to read graphs and reports on hourly usage for each individual meter throughout the system. Sensus Analytic Customer Portal also available as an option with Sensus Flex-Net.

Aqua Metric Sales Company *4050 Flat Rock Dr., Riverside CA 92505 • Phone: (951) 637-1400 Fax: (951) 637-1500*

Sensus AMI Cost Breakdown

Unit Description	Unit Cost	Qty	Unit Cost
Sensus M-400 AMI BaseStation 2-way	$25,000.00	2	$50,000.00
Sensus BaseStation Installation	$10,000.00*	2	$20,000.00
Raven 50 Cellular Backhaul (If necessary)	$1,000.00	2	$2,000.00
520-M SmartPoint Single Port	$171.00	1,190	$203,490.00
520-M SmartPoint Dual Port	$204.00	N/A	N/A
BaseStation Maintenance Fee (Starting Year 2)	$3,000.00	2	$6,000.00

* Estimated cost

Sensus AMI Software Cost Breakdown

Software as a Service Fees	Fee Type	Unit Cost
Sensus Analytics Essential Package (1-5000 Services)	Yearly	$5,150.00
Sensus RNI Software (1-5000 Services)	Yearly	8,240.00
SaaS RNI System Set-Up Fee	One Time	$7,959.00
Sensus Analytic Set-Up and Integration Fee	One Time	$7,750.00
Analytic and RNI Training (Onsite)	One Time	$1,250.00

SaaS includes software support and:

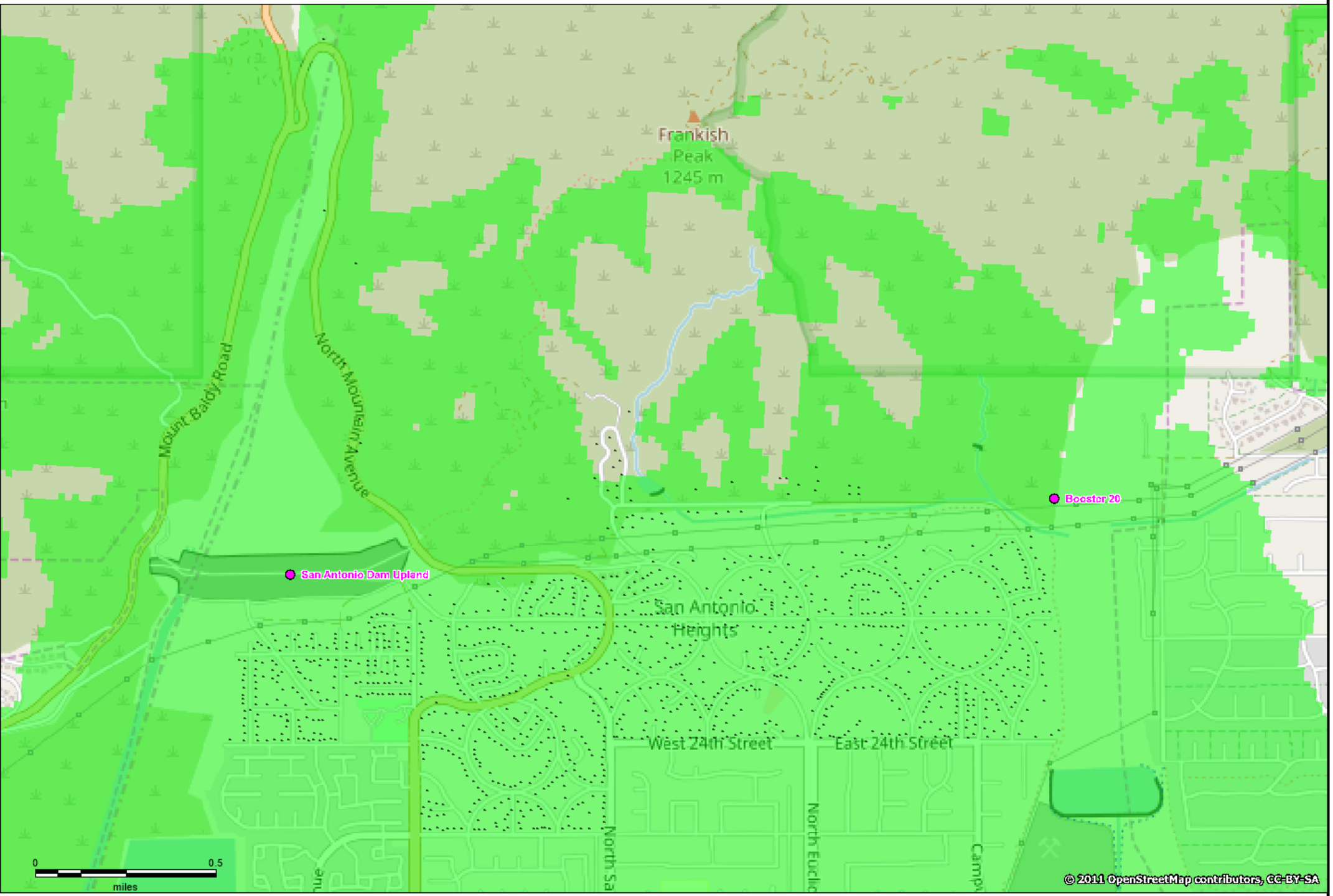
- Daily backup
- Data replication to a Disaster Recovery site
- Anti-Virus and Malware subscription and scanning
- Operating System support, troubleshooting, security patching and upgrades

- Linux Red Hat, Microsoft Windows Server, Microsoft SQL Server and Oracle licenses and ongoing maintenance
- Hardware maintenance or refresh
- Tier IV SSAE 16 Data Center facility

All products, software, and services are subject to a 3% yearly cost increase.

Estimated cost for system implementation is $306,000.00. Please note this does not include meter replacements (if necessary) or meters lids required for Sensus Flex-Net. Quoted prices do not include sales tax. Further information on all products and services proposed can be found at www.sensus.com. We would like to thank you again for your interest in Sensus Flex-Net and your ongoing business with Aqua Metric Sales Co.

Sincerely,
Steve Kamiyama
Aqua Metric Sales Company
Account Manager



FlexNet Design

Propagation Analysis

7705 – San Antonio Water Company
Upland, CA

RF Engineer: Jeff Lewis
Date: 04/30/2019

Proposed Site Details

Total Site Locations: 2
Total Base station Counts: 2
M400B2 = 2

Design Factors

Flex Net Version: V1
Modulation: FSK13HR
Endpoint Type: Water
Smart point Location: Pitset (AL)
Attenuation: 10dB

Category	Meters
Covered	1,183
Not_Covered	7
Meters_Read_@_Contract_RIS_Rate	1,165
Total_Meters_Analyzed	*1,190*

LEGEND

- Area of Coverage
- Site Location
- Endpoint Location

This propagation study is based on actual information provided by the utility pertaining to meter type, Smart point Location, potential antennae height on structure, structure height, and structure location. Any changes, deletions and/or additions that are not provided to the design engineers during the creation of this design may result in a study that does not correlate to actual field conditions.

For all tower mounted antennas, a minimum antenna standoff of 3' is required from the tower.

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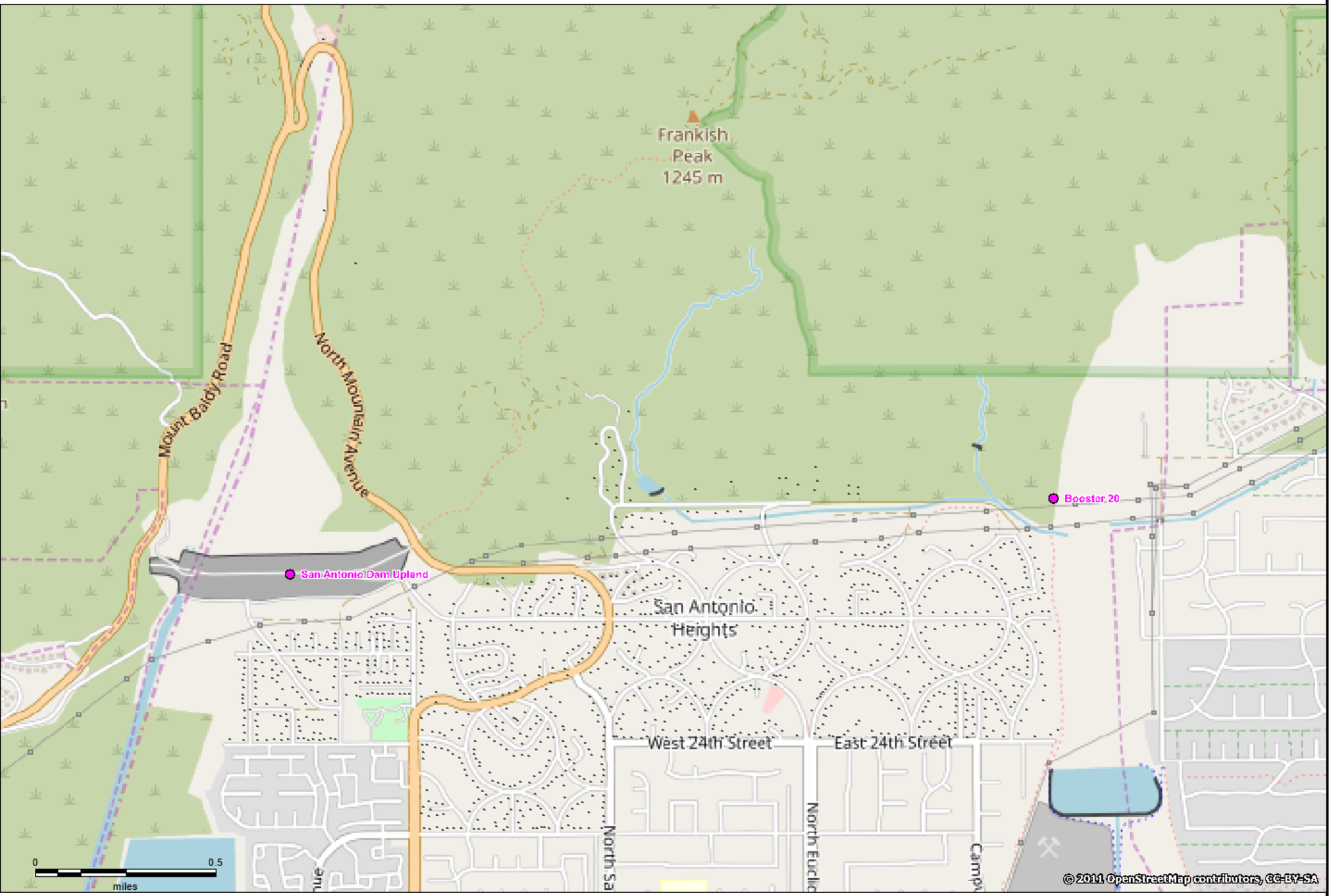
Base station and Meter Locations



LEGEND

- Site Location
- Endpoint Location

This propagation study is based on actual information provided by the utility pertaining to meter type, Smart point Location, potential antennae height on structure, structure height, and structure location. Any changes, deletions and/or additions that are not provided to the design engineers during the creation of this design may result in a study that does not correlate to actual field conditions.

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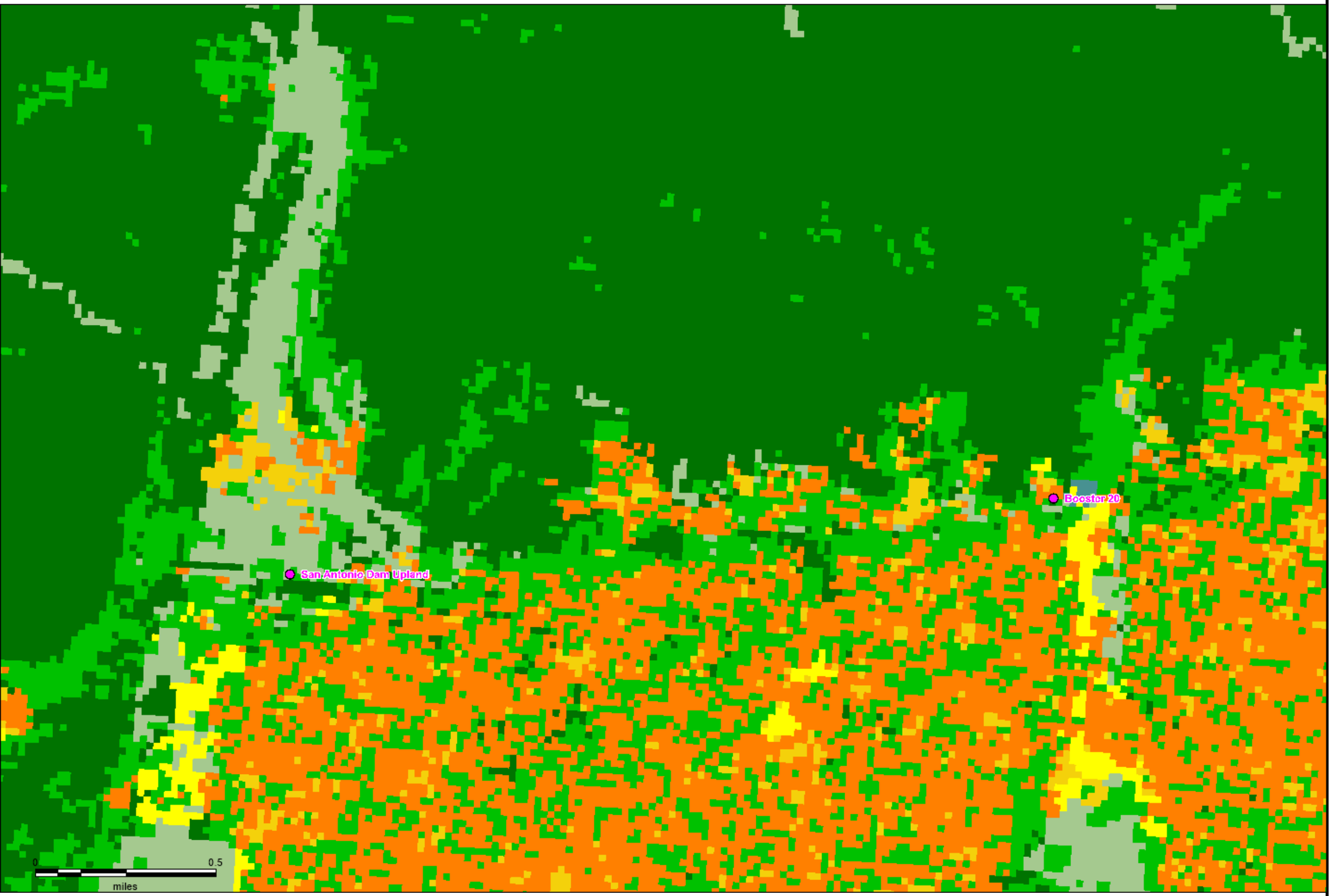
Base station and Clutter



LEGEND

- Site Location
- High Density Urban
- Commercial - Industrial
- Suburban Few Trees
- Suburban With Trees
- Airports
- Major Transportation
- Open
- Grass - Agriculture
- Forest
- Wetland
- Inland Water
- Sea Water

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SENSUS
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San Antonio Water Company

Incorporated October 25, 1882
Serving the original Ontario Colony lands

May 16, 2019

Mr. Eric Zuniga, Water Treatment Superintendent
California Water Resources Board, Drinking Water Division
San Bernardino, California

RE: Demonstration Pilot Study Report for Proposed MIH Biological Nitrate Removal Process at San Antonio Water Co. Well 31

Dear Mr. Zuniga:

Attached is the final report summarizing results of the nitrate reduction pilot study at our Well 31 site. This report was prepared by MIH and Loprest Division of WRT (proponents) and is intended to follow the Pilot Protocol submitted to your office back in August of 2018. We are submitting this report as part of our effort to receive process approval by the Division of Drinking Water.

As you are aware, several of our groundwater drinking wells have been placed in idle status due to high levels of nitrate. We would like to bring one or more of these wells back on-line. We believe that the nitrate treatment process as outlined in the pilot study report meets with the Division of Drinking Water requirements and are seeking approval for full-scale implementation.

The results of the pilot testing indicate that the proponent's nitrate treatment process may assist the Company in bringing those fallowed wells back into service. Additionally, the proponents have expressed their desire to move forward with project installation.

If you should have any questions regarding the MIH process or the performance results provided in the report, I ask that you please contact Mr. Peter Hall of MIH Water Treatment, Inc. or Mr. James Arnold of WRT LLC as they are most familiar with the pilot testing performed at our well site. I have enclosed their contact information for your convenience. Following your review of the report, we would like to schedule a meeting with you and your staff to directly address any comments or questions that you may have.

We appreciate your and your staff's time in reviewing this report and look forward to our next meeting.

Sincerely,

Brian Lee
General Manager

139 North Euclid Avenue ● Upland, California 91786 ● 909.982.4107 ● Fax 909.920.3047 ● Website: sawaterco.com

Case Study Report

on

MIH and WRT Nitrate Reduction and Removal System

conducted by

MIH Water Treatment Inc. and Loprest, a division of WRT
Westminster, Colorado

for the

San Antonio Water
Upland, California

April 30, 2019

Executive Summary

California water district authorities have been working with water treatment researchers and water service/equipment providers in assessing available drinking water treatment methods for the removal of nitrate and nitrite from their groundwater supplies. The need for an alternative nitrate treatment option that eliminates chloride brine waste and selectively removes nitrate from the source waters has never been greater. MIH Water Treatment Inc. has developed a unique biological nitrate reduction technology using a proprietary treatment vessel for advanced biological reduction of nitrate contaminant from groundwater sources. Biological nitrate reduction is not new. Various methods including growth substrates and biological growth containment schemes have been created to safely and effectively allow anoxic conditions for rapid nitrate reduction at the same time limit excess growth nutrient (electron donor) and biological material carryover from the process. Nearly all previous methods generate relatively high volumes of organic waste material and fail to prevent further reduction of sulfate in the treatment process. The MIH Water Treatment biological nitrate reduction system uses simple hydraulic mixing and a proprietary growth media to eliminate these common problems. The MIH system has been extensively tested and has been granted conditional approval for use for treatment of California drinking water by the California Water Resources Board Drinking Water Division. The use limitation currently includes post membrane filtration treatment of the treated water. MIH Water Treatment has teamed with Loprest Division of Water Remediation Technology LLC (WRT) to provide a much-simplified post filtration method due to the extremely low organic carryover loading from the MIH nitrate reduction process. This pilot tested has been devised to demonstrate the effective use of packed media bed filtration for MIH biological nitrate reduction treated water. The results have been very positive. This latest on-site MIH/Loprest demonstration pilot test was conducted in cooperation with the San Antonio Water Company in California at one of their drinking water service wells currently used for non-potable water supply due to nitrate compliance. Water produced from this well regularly tests for nitrate in excess of the California drinking water MCL standard of 10 mg/L as N and at the start of pilot testing, nitrate levels averaged 14 mg/L as N. San Antonio Water supported the continued testing of the MIH pilot equipment at the Well 31 site through mid-February 2019. Unseasonably wet weather conditions prevented additional testing beyond this time.

MIH and Loprest, a division of WRT installed a 3.0 gallon per minute (gpm) pilot test system at Well 31; a San Antonio Water groundwater well. This well water source has been operated only for non-potable water demand because of higher than MCL nitrate levels. The pilot test equipment was placed into service in November of 2018, treating a sample flow from a periodically replenished raw water supply tank. The raw water supply tank is filled from a high flow rate well water pump bleed stream connected to the main well water discharge piping.

The objectives of this case study are to 1) document the effectiveness of the MIH/Loprest biological nitrate reduction system on the removal of nitrate contaminant from the Division's well water to meet regulatory compliance and post-nitrate treatment filtration

meeting general finished water quality requirements, 2) document the operational efficiency of the removal system with continuous service operation including shutdown and restart conditions, and 3) develop the water treatment residuals waste determinations for estimating waste material disposal requirements and overall operating costs. The main objective of this pilot test is to verify the operating and maintenance requirements for a full-scale system design for planned implementation at this and other San Antonio Water well sites.

The results of this study show successful removal of nitrate contaminant from the well water on a continuous basis to less than 2 mg/L as N levels; well below the CWRB drinking water division limit MCL. The post-biological system filtration units provided very low suspended solids and controlled generation of disinfection by-products in the finished water quality. Once adjusted and stabilized for the operational conditions at the well site automated filtration backwash rate requirements, the Loprest filtration system performed very efficiently providing extended service periods between backwash cleaning cycles greater than 24 hours. Single-point continual addition of chlorine disinfectant at the biological nitrate reduction system discharge was successfully used to control residual free-chlorine levels at the final effluent water discharge. Very low nitrate levels in the finished water occurred in all conditions and finished water quality parameters for suspended solids were within acceptable operational range when the filtration system automatic backwash cleaning sequence operated as designed.

The solids waste collection analysis portion of the pilot study allowed characterization and quantitative determinations of the waste residuals generated and subsequently removed in the treatment process. Wastewater generated in the post-treatment filtration process can be easily treated and clarified for full water recovery into the treatment process. Non-hazardous disposal options are available for the solid waste material based upon the RCRA metals testing performed. The waste material quantity generated is quite modest, potentially allowing for economical disposal in California standard land waste disposal.

Efficient reduction of nitrate contaminant along with low quantities of waste material generated and requiring disposal are established characteristics of the MIH/Loprest biological nitrate reduction process. We have successfully met and in some cases exceeded our objectives in developing this process through multiple site pilot testing and are at a point in process development for demonstration of full-scale well treatment.

The original pilot test protocol was submitted on August 27. 2018 and subsequently reviewed and agreed to by the CWRB Division of Drinking Water prior to the start of this pilot testing. This report provides the test data and the findings of our pilot testing at the San Antonio Water Company well site. We recommend the Drinking Water Division approve the final design based upon the findings and results of this test for full-scale treatment system implementation.

The MIH and Loprest Nitrate Reduction and Removal System and Study Overview

MIH and Loprest, a division of WRT is testing a simplified biological nitrate reduction system using a unique MIH biological nitrate reduction system coupled with an efficient media filtration and UV sterilization post treatment system. The nitrate in the raw water is efficiently biologically reduced to inert gaseous nitrogen. Excess biological mass generated in the biological process is controlled to minimal levels and effectively immobilized using aeration and chlorine disinfection and removed from the water stream with media depth filtration as a post treatment operation. A final UV sterilization system is included to assure viable bacteria-free conditions in the final treated water. Collected biomass on the media filters is periodically backwashed from the filter beds and either directed to sanitary sewer or separately collected for disposal. Disposal material volumes are small; amounting to less than 40 grams per 1,000 gallons treated. Water treatment chemical reagents added to the water as an electron donor for the sustaining of biological processes, the proprietary biological growth substrate media, and post treatment filtration media are NSF/ANSI-44/60 and NSF/ANSI-44/61 certified for use in drinking water systems. The MIH biological removal system growth substrate media and downstream post treatment filtration media have nearly unlimited service life. Nitrate contaminant removal is simply based upon the consistent and controlled electron donor addition rate and effective biological excess mass filtration and removal. MIH and Loprest developed an on-site pilot test apparatus designed to simulate actual full-scale drinking water nitrate removal system conditions using expected chemical reagent addition rates and an automatically operated downflow media filtration unit. Raw water and treated water testing for nitrate, turbidity, and residual free chlorine content are used to monitor system performance. The settled solids from a collected filter backwash is tested for RCRA metals content for characterization and suitability of non-hazardous solid waste disposal.

Test Equipment Overview

The pilot test treatment equipment consists of two individual unit operations in separate operation trailer units. A trailer housing MIH biological nitrate removal system equipment and electron donor reagent feed systems provide the primary treatment process for nitrate removal. A post treatment filtration system housed in a separate trailer includes media filtration, chlorination disinfection addition, solids filtration aid addition and final UV sterilization equipment. Both trailer units are parked on site at the San Antonio Well No. 31 location. A temporary approximately 5,000-gallon raw water supply tank system is filled periodically to continually supply raw water from the well system. Refer to Figure 1 for the pilot equipment general process flow diagram.

The MIH biological nitrate removal system consists of a primary deaeration equalization tank, the MIH Hall CSTR nitrate removal vessel, an aerobic post treatment receiving tank, ancillary pumps for recirculation or transfer and of the treated water to the filtration trailer and instrumentation and process control equipment. The filtration post treatment portion of the system includes downflow packed media filtration, chlorine disinfection, filtration aid addition, final UV sterilization and process automation and control equipment.

Individual equipment components are illustrated on the process flow diagram and include pump units, flow control devices, reagent injection pumps, pressure and flow indication instrumentation and filter backwash support equipment. The source water enters the pilot test unit from a connection on the from the raw water supply pump, which transfers temporarily stored raw water from the raw water storage tank to the MIH biological nitrate removal system trailer. Raw water sampling occurs at this location referred to as SP1 on the process flow diagram. The water is first directed to a deaeration vessel where electron donor and phosphate reagents are added to promote biological growth for sustained nitrate reduction. The pretreated water then enters the Hall biological reaction vessel. Here continually stirred biological substrate carriers circulate using hydraulic movement and facilitate nitrate reduction at the substrate surfaces. The treated water exits the biological reaction vessel to an aerobic post treatment tank for immediate aeration to terminate anerobic biological reaction and growth and further oxidize residual electron donor material prior to post filtration and final disinfection. As the aerated water exits the biological nitrate reduction trailer, sodium hypochlorite is injected to further suspend biological activity and maintain residual disinfection through the final filtration process. A filtration aid is also injected at this location to provide coagulating assistance of suspended solids. The process flow then enters the Loprest filtration trailer and directed to through filtration media process columns. Three (3) columns are arranged in parallel flow for downflow packed bed filtration. Filtered water is then collected and enters a final UV sterilization unit to assure termination of biological activity. Final sampling of finished water occurs at this point referred to as SP2 on the process flow diagram.

Intermediate sampling for nitrate reduction, turbidity and periodic residual free-chlorine occurred downstream of the biological nitrate reduction system and at filtered water discharge points downstream of the media filter unit.

The media filter column is backwashed automatically using one of several backwash trigger points set at the PLC controller. Set points for filter backwash can be initiated manually, by operating time interval, by filter differential pressure loss or by filtered water discharge turbidity measurement. A filter backwash frequency of approximately once per operating day was chosen as a target set point with filter differential pressure not to exceed 7 psid. The water supply system operated in near continuous manner providing 24-hours of operation for the pilot system. Occasionally shutdown periods were necessary to replenish the raw water storage supply. Backwashing of the filter units is accomplished by directing treated and finished water from the treated water storage tank. Backwash water supply is directed automatically to each filter column sequentially upflow through the media column to expand the media bed and release the collected solids to exit the out of the top of the filter media column. The backwashed liquid and solids are sent to a water discharge sewer connection. A separate sampling of collected solids backwashed from the filter columns was conducted to quantify and characterize the solids generated in the process. These collected solids are were settled and clear liquid decanted from the solids that are retained for laboratory testing to determine solids settling rate, and for characterization.

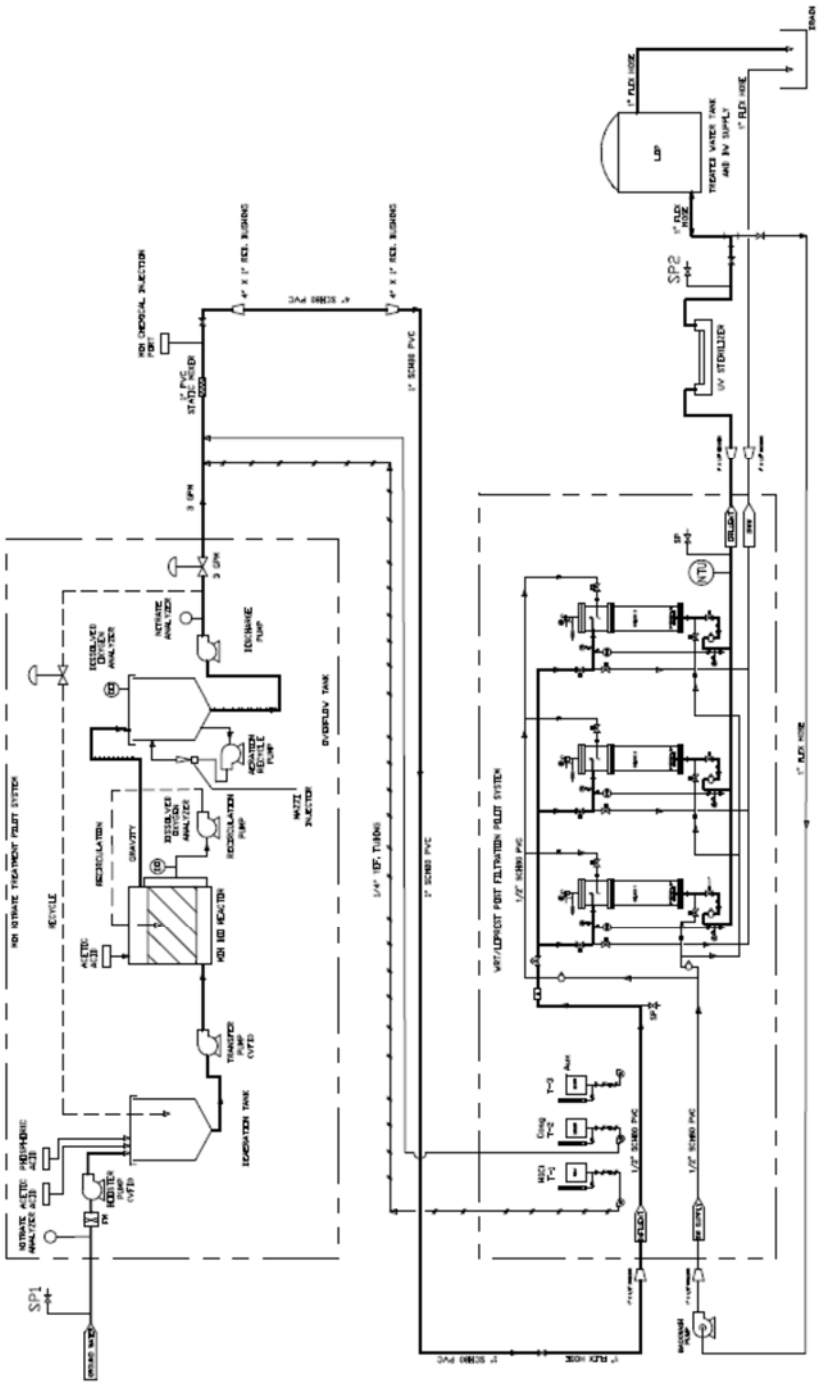

Figure 1. Pilot Study Equipment Process flow diagram

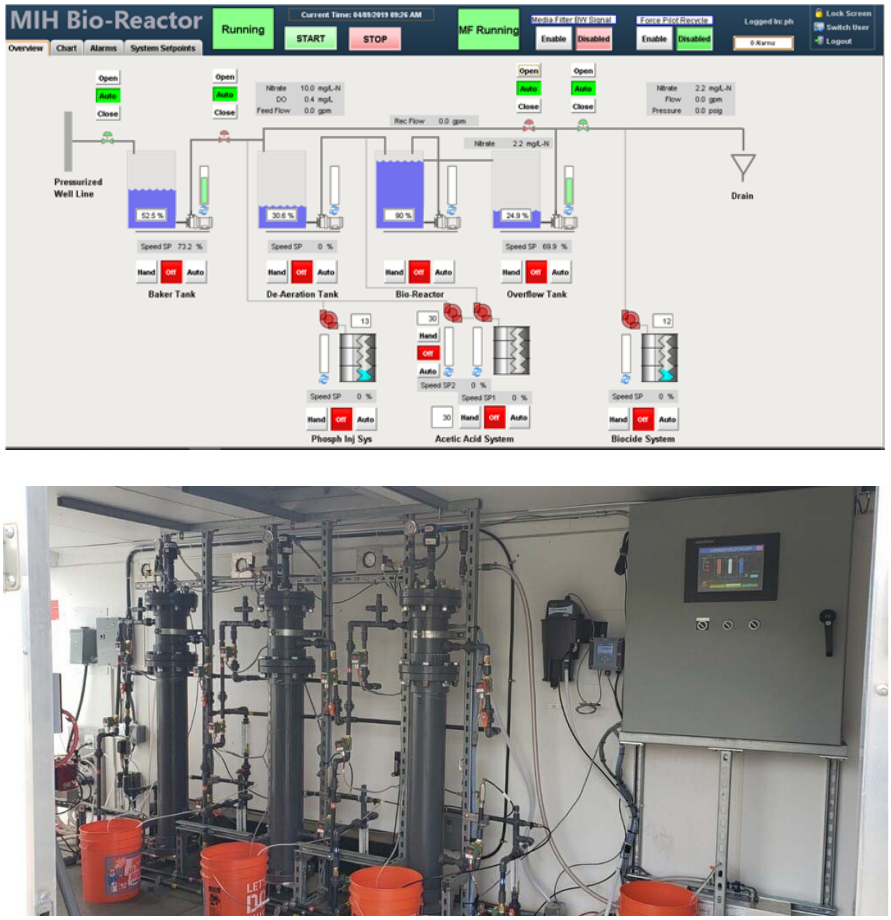

Figure 2. Photographs of MIH/Loprest Pilot Study Equipment and PLC Control panel.

Statement of Purpose

The nitrate levels in many San Antonio Water Company wells exceed the USEPA and State of California Drinking Water MCL standards of 10 mg/L (as N). Nitrate levels vary seasonally at the San Antonio Water well no. 31 but normally exceed the state mandated MCL testing between 13 and 20 mg/L as N.

The purposes of this study are to:

- Demonstrate the ability of the MIH/Loprest Nitrate Reduction Process to consistently and effectively reduce the nitrate levels to below MCL levels on water from the San Antonio Water Company well water supplies.
- Demonstrate consistent nitrate removal through shutdown and restart upset conditions.

- Demonstrate effective filtration and disinfection of final treated water at all times through the process.
- Demonstrate no appreciable generation of disinfection byproducts through the process.
- Comply with California SWRCB Division of Drinking Water regulatory testing requirements for the submitted pilot testing protocol.
- Provide a solution to disposal concerns over collected solids material water treatment residuals and finalize estimated overall water treatment costs.

Analytical

All organic and bacteriological water analyses were performed by external laboratories certified by the National Environmental Laboratory Accreditation Program. Total nitrate, in the raw and treated water were sampled normally once per week and bacteriological plate count, turbidity, Organic analysis, in the treated water were sample weekly during continuous service runs between daily backwash operations. All samples were analyzed immediately. Test samples are submitted to the Babcock Laboratories, Inc. using USEPA and California Water Resources Control Board recognized testing methods for drinking water.

Methods for analysis are:

Nitrate as N	EPA 300.0
Turbidity	SM 2130B
Total Organic Carbon	SM 5310B
VOC	EPA 524.2
Trihalomethane Formation Pot.	EPA 524.2
Haloacetic Acid	SM 6251B
Heterotrophic Plate Count (HPC)	SM 9223B
MMOMUG Coliform Presence/Absence	SM 9223B

Continuous analysis for outlet turbidity was performed using an on-line turbidimeter Hach 1720E. Sampling for free chlorine at various operating point and in the treated water outlet were performed using grab samples and colorimetric analysis on a Hach 890 colorimeter.

Results and Discussion

Pilot System Operational History and Specifics

Operation of the pilot system consists of initializing the continuous steady-state operation of the nitrate removal system for the pilot demonstration test period of 7 weeks per the submitted and agreed upon Test Protocol submitted in August of 2018. Three principle changes to the testing variables or the equipment flow path were instituted in the course of the initialization. Once consistent operation of the biological nitrate removal system was obtained through nitrate sampling with no substantial adjustments to the electron donor injection rate, the filtration system was placed in regular operation. The filtration system was initially designed for a starting filtration media flux rate of 5.0 gpm/ft^2 or 3.0 gpm pilot test flow rate. This media flux rate yielded backwash frequencies less than 12 hours of filter service time. In addition, turbidity recovery following the backwash sequence were longer than anticipated at more than 5 minutes of preservice rinse time. Therefore, a decision was made to reduce the filter media flux rate to 3.0 gpm/ft^2 or 1.8 gpm pilot test flow rate. This revised rate is selected based upon typical surface water filtration rates. The results from reduced flow rate were positive, extending backwash frequency to more than 24 hours of service run time and much better turbidity reduction recovery following a backwash event. Filter backwash trigger points were then set and programmed for either a 7 psid pressure loss across the filter units or a measured effluent turbidity of 0.3 NTU from the on-line turbidimeter signal. After this change, a 5-day steady state operation of the pilot units was selected to then start the official pilot test commencement point. The reduced flow rate from the biological nitrate reduction system proved difficult to maintain. A problem developed where the flow rate setting and control system on the biological nitrate reduction system was incompatible with expected changes in the differential pressure through the downflow packed bed media filters. As the inlet pressure increased through the filter column units the overall pilot system flow rate gradually reduced to an internal control point that automatically placed the biological nitrate reduction system recycle. This condition suspends all effluent to the filtration system. The first change to the process flow design for the system was devised.

The change included placing an effluent break tank between the biological nitrate reduction system chemical injection point and the feed to the filtration system. A separate feed pump designed to provide steady flow rate from the effluent water collection point through the filtration system is controlled from the filtration system control panel allowing independent operation of the biological nitrate reduction system and the filtration system. In theory, the concept should have provided much more consistent flow rate and operation of the pilot system. However, in practice, some complications arose in the nearly 1 month of operating the pilot system in this configuration. First it was acknowledged that a full-scale system would not include an effluent collection tank but the thought that a short 40-minute detention volume in the flow path would have little effect on the test results. After 2 weeks of steady operation of the system using the effluent break tank it was observed that a significant volume of suspended solid material was settling in the tank and was not being transferred to the filtration system. In addition, the first set of analytical results showed a

step increase in DBP Formation of THM and HAA5 materials in the effluent samples. The additional contact time and the concentrated quantity of organic materials in the effluent break tank were great enough to allow the reaction with chlorine. The pilot test group reviewed all operational and effluent analytical results to date and decided to make a final change in the flow path. This involved removing the effluent break tank and developing a coordinated control arrangement for flow rate control through the filtration columns while maintaining steady flow through the biological nitrate reduction system. An integrated signal between both systems placed the biological nitrate reduction system into a recycle flow arrangement during filtration backwash cycles. With the revised flow rate control all treated water from the biological nitrate reduction system is filtered through the filtration system. One final unit operation addition was the UV sterilization unit as the final treatment device. The UV sterilization unit was to assure that all viable biological activity was terminated at the effluent of the filter units.

The pilot test was restarted and after 2 days of control point adjustments, the pilot equipment was placed in steady operation to commence the start of the pilot testing. During the second week of pilot testing, the test site was the subject of a break-in. Some control equipment was stolen, and the on-line computer used for continuous effluent nitrate data logging was taken. The pilot system remained in operation without interruption until the site experienced 4 weeks of heavy rainfall precipitation weather events that forced the San Antonio Water Company to suspend water withdrawals from this well altogether. The final phase of pilot testing was terminated at this time.

A representative backwash volume was collected and the solids analyzed during this final test period. A hard shutdown test of the system was also performed in the second week of the latest equipment revision operation.

Pilot Test Results and Discussion

The pilot test equipment was manned daily in daylight hours during weekdays and left to operate with limited supervision throughout the weekends. The final phase of pilot study operation commenced on January 16, 2019 and continued until March 1, 2019. Continuous monitoring of effluent nitrate concentration using an on-line nitrate analyzer recorded nitrate levels using software data logging. Continuous monitoring of filter column flow rate and effluent turbidity was also completed in 15-minute time increments and recorded using software data logging. Grab samples at various sample points including pre-filtration and individual filter column effluents were used for free-chlorine on-site colorimetric analysis. All other samples of effluent water quality were sampled and analyzed through laboratory analysis.

Nitrate Removal Performance: Nitrate levels in the raw water and the effluent from the biological nitrate reduction system were monitored continually. The raw water influent nitrate level is used in the control system algorithm to set electron donor injection rates during regular operation. Nitrate levels were measured by an online continuous nitrate analyzer sampling a trickle sample flow from the Hall nitrate reduction vessel effluent.

Pilot study note remarks and some written results from on-site colorimetric analysis remain from the test written log and coincide with results obtained from the effluent sample laboratory analysis. All third-party laboratory analysis for effluent nitrate content at all samplings submitted are included. These results are plotted below in Figure 1.

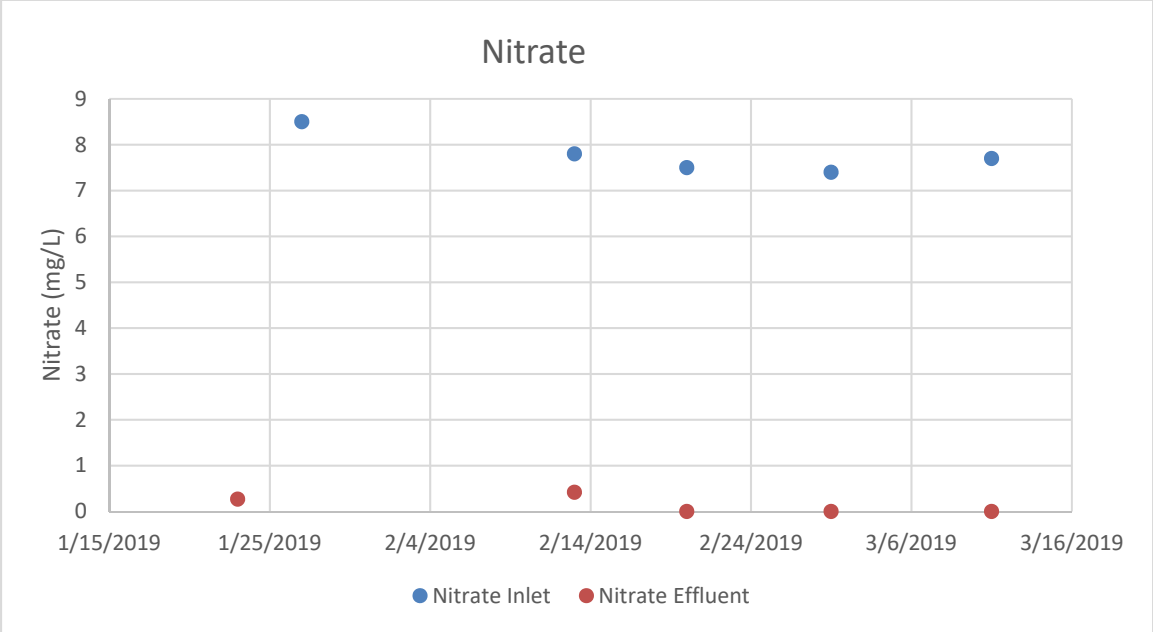

Figure 1. Nitrate inlet and effluent analysis results during demonstration pilot test period.

The nitrate effluent results show an average of 0.14 mg/L nitrate as N in the effluent finished water from an average of 7.8 mg/L nitrate as N. This represents an 98 percent reduction in nitrate levels from the influent raw water nitrate concentration.

Total Organic Carbon (TOC) results: TOC water quality was analyzed in the finished water effluent samples. Figure 2 provides the effluent TOC analysis. Inlet TOC levels in the raw water were measured twice during this stabilization and pilot testing period. Previous pilot test inlet TOC measurements reported between 0.5 and 1.2 mg/L TOC results. The only inlet TOC measurement during the pilot test period reported ND. And the most recent inlet TOC measurement sampled on April 2, 2019 returned a 0.32 mg/L result. These samples were analyzed by a third-party laboratory. See Table 1 for inlet raw water TOC results. Finished water TOC averaged 5.1 mg/L. An increase in TOC can be expected and has been the recognized operating experience of biological process treatment systems. The small increase in TOC from the raw water starting values are manageable.

Date	TOC Inlet (mg/L)	TOC Effluent (mg/L)
2/13/2019	N/D	4.8
2/20/2019		6.5
3/1/2019		3.9
4/3/2019	0.32	

Table 1: Raw water and treated effluent water TOC Results.

Effluent TOC from the MIH biological nitrate reduction system is controlled by careful management of electron donor injection rates. In full-scale conditions, control over TOC through electron donor addition rates to the nitrate reduction vessel is facilitated by more the mass of biological material in process. In full-scale systems, small addition rate changes do not create marked perturbations in TOC effluent values that we see in small pilot testing systems. TOC was not measured continuously in this pilot test. We do anticipate TOC effluent be measured continuously to better provide operations data and prevent overfeed of electron donor reagent to the system.

pH measurements: pH measurements were taken several times during the stabilization period for the biological nitrate reduction system and through the final pilot demonstration period. pH data is relevant to the biological nitrate reduction system and finished water pH is unaffected by the downstream post-filtration system. Therefore, all pH data taken from the start of the stable operation of the biological nitrate reduction system is provided. Table 2 includes effluent pH data from the nitrate reduction vessel.

Date	pH
2/20/2019	7.5
3/11/2019	7.6

Table 2: Treated water pH measurement from the Nitrate Reduction vessel effluent.

Effluent pH in the nitrate reduction system are very consistent at an average pH value of 7.7. Average raw water pH at the pilot site is 8.0. Very little change in water pH occurs through the biological nitrate reduction process and no significant changes in raw water pH were observed in the course of the pilot testing.

Dissolved Oxygen (DO) measurements: Dissolved oxygen in the effluent from the nitrate reduction vessel were continually measured using an on-line analysis probe. The dissolved oxygen levels in the aeration tank are considered a control parameter and are an

indication of electron donor overfeeding beyond that necessary to maintain sustainable biological activity in the nitrate reduction vessel. The measurements for dissolved oxygen were occasionally written into the field operations log. the site pilot log data book. We can present previous dissolved oxygen results for a previous pilot test run at this treatment site which shows very consistent oxidation of the effluent water to 5.5 mg/L DO average at the aeration vessel as well as a few written data points taken during the stabilization period and later pilot testing. The operational characteristics of the biological nitrate reduction system were identical in process to the earlier pilot work. During this testing, the effluent dissolved oxygen measurements showed nearly identical values throughout the pilot test period whereas the dissolved oxygen in the aeration tank was maintained between 5 and 6 mg/L continually.

Oxidation Reduction Potential (ORP) and Sulfide measurements: The ORP of the biological nitrate reduction vessel can be used to assess the nitrate reduction conditions within. ORP can be used to predict conditions that could allow undesirable sulfate reduction in the nitrate reduction process. Less than oxidative ORP measurements can indicate the possible formation of sulfur reduction compounds such as sulfide. Actual sulfide tests were conducted during the stabilization period and the pilot test period to test for the presence of any sulfide compounds in the water. ORP was measured several times early in the stabilization period while electron donor injection rates were determined prior to steady-state operation. Sulfide was measured twice during the final demonstration period of testing. Previous pilot tested has demonstrated no sulfate reduction and positive ORP values at all time during operation. In the course of this testing, ORP averaged 54 mV and measured positive in all measurements and presence of sulfide tested negative in all cases. Table 3 tabulates the measured results of ORP and sulfide in the biological nitrate reduction vessel.

Date	ORP	Sulfide
11/19/2018	58	
12/9/2018	90	
12/20/2018	10	
2/13/2019		N/D
2/20/2019		N/D
3/1/2019	60	

Table 3: Biological Nitrate Reduction vessel ORP and Sulfide .

Turbidity Measurements: Turbidity measurements were taken using a handheld analyzer and continually on the final filtrate effluent using a Hach 1720E turbidity analyzer. The onsite handheld turbidimeter was used to analyze suspended solids content at various points in the system. Filtrate turbidity from the filter effluent during standard operation of the filter units showed very low turbidity values of less than 0.3 NTU. See Figure 2 for graphical depiction of the filter system effluent turbidity.

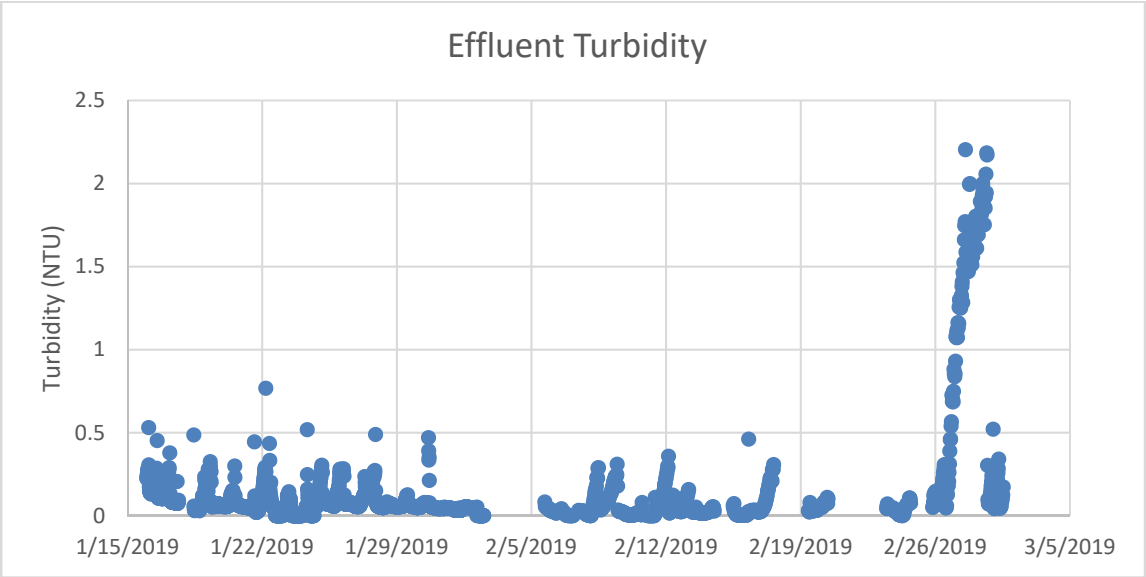

Figure 2. Filter system effluent turbidity – continuous monitoring.

Filter column control system includes a backwash cleaning sequence triggered using discharge turbidity and/or filter column differential pressure. For most of the pilot testing operating period, the filter control system cleaning sequence trigger setpoint was set at 0.3 NTU. This setpoint usually provided more than 24 hours of service run between filter cleanings. Most cleaning sequences were initiated through high pressure loss (greater than 7.0 psid) through the column and not discharge turbidity. Upon the conclusion of the cleaning sequence, the effluent turbidity quickly returned to less than 0.1 NTU within 5 minutes of pre-service rinse at the service flow rate. This can be illustrated with the continuous graph of effluent turbidity provided below. Backwash sequences were performed approximately every 24 to 28 hours of service run and generally initiated from pressure loss through the filter column. Occasionally, an effluent discharge turbidity above 0.3 NTU did trigger a backwash cleaning sequence. The typical filter performance and operating sequence is represented through the service run period from January 16, 2019 to March 1, 2019. Here several service runs and backwash sequences were performed where the effluent turbidity did not rise above 0.50 NTU and averaged well below 0.1 NTU for more than 20 hours of a typical 24 hour service cycle. The elevated turbidity depicted between February 25 and February 28 was a result of a control system setpoint omission by the pilot system operator. Had the setpoint been reset, the filter system would have immediately initiated a backwash cleaning sequence at a effluent discharge turbidity above the setpoint. This was not discovered until the extended service run created a turbidity breakthrough condition and outlet turbidity increased to more than 2 NTU. Upon discovery of the problem the filter columns were immediately placed into a backwash cleaning sequence. After the cleaning sequence concluded, normal operation resumed without further incident. To place this event in perspective, a full-scale system of this design would be equipped with monitoring of key effluent water quality parameters. Should effluent water quality drift outside control setpoint values, operational consequences ensue starting

with simple alarm notifications and in more extreme conditions or circumstances, the system prevents out-of-compliance water from entering water distribution. Our simple pilot test equipment is not equipped with automated alarm notifications or shutdown devices other than those available to site operators in the regular hours of manning the pilot system. We do not envision a similar event at a full-scale system where the control system would be purposefully prevented from a regular cleaning cycle without high-level operator notification. The effluent turbidity data is presented here without editing or redaction.

For each effluent sampling, the effluent turbidity is analyzed by the third-party laboratory. The results for this demonstration sampling period are provided in Figure 3.

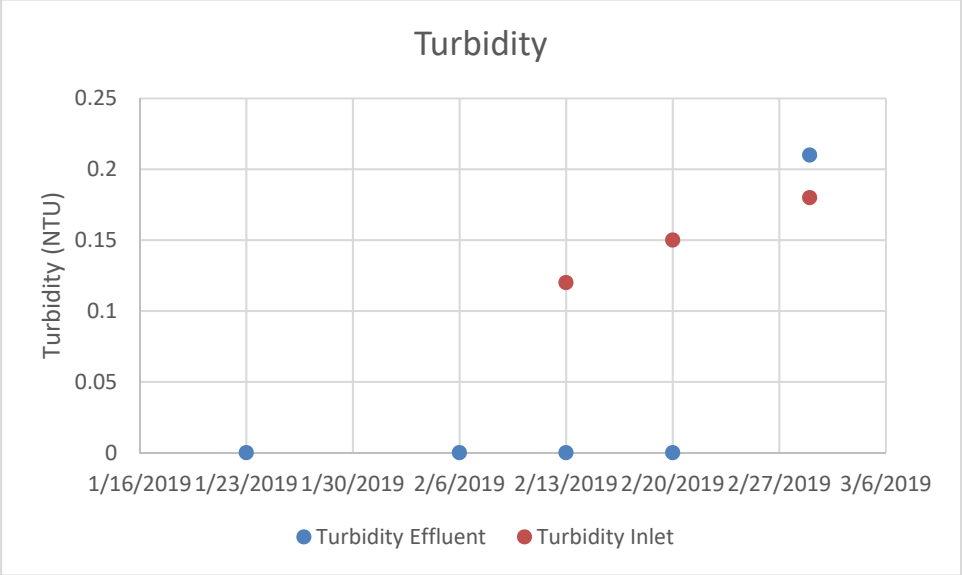

Figure 3. Filter system inlet and effluent sample turbidity.

Here the effluent samples show consistent low NTU values, which coincide with the online effluent turbidity sampling.

Free Chlorine Measurements: Free chlorine in the biological nitrate reduction system treated water is provided through a continuous sodium hypochlorite injection system added just downstream of the system aeration tank transfer pump. Here a calculated quantity of sodium hypochlorite solution is metered into the flow stream to maintain a free chlorine residual throughout the filter system. Free chlorine in the final treated water is controlled at a range between 1.2 to 2.0 mg/L (ppm). Some slight variation in the free chlorine level is observed throughout the filter service run as filtered solids concentration in the filter units increases. A decrease between 0.3 to 0.5 ppm of free chlorine was realized from the start of the filter service run to just before the initiation of a backwash cleaning sequence. Chlorine injection rates once adjusted for steady-state operating conditions from the biological nitrate reduction system were consistent and stable. The calculated

concentration of chlorine at the point of injection was approximately 8 to 10 ppm free chlorine to maintain a 1.5 to 2.0 ppm free chlorine residual in the final treated water. Final treated water free chlorine was analyzed and recorded prior to effluent sampling. These results are provided below in Table 4,

Date	Free Cl Inlet (mg/L)	Free Cl Effluent (mg/L)
1/24/2019	2	0.9
1/28/2019	2.1	1.9
1/28/2019	2.2	0.9
1/29/2019	2.3	0.8
1/29/2019	2	1.3
1/30/2019	2.3	1
1/30/2019	2.2	0.7
1/31/2019	2.5	1.2
1/31/2019	2.1	0.9
2/6/2019	2.4	0.8

Table 4. Free chlorine residual in the filter system effluent water samples.

As a final measure, each final treated water discharge sample was analyzed for Heterotrophic Plate Count (HPC) and e-coli and coliform bacteria. These results are tabulated for each sample during the demonstration test period below in Table 5.

Date	HPC Out	Total Coliform
1/23/2019	N/D	N/D
2/6/2019	1[1]	N/D
2/13/2019	N/D	N/D
2/20/2019	N/D	N/D
3/1/2019	N/D	N/D

Table 5. HPC, e-coli and coliform testing in the filter system effluent water samples.

[1] Positive hit for HPC occurred from sampling performed during dynamic shutdown test. See explanation in the following section.

Disinfection byproduct (DBPs) Testing: Filter effluent water samples were analyzed for disinfection byproducts Total Trihalomethane (TTHM) and Haloacetic acids (HAA5). Potentially the presence of chlorine and organic materials in the biologically treated water can elevate THM and disinfection byproduct formation. During the initial operation and system stabilization period, the addition of the break tank between the biological nitrate reduction system and the filtration system noticeably increased THM in the finished water samples. This was presumably the result of additional contact time with settled organic materials in the break tank volume and the chlorinated water. The break tank was subsequently removed in favor of an active flow control system.

Disinfection byproduct formation through TTHM and HAA5 analysis was performed on the finished water samples. The summary of the analysis is shown below in Figure 4 for the demonstration period.

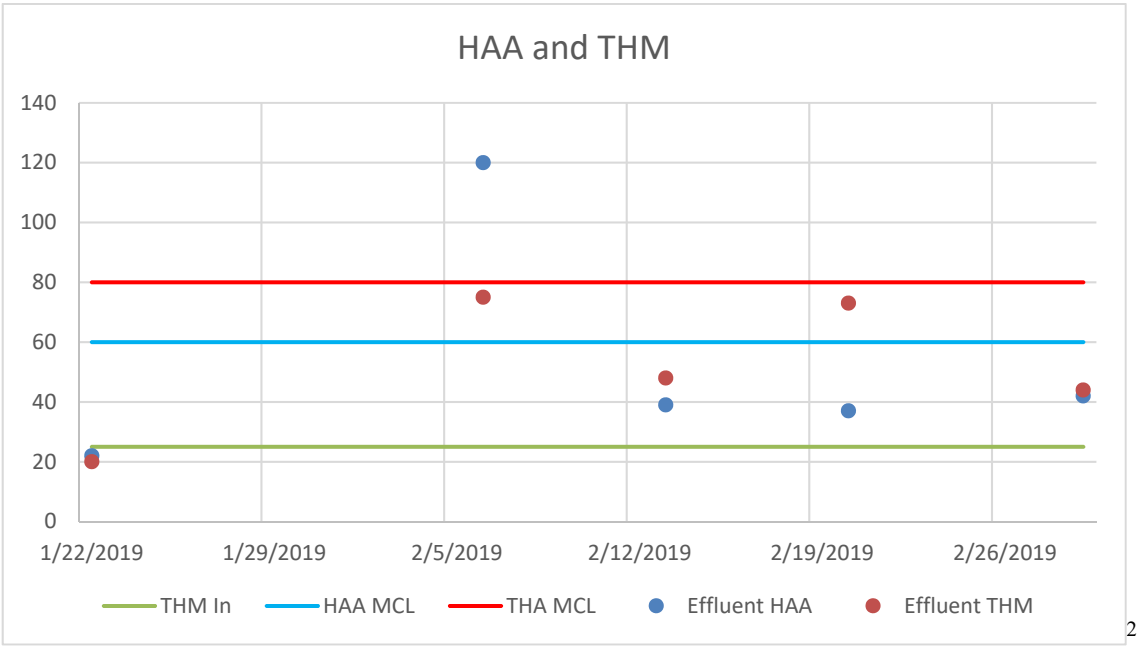

Figure 4. DBP Formation Potential Testing - TTHM and HAA during the pilot test demonstration period.[2]

The results show some increase in DBP formation from that measured in the raw water. TTHM and HAA5 averaged 52 mg/L and 52 mg/L respectively in the finished water samples. The average is below the MCL levels for both TTHM and HAA5 with the results from the dynamic test samples included. This does equate to a 108 percent increase in DBP formation from the 25 mg/L in the raw water. As mentioned previously and as demonstrated during the stabilization period of the testing, DPB formation is a function of organic material concentration and contact time with free chlorine in the water. The

[2] Data points above MCL on 2/6/19 are the result of effluent samples taken during the dynamic shutdown test. See explanation in the following section.

physical constraints associated with small-scale testing to provide the necessary mixing time for filtration aid mixing and the volumes of transfer piping involved exacerbate the conditions for DBP formation. This is not representative of a full-scale system where the contact times for biomass and chlorine are much shorter and the volume ratios to system surface areas are drastically different. While the DBP formation potential will not be zero, we anticipate that the increase in DBPs in a full-scale system is easily managed below MCL levels.

Dynamic shutdown test of the MIH and Loprest, a division of WRT Nitrate Reduction and Removal System: A dynamic shutdown test was performed on the system to simulate full flow interruptions to an operating system. A one-hour flow shutdown was initiated on the steady operating system. This test was completed on February 6, 2019. Effluent turbidity values were 0.058 NTU and discharge free-chlorine levels were 2.5 ppm. After a restart following a 1 hour and 10-minute shutdown period, the effluent turbidity values peaked at 0.221 NTU and stabilized to 0.050 in 9 minutes. A full finished water sampling was drawn at 25 minutes from the restart time calculated to coincide with the volume throughput from the biological nitrate reduction system. The results are reported in the February 6, 2019 sampling. Nitrate levels remain very low at 0.42 mg/L, THM and HAA5 values are elevated at 75 µg/L and 120 µg/L respectively. An HPC result showed 1.0 CFU/mL with absent E. coli and Total coliform. The HPC positive hit is most likely the result of a restart carryover and perhaps insufficient chlorine content in the sample volume as the shutdown interrupted all chlorine feed to the system. Residual chlorine levels were not measured continuously and actual free-chlorine content in the sample volume is not known for certain. It is also not fully known how or why viable bacteriological matter could survive UV sterilization in this case. In any event, residual chlorine in the treatment system effluent is a direct control parameter that should be measured continually in a full-scale production treatment system to provide residual disinfection in the finished water distribution. We can suspect that the elevated DBP results are a function of chlorine reaction with some of the suspended organics in the filtration system thus depleting the residual disinfection effect of the oxidant. As mentioned previously, DBP formation is function of organic material concentration and contact time. Here the suspended flow period for more than one hour can be attributed to the formation of more than usual DBP compounds in the effluent sample for the period prior to the system restart.

Solids Filtration, Collection and Analysis: A representative volume of backwash waste water was collected in a settling tank to assess the total mass and characterize the material for proper disposal. The collected solids contain essentially dead biological material with a coagulation aid to facilitate solids separation. Filtration and solids removal efficiency can be measured using a simple turbidity sampling of the untreated and treated water. This parameter is continually measured and used for filter run termination. A simple settling test performed onsite involved collecting a 5-gallon grab sample of the backwash wastewater and observing the solids settling rate. This test was used to assure the correct filtration aid addition rate and observe the clarity of the supernatant decant water. Photographs 1 and 2 illustrate the relative solids settling efficiency that occurred with the collected backwash waste sample. Very good clarification of the supernatant water was

demonstrated in this test, which can suggest further consideration of water recovery from the backwash water volume used in the cleaning cycles.

Photographs 3 and 4. Backwash water settling test example 20 minutes and 1 hour.

About 75 gallons of backwash water volume was generally required to complete the surface wash and backwash cleaning cycle through all three filter columns and purge the media beds of collected solids to the point where the backwash water runs essentially clear. The backwash cleaning sequence is comprised of a combination surface wash equivalent to 2 gpm/ft^2 and a simultaneous full filter bed backwash at 12 gpm/ft^2 for 4 minutes duration. This is followed by a full filter bed backwash at 12 gpm/ft^2 for an additional 4 minutes duration. A preservice rinse at the service flow rate normally occurs for a 4-minute time period directing the discharge water to waste. In the case of the pilot system, this exiting water is directed to the effluent collection tank. A sequential backwash cleaning cycle for the three filter columns occurs for a total time of 24 minutes for a total collected volume of 72 to 75 gallons of wastewater. This volume corresponds to a 6.8 BV of total filter backwash water. A service run of 25 hours was selected for the backwash waste collection test. The full backwash wastewater volume was allowed to settle for concentration of all solids into a settled sludge. A concentrated settled sludge volume of about 4 gallons was packaged and then transferred to the WRT laboratory in Westminster, Colorado for additional testing. Here the waste solids were further concentrated then filtered and dried to obtain a total dry solids estimate. A sample of the dry solids were separately analyzed for RCRA waste characterization for disposal purposes.

Waste solids collected can be described as small coagulated albuminous particulate material having a cream color. The backwash solids sludge sample was left to settle and concentrated again using vacuum filtration over a 1.6 micron filter paper. The solids and the filtrate were analyzed for RCRA metals and general water quality respectively. Laboratory analysis results are attached in the appendices. Notable findings show elevated

hardness levels and silica in the filtrate over that found in the raw water. The filtrate water did show slightly higher TOC content at 35.2 mg/L. The solids sludge material analyzed showed elevated levels of arsenic and barium at 37.7 mg/L and 84.3 mg/L respectively. This may or may not be a concern at the point of disposal depending upon the level of dewatering needed for disposal.

Quantitative Waste Analysis

Based on the waste material collected in the representative filter backwash cleaning cycle, an estimated expected quantity in full-scale system operation can be extrapolated.
Collected solids quantitative analysis showed a total dried filter cake weight of 47 grams for a total dry solids generation, equivalent of 627 grams per 1,000 gallons collected backwash wastewater. Solids generated as a proportion to the treated water produced is equivalent to 36 lbs dry solids for every 1 million gallons treated.

This value is as expected subject to operational conditions originally selected and modified in the testing. Careful attention to the collection of this single filter backwash waste solids was exercised with no known loss of waste solids apart from trace suspended solids in the decanted supernatant.

Conclusion and Summary of Testing Objectives

The results obtained for the MIH and Loprest, a division of WRT Nitrate Reduction and Removal System pilot testing have demonstrated consistent and effective removal of nitrate contaminant from the San Antonio well No. 31 water to very low levels. Some improvements to the overall biological nitrate removal process to facilitate downflow pressure filtration were accomplished through the course of the testing. A modification of the filtration rate and the addition of a final UV Sterilizer were made to provide a more robust post biological nitrate reduction treatment. The changes assure the combined system provides very consistent finished water quality results with very low suspended solids and predictably low TOC results. Finished water effluent samplings tested in a third-party laboratory confirm the water nitrate reduction performance and the discharge suspended solids turbidity analysis obtained in onsite analytical testing. The MIH biological nitrate reduction system is forgiving in terms of process upsets and flow interruptions. Internal safeguards for nitrate reduction prevent untreated water from exiting the system. The hard shutdown test confirms a fast system recovery from a flow rate loss and water flow interruption. The February 6, 2019 sampling and analysis confirm the unremarkable result of the shutdown effects on the system. The inherent efficiency of the MIH biological reduction vessel allows for nearly a stoichiometric ratio of electron donor reagent addition to greatly eliminate the effects of excess electron donor and excess biological material in the treated water. Controlling the anoxic environment in the biological reduction vessel is made much simpler as a result. TOC levels in the aeration tank are generally less than 5 or 6 ppm and the total suspended solids loading to the filtration system is manageable whereas greater than 24 hour filter service runs are possible and as demonstrated in this

pilot testing, the expected result. Apart from the operator-caused setpoint omission for the filter backwash cleaning sequence that occurred on February 28, 2019, the filter system operated reliably and predictably processing about 2,800 to 3,200 gallons between filter backwash cleaning cycles for a 24 to 28 hour service run. A failure of this type is unlikely to occur on a full-scale treatment system as alarm points would be triggered for operator notification. Such alarm notifications have not been instituted on this pilot control system.

CWRB DDW requirements for testing of the decanted supernatant filter backwash water revealed little difference from finished water quality other elevated TOC values than that in the raw water. Return of this water stream to the aeration overflow tank would provide the additional treatment necessary to reduce TOC to finished water quality levels. Therefore, all water used for filter backwash can be safely returned to the treatment process. This operational option provides a zero-liquid wastewater process where no wastewater volume collected requires disposal.

The concept of using simple biological reduction with the MIH process and a packed bed post-treatment solids filtration process using Loprest pressure filters appears to be an effective alternative to more elaborate filtration techniques and offers the least quantity of water treatment waste residuals per water volume treated. Manageable volumes of waste solids are suitable for non-hazardous waste disposal in California. The MIH/Loprest biological nitrate reduction process specifically reduces nitrate in a controlled manner without bulk dissolved solids removal or exchange removal of untargeted anion constituents. The final testing objectives for this pilot testing included full system concept verification to provide data for full-scale process development. With the data obtained through the testing conducted here in conjunction with the wastewater profiles of the waste solids generated in the process, these objectives were fulfilled.

MIH and Loprest, a division of WRT continues development of a full-service arrangement for treatment for nitrate contaminants in drinking water sources including waste residual handling and disposal methods that should reduce the operating costs and further reduce handling equipment at each treatment location. The results of the San Antonio Water Company pilot testing for MIH/Loprest biological reduction process has led us to the conclude that this treatment method offers the water provider the most cost effective and simple process for reliable nitrate treatment compared to other more complex competing and other traditional water treatment technologies. MIH/Loprest is confident that the process is ready for full-scale treatment implementation of all portions of the process. We trust the results of this study should provide San Antonio Water Company the support that the MIH/Loprest biological nitrate reduction process be given proper consideration for their nitrate treatment equipment.

Appendix A

Analytical Test Results
Page 22 - 57

BABCOCK Laboratories, Inc.
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Client Name: MIH Water Treatment, Inc.
Contact: Pete Hall
Address: 253 Belaire Court
Danville, QCA 94526

Report Date: 05-Feb-2019

Analytical Report: Page 1 of 4
Project Name: San Antonio Water - Well 31
Project Number: SA-31

Work Order Number: B9A2586

Received on Ice (Y/N): Yes Temp: 15 °C

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

Sample Identification

Lab Sample #	Client Sample ID	Matrix	Date Sampled	By	Date Submitted	By
B9A2586-01	SA-31 LP Outlet	Water	01/22/19 11:25	Peter Hall	01/22/19 12:19	Steve Corrington
B9A2586-02	SA-31 LP Outlet Travel Blank	Water	01/22/19 11:25	Peter Hall	01/22/19 12:19	Steve Corrington

mailing
P.O Box 432
Riverside, CA 92502-0432

location
6100 Quail Valley Court
Riverside, CA 92507-0704

P 951 653 3351
F 951 653 1662
www.babcocklabs.com

CA ELAP No. 2698
EPA No. CA00102
NELAP No. OR4035
LACSD No. 10119

Client Name: MIH Water Treatment, Inc.
Contact: Pete Hall
Address: 253 Belaire Court
Danville, QCA 94526

Report Date: 05-Feb-2019

Project Name: San Antonio Water - Well 31

Project Number: SA-31

Work Order Number: B9A2586

Received on Ice (Y/N): Yes Temp: 15 °C

Laboratory Reference Number

B9A2586-01

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
SA-31 LP Outlet	Water	01/22/19 11:25	01/22/19 12:19

Analyte(s)	Result		RDL	Units	Method	Analysis Date	Analyst	Flag
Anions								
Nitrate as N	0.27		0.20	mg/L	EPA 300.0	01/23/19 05:25	KBS	
Nitrite as N	ND		0.10	mg/L	EPA 300.0	01/23/19 05:25	KBS	
General Physical								
Turbidity	ND		0.10	NTU	SM 2130 B	01/23/19 19:57	JGZ	
Volatile Organic Compounds by EPA 524.2								
Total Trihalomethanes	20		0.50	ug/L	EPA 524.2	01/25/19 02:08	EEC	
Bromodichloromethane	2.6		0.50	ug/L	EPA 524.2	01/25/19 02:08	EEC	
Bromoform	ND		0.50	ug/L	EPA 524.2	01/25/19 02:08	EEC	
Chloroform	18		0.50	ug/L	EPA 524.2	01/25/19 02:08	EEC	
Dibromochloromethane	ND		0.50	ug/L	EPA 524.2	01/25/19 02:08	EEC	
Surrogate: 1,2-Dichloroethane-d4	97.4	%	50-150		EPA 524.2	01/25/19 02:08	EEC	
Surrogate: 4-Bromofluorobenzene	110	%	50-150		EPA 524.2	01/25/19 02:08	EEC	
Surrogate: Toluene-d8	99.2	%	50-150		EPA 524.2	01/25/19 02:08	EEC	
Haloacetic Acid by Standard Methods 6251B								
HAA5	22		2.0	ug/L	SM 6251B	01/31/19 15:01	DIS	
Monochloroacetic Acid	ND		2.0	ug/L	SM 6251B	01/31/19 15:01	DIS	
Dichloroacetic Acid	7.3		1.0	ug/L	SM 6251B	01/31/19 15:01	DIS	
Trichloroacetic Acid	15		1.0	ug/L	SM 6251B	01/31/19 15:01	DIS	
Monobromoacetic Acid	ND		1.0	ug/L	SM 6251B	01/31/19 15:01	DIS	
Dibromoacetic Acid	ND		1.0	ug/L	SM 6251B	01/31/19 15:01	DIS	
Surrogate: 2,3-Dibromoproprionic acid	106	%	70-130		SM 6251B	01/31/19 15:01	DIS	

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Client Name: MIH Water Treatment, Inc.
Contact: Pete Hall
Address: 253 Belaire Court
Danville, QCA 94526

Report Date: 05-Feb-2019

Project Name: San Antonio Water - Well 31
Project Number: SA-31

Work Order Number: B9A2586

Received on Ice (Y/N): Yes Temp: 15 °C

Laboratory Reference Number
B9A2586-02

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
SA-31 LP Outlet Travel Blank	Water	01/22/19 11:25	01/22/19 12:19

Analyte(s)	Result		RDL	Units	Method	Analysis Date	Analyst	Flag
Haloacetic Acid by Standard Methods 6251B								
HAA5	ND		2.0	ug/L	SM 6251B	01/31/19 15:47	DIS	
Monochloroacetic Acid	ND		2.0	ug/L	SM 6251B	01/31/19 15:47	DIS	
Dichloroacetic Acid	ND		1.0	ug/L	SM 6251B	01/31/19 15:47	DIS	
Trichloroacetic Acid	ND		1.0	ug/L	SM 6251B	01/31/19 15:47	DIS	
Monobromoacetic Acid	ND		1.0	ug/L	SM 6251B	01/31/19 15:47	DIS	
Dibromoacetic Acid	ND		1.0	ug/L	SM 6251B	01/31/19 15:47	DIS	
Surrogate: 2,3-Dibromoproprionic acid	103	%	70-130		SM 6251B	01/31/19 15:47	DIS	

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Client Name: MIH Water Treatment, Inc.
Contact: Pete Hall
Address: 253 Belaire Court
Danville, QCA 94526

Report Date: 05-Feb-2019

Project Name: San Antonio Water - Well 31

Project Number: SA-31

Work Order Number: B9A2586

Received on Ice (Y/N): Yes Temp: 15 °C

Notes and Definitions

ND:	Analyte NOT DETECTED at or above the Method Detection Limit **(if MDL is reported)**, otherwise at or above the Reportable Detection Limit (RDL)
NR:	Not Reported
RDL:	Reportable Detection Limit
MDL:	Method Detection Limit
* / ''' :	NELAP does not offer accreditation for this analyte/method/matrix combination

Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

Amanda C. Porter

cc:

e-Short_No Alias.rpt

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CA ELAP No. 2698
EPA No. CA00102
NELAP No. OR4035
LACSD No. 10119

BABCOCK Laboratories, Inc.
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Client Name: MIH Water Treatment, Inc.
Contact: Pete Hall
Address: 253 Belaire Court
Danville, QCA 94526

Report Date: 05-Feb-2019

Analytical Report: Page 1 of 1
Project Name: San Antonio Water - Well 31

Project Number: SA-31

Work Order Number: B9A2586

Received on Ice (Y/N): Yes Temp: 15 °C

BABCOCK Laboratories, Inc.
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6100 Quail Valley Court Riverside, CA 92507
(951) 653-3351 • FAX (951) 653-1662
www.babcocklabs.com

Chain of Custody & Sample Information Record

Client: MIH WATER
Contact: P J HALL
Fax No.
Phone No. 510-828-5073
email: PJHSITE2@MSN.COM
Project Name: SA-31
Project Location: SA WELL 31
Turn Around Time: Routine / *72 Hour Rush / *48 Hour Rush / *24 Hour Rush
*Lab TAT Approval: By: *Additional Charges Apply

Additional Reporting Requests
Include QC Data Package: ☐ Yes ☐ No
FAX Results: ☐ Yes ☐ No
Email Results: ☐ Yes ☐ No
State EDT: ☐ Yes ☐ No
(Include Source Number in Notes)

Sampler Information
Name: PETER HALL
Employer: MIH WATER
Signature: [signature]

Matrix: DW = Drinking Water; WW = Waste Water; GW = Ground Water; S = Source; SG = Sludge; L = Liquid; M = Miscellaneous

Notes: TB rec'd JG 1/22/19; All vials ok JG 1/22/19

Analysis Requested (annotation: mtm 1.23.19)

Sample ID	Date	Time	Unpreserved	H_2SO_4	HCl	HNO_3	$Na_2S_2O_3$	NaOH	NaOH/Zn Acetate	NH_4Cl	PDC	Total # of Containers	Routine	Resample	Special	NO3 NO2 TOX	HAA - TTHM	E.coli-coliform*	DA only*	Matrix	Notes
SA-31-LP OUTLET	01-22	11:25	✓									1									~~*Per Bottle~~
										✓		4					✓				~~Sample Filled~~
							✓					2					✓				~~JG 1/22/19~~
SA-31-MICRO												1						✓			*Per client
																					will resample
																					JG 1/22/19

Relinquished By (sign)	Print Name / Company	Date / Time	Received By (sign)	Print Name / Company
[signature]	Steve Covington MIH	1/22/19 1219	[signature]	Jenny G ESB

By signing on behalf of your organization and relinquishing this chain of custody you agree to abide by the Babcock Laboratories, Inc. *Terms and Conditions.*

(For Lab Use Only) Sample Integrity Upon Receipt/Acceptance Criteria

Sample(s) Submitted on Ice? (Yes) No
Custody Seal(s) Intact? Yes No (NA)
Sample(s) Intact? (Yes) No
Temperature: 15 °C ☐ Cooler Blank

Sample meets laboratory acceptance criteria? (Yes)
Permission to continue: Yes
Deviation/Notes:
Signature/Date:

B9A2586
1/22/2019 12:39
JUG

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Client Name: MIH Water Treatment, Inc.
Contact: Pete Hall
Address: 253 Belaire Court
Danville, QCA 94526

Report Date: 29-Jan-2019

Analytical Report: Page 1 of 3
Project Name: San Antonio Water - Well 31
Project Number: SA-31

Work Order Number: B9A2784

Received on Ice (Y/N): Yes Temp: 11 °C

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

Sample Identification

Lab Sample #	Client Sample ID	Matrix	Date Sampled	By	Date Submitted	By
B9A2784-01	SA-31 LP Outlet	Water	01/23/19 11:45	Steve Corrington	01/23/19 12:38	Steve Corrington

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Client Name: MIH Water Treatment, Inc.
Contact: Pete Hall
Address: 253 Belaire Court
Danville, QCA 94526

Report Date: 29-Jan-2019

Project Name: San Antonio Water - Well 31
Project Number: SA-31

Work Order Number: B9A2784

Received on Ice (Y/N): Yes Temp: 11 °C

Laboratory Reference Number
B9A2784-01

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
SA-31 LP Outlet	Water	01/23/19 11:45	01/23/19 12:38

Analyte(s)	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
Heterotrophic Plate Count - SM 9215 B							
Heterotrophic Plate Count	ND	1.0	CFU/mL	SM 9215B	01/25/19 13:00	SAR	
MMOMUG - Presence/Absence - SM 9223 B							
Total Coliform	Absent	1.1	----	SM 9223B	01/24/19 09:45	NGU	
E. coli	Absent	1.1	----	SM 9223B	01/24/19 09:45	NGU	

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Client Name: MIH Water Treatment, Inc.
Contact: Pete Hall
Address: 253 Belaire Court
Danville, QCA 94526

Report Date: 29-Jan-2019

Project Name: San Antonio Water - Well 31

Project Number: SA-31

Work Order Number: B9A2784

Received on Ice (Y/N): Yes Temp: 11 °C

Notes and Definitions

ND:	Analyte NOT DETECTED at or above the Method Detection Limit **(if MDL is reported)**, otherwise at or above the Reportable Detection Limit (RDL)
NR:	Not Reported
RDL:	Reportable Detection Limit
MDL:	Method Detection Limit
* / ''' :	NELAP does not offer accreditation for this analyte/method/matrix combination

Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

Amanda C. Porter

cc:

e-Short_No Alias.rpt

mailing
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location
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CA ELAP No. 2698
EPA No. CA00102
NELAP No. OR4035
LACSD No. 10119

BABCOCK Laboratories, Inc.
The Standard of Excellence for Over 100 Years

Client Name: MIH Water Treatment, Inc.
Contact: Pete Hall
Address: 253 Belaire Court
Danville, QCA 94526

Report Date: 29-Jan-2019

Analytical Report: Page 1 of 1
Project Name: San Antonio Water - Well 31
Project Number: SA-31

Work Order Number: B9A2784

Received on Ice (Y/N): Yes Temp: 11 °C

BABCOCK Laboratories, Inc.
The Standard of Excellence for Over 100 Years
6100 Quail Valley Court Riverside, CA 92507
(951) 653-3351 • FAX (951) 653-1662
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Chain of Custody & Sample Information Record

Client: MIH WATER | Contact: PJ Hall | Fax No.
Phone No. 510 828-5073 | email: PJHSITE2@MSN.COM
Project Name: SA-31 | Turn Around Time: Routine (*72 Hour Rush) *48 Hour Rush *24 Hour Rush
Project Location: SA-Well 31 | *Lab TAT Approval: | By: | *Additional Charges Apply

Additional Reporting Requests: Include QC Data Package: ☐ Yes ☐ No; FAX Results: ☐ Yes ☐ No; Email Results: ☐ Yes ☐ No; State EDT: ☐ Yes ☐ No (Include Source Number in Notes)

Sampler Information: Name: Steve Covington; Employer: MIH Water; Signature: SC

Sample ID	Date	Time	# of Containers & Preservatives: Unpreserved	H_2SO_4	HCl	HNO_3	$Na_2S_2O_3$	NaOH	NaOH/Zn Acetate	NH_4Cl	PDC	Total # of Containers	Sample Type: Routine	Resample	Special	Analysis Requested	Matrix	Notes
SA-31 LP outlet	1-23-2019	11:45					X					1			X	PA/THPC		* Rush Approved

Matrix: DW = Drinking Water; WW = Waste Water; GW = Ground Water; S = Source; SG = Sludge; L = Liquid; M = Miscellaneous

Relinquished By (sign)	Print Name / Company	Date / Time	Received By (sign)	Print Name / Company
SC	Steve Covington MIH	1/23/19 12:38		Alyssa / ESB

By signing on behalf of your organization and relinquishing this chain of custody you agree to abide by the Babcock Laboratories, Inc. *Terms and Conditions.*

(For Lab Use Only) Sample Integrity Upon Receipt/Acceptance Criteria

Sample(s) Submitted on Ice?	(Yes)	No	Sample meets laboratory acceptance criteria?	(Yes)	N
Custody Seal(s) Intact?	Yes	No (NA)	Permission to continue:	Yes	N
Sample(s) Intact?	(Yes)	No	Deviation/Notes:		
Temperature: 11 °C	☐ Cooler Blank		Signature/Date:		

B9A2784
1/23/2019 13:04
AJG

mailing
P.O Box 432
Riverside, CA 92502-0432

location
6100 Quail Valley Court
Riverside, CA 92507-0704

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www.babcocklabs.com

CA ELAP No. 2698
EPA No. CA00102
NELAP No. OR4035
LACSD No. 10119

BABCOCK Laboratories, Inc.
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Client Name: MIH Water Treatment, Inc.
Contact: Pete Hall
Address: 253 Belaire Court
Danville, QCA 94526

Report Date: 21-Feb-2019

Project Name: San Antonio Water - Well 31

Project Number: SA-31

Work Order Number: B9B0691

Received on Ice (Y/N): Yes Temp: 14 °C

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

Sample Identification

Lab Sample #	Client Sample ID	Matrix	Date Sampled	By	Date Submitted	By
B9B0691-01	SA-31 Outlet	Water	02/06/19 13:30	PVH	02/06/19 15:00	PJ Hall

mailing
P.O Box 432
Riverside, CA 92502-0432

location
6100 Quail Valley Court
Riverside, CA 92507-0704

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CA ELAP No. 2698
EPA No. CA00102
NELAP No. OR4035
LACSD No. 10119

Client Name: MIH Water Treatment, Inc.
Contact: Pete Hall
Address: 253 Belaire Court
Danville, QCA 94526

Report Date: 21-Feb-2019

Project Name: San Antonio Water - Well 31

Project Number: SA-31

Work Order Number: B9B0691

Received on Ice (Y/N): Yes Temp: 14 °C

Laboratory Reference Number

B9B0691-01

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
SA-31 Outlet	Water	02/06/19 13:30	02/06/19 15:00

Analyte(s)	Result		RDL	Units	Method	Analysis Date	Analyst	Flag
Anions								
Nitrate as N	0.42		0.20	mg/L	EPA 300.0	02/07/19 19:11	KBS	
Nitrite as N	ND		0.10	mg/L	EPA 300.0	02/07/19 19:11	KBS	
General Physical								
Turbidity	ND		0.10	NTU	SM 2130 B	02/07/19 23:15	JGZ	
Volatile Organic Compounds by EPA 524.2								
Total Trihalomethanes	75		0.50	ug/L	EPA 524.2	02/07/19 22:25	EEC	
Bromodichloromethane	3.1		0.50	ug/L	EPA 524.2	02/07/19 22:25	EEC	
Bromoform	ND		0.50	ug/L	EPA 524.2	02/07/19 22:25	EEC	
Chloroform	72		0.50	ug/L	EPA 524.2	02/07/19 22:25	EEC	
Dibromochloromethane	ND		0.50	ug/L	EPA 524.2	02/07/19 22:25	EEC	
Surrogate: 1,2-Dichloroethane-d4	99.3	%	50-150		EPA 524.2	02/07/19 22:25	EEC	
Surrogate: 4-Bromofluorobenzene	106	%	50-150		EPA 524.2	02/07/19 22:25	EEC	
Surrogate: Toluene-d8	98.2	%	50-150		EPA 524.2	02/07/19 22:25	EEC	
Trihalomethane Formation Potential by EPA Method 524.2								THMfp
Total Trihalomethanes (THMFP)	130		0.50	ug/L*	EPA 524.2	02/15/19 03:26	JES	
Bromodichloromethane (FP)	12		0.50	ug/L*	EPA 524.2	02/15/19 03:26	JES	
Bromoform (FP)	ND		0.50	ug/L*	EPA 524.2	02/15/19 03:26	JES	
Chloroform (FP)	120		5.0	ug/L*	EPA 524.2	02/15/19 02:58	JES	
Dibromochloromethane (FP)	2.6		0.50	ug/L*	EPA 524.2	02/15/19 03:26	JES	
Surrogate: 1,2-Dichloroethane-d4	99.9	%	50-150		EPA 524.2	02/15/19 03:26	JES	
Surrogate: 1,2-Dichloroethane-d4	103	%	50-150		EPA 524.2	02/15/19 02:58	JES	
Surrogate: 4-Bromofluorobenzene	99.6	%	50-150		EPA 524.2	02/15/19 03:26	JES	
Surrogate: 4-Bromofluorobenzene	97.1	%	50-150		EPA 524.2	02/15/19 02:58	JES	
Surrogate: Toluene-d8	98.8	%	50-150		EPA 524.2	02/15/19 02:58	JES	
Surrogate: Toluene-d8	99.7	%	50-150		EPA 524.2	02/15/19 03:26	JES	

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Client Name: MIH Water Treatment, Inc.
Contact: Pete Hall
Address: 253 Belaire Court
Danville, QCA 94526

Report Date: 21-Feb-2019

Project Name: San Antonio Water - Well 31
Project Number: SA-31

Work Order Number: B9B0691

Received on Ice (Y/N): Yes Temp: 14 °C

Laboratory Reference Number
B9B0691-01

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
SA-31 Outlet	Water	02/06/19 13:30	02/06/19 15:00

Analyte(s)	Result		RDL	Units	Method	Analysis Date	Analyst	Flag
Haloacetic Acid by Standard Methods 6251B								
HAA5	120		2.0	ug/L	SM 6251B	02/13/19 20:45	NAA	
Monochloroacetic Acid	3.9		2.0	ug/L	SM 6251B	02/13/19 20:45	NAA	
Dichloroacetic Acid	32		1.0	ug/L	SM 6251B	02/13/19 20:45	NAA	
Trichloroacetic Acid	87		2.0	ug/L	SM 6251B	02/13/19 20:45	NAA	
Monobromoacetic Acid	ND		1.0	ug/L	SM 6251B	02/13/19 20:45	NAA	
Dibromoacetic Acid	ND		1.0	ug/L	SM 6251B	02/13/19 20:45	NAA	
Surrogate: 2,3-Dibromoproprionic acid	94.4	%	70-130		SM 6251B	02/13/19 20:45	NAA	
Heterotrophic Plate Count - SM 9215 B								
Heterotrophic Plate Count	1.0		1.0	CFU/mL	SM 9215B	02/08/19 15:55	KJB	
MMOMUG - Presence/Absence - SM 9223 B								
Total Coliform	Absent		1.1	----	SM 9223B	02/07/19 12:15	NGU	
E. coli	Absent		1.1	----	SM 9223B	02/07/19 12:15	NGU	

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Client Name: MIH Water Treatment, Inc.
Contact: Pete Hall
Address: 253 Belaire Court
Danville, QCA 94526

Report Date: 21-Feb-2019

Project Name: San Antonio Water - Well 31

Project Number: SA-31

Work Order Number: B9B0691

Received on Ice (Y/N): Yes Temp: 14 °C

Notes and Definitions

THMfp	Sample dosed with 10 uL of a minimum 5% chlorine solution. Free Chlorine Residual present (>=1ppm) after 7 day incubation at or above 25 deg C.
ND:	Analyte NOT DETECTED at or above the Method Detection Limit **(if MDL is reported)**, otherwise at or above the Reportable Detection Limit (RDL)
NR:	Not Reported
RDL:	Reportable Detection Limit
MDL:	Method Detection Limit
* / ''' :	NELAP does not offer accreditation for this analyte/method/matrix combination

Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

Amanda C. Porter

cc:

e-Short_No Alias.rpt

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CA ELAP No. 2698
EPA No. CA00102
NELAP No. OR4035
LACSD No. 10119

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Client Name:	MIH Water Treatment, Inc.	Analytical Report:	Page 1 of 1
Contact:	Pete Hall	Project Name:	San Antonio Water - Well 31
Address:	253 Belaire Court Danville, QCA 94526	Project Number:	SA-31
Report Date:	21-Feb-2019	**Work Order Number:**	**B9B0691**

Received on Ice (Y/N): Yes Temp: 14 °C

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Chain of Custody & Sample Information Record

Client: MIH WATER Contact: Fax No.
Phone No. 510-828-6073 email:
Project Name: SA - 31
Project Location: SA-WELL 31
Turn Around Time: Routine *72 Hour Rush *48 Hour Rush *24 Hour Rush
*Lab TAT Approval: By: *Additional Charges Apply

Additional Reporting Requests
Include QC Data Package: ☐ Yes ☐ No
FAX Results: ☐ Yes ☐ No
Email Results: ☐ Yes ☐ No
State EDT: ☐ Yes ☐ No
(Include Source Number in Notes)

Sampler Information
Name: P HALL
Employer: MIH
Signature: [signature]

Matrix: DW = Drinking Water, WW = Waste Water, GW = Ground Water, S = Source, SG = Sludge, L = Liquid, M = Miscellaneous

Sample ID	Date	Time	Unpreserved	H_2SO_4	HCl	HNO_3	$Na_2S_2O_3$	NaOH	NaOH/Zn Acetate	NH_4Cl	PDC	Total # of Containers	Routine	Resample	Special	NO3 NO2 TUR	HAA	THM	E.COLI COLI	Matrix	Notes
SA-31-LP OUTLET	2/6 2019	1:30	✓									1				✓					
}										✓		4					✓				
}								✓				2					✓				
}			✓									8						✓			
MICRO -																			✓		

Relinquished By (sign)	Print Name / Company	Date / Time	Received By (sign)	Print Name / Company
[signature]	P HALL MIH	2/6/2019 5:00 PM	[signature]	Jordan G/ESB

By signing on behalf of your organization and relinquishing this chain of custody you agree to abide by the Babcock Laboratories, Inc. *Terms and Conditions.*

(For Lab Use Only) Sample Integrity Upon Receipt/Acceptance Criteria

Sample(s) Submitted on Ice? (Yes) No
Custody Seal(s) Intact? Yes No (NA)
Sample(s) Intact? (Yes) No
Temperature: 14 °C ☐ Cooler Blank

Sample meets laboratory acceptance criteria? (Yes)
Permission to continue: Yes
Deviation/Notes:
Signature/Date:

B9B0691
2/06/2019 16:28
JMG

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Client Name: MIH Water Treatment, Inc.
Contact: Pete Hall
Address: 253 Belaire Court
Danville, QCA 94526

Report Date: 28-Feb-2019

Project Name: San Antonio Water - Well 31

Project Number: SA-31

Work Order Number: B9B1525

Received on Ice (Y/N): Yes Temp: 17 °C

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

Sample Identification

Lab Sample #	Client Sample ID	Matrix	Date Sampled	By	Date Submitted	By
B9B1525-01	Inlet Water	Water	02/13/19 10:00	PJ Hall	02/13/19 12:50	Steve Corrington
B9B1525-02	Outlet LP	Water	02/13/19 10:00	PJ Hall	02/13/19 12:50	Steve Corrington
B9B1525-03	Micro	Water	02/13/19 10:00	PJ Hall	02/13/19 12:50	Steve Corrington

Client Name: MIH Water Treatment, Inc.
Contact: Pete Hall
Address: 253 Belaire Court
Danville, QCA 94526

Report Date: 28-Feb-2019

Project Name: San Antonio Water - Well 31

Project Number: SA-31

Work Order Number: B9B1525

Received on Ice (Y/N): Yes Temp: 17 °C

Laboratory Reference Number

B9B1525-01

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
Inlet Water	Water	02/13/19 10:00	02/13/19 12:50

Analyte(s)	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
Anions							
Nitrate as N	7.8	0.20	mg/L	EPA 300.0	02/13/19 22:45	KBS	
Nitrite as N	ND	0.10	mg/L	EPA 300.0	02/13/19 22:45	KBS	
Aggregate Organic Compounds							
Total Organic Carbon	ND	0.30	mg/L	SM 5310B	02/23/19 23:13	KCS	
General Physical							
Turbidity	0.12	0.10	NTU	SM 2130 B	02/14/19 01:30	MCM	

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Client Name: MIH Water Treatment, Inc.
Contact: Pete Hall
Address: 253 Belaire Court
Danville, QCA 94526

Report Date: 28-Feb-2019

Project Name: San Antonio Water - Well 31
Project Number: SA-31

Work Order Number: B9B1525

Received on Ice (Y/N): Yes Temp: 17 °C

Laboratory Reference Number
B9B1525-02

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
Outlet LP	Water	02/13/19 10:00	02/13/19 12:50

Analyte(s)	Result		RDL	Units	Method	Analysis Date	Analyst	Flag
Anions								
Nitrate as N	ND		0.20	mg/L	EPA 300.0	02/13/19 22:56	KBS	
Nitrite as N	ND		0.10	mg/L	EPA 300.0	02/13/19 22:56	KBS	
Aggregate Organic Compounds								
Total Organic Carbon	4.8		0.30	mg/L	SM 5310B	02/23/19 23:41	KCS	
General Physical								
Turbidity	ND		0.10	NTU	SM 2130 B	02/14/19 01:30	MCM	
Volatile Organic Compounds by EPA 524.2								
Total Trihalomethanes	48		0.50	ug/L	EPA 524.2	02/15/19 19:43	EEC	
Bromodichloromethane	4.9		0.50	ug/L	EPA 524.2	02/15/19 19:43	EEC	
Bromoform	ND		0.50	ug/L	EPA 524.2	02/15/19 19:43	EEC	
Chloroform	44		0.50	ug/L	EPA 524.2	02/15/19 19:43	EEC	
Dibromochloromethane	ND		0.50	ug/L	EPA 524.2	02/15/19 19:43	EEC	
Surrogate: 1,2-Dichloroethane-d4	97.1	%	50-150		EPA 524.2	02/15/19 19:43	EEC	
Surrogate: 4-Bromofluorobenzene	106	%	50-150		EPA 524.2	02/15/19 19:43	EEC	
Surrogate: Toluene-d8	97.3	%	50-150		EPA 524.2	02/15/19 19:43	EEC	
Trihalomethane Formation Potential by EPA Method 524.2								THMfp
Total Trihalomethanes (THMFP)	140		0.50	ug/L*	EPA 524.2	02/22/19 00:44	JES	
Bromodichloromethane (FP)	16		0.50	ug/L*	EPA 524.2	02/22/19 00:44	JES	
Bromoform (FP)	ND		0.50	ug/L*	EPA 524.2	02/22/19 00:44	JES	
Chloroform (FP)	120		5.0	ug/L*	EPA 524.2	02/22/19 18:37	EEC	
Dibromochloromethane (FP)	2.8		0.50	ug/L*	EPA 524.2	02/22/19 00:44	JES	
Surrogate: 1,2-Dichloroethane-d4	102	%	50-150		EPA 524.2	02/22/19 00:44	JES	
Surrogate: 1,2-Dichloroethane-d4	99.9	%	50-150		EPA 524.2	02/22/19 18:37	EEC	
Surrogate: 4-Bromofluorobenzene	97.5	%	50-150		EPA 524.2	02/22/19 00:44	JES	
Surrogate: 4-Bromofluorobenzene	103	%	50-150		EPA 524.2	02/22/19 18:37	EEC	
Surrogate: Toluene-d8	98.4	%	50-150		EPA 524.2	02/22/19 00:44	JES	
Surrogate: Toluene-d8	96.0	%	50-150		EPA 524.2	02/22/19 18:37	EEC	

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Client Name: MIH Water Treatment, Inc.
Contact: Pete Hall
Address: 253 Belaire Court
Danville, QCA 94526

Report Date: 28-Feb-2019

Project Name: San Antonio Water - Well 31
Project Number: SA-31

Work Order Number: B9B1525

Received on Ice (Y/N): Yes Temp: 17 °C

Laboratory Reference Number
B9B1525-02

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
Outlet LP	Water	02/13/19 10:00	02/13/19 12:50

Analyte(s)	Result		RDL	Units	Method	Analysis Date	Analyst	Flag
Haloacetic Acid by Standard Methods 6251B								
HAA5	39		2.0	ug/L	SM 6251B	02/21/19 00:27	NAA	
Monochloroacetic Acid	ND		2.0	ug/L	SM 6251B	02/21/19 00:27	NAA	
Dichloroacetic Acid	12		1.0	ug/L	SM 6251B	02/21/19 00:27	NAA	
Trichloroacetic Acid	26		1.0	ug/L	SM 6251B	02/21/19 00:27	NAA	
Monobromoacetic Acid	ND		1.0	ug/L	SM 6251B	02/21/19 00:27	NAA	
Dibromoacetic Acid	ND		1.0	ug/L	SM 6251B	02/21/19 00:27	NAA	
Surrogate: 2,3-Dibromoproprionic acid	99.3	%	70-130		SM 6251B	02/21/19 00:27	NAA	
Haloacetic Acid Formation Potential by Standard Methods 6251B								
HAA5FP	130		2.0	ug/L*	SM 6251B	02/21/19 07:18	NAA	
Monochloroacetic Acid (FP)	6.7		2.0	ug/L*	SM 6251B	02/21/19 07:18	NAA	
Dichloroacetic Acid (FP)	75		2.0	ug/L*	SM 6251B	02/21/19 07:18	NAA	
Trichloroacetic Acid (FP)	47		2.0	ug/L*	SM 6251B	02/21/19 07:18	NAA	
Monobromoacetic Acid (FP)	2.1		1.0	ug/L*	SM 6251B	02/21/19 07:18	NAA	
Dibromoacetic Acid (FP)	1.2		1.0	ug/L*	SM 6251B	02/21/19 07:18	NAA	
Surrogate: 2,3-Dibromoproprionic acid	124	%	70-130		SM 6251B	02/21/19 07:18	NAA	

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CA ELAP No. 2698
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NELAP No. OR4035
LACSD No. 10119

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Client Name: MIH Water Treatment, Inc.
Contact: Pete Hall
Address: 253 Belaire Court
Danville, QCA 94526

Report Date: 28-Feb-2019

Project Name: San Antonio Water - Well 31
Project Number: SA-31

Work Order Number: B9B1525

Received on Ice (Y/N): Yes Temp: 17 °C

Laboratory Reference Number
B9B1525-03

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
Micro	Water	02/13/19 10:00	02/13/19 12:50

Analyte(s)	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
Heterotrophic Plate Count - SM 9215 B							
Heterotrophic Plate Count	ND	1.0	CFU/mL	SM 9215B	02/15/19 15:05	NGU	
MMOMUG - Presence/Absence - SM 9223 B							
Total Coliform	Absent	1.1	----	SM 9223B	02/14/19 11:50	NGU	
E. coli	Absent	1.1	----	SM 9223B	02/14/19 11:50	NGU	

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Client Name: MIH Water Treatment, Inc.
Contact: Pete Hall
Address: 253 Belaire Court
Danville, QCA 94526

Report Date: 28-Feb-2019

Project Name: San Antonio Water - Well 31

Project Number: SA-31

Work Order Number: B9B1525

Received on Ice (Y/N): Yes Temp: 17 °C

Notes and Definitions

THMfp	Sample dosed with 10 uL of a minimum 5% chlorine solution. Free Chlorine Residual present (>=1ppm) after 7 day incubation at or above 25 deg C.
ND:	Analyte NOT DETECTED at or above the Method Detection Limit **(if MDL is reported)**, otherwise at or above the Reportable Detection Limit (RDL)
NR:	Not Reported
RDL:	Reportable Detection Limit
MDL:	Method Detection Limit
* / ''' :	NELAP does not offer accreditation for this analyte/method/matrix combination

Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

Amanda C. Porter

cc:

e-Short_No Alias.rpt

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CA ELAP No. 2698
EPA No. CA00102
NELAP No. OR4035
LACSD No. 10119

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Client Name:	MIH Water Treatment, Inc.	Analytical Report:	Page 1 of 1
Contact:	Pete Hall	Project Name:	San Antonio Water - Well 31
Address:	253 Belaire Court Danville, QCA 94526	Project Number:	SA-31
Report Date:	28-Feb-2019	**Work Order Number:**	**B9B1525**

Received on Ice (Y/N): Yes Temp: 17 °C

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Chain of Custody & Sample Information Record

Client: MIH WATER Contact: PJ HALL Fax No.
Phone No. 510-828-5073 email: PJHSITE2@MSN.COM
Project Name: SA-31 Turn Around Time: Routine *72 Hour Rush *48 Hour Rush *24 Hour Rush
Project Location: SA WELL 31 *Lab TAT Approval: By: *Additional Charges Apply

Additional Reporting Requests
Include QC Data Package: ☐ Yes ☐ No
FAX Results: ☐ Yes ☐ No
Email Results: ☐ Yes ☐ No
State EDT: ☐ Yes ☐ No
(Include Source Number in Notes)

Sampler Information
Name: PJ HALL
Employer: MIH WATER
Signature: [signature]

Matrix: DW = Drinking Water, WW = Waste Water, GW = Ground Water, S = Source, SG = Sludge, L = Liquid, M = Miscellaneous

Notes: All vials OK JG 2-13-19

Analysis Requested: [illegible] | [illegible] | [illegible] | TOC | E-COLI-COLIF | per HPC per project AG 2/13/19

Sample ID	Date	Time	Unpreserved	H_2SO_4	HCl	HNO_3	$Na_2S_2O_3$	NaOH	NaOH/Zn Acetate	NH_4Cl	PDC	Total # of Containers	Routine	Resample	Special	[illegible]	[illegible]	[illegible]	TOC	E-COLI-COLIF
INLET WATER	2/13 (2019 AG)	10:00	✓									1				✓				
OUTLET LP	↓	per	✓									1				✓				
↓	↓	bottles	✓									6					✓			
↓	↓	AG								✓		4						✓		
↓	↓	2/13/19					✓					2						✓		
↓	↓			✓								2						✓		
MICRO	↓																			✓
INLET WATER	↓			✓								2							✓	

Relinquished By (sign)	Print Name / Company	Date / Time	Received By (sign)	Print Name / Company
[signature]	Steve Covington MIH	2-13-19 1250	[signature]	Jordan G / ESB

By signing on behalf of your organization and relinquishing this chain of custody you agree to abide by the Babcock Laboratories, Inc. *Terms and Conditions.*

(For Lab Use Only) Sample Integrity Upon Receipt/Acceptance Criteria

Sample(s) Submitted on Ice? (Yes) No
Custody Seal(s) Intact? Yes No (NA)
Sample(s) Intact? (Yes) No
Temperature: 17 °C ☐ Cooler Blank

Sample meets laboratory acceptance criteria? (Yes)
Permission to continue: Yes
Deviation/Notes:
Signature/Date:

B9B1525
2/13/2019 13:19
AJG

Rev 6/16

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Client Name: MIH Water Treatment, Inc.
Contact: Pete Hall
Address: 253 Belaire Court
Danville, QCA 94526

Report Date: 07-Mar-2019

Analytical Report: Page 1 of 6
Project Name: San Antonio Water - Well 31
Project Number: SA-31

Work Order Number: B9B2320

Received on Ice (Y/N): Yes Temp: 11 °C

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

Sample Identification

Lab Sample #	Client Sample ID	Matrix	Date Sampled	By	Date Submitted	By
B9B2320-01	SA-31-Inlet	Water	02/20/19 10:00	PJ Hall	02/20/19 11:30	PJ Hall
B9B2320-02	SA-31-Outlet	Water	02/20/19 10:00	PJ Hall	02/20/19 11:30	PJ Hall
B9B2320-03	Micro	Water	02/20/19 10:00	PJ Hall	02/20/19 11:30	PJ Hall

BABCOCK Laboratories, Inc.
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Client Name: MIH Water Treatment, Inc.
Contact: Pete Hall
Address: 253 Belaire Court
Danville, QCA 94526

Report Date: 07-Mar-2019

Project Name: San Antonio Water - Well 31

Project Number: SA-31

Work Order Number: B9B2320

Received on Ice (Y/N): Yes Temp: 11 °C

Laboratory Reference Number

B9B2320-01

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
SA-31-Inlet	Water	02/20/19 10:00	02/20/19 11:30

Analyte(s)	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
Anions							
Nitrate as N	7.5	0.20	mg/L	EPA 300.0	02/20/19 15:33	KBS	
Nitrite as N	ND	0.10	mg/L	EPA 300.0	02/20/19 15:33	KBS	
General Physical							
Turbidity	0.15	0.10	NTU	SM 2130 B	02/20/19 21:28	JGZ	

Client Name: MIH Water Treatment, Inc.
Contact: Pete Hall
Address: 253 Belaire Court
Danville, QCA 94526

Report Date: 07-Mar-2019

Project Name: San Antonio Water - Well 31
Project Number: SA-31

Work Order Number: B9B2320

Received on Ice (Y/N): Yes Temp: 11 °C

Laboratory Reference Number
B9B2320-02

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
SA-31-Outlet	Water	02/20/19 10:00	02/20/19 11:30

Analyte(s)	Result		RDL	Units	Method	Analysis Date	Analyst	Flag
Anions								
Nitrate as N	ND		0.20	mg/L	EPA 300.0	02/20/19 15:48	KBS	
Nitrite as N	ND		0.10	mg/L	EPA 300.0	02/20/19 15:48	KBS	
Aggregate Organic Compounds								
Total Organic Carbon	6.5		0.30	mg/L	SM 5310B	02/24/19 04:32	KCS	
General Physical								
Turbidity	ND		0.10	NTU	SM 2130 B	02/20/19 21:28	JGZ	
Volatile Organic Compounds by EPA 524.2								
Total Trihalomethanes	73		0.50	ug/L	EPA 524.2	02/22/19 19:05	EEC	
Bromodichloromethane	6.0		0.50	ug/L	EPA 524.2	02/22/19 19:05	EEC	
Bromoform	ND		0.50	ug/L	EPA 524.2	02/22/19 19:05	EEC	
Chloroform	67		0.50	ug/L	EPA 524.2	02/22/19 19:05	EEC	
Dibromochloromethane	ND		0.50	ug/L	EPA 524.2	02/22/19 19:05	EEC	
Surrogate: 1,2-Dichloroethane-d4	97.3	%	50-150		EPA 524.2	02/22/19 19:05	EEC	
Surrogate: 4-Bromofluorobenzene	97.2	%	50-150		EPA 524.2	02/22/19 19:05	EEC	
Surrogate: Toluene-d8	93.2	%	50-150		EPA 524.2	02/22/19 19:05	EEC	
Trihalomethane Formation Potential by EPA Method 524.2								THMfp
Total Trihalomethanes (THMFP)	96		0.50	ug/L*	EPA 524.2	02/28/19 00:08	EEC	
Bromodichloromethane (FP)	9.8		0.50	ug/L*	EPA 524.2	02/28/19 00:08	EEC	
Bromoform (FP)	ND		0.50	ug/L*	EPA 524.2	02/28/19 00:08	EEC	
Chloroform (FP)	85		0.50	ug/L*	EPA 524.2	02/28/19 00:08	EEC	
Dibromochloromethane (FP)	1.2		0.50	ug/L*	EPA 524.2	02/28/19 00:08	EEC	
Surrogate: 1,2-Dichloroethane-d4	94.4	%	50-150		EPA 524.2	02/28/19 00:08	EEC	
Surrogate: 4-Bromofluorobenzene	108	%	50-150		EPA 524.2	02/28/19 00:08	EEC	
Surrogate: Toluene-d8	93.2	%	50-150		EPA 524.2	02/28/19 00:08	EEC	

Client Name: MIH Water Treatment, Inc.
Contact: Pete Hall
Address: 253 Belaire Court
Danville, QCA 94526

Report Date: 07-Mar-2019

Project Name: San Antonio Water - Well 31
Project Number: SA-31

Work Order Number: B9B2320

Received on Ice (Y/N): Yes Temp: 11 °C

Laboratory Reference Number
B9B2320-02

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
SA-31-Outlet	Water	02/20/19 10:00	02/20/19 11:30

Analyte(s)	Result		RDL	Units	Method	Analysis Date	Analyst	Flag
Haloacetic Acid by Standard Methods 6251B								
HAA5	37		2.0	ug/L	SM 6251B	02/23/19 02:32	NAA	
Monochloroacetic Acid	ND		2.0	ug/L	SM 6251B	02/23/19 02:32	NAA	
Dichloroacetic Acid	12		1.0	ug/L	SM 6251B	02/23/19 02:32	NAA	
Trichloroacetic Acid	25		1.0	ug/L	SM 6251B	02/23/19 02:32	NAA	
Monobromoacetic Acid	ND		1.0	ug/L	SM 6251B	02/23/19 02:32	NAA	
Dibromoacetic Acid	ND		1.0	ug/L	SM 6251B	02/23/19 02:32	NAA	
Surrogate: 2,3-Dibromoproprionic acid	101	%	70-130		SM 6251B	02/23/19 02:32	NAA	
Haloacetic Acid Formation Potential by Standard Methods 6251B								
HAA5FP	160		2.0	ug/L*	SM 6251B	03/06/19 01:18	NAA	
Monochloroacetic Acid (FP)	14		2.0	ug/L*	SM 6251B	03/06/19 01:18	NAA	
Dichloroacetic Acid (FP)	95		2.0	ug/L*	SM 6251B	03/06/19 01:18	NAA	
Trichloroacetic Acid (FP)	47		1.0	ug/L*	SM 6251B	03/06/19 01:18	NAA	
Monobromoacetic Acid (FP)	1.6		1.0	ug/L*	SM 6251B	03/06/19 01:18	NAA	
Dibromoacetic Acid (FP)	ND		1.0	ug/L*	SM 6251B	03/06/19 01:18	NAA	
Surrogate: 2,3-Dibromoproprionic acid	97.0	%	70-130		SM 6251B	03/06/19 01:18	NAA	

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Client Name: MIH Water Treatment, Inc.
Contact: Pete Hall
Address: 253 Belaire Court
Danville, QCA 94526

Report Date: 07-Mar-2019

Project Name: San Antonio Water - Well 31
Project Number: SA-31

Work Order Number: B9B2320

Received on Ice (Y/N): Yes Temp: 11 °C

Laboratory Reference Number
B9B2320-03

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
Micro	Water	02/20/19 10:00	02/20/19 11:30

Analyte(s)	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
Heterotrophic Plate Count - SM 9215 B							
Heterotrophic Plate Count	ND	1.0	CFU/mL	SM 9215B	02/22/19 14:00	NGU	
MMOMUG - Presence/Absence - SM 9223 B							
Total Coliform	Absent	1.1	----	SM 9223B	02/21/19 09:25	NGU	
E. coli	Absent	1.1	----	SM 9223B	02/21/19 09:25	NGU	

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EPA No. CA00102
NELAP No. OR4035
LACSD No. 10119

BABCOCK Laboratories, Inc.
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Client Name: MIH Water Treatment, Inc.
Contact: Pete Hall
Address: 253 Belaire Court
Danville, QCA 94526

Report Date: 07-Mar-2019

Project Name: San Antonio Water - Well 31

Project Number: SA-31

Work Order Number: B9B2320

Received on Ice (Y/N): Yes Temp: 11 °C

Notes and Definitions

THMfp	Sample dosed with 10 uL of a minimum 5% chlorine solution. Free Chlorine Residual present (>=1ppm) after 7 day incubation at or above 25 deg C.
ND:	Analyte NOT DETECTED at or above the Method Detection Limit **(if MDL is reported)**, otherwise at or above the Reportable Detection Limit (RDL)
NR:	Not Reported
RDL:	Reportable Detection Limit
MDL:	Method Detection Limit
* / ''' :	NELAP does not offer accreditation for this analyte/method/matrix combination

Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

Amanda C. Porter

cc:

e-Short_No Alias.rpt

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Client Name:	MIH Water Treatment, Inc.	Analytical Report:	Page 1 of 1
Contact:	Pete Hall	Project Name:	San Antonio Water - Well 31
Address:	253 Belaire Court Danville, QCA 94526	Project Number:	SA-31
Report Date:	07-Mar-2019	**Work Order Number:**	**B9B2320**

Received on Ice (Y/N): Yes Temp: 11 °C

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Chain of Custody & Sample Information Record

Client: MIH WATER Contact: PJ HALL Fax No.

Phone No. 510-828-5073 email: PJHSITEZ@MSN.COM

Project Name: SA-31 Turn Around Time: (Routine) *72 Hour Rush *48 Hour Rush *24 Hour Rush

Project Location: SA WELL 31 *Lab TAT Approval: By: *Additional Charges Apply

Additional Reporting Requests
Include QC Data Package: ☐ Yes ☐ No
FAX Results: ☐ Yes ☐ No
Email Results: ☐ Yes ☐ No
State EDT: ☐ Yes ☐ No
(Include Source Number in Notes)

Sampler Information
Name: PJ HALL
Employer: MIH WATER
Signature: [signature]

Matrix: (DW) = Drinking Water, WW = Waste Water, GW = Ground Water, S = Source, SG = Sludge, L = Liquid, M = Miscellaneous

Notes: 5 DAY TURNAROUND

PAA HPC per project AG 2/20/19

Sample ID	Date	Time	Unpreserved	H_2SO_4	HCl	HNO_3	$Na_2S_2O_3$	NaOH	NaOH/Zn Acetate	NH_4Cl	PDC	Total # of Containers	Routine	Resample	Special	NO3 NO2 Turb	THM-HAA5	TOC	HAA	E.Coli-Coliform
SA-31-INLET	2/20/19	10:00AM	✓									1				✓				
SA-31-OUTLET			✓									1				✓				
			✓									6					✓			
				✓								2						✓		
										✓		4							✓	
							✓					2							✓	
MICRO												1							X	✓

Relinquished By (sign)	Print Name / Company	Date / Time	Received By (sign)	Print Name / Company
[signature]	PJH MIH	2/20/19 11:13	[signature]	JB ESB

By signing on behalf of your organization and relinquishing this chain of custody you agree to abide by the Babcock Laboratories, Inc. *Terms and Conditions.*

(For Lab Use Only) Sample Integrity Upon Receipt/Acceptance Criteria

Sample(s) Submitted on Ice? (Yes) No
Custody Seal(s) Intact? Yes No (NA)
Sample(s) Intact? (Yes) No
Temperature: 11 °C ☐ Cooler Blank

Sample meets laboratory acceptance criteria? (Yes)
Permission to continue: Yes
Deviation/Notes:
Signature/Date:

B9B2320
2/20/2019 12:38
AJG

BABCOCK Laboratories, Inc.
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Client Name: MIH Water Treatment, Inc.
Contact: Pete Hall
Address: 253 Belaire Court
Danville, QCA 94526

Report Date: 14-Mar-2019

Project Name: San Antonio Water - Well 31
Project Number: SA - Well 31

Work Order Number: B9C0073

Received on Ice (Y/N): Yes Temp: 17 °C

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

Sample Identification

Lab Sample #	Client Sample ID	Matrix	Date Sampled	By	Date Submitted	By
B9C0073-01	Raw Water IN	Water	03/01/19 13:05	Steve Corrington	03/01/19 14:45	Steve Corrington
B9C0073-02	MIH-Outlet	Water	03/01/19 13:05	Steve Corrington	03/01/19 14:45	Steve Corrington
B9C0073-03	SA-31 Outlet	Water	03/01/19 13:05	Steve Corrington	03/01/19 14:45	Steve Corrington

Client Name: MIH Water Treatment, Inc.
Contact: Pete Hall
Address: 253 Belaire Court
Danville, QCA 94526

Report Date: 14-Mar-2019

Project Name: San Antonio Water - Well 31
Project Number: SA - Well 31

Work Order Number: B9C0073

Received on Ice (Y/N): Yes Temp: 17 °C

Laboratory Reference Number
B9C0073-01

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
Raw Water IN	Water	03/01/19 13:05	03/01/19 14:45

Analyte(s)	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
Anions							
Nitrate as N	7.4	0.20	mg/L	EPA 300.0	03/01/19 20:34	KBS	
Nitrite as N	0.12	0.10	mg/L	EPA 300.0	03/01/19 20:34	KBS	
General Physical							
Turbidity	0.18	0.10	NTU	SM 2130 B	03/01/19 18:15	KL	

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Client Name: MIH Water Treatment, Inc.
Contact: Pete Hall
Address: 253 Belaire Court
Danville, QCA 94526

Report Date: 14-Mar-2019

Project Name: San Antonio Water - Well 31
Project Number: SA - Well 31

Work Order Number: B9C0073

Received on Ice (Y/N): Yes Temp: 17 °C

Laboratory Reference Number
B9C0073-02

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
MIH-Outlet	Water	03/01/19 13:05	03/01/19 14:45

Analyte(s)	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
Anions							
Nitrate as N	ND	0.20	mg/L	EPA 300.0	03/01/19 20:46	KBS	
Nitrite as N	ND	0.10	mg/L	EPA 300.0	03/01/19 20:46	KBS	
General Physical							
Turbidity	6.6	0.10	NTU	SM 2130 B	03/01/19 18:15	KL	

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CA ELAP No. 2698
EPA No. CA00102
NELAP No. OR4035
LACSD No. 10119

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Client Name: MIH Water Treatment, Inc.
Contact: Pete Hall
Address: 253 Belaire Court
Danville, QCA 94526

Report Date: 14-Mar-2019

Project Name: San Antonio Water - Well 31
Project Number: SA - Well 31

Work Order Number: B9C0073

Received on Ice (Y/N): Yes Temp: 17 °C

Laboratory Reference Number
B9C0073-03

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
SA-31 Outlet	Water	03/01/19 13:05	03/01/19 14:45

Analyte(s)	Result		RDL	Units	Method	Analysis Date	Analyst	Flag
Anions								
Nitrate as N	ND		0.20	mg/L	EPA 300.0	03/01/19 20:58	KBS	
Nitrite as N	ND		0.10	mg/L	EPA 300.0	03/01/19 20:58	KBS	
Aggregate Organic Compounds								
Total Organic Carbon	3.9		0.30	mg/L	SM 5310B	03/09/19 04:22	KSL	
General Physical								
Turbidity	0.21		0.10	NTU	SM 2130 B	03/01/19 18:15	KL	
Volatile Organic Compounds by EPA 524.2								
Total Trihalomethanes	44		0.50	ug/L	EPA 524.2	03/01/19 23:59	EEC	
Bromodichloromethane	4.5		0.50	ug/L	EPA 524.2	03/01/19 23:59	EEC	
Bromoform	ND		0.50	ug/L	EPA 524.2	03/01/19 23:59	EEC	
Chloroform	39		0.50	ug/L	EPA 524.2	03/01/19 23:59	EEC	
Dibromochloromethane	ND		0.50	ug/L	EPA 524.2	03/01/19 23:59	EEC	
Surrogate: 1,2-Dichloroethane-d4	90.1	%	50-150		EPA 524.2	03/01/19 23:59	EEC	
Surrogate: 4-Bromofluorobenzene	107	%	50-150		EPA 524.2	03/01/19 23:59	EEC	
Surrogate: Toluene-d8	92.7	%	50-150		EPA 524.2	03/01/19 23:59	EEC	
Trihalomethane Formation Potential by EPA Method 524.2								THMfp
Total Trihalomethanes (THMFP)	120		0.50	ug/L*	EPA 524.2	03/09/19 01:37	EEC	
Bromodichloromethane (FP)	13		0.50	ug/L*	EPA 524.2	03/09/19 01:37	EEC	
Bromoform (FP)	ND		0.50	ug/L*	EPA 524.2	03/09/19 01:37	EEC	
Chloroform (FP)	100		5.0	ug/L*	EPA 524.2	03/11/19 12:30	EEC	
Dibromochloromethane (FP)	1.9		0.50	ug/L*	EPA 524.2	03/09/19 01:37	EEC	
Surrogate: 1,2-Dichloroethane-d4	87.5	%	50-150		EPA 524.2	03/11/19 12:30	EEC	
Surrogate: 1,2-Dichloroethane-d4	89.5	%	50-150		EPA 524.2	03/09/19 01:37	EEC	
Surrogate: 4-Bromofluorobenzene	107	%	50-150		EPA 524.2	03/11/19 12:30	EEC	
Surrogate: 4-Bromofluorobenzene	108	%	50-150		EPA 524.2	03/09/19 01:37	EEC	
Surrogate: Toluene-d8	90.7	%	50-150		EPA 524.2	03/09/19 01:37	EEC	
Surrogate: Toluene-d8	89.4	%	50-150		EPA 524.2	03/11/19 12:30	EEC	

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Client Name: MIH Water Treatment, Inc.
Contact: Pete Hall
Address: 253 Belaire Court
Danville, QCA 94526

Report Date: 14-Mar-2019

Project Name: San Antonio Water - Well 31
Project Number: SA - Well 31

Work Order Number: B9C0073

Received on Ice (Y/N): Yes Temp: 17 °C

Laboratory Reference Number
B9C0073-03

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
SA-31 Outlet	Water	03/01/19 13:05	03/01/19 14:45

Analyte(s)	Result		RDL	Units	Method	Analysis Date	Analyst	Flag
Haloacetic Acid by Standard Methods 6251B								
HAA5	42		2.0	ug/L	SM 6251B	03/06/19 06:52	NAA	
Monochloroacetic Acid	2.8		2.0	ug/L	SM 6251B	03/06/19 06:52	NAA	
Dichloroacetic Acid	14		1.0	ug/L	SM 6251B	03/06/19 06:52	NAA	
Trichloroacetic Acid	25		1.0	ug/L	SM 6251B	03/06/19 06:52	NAA	
Monobromoacetic Acid	ND		1.0	ug/L	SM 6251B	03/06/19 06:52	NAA	
Dibromoacetic Acid	ND		1.0	ug/L	SM 6251B	03/06/19 06:52	NAA	
Surrogate: 2,3-Dibromoproprionic acid	108	%	70-130		SM 6251B	03/06/19 06:52	NAA	
Heterotrophic Plate Count - SM 9215 B								
Heterotrophic Plate Count	ND		1.0	CFU/mL	SM 9215B	03/03/19 16:30	GSR	
MMOMUG - Presence/Absence - SM 9223 B								
Total Coliform	Absent		1.1	----	SM 9223B	03/01/19 16:45	TSA	
E. coli	Absent		1.1	----	SM 9223B	03/01/19 16:45	TSA	

BABCOCK Laboratories, Inc.
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Client Name: MIH Water Treatment, Inc.
Contact: Pete Hall
Address: 253 Belaire Court
Danville, QCA 94526

Report Date: 14-Mar-2019

Project Name: San Antonio Water - Well 31

Project Number: SA - Well 31

Work Order Number: B9C0073

Received on Ice (Y/N): Yes Temp: 17 °C

Notes and Definitions

THMfp	Sample dosed with 10 uL of a minimum 5% chlorine solution. Free Chlorine Residual present (>=1ppm) after 7 day incubation at or above 25 deg C.
ND:	Analyte NOT DETECTED at or above the Method Detection Limit **(if MDL is reported)**, otherwise at or above the Reportable Detection Limit (RDL)
NR:	Not Reported
RDL:	Reportable Detection Limit
MDL:	Method Detection Limit
* / ''' :	NELAP does not offer accreditation for this analyte/method/matrix combination

Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

Amanda C. Porter

cc:

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EPA No. CA00102
NELAP No. OR4035
LACSD No. 10119

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Client Name: MIH Water Treatment, Inc.
Contact: Pete Hall
Address: 253 Belaire Court
Danville, QCA 94526

Report Date: 14-Mar-2019

Analytical Report: Page 1 of 1
Project Name: San Antonio Water - Well 31
Project Number: SA - Well 31

Work Order Number: B9C0073

Received on Ice (Y/N): Yes Temp: 17 °C

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Chain of Custody & Sample Information Record

Client: MIH WATER TREATMENT Contact: PJHALL Fax No.
Phone No. 510-828-5073 email: PJHSITE1@MSN.COM NOTE
Project Name: SA-31
Project Location: SA-31 WELL
Turn Around Time: ~~Routine~~ *72 Hour Rush *48 Hour Rush *24 Hour Rush
*Lab TAT Approval: By: *Additional Charges Apply

Additional Reporting Requests
Include QC Data Package: ☐ Yes ☐ No
FAX Results: ☐ Yes ☐ No
Email Results: ☐ Yes ☐ No
State EDT: ☐ Yes ☐ No
(Include Source Number in Notes)

Sampler Information
Name: Steve Covington
Employer: MIH Wtr
Signature: SC

Sample ID	Date	Time	# of Containers & Preservatives: Unpreserved	H_2SO_4	HCl	HNO_3	$Na_2S_2O_3$	NaOH	NaOH/Zn Acetate	NH_4Cl	PDC	Total # of Containers	Sample Type: Routine	Resample	Special	Analysis Requested: NO3+NO2 Tot	TDC	TDA	E.coli-Coliform	TTHM		Matrix	Notes
RAW WATER IN	3/1/19	1:05	✓									1				✓							
MIH WATER OUT			✓									1				✓							
SA-31-OUTLET LP			✓									1				✓							
										✓		4											
				✓								2					✓						
							✓					2											
			✓									6											
MICRO												1							✓				

WEEK TURNAROUND
vials OK
AG 3/1/19

DW = Drinking Water
WW = Waste Water
GW = Ground Water
S = Source
SG = Sludge
L = Liquid
M = Miscellaneous

Relinquished By (sign)	Print Name / Company	Date / Time	Received By (sign)	Print Name / Company
SC	Steve Covington MIH	3/1/19 2:45	Alex Griffiths	Alex Griffiths / ESB

By signing on behalf of your organization and relinquishing this chain of custody you agree to abide by the Babcock Laboratories, Inc. *Terms and Conditions.*

(For Lab Use Only) Sample Integrity Upon Receipt/Acceptance Criteria

Sample(s) Submitted on Ice? (Yes) No
Custody Seal(s) Intact? Yes No (NA)
Sample(s) Intact? (Yes) No
Temperature: 17 °C ☐ Cooler Blank

Sample meets laboratory acceptance criteria? (Yes)
Permission to continue: Yes
Deviation/Notes:
Signature/Date:

B9C0073
3/01/2019 15:10
JUG

Appendix B

Backwash Waste Analytical Test Results
Page 58 – 71

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

Water Remediation Technology

Loprest San Antonio Pilot

PO# 014926

SGS Job Number: DA13581

Sampling Date: 02/13/19

Report to:

Water Remediation Technology
901 West 116th Avenue
Westminster, CO 80234
djones@wrtnet.com

ATTN: David Jones

Total number of pages in report: 13

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Scott Heideman
Laboratory Director

Client Service contact: Elizabeth Sutcliffe 303-425-6021

Certifications: CO (CO00049), ID (CO00049), NE (NE-OS-06-04), ND (R-027), NJ (CO007), OK (D9942) UT (NELAP CO00049), LA (LA150028), TX (T104704511), WY (8TMS-L)

Sections: 1 2 3 4

Table of Contents

Sample Summary

Water Remediation Technology

Job No: DA13581

Loprest San Antonio Pilot
Project No: PO# 014926

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
DA13581-1	02/13/19	00:00	DJ	02/14/19	AQ	Water	PILOT SLUDGE FILTRATE
DA13581-1F	02/13/19	00:00	DJ	02/14/19	AQ	Water Filtered	PILOT SLUDGE FILTRATE
DA13581-2	02/13/19	00:00	DJ	02/14/19	SO	Sludge	PILOT SLUDGE

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

Summary of Hits

Job Number: DA13581
Account: Water Remediation Technology
Project: Loprest San Antonio Pilot
Collected: 02/13/19

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
DA13581-1	**PILOT SLUDGE FILTRATE**					
Calcium		55300	800		ug/l	EPA 200.8
Iron		445	20		ug/l	EPA 200.8
Magnesium		8180	200		ug/l	EPA 200.8
Manganese		11.7	2.0		ug/l	EPA 200.8
Silicon		11400	50		ug/l	EPA 200.7
Sodium		27600	1000		ug/l	EPA 200.8
Strontium		317	40		ug/l	EPA 200.8
Alkalinity, Total as CaCO3		131	5.0		mg/l	SM 2320B-2011
Chloride		57.7	5.0		mg/l	EPA300.0/SW846 9056A
Hardness, Total as CaCO3 [a]		172	2.8		mg/l	SM 2340B-2011
Nitrogen, Nitrate		0.34	0.010		mg/l	EPA300.0/SW846 9056A
Phosphate, Ortho [b]		0.13	0.050		mg/l	EPA300.0/SW846 9056A
Sulfate		36.7	5.0		mg/l	EPA300.0/SW846 9056A
Total Organic Carbon		35.2	5.0		mg/l	SM 5310B-2011/9060A
DA13581-1F	**PILOT SLUDGE FILTRATE**					
Silicon		10500	50		ug/l	EPA 200.7
Silica, Dissolved [c]		22.5	0.11		mg/l	SW846 6010C\200.7
DA13581-2	**PILOT SLUDGE**					
Arsenic		37.7	2.5		mg/kg	SW846 6010C
Barium		84.3	1.0		mg/kg	SW846 6010C

(a) Calculated as: (Calcium * 2.497) + (Magnesium * 4.118)
(b) Sample originally analyzed in hold, however associated QC failed. Sample re-analyzed out of hold.
(c) Calculated as: (Silicon * 2.139)

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	PILOT SLUDGE FILTRATE		
Lab Sample ID:	DA13581-1	**Date Sampled:**	02/13/19
Matrix:	AQ - Water	**Date Received:**	02/14/19
		Percent Solids:	n/a
Project:	Loprest San Antonio Pilot		

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Calcium	55300	800	ug/l	2	02/15/19	02/18/19	EP	EPA 200.8 [1]	EPA 200.8 [3]
Iron	445	20	ug/l	2	02/15/19	02/18/19	EP	EPA 200.8 [1]	EPA 200.8 [3]
Magnesium	8180	200	ug/l	2	02/15/19	02/18/19	EP	EPA 200.8 [1]	EPA 200.8 [3]
Manganese	11.7	2.0	ug/l	2	02/15/19	02/18/19	EP	EPA 200.8 [1]	EPA 200.8 [3]
Silicon	11400	50	ug/l	1	02/21/19	02/21/19	JR	EPA 200.7 [2]	EPA 200.7 [4]
Sodium	27600	1000	ug/l	2	02/15/19	02/18/19	EP	EPA 200.8 [1]	EPA 200.8 [3]
Strontium	317	40	ug/l	2	02/15/19	02/18/19	EP	EPA 200.8 [1]	EPA 200.8 [3]

(1) Instrument QC Batch: MA11051
(2) Instrument QC Batch: MA11056
(3) Prep QC Batch: MP27359
(4) Prep QC Batch: MP27368

RL = Reporting Limit

Report of Analysis

Client Sample ID:	PILOT SLUDGE FILTRATE		
Lab Sample ID:	DA13581-1	**Date Sampled:**	02/13/19
Matrix:	AQ - Water	**Date Received:**	02/14/19
		Percent Solids:	n/a
Project:	Loprest San Antonio Pilot		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3	131	5.0	mg/l	1	02/15/19	PV	SM 2320B-2011
Chloride	57.7	5.0	mg/l	10	02/14/19 19:21	MA	EPA300.0/SW846 9056A
Fluoride [a]	< 1.0	1.0	mg/l	10	02/14/19 19:21	MA	EPA300.0/SW846 9056A
Hardness, Total as CaCO3 [b]	172	2.8	mg/l	1	02/18/19 23:04	EP	SM 2340B-2011
Nitrogen, Nitrate	0.34	0.010	mg/l	1	02/14/19 19:08	MA	EPA300.0/SW846 9056A
Nitrogen, Nitrite [a]	< 0.040	0.040	mg/l	10	02/14/19 19:21	MA	EPA300.0/SW846 9056A
Phosphate, Ortho [c]	0.13	0.050	mg/l	1	03/14/19 11:13	MA	EPA300.0/SW846 9056A
Sulfate	36.7	5.0	mg/l	10	02/14/19 19:21	MA	EPA300.0/SW846 9056A
Total Organic Carbon	35.2	5.0	mg/l	5	02/22/19 12:14	JB	SM 5310B-2011/9060A

(a) Elevated detection limit due to matrix interference.
(b) Calculated as: (Calcium * 2.497) + (Magnesium * 4.118)
(c) Sample originally analyzed in hold, however associated QC failed. Sample re-analyzed out of hold.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	PILOT SLUDGE FILTRATE		
Lab Sample ID:	DA13581-1F	**Date Sampled:**	02/13/19
Matrix:	AQ - Water Filtered	**Date Received:**	02/14/19
		Percent Solids:	n/a
Project:	Loprest San Antonio Pilot		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Silicon	10500	50	ug/l	1	03/01/19	03/01/19	JR	EPA 200.7 [1]	EPA 200.7 [2]

(1) Instrument QC Batch: MA11089
(2) Prep QC Batch: MP27444

RL = Reporting Limit

Report of Analysis

Client Sample ID:	PILOT SLUDGE FILTRATE		
Lab Sample ID:	DA13581-1F	**Date Sampled:**	02/13/19
Matrix:	AQ - Water Filtered	**Date Received:**	02/14/19
		Percent Solids:	n/a
Project:	Loprest San Antonio Pilot		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Silica, Dissolved [a]	22.5	0.11	mg/l	1	03/01/19 15:51	JR	SW846 6010C\200.7

(a) Calculated as: (Silicon * 2.139)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	PILOT SLUDGE		
Lab Sample ID:	DA13581-2	**Date Sampled:**	02/13/19
Matrix:	SO - Sludge	**Date Received:**	02/14/19
		Percent Solids:	96.1
Project:	Loprest San Antonio Pilot		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	37.7	2.5	mg/kg	1	02/18/19	02/19/19	JR	SW846 6010C [2]	SW846 3050B [5]
Barium	84.3	1.0	mg/kg	1	02/18/19	02/19/19	JR	SW846 6010C [2]	SW846 3050B [5]
Cadmium	< 1.0	1.0	mg/kg	1	02/18/19	02/18/19	JR	SW846 6010C [1]	SW846 3050B [5]
Chromium	< 1.0	1.0	mg/kg	1	02/18/19	02/18/19	JR	SW846 6010C [1]	SW846 3050B [5]
Lead	< 5.1	5.1	mg/kg	1	02/18/19	02/18/19	JR	SW846 6010C [1]	SW846 3050B [5]
Mercury [a]	< 0.85	0.85	mg/kg	10	02/21/19	02/21/19	JM	SW846 7471B [3]	SW846 7471B [4]
Selenium	< 5.1	5.1	mg/kg	1	02/18/19	02/18/19	JR	SW846 6010C [1]	SW846 3050B [5]
Silver	< 3.0	3.0	mg/kg	1	02/18/19	02/18/19	JR	SW846 6010C [1]	SW846 3050B [5]

(1) Instrument QC Batch: MA11048
(2) Instrument QC Batch: MA11052
(3) Instrument QC Batch: MA11054
(4) Prep QC Batch: MP27366
(5) Prep QC Batch: MP27369

(a) Elevated detection limit due to dilution required for possible matrix interference.

RL = Reporting Limit

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

CHAIN OF CUSTODY

SGS ACCUTEST

4036 Youngfield Street, Wheat Ridge, CO 80033
TEL. 303-425-6021 FAX: 303-425-6854
www.accutest.com

PAGE 1 OF 1

FED-EX Tracking #:
Bottle Order Control #:
SGS Accutest Quote #:
SGS Accutest Job #: DA13581

Client / Reporting Information

Company Name: WRT
Street Address: 901 W. 116th Ave
City: WESTMINSTER, CO
Project Contact: DAVID JONES
Phone # / Email: djones@wrtnet.com
Sampler(s) Name(s): DAVID JONES

Project Information

Project Name: LOPREST SAN ANTONIO PILOT
Street:
City, State:
Project #:
Client Purchase Order #: 014926
Project Manager:

Billing Information (If different from Report to)

Company Name:
Street Address:
City, State ZIP:
Attention:

Requested Analysis (see TEST CODE sheet)

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL - Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB-Field Blank; EB-Equipment Blank; RB- Rinse Blank; TB-Trip Blank

SGS Accutest Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	Number of preserved Bottles: HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Alkalinity (as CaCO3)	Ca, Cl, Fe, Mg, Mn, Si, Na	Sr, TOC, Sulfate	Phosphate, Nitrate (Nitrate)	Hardness (as CaCO3), Fluoride	RCRA Metals (Ag, As, Ba, Cd, Cr, Hg, Pb, Se)	LAB USE ONLY
	PILOT SLUDGE FILTRATE		2/13/19		DJ	WW	2					✓				✓	✓	✓	✓	✓		01
	PILOT SLUDGE		2/13/19		DJ	SL	1						✓								✓	02

Turnaround Time (Business days)

- [ ] Std. 15 Business Days
- [x] Std. 10 Business Days
- [ ] 5 Day RUSH
- [ ] 3 Day Emergency
- [ ] 2 Day Emergency
- [ ] 1 Day Emergency
- [ ]

Approved By (SGS Accutest PM): / Date:

Emergency & Rush T/A data available VIA Lablink

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] COMMBN
- [ ] COMMBN+
- [ ] State Forms Required
- [ ] Send Forms to State
- [ ] Report by Fax
- [ ] Report by PDF
- [ ] EDD Format

Commercial "A" = Results Only
Commercial "B" = Results + QC Summary
Commercial BN = Results/QC/Narrative + chromatograms

Comments / Special Instructions

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1		2/14/19 15:00	1	2		2
3			3	4		4
5			3			

Custody Seal #: HO — Intact — Preserved where applicable — On Ice — Cooler Temp. 5.9

DA13581: Chain of Custody
Page 1 of 2

SGS Accutest Sample Receipt Summary

Job Number: DA13581 **Client:** WRT **Project:** LOPREST

Date / Time Received: 2/14/2019 3:00:00 PM **Delivery Method:** **Airbill #'s:** HD

Cooler Temps (Initial/Adjusted): #1: (5.9/5.9);

Cooler Security	Y	or	N		Y	or	N
1. Custody Seals Present:	☑		☐	3. COC Present:	☑		☐
2. Custody Seals Intact:	☑		☐	4. Smpl Dates/Time OK	☑		☐

Cooler Temperature	Y	or	N
1. Temp criteria achieved:	☑		☐
2. Cooler temp verification:	Bar Therm;		
3. Cooler media:	Ice (Bag)		
4. No. Coolers:	1		

Quality Control Preservation	Y	or	N	N/A
1. Trip Blank present / cooler:	☐		☐	☑
2. Trip Blank listed on COC:	☐		☐	☑
3. Samples preserved properly:	☑		☐	
4. VOCs headspace free:	☐		☐	☑

Sample Integrity - Documentation	Y	or	N
1. Sample labels present on bottles:	☑		☐
2. Container labeling complete:	☑		☐
3. Sample container label / COC agree:	☑		☐

Sample Integrity - Condition	Y	or	N
1. Sample recvd within HT:	☑		☐
2. All containers accounted for:	☑		☐
3. Condition of sample:	Intact		

Sample Integrity - Instructions	Y	or	N	N/A
1. Analysis requested is clear:	☑		☐	
2. Bottles received for unspecified tests	☐		☑	
3. Sufficient volume recvd for analysis:	☑		☐	
4. Compositing instructions clear:	☐		☐	☑
5. Filtering instructions clear:	☐		☐	☑

Comments

Appendix C

MIH and Loprest Pilot Test Daily Operations Log
Page 72 - 75

LOPREST DIVISION OF WRT

Job Name:

Job Number:

Pilot Test Data Log

COLUMN # ~~gal H2O~~ ~~gal H2O~~

MEDIA TYPE:

MEDIA DEPTHS: To Hall FLT

SHEET No.

Run #	Date	Time	~~ACID PUMP~~ ml/min	~~ACID STOCK~~ SOL'N	CI PUMP ml/min	CI STOCK SOL'N	Poly PUMP ml/min	Poly STOCK SOL'N	CI Free IN mg/l	CI Free OUT mg/l	Turb In NTU	~~Turb Out~~ NTU	Turb Out Meter NTU	Nitrate N In mg/l	Nitrate N Out mg/l	Diff. Press. psid	pH In/Out	Sample yes/no	B.wash freq per day	B.wash Vol gal	Temp °F	LOAD RATE gpm/sf	FLOW RATE GPM	CUMM. FLOW GAL	Notes
29	12/10/18	9:20			12.5	1825 / 10gal	11.5	380ml / 10gal	3.57	.40	7.61		.048	10-11	1.3	7	7.3 / 7.2		1 / 26 HRS		67.1		1.2-2		
32	12/13/18	11:15			12.5	1825 / 10gal	11.5	380ml / 10gal	2.88	0.25	8.41		.049	12.3	.9	5.5	7.2 / 7.2		1 / 26 HRS		66		1.2-1.8		
36	12/17/18	11:15			12.5	1825 / 10gal	✓	✓	4.32	2.15	9.8		.109	10-11	1.9	1	7.1 / 7.1		1/36 HRS		65		1.8-2.2		25 mins after BW.
40	12/21/18	9:00			16	✓	12.5	✓	4.56	1.32	7.26		.069	10-12	1.7	8	7.1 / 7.2		1/24 HRS		64.7		1-1.3		
44	12/27/18	13:45			13.5	✓	12.5	✓	4.28	1.27	6.62		.038		1.5	1	7.1 / 7.2		1/36 HRS		65.5		1.6-1.8		@10:30, Cl out = 3.42. PZ TO → 60CPM to get Cl rapidly to range for sample. Pump set to 65CPM @ 3pm after weekly sampling of wells
44 (SPLIT)	12/28	12:30			14	✓	13	✓	5.80	1.25	5.78		.069		1.4	7	7.2 / 7.2		1/36 HRS		59.0		1.4-1.6		@11:34, Cl out = 1.75 \ 63CPM
45	1/14/19	10:50				✓		✓																	
47	1/16/19					1216 / 15gal		✓																	• END

Note: All samples taken from effluent except as noted by "in"

@4:00 Cl = 0.12 of 2b 185 flr. low Cl conc.

1216 ml Cl_2 / 10 gal H_2O

1825 ml → 10 gal

15 gal

1825 ml 15 gal

1216 ml

4.

1825 | 15
32 | 121.6
25
100
100

LOPREST DIVISION OF WRT

Job Name:

Job Number:

Pilot Test Data Log

COLUMN #

MEDIA TYPE:

MEDIA DEPTHS:

SHEET No.

Run #	Date	Time	ACID PUMP ml/min	ACID STOCK SOL'N	Cl PUMP ml/min	Cl STOCK SOL'N	Poly PUMP ml/min	Poly STOCK SOL'N	Cl Free IN mg/l	Cl Free OUT mg/l	Turb In NTU	Turb Out NTU	Turb Out Meter NTU	Nitrate N In mg/l	Nitrate N Out mg/l	Diff. Press. psid	pH In/Out	Sample yes/no	B.wash freq per day	B.wash Vol gal	Temp °F	LOAD RATE gpm/sf	FLOW RATE GPM	CUMM. FLOW GAL	Notes
	1/18/19	—	—	—	—	—	—	—	—	—	SHUT DOWN			—	—	—	—	—	—	—	—	—	—	—	System shutdown NO chemicals for ~3 hrs after restart
	1/21/19	12pm			60 strokes				1.4	0															
	1/21/19	4pm			15.5ml 64 strokes				1.5	1-1.1															Flow 1.6 – 2.05
	1/22/19	7am							2	1.7															Flow 2.2 – 2.6 Cl pump 64 strokes Adjusted Flow 1.7 – 2.15 Cl pump – 63
	1/24	11:30			75 strokes	30 gal	40	30 gal	2	.9			.085										1.7-2.2		
	1/28	12 PM			77 strokes		40 strokes		2.1	1.9			0.068										1.8-2.2		Flow 1.3-1.7, adjusted to 1.8-2.2
	1/28	3:30 PM			77		40		2.2	0.9			0.061										1.6-2.0		
	1/29	9:30AM			77		40		2.3	0.8			0.089										1.5-2.1		Flow was around 4gpm - adjusted, but super touchy BW ~12:30 PM
	1/29	3PM			77	~25gal	40	~25gal	2.0	1.3			0.070										1.9-2.2		END

Note: All samples taken from effluent except as noted by "in".

LOPREST DIVISION OF WRT

Job Name: San Antonio Water Systems
Job Number: 33622

Pilot Test Data Log
COLUMN # 1, 2 and 3

MEDIA TYPE: Filter Sand
MEDIA DEPTHS: 30"

SHEET No.
1 of 5

Run #	Date	Time	ACID PUMP ml/min	ACID STOCK SOL'N	CI PUMP ml/min	CI STOCK SOL'N	Poly PUMP ml/min	Poly STOCK SOL'N	CI Free IN mg/l	CI Free OUT mg/l	Turb In NTU	Turb Out NTU	Turb Out Meter NTU	Nitrate N In mg/l	Nitrate N Out mg/l	Diff. Press. psid	pH In/Out	Sample yes/no	Currnet Run Volume	Last Run Volume	Temp °F	LOAD RATE gpm/sf	FLOW RATE GPM	Total Treated Volume	Notes (from treat charts on NTU and Flow)
1	1/30	8 AM			77 strokes		40 strokes		2.3	1.0			0.071									6	1.8-2.1		Flow was a little high. Closed valve a little
2	1/30	4:30			77		40		2.2	0.7			0.276 (dropping) 0.075@5PM										1.9-2.2		Pumps stopped around 1PM - called Tim, program error, started backup around 3PM Ran BW & collected solids
3	1/31	8Am			77		40		2.5	1.2			0.044										1.7-1.9		
4	1/31	11:30Am			77		40		2.1	0.9			0.083										1.8-2.2		Filled chemicals
5	2/3	4:30 PM											0.093										1.9		STOPPED RUN
6	2																								
7	2/6	11:35			79				2.4	0.8													1.9		
8																									
9																									
10																									

Note: All samples taken from effluent except as noted by "in".

2/6 2019

7. Set up active flow control. Gain 4.0 Reset 1.0
Backwash sequence at 11:15 AM
turbidity reduced to < 0.3 in 7 min after full-flow restart.

Dynamic shutdown test. - 12:10 PM
turbidity 0.058
Outlet Cl_2 - 2.5 ppm.
Inlet Cl_2 - 3.4 ppm.
Cl_2 pump 72 strokes/min

1 hr. duration.

PJH @ 3:15 PM
2/
Cl 3.0 - 5.0
OVER LIMIT
3:30

Drew samples for HC @ 9:00
3.6 IN
@ 9:20 2.2°
Received to 11.

restart at 13:20
flow rate stabilized in 3 minutes
turbidity maximum 0.221 NTU
0.050 in 9 minutes

HC 13:45
Coliform
DBP

Tim - 925-330-6615

2/11 1045 - REFILL 10 GAL POLY
20 GAL Cl_2