WATER SYSTEM IMPROVEMENT PROJECT

STATE WATER RESOURCES CONTROL BOARD

PROP 1 PROJECT NO.: 4500006-001P

AGREEMENT NO.: D17-02001

PRELIMINARY ENGINEERING REPORT

FOR

SHASTA COUNTY

SERVICE AREA NO. 2 SUGARLOAF

NOVEMBER 2019

JOB NO. 199.95

PACE ENGINEERING

November 25, 2019

199.95.600

SENT BY MAIL AND EMAIL
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We are pleased to present the Final Preliminary Engineering Report entitled:

SHASTA COUNTY SERVICE AREA NO. 2 SUGARLOAF
WATER SYSTEM IMPROVEMENT PROJECT
PRELIMINARY ENGINEERING REPORT

This Final Preliminary Engineering Report is a necessary attachment to submit a complete Financial Assistance Application for construction funding should the County choose to pursue such funding.

Funding for this Final Preliminary Engineering Report has been provided in full through Agreement No. D17-02001 with the State Water Resources Control Board (SWRCB). The contents of this document do not necessarily reflect the views and policies of the SWRCB nor does mention of trade names or commercial products constitute endorsement or recommendation for use (Government Code, § 7550; 40 CFR § 31.20).

PACE Engineering, Inc. would like to thank County staff for their able assistance in its preparation. Please contact us with any questions you may have regarding this report.

Sincerely,

Laurie McCollum, P.E.
Senior Engineer

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PRELIMINARY ENGINEERING REPORT

FOR

SHASTA COUNTY
SERVICE AREA NO. 2 SUGARLOAF

COUNTY OF SHASTA CALIFORNIA

WATER SYSTEM IMPROVEMENT PROJECT

NOVEMBER 2019

JOB NO. 199.95

Prepared By:

11/25/19

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ABBREVIATIONS

The following abbreviations are used in this report:

ADD	Average Daily Demand. This is the average rate of water usage per day within a year. It can be expressed on an individual basis such as gallons per connection per day (GPCD), or on a community basis in million gallons per day (MGD), acre-feet per day, or per year.
AIR	Annual Inspection Report
AIS	American Iron & Steel
AMR	Automatic Meter Reader
Board	Shasta County Board of Supervisors
BPS	Booster Pump Station
CAB	Community Advisory Board
CCR	Consumer Confidence Report
CEQA	California Environmental Quality Act
CIPP	Cured-in-Place Pipe
County	Shasta County
CRWA	Cal Rural Water Association
CSA 2	Shasta County Service Area No. 2 Sugarloaf
CVP	Central Valley Project
DDW	Division of Drinking Water
DOF	Department of Finance
DWSRF	Drinking Water State Revolving Fund
Enloe	Enloe Drilling and Pumps, Inc.
ENR CCI	Engineering News Record Construction Cost Index
EPA	Environmental Protection Agency
ESWTR	Enhanced Surface Water Treatment Rule
FPS	Feet per Second
Ft	Feet
FY	Fiscal Year
GPD	Gallons Per Day
GPM	Gallons Per Minute
HAA5	Haloacetic Acids
HDD	Horizontal Directional Drilling

HDPE	High-Density Polyethylene
HP	Horsepower
L&A	Lawrence & Associates
LAFCO	Local Agency Formation Commission
LCC	Life Cycle Cost
MCL	Maximum Contaminant Level
MDD	Maximum Day Demand. Same units as ADD.
MG	Million Gallons
MGD	Million Gallons per Day
	NOTE: 1 MGD = 694 GPM = 3.07 Ac-ft/Day
MHD	Maximum Hourly Demand. Same units as ADD.
MHI	Median Household Income
MSR	Municipal Services Review
NEPA	National Environmental Policy Act
NPW	Net Present Worth
NSF	National Sanitation Foundation
NTU	Nephelometric Turbidity Units
O&M	Operations and Maintenance
PACE	PACE Engineering, Inc.
PG&E	Pacific Gas & Electric
PVC	Polyvinyl Chloride Pipe
SDWA	Safe Drinking Water Act
SF	Square Foot
Solid Rock	Solid Rock Construction, Inc.
SWRCB	State Water Resources Control Board
TTHM	Total Trihalomethanes
USFS	United States Forest Service
USGS	United States Geological Survey
WTP	Sugarloaf Water Treatment Plant

SHASTA COUNTY SERVICE AREA NO. 2 SUGARLOAF WATER SYSTEM IMPROVEMENT PROJECT PRELIMINARY ENGINEERING REPORT NOVEMBER 2019

EXECUTIVE SUMMARY

A. INTRODUCTION

Shasta County (County) Service Area No. 2 Sugarloaf (CSA 2) is a small community located on the Sacramento River arm of Shasta Lake directly across from Salt Creek Inlet and south of Lakeshore in Shasta County. The zoning designation at the project site is rural residential within the National Recreation Area, Shasta Unit per the Shasta County Zoning Plan. CSA 2 has a total of 90 metered service connections within the service area boundary, 62 of which are active. All active connections are single-family residential. Sugarloaf is not a Census Designated Place, so exact population statistics are not available. The California Public Water Supply Drinking Water Watch indicates a current estimated population served of 160. There are currently no developments proposed for connection to the water system, and as such, growth in CSA 2 in the next 20 years is assumed to be negligible.

B. NEED FOR PROJECT

As described in the most recent State Water Resources Control Board Division of Drinking Water Annual Inspection Report, completed May 19, 2015, numerous areas of noncompliance were documented with surface water treatment requirements, inadequate source water and storage capacity, incomplete monitoring of disinfection byproducts, and poor well and water storage conditions. This led to issuance of Compliance Order No. 01-02-15R-005 for violation of California Code of Regulations, Title 22, Section 64652 pertaining to the use of inline filtration, which is an unapproved filtration technology.

While improvements to the Shale Lane Well in 2017 eliminated coliform issues associated with that source, a Boil Water Notice is required whenever the County must utilize the surface water spring source. The most recent occurrence of a Boil Water

Notice being issued was in June 2018 when the well pump went out and required replacement. The County is still currently on the Boil Water Notice for when the Sugarloaf Water Treatment Plant (WTP) must be utilized given the limited source supply they currently have.

Existing source and storage capacity are not adequate to meet production maximum day demand (MDD) primarily due to the exceptionally high average of unaccounted-for water loss of 75% over the last five years, which points to the need for pipeline main and service replacement. There is also not currently an emergency generator dedicated to CSA 2, which is badly needed given that the remote area is surrounded by forest and is susceptible to high fire danger.

Collectively, the above-described problems represent the most severe health threats.

C. ALTERNATIVES CONSIDERED

Water supply alternatives considered included increasing the existing water right, finding another surface water source, installing a larger Shale Lane well pump, and drilling a new well.

Water treatment alternatives considered included installing a contact clarifier and filters, constructing a flocculation pipeline, performing a particle removal study, and performing a Cryptosporidium action plan study.

Distribution system alternatives considered included constructing a larger water storage tank and converting the existing to a pretreatment tank; rehabilitating the existing water storage tank; constructing a bolted steel tank or a welded steel tank; and open-cut, pipe bursting, horizontal directional drilling, and cured-in-place pipe for pipeline replacement.

Consolidation: While there are a couple of very small, private mutual water systems in the vicinity of CSA 2, they are either not large enough to consider consolidation with or would entail significant environmental and permitting issues. The Skyline Mutual Water

Company Water System operates a well located approximately 300 feet south of the WTP. According to the County Environmental Health Division 2008 Inspection Report, the well provides service to seven parcels and produced approximately 60 gallons per minute during a one-hour pump test performed in 2001. While it appears to have good production, a one-hour pump test is not adequate to evaluate the long-term water production capabilities of the well. Additionally, the well has had iron and manganese detected above the maximum contaminant level. Among other improvements, consolidation with this system would require a pipeline to be constructed across a large ravine and an unnamed stream on US Forest Service land. This would entail a great deal of environmental and permitting work that would likely delay project completion. Consolidation would also result in the County taking over the system since it is so small, which would likely not be viewed favorably by existing parcel owners who perceive the consolidation as a loss of control over a system that gives them "no problems." Additionally, this alternative would not solve the current water storage shortage or replace aging infrastructure that has met its useful service life. As such, consolidation is considered to be infeasible at this time, and a cost estimate is not provided herein for this alternative.

No Project Alternative: The No Project Alternative is considered infeasible because it would not address health, safety, and regulatory needs of the community. CSA 2 would continue to operate a system that is not an approved filtration technology, nor be able to provide a reliable source or adequate storage to meet MDD. Existing infrastructure would continue to not meet low lead requirements. Aging, inaccurate, and inefficient meters and pipelines and services with frequent leaks would not be addressed. As such, this alternative is not feasible.

The small number of connections in CSA 2 limits the ability to fund a large capital improvement project and is primarily based on the availability of grant funding. As such, cost estimates were completed for several scenarios ranging from completion of all improvements recommended in the report (Alternative 1), to only distribution system improvements (Alternative 4).

D. LIFE CYCLE COST (LCC) ANALYSIS

LCCs were only carried through for feasible alternatives using projected annual operation and maintenance (O&M) costs and expected useful life for salvage value as taken from US Environmental Protection Agency Asset Management: A Handbook for Small Drinking Water Systems. EPA 816-R-03-016. September 2003. LCCs for feasible alternatives including the recommended project are shown in Table 18 of the report and is included at the end of this Executive Summary for ease of reference. As shown therein, Alternative 4, Distribution System Improvements Only, is anticipated to have the lowest capital cost and therefore the lowest LCC, followed by Alternative 3, New Storage Tank and Distribution System Improvements. Alternative 1, WTP, Storage, and Distribution System Improvements would have the highest capital cost and highest LCC accordingly.

Non-monetary factors were also considered for each feasible alternative which included ability to obtain easements and permits, simplicity of operation, ability to meet future regulations, future serviceability and reliability, likelihood of implementation, security and safety to workers and the public, and environmental impact. Primarily due to the best ability to meet future regulations and resulting simplicity of operation if all improvements needed were to be completed, Alternative 1 is preferred based upon non-monetary criteria.

Although complete treatment, storage, and distribution system improvements included in Alternative 1 would be ideal, even if minimal required distribution system improvements only (Alternative 4) were to be constructed via 100% loan, a bimonthly rate increase of $200.66 would result. As such, grant funding is required for any improvements to be feasible given the small number of active service connections in a disadvantaged community.

E. PROPOSED PROJECT

Depending on available grant funding, Alternative 3, New Storage Tank and Distribution System Improvements is the recommended project to be pursued at a total project cost of $2,247,000, including a 10% construction contingency. Total project costs are based on November 2019 dollars but have been projected forward to construction in 2021. The tank will likely be bid as an additive alternative to the recommended distribution system components. If only limited grant funding can be obtained, it is recommended Alternative 4, Distribution System Improvements Only, be pursued at a total project cost of $1,440,000, including a 10% construction contingency.

TABLE ES-1
CSA 2 Sugarloaf
Water System Improvement Project
Preliminary Engineering Report
Alternative Project Present Worth Analysis

Alt No.	Description	Total Project Capital Cost[1]	Annual O&M	O&M Present Worth[2] (P/A, 1.5%, 20 Yrs) PW Factor = 17.169	Salvage Value	Salvage Value Present Worth[2] (P/F, 1.5%, 20 Yrs) PW Factor = 0.7425	Net Present Worth
1	WTP, Storage, and Distribution System Improvements	$3,426,000	$51,000	$875,601	$821,000	$609,568	$3,692,032
2	Sand Filter Only, Storage, and Distribution System Improvements	$2,830,000	$49,500	$849,848	$760,000	$564,278	$3,115,570
3	New Storage Tank and Distribution System Improvements	$2,081,000	$61,100	$1,049,004	$461,000	$342,279	$2,787,725
4	Distribution System Improvements Only	$1,338,000	$61,100	$1,049,004	$329,000	$244,273	$2,142,731

1. Total Project Cost does not include contingencies.

2. Real Interest Rates on Treasury Notes and Bonds of Specified Maturities (in percent) according to the Office of Management and Budget Circular No. A-94, revised November 2018.

SHASTA COUNTY SERVICE AREA NO. 2 SUGARLOAF WATER SYSTEM IMPROVEMENT PROJECT PRELIMINARY ENGINEERING REPORT NOVEMBER 2019

I. PROJECT PLANNING

A. LOCATION MAPS

Shasta County (County) Service Area No. 2 Sugarloaf (CSA 2) is a small community located on the Sacramento River arm of Shasta Lake directly across from Salt Creek Inlet and south of Lakeshore in Shasta County as shown on the United States Geological Survey (USGS) map in Figure 1. CSA 2 encompasses approximately 55 acres. The proposed project is located in Section 26, Township 35 North, Range 5 West, Mount Diablo Base and Meridian. Existing major water system components are shown in Figure 2. The zoning designation at the project site is rural residential within the National Recreation Area, Shasta Unit per the Shasta County Zoning Plan.

B. ENVIRONMENTAL RESOURCES PRESENT

There does not appear to be any lasting impact on land resources, historic sites, wetlands, flood plains, endangered species, or critical habitat as a result of the proposed project. Biological and cultural resource studies are being completed by ENPLAN to meet California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) requirements. Initial review indicates the recommended project will be categorically exempt per CEQA guidelines. Contingent upon findings of the environmental document, the project design and construction are anticipated to incorporate typical specific mitigation measures, included in Table 1, so as to not impact natural resources.

C. POPULATION TRENDS

CSA 2 has a total of 90 metered service connections within the service area boundary, 62 of which are active. All active connections are single-family residential. Sugarloaf is not a Census Designated Place, so exact population statistics are not available. The California Public Water Supply Drinking Water Watch indicates a current estimated population served of 160. The 2003 County of Shasta Local Agency Formation Commission (LAFCO) Municipal Services Review (MSR) for CSA 2 indicated an approximate population of 150, for an average annual growth rate in the last 15 years of about 0.4%.

According to the most recent LAFCO MSR for CSA 2, completed April 2017, future growth in the unincorporated areas of Shasta County will likely be negligible. The Department of Finance (DOF) predicts an overall growth rate of just under 0.4% for all of the County in the next 20 years according to March 2017 predictions. However, a May 2016 report by the DOF noted a decrease of 0.5% in the County's unincorporated areas between 2015 and 2016. This is not surprising, as rural unincorporated areas typically have slower growth than more urban areas. There are currently no developments proposed for connection to the water system, and as such, growth in CSA 2 in the next 20 years is assumed to be negligible. If a 0.4% growth rate over the next 20 years does occur, an approximate population of 173 will result.

D. COMMUNITY ENGAGEMENT

A Community Advisory Board (CAB), consisting of seven members, serves as a liaison between CSA 2 residents and the County. According to the 2017 MSR, the CSA 2 CAB was established by the County in 1984. CAB members are appointed by the County Board of Supervisors (Board) and each serve two-year terms. Each year, property owners are invited to nominate CAB candidates for vacant seats, and elections are held if the number of candidates exceed the number of vacant seats. The CAB provides a vehicle for more local participation and accountability. There are currently five members on the CAB who meet quarterly with County representatives for updates on current projects and associated funding, rate studies, etc. The County has been updating the CAB throughout the planning process regarding the project described herein.

II. EXISTING FACILITIES

A. FACILITIES LAYOUT MAP

Existing water facilities in CSA 2 are shown on Figure 2.

B. HISTORY

Photo 1 – Sugarloaf Water Treatment Plant

History of the major system components in CSA 2 are shown in Table 2.

As described in the most recent State Water Resources Control Board (SWRCB) Division of Drinking Water (DDW) Annual Inspection Report (AIR), completed May 19, 2015, numerous areas of noncompliance were documented with surface water treatment requirements, inadequate source water and storage capacity, incomplete monitoring of disinfection byproducts, and poor well and water storage conditions. DDW found one serious health hazard of holes in the roof of the storage tank, where corrective action was taken immediately; nine critical system or operational defects and/or potential health hazards that were to be corrected as soon as possible; two system or operational defects of lesser public health significance that need to be addressed as workload permits, which still exist; and two system or operational defects or potential health hazards that are costly to correct and are to be included in any long-range water improvement project, which still exist. Refer to Appendix A for the 2015 AIR.

This led to issuance of Compliance Order No. 01-02-15R-005 for violation of California Code of Regulations, Title 22, Section 64652 pertaining to the use of inline filtration, which is an unapproved filtration technology. See Appendix B for the Compliance Order.

C. CONDITION OF EXISTING FACILITIES

Photo 2 – Shale Lane Well Pre-2017

The original CSA 2 water system was improved in 1978 with construction of the existing groundwater well on Shale Lane, the 42,500-gallon storage tank, and distribution system pipeline improvements. Most recently, well improvements were completed in 2017, which included raising up the well casing, routing surface drainage around a new well building, and installation of new Harmsco filters, chlorine dosing pump, mixer, chlorine residual analyzer, flow meter, and electrical. These improvements improved the safety and security of the well source by minimizing the chance for surface water inundation and contamination. Additionally, the well pump was replaced in June 2018 after the previous one failed. Aside from the Shale Lane Well, all other remaining equipment is original and has met its useful service life as described in the Infrastructure Issues Section below.

Historically, the primary drinking water source for CSA 2 was an unnamed spring at a diversion dam upstream of the Sugarloaf Water Treatment Plant (WTP) at the southern section of the service area boundary as shown in Figure 2. As described in the 2015 AIR, the water behind the diversion dam collects in a rock depression and is covered with a metal roof with a locking door.

Photo 3 – Improved Existing Shale Lane Well

A screened overflow and bottom flush valve clean debris and sediment. An above-ground, 3-inch-diameter polyvinyl chloride pipe (PVC) pipe runs along the steep bank near the creek and delivers water to the WTP. The spring appropriated water right is not to exceed 14,500 gallons per day (GPD), per the water rights permit included in Appendix C. The spring water right was historically supplemented during the summer by the Shale Lane Well. However, compliance issues associated with the WTP in recent years have changed the primary water source from the WTP to the recently improved well.

Photo 4 – Spring Diversion Dam

Water flows by gravity to a 1,000-gallon raw water tank at the WTP and is then pumped, with sodium hypochlorite and coagulant added immediately prior to filtration, through four separate single-media filter tanks prior to entering the 42,500-gallon storage tank. Backwash water flows to the backwash tank and is discharged on the ground. Two pressure tanks boost water to a higher-elevation service zone.

The existing distribution system is comprised of primarily 4-inch PVC pipe, with some 2-inch through 8-inch welded steel pipe. The PVC pipe is reportedly in good condition, but the welded steel pipe has had repeated leaks, which have been temporarily repaired with numerous band clamps throughout the years.

D. FINANCIAL STATUS OF EXISTING FACILITIES

Rate Schedule: The current water rate schedule for CSA 2 was adopted by the County Board of Supervisors on June 5, 2018 and is included in Appendix D. The bimonthly base rate was increased from $75 to $131.50 starting July 1, 2018 as a result. There are currently 62 active water connections – all of which are residential.

Annual Budget: An excerpt from the County's fiscal year 2017-2018 (FY 17/18) audited financials covering the CSA 2 Nonmajor Enterprise Fund is included in Appendix E. As shown therein, the operating revenue was $42,084, while the operating expenses were $86,940, for an operating loss of $44,856. As such, CSA 2 is operating in the red, and there are no funds available for future capital improvements. However, since that time, two enormous leaks were discovered and repaired in April. Expected resulting water savings are anticipated to increase revenues to match that of expenditures this year. A rate study is anticipated to be completed in the near future to raise rates to ensure revenues meet expenditures in subsequent years and that future improvements are budgeted for.

As shown on in the FY 18/19 budget, the budgeted revenue is $60,000, while the total budgeted expenses are $83,860, for a deficit of $23,860. Operation and maintenance (O&M) expenses for FY 18/19 are budgeted to be $69,894, with $6,000 (8.5%) budgeted for the utilities line item, which only includes Pacific Gas and Electric (PG&E) energy costs.

CSA 2 does not currently have any existing debts.

E. WATER/ENERGY/WASTE AUDIT

The County has not conducted any energy audits related to the water distribution system. Refer to Appendix A for the most recent AIR completed May 19, 2015 by DDW.

Unaccounted-for water losses are significant in CSA 2 and have been increasing over the last five years, with leaks known to be the primary cause. The average unaccounted-for water loss over this time period was 75%. Refer to Table 3 for unaccounted-for water loss from January 2014 through June 2019. Two very large leaks were found and repaired in April of this year, and unaccounted-for water loss decreased to 69% from the 92% that occurred in January and February 2019.

A leak detection survey was completed by Cal Rural Water Association (CRWA) on August 20, 2019. Results of the survey found a few minor issues primarily involving leaks on the customer side of the meter but nothing significant for the County to address. Refer to Appendix J for the survey report.

III. NEED FOR PROJECT

A. HEALTH, SANITATION, AND SECURITY

Photo 5 – 42,500-Gallon Storage Tank

The 2015 AIR documented numerous areas of noncompliance with surface water treatment requirements, inadequate source water and storage capacity, incomplete monitoring of disinfection byproducts, and poor well and water storage conditions. DDW found one serious health hazard of holes in the roof of the storage tank, where corrective action was taken immediately; nine critical system or operational defects and or potential health hazards that were to be corrected as soon as possible; two system or operational defects of lesser public health significance that need to be addressed as workload permits, which still exist; and two system or operational defects or potential health hazards that are costly to correct and are to be included in any long-range water improvement project, which still exist. This led to issuance of Compliance Order No. 01-02-15R-005 for violation of California Code of Regulations, Title 22, Section 64652 pertaining to the use of inline filtration, which is an unapproved filtration technology. See Appendix B for the Compliance Order.

The single filter media sand filtration system is classified as in-line, which is not an approved filtration technology as outlined in Section 64653 of the California Safe Drinking Water Act (SDWA). Also, the system does not meet Section 64652(a) of the SDWA, which requires a 99% reduction of Giardia cysts and 99.99% reduction of viruses through filtration and disinfection. Customers were notified of non-compliance with filtration and disinfection process requirements by the County in Failure to Comply Notices issued in July 2010, also included in Appendix B. Additionally, California regulations limit single-media pressure filters to a loading rate of no more than two gallons per minute per square foot (GPM/SF); however, flow rates through the WTP have exceeded this on a number of occasions. CSA 2 also does not monitor individual effluent turbidity from each filter as required per the California Code of Regulations.

While improvements to the Shale Lane Well eliminated coliform issues associated with that source, a Boil Water Notice is required whenever the County must utilize the surface water spring source. The most recent occurrence of a Boil Water Notice being issued was in June 2018 when the well pump went out and required replacement. The County is still currently on the Boil Water Notice for when the WTP must be utilized. Refer to Appendix F for the current Boil Water Notice.

Additionally, the well capacity is not adequate to provide sufficient water to residents during maximum day demand (MDD). The current system MDD is just over 53 GPM (77,000 GPD), which occurred March 28, 2015, as recorded in CSA 2's monthly water production logs and shown in Table 4. However, production numbers are suspect due to significant leaks not being identified until visible water eventually surfaces. As such, a review of water sold was also completed.

Photo 6 – Existing WTP Instrumentation

Meters are read on a bimonthly basis, so daily consumption numbers are not available. As such, average daily usage was calculated, then multiplied by the historical production peaking factor of MDD to average day demand (ADD) as shown in Table 4. If the absolute MDD of 77,000 GPD produced in the last five years is utilized, this peaking factor would be about 6.2. However, this only occurred once in the month of March 2015. Additionally, the exceptionally high production peaking factor does not correlate with consumption for the same month. A similarly large number of 71,000 GPD was recorded in May 2014. Again, consumption during the month was not reflective of such a large production value. As such, it is suspected that the March 2015 and May 2014 production is not like representative of actual MDD. The average of all production MDD to ADD peaking factors for the last five years is 2.0. Based on this peaking factor, MDD equates to 27,000 GPD (18.7 GPM). However, existing manually read meters are antiquated and have met their useful service life. Typically, as meters age they become less accurate and read low. As such, if a 25% meter inaccuracy is applied, the MDD increases to about 34,000 GPD (23.4 GPM).

A 2012 constant rate drawdown test indicated the Shale Lane Well can reliably produce 31 GPM (44,600 GPD) for a sustained amount of time and not pump below the perforations. However, given recent drought conditions, both the spring source and the well together have not been able to keep up with demand during recent summers. In August 2018, residents in the highest areas of the service area ran out of water completely, and emergency bulk water had to be trucked in. As such, if the WTP is improved such that the maximum spring surface water right of 14,500 GPD (10 GPM) could reliably be treated, an additional source would still be required to meet MDD.

While chlorine is used for disinfection at the well, there is little contact time; consequently, the chlorine dose is increased, which along with reduced water demand and subsequent long residence time contributes to high disinfection byproducts (Total Total Trihalomethanes [TTHM] = 85 ug/L and Haloacetic Acids [HAA5] = 62.8 ug/L) in the system as indicated in the 2010 Disinfection Byproduct Rule Violation letter from the Shasta County Environmental Health Division and 2009 Consumer Confidence Report (CCR) – See Appendix B. Flushing the system appears to reduce TTHM and HAA5, but limited storage reduces the opportunity to carry out a flushing program on a regular basis.

There is not currently an emergency generator dedicated to CSA 2, which is badly needed given that the remote area is surrounded by forest and susceptible to high fire danger.

Collectively, the above-described problems represent the most severe health threats.

B. INFRASTRUCTURE ISSUES

Aside from the Shale Lane Well, most all other mechanical, electrical, and instrumentation equipment in CSA 2 has met its useful service life and is no longer reliable. One of the filters required welding as a temporary fix to the filter rusting through and creating a hole in the side of the filter. New chart recorders, analyzers, and controls are needed to replace outdated and inoperable ones currently in place for which replacement parts are no longer available.

Photo 7 – WTP Filter Weld

Additional problems include the condition of the existing 42,500-gallon storage reservoir, as well as the lack of system storage to meet MDD, provide any fire suppression, or proper flushing of the distribution system. A site visit conducted by County staff and PACE Engineering, Inc. (PACE) on April 6, 2012, found the reservoir to have holes in the roof and missing bolts, with rust on the interior and exterior. The 2015 AIR reiterated these findings noting significant rust and corrosion. Holes have since been repaired, but the tank interior was last recoated in 1994, and now 25 years later, the tank needs to be repaired and recoated inside and out.

Photo 8 – WTP Filters

California Code of Regulations, Section 64554 (a)(2), requires that a water system with less than 1,000 connections must have the storage capacity equal to or greater than MDD. Per the DDW 2015 AIR, at least an additional amount of 34,500 gallons is needed to meet this requirement. However, as noted above, this is based on inaccurate production

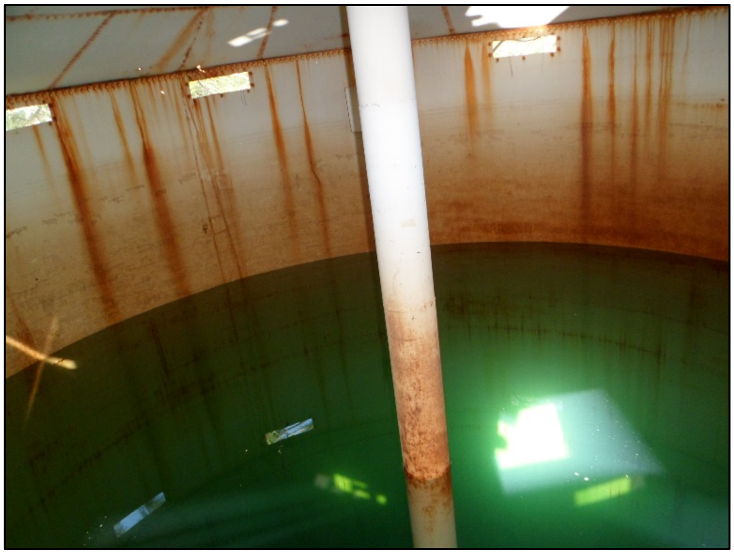


Photo 9 – Rust Inside Storage Tank in 2012

numbers. It is more likely that the actual MDD, if leaks and inaccurate meters were to be fixed, would be about 34,000 GPD. However, this limited storage does not allow for needed system flushing to minimize system disinfection byproducts nor does it account for any available fire storage in a community surrounded by forest and very conducive to high fire danger.

The exceptionally high average of unaccounted-for water loss of 75% over the last five years points to the need for pipeline main and service replacement. One stretch of deficient pipeline on Shore Drive was reportedly replaced a few years ago, but two significant problem areas still remain and have been identified by system operators as having multiple repairs over the years. These include approximately 1,200 feet of 8-inch steel water main from the WTP to Shasta Drive and 500 feet of 2-inch steel main on Lake Drive between Oak Knoll Drive and Shasta Drive. The 8-inch pipeline runs cross-country along a very steep terraced section of roads; driveways; and rocky, wooded terrain where accessibility is extremely difficult in some sections. Two accessible sections of the pipeline have been replaced with PVC pipe, but the remainder of the steel pipe has reached its useful service life and is nearly all repair clamps now. The recent large leaks that occurred earlier this year were in these locations.

Additionally, replacement of old, inaccurate, and inefficient manually read water meters that do not meet National Sanitation Foundation (NSF) requirements as well as all polybutylene service connections with a history of failures is also recommended to lower the excessive unaccounted-for water losses. Finally, replacement of the two existing booster pump stations and enclosures is recommended as they have met their useful service life. At the very least, the existing wooden box needs to be replaced at the Shale Lane Booster Pump Station. It floods during rain events and does not adequately protect the station from outside elements.

C. REASONABLE DESIGN CAPACITY

Given that there has been a recent population decline in the County's unincorporated areas, together with no developments proposed for connection to the water system, growth in CSA 2 in the next 20 years is assumed to be negligible. Improvements recommended herein are needed to meet current demands and do not anticipate any growth.

The recommended project is consistent with the Shasta County General Plan to provide potable water to existing County residents. Additionally, the proposed project is consistent with LAFCO's goal to discourage urban sprawl by providing adequate urban services, including police, fire, water, and sanitation services.

IV. ALTERNATIVES CONSIDERED

The CSA 2 aging water infrastructure including the WTP, storage tank, steel pipeline mains, meters, and services have all reached or exceeded their useful life and all pose health risks to the community. Proposed solutions will install infrastructure to current design standards that will better meet regulatory requirements and more properly serve the community in the future.

A. DESCRIPTION OF ALTERNATIVES CONSIDERED

Water Supply Alternatives: Alternatives considered to provide an adequate high-quality water supply to residents of CSA 2 include either an increase to existing water rights or improvements to the existing WTP and/or an additional well source.

Increase Existing Water Right: To obtain enough water from the spring to meet MDD, the allocation would need to be more than double what is currently allotted. The existing water right allows for a maximum of 14,500 GPD, while a total of 34,000 GPD is needed to meet MDD. In 2012, the County was in the process of re-allocating Central Valley Project (CVP) Contract Water to supplement the water right and meet system demands with the surface water source only. The idea was to replace the existing well source. A draft contract for the purchase of an additional 14,500 GPD of CVP water was submitted to the US Bureau of Reclamation at that time. However, since then, the State went through a time of extreme drought, and mandatory water conservation restrictions were put in place. Additionally, the County received a notice from the SWRCB Division of Water Rights in April 2015 to curtail the existing surface water diversion due to the drought conditions. The spring began to dry up and not produce enough water to meet CSA 2 demand. This most recently occurred again in August 2018, during which time residents in the highest elevations of the service area boundary were out of water, and the storage tank only had about a foot of water left in it. At that time, CSA 2 received delivery of bulk water via emergency funding but only 9,000 GPD for the entire system, so mandatory conservation measures were put in place. As such, even if the County was successful in getting an increase to the existing water right, which is not likely in a time following extreme drought when water rights are at a premium, this still would not result in a reliable source for CSA 2 during MDD. Therefore, this alternative would not solve the source problem and is not considered feasible.

Find Another Surface Water Source: The only available nearby surface water, aside from the existing spring source from which the maximum water right is already being utilized, is Shasta Lake. Additional pumping, filtration, and disinfection would be required, which would increase capital and O&M costs. An intake structure for lake water would be required and would certainly increase and complicate operational demands on an agency with an already stretched-thin O&M staff. Lake water level can drop by 150 feet within a season, which poses numerous O&M costs for the raw water pump. The inlet structure would have to be capable of automatically accommodating water level variations and must at the same time pose no threat to nearby boaters and skiers. Such a structure represents a considerable capital and maintenance expense under US Forest Service (USFS) jurisdiction.

Other problems associated with the use of lake water include a greater potential for polluted raw water. The extensive use of septic tanks in the area, use of the lake for swimming, nearby boating activity, and large amount of runoff that enters the lake are all deterrents to the use of lake water for domestic purposes. The significant project costs associated with construction and O&M of a lake intake structure and uncertainty of resulting water quality result in this alternative being infeasible for this small community, and a cost estimate is not provided herein.

Install Larger Shale Lane Well Pump: The existing improved Shale Lane Well is a good quality water source, but a 3-inch water main from the well site to the WTP is recommended to allow for long-term adequate chlorine contact time and filtration of the well water to eliminate any coliform, iron, manganese, high turbidity, or other undesirable constituents that may be present. Consideration was given to installing a larger well pump at the Shale Lane Well. The recently installed Harmsco well filters and chlorination system are working as designed, but the filters cartridges require frequent

Photo 10 – Well 1 Filter

and costly changing. It is reportedly, on average, about $8,000 every 18 months or so to replace the filter cartridges depending on groundwater quality. More frequent replacement is required at times. This cost alone resulted in a $20 bimonthly rate increase to the base water rate.

Although a pump test has indicated the Shale Lane Well can provide 31 GPM, it has proven to not be able to keep up with MDD at times. Well drawdown tests indicate this flow may be doubled and pumping would still not fall below the well screens; however, in the summer months during the most recent drought, the well reportedly dried up altogether and could not keep up with demand. During the summer of 2018, for every day of operation of the well, two days were required for the well to adequately recharge. As such, this alternative would not provide an adequate reliable source during MDD and is not considered feasible. Therefore, a cost estimate is not provided herein for this alternative.

<u>Drill a New Well</u>: Consideration was given to drilling a new well at another location; although there is no guarantee a future well site would be productive enough to meet MDD. Fortunately, the County received a $500,000 SWRCB Drinking Water State Revolving Fund (DWSRF) Proposition 1 Planning Grant in March 2018, a portion of which was available to fund drilling of a test well.

There is a limited availability of relatively flat land in the service area boundary having the required 100-foot radius free from possible sources of contamination, either currently or in the future when bare lots are developed. However, three possible sites were identified for development of a second well in CSA 2. Refer to Figure 3 for the location of possible sites. Two of the three sites would require land or easement acquisition as well as significant piping to the WTP if treatment was needed, neither of which planning funding was available for. The third site is located on the existing County-owned easement of the Sugarloaf WTP, so no land acquisition would be required and very minimal piping for plumbing into the WTP would be needed. As such, this site was chosen on which to drill a test well for an additional water source.

Photo 11 – Test Well Drilling

Enloe Drilling and Pumps, Inc., (Enloe) drilled an 8-inch hole via air-rotary method August 30 and 31, 2018 to a depth of 310 feet. Lawrence & Associates (L&A) logged the cuttings during drilling and recommended screen placement. In October, Enloe installed the 6¾-inch-diameter copper-bearing steel blank casing from ground surface to 150 feet, the 50-slot (0.050-inch) copper-bearing steel screen from 150 feet to 270 feet, and the blank casing from 270 feet to 290 feet. A 70-foot-thick Portland cement well seal was poured to ground surface following a 5-foot non-hydrated bentonite seal after the 6x12 gravel pack. PACE, DDW, and Shasta County Environmental Health observed the casing, filter pack, and well seal installation.

L&A observed Enloe perform a variable-speed discharge test on October 23, 2018, at 10, 20, and 50 GPM. Based on results of this test, the 72-hour constant discharge test was attempted at 50 GPM. Unfortunately, at 27 hours this test was terminated due to excessive drawdown. Subsequent analysis indicated this was likely due to the presence of a fracture zone at or near the 190-foot level. The water level in the well decreases rapidly once this zone is reached. As such, considering the allowable drawdown, it is not recommended the well be pumped greater than 64 GPM at any time. For additional details, refer to Appendix G for the Well Evaluation of Yield and Quality for the test well dated December 17, 2018 by L&A.


Photo 12 – Completed Test Well

On October 26, 2018, Enloe and L&A began the 72-hour constant discharge test once again at a pumping rate of 30 GPM based on long-term yield calculations. This test ran and recovered successfully. The resulting projected drawdown curve indicates if pumping continuously at 30 GPM, drawdown at the end of 180 days would be approximately 87 feet. The resulting theoretical long-term yield of the well is approximately 21 GPM.

Initial water quality testing of the newly drilled well sampled October 31, 2018, indicated antimony, iron, and manganese all to be above maximum contaminant levels (MCLs). Iron and manganese are secondary MCLs, while antimony is a primary MCL. Elevated levels of iron and manganese have historically been present at the Shale Lane Well and therefore were not surprising; however, an antimony result of 20 ug/L was questionable. As such, after a well pump was reinstalled for subsequent testing, additional samples were taken March 15, 16, and 19, 2019. Additionally, PACE utilized a pilot filter with sodium hypochlorite to determine the effectiveness of filtration on antimony removal. Samples taken March 15 were after the well had been running for approximately four hours, while samples taken March 16 were after an approximate total run time of 28 hours. Upon return for additional samples on March 17 at 8:30 a.m., it was discovered the generator had run out of fuel, so pumping had stopped. On March 19, the generator was refueled, the well started at about 11 a.m., and additional sampling was conducted with coagulant added at approximately 1 p.m. Sampling field notes and all results are included in Appendix H.

As shown in Appendix H, a total of ten samples each of total and dissolved antimony, iron, and manganese (pre- and post-filter) all resulted in non-detect for antimony, as did one additional sample of backwash water taken March 19, 2019, when the pilot filter was cleaned. Filtration removed iron and manganese concentrations below MCLs; however, even raw water iron and manganese levels were not much higher than MCLs and were much better than those historically seen at the Shale Lane Well. Coagulant addition did not appear to improve iron or manganese removal above that of filtration alone. Given the positive results of antimony being non-detect in subsequent water quality testing, it is recommended the new well be connected to the water system.

Connection of the new Well 2 was originally intended to be included as part of the construction project recommended herein. However, last month, the County was on the verge of needing emergency water to be trucked in once again. The lack of rain so far this fall left the spring source nearly dry, and Well 1 could not keep up with demand, with only about seven feet left in the water storage tank. Plans and specifications were developed to allow for connection of the test well to the distribution system in-house, and the County entered into a construction agreement with TICO Construction. Construction has started, and TICO estimates the new well should be up and running no later than December 2019.

Water Treatment Alternatives:

Install Contact Clarifier and Filters: To convert the WTP from in-line to direct filtration, one contact clarifier and two filters are proposed to be installed. This alternative has proven successful at producing filtered water with turbidity less than 0.1 Nephelometric Turbidity Units (NTU). Surface loading rates given an MDD of about 24 GPM for one 3-foot-diameter contact clarifier is 3.4 GPM/SF and 1.7 GPM/SF for the two dual media pressure filters. Ancillary improvements include new controls, backwash pump, individual and combined turbidimeters, chlorine residual analyzers, chemical feed pumps and backups, air compressor for air scour supply, flow meters, hydropneumatic tank, and diaphragm filter control valves. Refer to Table 5 for a cost estimate that includes these improvements.

Construct Flocculation Pipeline: Another alternative considered for converting the WTP from in-line to direct filtration was to install 400 feet of 4-inch flocculation pipeline within the existing road right-of-way. Coagulant and chlorine would be added at the beginning of the 4-inch main opposite the WTP. This would provide the required 10-minute contact time as desired by DDW. Note that a similar flocculator pipe was constructed at the Castella CSA 3 WTP. County staff has reported the Castella facilities function well and meet turbidity standards.

Table 6 summarizes the G and Gt calculations completed for the CSA 2 pipeline flocculator utilizing the Pipeline Flocculator Program – Version 5.0, developed by Guy Schott, DDW. A cost comparison indicated the flocculation pipeline would likely be slightly less costly than installation of a contact clarifier; however, potential O&M issues associated with a flocculation pipeline outweigh the cost benefits. As shown in Table 6, very low velocities are present in these pipelines, even at MDD, which can result in accumulation of sediment causing operational problems for the flocculator pipe compared to the contact clarifier, which is backwashed free of filtered solids. Additionally, ensuring adequate contact time throughout the range of flows that occur at various times in the system is not easily accomplished. Finally, the ease of installation and maintenance of contact clarifier and filter skid-mounted units is much greater than 400 feet of pipeline in a roadway, which requires the remaining available land at the WTP site that is already encumbered by existing pipe. It is not practicable to acquire land for an underground pipeline that will have future O&M problems compared to an above-ground clarifier, which requires no additional land purchase. As such, a cost estimate was not given for this alternative.

<u>Perform Particle Removal Study</u>: As an alternative to conversion from in-line to direct filtration, the Federal Long Term 1 Enhanced Surface Water Treatment Rule requires a Cryptosporidium removal (Particle Removal) demonstration study be completed for in-line filtration systems. The study must show the filter plant is capable of consistently achieving 2-log Cryptosporidium removal. Results of this study could be used by DDW to set performance standards for the WTP.

PACE has conducted numerous similar pilot studies for various systems to demonstrate compliance with the Enhanced Surface Water Treatment Rule (ESWTR) as described above. One such study was completed in 2008 for the Shasta Community Services District's in-line filtration process. The results of the study indicated the in-line process was capable of successfully treating water up to 6 GPM/SF; however, the filtered water turbidity was required to be less than 0.2 NTU after the study was completed. This is more stringent than the standard ESWTR regulation for filtered water of 0.3 NTU for a conventional or direct filtration water treatment plant. Particle removal demonstration studies can result in more stringent treated water quality regulations. In addition, the approval process takes a considerable amount of time for field testing, is expensive, and the outcome may not be beneficial for CSA 2. As such, a cost estimate for this alternative was not provided, as improvements are needed as soon as possible.

Perform Cryptosporidium Action Plan Study: DDW also allows a filtered effluent turbidity demonstration study where it is determined if the WTP can produce water meeting the Cryptosporidium Action Plan goals. These goals include achieving an effluent turbidity of 0.1 NTU or less 95% of the time in all months during a 12-month period. Following backwash, the maximum turbidity spike should be less than 0.3 NTU, and effluent turbidity should meet the 0.1 NTU optimization goal within 15 minutes.

A review of WTP records indicates the filtered water has exceeded the 0.1 NTU optimization goal in more than 5% of the turbidity samples collected the majority of the time. While the existing single media filters are substandard and need to be replaced, this alternative is not recommended for small facilities such as CSA 2 where on/off operations and limited operator attention is the norm and could lead to violations. As such, a cost estimate was not given for this alternative.

Distribution System Alternatives:

Construct Larger Water Storage Tank and Convert Existing to Pretreatment Tank: As previously described, CSA 2 does not have enough system storage to meet current production MDD. While existing storage may be able to meet anticipated MDD if leaking pipelines and inefficient equipment are replaced, the existing reservoir is in need of repair with patched holes in the roof, missing bolts, and significant corrosion on the interior and exterior of the tank. It is also of inadequate size for system flushing or fire storage of any kind.

As such, it is recommended the existing 42,500-gallon storage tank be converted into a pretreatment tank and a new treated water storage tank be constructed. Furthermore, backwash water is not currently recycled; instead it is an uncontrolled, unpermitted discharge to land. Therefore, it is recommended the existing raw water tank be retrofitted with a decant pump to pump settled backwash water into the newly converted pretreatment tank for reuse. Refer to Table 5 which includes these recommended improvements.

It is usually more economical and reliable to provide stored water for supply needed during: (1) fire demands, (2) peak demands in excess of maximum daily demand, and (3) in the event of an emergency such as a power outage that interrupts the normal source of water. Desired storage in a typical water system is a function of three quantities as follows:

1. Equalizing storage is the amount of water needed over and above the MDD rate (24-hour average) to satisfy peak demands of the day. This is often found to be between 15% and 20% of the MDD, and engineering practice is to use 20% for design purposes, which equates to 6,800 gallons for CSA 2.

2. Fire storage is usually based on the theoretical amount that could be used to combat a major fire in the high value districts. Shasta County Fire Safety Standards recommend minimum fire flows of 1,000 GPM for single-family residential lots less than one acre in size, which is the case for most lots in CSA 2. However, the majority of existing pipelines that are in good condition are 4-inch PVC and would have resulting velocities of more than 25 feet per second (FPS) at a flow of 1,000 GPM. Therefore, it is recommended storage be sized for the minimum acceptable fire flow of 500 GPM at this time. Once the most critical infrastructure improvements are completed as part of the recommended project herein, it is recommended a rate study be completed to fund future fire-related improvements. Fire storage requirements are based on being capable of

providing the minimum residential fire flow for a period of two hours. Therefore, 60,000 gallons is recommended to meet minimum fire flow requirements in CSA 2 at this time.

3. Emergency Storage is the amount of water necessary to continue service in the event of power failure or some other failure of the supply system. This is usually assumed to be the MDD rate multiplied by some interval of time that might occur during a power outage. Six hours is typically used, or 25% of MDD, which would be 8,600 gallons.

It is recommended storage be sized for the largest two of the three components above, which would be fire and emergency storage, for a total tank volume of about 68,600 gallons. Often in rural, wooded areas such as CSA 2, when there is a fire in the vicinity, power is lost as well, so it is not improbable to need both at the same time. This is particularly true given the relatively recent notification of PG&E having Public Safety Power Shutoffs during extreme fire danger conditions. A preliminary site survey indicated the replacement treated water tank will fit within the existing easement at the WTP as shown in Figure 4. Tank dimensions would be 21 feet in diameter by about 30 feet in height to maintain the existing system hydraulic grade line, for a total operating volume of about 71,300 gallons.

Consideration was given to installing a bolted steel tank as opposed to a welded tank. In our experience with all things being equal, bolted steel tanks have a shorter life expectancy, estimated at less than 40 years, compared to welded steel tanks at approximately 80 years. Bolted steel tanks come precoated and are field erected using zinc-coated bolts. The number of exposed edges in a bolted steel tank predisposes it to corrosion. Whereas a welded steel tank costs more initially compared to the bolted steel tank, by design, it has fewer exposed edges and thus a reduced chance for corrosion. Bolted steel tanks do have the distinct advantage in that the tank materials come precoated, so in theory, no field painting is required. Unfortunately, PACE has had to require the inside of a new bolted steel tank to be recoated in the field because the tank installer did not protect the steel during construction, and the paint was damaged.

Although, faulty field painting of welded steel tanks has also required a second paint attempt on PACE projects as well, so there can always be issues in the field with either alternative.

In all cases, periodic maintenance is essential to maintaining the useful service life of a tank. A review of supposed life cycle costs analyses available on the web is quite varied and depends on each unique experience and from which point of view it is taken, although in general, welded steel tends to require less long-term O&M than bolted steel. In 2015, budgetary cost estimates were requested from welded steel (Resource Development Corporation, Reno, Nevada) and bolted steel (Darrell Thompson Tank, Bakersfield, California) tank suppliers who have constructed similar prevailing wage rate projects in the north state for a tank replacement project in Shasta Community Services District. It should be noted that the assumptions included in these budgetary estimates is likely to vary between suppliers and will most certainly vary come bid time. Table 7 compares welded versus bolted tank costs side-by-side in 2015 dollars. Given the relatively small additional capital cost for a welded steel tank, it is recommended a welded tank be constructed for ease of future O&M longevity.

Photo 13 – Shale Lane BPS Enclosure

Other improvements necessary for the safe and efficient delivery of water to County residents include a new structure around the existing booster pump station (BPS) on Shale Lane located above the existing well. The existing wooden box floods during rain events and does not adequately protect the station from outside elements. Replacement of existing inefficient manually read water meters that do not meet NSF requirements and polybutylene service connections with a history of failures is also recommended, as well as installation of a permanent emergency generator and automatic transfer switch. Meters will be replaced with automatic meter readers (AMRs) allowing for more efficient drive-by monitoring. These recommended improvements are included in Table 5.

Consideration was given to replacing the entire distribution system; however, minimal leaks have been reported throughout much of the system with the exception of at services and select water mains. The main problem areas, as identified by system operators, are approximately 1,200 feet of 8-inch steel water main from the WTP to Shasta Drive and 500 feet of 2-inch steel main on Lake Drive between Oak Knoll Drive and Shasta Drive. The 8-inch pipeline runs along a very steep terraced section of roads; driveways; and rocky, wooded terrain where accessibility is extremely difficult in some sections. Two accessible sections of the pipeline have been replaced with PVC pipe, but the remainder of the steel pipe has reached its useful service life and is nearly all repair clamps now. Several alternatives were considered for the replacement of these two pipeline sections including open cut, pipe bursting, and horizontal directional drilling.

<u>Open-cut</u> trench excavation consists of excavating a trench for the manual installation of each piece of pipe. This method is usually the least expensive method if the pipe is not located under pavement. The open-cut trench method involves excavating down to install the new pipe and then backfilling. If the open-cut trench excavation is located in a non-drivable area, the excavation can be backfilled with select native soil and surface vegetation restored by seed or sod. When the open-cut trench excavation is located under pavement, the existing pavement must be saw cut and removed, the excavation filled with granular backfill to prevent settlement, and the pavement replaced.

Advantages:

- Can be less expensive than trenchless methods in unpaved areas.
- Many more contractors available to bid project.

Disadvantages:

- More excavation is required compared to trenchless methods.
- May require removal of pavement, which increases expense.
- Compaction control during installation is essential.

Environmental impacts of open-cut trench excavation are greater than trenchless methods as it requires more earth disturbance, which increases the potential for erosion. It will also include removal and replacement of pavement in some areas, which increases temporary air quality impacts during construction due to additional earth disturbance and emissions from materials used for repaving.

Pipe bursting is a trenchless method of replacing buried pipelines without the need for a traditional open-cut trench. Launching and receiving pits replace the trench needed by conventional, open-cut pipe laying. Pipe bursting, which can be either pneumatic, hydraulic expansion, or static pull, fractures the existing pipe and displaces the fragments outwards while a new pipe is drawn in to replace it. Typically, PVC or high-density polyethylene pipe (HDPE) pipe is utilized for the new pipe in the pipe bursting process. Although this technology is trenchless, excavation would still be required at service connections to reconnect each service.

Advantages:

- Reduces the amount of excavation required.
- May reduce pavement removal and replacement costs.
- Jointless pipe reduces root and water infiltration.
- Can increase the diameter of existing pipe.
- Can avoid environmentally sensitive areas.

Disadvantages:

- More expensive than open cut trench excavation in unpaved areas.
- Cannot be utilized on mains smaller than four inches.
- Cannot be utilized on mains with a shallow bury depth.
- Difficult on steel and ductile iron pipe
- Before bursting can occur, the main must be taken out of service and drained requiring temporary service connections to be installed above-grade.

Environmental impacts of pipe bursting are less than open-cut trenching in that the amount of excavation and pavement removal and replacement is reduced. This reduces the potential for erosion and air quality impacts. Unfortunately, the 8-inch pipeline needing replacement has little to no cover in some sections, as well as both PVC and steel pipe, thus this is not a feasible option for that stretch of pipeline.

Horizontal directional drilling (HDD) is a trenchless technology that is typically used when attempting to minimize surface disturbance. HDD relies upon entry and exit pits and requires substantial laydown area for the pipe to be pulled into place. A horizontal hole is drilled and reamed, and the new pipe, which is typically HDPE or fused PVC, is pulled into place.

Advantages:

- Reduces amount of excavation.
- May eliminate pavement removal and replacement costs.
- Jointless pipe reduces root and water infiltration.
- Can be used for deep excavations.
- Can avoid environmentally sensitive areas.

Disadvantages:

- More expensive than open cut trench excavation in unpaved areas.
- Not suitable for all soil types and conditions, including some rock formations.
- A high risk of drilling through unknown and incorrectly located utilities, which could hamper service to nearby customers.
- Possibility of fracking out when limited cover.

Environmental impacts of HDD are similar to pipe bursting in that they are less than open-cut trenching. HDD reduces the amount of excavation required and may eliminate pavement removal and replacement costs. This reduces the potential for erosion and air quality impacts.

PACE met with RJ Smith of Solid Rock Construction, Inc. (Solid Rock), at the site of the 8-inch pipeline on September 12, 2019, to determine the feasibility of HDD for this section of pipeline. Solid Rock specializes in HDD and underground excavation in the northern California area. Due to the known soil conditions of subsurface fractured rock formations in the area, limited access for the large drill rig that would be required to attempt the work, and limited cover and high possibility of fracking out, RJ does not recommend attempting either HDD or pipe bursting for replacement of that section of pipeline.

Cured-In-Place Pipe (CIPP) is a trenchless rehabilitation method used mainly to repair existing pipelines. CIPP is a jointless, seamless pipe within the existing pipe. A resin-saturated felt tube made of various materials is inverted or pulled into a damaged pipe. It is typically done from the upstream access point, usually an access pit or manhole. The liner can be inverted using water or air pressure. Hot water, UV light, ambient cured, or steam is used to cure the resin and form a tight fitting, jointless, and corrosion-resistant replacement pipe.

Advantages:

- Reduces amount of excavation required.
- May eliminate pavement removal and replacement costs.
- Jointless pipe reduces root and water infiltration.
- Can avoid environmentally sensitive areas.

Disadvantages:

- More expensive than open cut trench excavation in unpaved areas.
- Roots and debris must be removed from pipe before installation.
- Open cut trenches required at some fittings.
- Not applicable for collapsed, severely broken pipe or heavy root blockages.
- Costly NSF-certified resin required.
- Large equipment required for install.

CIPP in pressure pipe is a relatively new technology that not many contractors are experienced with in northern California. Most applications being installed are gravity pipelines, and there are minimal contractors with experience installing pressure pipe. Similar to HDD, entry and exit pits need to be dug. Although the amount of lay down distance is not as long, the general rule of thumb CIPP requires is 100-foot of length and one lane of travel. This is not available in the CSA 2 area. Additionally, CIPP requires multiple large trucks for installation, which are not able to access the narrow winding roads up through CSA 2. Therefore, this is not a feasible alternative.

Given the extremely limited options for repair or replacement, it is recommended the original welded steel sections of the existing 8-inch pipeline and those that run across steep inaccessible terrain with little to no cover be abandoned in place. It is recommended a new 8-inch PVC pipeline be constructed as much within the existing road right-of-way as possible and the 500 feet on Lake Drive from Oak Knoll Drive to Shasta Drive also be upsized to 6-inch via traditional open-cut trenching. The section of pipeline on Lake Drive is entirely in the paved right-of-way such that environmental impacts will be negligible and access easily obtained. One section of the new 8-inch pipeline will still be located on a hillside; however, it will be a shorter stretch with adequate cover. As such, future O&M will still be significantly easier and more cost effective than existing. The environmental document being prepared separate from this report will further evaluate resulting environmental impacts.

Rehabilitate Existing Water Storage Tank: Consideration was given to just improving the existing water storage tank but not converting it to a pretreatment tank. This alternative would include recoating the interior and exterior of the existing tank, replacing bolts and interior caulking, and repairing foundation grout. A mixer would be installed. While this would improve the condition of the existing tank and provide for better mixing, it would not allow for adequate flushing and fire suppression storage. It would also not allow for recycle of backwash water, which would continue to flow back onto the ground.

Consolidation: While there are a couple of very small, private mutual water systems in the vicinity of CSA 2, they are either not large enough to consider consolidation with or would entail significant environmental and permitting issues. The Skyline Mutual Water Company Water System operates a well located approximately 300 feet south of the WTP. According to the County Environmental Health Division 2008 Inspection Report, the well provides service to seven parcels and produced approximately 60 GPM during a one-hour pump test performed in 2001. While it appears to have good production, a one-hour pump test is not adequate to evaluate the long-term water production capabilities of the well. Additionally, the well has had iron and manganese detected above the MCL. Among other improvements, consolidation with this system would require a pipeline to be constructed across a large ravine and an unnamed stream on USFS land. This would entail a great deal of environmental and permitting work that would likely delay project completion. Consolidation would also result in the County taking over the system since it is so small, which would likely not be viewed favorably by existing parcel owners who perceive the consolidation as a loss of control over a system that gives them "no problems." Additionally, this alternative would not solve the current water storage shortage or replace aging infrastructure that has met its useful service life. As such, consolidation is considered to be infeasible at this time, and a cost estimate is not provided herein for this alternative.

No Project Alternative: The No Project Alternative is considered infeasible because it would not address health, safety, and regulatory needs of the community. CSA 2 would continue to operate a system that is not an approved filtration technology, nor be able to provide a reliable source or adequate storage to meet MDD. Existing infrastructure would continue to not meet low lead requirements. Aging, inaccurate, and inefficient meters and pipelines and services with frequent leaks would not be addressed. As such, this alternative is not feasible.

The small number of connections in CSA 2 limits the ability to fund a large capital improvement project and is primarily based on the availability of grant funding. As such, cost estimates were completed for several scenarios ranging from completion of all improvements recommended herein, to distribution system only improvements.

Table 5 includes preliminary project costs for all recommended improvements including WTP, storage, and distribution system. These improvements are shown in Figures 4 and 7. While these improvements would remedy most all of the current issues in CSA 2 previously described herein, associated costs are much too high for ratepayers to afford. The preliminary project cost of $3,704,000 would result in a $461.77 bimonthly rate increase to repay a 100% loan as detailed later herein. As such, this alternative is not recommended.

Table 8 includes construction of a sand filter only rather than complete rehabilitation of the entire WTP and also includes storage and distribution system improvements, as well. These improvements are shown in Figures 5 and 7. The sand filter would only allow for use of the spring surface water source if needed in emergency situations. However, this alternative is also too expensive for rate payers at a preliminary project cost of $3,054,000, which would result in a $386.80 bimonthly rate increase to repay a 100% loan. Therefore, it is not recommended.

Table 9 includes construction of a new storage tank and distribution system improvements only, but no WTP improvements or rehabilitation of the existing storage tank. These improvements are shown in Figures 6 and 7. Adequate storage for MDD and increased flushing and fire flow protection would result, but use of the surface water source would not be improved. If this alternative can minimize unaccounted-for water loss such that the existing Well 1 and newly connected Well 2 can provide MDD during the summer months, the surface water source would no longer be required. However, if adequate grant funding cannot be obtained, this alternative will also be too costly for rate payers. A preliminary project cost of $2,247,000 would require a $293.73 bimonthly rate increase to repay a 100% loan. It is recommended this alternative be pursued; however, if inadequate grant funding is obtained, then the following alternative of distribution system improvements only is recommended to be constructed.

Table 10 includes construction of minimal distribution system improvements only, which are absolutely necessary. These improvements are shown in Figure 7. No treatment or storage improvements would be constructed. However, similar to the above-considered alternative, if unaccounted-for water loss can be minimized by these improvements, Wells 1 and 2 may be able to provide adequate MDD during the summer months. This is the recommended alternative if minimal grant funding is available, although even this small of a project at a preliminary project cost of $1,440,000 would require a $200.66 bimonthly increase to repay a 100% loan.

B. DESIGN CRITERIA

The design criteria used for evaluation of all alternatives was generated from available historical data as well as industry recognized design standards adopted by local regulatory agencies including DDW. In addition, Shasta County Fire Safety Standards were adhered to for determining fire flow requirements.

C. MAPS

Refer to Figures 4 through 7 for the proposed water system improvement alternatives.

D. ENVIRONMENTAL IMPACTS

Proposed project alternatives do not appear to have any lasting, significant impacts on land resources, historic sites, wetlands, flood plain, endangered species, or critical habitat. CEQA and NEPA documentation is being prepared by ENPLAN. The recommended project design and construction will need to take into account specific mitigation measures for short-term construction-related activities so as not to cause any long-term environmental impacts. Project mitigation measures will need to be monitored during active phases of the project. A preliminary mitigation monitoring checklist is included in Table 1. These measures will typically be required with all alternatives that include construction activities. The County will verify these measures are included in the construction contract and are adhered to both during and after construction of the project, where applicable.

E. LAND REQUIREMENTS

Considered alternatives are anticipated to take place within existing publicly owned right-of-way and pipeline easements as much as possible. Additional easements will likely be needed for the revised new 8-inch pipeline alignment between Oak Knoll and Shasta Drive.

F. POTENTIAL CONSTRUCTION PROBLEMS

Depending upon the seasonal weather conditions in the area, construction that requires trench paving or tank painting may not be advised during the winter months. Cold temperatures that may occur during this time significantly impact the ability to pave, perform trench compaction, and paint water storage tanks.

Potential construction problems with subsurface fractured rock could slow open-cut trenching. However, this should not pose a significant problem as long as the contractor is well aware of the project conditions. Such language will be included in construction contract documents.

Mitigation measures described in Table 1 will be required of the contractor, which will reduce construction-related problems. The construction efforts will take place mostly within previously developed roads and disturbed sites; therefore, no major construction problems are envisioned.

G. SUSTAINABLE CONSIDERATIONS/CLIMATE CHANGE EVALUATION

Water and Energy Efficiency: Water and energy efficiency will both be increased as a result of this project. The proposed alternatives all include replacement of sections of the water system that have a history of significant leaks. Reducing the number of leaks in the system will not only reduce O&M but will minimize the amount of unaccounted-for water loss in the system, thus reducing the amount of groundwater pumping and/or water treatment required. More efficient usage of existing water supplies will better prepare the community for future water shortages that will result due to climate change.

H. COST ESTIMATES

Total project costs including construction and indirect costs for feasible Alternatives 1 through 4 are given in Tables 5, 8, 9, and 10, respectively, and summarized in Table 11. Cost estimates were not developed for alternatives that were considered to be infeasible. Construction costs are based on American Iron & Steel (AIS) requirements. These costs are based upon similar prevailing wage rate public works projects constructed in northern California and include a 10% construction contingency. Costs are inflated by the Engineering News Record Construction Cost Index (ENR CCI), which stands at 11,380 for November 2019 and are based upon bidding in 2021 under favorable conditions.

Annual O&M Costs: Annual O&M costs anticipated to change from those currently budgeted for all considered Alternatives 1 through 4 include labor, equipment maintenance, power, and generator fuel as shown in Table 12. Labor costs include benefits and assume more time will be needed fixing system deficiencies for Alternatives 3 and 4 due to less improvements being completed. However, labor for all alternatives are projected to be lower than existing due to more efficient AMR drive-by meter reading. Equipment maintenance costs for all alternatives are also projected to be lower due to varying degrees of deficient equipment replacement. Power and generator fuel costs are dependent on pump horsepower (HP) size. Generator fuel was determined assuming the emergency generator would be exercised under full load for at least one hour per month. As shown in Table 12, Alternative 2 is projected to have the lowest O&M cost, followed by Alternative 1. Alternatives 3 and 4 are projected to have nearly the same future annual O&M costs.

Replacing the leak-prone pipelines, services, and meters in the system will reduce the substantial O&M cost CSA 2 currently expends on leak repairs and unnecessary pumping and treatment of unaccounted-for water. Additionally, improving the infrastructure will minimize the potential for contamination due to pressure losses from pipe breaks.

Engineer's opinions of probable project costs are made on the basis of Engineer's experience, qualifications, and general familiarity with the construction industry. However, because the Engineer has no control over the costs of labor, materials, equipment, or services furnished by others, or over contractors' methods of determining prices, or over competitive bidding or market conditions, the Engineer cannot and does not guarantee that proposals, bids, or actual cost will not vary from opinions of probable cost.

V. SELECTION OF AN ALTERNATIVE

A. LIFE CYCLE COST ANALYSIS

Life Cycle Cost (LCC) estimate is a tool to determine the most cost-effective option among different competing alternatives to purchase, own, operate, maintain, and finally dispose of an object or process. Each alternative should be equally appropriate to be implemented on technical grounds. All the costs are totaled to a present-day value known as net present worth (NPW) or present worth. LCC estimates are based on time of construction and include costs for construction, indirect costs, O&M, and salvage value.

LCC analysis parameters include:

1. Construction costs based on November 2019 dollars (ENR CCI = 11,380).

2. Discount or interest rate based upon the Real Discount Rate, which is a forecast of real interest rates from which the inflation premium has been removed and based on the economic assumptions for the Federal 2020 Budget. Real rates are used for discounting constant-dollar flows, as is often required in cost-effectiveness analysis. The 20-Year Real Interest Rate is 1.5% according to the Office of Management and Budget Circular No. A-94, revised November 2018.

3. Projected annual O&M changes from existing operations as shown in Table 12.

4. Salvage value as determined using typical life expectancies shown in Table 13, which was taken from US Environmental Protection Agency Asset Management: A Handbook for Small Drinking Water Systems. EPA 816-R-03-016. September 2003. Calculated salvage value was projected to the end of the 20-year LCC period as included in Tables 14 through 17 for each feasible alternative considered.

LCCs were only carried through for feasible alternatives. LCCs for feasible alternatives including the recommended project are shown in Table 18. As shown therein, Alternative 4, Distribution System Improvements Only, is anticipated to have the lowest capital cost and therefore the lowest LCC, followed by Alternative 3. Alternative 1 would have the highest capital cost and highest LCC accordingly.

B. NON-MONETARY FACTORS

Non-monetary factors can be considered when evaluating alternatives if the range between present worth values is small. Alternatives were further analyzed and ranked using the non-monetary factor decision matrix shown in Table 19. This matrix utilized seven evaluation criteria. Ranking of evaluation criteria was accomplished with weighting factors utilizing a scoring of 10 as most favorable and 1 as least favorable. The non-monetary criteria and weighting factors are subject to interpretation and discussion by those familiar with public works projects including regulators, responsible public agencies, engineers, funding agencies, and County staff.

Non-monetary factors considered include ability to obtain easements and permits, simplicity of operation, ability to meet future regulations, future serviceability and reliability, likelihood of implementation, security and safety to workers and the public, and environmental impact. As shown in Table 19, primarily due to the best ability to meet future regulations and resulting simplicity of operation if all improvements needed were to be completed, Alternative 1 is preferred based upon non-monetary criteria.

VI. PROPOSED PROJECT

A. PRELIMINARY PROJECT DESIGN

Although complete treatment, storage, and distribution system improvements included in Alternative 1 would be ideal, limited available funding options and the small number of disadvantaged connections does not allow for this project to be feasible at this time. Depending on available grant funding, Alternative 3 is the recommended project to be pursued. If limited grant funding can be obtained, Alternative 4 will be implemented.

The preliminary design of the recommended project is described for each major project component below:

Storage Tank Improvements:
A new welded steel, above-grade 70,000-gallon water storage tank will be constructed to meet the project needs and objectives described hereinbefore. The new tank will be located adjacent to the existing WTP at the same hydraulic grade elevation as the existing, as shown on Figure 6. Approximately 15 feet of new 8-inch pipeline will be constructed from the tank to the intersection of the 8-inch supply piping at the WTP site. The pipe will both supply water to and from the new tank.

The proposed tank will be welded steel, coated with epoxy paint on the interior and zinc/acrylic on the exterior, about 21 feet in diameter, and about 30 feet tall. The maximum height to water surface will be about 27.5 feet from the bottom of the tank. The tank will feature an access ladder with an anti-climb shield and safety cage with landings, as required by the Occupational Safety and Health Administration. About 25 feet of retaining wall will be required. Storm water runoff from the new tank site will be directed to a constructed cobble-lined ditch for discharge to the existing drainage located nearby.

The new tank will be monitored with an electronic level transmitter that will convey real-time tank level data via telemetry to the CSA 2 wells. The tank level signal will be used to control the wells in a lead/lag fashion. A mixer will also be installed to provide adequate contact time and reduce system disinfection byproducts.

Depending on available grant funding, the tank will likely be bid as an additive alternative to the recommended distribution system components further described below.

Distribution System Improvements:

The project will replace approximately 1,200 feet of existing 8-inch welded steel main with new 8-inch PVC and approximately 500 feet of existing 2-inch welded steel main with new 6-inch PVC to replace old leaking steel mains that have reached or exceeded their useful life. All existing active water services will be replaced, including water meters and boxes as needed, and installation of meter valves will allow for customer isolation. The existing Shale Lane BPS structure will also be replaced. Finally, a permanent emergency generator and automatic transfer switch will be constructed at the WTP site and sized to run both Well 2 and the WTP in the event of a power outage.

B. PROJECT SCHEDULE

Assuming the County is able to obtain funding for the construction of the recommended project, the anticipated project schedule is shown in Table 20.

C. PERMIT REQUIREMENTS

General State Division of Occupational Safety and Health permits related to working in trenches and excavations will be required for construction in addition to a Shasta County Department of Resource Management Air Quality Management District Authority to Construct/Permit to Operate the new emergency generator as well as a Shasta County building permit. Preliminary site review by ENPLAN indicates a Water Quality Certification from the Regional Board and a Streambed Alteration Agreement from California Department of Fish and Game will likely be required. Complete environmental permitting will be completed by ENPLAN as part of the CEQA/NEPA environmental documents.

D. SUSTAINABILITY CONSIDERATIONS

Water and Energy Efficiency: The proposed project will replace aging water system infrastructure that has a history of water losses through leaks. Addressing these leaks will ensure that water is utilized efficiently and that excess water does not continue to go unaccounted for.

Reduced unaccounted-for water loss will also result in an energy savings, as less water will need to be pumped and/or treated.

E. TOTAL PROJECT COST ESTIMATE

The total project cost estimate for the recommended project in USDA RD format is $2,247,000, as detailed in Table 21. Construction costs are based on AIS requirements. Total project costs are based on November 2019 dollars (ENR CCI = 11,380) but have been projected forward to construction in 2021.

F. ANNUAL OPERATING BUDGET

It is expected construction will begin fall 2021 and be completed by early 2022 (FY 2021-2022). As such, financial needs and projections are based on forecast numbers per the County’s 2018-19 adopted budget and modified to reflect expected debt service needs for the proposed project.

INCOME

The bimonthly base rate was increased from $75 to $131.50 starting July 1, 2018. There are currently 62 active water connections, all of which are residential. As shown in the FY 18/19 budget, the budgeted revenue is $60,000 for the 62 active single-family connections. The County anticipates completing a rate increase to fund repayment of the loan component of the recommended project described herein, as well as future improvements, once available grant funding is known.

ANNUAL O&M COSTS

As described above, improvements recommended in this project are anticipated to decrease current daily O&M costs. More efficient AMRs will be installed, as well as reduced unaccounted-for water losses requiring less pumping costs and time spent on labor fixing leaks. However, O&M costs will increase proportionate to the change in the consumer price index and salary increases. O&M expenses for FY 2021-22 are projected to be about $68,000 as shown in Table 22, which accounts for anticipated lower daily O&M costs but also increased costs due to inflation.

DEBT REPAYMENTS

As shown in Table 23, if 100% loan was required to complete the recommended project, a bi-monthly rate increase of $293.73 would result. For planning purposes, it was assumed the USDA loan would be for 40 years at 2.75% interest. The Rural Community Assistance Corporation completed a Median Household Income (MHI) Survey on March 26, 2019, which determined CSA 2 has an MHI of $41,000. Refer to Appendix I for a copy of the MHI Survey. Even if minimal required distribution system improvements only were to be constructed via 100% loan, a bimonthly rate increase of $200.66 would result. As such, grant funding is required for any improvements to be feasible given the small number of active service connections in a disadvantaged community.

RESERVES

CSA 2 does not have any reserves and has been operating in the red in recent years, primarily due to high O&M costs resulting from excessive unaccounted for water loss.

Debt Service Reserve

CSA 2 does not currently have any existing required debt service reserve. Future required debt service reserve will depend on how much grant funding can be obtained. As shown in Table 23, the worst-case scenario in which case no grant funding is obtained would result in a required 10% debt service reserve of about $8,700.

Short-Lived Asset Reserve

A breakdown of short-lived assets is shown in Table 24 and reflects those assets with a useful life of 5 to 15 years. The short-lived assets reserve is intended to collect revenue to replace these assets at the end of their service life. As indicated, the total annual revenue needed to fund this reserve is about $12,900 per year.

VII. CONCLUSION AND RECOMMENDATIONS

Based upon the available information to date, the recommended project consists of the items summarized in Section VI. Anticipated outcomes of the recommended alternative include:

- Replacement of aging, inefficient, and leaking water main pipes, meters, and services
- Reduction in ongoing maintenance costs and minimizing the potential for contamination due to leaks
- Providing adequate water storage capacity
- Providing backup power in case of emergency

The total project cost, including indirect costs for administration and engineering, is estimated at $2,247,000 in 2021 dollars. This includes a 10% construction contingency.

PACE Engineering, CSA 2 PSA for Sugarloaf Water Improvement Project, $480,000.

The total agreement amount above represents compensation for multiple activities and multiple phases of the overall planning and design project. This report is one of six documents produced under this agreement. This document was prepared with assistance and information from subcontracts completed with Lawrence and Associates, Enloe Drilling and Pumps, Inc., and ENPLAN.

TABLES

TABLE 1
CSA 2 Sugarloaf
Water System Improvement Project
Preliminary Engineering Report
Mitigation Monitoring Checklist

Mitigation Measure		Monitoring Action
Work Area		
1	Minimize Work Area	Define limits of work area in Contract Documents and delineate any sensitive areas that are to be left undisturbed.
2	Erosion Control	Establish erosion control procedures in Contract Documents including sensitive areas to be left undisturbed. Standard practices required by the County will be strictly adhered to by the construction contractor and enforced by the Engineer.
3	Revegetation of Disturbed Areas	All areas disturbed shall be seeded and mulched. Revegetation shall consist of native species, grasses, and forbs. Revegetation efforts shall be in place prior to the return of the wet season and in no case later than October 15th of each season.
Construction Activities		
1	Dust Control	Roads and work areas likely to generate dust shall be watered during construction activities and swept clean where possible.
2	Noise Control	Work hours will be limited typically to weekdays between the hours of 7 a.m. to 5 p.m. in residential areas unless special activities, i.e. tie-ins, are required at night during periods of low flow times.
Sensitive Resources		
1	Subsurface Cultural Resources	If subsurface cultural materials are encountered during construction activities, all activities shall be halted within a 50-foot radius and an archaeologist called in to examine the artifacts and determine if additional mitigation measures are required.
2	Botanical Field Survey	A botanical field survey shall be conducted in the summer. In the unlikely event that special-status plant species are present, final design shall avoid the plant population(s) to the extent practicable. If avoidance is not feasible, loss of the special-status plants shall be offset through creation of suitable habitat at a minimum 3:1 ratio. A detailed mitigation plan shall be submitted to the County and California Department of Fish and Wildlife for review and approval. Mitigation shall be undertaken concurrently with or in advance of the start of project construction.
3	Migratory Birds	To ensure that active nests of migratory birds are not disturbed, vegetation removal and construction activities shall occur between August 31 and February 1, if feasible. If vegetation removal or construction must occur during the nesting season, a nesting survey shall be conducted by a qualified biologist to identify active nests. If nesting birds are found, the nest sites shall not be disturbed until after the young have fledged. Further, to prevent nest abandonment and mortality of chicks and eggs, no vegetation removal or construction activities shall occur within 500 feet of an active nest, unless a smaller buffer zone is authorized by the California Department of Fish and Wildlife and the U.S. Fish and Wildlife Service.

TABLE 2
CSA 2 Sugarloaf
Water System Improvement Project
Preliminary Engineering Report
History of Major System Components

System Component	Name	Year Constructed	Year(s) Renovated	Description of Renovation
Water Source	Spring and diversion dam from unnamed creek	Pre-1950	-	
Water Source	Well 1	1978	2017, 2018	Well building and filtration installed in 2017, new well pump installed in 2018
Water Source	Well 2	2018	-	Construction currently underway to connect this well to the distribution system by the end of December 2019
Treatment	Sugarloaf WTP	1978	-	
Storage Tank	1,000-gallon creek raw water diversion tank	1978	-	
Storage Tank	42,500-gallon treated water tank	1978	-	
Distribution System	-	1978	-	Minor pipeline repairs as needed when leaks occur
Booster Pump Station	Shale Lane	1978	-	
Booster Pump Station	Lake Drive	1978	-	

TABLE 3

CSA 2 Sugarloaf

Water System Improvement Project

Preliminary Engineering Report

Unaccounted-For Water Loss (MG)[1]

	2014				2015				2016			
Month	**Produced**	**Sold**	**MDD[2]**	**% Loss**	**Produced**	**Sold**	**MDD[2]**	**% Loss**	**Produced**	**Sold**	**MDD[2]**	**% Loss**
January	0.156				0.269				0.299			
February	0.643	0.204	0.007	75%	0.243	0.175	0.006	66%	0.400	0.163	0.006	77%
March	0.787				0.386				0.203			
April	0.958	0.447	0.015	74%	0.398	0.344	0.012	56%	0.342	0.306	0.010	44%
May	1.099				0.326				0.550			
June	0.448	0.494	0.017	68%	0.546	0.385	0.013	56%	0.737	0.450	0.015	65%
July	0.646				0.881				0.776			
August	0.501	0.765	0.026	33%	0.856	0.544	0.018	69%	0.919	0.795	0.027	53%
September	0.592				0.733				0.638			
October	0.582	0.377	0.013	68%	0.814	0.288	0.010	81%	0.551	0.321	0.011	73%
November	0.664				0.576				0.399			
December	0.732	0.186	0.006	87%	0.264	0.234	0.008	72%	0.507	0.172	0.006	81%
Yearly Totals:	7.808	2.471		68%	6.292	1.969		69%	6.321	2.207		65%

	2017				2018				2019			
Month	**Produced**	**Sold**	**MDD[2]**	**% Loss**	**Produced**	**Sold**	**MDD[2]**	**% Loss**	**Produced**	**Sold**	**MDD[2]**	**% Loss**
January	0.463				0.364				0.782			
February	0.554	0.212	0.007	79%	0.362	0.147	0.005	80%	1.092	0.145	0.005	92%
March	0.689				0.437				1.634			
April	0.695	0.234	0.008	83%	0.509	0.168	0.006	82%	1.399	0.256	0.009	92%
May	0.822				0.772				1.019			
June	0.890	0.429	0.015	75%	0.908	0.337	0.011	80%	1.209	0.699	0.024	69%
July	0.771				1.077							
August	0.752	0.573	0.019	62%	1.015	0.529	0.018	75%			0.000	
September	0.611				0.849							
October	0.429	0.310	0.011	70%	0.797	0.262	0.009	84%			0.000	
November	0.397				0.730							
December	0.443	0.176	0.006	79%	0.818	0.202	0.007	87%			0.000	
Yearly Totals:	7.515	1.934		74%	8.638	1.645		81%	7.134	1.100		85%

MDD based on consumption:	0.027	MGD =	18.7	GPM
MDD with 25% meter inaccuracy:	0.034	MGD =	23.4	GPM

1. Water production is the total of both the existing well and spring source.
2. Maximum day demand based on average daily usage * 2.0.

TABLE 4
CSA 2 Sugarloaf
Water System Improvement Project
Preliminary Engineering Report
Historical Water Production (MG)[1]

	2014				2015				2016			
Month	**Produced**	**ADD**	**MDD[2]**	**MDD/ADD**	**Produced**	**ADD**	**MDD[2]**	**MDD/ADD**	**Produced**	**ADD**	**MDD[2]**	**MDD/ADD**
January	0.70	0.022	0.036	1.6	0.23	0.007	0.018	2.4	0.30	0.010	0.020	2.1
February	0.64	0.023	0.040	1.7	0.24	0.009	0.016	1.8	0.40	0.014	0.029	2.1
March	0.79	0.025	0.053	2.1	0.39	0.012	0.077	6.2	0.20	0.007	0.025	3.8
April	0.96	0.032	0.049	1.5	0.40	0.013	0.019	1.4	0.34	0.011	0.021	1.8
May	1.10	0.035	0.071	2.0	0.33	0.011	0.021	2.0	0.55	0.018	0.037	2.1
June	0.45	0.015	0.031	2.1	0.55	0.018	0.041	2.3	0.74	0.025	0.048	1.9
July	0.65	0.021	0.048	2.3	0.88	0.028	0.053	1.9	0.78	0.025	0.043	1.7
August	0.50	0.016	0.035	2.1	0.86	0.028	0.053	1.9	0.92	0.030	0.045	1.5
September	0.59	0.020	0.037	1.9	0.73	0.024	0.043	1.8	0.64	0.021	0.032	1.5
October	0.58	0.019	0.048	2.6	0.81	0.026	0.034	1.3	0.55	0.018	0.046	2.6
November	0.66	0.022	0.034	1.6	0.58	0.019	0.041	2.1	0.40	0.013	0.019	1.4
December	0.73	0.023	0.050	2.2	0.26	0.009	0.017	1.9	0.51	0.016	0.027	1.7
MDD			0.071				0.077				0.048	
MMD		0.035				0.028				0.030		
ADD	0.023				0.017				0.017			
	2017				**2018**				**2019**			
Month	**Produced**	**ADD**	**MDD[2]**	**MDD/ADD**	**Produced**	**ADD**	**MDD[2]**	**MDD/ADD**	**Produced**	**ADD**	**MDD[2]**	**MDD/ADD**
January	0.46	0.015	0.033	2.2	0.36	0.012	0.023	1.9	0.78	0.025	0.044	1.8
February	0.55	0.020	0.036	1.8	0.36	0.013	0.028	2.1	1.09	0.039	0.059	1.5
March	0.69	0.022	0.030	1.3	0.44	0.014	0.060	4.2	1.63	0.053	0.075	1.4
April	0.69	0.023	0.033	1.4	0.51	0.017	0.044	2.6	1.40	0.047	0.071	1.5
May	0.82	0.027	0.047	1.8	0.77	0.025	0.041	1.6	1.02	0.033	0.048	1.5
June	0.89	0.030	0.061	2.1	0.91	0.030	0.054	1.8	1.21	0.040	0.059	1.5
July	0.77	0.025	0.031	1.3	1.08	0.036	0.05	1.5				
August	0.75	0.024	0.031	1.3	1.02	0.033	0.05	1.5				
September	0.61	0.020	0.032	1.6	0.85	0.028	0.05	1.7				
October	0.43	0.014	0.022	1.6	0.80	0.027	0.05	1.7				
November	0.40	0.013	0.025	1.9	0.73	0.024	0.03	1.3				
December	0.44	0.014	0.022	1.5	0.82	0.027	0.04	1.5				
MDD			0.061				0.060				0.075	
MMD		0.030				0.036				0.053		
ADD	0.021				0.024				0.020			

Average MDD/ADD 2.0
Max MDD/ADD 6.2

1. Water production and demand values are totals of both the existing well and spring sources.
2. Maximum day demand based on production

Maximum Values Based on Production:
MDD = 53 GPM
MMD = 25 GPM
ADD = 16 GPM

TABLE 5
CSA 2 Sugarloaf
Water System Improvement Project
Preliminary Engineering Report
Preliminary Project Cost Estimate - Alternative 1
WTP, Storage, and Distribution System Improvements

No.	Item	Quantity	Unit	Unit Cost	Total Cost[1]
Site Work & General Costs					
1	Mobilization/Demobilization	1	LS	$200,000	$200,000
2	Site work	1	LS	$30,000	$30,000
3	Building repair & double-wide door	1	LS	$30,000	$30,000
4	Exterior piping	1	LS	$35,000	$35,000
5	ORT	1	LS	$10,000	$10,000
6	FAT	1	LS	$10,000	$10,000
7	Bonds	1	LS	$40,000	$40,000
8	Submittals	1	LS	$50,000	$50,000
9	Insurance	1	LS	$20,000	$20,000
10	Equipment O&M Manuals	1	LS	$10,000	$10,000
11	Testing and disinfection	1	LS	$50,000	$50,000
12	Cleanup	1	LS	$20,000	$20,000
				Subtotal Site Work	$505,000
Water Treatment Plant Improvements					
13	3-foot-diameter pressure contact clarifier & piping	1	LS	$40,000	$40,000
14	3-foot-diameter pressure filters & piping	2	LS	$40,000	$80,000
15	Clarifier & filter control valves	12	EA	$4,000	$48,000
16	Backwash booster pump & plumbing	1	LS	$30,000	$30,000
17	Backwash recycle pump & plumbing	1	LS	$30,000	$30,000
18	1,500-gallon hydropneumatic tank	1	LS	$25,000	$25,000
19	Filter & hydropneumatic tank slab	150	SF	$200	$30,000
20	Coagulant carrier water pump	2	EA	$7,000	$14,000
21	Pre & post filter turbidimeters	3	EA	$7,000	$21,000
22	Coagulant & sodium hypochlorite dosing pumps	3	EA	$7,000	$21,000
23	Sodium hypochlorite storage room modifications	1	LS	$25,000	$25,000
24	Chlorine residual analyzer & recorder	1	LS	$20,000	$20,000
25	Electrical controls, SCADA, & RTU	1	LS	$50,000	$50,000
				Subtotal WTP Improvements	$434,000
Pretreatment Tank & Storage Tank Improvements					
26	70,000-gallon welded steel tank, erection, & paint	1	LS	$220,000	$220,000
27	Tank site excavation and footing	1	LS	$150,000	$150,000
28	Retaining wall	1	LS	$35,000	$35,000
29	Tank site piping	1	LS	$25,000	$25,000
30	Tank mixer	1	LS	$25,000	$25,000
31	Blast pretreatment tank interior	1	LS	$35,000	$35,000
32	Interior caulking and bolt replacement	1	LS	$5,000	$5,000
33	Recoat pretreatment tank interior	1	LS	$30,000	$30,000
34	Scrub and power rinse pretreatment tank exterior	1	LS	$10,000	$10,000
35	Recoat pretreatment tank exterior	1	LS	$30,000	$30,000
36	Repair foundation grout	1	LS	$6,000	$6,000
37	Level float sensor	1	LS	$18,000	$18,000
38	Decant float system	1	LS	$25,000	$25,000
				Subtotal Tank Improvements	$614,000
Distribution System Improvements					
39	Connect new well to distribution system	1	LS	$65,000	$65,000
40	Replace booster pump station structure	36	SF	$300	$10,000
41	Replace 8-inch supply main	1,200	LF	$150	$180,000
42	8-inch main tie-ins	2	EA	$7,000	$14,000
43	Replace wharf hydrant	1	EA	$3,000	$3,000
44	Replace 2-inch distribution main with 6-inch	500	LF	$150	$75,000
45	6-inch main tie-ins	2	EA	$5,000	$10,000
46	Replace services	2,500	LF	$100	$250,000
47	Replace water meters and install meter valves	62	EA	$1,500	$93,000
48	15 kw permanent emergency generator	1	LS	$35,000	$35,000
49	Automatic transfer switch	1	LS	$15,000	$15,000
50	Misc. items	1	LS	$30,000	$30,000
				Subtotal Distribution System Improvements	$780,000
51				Subtotal Construction Costs	$2,333,000
52				Contractor Overhead and Profit @ 8%	$187,000
53				Inflation Adder for Construction in 2021 @ 5% per year	$258,000
54				**TOTAL CONSTRUCTION COSTS**	**$2,778,000**
Indirect Costs					
Engineering Services					
55	Final planning and design				$40,000
56	Bidding/Contract award services				$20,000
57	Engineering & construction administration @ 10% of construction costs				$278,000
58	Inflation adder for construction administration in 2021 @ 3% per year				$17,000
59	Construction observation @ full-time for 4 months				$116,000
60	Inflation adder for construction observation in 2021 @ 3% per year				$7,000
61	Record Drawings				$10,000
				Total Engineering Services	$488,000
Other Indirect Services					
62	Shasta County administration & legal, bond counsel				$50,000
63	Construction Phase surveying				$10,000
64	Relocate PG&E service				$20,000
65	Assessment District Engineer's Report				$20,000
66	Permits/Easements/Right-of-way				$10,000
67	Funding administration				$10,000
68	Environmental compliance during construction				$10,000
69	Labor Code compliance				$30,000
				Total Other Indirect Services	$160,000
70				**TOTAL INDIRECT COSTS**	$648,000
71				Project Contingency @ 10% of Construction Costs	$278,000
72				**TOTAL PROJECT COST**	**$3,704,000**

1. Costs in November 2019 dollars at an ENR CCI of 11,380.

TABLE 6

CSA 2 Sugarloaf

Water System Improvement Project

Preliminary Engineering Report

Gt Calculations Summary of Results for Flocculation Pipeline

Flow (GPM)	Flow (Ft/Sec)	G (1/Sec)	Gt	Contact Time (Min)	Pipe Size (Inches)	Pipe Length (Feet)	Reynolds #	Headloss (Inches)	Friction Factor, f	Temp (^oC)
24.0	0.61	29	18,856	10.9	4	400	18,740	2.21	0.02634	20
24.0	0.61	29	14,142	8.2	4	300	18,740	1.66	0.02634	20
24.0	0.27	7	10,799	24.5	6	400	12,493	0.32	0.02916	20

TABLE 7

CSA 2 Sugarloaf
Water System Improvement Project
Preliminary Engineering Report

Bolted Versus Welded Steel Tank Costs[1]

Pressure Zone	Active Water Height (Ft)	Diameter (Ft)	Volume (MG)	Bolted Steel Tank Cost	Welded Steel Tank Cost
Record Heights	14	33	0.087	$115,000	$150,000
Middle Brunswick	14	38	0.122	$160,650	$168,000
Upper Brunswick	14	30	0.073	$100,000	$130,000
Highland Circle	14	37	0.114	$150,150	$165,000

1. Costs in 2015 dollars.

TABLE 8
CSA 2 Sugarloaf
Water System Improvement Project
Preliminary Engineering Report
Preliminary Project Cost Estimate - Alternative 2
Sand Filter Only, Storage, and Distribution System Improvements

No.	Item	Quantity	Unit	Unit Cost	Total Cost[1]
Site Work & General Costs					
1	Mobilization/Demobilization	1	LS	$20,000	$20,000
2	Site work	1	LS	$20,000	$20,000
3	Exterior piping	1	LS	$25,000	$25,000
4	ORT	1	LS	$10,000	$10,000
5	FAT	1	LS	$10,000	$10,000
6	Bonds	1	LS	$30,000	$30,000
7	Submittals	1	LS	$40,000	$40,000
8	Insurance	1	LS	$20,000	$20,000
9	Equipment O&M Manuals	1	LS	$10,000	$10,000
10	Testing and disinfection	1	LS	$40,000	$40,000
11	Cleanup	1	LS	$20,000	$20,000
				Subtotal Site Work	$245,000
Water Treatment Plant Improvements					
12	3-foot-diameter pressure filter & piping	1	LS	$40,000	$40,000
13	Filter control valves	2	EA	$4,000	$8,000
14	Backwash booster pump & plumbing	1	LS	$30,000	$30,000
15	Backwash recycle pump & plumbing	1	LS	$30,000	$30,000
16	1,500-gallon hydropneumatic tank	1	LS	$25,000	$25,000
17	Filter & hydropneumatic tank slab	100	SF	$200	$20,000
18	Pre & post filter turbidimeters	1	EA	$7,000	$7,000
19	Sodium hypochlorite dosing pumps	1	EA	$7,000	$7,000
20	Sodium hypochlorite storage room modifications	1	LS	$25,000	$25,000
21	Chlorine residual analyzer & recorder	1	LS	$20,000	$20,000
22	Electrical controls, SCADA, & RTU	1	LS	$30,000	$30,000
				Subtotal WTP Improvements	$242,000
Pretreatment Tank & Storage Tank Improvements					
23	70,000-gallon welded steel tank, erection, & paint	1	LS	$220,000	$220,000
24	Tank site excavation and footing	1	LS	$150,000	$150,000
25	Retaining wall	1	LS	$35,000	$35,000
26	Tank site piping	1	LS	$25,000	$25,000
27	Tank mixer	1	LS	$25,000	$25,000
28	Blast pretreatment tank interior	1	LS	$35,000	$35,000
29	Interior caulking and bolt replacement	1	LS	$5,000	$5,000
30	Recoat pretreatment tank interior	1	LS	$30,000	$30,000
31	Scrub and power rinse pretreatment tank exterior	1	LS	$10,000	$10,000
32	Recoat pretreatment tank exterior	1	LS	$30,000	$30,000
33	Repair foundation grout	1	LS	$6,000	$6,000
34	Level float sensor	1	LS	$18,000	$18,000
35	Decant float system	1	LS	$25,000	$25,000
				Subtotal Tank Improvements	$614,000
Distribution System Improvements					
36	Connect new well to distribution system	1	LS	$65,000	$65,000
37	Replace booster pump station structure	36	SF	$300	$10,000
38	Replace 8-inch supply main	1,200	LF	$150	$180,000
39	8-inch main tie-ins	2	EA	$7,000	$14,000
40	Replace wharf hydrant	1	EA	$3,000	$3,000
41	Replace 2-inch distribution main with 6-inch	500	LF	$150	$75,000
42	6-inch main tie-ins	2	EA	$5,000	$10,000
43	Replace services	2,500	LF	$100	$250,000
44	Replace water meters and install meter valves	62	EA	$1,500	$93,000
45	15 kw permanent emergency generator	1	LS	$35,000	$35,000
46	Automatic transfer switch	1	LS	$15,000	$15,000
47	Misc. items	1	LS	$30,000	$30,000
				Subtotal Distribution System Improvements	$780,000
48				Subtotal Construction Costs	$1,881,000
49				Contractor Overhead and Profit @ 8%	$150,000
50				Inflation Adder for Construction in 2021 @ 5% per year	$208,000
51				**TOTAL CONSTRUCTION COSTS**	**$2,239,000**
Indirect Costs					
Engineering Services					
52	Final planning and design				$40,000
53	Bidding/Contract award services				$20,000
54	Engineering & construction administration @ 10% of construction costs				$224,000
55	Inflation adder for construction administration in 2021 @ 3% per year				$14,000
56	Construction observation @ full-time for 4 months				$116,000
57	Inflation adder for construction observation in 2021 @ 3% per year				$7,000
58	Record Drawings				$10,000
				Total Engineering Services	$431,000
Other Indirect Services					
59	Shasta County administration & legal, bond counsel				$50,000
60	Construction Phase surveying				$10,000
61	Relocate PG&E service				$20,000
62	Assessment District Engineer's Report				$20,000
63	Permits/Easements/Right-of-way				$10,000
64	Funding administration				$10,000
65	Environmental compliance during construction				$10,000
66	Labor Code compliance				$30,000
				Total Other Indirect Services	$160,000
67				**TOTAL INDIRECT COSTS**	$591,000
68				Project Contingency @ 10% of Construction Costs	$224,000
69				**TOTAL PROJECT COST**	**$3,054,000**

1. Costs in November 2019 dollars at an ENR CCI of 11,380.

TABLE 9
CSA 2 Sugarloaf
Water System Improvement Project
Preliminary Engineering Report
Preliminary Project Cost Estimate - Alternative 3
New Storage Tank and Distribution System Improvements

No.	Item	Quantity	Unit	Unit Cost	Total Cost[1]
Site Work & General Costs					
1	Mobilization/Demobilization	1	LS	$15,000	$15,000
2	Site work	1	LS	$20,000	$20,000
3	ORT	1	LS	$5,000	$5,000
4	FAT	1	LS	$5,000	$5,000
5	Bonds	1	LS	$20,000	$20,000
6	Submittals	1	LS	$30,000	$30,000
7	Insurance	1	LS	$10,000	$10,000
8	Equipment O&M Manuals	1	LS	$8,000	$8,000
9	Testing and disinfection	1	LS	$30,000	$30,000
10	Cleanup	1	LS	$15,000	$15,000
				Subtotal Site Work	$158,000
Storage Tank Improvements					
11	70,000-gallon welded steel tank, erection, & paint	1	LS	$220,000	$220,000
12	Tank site excavation and footing	1	LS	$150,000	$150,000
13	Retaining wall	1	LS	$35,000	$35,000
14	Tank site piping	1	LS	$25,000	$25,000
15	Tank mixer	1	LS	$25,000	$25,000
				Subtotal Tank Improvements	$455,000
Distribution System Improvements					
16	Connect new well to distribution system	1	LS	$65,000	$65,000
17	Replace booster pump station structure	36	SF	$300	$10,000
18	Replace 8-inch supply main	1,200	LF	$150	$180,000
19	8-inch main tie-ins	2	EA	$7,000	$14,000
20	Replace wharf hydrant	1	EA	$3,000	$3,000
21	Replace 2-inch distribution main with 6-inch	500	LF	$150	$75,000
22	6-inch main tie-ins	2	EA	$5,000	$10,000
23	Replace services	2,500	LF	$100	$250,000
24	Replace water meters and install meter valves	62	EA	$1,500	$93,000
25	15 kw permanent emergency generator	1	LS	$35,000	$35,000
26	Automatic transfer switch	1	LS	$15,000	$15,000
27	Misc. items	1	LS	$30,000	$30,000
				Subtotal Distribution System Improvements	$780,000
28				Subtotal Construction Costs	$1,393,000
29				Contractor Overhead and Profit @ 8%	$111,000
30				Inflation Adder for Construction in 2021 @ 5% per year	$154,000
31				**TOTAL CONSTRUCTION COSTS**	**$1,658,000**
Indirect Costs					
Engineering Services					
32	Final planning and design				$20,000
33	Bidding/Contract award services				$20,000
34	Construction administration @ 8% of construction costs				$133,000
35	Inflation adder for construction administration in 2021 @ 3% per year				$8,000
36	Construction observation @ full-time for 3 months				$87,000
37	Inflation adder for construction observation in 2021 @ 3% per year				$5,000
38	Record Drawings				$5,000
				Total Engineering Services	$278,000
Other Indirect Services					
39	Shasta County administration & legal, bond counsel				$50,000
40	Construction Phase surveying				$5,000
41	Relocate PG&E service				$20,000
42	Assessment District Engineer's Report				$20,000
43	Permits/Easements/Right-of-way				$10,000
44	Funding administration				$10,000
45	Environmental compliance during construction				$10,000
46	Labor Code compliance				$20,000
				Total Other Indirect Services	$145,000
47				**TOTAL INDIRECT COSTS**	$423,000
48				Project Contingency @ 10% of Construction Costs	$166,000
49				**TOTAL PROJECT COST**	**$2,247,000**

1. Costs in November 2019 dollars at an ENR CCI of 11,380.

TABLE 10
CSA 2 Sugarloaf
Water System Improvement Project
Preliminary Engineering Report
Preliminary Project Cost Estimate - Alternative 4
Distribution System Improvements Only

No.	Item	Quantity	Unit	Unit Cost	Total Cost[1]
Site Work & General Costs					
1	Mobilization/Demobilization	1	LS	$10,000	$10,000
2	Bonds	1	LS	$15,000	$15,000
3	Submittals	1	LS	$15,000	$15,000
4	Insurance	1	LS	$10,000	$10,000
5	Testing and disinfection	1	LS	$15,000	$15,000
6	Cleanup	1	LS	$10,000	$10,000
				Subtotal Site Work	$75,000
Distribution System Improvements					
7	Connect new well to distribution system	1	LS	$65,000	$65,000
8	Replace booster pump station structure	36	SF	$300	$10,000
9	Replace 8-inch supply main	1,200	LF	$150	$180,000
10	8-inch main tie-ins	2	EA	$7,000	$14,000
11	Replace wharf hydrant	1	EA	$3,000	$3,000
12	Replace 2-inch distribution main with 6-inch	500	LF	$150	$75,000
13	6-inch main tie-ins	2	EA	$5,000	$10,000
14	Replace services	2,500	LF	$100	$250,000
15	Replace water meters and install meter valves	62	EA	$1,500	$93,000
16	15 kw permanent emergency generator	1	LS	$35,000	$35,000
17	Automatic transfer switch	1	LS	$15,000	$15,000
18	Misc. items	1	LS	$30,000	$30,000
				Subtotal Distribution System Improvements	$780,000
19				Subtotal Construction Costs	$855,000
20				Contractor Overhead and Profit @ 8%	$68,000
21				Inflation Adder for Construction in 2021 @ 5% per year	$95,000
22				**TOTAL CONSTRUCTION COSTS**	**$1,018,000**
Indirect Costs					
Engineering Services					
23	Final planning and design				$10,000
24	Bidding/Contract award services				$10,000
25	Engineering & construction administration @ 10% of construction costs				$102,000
26	Inflation adder for construction administration in 2021 @ 3% per year				$6,000
27	Construction observation @ full-time for 2 months				$58,000
28	Inflation adder for construction observation in 2021 @ 3% per year				$4,000
29	Record Drawings				$5,000
				Total Engineering Services	$195,000
Other Indirect Services					
30	Shasta County administration & legal, bond counsel				$50,000
31	Construction Phase surveying				$5,000
32	Assessment District Engineer's Report				$20,000
33	Permits/Easements/Right-of-way				$10,000
34	Funding administration				$10,000
35	Environmental compliance during construction				$10,000
36	Labor Code compliance				$20,000
				Total Other Indirect Services	$125,000
37				**TOTAL INDIRECT COSTS**	$320,000
38				Project Contingency @ 10% of Construction Costs	$102,000
39				**TOTAL PROJECT COST**	**$1,440,000**

1. Costs in November 2019 dollars at an ENR CCI of 11,380.

TABLE 11
CSA 2 Sugarloaf
Water System Improvement Project
Preliminary Engineering Report
Alternative Project Cost Summary[1]

Alt No.	Description	Construction Cost	Indirect Cost	10% Project Contingency	Total Cost
1	WTP, Storage, and Distribution System Improvements	$2,778,000	$648,000	$278,000	$3,704,000
2	Sand Filter Only, Storage, and Distribution System Improvements	$2,239,000	$591,000	$224,000	$3,054,000
3	New Storage Tank and Distribution System Improvements	$1,658,000	$423,000	$166,000	$2,247,000
4	Distribution System Improvements Only	$1,018,000	$320,000	$102,000	$1,440,000

1. Costs in November 2019 dollars at an ENR CCI of 11,380.

TABLE 12 CSA 2 Sugarloaf Water System Improvement Project Preliminary Engineering Report **Annual Operation & Maintenance Cost Estimates**					
No.	**Item**	**Quantity**	**Unit**	**Unit Cost[1]**	**Total Cost**
Alt 1 - WTP, Storage, and Distribution System Improvements					
1	Labor including benefits	913	Hrs	$40	$36,500
2	Equipment maintenance	1	LS	$4,000	$4,000
3	Power	65,350	Kw-Hrs	$0.15	$9,900
4	Emergency generator fuel	132	Gallons	$4.50	$600
				Alt 1 Total Estimated Annual O&M Costs	**$51,000**
Alt 2 - Sand Filter Only, Storage, and Distribution System Improvements					
1	Labor including benefits	913	Hrs	$40	$36,500
2	Equipment maintenance	1	LS	$5,000	$5,000
3	Power	49,012	Kw-Hrs	$0.15	$7,400
4	Emergency generator fuel	132	Gallons	$4.50	$600
				Alt 2 Total Estimated Annual O&M Costs	**$49,500**
Alt 3 - New Storage Tank and Distribution System Improvements					
1	Labor including benefits	1,186	Hrs	$40	$47,500
2	Equipment maintenance	1	LS	$8,000	$8,000
3	Power	32,675	Kw-Hrs	$0.15	$5,000
4	Emergency generator fuel	132	Gallons	$4.50	$600
				Alt 3 Total Estimated Annual O&M Costs	**$61,100**
Alt 4 - Distribution System Improvements Only					
1	Labor including benefits	1,186	Hrs	$40	$47,500
2	Equipment maintenance	1	LS	$8,000	$8,000
3	Power	32,675	Kw-Hrs	$0.15	$5,000
4	Emergency generator fuel	132	Gallons	$4.50	$600
				Alt 4 Total Estimated Annual O&M Costs	**$61,100**

1. Costs in November 2019 dollars at an ENR CCI of 11,380.

TABLE 13
CSA 2 Sugarloaf
Water System Improvement Project
Preliminary Engineering Report
Estimated Useful Lives of Water System Equipment

Component	Useful Life (years)[1]
Intake Structures	35-45
Wells and Springs	25-35
Galleries and Tunnels	30-40
Chlorination Equipment	10-15
Other Treatment Equipment	10-15
Storage Tanks	30-60
Pumps	10-15
Buildings	30-60
Electrical Systems	7-10
Transmission Mains	35-40
Distribution Pipes	35-40
Valves	35-40
Blow-off Valves	35-40
Backflow Prevention	35-40
Meters	10-15
Service Lines	30-50
Hydrants	40-60
Lab/Monitoring Equipment	5-7
Tools and Shop Equipment	10-15
Landscaping/Grading	40-60
Office Furniture/Supplies	10
Computers	5
Transportation Equipment	10

1. Typical Life Expectancies taken from US Environmental Protection Agency Asset Management: A Handbook for Small Drinking Water Systems. EPA 816-R-03-016. September 2003. These numbers are ranges of expected useful lives drawn from a variety of sources. The ranges assume that assets have been properly maintained.

TABLE 14
CSA 2 Sugarloaf
Water System Improvement Project
Preliminary Engineering Report
Alternative 1 Salvage Value

Item		Cost[1]	Useful Life[2]	Salvage Value[3]
1	3-foot-diameter pressure contact clarifier & piping	$40,000	40	$20,000
2	3-foot-diameter pressure filters & piping	$80,000	40	$40,000
3	Clarifier & filter control valves	$48,000	40	$24,000
4	Backwash booster pump & plumbing	$30,000	15	$0
5	Backwash recycle pump & plumbing	$30,000	15	$0
6	1,500-gallon hydropneumatic tank	$25,000	60	$16,667
7	Filter & hydropneumatic tank slab	$30,000	60	$20,000
8	Coagulant carrier water pump	$14,000	15	$0
9	Pre & post filter turbidimeters	$21,000	7	$0
10	Coagulant & sodium hypochlorite dosing pumps	$21,000	15	$0
11	Sodium hypochlorite storage room modifications	$25,000	60	$16,667
12	Chlorine residual analyzer & recorder	$20,000	15	$0
13	Electrical controls, SCADA, & RTU	$50,000	10	$0
14	70,000-gallon welded steel tank, erection, & paint	$220,000	60	$146,667
15	Tank site excavation and footing	$150,000	60	$100,000
16	Retaining wall	$35,000	60	$23,333
17	Tank site piping	$25,000	40	$12,500
18	Tank mixer	$25,000	15	$0
19	Blast pretreatment tank interior	$35,000	60	$23,333
20	Interior caulking and bolt replacement	$5,000	60	$3,333
21	Recoat pretreatment tank interior	$30,000	60	$20,000
22	Scrub and power rinse pretreatment tank exterior	$10,000	60	$6,667
23	Recoat pretreatment tank exterior	$30,000	60	$20,000
24	Repair foundation grout	$6,000	60	$4,000
25	Level float sensor	$18,000	10	$0
26	Decant float system	$25,000	10	$0
27	Connect new well to distribution system	$65,000	40	$32,500
28	Replace booster pump station structure	$10,000	60	$6,667
29	Replace 8-inch supply main	$180,000	40	$90,000
30	Replace wharf hydrant	$3,000	40	$1,500
31	Replace 2-inch distribution main with 6-inch	$75,000	40	$37,500
32	6-inch main tie-ins	$10,000	40	$5,000
33	Replace services	$250,000	50	$150,000
34	Replace water meters and install meter valves	$93,000	15	$0
35	15 kw permanent emergency generator	$35,000	10	$0
36	Automatic transfer switch	$15,000	10	$0
			Total Salvage Value	$821,000

1. Costs in November 2019 dollars at an ENR CCI of 11,380.
2. Service lives are as presented in Table 13.
3. No salvage value for engineering, legal, & administration costs.

TABLE 15
CSA 2 Sugarloaf
Water System Improvement Project
Preliminary Engineering Report
Alternative 2 Salvage Value

Item		Cost[1]	Useful Life[2]	Salvage Value[3]
1	3-foot-diameter pressure filter & piping	$40,000	40	$20,000
2	Filter control valves	$8,000	40	$4,000
3	Backwash booster pump & plumbing	$30,000	15	$0
4	Backwash recycle pump & plumbing	$30,000	15	$0
5	1,500-gallon hydropneumatic tank	$25,000	60	$16,667
6	Filter & hydropneumatic tank slab	$20,000	60	$13,333
7	Pre & post filter turbidimeters	$7,000	7	$0
8	Sodium hypochlorite dosing pumps	$7,000	15	$0
9	Sodium hypochlorite storage room modifications	$25,000	60	$16,667
10	Chlorine residual analyzer & recorder	$20,000	15	$0
11	Electrical controls, SCADA, & RTU	$30,000	10	$0
12	70,000-gallon welded steel tank, erection, & paint	$220,000	60	$146,667
13	Tank site excavation and footing	$150,000	60	$100,000
14	Retaining wall	$35,000	60	$23,333
15	Tank site piping	$25,000	40	$12,500
16	Tank mixer	$25,000	15	$0
17	Blast pretreatment tank interior	$35,000	60	$23,333
18	Interior caulking and bolt replacement	$5,000	60	$3,333
19	Recoat pretreatment tank interior	$30,000	60	$20,000
20	Scrub and power rinse pretreatment tank exterior	$10,000	60	$6,667
21	Recoat pretreatment tank exterior	$30,000	60	$20,000
22	Repair foundation grout	$6,000	60	$4,000
23	Level float sensor	$18,000	10	$0
24	Decant float system	$25,000	10	$0
25	Connect new well to distribution system	$65,000	40	$32,500
26	Replace booster pump station structure	$10,000	60	$6,667
27	Replace 8-inch supply main	$180,000	40	$90,000
28	8-inch main tie-ins	$14,000	40	$7,000
29	Replace 2-inch distribution main with 6-inch	$75,000	40	$37,500
30	6-inch main tie-ins	$10,000	40	$5,000
31	Replace services	$250,000	50	$150,000
32	Replace water meters and install meter valves	$93,000	15	$0
33	15 kw permanent emergency generator	$35,000	10	$0
34	Automatic transfer switch	$15,000	10	$0
			Total Salvage Value	$760,000

1. Costs in November 2019 dollars at an ENR CCI of 11,380.
2. Service lives are as presented in Table 13.
3. No salvage value for engineering, legal, & administration costs.

TABLE 16
CSA 2 Sugarloaf
Water System Improvement Project
Preliminary Engineering Report
Alternative 3 Salvage Value

Item		Cost[1]	Useful Life[2]	Salvage Value[3]
1	70,000-gallon welded steel tank, erection, & paint	$220,000	60	$146,667
2	Tank site excavation and footing	$150,000	60	$100,000
3	Retaining wall	$35,000	60	$23,333
4	Tank site piping	$25,000	40	$12,500
5	Tank mixer	$25,000	15	$0
6	Connect new well to distribution system	$65,000	40	$32,500
7	Replace booster pump station structure	$10,000	40	$5,000
8	Replace 8-inch supply main	$180,000	40	$90,000
9	8-inch main tie-ins	$14,000	40	$7,000
10	Replace 2-inch distribution main with 6-inch	$75,000	40	$37,500
11	6-inch main tie-ins	$10,000	50	$6,000
12	Replace water meters and install meter valves	$93,000	15	$0
13	15 kw permanent emergency generator	$35,000	10	$0
14	Automatic transfer switch	$15,000	10	$0
			Total Salvage Value	$461,000

1. Costs in November 2019 dollars at an ENR CCI of 11,380.
2. Service lives are as presented in Table 13.
3. No salvage value for engineering, legal, & administration costs.

TABLE 17
CSA 2 Sugarloaf
Water System Improvement Project
Preliminary Engineering Report
Alternative 4 Salvage Value

Item		Cost[1]	Useful Life[2]	Salvage Value[3]
1	Connect new well to distribution system	$65,000	40	$32,500
2	Replace booster pump station structure	$10,000	60	$6,667
3	Replace 8-inch supply main	$180,000	40	$90,000
4	8-inch main tie-ins	$14,000	40	$7,000
5	Replace 2-inch distribution main with 6-inch	$75,000	40	$37,500
6	6-inch main tie-ins	$10,000	40	$5,000
7	Replace services	$250,000	50	$150,000
8	Replace water meters and install meter valves	$93,000	15	$0
9	15 kw permanent emergency generator	$35,000	10	$0
10	Automatic transfer switch	$15,000	10	$0
			Total Salvage Value	$329,000

1. Costs in November 2019 dollars at an ENR CCI of 11,380.
2. Service lives are as presented in Table 13.
3. No salvage value for engineering, legal, & administration costs.

TABLE 18

CSA 2 Sugarloaf

Water System Improvement Project

Preliminary Engineering Report

Alternative Project Present Worth Analysis

Alt No.	Description	Total Project Capital Cost[1]	Annual O&M	O&M Present Worth[2] (P/A, 1.5%, 20 Yrs) PW Factor = 17.169	Salvage Value	Salvage Value Present Worth[2] (P/F, 1.5%, 20 Yrs) PW Factor = 0.7425	Net Present Worth
1	WTP, Storage, and Distribution System Improvements	$3,426,000	$51,000	$875,601	$821,000	$609,568	$3,692,032
2	Sand Filter Only, Storage, and Distribution System Improvements	$2,830,000	$49,500	$849,848	$760,000	$564,278	$3,115,570
3	New Storage Tank and Distribution System Improvements	$2,081,000	$61,100	$1,049,004	$461,000	$342,279	$2,787,725
4	Distribution System Improvements Only	$1,338,000	$61,100	$1,049,004	$329,000	$244,273	$2,142,731

1. Total Project Cost does not include contingencies.

2. Real Interest Rates on Treasury Notes and Bonds of Specified Maturities (in percent) according to the Office of Management and Budget Circular No. A-94, revised November 2018.

TABLE 19
CSA 2 Sugarloaf
Water System Improvement Project
Preliminary Engineering Report
Alternative Weighted Matrix Ranking

Non-monetary Factor	Weight	Alternative No.			
		1	2	3	4
Ability to Obtain Easements & Permits	10	5	5	5	5
Simplicity of Operation	20	10	8	5	2
Ability to Meet Future Regulations	20	10	8	5	2
Future Serviceability/Reliability	15	10	8	5	2
Likelihood of Implementation	10	2	5	8	10
Security & Safety to Workers/Public	15	10	8	5	2
Environmental Impact	10	2	2	5	5
Weighted Total:	100	79%	68%	53%	34%

Notes:

1. Weighting based upon a scale from 1-10. 1 = Least Favorable, 10 = Most Favorable

TABLE 20
CSA 2 Sugarloaf
Water System Improvement Project
Preliminary Engineering Report
Preliminary Project Schedule

Item No.	Action	Target Date	Completion Date
1	County hired PACE and authorized start of work for USDA Preliminary Engineering Report		Jun-16
2	Engineering Agreement Amendment 1 entered into by PACE and County for DWSRF Preliminary Report		Jan-17
3	County received DWSRF Planning Grant		Feb-18
4	Engineering Agreement Amendment 2 entered into by PACE and County for test well drilling		Feb-18
5	PACE entered into subconsultant agreement with Lawrence and Associates (L&A)		Mar-18
6	PACE and L&A completed draft plans and specifications for test well drilling		Apr-18
7	PACE received comments from County, DDW, and DWSRF on test well contract documents		Apr-18
8	PACE and L&A submitted final test well plans, specs, and cost estimate to County, DDW, and DWSRF		May-18
9	PACE was approved to bid test well construction		May-18
10	PACE solicited construction bids for test well drilling		May-18
11	PACE entered into subconsultant agreement with Enloe Drilling and Pumps, Inc. (Enloe) for test well drilling		Jul-18
12	Enloe completed test well drilling and pump test		Oct-18
13	L&A completed test well Evaluation of Yield and Quality		Dec-18
14	PACE entered into Subconsultant Agreement Amendment 1 with Enloe for reinstallation of well pump		Jan-19
15	Additional well testing completed		Mar-19
16	Additional well testing results received with non-detect for all antimony		Apr-19
17	Engineering Agreement Amendment 3 entered into by PACE and County for in-house test well connection construction plans and specs, Multi-Agency Project Report, 90% design, and environmental of complete improvement project		Jul-19
18	California Rural Water Association (CRWA) completed Leak Detection Survey		Aug-19
19	Leak Detection Survey Report completed		Sep-19
20	PACE completed Draft Multi-Agency Report		Oct-19
21	PACE received comments from County, DDW, DWSRF, and USDA RD on Draft Report		Nov-19
22	PACE completed Final Report		Nov-19
23	Enplan completes Draft Environmental Documents	Dec-19	
24	Enplan completes Final Environmental Documents	Feb-20	
25	PACE submits draft 50% plans, specs, and cost estimate to County, DDW, DWSRF, and USDA RD	Apr-20	
26	County submits USDA RD construction funding application	Apr-20	
27	PACE receives comments from County, DDW, and USDA RD	Jun-20	
28	PACE submits final 90% plans, specs, and cost estimate to County, DDW, DWSRF, and USDA RD	Aug-20	
29	DWSRF Planning Grant Work Completion	Aug-20	
30	County receives USDA RD construction funding agreement	Oct-20	
31	Engineering Agreement Amendment 4 entered into by PACE and County for bidding and construction management engineering services	Nov-20	
32	Bid documents finalized	Dec-20	
33	County approves advertising for bids	Jan-21	
34	County invites construction bids	Feb-21	
35	Construction bids received	May-21	
36	Recommendation of Award considered at County Board of Supervisors Meeting	Jun-21	
37	Construction contract awarded	Jul-21	
38	Begin construction	Sep-21	
39	Construction complete	May-22	

TABLE 21
CSA 2 Sugarloaf
Water System Improvement Project
Preliminary Engineering Report
Recommended Project Cost Estimate - USDA RD Format

No.	Item	Subtotal	Total[1]
INDIRECT COSTS			
1	**Easement Acquisition/Right-of-Way/Water Rights Agreements**		$10,000
2	**Bond Counsel**		$40,000
3	**Legal Counsel**		$10,000
ENGINEERING SERVICES			
4	**Basic Services:**		
5	Preliminary and Final Design Phase Services	$20,000	
6	Bidding/Contract Award Phase Services	$20,000	
7	Construction Phase Services (w/o inspection)	$141,000	
8	**Resident Project Representative Services (Resident Inspector)**	$92,000	
9	**Additional Services:**		
10	PG&E Service Relocation	$20,000	
11	Assessment District Engineer's Report	$20,000	
12	Funding Administration	$10,000	
13	Labor Code Compliance	$20,000	
14	Environmental Mitigation Services (Construction Phase)	$10,000	
15	Construction Surveying Services	$5,000	
16	Record Drawings	$5,000	
17	**Total Engineering Services**		$363,000
18	Owner Direct Procurement Agreements		$0
19	Construction Contract[2]		$1,658,000
20	Construction Contingency (10% of construction)		$166,000
	TOTAL ESTIMATED PROJECT COST		**$2,247,000**

1. The estimated project cost is based on the understanding that the project is required to be in compliance with the USDA Rural Development American Iron and Steel (AIS) requirements.

2. All costs based on November 2019 dollars but projected forward to construction in 2021.

TABLE 22
CSA 2 Sugarloaf
Water System Improvement Project
Preliminary Engineering Report
Projected Operation & Maintenance Costs

No.	Item	Budgeted O&M FY 2018/19	Yearly Inflation Factor	Projected O&M FY 21/22
1	Insurance Expense Miscellaneous	$63	3%	$69
2	Maintenance of Equipment	$10,000	3%	$8,927
3	Charges Facility Management Maintenance Structures	$500	3%	$546
4	Memberships	$200	3%	$219
5	Charges OC Postage Services	$631	3%	$690
6	Professional and Special Services	$1,000	3%	$1,093
7	Professional Lab Services	$4,000	3%	$4,371
8	Professional Maintenance Services	$46,000	3%	$44,265
9	Special Departmental Expense	$1,500	3%	$1,639
10	Utilities	$6,000	3%	$6,156
	Annual O&M Costs:	$69,894		$67,975

1. Projected FY 21/22 anticipated maintenance operation expense takes into account an overall decrease of approximately $9,000 in annual O&M resulting from the recommended project.

TABLE 23
CSA 2 Sugarloaf
Water System Improvement Project
Preliminary Engineering Report
Debt Repayment Schedule

Loan Amount	$2,247,000
Repayment Period (years)	40
Interest Rate	2.375%
Annual Repayment Amount	$87,638
Debt Service Reserve at 10%	$8,764
Short-Lived Assets Reserve	$12,867
Total Annual Cost	$109,268
Number of HEs	62
Monthly Cost Per HE	$146.87
Bimonthly Cost Per HE	$293.73

TABLE 24 CSA 2 Sugarloaf Water System Improvement Project Preliminary Engineering Report **Short-Lived Assets Reserve**			
Infrastructure	**Useful Life (Years)**	**Replacement Cost[1]**	**Annual Reserve**
Tank mixer	15	$25,000	$1,667
Replace water meters and install meter valves	15	$93,000	$6,200
15 kw permanent emergency generator	10	$35,000	$3,500
Automatic transfer switch	10	$15,000	$1,500
		Total Annual Reserve	$12,867

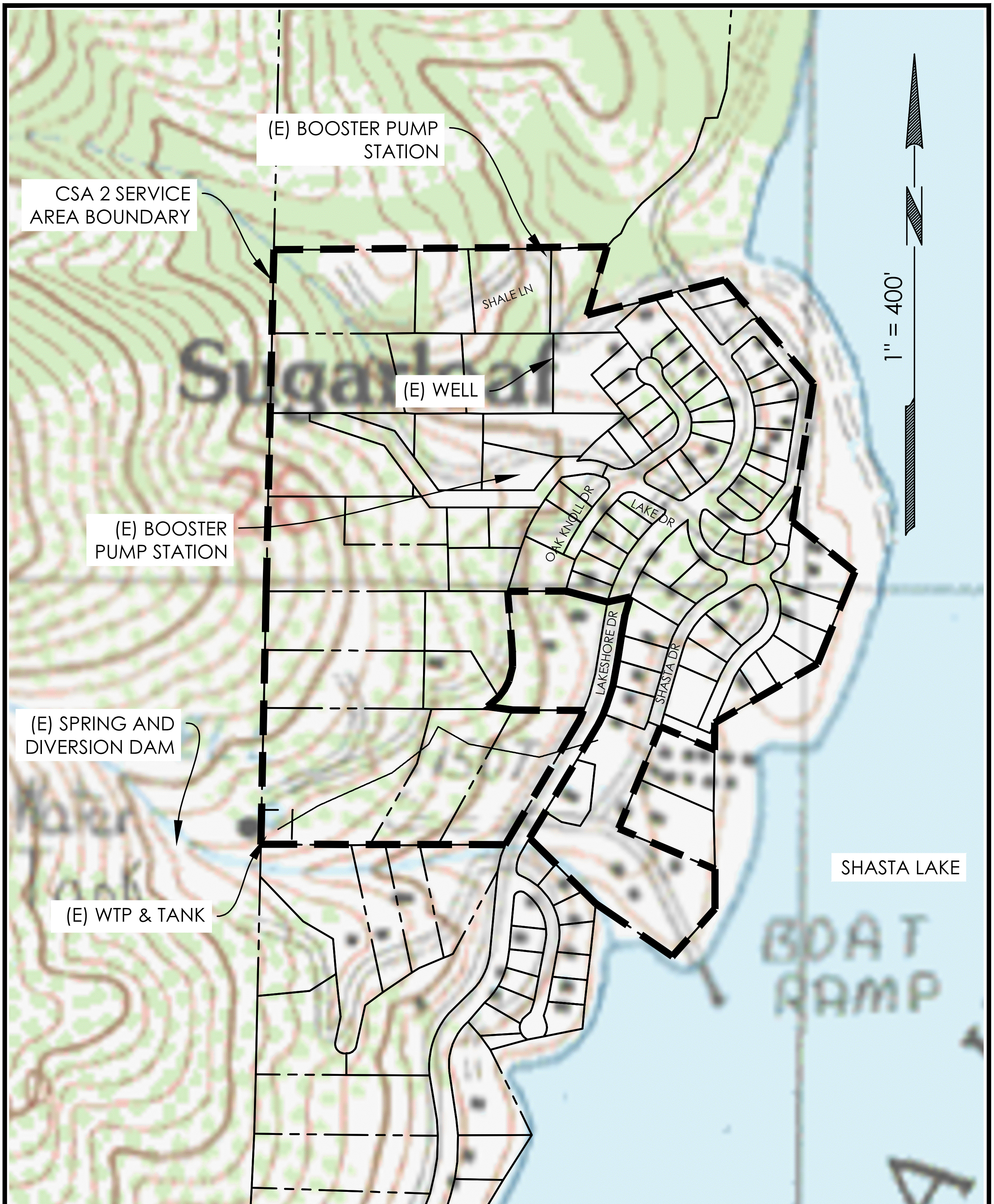
1. Costs in November 2019 dollars at an ENR CCI of 11,380.

FIGURES

DATE	PACE ENGINEERING REDDING, CALIFORNIA	CSA 2 SUGARLOAF LOCATION MAP	FIGURE 1
06/19/19			JOB #199.95

Plot Date: June 19, 2019 – 4:48 pm Login Name: lmccollum

File Name: M:\Land Projects\0199.95 CSA 2 Sugarloaf Water Improvement Project\DWG\LOCATION MAP.dwg, Layout: FIG 1

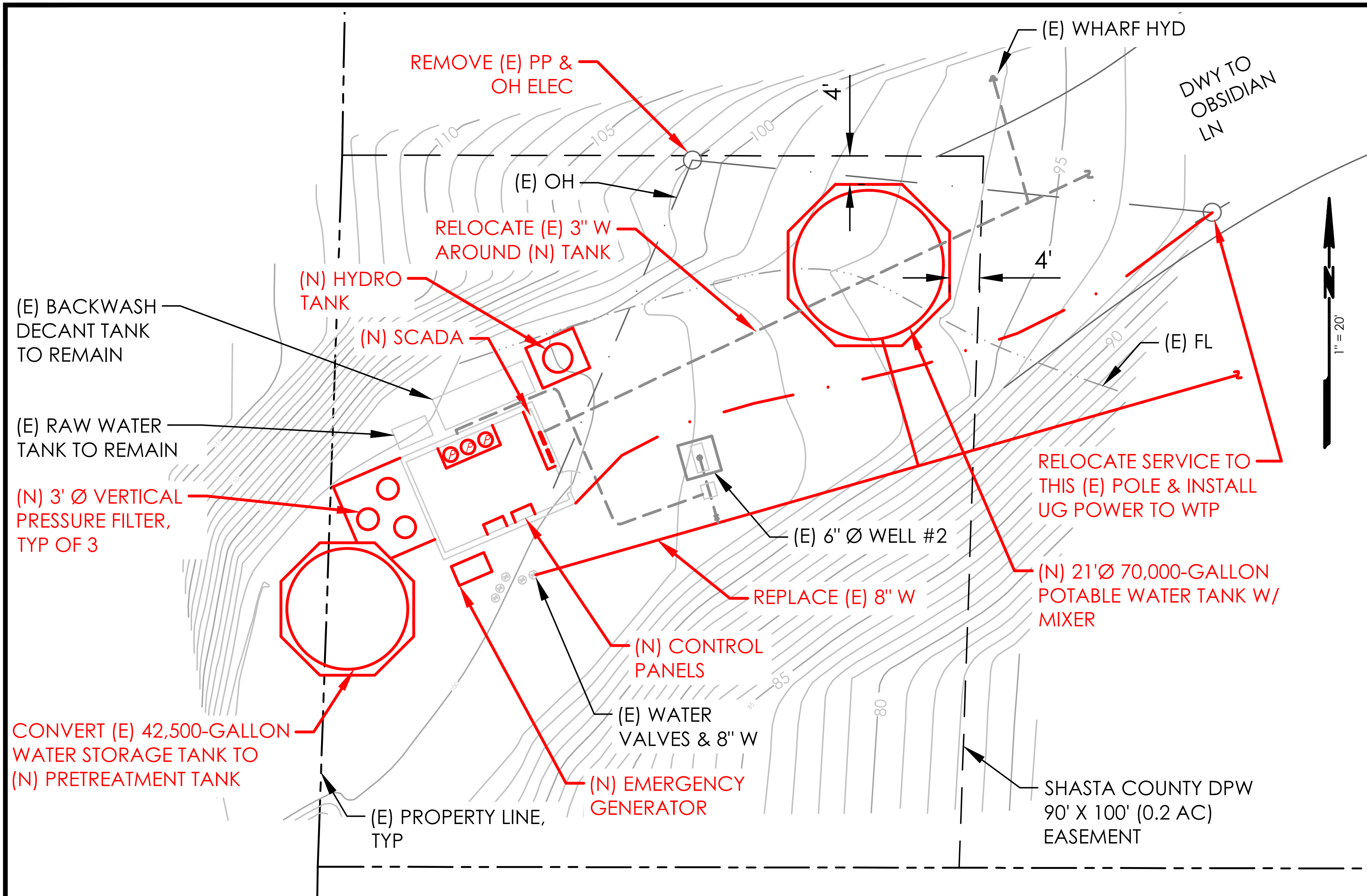


DATE	PACE ENGINEERING REDDING, CALIFORNIA	CSA 2 SUGARLOAF EXISTING FACILITIES	FIGURE 2
11/21/19			JOB #199.95

Plot Date: November 21, 2019 – 2:13 pm Login Name: lmccollum
File Name: M:\Land Projects\0199.95 CSA 2 Sugarloaf Water Improvement Project\DWG\LOCATION MAP updated 9.13.19.dwg, Layout: FIG 2

DATE	PACE ENGINEERING REDDING, CALIFORNIA	CSA 2 SUGARLOAF POSSIBLE WELL LOCATIONS	FIGURE 3
06/19/19			JOB #199.95

Plot Date: June 19, 2019 – 4:51 pm Login Name: lmccollum
File Name: M:\Land Projects\0199.95 CSA 2 Sugarloaf Water Improvement Project\DWG\LOCATION MAP.dwg, Layout: FIG 3

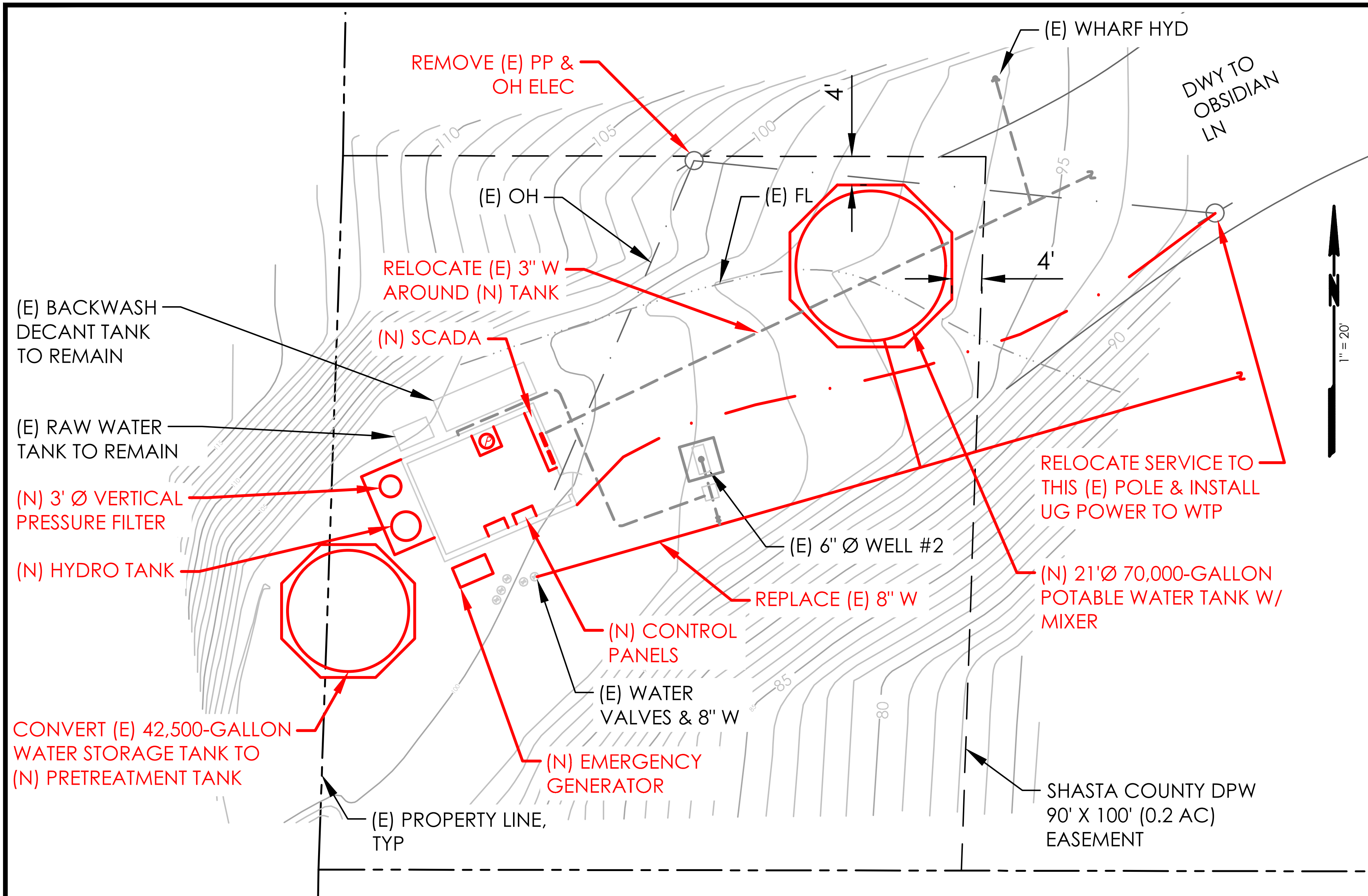


PACE ENGINEERING
REDDING, CALIFORNIA

CSA 2 SUGARLOAF
WTP SITE PLAN –
ALTERNATIVE 1

FIGURE 4
DATE: 10/21/19
JOB # 199.95.600

Plot Date: October 25, 2019 – 1:02 pm Login Name: lmccollum
File Name: M:\Land Projects\0199.95 CSA 2 Sugarloaf Water Improvement Project\DWG\FIGURE 4 ALT 1.dwg, Layout: FIGURE 4



PACE ENGINEERING
REDDING, CALIFORNIA

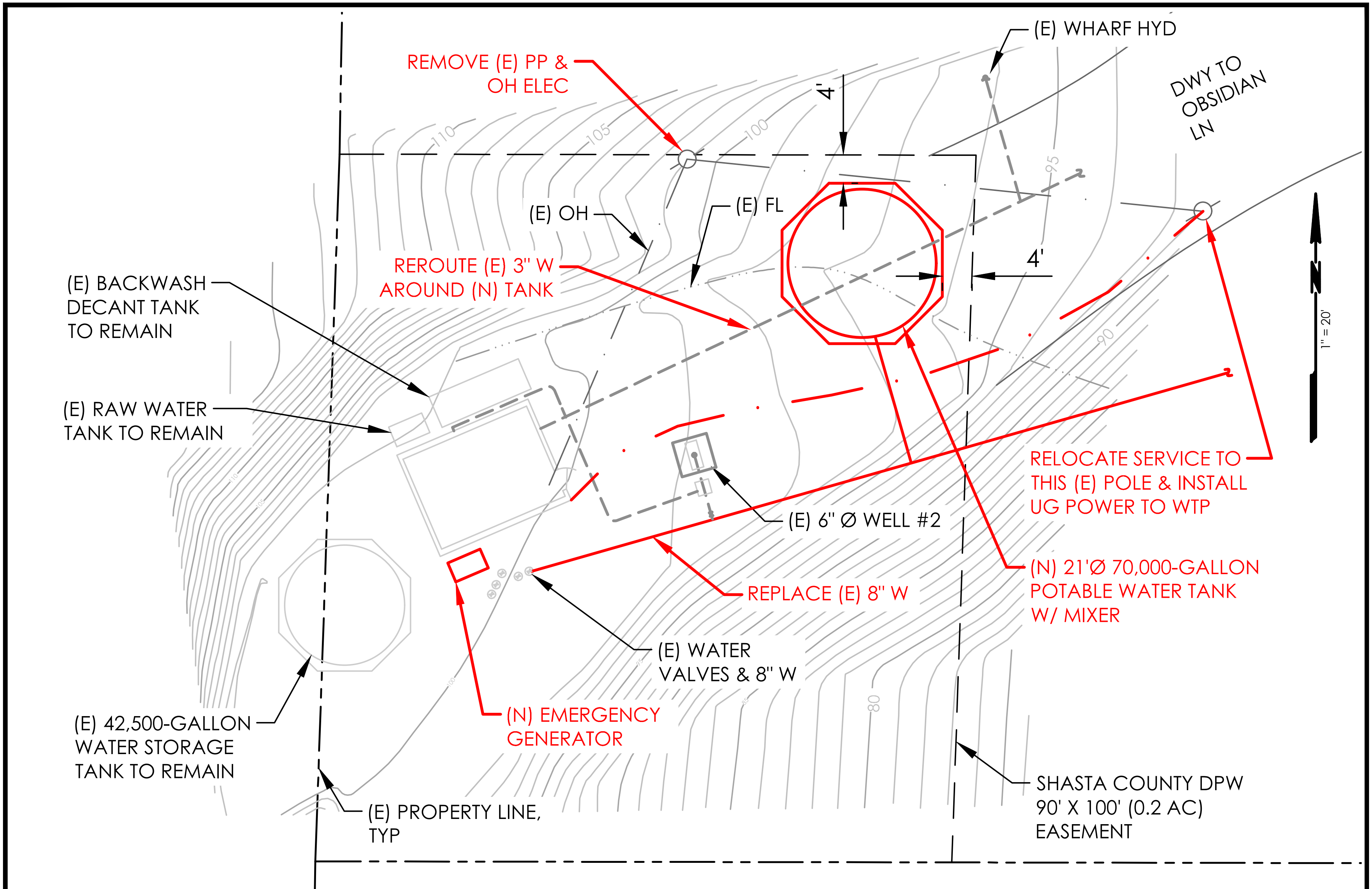
CSA 2 SUGARLOAF WTP SITE PLAN – ALTERNATIVE 2

FIGURE 5

DATE: 10/21/19

JOB # 199.95.600

Plot Date: October 25, 2019 – 1:03 pm Login Name: lmccollum
File Name: M:\Land Projects\0199.95 CSA 2 Sugarloaf Water Improvement Project\DWG\FIGURE 5 ALT 2.dwg, Layout: FIGURE 5



PACE ENGINEERING
REDDING, CALIFORNIA

CSA 2 SUGARLOAF WTP SITE PLAN – ALTERNATIVE 3

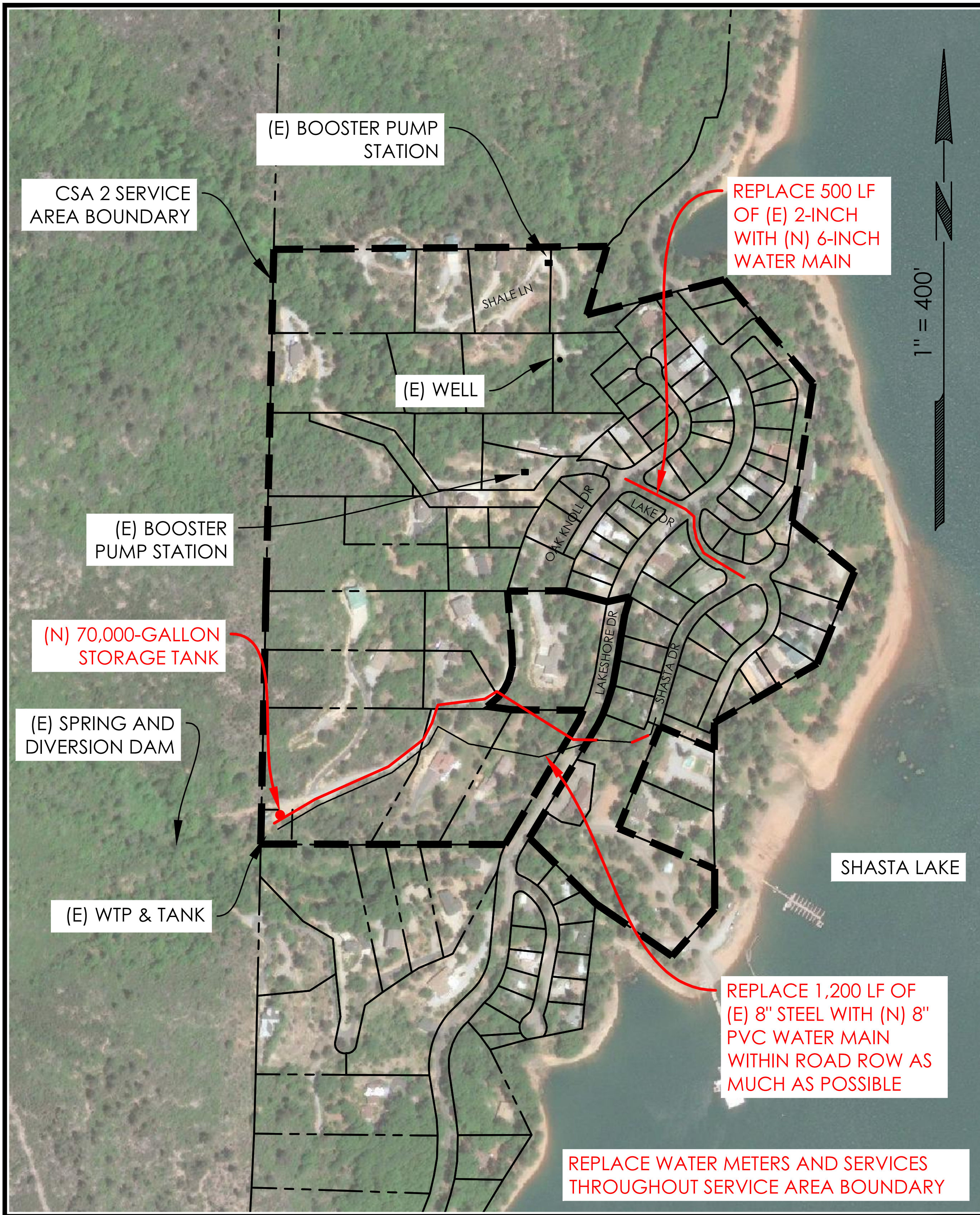
FIGURE 6

DATE: 10/21/19

JOB # 199.95.600

Plot Date: October 25, 2019 – 1:00 pm Login Name: lmccollum

File Name: M:\Land Projects\0199.95 CSA 2 Sugarloaf Water Improvement Project\DWG\FIGURE 6 ALT 3.dwg, Layout: FIGURE 6



DATE	PACE ENGINEERING REDDING, CALIFORNIA	CSA 2 SUGARLOAF RECOMMENDED DISTRIBUTION SYSTEM IMPROVEMENTS	FIGURE 7
11/25/19			JOB #199.95

Plot Date: November 25, 2019 – 7:43 am Login Name: lmccollum
File Name: M:\Land Projects\0199.95 CSA 2 Sugarloaf Water Improvement Project\DWG\LOCATION MAP updated 9.13.19.dwg, Layout: FIG 7

APPENDIX A

2015 DIVISION OF DRINKING WATER ANNUAL INSPECTION REPORT

State Water Resources Control Board
Division of Drinking Water
Inspection Report

Purveyor: Shasta County Service Area No. 2 -- Sugarloaf (CSA) **System No:** 45~~1~~60006
Person(s) Contacted/Position: Scott Sealander, Chief Operator (Phone # 347-0431, 949-6768 cell)
Date of inspection: May 19, 2015 **Reviewing Engineer:** Katie Connaughton, P.E.
Last Annual Inspection May 22, 2012 (by Shasta Co.) **District Engineer:** Mike McNamara P.E.

A. INTRODUCTION

1. **Permit Status (Date Issued/Amendment Purpose)**

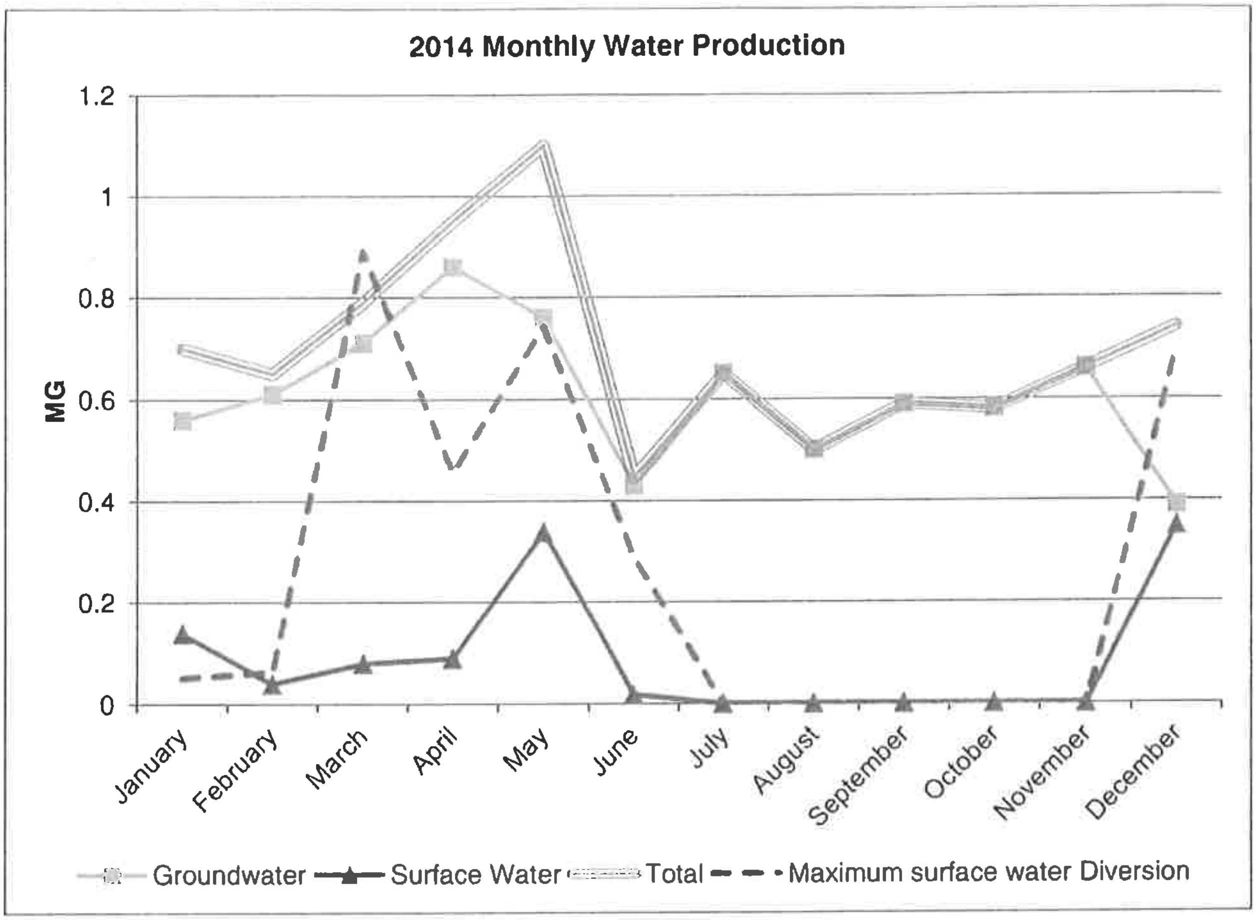
   Full: June 2, 2004, originally permitted in June 1984, but renewed annually by Shasta County
   Amendment(s): None
   Are the permit provisions complied with? No
   Is the permit up to date? Yes
   System Classification / Population / Service Connections The CSA serves a subdivision, restaurant, and is the backup water supply for Sugarloaf Rental Cottages near the community of Lakehead. The water system is supplied by a surface water source (unnamed creek) and a groundwater well. Surface water is treated with a polymer coagulant, and chlorine disinfectant prior to filtration through four small single media filters. The well is also treated with chlorine. Finished water is pumped to a 42,500 gallon storage tank. The system serves a population of about 160 and there are approximately 60 service connections. It is estimated that approximately 70% of the connections are in use year round with full time population of about 87. The average size household in the area is 2.01.

2. **Changes in System**
   a) **Since last annual inspection:** No major changes
   b) **Planned future changes:** unknown

3. **Consumer & Production Data**
   Discussion and Appraisal: The consumer and production values for the Sugarloaf water system were provided by the County before inspection. Shasta County has submitted annual reports electronically for 2012 and 2014. The table below provides water production values for the last five years, from both surface water and groundwater sources. Monthly water production data from 2014 is presented in the following chart.

Year	Total Reported Demand				Service Connections	Max Day Demand per Connection
	Annual	Max Month	Max Day			
	(MG)	(MG)	(MG)	(gpm)		(gpmpc)
2010	5.5	0.893	0.046	31.94	60	0.53
2011	3.27	0.4802	0.09	62.50	60	1.04
2012	4.8 = 3.3 GW + 1.5 SW	68	0.078	54.17	63	0.86
2013	not reported			0.00		
2014*	8.36 = 7.3 GW + 1.058 SW	1.2	0.076	52.78	60	0.88

*2014 - April Max Month, 5-1-14 Max Day



B. SOURCE DATA

Sources	Status	Capacity, gpm	Comments
Surface Water Unnamed Creek	Active (Dec – Jun)	17.4 gpm (25,056 gpd)	Pump / Pressure Tanks = unknown Surface Area = 8.72 ft^2 Single media filters maximum allowable loading = 2 gpm/ft^2
Groundwater Well 01	Active	45 gpm (64,800 gpd), 5 hp pump installed around 2012. 1978 pump test produced 100 gal/min for 6 hours	Well Drillers Report (4-20-1978): 250 feet bgs, perforated well casing 120-240 ft bgs Logged in ft bgs 0-3 Fill 3-7 brown clay rock 7-16 brown shale 16-19 grey shale 19-179 pit shale 179-190 gray lava (hard) 190-207 pit shale
Total		**62 gpm (89,280 gpd)**	

Discussion and Appraisal: Shasta County is licensed to divert water from the unnamed creek during the months of December through June. The appropriative water right establishes a maximum rate of diversion for each month. However, in response to an ongoing drought, Shasta County was issued a Notice of Unavailability of Water in April 2015. The Notice lets water right holders know that if surface water diversions are not stopped, that the water right holder may be subject to enforcement. Shasta County's surface water right curtailment began in May and will continue until further notice and/or conditions improve.

Most recently, the source water capacity appeared to be adequate for portions of the year; however, during months when surface water cannot be diverted and there is not secondary water source, the source capacity does not meet the California Waterworks Standards, which require public water systems to have source capacity to meet the systems maximum day demand. The maximum day demand in 2014 was 76,000 gallons. If the groundwater well has a pumping capacity of 45 gpm, then only 64,800 gallons per day can be produced. During the curtailment period, the groundwater well is the only source of water supply.

C. TREATMENT

1. Watershed and Source Water

Name of source Water for the subdivision is mostly groundwater from a well located in the northern portion of the subdivision, but the system supplements with treated surface water diverted from an unnamed creek on the east side of Sugarloaf Mountain, during the months of December through June.

Are there significant sewage hazards? The surface water intake is located at an elevation above the subdivision. The risk of sewage contamination is very low. The well has a history of positive total coliform results, which initiated chlorination of the well. The source of the bacteria is unknown. The sugarloaf subdivision is set upon a hillside and the well is at a lower elevation than many homes in the subdivision. The subsurface characteristics of the area surrounding Shasta Lake include fractured and consolidated bedrock of silty clay and well-sorted gravel.

Is there significant recreation? No. The Sugarloaf subdivision is located along a steep hillside, and recreation is limited.

Have there been significant changes to or activities on the watershed since the last inspection and/or changes in raw water quality, such as, turbidity or coliform levels? No

What is date of last watershed survey? Unknown

2. Surface Water- General Information

Name of Plant Shasta County Service Area #2 - Sugarloaf Water Treatment Plant (WTP)

Classification The treatment system is considered an unapproved alternative filtration technology, referred to as "in-line" filtration. Under specific operating conditions, "in-line" filtration can meet the performance standards of direct filtration. Approved technologies (i.e. conventional, direct, diatomaceous earth, and slow sand) are already deemed capable of achieving specific removal effiencies of *Giardia*, *Cryptosporidium*, and viruses. However, this system does not meet the performance criteria to be considered equivalent to direct filtration, and has not demonstrated that the alternative filtration technology provides the minimum removal efficiencies for *Giardia*, and *Cryptosporidium*, in addition to meeting the turbidity performance standards established by the Division. *As such, the Division requires an effluent turbidity goal of 0.1 NTU for alternative filtration technologies to minimize the risk of exposure of pathogens, including Cryptosporidium.* This treatment plant is classified as **T2**.

General description of process Raw surface water from an unnamed creek is diverted to a 1,000-gallon storage tank prior to treatment. If the treatment plant is offline, the water bypasses the treatment system and is piped back into the creek, through an outlet in the tank. If treatment is provided, a chlorine disinfectant and a polymer coagulant are injected in-line prior to filtration. Four single media sand filters operate in parallel and filtered water is pumped to a 42,500 gallon storage tank.
Groundwater, from Well 01, is chlorinated at the well site and also pumped to the 42,500 gallon storage tank.

Standby power for treatment plant? There is no standby power on site.

Is operations plan up-to-date? No.

Describe removal credits granted by the Department: Direct filtration systems that meet effluent turbidity standards are deemed capable of providing a 2-log (99%) removal of *Giardia* cysts and *Cryptosporidium*, and 1-log (90%) removal of viruses. However, the surface water treatment system is not considered equivalent to direct filtration, and removal efficiencies are unknown. Therefore, to be considered capable of meeting the required removal credits, the system must demonstrate that the treatment facilities provide at least 2.0-log removal of *Giardia* cysts and *Cryptosporidium*, and 1.0-log removal of viruses.

3. Filtration and Disinfection
a) Facilities

Process	Chemical	Dosages	Injection point	Mixing
Coagulation	Zeta Floc 20 Cationic polymer 30-gallon tank	2 to 4 ppm	immediately prior to filters	Pipe line
Pre-chlorination	Chlorine solution (12.5% sodium hypochlorite) 50-gallon tank	1 to 5 ppm	immediately prior to filters	Pipe line

Rapid mix type (propeller, static, pipe): Pipeline
Flocculation/sedimentation (paddle wheel, pressure tank, absorption clarifier, upflow clarifier): Flocculation is not considered to occur.
Filters (gravity/pressure, filter area, media, media depth): Four vertical single media sand pressure filters. Information regarding the filter specifications is unknown, however, based on a previous inspection report, by Shasta County, each filter vessel has 2.18 square feet of surface are. Single media filters, are limited to 2 gpm/ft^2 (§64660, CCR). The filters may have formerly contained 2-inch filter plates made of a silica sand epoxy. Each filter has a 6-inch diameter top access inspection port.
Multiple filter units for redundant capacity? Yes (4 filters)

b) Filtration Operations
Approved maximum filter rate and plant capacity Single media pressure filters shall not exceed a loading rate of 2.0 gpm/ft^2, **17.4 gpm** = (2 gpm/ft^2 × 2.18 ft^2 × 4 filters).
How is filter rate controlled? Pump/Filter rates were assumed to be constant, however the reported flows through the treatment system vary. The mechanism that controls filter rates is unknown. The system operates on demand, by a float switch in the storage tank.
Have filter rates exceeded maximum approved rate? Records show the filters have exceeded the maximum approved rate. The filter loading rate averages approximately 1.7 gpm/ft^2, but frequently has exceeded the maximum approved rate of 2 gpm/ft^2. In February 2015, the treatment plant filtered surface water at rates between 17 gpm to 20 gpm. In January 2015, the treatment plant filtered surface water at rates between 2 gpm and 18 gpm.
Are design criteria met? If not what facilities are needed? The design criteria for the filters are unknown.
Are filters operated to minimize shutdowns and startups or rapid changes in filter rates and are filter rates constant or varied to meet system demands? The treatment plant operates at varied rates. The mechanism to control filter rates is unknown. Additional operational information is needed.
Coagulation (and flocculation) used at all times and optimized or 80% reduction in turbidity? Coagulant is used at all times. Turbidity reduction is greater than 80%. Coagulant is injected into the pipeline immediately before the filters, therefore, pipeline flocculation is not considered to occur.
How is coagulant feed rate determined and optimized? Historical use. Dosages are calculated and included in records submitted to our office.
Metering pumps (make, model, and capacity) LMI A181-191, 18 gpd.
Standby metering pumps Yes.
How often are metering pumps calibrated? Unknown

c) **Describe backwash cycle (source of backwash water, flow rates, use of air/water, length of backwash, surface wash)** The source of backwash (BW) water for each filter is the 42,500 gallon storage tank. The frequency and length of the backwash cycle is unknown. Backwash water is stored in a 5,000 gallon tank, prior to discharge to a sump. When the sump is full, backwash water appears to run down the access road. Approximately 1,600 gallons of backwash water is generated per backwash, but the frequency of backwashing is unknown. According to previous reports, the backwash tank fills every third backwash cycle.

Frequency of backwashing and/or what initiates backwash? Unknown

Method used to minimize turbidity spikes after backwashing or other interruption events. Filter-to-waste option unknown

Are filter rates gradually increased after backwashing or other shut down? Unknown

If coagulant added to backwash water, dosage and name of coagulant? No coagulant is added.

If reclaimed backwash water returned to headworks, describe treatment, settling time provided, percent solids removal, and return rate to plant. Backwash water is not recycled

d) **Are pressure filters physically inspected annually?** Unknown.

Are filters equipped with surface or subsurface wash? No

Is appropriate backflow prevention device installed on surface wash? N/A

Is emergency plan for disinfection failure up-to-date? None in file

Is operations plan up-to-date? None in file

e) **Filtration performance**

Summarize performance over last year, (performance standard is a combined effluent turbidity of ≤ 0.1 NTU 95% of time and not to exceed 1 NTU at any time) This system does not meet the performance criteria to be considered equivalent to direct filtration, and is therefore an alternative technology. The Division of Drinking Water requires the treatment system to meet an effluent turbidity goal of 0.1 NTU in accordance with the Division of Drinking Water *Cryptosporidium Action Plan* (1995), to minimize the risk of exposure to pathogens. Combined filter effluent turbidity is generally below 0.1 NTU, but there are frequent events, when combined filter effluent turbidity has been recorded up to 0.3 NTU.

Does turbidity after backwashing meet criteria for each filter? (≤ 0.3 NTU after 4 hours and ≤ 1.0 NTU 90% of time during last 12 months and not to exceed 2.0 NTU) Unknown. Monitoring reports do not indicate when backwash events occur.

Are performance standards met for combined effluent and individual filters? The combined filter performance generally results in effluent turbidity of less than 0.1 NTU, but there are frequent events when this performance standard is exceeded. Individual filter effluent turbidity is not recorded; therefore we cannot determine if performance standards are met for individual filters.

Discussion & appraisal Effluent turbidity should be recorded at each individual filter continuously (at least once every 15 minutes), and the combined filter effluent (by grab sample) at least once every four hours, per Table 64655 of the California Code of Regulations.

4. Monitoring and Alarms

Parameter	Location	Sample Frequency	Recording	Alarmed (yes/no)	Alarm Set-point	Alarm Result
Turbidity	Effluent	Continuous	HACH 1720C	Yes	0.3 NTU	Plant Shutdown

Are samples collected at proper locations that give accurate and representative results (i.e. turbidity sample must be before clearwell)? Yes

Can each filter and/or filter cell be monitored for turbidity? There are sample taps at each filter

Discuss other monitoring or sampling (particle counters, etc.) None

Other alarms related to treatment plant process There are no other alarms

Alarms adequate to provide warning of coagulation, filtration, and disinfection failures or describe alternatives? No.

Are alarms tested, and if so, how often? Unknown.
Discussion & appraisal Sampling and alarms are not adequate for this system.

Turbidimeters
Type and model of turbidimeters used HACH (1720C)-inline, Scientific Inc. (Micro 100) bench-top
How often turbidimeters calibrated? Unknown.
How are they calibrated and what standards are used? With known turbidity standards
Discussion & appraisal Meter calibration records should be submitted to the Division. The in-line turbidimeters may also be validated by comparison to the bench-top turbidimeter.

5. **Disinfection**
Required log inactivation 1-log
Type and model of chlorine residual monitors or test kits US Filter (Wallace & Tiernan Deplox 3) continuous

Pre-chlorination
Type Chlorine solution feed metering pump is a Wallace & Tiernan Premia 75 LMI C
Capacity 24 GPD
Standby feeders Unknown.

Post-chlorination - None

Facilities providing contact time:

Facility	Length	Length (if pipe) or, Lowest operating level (% of full) (if tank) or, % available volume (if filter)	Short circuit factor	Effective volume (gal)
4 filters	Approx. 4 ft. x 1.5 ft.	$V = L \times \pi r^2$ V = 4 × 4 ft. × π × $(1.5/2)^2$ × (7.48 gal./ft.^{3})	0.35	74
storage tank		42,500 gallons	0.3	12,750
8-inch pipeline (1st service connection)	800 ft.	$V = L \times \pi r^2$ V = 800 ft. × π × $(8/2 \text{ in.} / 12 \text{ in/ft.})^2$ × (7.48 gal./ft.^{3})	1	665
Total				13,489

Total effective contact volume = 13,489 gallons

Disinfectant Contact Time "CT" Values

	For worst case in spring	For worst case in winter
Temperature (low)	15 deg C	12 deg C
pH (high)	7.0	7.8
Required CT (1-log removal)	26.2 min*ppm at filters, 23.3 min*ppm at tank and distribution	43.7 min*ppm at filters, 38.1 min*ppm at tank and distribution
Required CT (3-log removal)	78.5 min*ppm at filters, 70.0 min*ppm at tank and distribution	131.0 min*ppm at filters, 114.4 min*ppm at tank and distribution
Flow	20 gpm through plant (max observed), 17 gpm (max allowed), and 3 gpm delivered to Sugarloaf	20 gpm through plant (max observed), 17 gpm (max allowed), and 3 gpm delivered to Sugarloaf
Residual	1.5 ppm pre-filtration, 0.2 ppm post-filtration, 0.1 distribution	11.5 ppm pre-filtration, 0.2 ppm post-filtration, 0.1 distribution
Contact Time	3.7 min through filters, 637.5 min through tank & 221 min to first SC	3.7 min through filters, 637.5 min through tank & 221 min to first SC

	For worst case in spring	For worst case in winter
Available CT	(3.7 min * 1.5 ppm) = 5.5 min*ppm (637.5 min * 0.2 ppm) = 127.5 min*ppm (221 min * 0.1 ppm) = 155.2 min * ppm	(3.7 min * 1.5 ppm) = 5.5 min*ppm (637.5 min * 0.2 ppm) = 127.5 min*ppm (221 min * 0.1 ppm) = 155.2 min * ppm
CT ratio (1-log removal)	available CT / required CT (5.5/26.2) + (127.5/23.3) + (155.2/23.3) = 12.3	available CT / required CT (5.5/43.7) + (127.5/38.1) + (155.2/38.1) = 7.5
CT ratio (3-log removal)	available CT / required CT (5.5/78.5) + (127.5/70.0) + (155.2/70.0) = 4.1	available CT / required CT (5.5/131.0) + (127.5/114.4) + (155.2/114.4) = 2.5

Are CT requirements being consistently met before the first service connection? Section 64652, CCR, states:

"(a) A supplier using an approved surface water shall provide multi-barrier treatment that meets the requirements of this chapter and reliably ensures at least, between a point where the raw water is not subject to recontamination by surface water runoff and a point downstream before or at the first customer:
(1) A total of 99.9 percent reduction of *Giardia lamblia* cysts through filtration and disinfection;
(2) A total of 99.99 percent reduction or viruses through filtration and disinfection; and
(3) A total of 99 percent removal of *Cryptosporidium* through filtration."

However, because the plant is using an unapproved filtration technology, and has not demonstrated the removal efficiency of *giardia* cysts and *cryptosporidium*, a 2.0-log removal credit by filtration cannot be assumed.

Are residuals entering distribution system ≥ 0.2 ppm? Generally chlorine residuals entering the distribution system are greater than 0.2, but are often measured at 0.1 ppm. Section 64654, CCR states, "*Water delivered to the distribution system shall not contain a disinfectant residual of less than 0.2 mg/L for more than four hours in any 24 hour period.*" Additionally, Section 64656, CCR states, "*A supplier serving 3,300 or fewer persons may collect and analyze grab samples of disinfectant residual each day as shown below in lieu of the continuous monitoring specified in subsection (b), provided that any time the residual disinfectant falls below 0.2 mg/L, the supplier shall take a grab sample every four hours until the residual concentration is equal to or greater than 0.2 mg/L.*"

Are distribution system residuals at least a trace 95%? Yes.

Discussion & appraisal Under the conditions shown in the above charts, which were developed from submitted WTP records, the CSA will achieve at least 1.0-log inactivation of *Giardia* cysts through disinfection. However, the removal of *Cryptosporidium* is a concern.

6. **Groundwater Sources** Groundwater Well 01

7. **Other Treatment or Blending Facilities** Groundwater is chlorinated at the well. Booster stations, pump chlorinated groundwater to the storage tank and the distribution system.

8. **Describe Records Maintained of Treatment** The CSA is submitting monthly records that provide daily raw and treated turbidity grab samples as well as continuous CFE turbidity information and continuous free chlorine residual data. The records also include water production, daily quantities of coagulant and chlorine chemicals used in water treatment; pH, temperature, and other daily readings of water production.

D. STORAGE DATA

Name	Type	Capacity	Comments
	Steel	1,000 gallons	Raw surface water storage tank. Water from the creek is diverted to this tank. There is a float switch that will shut the plant off when the water flows are low. The tank has an overflow that delivers water back to the creek when the plant is off.
Main	Bolted Steel	42,500 gallons	Finished water storage tank. The tank is rusted inside and out. There are pencil size holes in the roof of the tank.

Does storage capacity comply with Waterworks Standards? The maximum day demand (MDD) in 2014 was 76,000 gallons. Section 64554 of the California Code of Regulations requires that "*systems with less than 1,000 service connections, the system shall have storage capacity equal to or greater than MDD, unless the system can demonstrate that it has an additional source of supply or has an emergency source connection that can meet the MDD requirements.*" Based on 2014 usage information, at least 34,000 gallons of additional storage capacity is needed to comply with the California Water Works Standards.

Are all data sheets completed & on file? Yes, but contain very minimal information

Discussion & appraisal (i.e., were reservoirs coated, cleaned &/or inspected last year? Plans for recoating, cleanings &/or inspections? The storage tank has pencil size holes in the roof and the interior of the tank is showing significant rust/corrosion. The discharge location of the tank overflow is also a concern. In the event of an overflow, chlorinated water would be discharged back into the source water stream. There are no known plans for inspections, recoating, or cleaning.

E. TRANSMISSION FACILITIES

Describe transmission facilities A concrete dam was constructed in the unnamed creek to transmit surface water to the treatment plant. The water behind the dam collects in a rock depression and is covered with a metal roof with a locking door. The water gallery has a screened overflow and a bottom flush valve to clean debris and sediment. A 3-inch diameter PVC pipe delivers water to the treatment plant. The pipe is not buried and runs along the surface of a steep bank near the creek.

Are there low head lines? No

F. DISTRIBUTION SYSTEM

1. Pressure Zones:

Pressure Zone Name	Pressure Range	Water Sources	Storage Capacity	No. of Conn.
Treatment plant to downhill users	Gravity flow 40 psi to 100+ psi	Creek and Well	42,500 gal	~49
Treatment plant to uphill lots on Obsidian Lane	70 psi to 82 psi	Creek and Well	42,500 gal	Up to 5 lots
Shale Drive	60 psi to 120 psi	Creek and Well	42,500 gal	5

2. Pump Stations & Reducing Stations

Station	Capacity	Comments
Treatment Plant	6 bladder type pressure tanks and two, 2-hp pumps	To supply water to the 5 lots uphill of the treatment plant on Obsidian Lane
Shale Lane (uphill of well)	Two, 1.5 hp pumps (70 gpm)	Two pumps and a 1,000 gallon steel pressure tank
Lake Drive	Two, 1.5 hp pumps (70 gpm)	Two pumps and a 1,000 gallon steel pressure tank

3. **Mains**

Material	Amount	Size	Condition
Steel	1200 ft.	8 in. diam.	?
Steel	350 ft.	4 in. diam.	?
Steel	400 ft.	2 in. diam.	?
PVC	5100 ft.	4 in. diam.	?

4. **Leak History**
Discuss leak history during past 12 months (mains & connections)
1 leak was reported in 2014, due to corrosion, and was repaired with a full circle clamp.

G. WATER QUALITY & MONITORING

1. **Bacteriological Monitoring**
Description of program One (1) routine total coliform sample is collected each month from one of four locations in the distribution system. CCR, Table 64423-A requires a minimum of one sample for a population served between 25 and 1,000 (15-400 service connections). Raw surface water is sampled monthly for total coliform and *E.coli* (quantified). A raw surface water sample was not submitted for January 2015. Raw groundwater from Well 01 has not been sampled for the 2015 year. Division of Drinking Water requests that raw water from the well be included into the monthly monitoring program for total coliform and *E.coli* (quantified).
Sampling plan approved & current (do we have a copy?) The bacteriological sample siting plan is not up to of date. The BSSP was last submitted in December 2014, but should be updated and corrected. A copy of the plan is attached with needed corrections identified.
MCL violations in past year? None.

Raw Surface Water Bacteriological Monitoring Results for 2015

Month	Total Coliform (MPN/100 mL)	E. Coli (MPN/100 mL)
January	No sample	
February	770	1
March	365	0
April	649	0
May	687	1

2. **Source Water Chemical Monitoring**
Description of program The Division provided the CSA with an updated chemical monitoring schedule during the inspection.
Who collects samples? Basic Laboratory or Shasta County extra help
Discussion & appraisal The following chemical monitoring is due:
Surface Water – nitrite
Groundwater – chloride, copper, foaming agents (MBAS), iron, manganese, sodium, specific conductance, sulfate, total dissolved solids, zinc, asbestos, fluoride, and radium 228

4. **Other Organics** None

5. **Iron and Manganese** Iron and Manganese in raw groundwater exceeds the secondary MCL for iron and manganese (300 µg/L & 50 µg/L respectively). In the 2012 Consumer Confidence Report, the CSA reports iron and manganese at 149 µg/L and 5.25 µg/L respectively, which does not coincide with the laboratory data shown in the table below.

Constituents that exceed the secondary MCL shall be monitored quarterly, and compliance shall be determined by a running annual average of the four quarterly samples.

Date	Iron (μg/L) Secondary MCL = 300	Manganese (μg/L) Secondary MCL =50
5/2/2012	149	*192.4 ?*
11/5/2002	1020	199
12/7/1999	1220	288
10/7/1996	2300	267
11/26/1996	1120	252

6. Distribution System Haloacetic Acid (HAA5) and Trihalomethane (TTHM) Monitoring

Discussion & appraisal The CSA is required to monitor **two locations per quarter** for TTHM and HAA5.
Discrete samples in the distribution system have shown concentrations of Haloacetic acids (HAA5) above the MCL. The regulations state that the running annual arithmetic average shall not exceed the MCL. However, the CSA has not taken samples in accordance with the Stage 2 Compliance Monitoring Plan for Disinfection Byproducts, and DDW is unable to determine compliance. Samples are to be obtained as described in the Disinfection Byproduct Compliance Monitoring Plan, which provides sample location information for Lake Drive and Shore Drive. The goal of the monitoring plan is to obtain consecutive samples at two locations over the course of a year to determine compliance.

Date	Lake Drive		Shale Drive		Shasta St		Shore Drive	
	TTHM MCL = 80 μg/L, Reduced Monitoring Trigger = 40 μg/L							
	HAA5 MCL = 60 μg/L, Reduced Monitoring Trigger = 30 μg/L							
	TTHM	HAA5	TTHM	HAA5	TTHM	HAA5	TTHM	HAA5
2/26/2012	17.1	32.1	30.2	40.1				
5/29/2012	52.4	49.5					53.8	47.2
8/12/2012			4.7	2.4	0.6	0		
2/27/13	3.9	3.8	5.3	1.86				
5/31/2013	2.9	1.0					1.4	2.9
8/29/13			2.2	0	66.2	**185**		
11/24/13[2]	9.1	2.7						
11/24/13[1]	1.7	0						
3/2/2014	2.2	4.1	11	6.5				
5/27/2014	51.4	**83.4**					53.4	**112**
9/1/2014			1.1	0	1.1	0		
11/30/2014[1]	5.8	1.6						
11/30/2014[2]	5.7	1.7						
3/1/2015[1]	55.8	58.9						
3/1/2015[2]	60.9	**69.2**						

[1]Lake Drive south end of line
[2]Lake Drive west end of line

5. **Additional Monitoring (Lead and Copper)**
Description of program (Physical quality of distribution system, corrosion, lead monitoring, etc.) The CSA is required to take 5 lead and copper samples from the distribution system every three years, during the months of June, July, August, or September. Regulations require that the 90th percentile shall not exceed the lead and copper action levels of 0.015 mg/L and 1.3 mg/L respectively.
Discussion & appraisal All sample results obtained since September 1999 have been in compliance with the lead and copper action levels. The 90th percentiles of samples from 8/17/2012 were 0.0032 mg/L for lead and 0.188 for copper.

6. **Was the Consumer Confidence Report sent to the customers?** A CCR was sent to the customers for 2014. Current CCRs are posted on the Shasta County website
Is a copy of the report on file with DDW? Yes
Are there needed additions or changes? No, report is in compliance with state regulations

H. OPERATION & MAINTENANCE

1. **Planning & Personnel**
Are system improvements made in accordance with the Waterworks Standards? As reported, yes.
Does the utility have up-to-date distribution system maps? Yes.
Is up-to-date copy of system schematic on file? No
What is the minimum grade requirement? The CSA is required to have at least a T2, and D1 operator. The County hires extra help (<1,000 hours/year) to perform daily plant checks. The extra help are not certified.

Name	Title	Distribution Grade	Treatment Grade
Required		**D1**	**T2**
Scott Sealander	Chief Operator	D3	T3
	Extra Help		
Dave and Carmen Lee			

2. **Cross-Connection Control Program**
Discussion & appraisal There is no cross-connection ordinance on file. The CSA has no known cross-connections in the distribution system.

3. **Complaints**
Describe complaint program: The CSA did not report any complaints for 2014. In 2012, the CSA reported 2 turbidity complaints, likely a result of flushing, and 2 low pressure complaints, due to a broken line. There were no annual reports on file or submitted electronically for 2013. The Division of Drinking Water has received color and taste complaints from individuals using water from the CSA. The CSA is either not receiving these complaints or is not tracking and reporting the complaints.

4. **Outages and Low Pressures**
Frequency of outages, their duration and cause No outages reported last year.
Areas where low pressures occur; their frequency, duration, and cause None reported

5. **Emergency Response**
Is an up-to-date emergency notification plan on file? The CSA should submit an updated ENP.
Emergency response plan Unknown

6. **Main Disinfection Program**
Describe main disinfection program (i.e., method, contact time, chlorine residual, bacteriological tests, records) for new & repaired mains Unknown
Discussion & appraisal The main disinfection program is not on file.

7. **Valve Maintenance Program**
   Describe program Valves are exercised once per year
   Are number & location of valves satisfactory? (i.e., mainline, ARVR, blow off valves, etc.) yes

8. **Flushing**
   Describe flushing program (i.e. dead ends, records, etc.) Once per year.
   Approximate number of dead ends 5 **Percent with flushing valves** ______
   Discussion & appraisal There are 16 fire hydrants

I. OVERALL SYSTEM APPRAISAL

The Sugarloaf public water system is out of compliance in a number of areas. One of the main areas of concern is the surface water filtration system. The system does not ~~meet the~~ performance criteria to be considered equivalent to direct filtration, and is therefore an alternative technology referred to as "in-line filtration". As such, the Division of Drinking Water requires that the system treat to a higher effluent turbidity standard of less than 0.1 NTU, to minimize the risk of exposure to pathogens, including *Cryptosporidium*. Furthermore, the CSA is not monitoring effluent turbidity from the individual filters. The California Code of Regulations requires water systems to monitor individual filter turbidities when there are more than two filters. Additionally, California regulations limit single media pressure filters to a loading rate of no more than 2.0 gpm/ft^2, approximately 17.4 gpm for the Sugarloaf filtration system. Flow rates through the treatment plant have exceeded this loading rate on a number of occasions with flow rates up to 20 gpm (2.3 gpm/ft^2).

Finished water storage is another significant area of concern. The 42,500 gallon bolted steel water storage tank is corroding, showing rust both inside the tank and on the exterior. Pencil size holes were observed in the tank roof, making the finished water storage vulnerable to contamination. In addition to the condition of the tank, the CSA does not appear to have adequate storage capacity. The maximum day demand in 2014 was 76,000 gallons. California regulations require systems with less than 1,000 service connections to have storage capacity equal to or greater than the maximum day demand, unless the system can demonstrate that is has an additional source of supply or has an emergency source connection that can meet the requirement.

A third area of concern, is the groundwater supply well, which is located at the bottom of a hill in a drainage alongside a driveway. Following wet weather events, sediment and debris have to be removed from the well area. It appears that the well is vulnerable to inundation and possibly contamination. The well is not covered, and the well components are showing signs of corrosion due to exposure. The chlorine tank is secured within just a few inches of soil and covered with a plastic lid and trash bag that is secured with a bungee cord. Although, the well is located behind a secured gate and only a couple of residences are located beyond the gate, there is concern that the chlorine tank could be accessed by children, wildlife, or other event and a release could occur. The well site requires some improvements that may include extending the well casing and/or construction of a well house.

Iron and Manganese in raw groundwater exceeds the secondary MCL of 300 µg/L & 50 µg/L respectively. Concentrations of iron ranged from 1,020 µg/L to 2,300 µg/L from 1996 to 2002. Iron was most recently detected at a concentration of 149 µg/L in 2012. Manganese concentrations ranged from 192.4 µg/L to 288 µg/L between 1996 and 2012.

The well is also the only source of water supply since May 2015. In response to the ongoing drought, the State Water Resources Control Board issued curtailment notices in April, requiring Shasta County to stop diverting water from the unnamed creek. The Division is concerned that the CSA does not have adequate source water capacity to meet the maximum day demand.

J. APPENDIX

System Record

Report prepared by:
Katie Connaughton, P.E.

Kate Conn 7-10-15

Signature Date

SYSTEM RECORD

Name of System Shasta County Service Area No. 2 – Sugarloaf **System Number** 4500006

Date Noted	Description of Needed Correction	Order No.	Reported Corrected	Confirmed Corrected
5/19/2015	The CSA does not monitor individual filter turbidity	2		
	The filtration treatment technology is unapproved and does not reliably meet the 0.1 NTU performance standard	2		
	Pressure filter loading rates exceed the allowable rate of 2.0 gpm/ft^2 for single media sand filters	2		
	The CSA needs to report when backwash cycles occur	2		
	General housekeeping in the surface water treatment plant filtration is poor. Records should be organized. Spent materials and container should be properly disposed of, and plant equipment should be stored properly on shelves or on stable surfaces, not on pipes, pumps, or other treatment system components.	3		
	The groundwater well is vulnerable to contamination and is not secure. The well is located at the end of a drainage ditch along the side of a driveway. The well and its apparatuses, including the chlorine, are not sheltered.	2		
	The groundwater well vent needs to be screened	3		
	The bolted steel 42,500 gallon storage tank shows significant corrosion. There are pencil size holes in the roof of the storage tank	1		
	Storage capacity is not adequate to meet Maximum Day Demand	4		
	During months when surface water cannot be diverted, the source water capacity does not appear to meet Maximum Day Demand	4		
	Chemical monitoring due: Raw surface water – nitrite Groundwater – chloride, copper, carbonate alkalinity, iron manganese, sodium, specific conductance, sulfate, total dissolved solids, zinc, asbestos, fluoride, and radium 228 Distribution System – Lead and Copper by September 2015	2		
	Sample TTHM and HAA5 in accordance with the Stage 2 Compliance Monitoring Plan	2		
	The CSA has not obtained monthly raw water bacteriological monitoring samples from Well 01	2		
	Iron and Manganese in raw groundwater exceed the secondary MCLs	2		

Order Number

1. Serious health hazard; corrective action must be taken immediately.
2. Critical system or operational defect &/or potential health hazard; must be corrected as soon as possible.
3. System or operational defect &/or potential contamination hazards of lesser public health significance. Must be corrected as workload permits.
4. System or operational defect &/or potential health hazard - costly to correct - to be included in any long-range water improvement project.

APPENDIX B

COMPLIANCE ORDER NO. 01-02-15R-005 AND FAILURE TO COMPLY NOTICES

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

State Water Resources Control Board
Division of Drinking Water

System No. 4500006

July 17, 2015

Certified Mail
7012 3460 0003 1113 1427

Shasta County Department of Public Works
1855 Placer Street
Redding, CA 96001

Attn: Eric Wedemeyer, Supervising Engineer

TRANSMITTAL OF COMPLIANCE ORDER NO. 01-02-15R-005

The State Water Resources Control Board Division of Drinking Water has issued the Shasta County Service Area No. 2 – Sugarloaf a compliance order, which is attached.

If you have any questions regarding this matter, please call staff engineer Steve Watson at (530) 224-4828 or me at (530) 224-4800.

Michael J. McNamara

Michael J. McNamara, P.E.
Lassen District Engineer
Drinking Water Field Operations Branch

cc: Bruce Burton, Assistant Deputy Director, DDW

Enclosure: Compliance Order No. 01-02-15R-005

KEC \ 4500006 Shasta CSA No. 2 – Sugarloaf \ File: Enforcement

STATE OF CALIFORNIA

STATE WATER RESOURCES CONTROL BOARD

DIVISION OF DRINKING WATER

TO: Shasta County Community Services Area No. 2 – Sugarloaf
1855 Placer Street
Redding, CA 96001

Attn: Eric Wedemeyer, Supervising Engineer

COMPLIANCE ORDER NO. 01-02-15R-005,

FOR

VIOLATION OF CALIFORNIA CODE OF REGULATIONS,

TITLE 22, SECTION 64652 – WATER SYSTEM NO. 4500006

Issued on July 17, 2015

The State Water Resources Control Board (hereinafter "Board"), acting by and through its Division of Drinking Water (hereinafter "Division) and the Deputy Director for the Division, hereby issues this compliance order (hereinafter "Order") pursuant to Section 116655 of the California Health and Safety Code (hereinafter "CHSC"), to Shasta County Community Services Area No. 2 – Sugarloaf (hereinafter "CSA") for violation of CHSC Section 116555(a)(1) & (a)(3) and Title 22, California Code of Regulations (hereinafter "CCR), Section 64652.

APPLICABLE AUTHORITIES

CHSC, Section 116655 states in relevant part:

(a)Whenever the department determines that any person has violated or is violating this chapter, or any permit, regulation, or standard issued or adopted pursuant to this chapter, the director may issue an order doing any of the following:

(1) Directing compliance forthwith.

(2) Directing compliance in accordance with a time schedule set by the department.

(3) Directing that appropriate preventative action be taken in the case of a threatened violation.

(b) An order issued pursuant to this section may include, but shall not be limited to, any or all the following requirements:

(1) That the existing plant, works, or system be repaired, altered, or added to.

(2) That purification or treatment works be installed.

(3) That the source of the water supply be changed.

(4) That no additional service connection be made to the system.

(5) That the water supply, the plant, or the system be monitored.

(6) That a report on the condition and operation of the plant, works, system, or water supply be submitted to the department.

CHSC, Section 116555(a)(1) & (3) states in relevant part:

(a) Any person who owns a public water system shall ensure that the system does all of the following:

(1) Complies with primary and secondary drinking water standards...

(3) Provides a reliable and adequate supply of pure, wholesome, healthful, and potable water.

CCR, Title 22, Section 64652 provides in relevant part:

(a) A supplier using an approved surface water shall provide multibarrier treatment that meets the requirements of this chapter and reliably ensures at least, between a point where the raw water is not subject to recontamination by surface water runoff and a point downstream before or at the first customer:

(1) A total of 99.9 percent reduction of *Giardia lamblia* cysts through filtration and disinfection;

(2) A total of 99.99 percent reduction of viruses through filtration and disinfection; and

(3) A total of 99 percent removal of *Cryptosporidium* through filtration.

CCR, Title 22, Section 64653 provides in relevant part:

(a) All approved surface water utilized by a supplier shall be treated using one of the following filtration technologies unless an alternative process has been approved by the State Board pursuant to subsections (e), (f), (g) and (h):

(1) Conventional filtration treatment;

(2) Direct filtration treatment

(3) Diatomaceous earth filtration; or

(4) Slow sand filtration

(e) An alternative to filtration technologies specified in subsection (a) may be used provided that the supplier demonstrates to the State Board that the alternative technology:

(1) Provides a minimum of 99 percent *Giardia lamblia* cyst removal, 90 percent virus removal for the supplier serving more than 500 persons, and 99 percent *Cryptosporidium* removal; and

(2) Meets the turbidity performance standards established by the State Board, as determined from the alternative filtration technology demonstration conducted pursuant to subsection (f). The turbidity performance standards shall not be less stringent than the turbidity performance standards established in subsection (c)(1).

(f) The alternative filtration technology demonstration shall be based on the results from a prior equivalency demonstration or a testing of a full scale installation that is treating a water with similar characteristics and is exposed to similar hazards as the water proposed for treatment. A pilot plant test of the water to be treated may also be used for this demonstration if conducted with the approval of the State Board. The demonstration shall be presented in an engineering report prepared by a qualified engineer.

STATEMENT OF FACTS

The CSA supplies domestic water to the Sugarloaf subdivision in Lakehead. The sources of domestic water are from an unnamed creek and a groundwater supply well. The CSA's surface water treatment plant uses an "in-line filtration" treatment process to serve approximately 160 individuals through 60 water service connections. The treatment process consists of injecting a coagulant polymer and chlorine disinfectant just prior to filtration through four single media sand pressure filters.

As of July 1, 2013, the Federal Long-Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR) became effective as a state regulation. The LT1ESWTR requirements have been incorporated into the state's Surface Water Treatment Regulations (hereinafter SWTR) contained in Title 22, Chapter 17 (Surface Water Treatment), CCR. The LT1ESWTR provides increased public health protection against microbial pathogens, specifically the protozoan *Cryptosporidium* including requiring water system treating surface water sources to provide a minimum of 99% removal of *Cryptosporidium* through filtration.

In-line filtration is a technology in which a coagulant is injected into a raw water supply immediately upstream of filters, without the provision of flash mix and/or flocculation processes. This type of filtration does not meet the definition of any of the approved filtration technologies listed in CCR Section 64653. As an alternative filtration technology, therefore, water systems that use in-line filtration must demonstrate that their treatment facilities provide 99% removal of *Giardia* and 90% removal of viruses as required under Section 64653. In addition, these filtration plants must demonstrate their ability to provide the required 99% removal of *Cryptosporidium* required under the LT1ESWTR.

Past experience with performing particle count studies at treatment plants using in-line filtration indicates that many of these facilities failed to provide a 2-log reduction of particles in the *Cryptosporidium* size range (2-5 microns), even while in compliance with the turbidity performance criteria (0.3 NTU at 95 percentile). Therefore, evaluations of such water treatment plants need to provide a means of demonstrating compliance with the pathogen removal requirements that go beyond simply meeting the turbidity performance criteria. Other than meeting turbidity performance criteria, the CSA has not demonstrated compliance with the pathogen removal requirements.

Two approaches to demonstrating compliance are to determine whether the plant's performance meets the Cryptosporidium Action Plan goals; specifically, whether or not the effluent turbidity is able to consistently achieve an effluent turbidity of 0.10 NTU at the 95th percentile or to perform a particle count study of the plant's influent and effluent to determine whether it is achieving a 99% reduction of particles in the size range at the 95th percentile. Under either approach, sufficient data must be collected to provide a valid statistical analysis and to reflect seasonal changes in water quality.

Section 64650 (d) of the SWTR states, "If at any time the Department determines that a water supplier is not in compliance with the requirements of this chapter, the supplier shall submit for Department approval a plan and schedule to modify its system to meet the requirements of this chapter. The supplier shall submit the plan and schedule within 90 days of receipt of the Departments determination."

DETERMINATIONS

Based on the above Findings of Fact, the Division of Drinking Water finds that the CSA has violated Section 64652, Chapter 17, Title 22, of the CCR. Specifically, the CSA has not demonstrated that the system provides filtration treatment that reliably ensures at least a total of 99% removal of *Cryptosporidium* through filtration.

DIRECTIVES

Shasta County CSA No. 2 – Sugarloaf is hereby directed to take the following actions:

1. (a) Identify and provide either an alternate source of supply (i.e., groundwater) or filtration treatment that provides effective reduction of all pathogenic

organisms that may be present in the raw water supply. The treatment must provide at least 99.9% reduction of Giardia cysts and 99.99% reduction of viruses through filtration and disinfection, and a total of 99% removal of *Cryptosporidium* through filtration. A letter describing the proposed treatment method shall be submitted to the Division of Drinking Water for approval no later than October 1, 2015 and shall be in operation no later than December 1, 2016.

OR

(b) Demonstrate that the CSA's treatment plant is capable of providing at least 99.9% reduction of Giardia cysts, 99.99% reduction of viruses through filtration and disinfection, and a total of 99% removal of *Cryptosporidium* through filtration, and that the CSA's filtration process complies with the requirements for alternative filtration technologies set forth in Section 64653(f) of the CCR; i.e. provide 99% reduction of giardia cysts and cryptosporidium, and 90% reduction of viruses. A letter describing the proposed demonstration study shall be submitted to the Department for approval no later than October 1, 2015.

2. By September 1, 2015, submit, for approval, a notice that will be used to provide notification to the customers of the failure to comply with Section 64652, Chapter 17, Title 22 of the CCR as required in Section 64666, Chapter

17, Title 22 of the CCR in accordance with Section 64464.3 (a) (2) and (b) (1), Chapter 15, Title 22 of the CCR. The public notification shall be published in a local newspaper no later than October 1, 2015 and the first mailed notice shall be sent to all the CSA customers no later than October 1, 2015. The mailed notice shall be repeated on a quarterly basis until compliance is achieved.

3. The CSA shall submit to the Division of Drinking Water a plan and schedule for complying with this Order by October 1, 2015.

4. The CSA shall submit an interim operations plan for the Sugarloaf plant by September 1, 2015.

All submittals required by this Order shall be submitted to the Division at the following address:

Michael McNamara, P.E.
District Engineer, Lassen District
Drinking Water Field Operations
State Water Resources Control Board
Division of Drinking Water
364 Knollcrest Drive, Suite 101
Redding, CA 96002

As used in the Order, the date of issuance shall be the date of this Order; and the date of service shall be the date of service of this Order, personal or by certified mail, on the CSA.

The Division reserves the right to make such modifications to this Order and/or to issue such further order(s) as it may deem necessary to protect public health and safety. Such modifications may be issued as amendments to this Order and shall be deemed effective upon issuance.

Nothing in this Order relieves the CSA of its obligation to meet the requirements of the California Safe Drinking Water Act (SDWA), or any regulation, standard, or permit issued thereunder.

PARTIES BOUND

This Order shall apply to and be binding upon the CSA, its owners, shareholders, officers, directors, employees, agents, contractors, successors, and assignees.

SEVERABILITY

The directives of this Order are severable, and the CSA shall comply with each and every provision thereof, notwithstanding the effectiveness of any other provision.

FURTHER ENFORCEMENT ACTION

The California SDWA authorizes the Board to: issue a citation with assessment of administrative penalties to a public water system for violation or continued violation of the requirements of the California SDWA or any regulation, permit, standard, citation, or order issued or adopted thereunder including, but not limited to, failure to correct a violation identified in a citation or compliance order. The California SDWA also authorizes the Board to take action to suspend or revoke a permit that has been issued to a public water system if the public water system has violated applicable law or regulations or has failed to comply with an order of the Board; and to petition the superior court to take various enforcement measures against a public water system that has failed to comply with an order of the Board. The Board does not waive any further enforcement action by issuance of this Order.

7/17/2015
Date

Richard L. Hinrichs, P.E., Chief
Northern California Section
Division of Drinking Water
State Water Resources Control Board

CERTIFIED MAIL No. 7012 3460 0003 1113 1427

Shasta County

DEPARTMENT OF PUBLIC WORKS

1855 PLACER STREET
REDDING, CA 96001-1759
530 225-5661   530 225-5667 FAX
800 479-8022   California Relay Service at 700 or 800-735-2922

PATRICK J. MINTURN, DIRECTOR
C. TROY BARTOLOMEI, DEPUTY
SCOTT G. WAHL, DEPUTY

July 1, 2010   CSA #2

Dear Water Service Customer:

The California Domestic Water Quality and Monitoring Regulations (Title 22, California Code of Regulations) require that each community water system distribute an annual report on the quality of water served within its system.

Drinking water standards are established by both the State of California's Department of Health Services and the U.S. Environmental Protection Agency. Primary standards are set to protect public health from substances in water that may be immediately harmful to humans or affect their health if consumed for long periods of time (70+ years). These standards are shown as Maximum Contaminant Levels (MCLs). Secondary Standards govern aesthetic qualities of water such as taste, mineral content, odor or clarity. These standards specify limits for substances that may influence consumer acceptance of water. Action levels refer to state recommended maximum exposure limits for substances not yet regulated by formal standards.

CSA #2 - Sugarloaf is a County Service Area, which is operated by the Shasta County Department of Public Works CSA Division. The water gravity flows from a small stream, and is processed through the filter plant. A 42,500 gallon reservoir transmits water into the distribution system, which feeds water to the community of Sugarloaf. The water district uses a well as a backup source. If the well is needed to meet demand, CL^2 will be added for disinfection.

All water samples are taken by Shasta County staff and are analyzed by same on a daily basis for turbidity; on a monthly basis by Basic Lab for coliform bacteria; and quarterly, or as prescribed by the Department of Health Services, by Basic Lab for organic and inorganic chemicals, radiological, secondary standards and additional constituents.

This notification of the public is required by the California Code of Regulations, Title 22, Section 64666(d). This type of notification is required whenever there is a water quality failure of a State standard that is determined to constitute a threat to public health. The intent of this notification is to inform you, the consumer, about your drinking water because, if failures of State standards continue, appropriate improvements to the water system or its operation will be required.

The findings to date indicate no special precautions are necessary on your part at this time.

Consumers wishing more information should contact the Shasta County Department of Public Works, CSA Division at (530) 347-0431.

Very truly yours,

Patrick J. Minturn, Director

By Randy Gillichbauer
Randy Gillichbauer,
Utilities Operation Superintendent

RG/lcg

c: Environmental Health

Shasta County

DEPARTMENT OF PUBLIC WORKS

1855 PLACER STREET
REDDING, CA 96001-1759
530 225-5661 530 225-5667 FAX
800 479-8022 California Relay Service at 700 or 800-735-2922

PATRICK J. MINTURN, DIRECTOR
C. TROY BARTOLOMEI, DEPUTY
SCOTT G. WAHL, DEPUTY

July 1, 2010

CSA #2

To: Customers of County Service Area #2 - Sugarloaf

FAILURE TO COMPLY WITH SURFACE WATER TREATMENT TECHNIQUES

Dear Water Service Customer:

The Sugarloaf Water System #4500006 utilizes surface water from a stream at the end of Oak Knoll Drive near Obsidian Lane and also uses a well as a backup source. The California Surface Water Treatment Regulations require continuous filtration and disinfection of all surface water sources being utilized by domestic water supply systems. The Sugarloaf Water System has failed to comply with the surface water treatment requirements as required by its operating permit and CCR, Title 22, Sections 64656. The Sugarloaf Water System has not met the minimum disinfection contact time (CT) prior to the first service connection.

The State Department of Health Services requires the following language to be included in this notice:

The State of California Department of Health Services (DHS) sets drinking water standards and has determined the presence of microbiological contaminants are a health concern at certain levels of exposure. If water is inadequately treated, microbiological contaminants in that water may cause disease. Disease symptoms may include diarrhea, cramps, nausea and possibly jaundice, and any associated headaches and fatigue. These symptoms, however, are not just associated with disease-causing organisms in drinking water, but also may be caused by a number of factors other than your drinking water. DHS has set enforceable requirements for treating drinking water to reduce the risk of these adverse health effects. Treatment such as filtering and disinfecting the water removes or destroys microbiological contaminants. Drinking water which is treated to meet DHS requirements is associated with little to none of this risk and should be considered safe.

This notification of the public is required by the California Code of Regulations, Title 22, Section 64666(d). This type of notification is required whenever there is a water quality failure of a State standard that is determined to constitute a threat to public health. The intent of this notification is to inform you, the consumer, about your drinking water because, if failures of State standards continue, appropriate improvements to the water system or its operation will be required.

The findings to date indicate no special precautions are necessary on your part at this time.

Consumers wishing more information should contact the Shasta County Department of Public Works, CSA Division at (530) 347-0431.

Very truly yours,

Patrick J. Minturn, Director

By Randy Gellichbauer
Randy Gellichbauer,
Utilities Operation Superintendent

RG/lcg

c: Environmental Health

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER

Este informe contiene información muy importante sobre su agua potable.
Tradúzcalo o hable con alguien que lo entienda bien.

CSA # 2 - Sugarloaf Water System

Did Not Meet Treatment Requirement

(Disinfection Byproduct Precursors)

Our water system recently violated a drinking water standard. Although this is not an emergency, as our customers, you have a right to know what you should do, what happened, and what we are doing to correct this situation.

We routinely monitor for total trihalomethanes (TTHM) and haloacetic acids (five) (HAA5) in our distribution system. These measurements tell us whether or not further treatment is needed to remove disinfection byproduct (DBP) precursors from the water supply. During the past 12 months, the chlorine disinfection byproduct chemicals known as Haloacetic Acids (HAA5) were detected in the water served by the CSA# 2- Sugarloaf domestic water system and did not meet the drinking water standards as specified in the California Safe Drinking Water Act, Title 22, CCR, Section 64535.2. The annual average of quarterly water samples collected was calculated at 0.085mg/l for HAA5 chemicals. This result exceeds the maximum contaminant level (MCL) of 0.060mg/l for HAA5 chemicals. The annual average of TTHM chemicals were below the MCL in 2009.

What should I do?

- You do not need to boil your water or take other actions.
- This is not an emergency. If it had been, you would have been notified immediately.
- The California Department of Health Services (DHS) sets drinking water standards and requires the disinfection of drinking water. However, when used in the treatment of drinking water, disinfectants react with naturally-occurring organic and inorganic matter present in water to form chemicals called disinfection byproducts (DBPs). The California Department of Health Services has determined that a number of DBPs are a health concern at certain levels of exposure. Certain DBPs, including some trihalomethanes (TTHM) and some haloacetic acids (HAA5), have been shown to cause cancer in laboratory animals. Other DBPs have been shown to affect the liver and the nervous system, and cause reproductive or developmental effects in laboratory animals. Exposure to certain DBPs may produce similar effects in people. DHS has set standards to limit exposure to THMs, HAAs, and other DBPs.
- If you have other health issues concerning the consumption of this water, you may wish to consult with your doctor.

What happened? What is being done?

The CSA# 2- Sugarloaf Water System is working to correct and lower future laboratory results of HAA5 chemicals in the water supply. CSA# 2- Sugarloaf Water System will continue routine monitoring of these chemicals.

For more information, please contact a CSA#2 representative at (530) 347-0431.

Shasta County

DEPARTMENT OF RESOURCE MANAGEMENT
1855 Placer Street, Redding, CA 96001

Russ Mull, R.E.H.S.,A.I.C.P.
Director

Richard W. Simon, AICP
Assistant Director

November 15, 2010

Shasta County Department of Public Works
CSA Division
1855 Placer Street
Redding, CA 96001

Attn: Randy Gillichbauer

DISINFECTION BYPRODUCT RULE VIOLATION, THIRD QUARTER 2010 - PUBLIC WATER SYSTEM NO. 4500006, SHASTA COUNTY CSA #2-SUGARLOAF

This letter is to inform you that the CSA#2-Sugarloaf Water System is in violation of the federal and state Disinfection Byproduct Rule (DBPR) for exceeding the maximum contaminant levels for Haloacetic Acids (HAA5) and Total Trihalomethanes (TTHM). Sections 64530 - 64537.6 , Chapter 15.5 of Title 22, California Code of regulations (Title 22) sets maximum contaminant levels and monitoring requirements for public water systems. I have reviewed the laboratory monitoring data for chlorine byproducts in water samples collected between 11/24/09 and 8/31/10. The running annual arithmetic average, computed quarterly of laboratory analysis, shows that the average exceeds the maximum contaminant levels (MCL) of 0.060mg/l for Haloacetic Acids (HAA5) and 0.080ug/l for Total Trihalomethanes (TTHM) MCL.

CSA #2 Total Trihalomethanes average = 0.083ug/l
CSA #2 Haloacetic Acids average = 0.089ug/l

Because the quarterly averages of Haloacetic Acids and Trihalomethanes are above the MCL, you shall take the following actions:

1. Continue monitoring quarterly for HAA5 and TTHM chemicals.

2. At this time, complete public notification to all water users of the CSA#2-Sugarloaf Water System as required in section 64535.2(b)(3), Title 22. I have enclosed a sample public notification form and certification form. After notification has been completed, please submit a copy of your notification along with the certification form to this office for our records. Public notification shall be completed quarterly as long as the water system continues to exceed the requirements listed in Title 22 CCR, Chapter 15.5, Article 4, Section 64535.2 (b1) and (b3) of the California Safe Drinking Water Act.

3. Provide this Division a letter indicating your proposed plans and time frame to reduce the level of disinfection byproducts in the water supply. You should consult with a qualified water treatment expert for corrective action(s) to eliminate future disinfection byproducts MCL violations.

A violation for exceeding the HAA5 and TTHM MCL will be reported to the California Department of Public Health-Drinking Water Division.

Please refer to California Safe Drinking Water Act- Title 22, California Code of Regulations, Chapter 15.5, Sections 64530 - 64537.6 for compliance requirements.

If you have any questions regarding this matter, please contact me Monday through Friday from 8:00 to 8:30 a.m.

Sincerely,

Mark Cramer, R.E.H.S.
Senior Environmental Health Specialist

MC/pw
CSANOV15-10.WPD

Enclosure

CERTIFICATION OF COMPLETION OF PUBLIC NOTICE

This form when completed and returned to the Shasta County Environmental Health Division serves as certification that public notification to water users was completed as required by the California Water Quality and Monitoring Regulations. Completing public notification and providing this office with certification is important. Failure to do so may result in a formal enforcement action with monetary penalties.

Public Water System Name CSA# 2- Sugarloaf System

Public Water System No. 4500006

Public notification for the 2009-2010 monitoring of Disinfection Byproduct Rule (HAA5) MCL exceedance was performed by the following method.

METHOD NUMBER [4 or 5] method is listed in attachment A.
Describe the method used and dates notification completed. Provide a copy of the notice with this information.____________________

I hereby certify that the above information is factual.

____
Printed Name

____
Signature

____
Date

Attachment A
Notification Methods

____ Method 1 (Electronic Media Notice) - Notice shall be given by furnishing a copy of the notice to the radio and television stations broadcasting in the area served by the system, as soon as possible but in no case later than 24 hours after being directed to do so by the Department.

___ Method 2 (Daily Newspaper Notice of Water Quality Failure) - Notice shall be given once within 14 days after the violation or failure by publication in a daily newspaper of general circulation in the area served by the system.

___ Method 3 (Weekly Newspaper Notice of Water Quality Failure) - Notice shall be given once within 14 days after the violation or failure by publication in a weekly newspaper of general circulation serving the area.

_X_ Method 4 (Mail Delivery of Notice of Water Quality Failure) - Notice by direct mail or with the water bill shall be given once within 45 days after the violation or failure. The Department may waive the requirement for mail delivery if it determines that the violation or failure has been corrected within the 45 day period. If such a waiver is given it shall be given in writing within the 45 day period. Repeat notice by mail shall be given at least once every 3 months for as long as the violation or failure continues.

_X_ Method 5 (Hand Delivery of Notice of Water Quality Failure) - Notice by hand delivery shall be given once within 45 days after the violation or failure. The Department may waive the requirement for hand delivery if it determines that the violation has been corrected within the 45 day period. If such a waiver is given it shall be given in writing within the 45 day period. Repeat notice by hand delivery shall be given at least once every 3 months for as long as the violation or failure continues.

___ Method 6 (Expedited Hand Delivery of Notice of Water Quality Failure) - Notice by hand delivery shall be given once within 14 days after the violation or failure. Repeat notice by hand delivery shall be given at least once every 3 months for as long as the violation or failure continues.

___ Method 7 (Continuous Posting of Notice of Water Quality Failure) - Notice by posting in conspicuous places within the area served by the system shall be initiated within 14 days after the violation or failure. Posting shall continue for as long as the violation or failure exists.

___ Method 8 (Daily Newspaper Notice of Procedural Failure) - Notice shall be given once within three months of the violation or failure by publication in a daily newspaper of general circulation in the area served by the system.

___ Method 9 (Weekly Newspaper Notice of Procedural Failure) - Notice shall be given once within three months of the violation or failure by publication in a weekly newspaper of general circulation serving the area.

____ Method 10 (Mail Delivery of Notice of Procedural Failure) - Notice by direct mail or with the water bill shall be given at least once every three months for as long as the violation or failure continues.

____ Method 11 (Hand Delivery of Notice of Procedural Failure) - Notice by hand delivery shall be given once within three months of the violation or failure. Repeat notice by hand delivery shall be given at least once every three months for as long as the violation or failure continues.

___ Method 12 (Continuous Posting of Notice of Procedural Failure) - Notice by posting in conspicuous places within the area served by the system shall be initiated within 3 months of the violation or failure. Posting shall continue for as long as the violation or failure exists.

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER

Este informe contiene información muy importante sobre su agua potable.
Tradúzcalo o hable con alguien que lo entienda bien.

CSA # 2 - Sugarloaf Water System

Has Levels of Chlorine Byproducts

Above the Drinking Water Standards

Our water system recently violated a drinking water standard. Although this is not an emergency, as our customers, you have a right to know what you should do, what happened, and what we are doing to correct this situation.

We routinely monitor for the presence of drinking water standards. Water sample results from 11/24/09 through 8/31/10 showed levels of Trihalomethanes (TTHM) and Haloacetic Acids (HAA5) in our distribution system. During the past 12 months, the chlorine disinfection byproduct chemicals known as Haloacetic Acids (HAA5) and Trihalomethanes (TTHM) were detected in the water served by the CSA# 2- Sugarloaf domestic water system and did not meet the drinking water standards as specified in the California Safe Drinking Water Act, Title 22, CCR, Section 64535.2. The running quarterly average of water samples collected was calculated at 0.089mg/l for HAA5 chemicals and 0.083mg/l for TTHM chemicals. This result exceeds the maximum contaminant level (MCL) of 0.060mg/l for HAA5 and 0.080mg/l for TTHM.

What should I do?

- You do not need to use an alternative water supply (e.g., bottled water) or take other actions.
- This is not an emergency or an immediate risk. If it had been, you would have been notified immediately.
- The California Department of Health Services (DHS) sets drinking water standards and requires the disinfection of drinking water. However, when used in the treatment of drinking water, disinfectants react with naturally-occurring organic and inorganic matter present in water to form chemicals called disinfection byproducts (DBPs). The California Department of Health Services has determined that a number of DBPs are a health concern at certain levels of exposure. Certain DBPs, including some Trihalomethanes (TTHM) and some Haloacetic Acids (HAA5), have been shown to cause cancer in laboratory animals. Other DBPs have been shown to affect the liver and the nervous system, and cause reproductive or developmental effects in laboratory animals. Exposure to certain DBPs may produce similar effects in people. DHS has set standards to limit exposure to TTHM and HAA5 chemicals.
- If you have other health issues concerning the consumption of this water, you may wish to consult with your doctor.

What happened? What is being done?

The CSA# 2- Sugarloaf Water System is working to correct and lower future laboratory results of HAA5 and TTHM chemicals in the water supply. CSA# 2- Sugarloaf Water System will continue routine quarterly monitoring of these chemicals.

For more information, please contact a CSA#2 representative at (530) 347-0431.

ATTACHMENT NO. 1

Sugarloaf
(CSA No. 2)

Existing Water Treatment Plant System

The system's primary water source is collected from an unnamed spring at a diversion dam upstream of the treatment plant and is conveyed to a raw water tank at the treatment plant. The raw water is then pumped through a chlorination and polymer coagulant (a filter aid) process prior to filtration treatment. The in-line filtration consists of four separate filter tanks that have in-line porous silica impregnated plates. The backwash effluent is pumped to a tank and the potable water is pumped to a 50,000-gallon tank reservoir. Two pressure tanks boost water to a higher elevation service zone.

The secondary backup source is a well that does not meet the Federal Long Term 1 Enhanced Surface Water Treatment Rule. The well is contaminated with fecal coliform and chlorine is used for disinfection.

Additionally, the distribution service lines are aged and rupturing, resulting in ground water infiltration and coliform violations.

Proposed Improvements to Meet SWTR and IESWTR (prioritized according to available funding)

1. The most costly improvement would be to install a KOCH HF-4 4 log removal membrane package water system. This would meet the criteria of the SWTR and IESWTR to upgrade to an approved technology. The existing electrical system is 220 volt, single phase, so the proposed filtration system would have to be sized to operate under this available power. If a package water system were not available to operate under the existing electrical system, then improvements would be required to upgrade the voltage and phasing.
2. The next less expensive alternative proposed is to install the P-TEC PF Flocculator. This system is currently recommended by the California Department of Health Services as being an upgrade to an approved technology for filtration. This system includes mixing zones for both coagulation and flocculation required for chemical treatment of wastewater. The backwash tank is not adequately sized for this proposed system and would require improvements as well.
3. Alternatively, a demonstration study could be performed to show that the treatment facility is capable of providing 99% removal of *Cryptosporidum* sized particles and 99% removal of *Giardia* sized particles while operating in the in-line mode. The protocol for the demonstration study is not completed at this time but would be implemented once funding has been determined.
4. Finally, we propose to drill a new well in a new location to provide a more reliable secondary water source. This would also include piping to tie into the existing water system. There are two potential well sites and these are depicted on the exhibit for CSA No. 2 attached hereon.

2009 Consumer Confidence Report

Water System Name: **CSA #2 - Sugarloaf Source #1 Stream & Source #2 Well** Report Date: 06/17/10

We test the drinking water quality for many constituents as required by State and Federal Regulations. This report shows the results of our monitoring for the period of January 1 - December 31, 2009.

Este informe contiene información muy importante sobre su agua beber. Tradúzcalo ó hable con alguien que lo entienda bien.

Type of water source(s) in use: Stream & Well
Stream at the end of Oak Knoll near Obsidian in Sugarloaf.
Well at end of Oak Knoll on Shale Lane in Sugarloaf

Drinking Water Source Assessment information: Stream: Raw
Well : Shasta County, CSA#2 - Sugarloaf

Stream-The source is not considered vulnerable to any contaminating activities at this time

Well-The source is not considered vulnerable to any contaminating activities at this time.
Sepitc systems -low density

Discussion of Vulnerability:
There have been no contaminants detected in the water supply, however the source is still considered vulnerable to activities near the drinking water source

A copy of the complete assessment may be viewed at :
Shasta County Environmental Health Division
1855 Placer Street, Suite 201
Redding Ca. 96001

You may request a summary of the assessment be sent to you by contacting:
Shasta County Environmental Health Division
R.E.H.S. - water systems Program Manager
(530) 225-5787
(530) 225-5413 FAX
scehd@co.shasta.ca.us

Time and place of regularly scheduled board meetings for public participation: N/A

For more information, contact Randy Gillichbauer *Phone:* (530) 225-5571

TERMS USED IN THIS REPORT:

Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.

Primary Drinking Water Standards (PDWS): MCLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.

Secondary Drinking Water Standards (SDWS): MCLs for contaminants that affect taste, odor, or appearance of the drinking water. Contaminants with SDWSs do not affect the health at the MCL levels.

ND: not detectable at testing limit

ppm: parts per million or milligrams per liter (mg/L)

ppb: parts per billion or micrograms per liter (ug/L)

ppt: parts per trillion or nanograms per liter (ng/L)

pCi/L: picocuries per liter (a measure of radiation)

Public Health Goal (PHG): The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.

Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the U.S. Environmental Protection Agency (USEPA).

Treatment Technique (TT): A required process intended to reduce the level of a contaminant in drinking water **Maximum Residual Disinfectant Level (MRDL)**: The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Maximum Residual Disinfectant Level Goal (MRDLG): The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

Regulatory Action Level (AL): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

Variances and Exemptions: Department permission to exceed an MCL or not comply with a treatment technique under certain conditions.

- *Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline (1-800-426-4791).*

- Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. USEPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

- *The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.*

- *Contaminants that may be present in source water include:*

- *Microbial contaminants, such as viruses and bacteria that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.*

- *Inorganic contaminants, such as salts and metals, that can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.*

- *Pesticides and herbicides that may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.*

- *Organic chemical contaminants, including synthetic and volatile organic chemicals, that are by-products of industrial processes and petroleum production, and can also, come from gas stations, urban storm water runoff, agricultural application, and septic systems.*

- *Radioactive contaminants that can be naturally-occurring or be the result of oil and gas production and mining activities.*

- *In order to ensure that tap water is safe to drink, the U.S. Environmental Protection Agency (USEPA) and the State Department of Public Health (Department) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. Department regulations also establish limits for contaminants in bottled water that provide the same protection for public health.*

- *If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Shasta County CSA#2 Sugarloaf is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the* **Arsenic** above 5 ppb, but below or equal to 10 ppb:

  While your drinking water meets the federal and state standard for arsenic, it does contain low levels of arsenic. The arsenic standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. The U.S. Environmental Protection Agency continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems. Safe Drinking Water Hotline or at http://www.epa.gov/safewater/lead.

-

Tables 1, 2, 3, 4, and 5 list all of the drinking water contaminants **that were detected during the most recent sampling for the constituent.** The presence of these contaminants in the water does not necessarily indicate that the water poses a health risk. The Department requires us to monitor for certain contaminants less than once per year because the concentrations of these contaminants are not expected to vary significantly from year to year. Some of the data, though representative of the water quality, are more than one year old.

TABLE 1 - SAMPLING RESULTS SHOWING THE DETECTION OF COLIFORM BACTERIA

Microbiological Contaminants (to be completed only if there was a detection of bacteria)	**Highest No. of detections**	**No. of months in violation**	**MCL**	**MCLG**	**Typical Source of Bacteria**	**Health Effects Language**
Total Coliform Bacteria (Total Coliform Rule)	0	0	More than 1 sample in a month with a detection	0	Naturally present in the environment	Fecal coliforms and *E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems
Fecal coliform and *E. coli* (Total Coliform Rule)	(In the year) 0	0	A routine sample and a repeat sample detect total coliform and either sample also detects fecal coliform or *E. coli*	0	Human and animal fecal waste	Fecal coliforms and *E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.

TABLE 2 - STREAM SAMPLING RESULTS SHOWING THE DETECTION OF LEAD AND COPPER

Lead and Copper (to be completed only if there was a detection of lead or copper in the last sample set)	**No. of samples collected DATE**	**90th percentile level detected**	**No. Sites exceeding AL**	**AL**	**MCLG**	**Typical Source of Contaminant**	**Health Effects Language**
Lead (ppb)	5 8/2009	8.2	0	15	0.2	Internal corrosion of household water plumbing systems; discharges from industrial manufacturers; erosion of natural deposits	Infants and children who drink water containing lead in excess of the action level may experience delays in their physical or mental development. Children may show slight deficits in attention span and learning abilities. Adults who drink this water over many years may develop kidney

							problems or high blood pressure.
Copper (ppm)	5 8/2009	0.098	0	1.3	0.17	Internal corrosion of household water plumbing systems; erosion of natural deposits; leaching from wood preservatives.	Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time may experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years may suffer liver or kidney damage. People with Wilson's Disease should consult their personal doctor.

TABLE 2 -WELL#5 SAMPLING RESULTS SHOWING THE DETECTION OF LEAD AND COPPER

Lead and Copper (to be completed only if there was a detection of lead or copper in the last sample set)	collected DATE	level detected	MCL	AL	MCLG	Typical Source of Contaminant	Health Effects Language
Lead (ppb)	8/16/06	ND	0	15	2	Internal corrosion of household water plumbing systems; discharges from industrial manufacturers; erosion of natural deposits.	
Copper (ppm)	8/16/06	0.259	0	1.3	0.17	Internal corrosion of household water plumbing systems; erosion of natural deposits; leaching from wood preservatives.	Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time may experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years may suffer liver or kidney damage. People with Wilson's Disease should consult their personal doctor.

TABLE 3 - STREAM & WELL SAMPLING RESULTS FOR SODIUM AND HARDNESS

…mical or Constituent … reporting units)	Sample Date	Level Detected	Range of Detections	MCL	PHG (MCLG)	Typical Source of Contaminant
Sodium (ppm) Stream	11-05-02	3	N/A	none	none	Generally found in ground and surface water
Sodium (ppm) Well	11-05-02	4	N/A	none	none	Generally found in ground and surface water

'ardness (ppm) Stream	11-05-02	28	N/A	none	none	Generally found in ground and surface water
ardness (ppm) Well	11-05-02	137	N/A	none	none	Generally found in ground and surface water

**Any violation of an MCL or AL is asterisked. Additional information regarding the violation is provided on the next page.*

TABLE 4 – STREAM DETECTION OF CONTAMINANTS WITH A PRIMARY DRINKING WATER STANDARD

Chemical or Constituent (and reporting units)	Sample Date	Level Detected	Range of Detections	MCL	PHG (MCLG)	Typical Source of Contaminant
N/D		N/D	N/D			

TABLE 4 -WEL#5 DETECTION OF CONTAMINANTS WITH A PRIMARY DRINKING WATER STANDARD

Chemical or Constituent (and reporting units)	Sample Date	Level Detected	Range of Detections	MCL	PHG (MCLG)	Typical Source of Contaminant
Well Barium (ppm)	03/2008	147.6	N/A	1	2	Discharge of oil drilling wastes and from metal refineries; erosion of natural deposits
Well Turbidity (units)	11/2002	12.6**	N/A	5	N/A	Soil runoff
Well Arsenic (ppb)	11/2002	2.0	N/A	50	N/A	Erosion of natural deposits; runoff from orchards; glass and electronics production wastes
Chromium (ppb)	11/2002	1.0	N/A	50	100	Discharge from steel and pulp mills and chrome plating; erosion of natural deposits

Distribution System

'isinfection Byproducts, Disinfectant Residuals, and Disinfection Byproduct Precursors

:ral Rule

Chemical or Constituent (and reporting units)	Sample Date	Level Detected	Range of Detections	MCL	PHG (MCLG)	Typical Source of Contaminant	Health Effects Language
Trihalomethanes (ppb)	2/2009	182			N/A	By-product of drinking water chlorination	Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience liver, kidney, or central nervous system problems, and may have an increased risk of getting cancer.
	2/2009	92.7	N/A				
	5/2009	55.8					
	5/2009	20.5					
	8/2009	61.3					
	8/2009	84.3					
	11/2009	173					
	11/2009	11.0		80			
	average	***85**	Violation				
Haloacetic Acids (ppb)	2/2009	87.9	N/A		N/A	By-product of drinking water disinfection	Some people who drink water containing halocetic acids in excess of the MCL over many years may have an increased risk of getting cancer.
	2/2009	51.9					
	5/2009	43.8					
	5/2009	27.2					
	8/2009	36.6					
	8/2009	69.4					
	11/2009	97.0					

	11/2009 average	89.0 *62.8	Violation	60			

TABLE 5 -STREAM DETECTION OF CONTAMINANTS WITH A SECONDARY DRINKING WATER STANDARD						
Chemical or Constituent (and reporting units)	Sample Date	Level Detected	Range of Detections	MCL	PHG (MCLG)	Typical Source of Contaminant
Sulfate (SO4) (ppm)	11-05-02	3.56	N/A	500	N/A	Runoff/leaching from natural deposits' industrial wastes
Chloride (Cl) (ppm)	11-05-02	0.64	N/A	500	N/A	Runoff/leaching from natural deposits; sea water influence
Specific Conductance (EC) (umhos/cm)	11-05-02	24	N/A	1600	N/A	Substances that form ions when in water; seawater influence
Total Filterable Residue (TDS) (ppm)	11-05-02	37	N/A	1000	N/A	Runoff/leaching from natural deposits

WELL#5 DETECTION OF CONTAMINANTS WITH A SECONDARY DRINKING WATER STANDARD							
Chemical or Constituent (and reporting units)	Sample Date	Level Detected	Range of Detections	MCL	PHG (MCLG)	Typical Source of Contaminant	Health Effects Language
Sulfate (SO4) (ppm)	11/2002	13.1	N/A	500	N/A	Runoff/leaching from natural deposits' industrial wastes	
Chloride (Cl) (ppm)	11-05-02	1.15	N/A	500	N/A	Runoff/leaching from natural deposits; sea water influence	
Specific Conductance (EC) (umhos/cm)	11-05-02	284	N/A	160 0	N/A	Substances that form ions when in water; seawater influence	
Total Filterable Residue (TDS) (ppm)	11-05-02	160	N/A	100 0	N/A	Runoff/leaching from natural deposits	

Zinc (ppb)	11-05-02	156**	N/A	5	N/A	Runoff/leaching from natural deposits; industrial wastes	
Turbidity (units)	11-05-02	12.6**	N/A	5	N/A	Soil Runoff	Turbidity has no health effects. However, high levels of turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.
Manganese (ppb)	06-23-03	259**	N/A	50	N/A	Leaching from natural deposits	
Iron (ppb)	06-23-03	830	N/A	300	N/A	Leaching form natural deposits; industrial wastes	

TABLE 6 - DETECTION OF UNREGULATED CONTAMINANTS				
Chemical or Constituent	**Sample Date**	**Level Detected**	**Action Level**	**Health Effects Language**

y violation of an MCL or AL is asterisked. Additional information regarding the violation is provided below.

Additional General Information on Drinking Water

All drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline (1-800-426-4791).

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. USEPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

Well#5 Summary Information for Contaminants Exceeding an MCL or AL, or a Violation of any Treatment or Monitoring and Reporting Requirements

*These constituents were found to exceed the recommended Secondary Standards. The MCL of secondary standards are not health related standards but were set to protect you against unpleasant aesthetic effects such as color, taste, odor and the staining of plumbing fixtures (e.g. tubs and sinks) and the staining of clothing while laundering. This sample was taken in November when the well is not being used, without proper flushing of the well prior to sampling metallic elements can leach from the well casing and give unusually high laboratory results. Prior to serving our customers water from this source in the summer months we do flush the well and chlorinate for disinfection. This does lower our results considerably on all these constituents.

** Turbidity is a test of the cloudiness of the water and is a primary standard due to the possibility of bacterial content existing in turbid water. As stated in the previous paragraph this sample was taken on sitting water while the well was not in service and had not been flushed or disinfected against bacteria. Prior to serving our customers water from this source in the summer months we do flush and chlorinate for disinfection. Turbidity (measured in NTU) is a measurement of the cloudiness of water and is a good indicator of water quality and filtration performance. Turbidity results which meet performance standards are considered to be in compliance with filtration requirements

Stream Summary Information for Contaminants Exceeding an MCL or AL, or a Violation of any Treatment or Monitoring and Reporting Requirements

This treatment plant is not an approved technology, in line filtration is not listed as an approved alternative filtration technology. Disinfection byproduct precursors requirements (Stage 1 Disinfectants and Disinfection Byproducts Rule). The violation may be contributed to the failure to comply with the enhanced coagulation requirement.

In order to comply with the enhanced surface water treatment rules, adopted by the State of California in 2005, it is necessary to upgrade the water treatment unit with an approved filtration and disinfection technology. The Shasta County Public Works is aggressively seeking funding through state loan and grants programs. The support of the water users is necessary in order to obtain funding and complete the necessary upgrade to bring the treatment plant in to compliance with the California Safe Drinking Water Act and Federal Regulations.

For Systems Providing Surface Water As A Source Of Drinking Water:

TABLE 7 - SAMPLING RESULTS SHOWING TREATMENT OF SURFACE WATER SOURCES	
Treatment Technique * NOT Approved (Type of approved filtration technology used)	In - Line Filtration
Turbidity Performance Standards ** (that must be met through the water treatment process)	Turbidity of the filtered water must: 1 - Be less than or equal to 0.3 NTU in 95% of measurements in a month. 2 - Not exceed 1.0 NTU for more than eight consecutive hours. 3 - Not exceed 5.0 NTU at any time.
Lowest monthly percentage of samples that met Turbidity Performance Standard No. 1.	100%
Highest single turbidity measurement during the year	0.30
The number of violations of any surface water treatment requirements	0

* A required process intended to reduce the level of a contaminant in drinking water.

** **Turbidity (measured in NTU) is a measurement of the cloudiness of water and is a good indicator of water quality and filtration performance. Turbidity results which meet performance standards are considered to be in compliance with filtration requirements.**

Summary Information for Surface Water Treatment

Last year your tap water failed to meet all EPA and State drinking water health standards. Shasta County Public Works is still aggressively seeking funding to make the necessary upgrades to your plant. County staff will increase the flushing the water distribution system at all dead ends and adjust chemical doses to stay with in compliance by lowering the disinfection by products. Monitoring samples are required quarterly until this problem is resolved

APPENDIX C

WATER RIGHTS PERMIT

STATE OF CALIFORNIA—STATE WATER RIGHTS BOARD

License for Diversion and Use of Water

APPLICATION 13737 PERMIT 8566 LICENSE 7422

THIS IS TO CERTIFY, *That* Fawn Renfro, Robin Renfro, and Bryan Renfro (over)
c/o Alvin M. Cibula
1525 Pine Street
Redding, California 96001
have made proof as of August 21, 1964,

(the date of inspection) to the satisfaction of the State Water Rights Board of a right to the use of the water of an unnamed spring in Shasta County

tributary to Shasta Reservoir

for the purpose of domestic and fire protection uses
under Permit 8566 *of the State Water Rights Board and that said right to the use of said water has been perfected in accordance with the laws of California, the Rules and Regulations of the State Water Rights Board and the terms of the said permit; that the priority of the right herein confirmed dates from* May 15, 1950, *and that the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to the amount actually beneficially used for said purposes and shall not exceed* fourteen thousand five hundred (14,500) gallons per day to be diverted from January 1 to December 31 of each year.

The point of diversion of such water is *located* :

North one thousand nine hundred eighty (1980) feet and east nine hundred ninety (990) feet from SW corner of Section 26, T35N, R5W, MDB&M, being within NW¼ of SW¼ of said Section 26.

A description of the lands or the place where such water is put to beneficial use is as follows:

Within SW¼ of NE¼, SE¼ of NE¼, NW¼ of SE¼, NE¼ of SE¼ of Section 26, T35N, R5W, MDB&M.

All rights and privileges under this license including method of diversion, method of use and quantity of water diverted are subject to the continuing authority of the State Water Rights Board in accordance with law and in the interest of the public welfare to prevent waste, unreasonable use, unreasonable method of use or unreasonable method of diversion of said water.

Reports shall be filed promptly by licensee on appropriate forms which will be provided for the purpose from time to time by the State Water Rights Board.

The right hereby confirmed to the diversion and use of water is restricted to the point or points of diversion herein specified and to the lands or place of use herein described.

FORM 64

This license is granted and licensee accepts all rights herein confirmed subject to the following provisions of the Water Code:

Section 1625. Each license shall be in such form and contain such terms as may be prescribed by the board.

Section 1626. All licenses shall be under the terms and conditions of this division (of the Water Code).

Section 1627. A license shall be effective for such time as the water actually appropriated under it is used for a useful and beneficial purpose in conformity with this division (of the Water Code) but no longer.

Section 1628. Every license shall include the enumeration of conditions therein which in substance shall include all of the provisions of this article and the statement that any appropriator of water to whom a license is issued takes the license subject to the conditions therein expressed.

Section 1629. Every licensee, if he accepts a license does so under the conditions precedent that no value whatsoever in excess of the actual amount paid to the State therefor shall at any time be assigned to or claimed for any license granted or issued under the provisions of this division (of the Water Code), or for any rights granted or acquired under the provisions of this division (of the Water Code), in respect to the regulation by any competent public authority of the services or the price of the services to be rendered by any licensee or by the holder of any rights granted or acquired under the provisions of this division (of the Water Code) or in respect to any valuation for purposes of sale to or purchase, whether through condemnation proceedings or otherwise, by the State or any city, city and county, municipal water district, irrigation district, lighting district, or any political subdivision of the State, of the rights and property of any licensee, or the possessor of any rights granted, issued, or acquired under the provisions of this division (of the Water Code).

Section 1630. At any time after the expiration of twenty years after the granting of a license, the State or any city, city and county, municipal water district, irrigation district, lighting district, or any political subdivision of the State shall have the right to purchase the works and property occupied and used under the license and the works built or constructed for the enjoyment of the rights granted under the license.

Section 1631. In the event that the State, or any city, city and county, municipal water district, irrigation district, lighting district, or political subdivision of the State so desiring to purchase and the owner of the works and property cannot agree upon the purchase price, the price shall be determined in such manner as is now or may hereafter be provided by law for determining the value of property taken in eminent domain proceedings.

Dated: SEP 2 1965

L. K. Hill
L. K. Hill
Executive Officer

3-17-80 Asgd to County of Shasta Service Area #2 - Sugarloaf

LICENSE 7422

STATE OF CALIFORNIA
STATE WATER RIGHTS BOARD

LICENSE
TO APPROPRIATE WATER

ISSUED TO Fawn Renfro, Robin Renfro, and Bryan Renfro

DATED SEP 2 1965

APPENDIX D

WATER RATE SCHEDULE

ORDINANCE NO. 741

AN ORDINANCE OF THE BOARD OF SUPERVISORS OF THE COUNTY OF SHASTA, COUNTY SERVICE AREA NO. 2–SUGARLOAF WATER, REPEALING ORDINANCE NO. 701 AND SETTING FORTH THE CHARGES, RATES, AND FEES FOR WATER AND RELATED SERVICES

The Board of Supervisors of the County of Shasta ordains as follows:

WHEREAS, on April 10, 2018, a written notice describing the proposed rates, fees, and charges to be imposed for water and related services was mailed to the affected property owners in accordance with the provisions of Cal. Const., art. XIII D, §6; and

WHEREAS, on June 5, 2018, a public hearing was held to provide an opportunity to protest the proposed the proposed rates, fees, and charges to be imposed for water and related services in accordance with Cal. Const., art. XIII D, §6; and

WHEREAS, the proposed rates, fees, and charges are necessary in providing water services, including an appropriate level of reserves, and will not produce revenues in excess of the costs of such service; and

WHEREAS, there was not a majority protest to the proposed rates, fees, and charges to be imposed for water and related services; and

WHEREAS, this ordinance complies with the legal and procedural requirements for setting the charges and rates for water and related services including, but not limited to, Cal. Const., art. XIII D, §6 and Government Code section 53750 *et seq*.

Now therefore, the Board of Supervisors of the County of Shasta hereby and ordains as follows:

Section 1. Water Rate Schedule: The rates, fees, and charges to be imposed for water and related services in County Service Area No. 2 (Sugarloaf Water) shall be as follows:

Basic Bi-monthly Charge Effective July 1, 2018

(1) A basic bi-monthly charge of $131.50, which includes the first 900 cubic feet of water consumed (0 - 900 cubic feet);

(2) A charge of $8.00 for every 100 cubic feet or portion thereof for that portion of the total bi-monthly consumption over 900 cubic feet.

Basic Bi-monthly Charge Effective January 1, 2019

(1) A basic bi-monthly charge of $131.50, which includes the first 900 cubic feet of water consumed (0 - 900cubic feet);

(2) A charge of $5.00 for every 100 cubic feet or portion thereof for that portion of the total bi-monthly consumption over 900 cubic feet.

Water Sales to Out-of-District Users (Short-Term Usage): Persons who are not residents or property owners in County Service Area No. 2 – Sugarloaf Water may purchase water where and when available at the rate of twice the amount charged to regular customers for the same usage in a two-month period.

County Service Area No. 2 - Sugarloaf Water will provide a meter to record water usage upon receipt of a $500.00 deposit. A permit will be issued outlining the conditions of use.

Section 2. **Standby Charge Unchanged:** $25.00 (Bi-monthly)

(1) **Not Connected to Water System:** A standby charge shall be paid by the owner of each parcel in the service area for which delivery of water service is readily available but has not been initiated, whether structures are present on the property or not. Parcels that are determined not to be suitable for residential or commercial development may not be charged a standby fee. This determination will include factors such as size of the property, the topography of the property, and the shape of the property. The Director of Public Works will make this determination.

(2) **Vacation Status:** Pursuant to the Shasta County Service Area Ordinance, customers with a meter may be charged the applicable standby fee during the months the property is vacant, upon request, if the property is to receive regular water service for less than three (3) consecutive months per year.

Section 3. This ordinance supersedes any prior ordinance or resolution setting water rate fees for County Service Area No. 2 – Sugarloaf Water. Ordinance No. 701 is repealed.

Section 4. This ordinance shall take effect and be in full force and effect from and after 30 days after its passage. The Clerk shall cause this ordinance to be published as required by law.

Section 5. If any section, subsection, clause, phrases, or portion of this ordinance is for any reason held to be invalid or unconstitutional by the decision of any court of competent jurisdiction, such decision shall not affect the validity of the remaining portions of this ordinance.

DULY PASSED AND ADOPTED this 5th day of June, 2018, by the Board of Supervisors of the County of Shasta, State of California, County Service Area No. 2 - Sugarloaf Water by the following vote:

AYES:	Supervisor Moty, Kehoe, Rickert, Morgan, and Baugh
NOES:	None
ABSENT:	None
ABSTAIN:	None
RECUSE:	None

LES BAUGH, CHAIRMAN
Board of Supervisors
County of Shasta
State of California

ATTEST:

LAWRENCE G. LEES
Clerk of the Board of Supervisors

By: Trisha Boss
Deputy

THIS INSTRUMENT IS A CORRECT COPY
OF THE ORIGINAL ON FILE IN THIS OFFICE

ATTEST JUN 06 2018

CLERK OF THE BOARD
Supervisors of the County of Shasta, State of California
BY: Trisha Boss

APPENDIX E

FY 2017-18 AUDITED FINANCIALS FOR CSA 2

COUNTY of SHASTA

COMPREHENSIVE ANNUAL FINANCIAL REPORT
FOR THE YEAR ENDED JUNE 30, 2018

BRIAN MUIR,
AUDITOR-CONTROLLER

NONMAJOR ENTERPRISE FUNDS

COUNTY OF SHASTA
CALIFORNIA

COUNTY OF SHASTA
COMBINING STATEMENT OF NET POSITION
NONMAJOR ENTERPRISE FUNDS
JUNE 30, 2018

	CSA #2 Sugarloaf Water	CSA #3 Castella Water	CSA #8 Palo Cedro
ASSETS			
Current Assets:			
Cash and Investments	$ -	$ 28,659	$ 259,821
Receivables, Net	6,198	10,513	27,966
Due from Other Governments	15,087	-	-
Other Assets	-	-	-
Due from Other Funds	4,539	4,117	12,574
Total Current Asset	25,824	43,289	300,361
Noncurrent Assets:			
Special Assessments Receivable	-	156,630	-
Cash and Investments Restricted	-	9,065	-
Capital Assets:			
Nondepreciable, Net	5,562	19,860	340,835
Depreciable, Net	198,279	643,067	846,036
Total Noncurrrent Asset	203,841	828,622	1,186,871
Total Assets	229,665	871,911	1,487,232
LIABILITIES			
Current Liabilities:			
Accounts Payable	9,730	1,101	1,491
Accrued Interest Payable	-	2,251	-
Due to Other Funds	47,276	110	-
Due to Other Governments	-	-	-
Deposits from Others	-	-	500
Unearned Revenue	1,719	1,393	3,182
Bonds, Notes Payable	-	2,900	20,000
Total Current Liabilities	58,725	7,755	25,173
Noncurrent Liabilities:			
Advances from Other Funds	-	-	-
Notes Payable	-	-	-
Bonds Payable	-	160,800	-
Total Noncurrent Liabilities	-	160,800	-
Total Liabilities	58,725	168,555	25,173
NET POSITION			
Net Investment in Capital Assets	203,841	499,427	1,166,871
Unrestricted	(32,901)	203,929	295,188
Total Net Position	$ 170,940	$ 703,356	$ 1,462,059

COUNTY OF SHASTA
COMBINING STATEMENT OF REVENUES, EXPENSES AND CHANGES IN NET POSITION
NONMAJOR ENTERPRISE FUNDS
YEAR ENDED JUNE 30, 2018

	CSA #2 Sugarloaf Water	CSA #3 Castella Water	CSA #8 Palo Cedro
OPERATING REVENUES			
Charges for Services	$ 42,084	$ 66,962	$ 158,849
Total Operating Revenues	42,084	66,962	158,849
OPERATING EXPENSES			
Services and Supplies	79,345	58,354	253,488
Central Service Costs	2,938	5,071	2,502
Depreciation	4,658	41,199	95,778
Total Operating Expenses	86,940	104,624	351,768
OPERATING INCOME (LOSS)	(44,856)	(37,662)	(192,918)
NON-OPERATING REVENUES (EXPENSES)			
Interest	(1,085)	514	3,817
Property Tax Revenues	-	-	-
Nonoperating Grants	176,000	-	-
Other Revenue	-	12	-
Other Expense	(231)	(418)	(322)
Interest Expense	-	(6,771)	-
Total Nonoperating Revenues (Expenses)	174,684	(6,662)	3,495
INCOME BEFORE CAPITAL CONTRIBUTIONS	129,828	(44,324)	(189,423)
Capital Grants and Contributions	15,087	-	-
Transfers In	20,000	-	-
CHANGE IN NET POSITION	164,914	(44,324)	(189,424)
Net Position - Beginning	6,026	747,681	1,651,481
NET POSITION - ENDING	$ 170,940	$ 703,356	$ 1,462,059

COUNTY OF SHASTA
COMBINING STATEMENT OF CASH FLOWS
NONMAJOR ENTERPRISE FUNDS
YEAR ENDED JUNE 30, 2018

	CSA #2 Sugarloaf Water	CSA #3 Castella Water	CSA #8 Palo Cedro
CASH FLOWS FROM OPERATING ACTIVITIES			
Receipts from Customers	$ 39,398	$ 64,906	$ 149,321
Payments to Suppliers	(131,482)	(65,303)	(266,151)
Operating Subsidies and Transfers	-	-	-
Other Receipts	35,088	12	-
Other Payments	(231)	(418)	(322)
Net Cash Provided (Used) by Operating Activities	(57,227)	(803)	(117,152)
CASH FLOWS FROM NONCAPITAL FINANCING ACTIVITIES			
Property Taxes	-	-	-
Nonoperating Subsidies and Transfers	161,960	416	1,060
Net Cash Provided (Used) by Noncapital Financing Activities	161,960	416	1,060
CASH FLOWS FROM CAPITAL AND RELATED FINANCING ACTIVITIES			
Acquisition and Construction of Capital Assets	(103,648)	-	-
Capital Improvement Fees	-	-	500
Principal Payments on Capital Debt	-	(2,700)	-
Special Assessments	-	(180)	-
Capital Grants Received	-	-	-
Interest Payments on Capital Debt	-	(6,808)	-
Net Cash (Used) by Capital and Related Financing Activities	(103,648)	(9,688)	500
CASH FLOWS FROM INVESTING ACTIVITIES			
Interest on Investments	(1,085)	514	3,817
Net Cash Provided (Used) by Investing Activities	(1,085)	514	3,817
NET INCREASE (DECREASE) IN CASH	-	(9,561)	(111,775)
Cash and Cash Equivalents - Beginning of Year*	-	47,285	371,595
CASH AND CASH EQUIVALENTS - END OF YEAR*	$ -	$ 37,724	$ 259,821

*** Includes Restricted Cash and Imprest Cash**

COUNTY OF SHASTA
COMBINING STATEMENT OF CASH FLOWS
NONMAJOR ENTERPRISE FUNDS
YEAR ENDED JUNE 30, 2018

	CSA #2 Sugarloaf Water	CSA #3 Castella Water	CSA #8 Palo Cedro
RECONCILIATION OF OPERATING INCOME (LOSS) TO NET CASH PROVIDED (USED) BY OPERATING ACTIVITIES			
Operating Income (Loss)	$ (44,856)	$ (37,662)	$ (192,918)
Adjustments to Reconcile Net Operating Income to Net Cash Provided (Used) by			
Operating Activities:			
Other Nonoperating Receipts	35,088	12	-
Other Nonoperating Payments	(231)	(418)	(322)
Depreciation Expense	4,658	41,199	95,778
Change in Assets and Liabilities:			
Receivables, Net	1,192	(2,115)	27
Due from Other Funds	(3,878)	-	(9,555)
Due from Other Governments	-	-	-
Accounts and Other Payables	(73,863)	237	1,013
Due to Other Funds	24,664	(2,115)	(11,174)
Unearned Revenue	-	59	-
Other Liabilities	-	-	-
Deposits from Others	-	-	-
Due to Other Governments	-	-	-
Net Cash Provided (Used) by Operating Activities	$ (57,227)	$ (803)	$ (117,152)

*** Includes Restricted Cash and Imprest Cash**

APPENDIX F

BOIL WATER NOTICE

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER

Este informe contiene información muy importante sobre su agua potable.
Tradúzcalo o hable con alguien que lo entienda bien.

DRINKING WATER WARNING
BOIL YOUR WATER BEFORE USING
Shasta CSA – Sugarloaf #2

Our Sugarloaf water system is served year-round by one groundwater well. When our demands are more than what our well produces, we need to pump surface water. Federal and State regulations require surface water be properly filtered and disinfected. Because Sugarloaf's surface water treatment plant is old and cannot reliably produce water that is safe to drink, **you must boil your drinking water** whenever surface water is provided. In June 2018, we issued a boil water advisory because production from our groundwater well had declined and we needed to provide surface water to meet demand. That Boil Water Advisory remains in effect.

What should I do?

- **DO NOT DRINK THE WATER WITHOUT BOILING IT FIRST.** Bring all water to a boil, let it boil for one minute, and let it cool before using, or use bottled water. Boiled or bottled water should be used for drinking, making ice, brushing teeth, washing dishes, and food preparation **until further notice**. Boiling kills bacteria and other organisms in the water.
- *Fecal coliforms and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.* The symptoms above are not caused only by organisms in drinking water. If you experience any of these symptoms and they persist, you may want to seek medical advice.
- People with severely compromised immune systems, infants, and some elderly may be at increased risk. These people should seek advice about drinking water from their health care providers. General guidelines on ways to lessen the risk of infection by microbes are available from U.S. EPA's Safe Drinking water Hotline at 1(800) 426-4791.

What happened? In 2017, the State Water Resources Control Board determined that our surface water plant was unable to reliably produce water that meets State drinking water standards. For that reason, the State requires us to issue a boil water advisory whenever surface water is provided.

In June 2018, we issued a boil water advisory because production from our groundwater well had declined and we needed to provide surface water. We had planned to lift the boil water advisory once the rains came and the well recharged. However this winter, demands still exceed well production, despite the increased groundwater supply. Consequently, we continue pumping surface water and must continue issuing this boil water advisory.

What is being done? While we operate the plant diligently to provide the best possible water the plant can produce, the plant is old and unable to consistently meet drinking water standards in the winter when raw water turbidities are high. The plant has exceeded the turbidity standard several times this winter.

We drilled a new groundwater test well last year. It appears to be an adequate producer, but we are conducting further chemical testing to determine if the groundwater meets drinking water quality standards.

To reduce our demand, we continue to look for leaks in our distribution system and repair them immediately when they are found. **We urge you to contact us if you suspect a leak.**

We will continue to monitor the water supply and inform you when you no longer need to boil your water**. This boil water advisory will remain in effect until you are notified in writing otherwise.**

For more information, please contact:

Shasta County Public Works, CSA Division, 530-225-5571

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this public notice in a public place or distributing copies by hand or mail. Additionally, upon receipt of notification, RENTAL PROPERTY OWNERS OR MANAGERS (including nursing homes and care facilities) must notify tenants.

This notice is being sent to you by Shasta CSA – Sugarloaf #2.

State Water System ID#: **4500006.** Date distributed: ___________

APPENDIX G

EVALUATION OF YIELD AND QUALITY FOR THE TEST WELL

LAWRENCE
& ASSOCIATES
ENGINEERS & GEOLOGISTS

018024.00

EVALUATION OF YIELD AND QUALITY

FOR

SUGARLOAF WELL #2

LAKEHEAD, SHASTA COUNTY, CALIFORNIA

December 17, 2018

CERTIFIED HYDROGEOLOGIST
DAVID L. KIRK
David L Kirk
No. HG857
STATE OF CALIFORNIA
exp 9-30-19

Prepared for:

Shasta County Water Agency
Community Service Area No. 2
1855 Placer Street
Redding, CA 96001

c/o Pace Engineering, Inc.
1730 South Street
Redding, CA 96001

TABLE OF CONTENTS

INTRODUCTION

This report presents the results of the drilling, installation, and testing of Sugarloaf Well #2, in Lakehead, California (**Figures 1** and **2**). The well was installed on behalf of the Shasta County Water Agency's Sugarloaf Community Service Area (CSA) and its purpose is to replace spring water, which is currently being used by the CSA, with groundwater. The work consisted of drilling a 12-¾ inch borehole, installing six-inch steel blank and perforated casing, installing a filter pack and surface seal, developing the well, performing an eight-hour variable discharge test (step test) and a three-day constant-discharge aquifer test and one-day recovery test, and collecting one sample from the well for laboratory analyses.

The pumped water was discharged onsite, into a swale located approximately 70 feet east of the well, and allowed to infiltrate/evaporate. The discharge was permitted by the Central Valley Regional Water Quality Control Board (CVRWQCB) under General Order No. WQ 2014-0194-DWQ.[1]

SUMMARY

Figure 3 shows the construction diagram and geologic log for the well. **Appendix A** contains well permit documents and **Appendix B** contains the specifications that guided the drilling, installation, testing, and discharge control for the well.

Discharged water was directed away from the site via a fire hose and discharged into a turbidity control bag before exiting into a forested hillside area towards the drainage to the south. Discharge did not reach Shasta Lake.

Three geologic units were encountered at the Site. The upper unit, from ground surface to a depth of 15 feet below ground surface (bgs), consisted of metaconglomerate clasts in a silty matrix and is interpreted as fill; underlying the upper unit, from 15 feet bgs to 87 feet bgs, a metaconglomerate was encountered, and is the source of the majority of clasts observed in the uppermost unit; underlying the metaconglomerate unit is a metasandstone from 87 feet bgs to the bottom of the well at 310 feet bgs.

There was a maximum of 54.39 feet of drawdown at the end of the three-day constant discharge test, at a pumping rate of 30 gallons per minute (gpm). **Appendix C** presents L&A's field-data sheets, transducer calibration sheets, and transducer recorded test data sheets.

The aquifer has a transmissivity of 377 gpd/foot. Using an aquifer thickness 60 feet (75 percent of the 80-foot height of the water column above a fracture zone at 190 feet bgs which provides the

[1] https://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2014/wqo2014_0194_dwq.pdf

majority of the water produced by the well), the hydraulic conductivity is calculated to be 0.84 feet/day. The theoretical long-term yield is calculated to be 21 gpm.

All parameters in groundwater were below their respective Maximum Contaminant Levels (MCL), with the exceptions of antimony at 20 µg/L (MCL = 6 µg/L), iron at 850 µg/L (MCL = 300 µg/L), and manganese at 130 µg/L (MCL = 50 µg/L). Otherwise, the water quality is excellent. The Langlier Index (-0.49) suggests that the water may be corrosive (because of the relatively low alkalinity and hardness combined with a neutral pH). **Appendix D** presents laboratory data sheets.

SITE DESCRIPTION

GENERAL SETTING

The Site is located in the Sugarloaf area, near Lakehead, in Shasta County, California (**Figures 1** and **2**). The latitude and longitude of the well are 40º51'23.00" N and 122°24'05.74" W, respectively. The property (Assessor's Parcel No. 085-060-033) is owned by Shasta County.

The site is located on a steeply sloping hillside with a drainage to the south. Vegetation consists mainly of manzanita, pine trees, oak trees and brush. The property on which the well is located is publicly accessible.

Review of Federal Emergency Management Agency (FEMA) flood map for the Site area indicates the site is in an area determined to be outside the 0.2 percent annual chance floodplain (*i.e.*, outside the 500-year flood zone).[2]

CLIMATE

The site is in an area of relatively high rainfall with an average of approximately 70 inches of rain and 18 inches snowfall per year.[3] The 100-year annual precipitation is 63.22 inches (at Mt. Shasta City). Some of the stormwater and snowmelt infiltrate into the surface geologic materials however, because of the steep topography, the majority of precipitation exits the site as runoff into Shasta Lake.

Average annual evaporation is approximately 50 inches, based on data from Scott Valley, in a similar setting in the Northeastern Plateau Region of California.[4] The majority of evaporation occurs in the dry season (May through October).

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[2] FEMA Flood Insurance Rate Map Panel (Map Number 06093C2600D), January 19, 2011.

[3] https://www.bestplaces.net/climate/zip-code/california/lakehead/96051.

[4] California Irrigation Management Information System (CIMIS), http://wwwcimis.water.ca.gov/.

GEOLOGY & HYDROGEOLOGY

REGIONAL

The Site is located in the eastern plate of the Klamath Range Geologic Province. The Site is underlain by Mississippian age (359 to 323 million years old) metamorphic marine deposits of the Bragdon Formation. The Bragdon Formation is composed of interstratified shale, siltstone, sandstone, grit, conglomerate, a small amount of rhyolite tuff, and a small flow of mafic lava. Beds of shale make up more than 75 percent of formation and the formation is up to 3,500 feet thick. The Bragdon Formation overlies the Kennett Formation, but, where the Kennett was either not deposited or was locally eroded, the Bragdon rests upon either the Balaklala rhyolite or Copley greenstone.[5]

SPRINGS

There is a spring in the unnamed drainage to the west and south of the well location that has been dammed and diverted to provide water to the Sugarloaf CSA.

DRILLING & INSTALLATION

Between August 30 and 31, 2018, L&A staff visually logged cuttings during the drilling of the Sugarloaf #2 well, located 0 Oak Knoll Drive, Lakehead, Assessor's Parcel # 085-060-033. The well was drilled using the air-rotary method by Enloe Drilling and Pumps, Inc. (Enloe), using a Schramm T-660 drill with an 8-inch bit, and was drilled to a depth of 310 feet below ground surface (bgs).

In October, Enloe reamed the hole with a 12-1/4-inch diameter bit to 308 feet bgs, installed 6-3/4-inch diameter blank copper-bearing steel casing from ground surface to 150 feet bgs, 50-slot (0.050 inch) copper-bearing steel screen from 150 feet bgs to 270 feet bgs, and blank copper-bearing steel casing from 270 to 290 feet bgs. Following casing installation, Enloe installed 6 x 12 gravel filter pack around from 75 feet bgs to 310 feet bgs, non-hydrated bentonite seal from 70 to 75 feet bgs and a Portland cement well seal from 70 feet bgs to ground surface in the annular space between the casing and wall of the boring. PACE and Shasta County Environmental Health Department staff observed the casing, filter pack, and well-seal installation.

Figure 3 presents a description of the drill cuttings and well-construction details.

On October 21 and 22, 2018, Enloe developed the well by air lifting, starting at the bottom of the screened interval (270 feet bgs), then moving up through the screened interval until the discharge was free of drilling mud and sand and turbidity was less than 100 NTUs; following aquifer testing, turbidity was approximately 1 NTU.[6]

---

[5] https://ngmdb.usgs.gov/Geolex/UnitRefs/BragdonRefs_12417.html

[6] Personal communication with Jordan Enloe, December 11, 2018.

AQUIFER TESTING

METHODS

On October 23, 2018, Enloe installed a 5-horsepower stainless-steel pump in the well at a depth of 260 feet bgs and L&A staff installed an In-Situ Level Troll 500 pressure transducer in the well at a depth of 195 feet bgs to electronically record changes in groundwater levels in the well during aquifer testing. Additionally, Enloe Drilling and L&A staff measured depth-to-water measurements manually with a Waterline Model 300 electric well probe and recorded the depth to the nearest 0.01 foot.

On October 23, 2018, Enloe performed a variable-speed discharge test (stepped test) on the well. The stepped-discharge test consisted of pumping the well at increasing rates of discharge (10, 20, and 50 gpm) while measuring the change in water level in the well. Flow was measured with a Netafirm™ digital flow and totalizing meter installed in the 2-inch diameter discharge line. Discharged water was piped into a filter bag before exiting into a swale located approximately 70 feet east of the well to prevent discharge water from infiltrating back into the well area and influencing the test. The purpose of the stepped-discharge test was to evaluate the aquifer's response to various pumping rates in order to choose a pumping rate for the 72-hour constant rate discharge test that would maximize drawdown in the well without exposing the pump.

Figure 4 shows a graph of depth-to-water vs. elapsed time for the stepped-discharge test and the projected depth-to-water at the end of a 72-hour test with the final pumping rate of 50 gpm. Based on the stepped-testing data a pumping rate of 50 gpm was chosen for the 72-hour constant discharge test.

Figure 5 shows a plot of drawdown vs. pumping rate (discharge) for initial (10 gpm), intermediate (20 gpm) and final (50 gpm) stages of the stepped-discharge test. As the graph shows, drawdown at successively higher discharge rates is not linear. That is, as discharge increases linearly, drawdown increases exponentially. Considering the allowable drawdown (calculated to be 75% of the difference between the static water level of about 110 feet bgs and the fracture zone at an elevation of about 190 feet bgs), it is not recommended to pump the well at a rate greater than 64 gpm. Pumping the well at a rate above this rate would quickly lower the water level in the well below the fracture zone and would dewater the well.

On October 24, 2018, Enloe and L&A staff started the 72-hour constant rate discharge test at a pumping rate of 50 gpm, however after 27 hours the test was terminated because the water level in the well had dropped below the level of the transducer and was nearing the intake elevation of the submersible pump (260 feet bgs). After analyzing the manual depth-to-water data for the test, it was determined that once the water level in the well dropped below an elevation of approximately 190-feet bgs, the well dewatered rapidly. This rapid dewatering indicates that the majority of the water produced by the well originates in a fracture zone at or the 190-foot bgs level and that once this zone is dewatered the water level in the well decreases rapidly.

Figure 6 shows a graph of transducer recorded depth to water vs. time data for the aborted test and **Figure 7** shows hand measured depth to water vs. time data for the aborted test as well as the calculations for long-term yield on the aquifer above and below the fracture zone at 190 feet bgs. Based on the long-term yield calculations a pumping rate of 30 gpm was selected for the second attempt of the 72-hour test.

On October 26, 2018, Enloe Drilling and L&A staff started the 72-hour constant rate discharge test at a pumping rate of 30 gpm, this test successfully ran for the entirety of the 72 hours. Pumping was stopped at 72 hours and recovery was measured for the next 24 hours. At the end of the 24-hour recovery test, L&A staff retrieved the pressure transducer from the well and downloaded the test data.

RESULTS

Figure 8 shows a graph of depth to water vs. time for the constant-discharge test and **Figure 9** shows interpretive graphs for calculation of aquifer parameters and long-term yield.

There was a maximum of 54.39 feet of drawdown at the end of the test, to a depth of 171.06 feet bgs (note that the depth to water recorded during the test was in feet below the reference point, which was 2.50 feet above ground surface; the data sheets and graphs reflect depth to water below the reference point, not ground surface).

Based on the pumping water level, the interval from 110 to 190 feet bgs did not contributed a significant amount of water during the testing and the majority of water produced from the well is from a fracture zone at 190-foot bgs. The maximum pumping level during the successful test (approximately 171 feet bgs) was above the fracture zone. If most of the pumped water were coming from the fracture zone, it would be expected that the drawdown curve would steepen as the aquifer is dewatered past this point which is what happened during the unsuccessful test conducted at 50 gpm (**Figures 6** and **7**).

Figure 9 shows drawdown plotted on a semi-logarithmic plot and calculations for aquifer transmissivity and hydraulic conductivity. The aquifer has a transmissivity of 377 gpd/foot (calculated using the simplified Theis equation). Using an aquifer thickness of 60 feet (75 percent of the total height of the water column above the likely water-bearing fracture zone), the hydraulic conductivity is 0.84 feet/day.

Using a graphical method by projecting the drawdown curve from the testing out in time, a long-term pumping rate can be estimated. The drawdown line projected out to 180 days (one dry season) shows that if pumping continued continuously at the test rate of 30 gpm, drawdown at the end of 180 days would be approximately 87 feet. The calculation also uses the maximum allowable drawdown. For this location, it is set at 60 feet, which is the approximately 75 percent of the 80-foot difference between the static water level at the beginning of the successful test (110 feet bgs) and the top of the productive fracture zone (190 feet).

To estimate the long-term yield, the maximum allowable drawdown (60 feet) was divided by the predicted drawdown (87 feet) at 180 days of pumping, and then multiplied by the aquifer-test discharge (30 gpm). These calculations show that the test well has a theoretical long-term yield of approximately 21 gpm.

GROUNDWATER QUALITY

LABORATORY ANALYSES & DISCHARGE TESTING

On October 31, 2018, prior to the pump being removed from the well, Enloe staff restarted the pump and L&A staff collected groundwater samples from the discharge. The samples were collected in laboratory provided bottles and then placed in an iced cooler and shipped under chain-of-custody to B.C, Laboratories in Bakersfield California where they were analyzed for *Title 22* parameters.

Table 1 summarizes analytical results for Sugarloaf Well #2 for *Title 22* parameters. All parameters were below their respective Maximum Contaminant Levels (MCL), with the exceptions of antimony at 20 µg/L (MCL = 6 µg/L), iron at 850 µg/L (MCL = 300 µg/L), and manganese at 130 µg/L (MCL = 50 µg/L). Otherwise, the water quality is excellent. The Langlier Index (-0.49) suggests that the water may be slightly corrosive (because of the relatively low alkalinity and hardness combined with a neutral pH).

Table 1. Summary of Water-Quality in Sugarloaf Well #2 (October 31, 2018)

Parameter	Result	MCL	Parameter	Result	MCL
General Parameters			**Metals**		
pH (units)	7.51 [S05]	6.5-8.5	Hexavalent Chromium (µg/L)	0.045 [J]	
EC (µmhos/cm) *	232	900	Aluminum (µg /L)	160	1000
Turbidity (NTU) **	<1	5	Antimony (µg /L)	**20** [J]	6
Calcium (mg/L)	31		Arsenic (µg /L)	<3.5 [A07]	10
Magnesium (mg/L)	5.3		Barium (µg /L)	90	1000
Sodium (mg/L)	6.3		Beryllium (µg /L)	2.2 [J, A07]	4
Potassium (mg/L)	0.41 [J]		Cadmium (µg /L)	<0.11	5
Bicarbonate (mg/L)	120		Chromium (µg /L)	<1.2	50
Carbonate (mg/L)	<2.5		Copper (µg /L)	1.5 [J]	1300
Hydroxide (mg/L)	<1.4		Iron (µg /L)	**850**	300
Alkalinity as $CaCO_3$ (mg/L)	95		Lead (µg /L)	0.39 [J]	15
Hardness (mg/L)	100		Manganese (µg /L)	**130**	50
Aggressive Index	11.4		Mercury (mg/L)	0.000048 [J]	2
Langlier Index	-0.49		Nickel (µg /L)	2.5 [J]	100
Chloride (mg/L)	0.64	250	Selenium (µg /L)	<0.19	50
Fluoride (mg/L)	0.075	1.4	Silver (µg /L)	<0.10	100
Nitrate as NO_3 (mg/L)	<0.092	45	Thallium (µg /L)	<11	2
Nitrate + Nitrite as N (mg/L)	<0.029	1	Zinc (µg /L)	30	5000
Sulfate (mg/L)	7.5	250	**Organics, Radiological**		
Total Dissolved Solids (mg/L)	140	500	Perchlorate (mg /L)	<0.00092	
MBAS (mg/L)	<0.015	0.5	Toluene (µg /L)	4.5	150
Color (units)	3.0	15	Gross Alpha (pCi/L)	<3	
Corrosive-Aggressive Index (NA)	11.4		Radium-228 (pCi/L)	0.839	5

Notes: Bold values exceed their MCL; * = L&A field measurement; ** = Verbal communication w/ Jordan Enloe; J = Estimated value; S05 = Sample holding time was exceeded; A07 = Detection & quantitation limits were raised due to sample dilution caused by high analyte concentration or matrix interference.

SITE LOCATION MAP	PROJECT NAME: NEW WELL	PROJECT NO: 018024.00	DATE: 3/28/2018
MAP ADAPTED FROM USGS 7.5-MINUTE TOPOGRAPHIC QUADS, LAMOINE, BOHEMOTASH MTN., HANLAND PEAK, & OBRIEN, CA.	CLIENT: PACE ENG.	DRAWN BY: J. BEERS	FIGURE 1
	SCALE: 1"=2,000'	CHECKED BY: B. LAMPLEY	

LAWRENCE & ASSOCIATES
ENGINEERS & GEOLOGISTS

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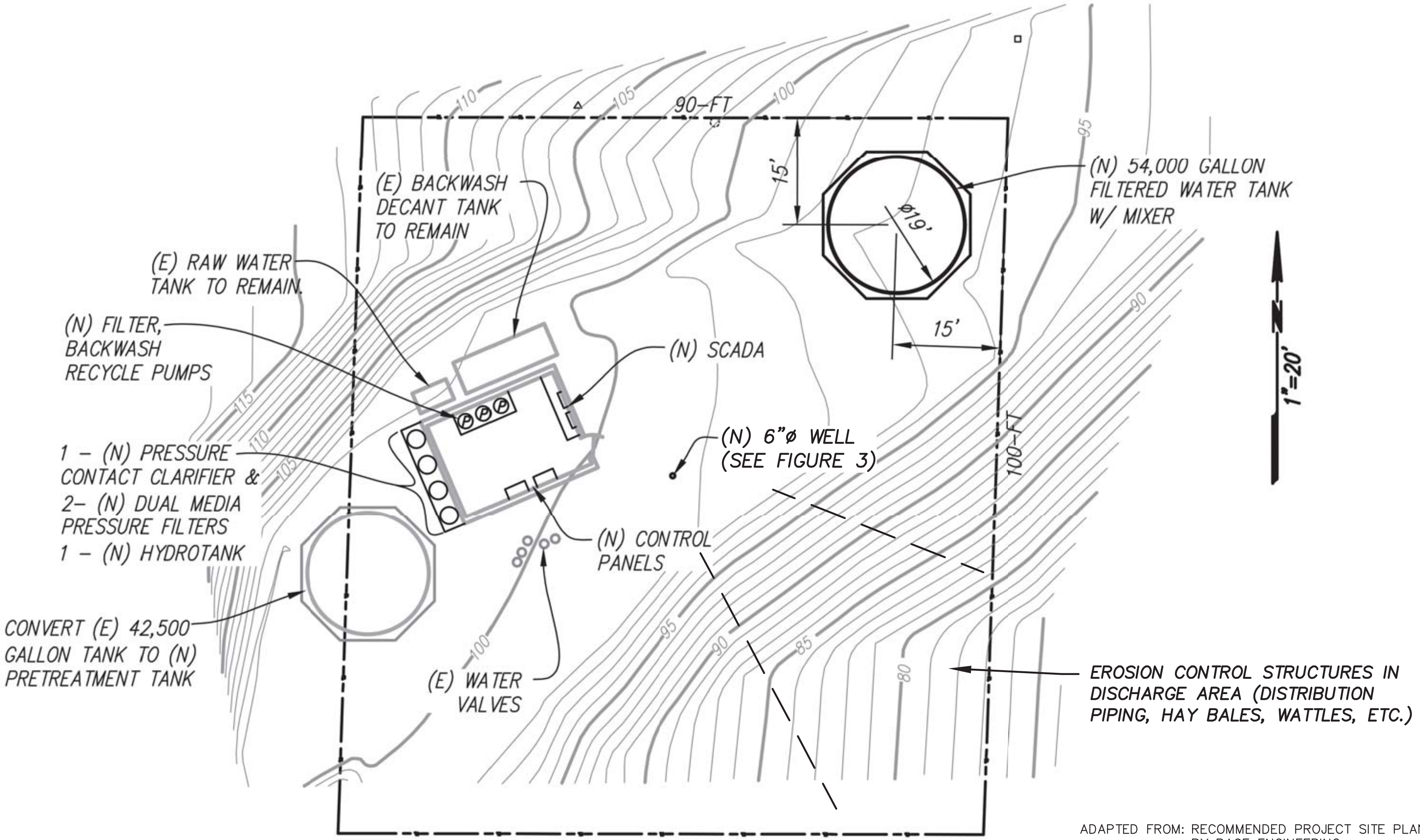


ADAPTED FROM: RECOMMENDED PROJECT SITE PLAN BY PACE ENGINEERING, DATED 4/3/18, JOB #199.95

LAWRENCE & ASSOCIATES ENGINEERS & GEOLOGISTS	SITE MAP SHASTA COUNTY SERVICE AREA NO. 2 SUGARLOAF	NEW WELL PACE ENGINEERING REDDING, CA.	PROJECT NO: 018024.00 DRAWN BY: J. BEERS CHECKED BY: B. LAMPLEY	SCALE: 1" = 20' DATE: 4/4/2018 FIGURE 2

p:\018024.00_pace\site_map.dwg J.R.B. 4/4/2018

LAWRENCE & ASSOCIATES 3590 IRON COURT RD SHASTA LAKE, CA 96019	PHONE : (530) 275-4800 FAX : (530) 275-7970	PROJECT: PACE ENGINEERING SUGARLOAF WELL #2	SHEET 1 OF 1 WELL#: #2
		JOB #: 018024.00	DATE: 8/30-8/31/18
FIELD LOCATION OF WELL	SEE FIGURE 2 FOR WELL LOCATION	LOGGED BY: D. KIRK DRILLER: ENLOE DRILLING	
		GROUND SURFACE ELEVATION: N/A	
		EQUIPMENT AND SPECIFICATIONS: SCHRAMM T660 WITH 8-INCH AND $12\frac{1}{4}$-INCH BITS	

DEPTH INTERVAL (FEET)	DRILL RATE ft/min.
50'-70'	2.5
70'-90'	2.2
90'-110'	
110'-130'	1.1
130'-150'	1.05
150'-170'	1.33
170'-190'	0.91
190'-210'	0.91
210'-230'	0.74
230'-250'	0.64
250'-270'	0.57
270'-290'	1.00

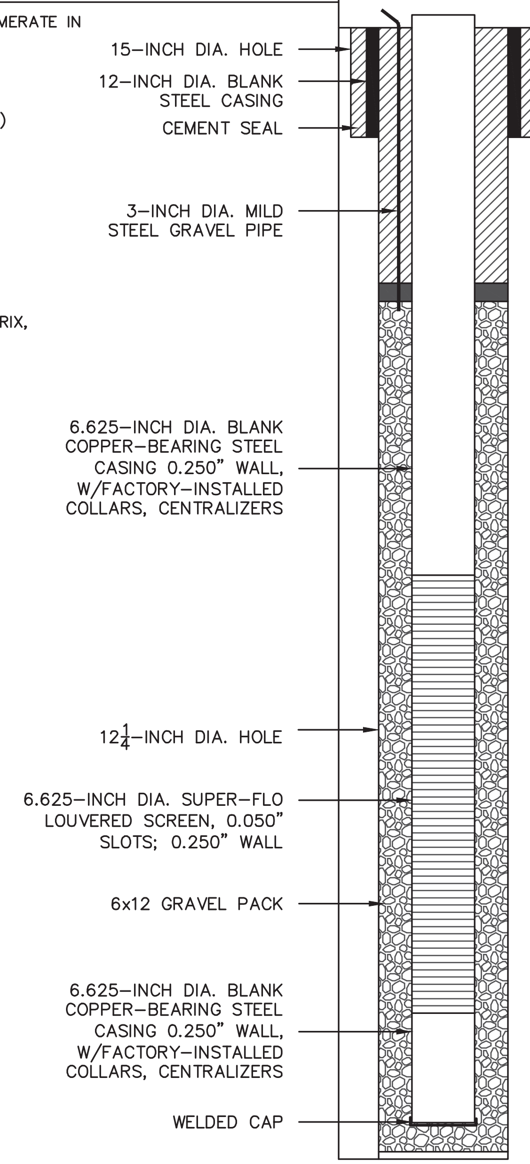
SOIL GROUP USCS SYMBOL: ML (0'-10')

DESCRIPTION

DEPTH	DESCRIPTION
0'-10'	FILL, LOOSE, DRY, CLASTS ARE METACONGOLMERATE IN SILT MATRIX, REDDISH YELLOW (7.5YR 6/6)
10'-35'	WEATHERED METACONGOLMERATE: DRY TO SLIGHTLY MOIST, STRONG BROWN (7.5YR 5/6)
35'-80'	METACONGLOMERATE, HARD, DRY
80'-87'	METACONGOLMERATE, WEATHERED, SILTY MATRIX, MOIST TO WET, LIGHT BROWN (7.5YR 6/4)
87'-308'	METASANDSTONE, HARD, BLACK
110'-130'	SLIGHT H_2S ODOR
130'-150'	~20 TO 30 GPM PER DRILLER
167'-180'	SMOOTHER DRILLING (LESS CHATTER)
190'	FRACTURES (BASED ON AQUIFER TEST)
235'	SOME QUARTZ

TOTAL DEPTH = 308'

WELL CONSTRUCTION



WELL CONSTRUCTION SYMBOLS

- 6-INCH DIA., LOUVERED SCREEN, 0.050" SLOTS; 0.250" WALL
- 6x12 GRAVEL PACK
- CEMENT SEAL
- BENTONITE GROUT

FIGURE 3

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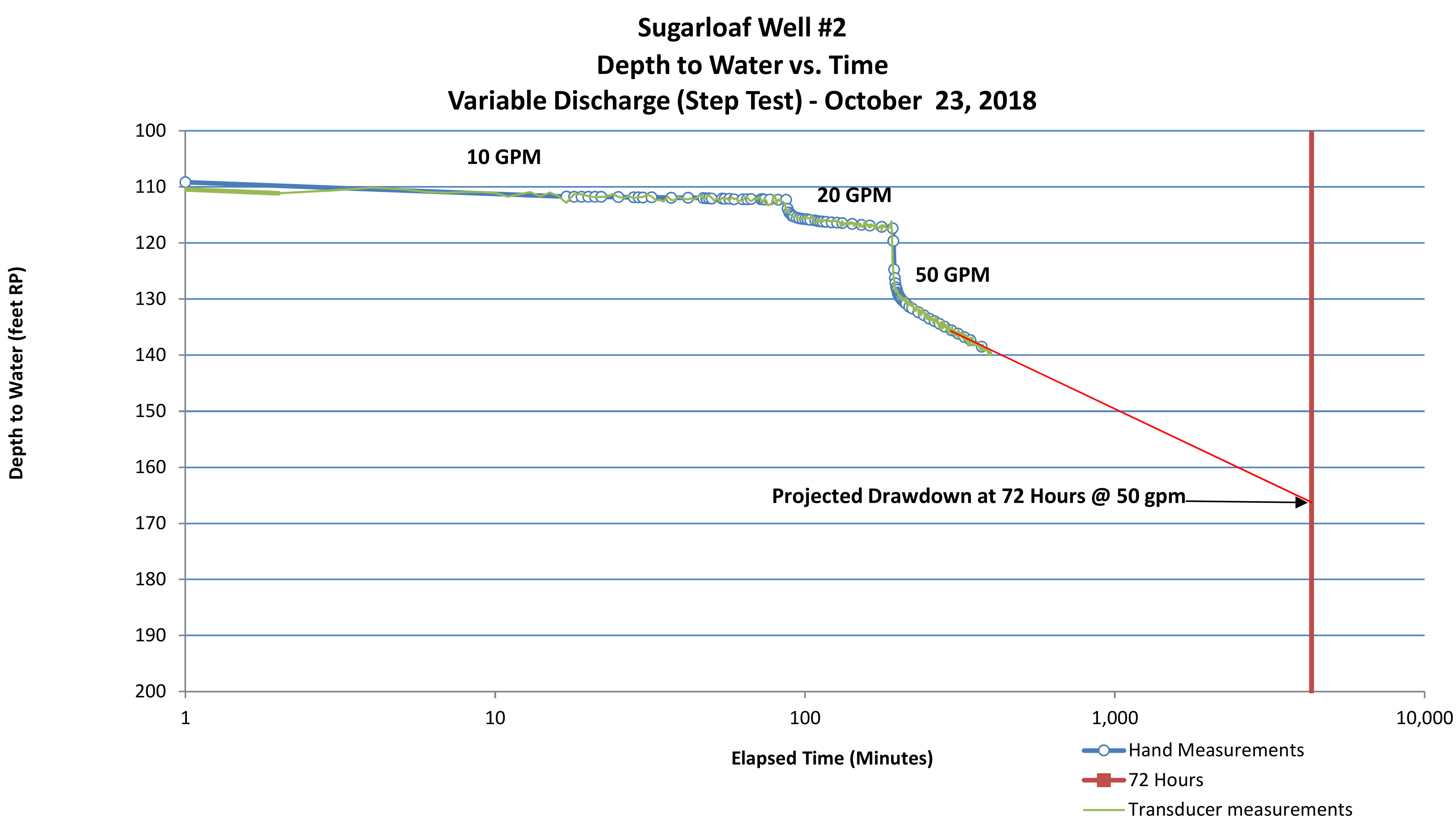


Lawrence & Associates, 015024.00

FIGURE 4

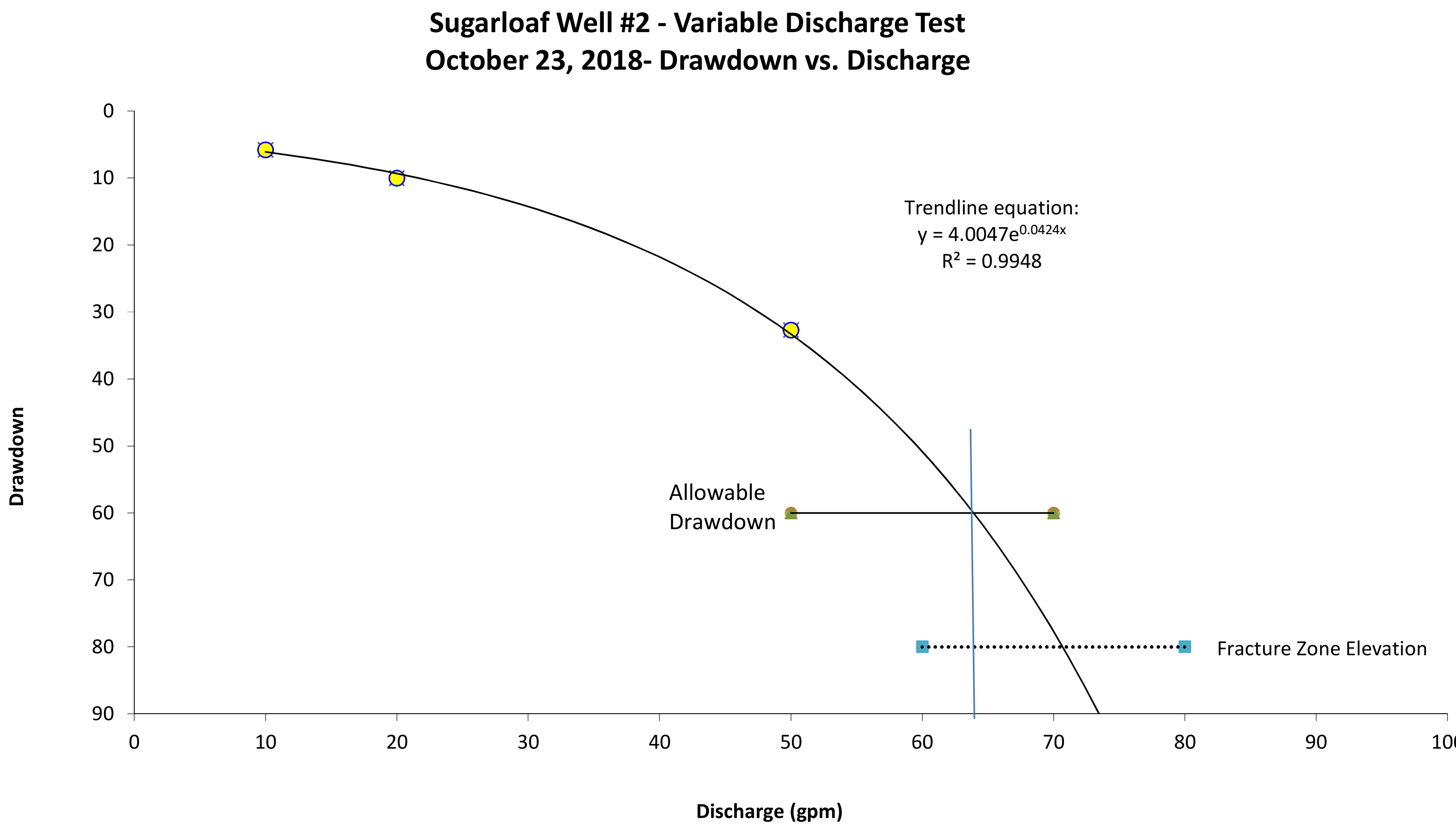
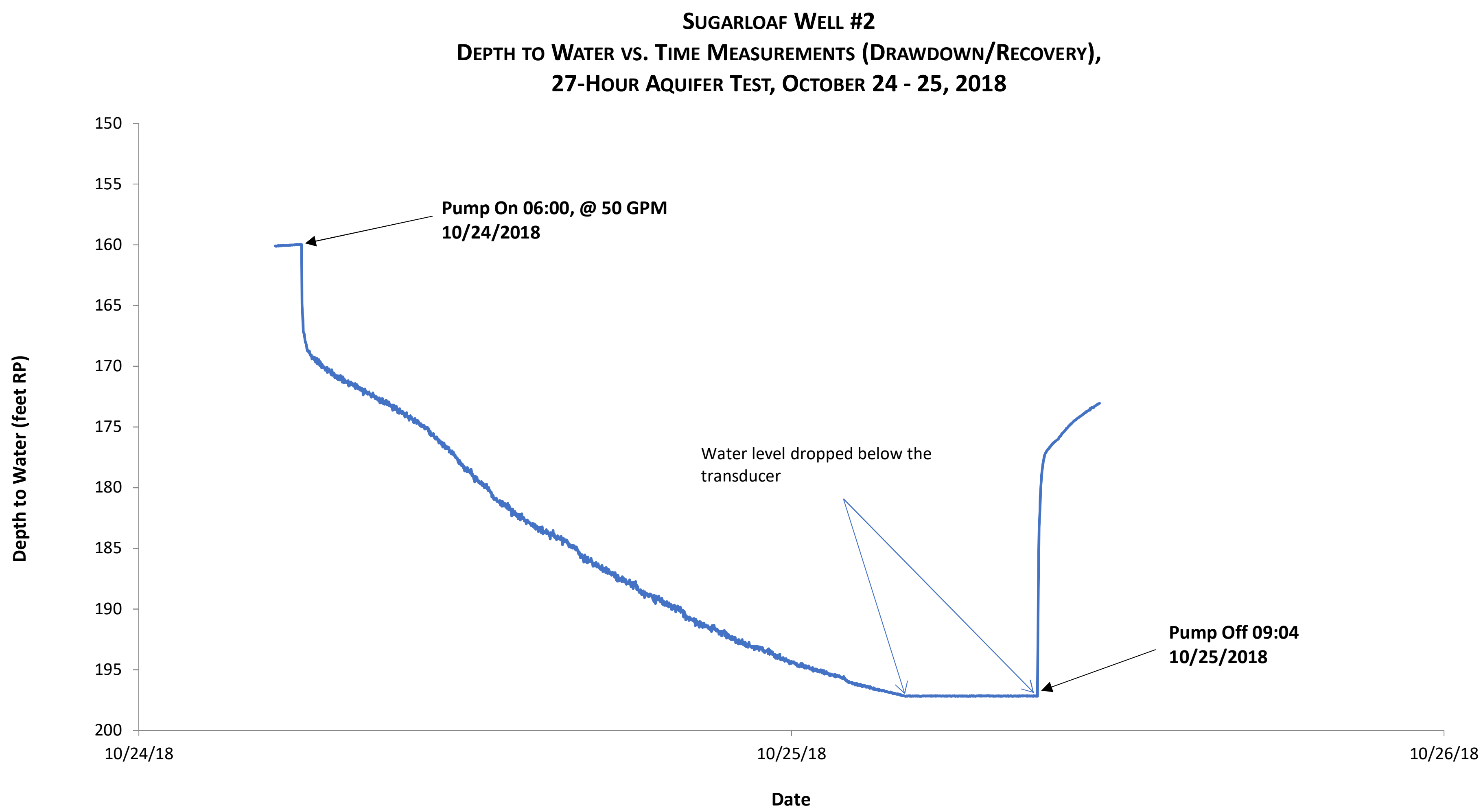

Sugarloaf Well #2 - Variable Discharge Test
October 23, 2018- Drawdown vs. Discharge
Drawdown
0
10
20
30
40
50
60
70
80
90
0
10
20
30
40
50
60
70
80
90
100
Discharge (gpm)
Trendline equation:
$y = 4.0047e^{0.0424x}$
$R^2 = 0.9948$
Allowable Drawdown
Fracture Zone Elevation

Figure 5



Sugarloaf Well #2
Depth to Water vs. Time Measurements (Drawdown/Recovery),
27-Hour Aquifer Test, October 24 - 25, 2018
Depth to Water (feet RP)
150
155
160
165
170
175
180
185
190
195
200
Pump On 06:00, @ 50 GPM
10/24/2018
Water level dropped below the
transducer
Pump Off 09:04
10/25/2018
10/24/18
10/25/18
10/26/18
Date

FIGURE 6

Sugarloaf Well #2

Depth to Water vs. Time (Hand Measurements), 27-Hour Pump Test with Long-Term Yield Calculations October 24 to 25, 2018

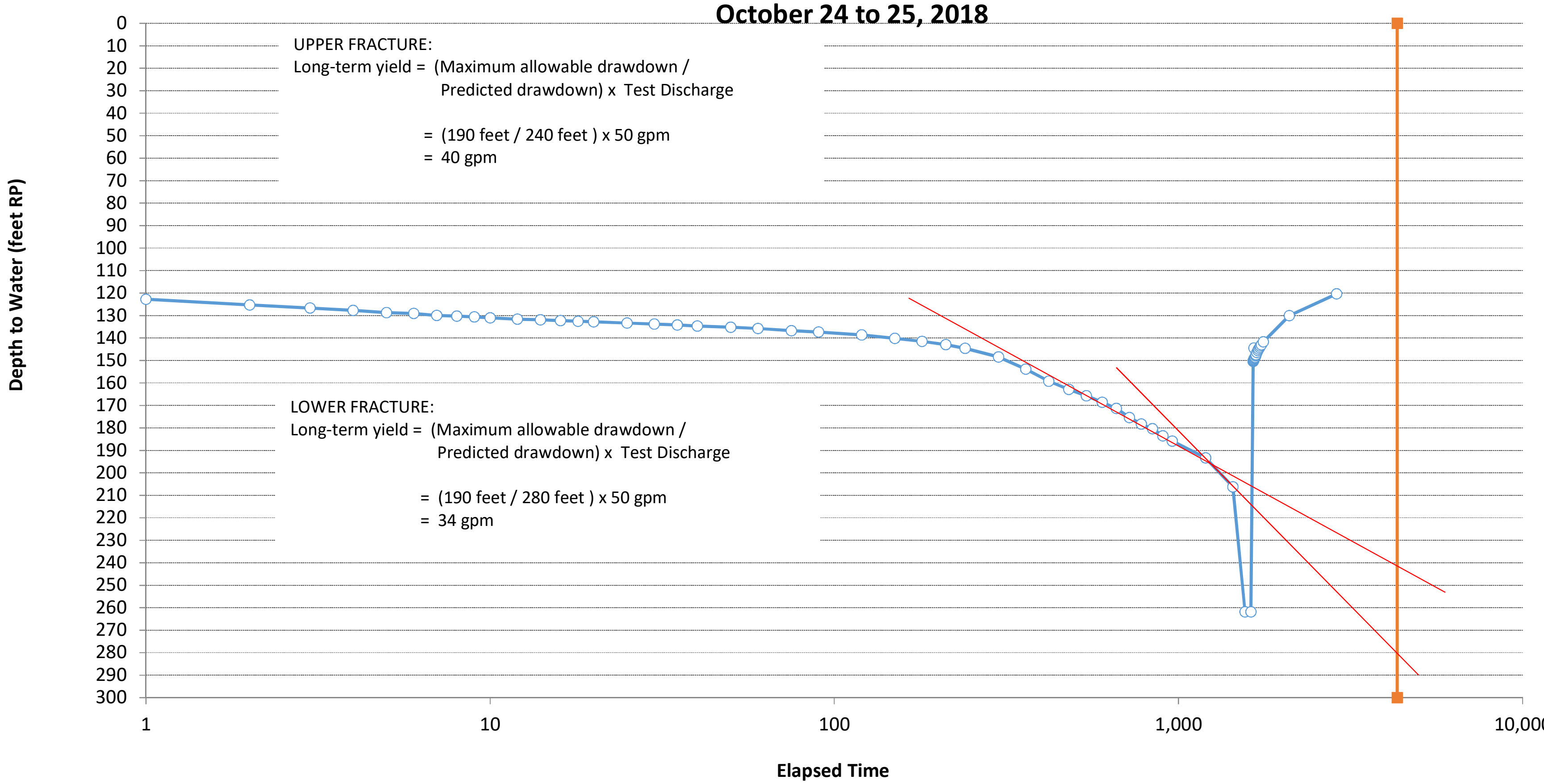
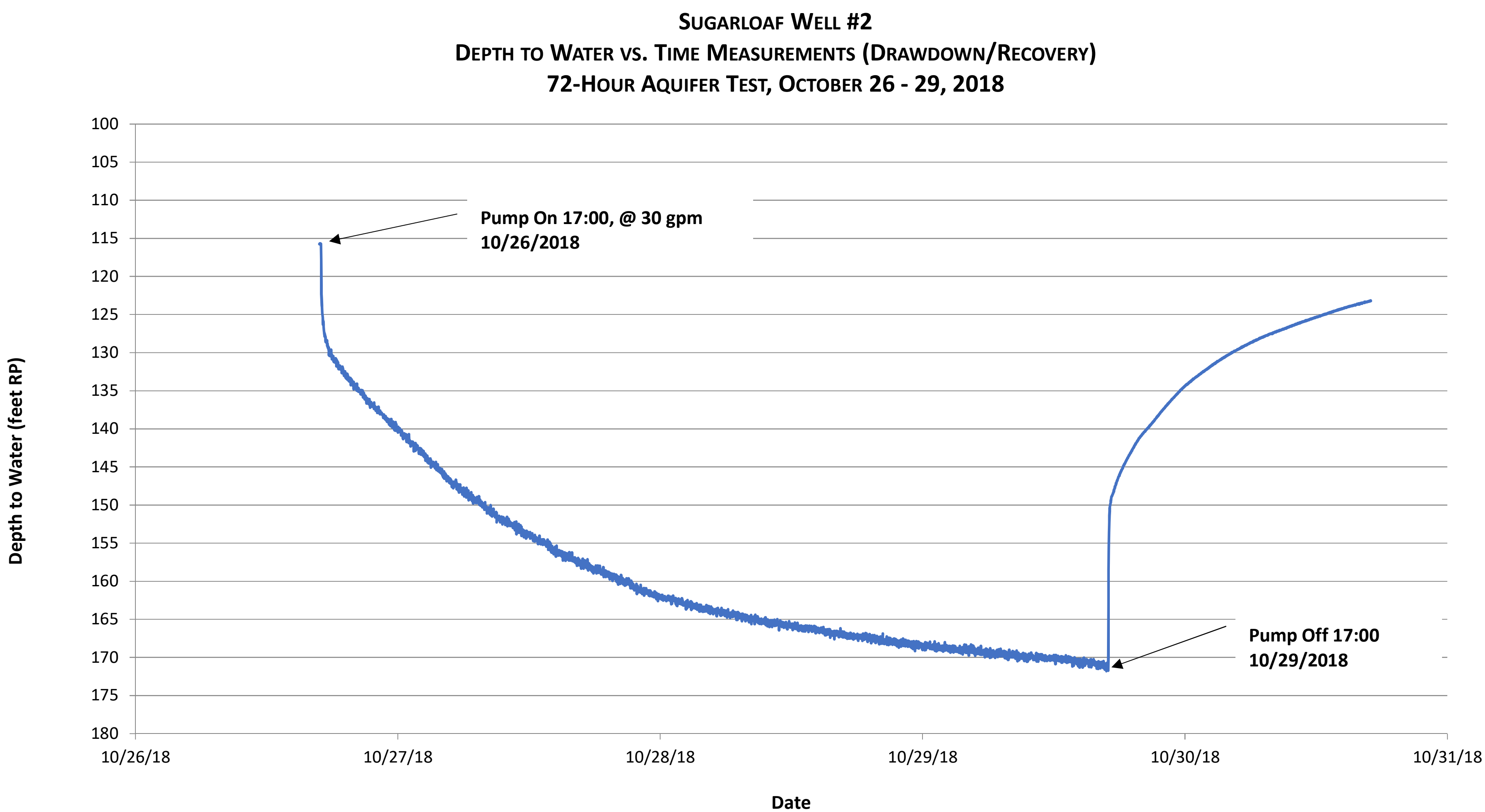
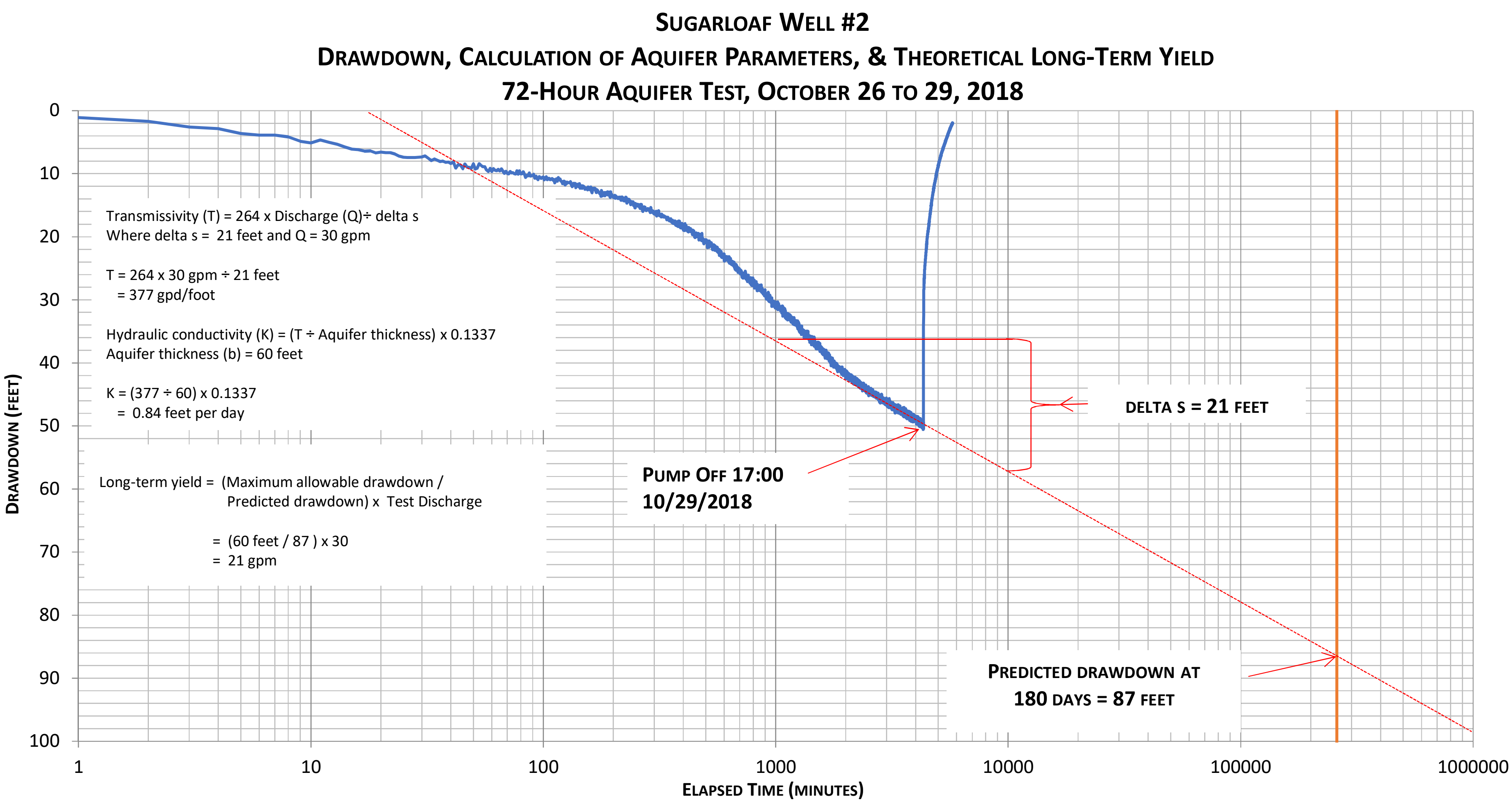


FIGURE 7



Sugarloaf Well #2
Depth to Water vs. Time Measurements (Drawdown/Recovery)
72-Hour Aquifer Test, October 26 - 29, 2018
Depth to Water (feet RP)
100
105
110
115
120
125
130
135
140
145
150
155
160
165
170
175
180
Pump On 17:00, @ 30 gpm
10/26/2018
Pump Off 17:00
10/29/2018
10/26/18
10/27/18
10/28/18
10/29/18
10/30/18
10/31/18
Date

FIGURE 8



Sugarloaf Well #2
Drawdown, Calculation of Aquifer Parameters, & Theoretical Long-Term Yield
72-Hour Aquifer Test, October 26 to 29, 2018
Drawdown (feet)
Elapsed Time (minutes)
0
10
20
30
40
50
60
70
80
90
100
1
10
100
1000
10000
100000
1000000
Transmissivity (T) = 264 x Discharge (Q)÷ delta s
Where delta s = 21 feet and Q = 30 gpm
T = 264 x 30 gpm ÷ 21 feet
= 377 gpd/foot
Hydraulic conductivity (K) = (T ÷ Aquifer thickness) x 0.1337
Aquifer thickness (b) = 60 feet
K = (377 ÷ 60) x 0.1337
= 0.84 feet per day
Long-term yield = (Maximum allowable drawdown / Predicted drawdown) x Test Discharge
= (60 feet / 87) x 30
= 21 gpm
Pump Off 17:00
10/29/2018
Delta s = 21 feet
Predicted drawdown at
180 days = 87 feet

FIGURE 9

APPENDIX A

PERMITTING DOCUMENTS

Shasta County Department of Resource Management
Environmental Health Division

1855 Placer Street, Suite 201, Redding, CA 96001. Phone (530) 225-5787, FAX (530) 225-5413

WELL PERMIT

PERMIT NUMBER: WTR18-0128

Completed
11-6-18
by CG

Property Owner: SHASTA COUNTY DPW
Well Number:
Site Address: OAK KNOLL DRIVE
Assessor's Parcel #: 085060033000
Work Type: NEW WELL
Proposed Use: PUBLIC

Water District:
Well Driller: ENLOE DRILLING AND PUMPS INC

The permitted well shall conform to the specifications and provisions of the State of California Water Well Standards Bulletin 74-81 and Supplement Bulletin 74-90. Deviations from the specifications in this permit shall have prior approval from the Shasta County Environmental Health Division.

Driller shall possess a C-57 well drilling license and be currently bonded with Shasta County.

The well shall be located on the property as shown in the attached drawing prepared by PACE ENGINEERING and dated 7/13/2018. Changes shall be approved in advance by the Shasta County Environmental Health Division prior to construction.

Please contact the Shasta County Environmental Health Division at 530/225-5787, if you have any questions regarding this permit.

Standard Permit Conditions:

1: Seal depth shall be a minimum of 50 feet.
2: Maintain all required setbacks.
3: Well is to be located a minimum of 50 feet from any sewer, septic tank, or pit privy and a minimum of 100 feet from any structure or facility designed to allow sewage to percolate into the ground.

Special Permit Conditions:

This permit does not authorize the violation of any law or regulations of Shasta County and the State of California.

The driller shall submit the well completion report to the Shasta County Environmental Health Division within 60 days of construction.

Well permits expiring without well completion report may result in a Notice of Non-Compliance recorded on the parcel.

The California Department of Water Resources shall be notified within 60 days of construction pursuant to the Water Code, Section 13751.

Issued by: Christy Gilbreath
CHRISTY GILBREATH, R.E.H.S

Effective date: 07/30/2018
Expiration date: 07/29/2020
PERMIT IS NON-RENEWABLE

SEE REVERSE REGARDING WELL INSTALLATION INSPECTION NOTIFICATION

State of California
Well Completion Report
Form DWR 188 Submitted 11/6/2018
WCR2018-010033

Owner's Well Number 1 | Date Work Began 08/30/2018 | Date Work Ended 10/14/2018

Local Permit Agency Shasta County Environmental Health

Secondary Permit Agency | Permit Number wtr18-0128 | Permit Date

Well Owner (must remain confidential pursuant to Water Code 13752)

Name SHASTA COUNTY DPW, E Wedemeyer

Mailing Address 1855 Placer St

City Redding | State CA | Zip 96001

Planned Use and Activity

Activity New Well

Planned Use Water Supply Public

Well Location

Address 0 Oak Knoll Dr

City Lakehead | Zip 96051 | County Shasta

	Deg.	Min.	Sec.	
Latitude	40	51	22.8852	N
Longitude	-122	24	5.7582	W

Dec. Lat. 40.856357 | Dec. Long. -122.4015995

Vertical Datum | Horizontal Datum WGS84

Location Accuracy | Location Determination Method

APN 085060033000

Township 35 N

Range 05 W

Section 26

Baseline Meridian Mount Diablo

Ground Surface Elevation

Elevation Accuracy

Elevation Determination Method

Borehole Information

Orientation Vertical | Specify

Drilling Method Downhole Rotary Hammer | Drilling Fluid Foam

Total Depth of Boring 310 Feet

Total Depth of Completed Well 290 Feet

Water Level and Yield of Completed Well

Depth to first water 110 (Feet below surface)

Depth to Static Water Level 97 (Feet) | Date Measured 10/14/2018

Estimated Yield* 30 (GPM) | Test Type Pump

Test Length 72 (Hours) | Total Drawdown 171 (feet)

*May not be representative of a well's long term yield.

Geologic Log - Free Form

Depth from Surface Feet to Feet		Description
0	11	Top Soil/ Cobbles
11	100	Brown Clay and Gravel
100	310	Black Fractured Rock

Casings

Casing #	Depth from Surface Feet to Feet		Casing Type	Material	Casings Specificatons	Wall Thickness (inches)	Outside Diameter (inches)	Screen Type	Slot Size if any (inches)	Description
1	0	150	Blank	Copper-Bearing Steel	Nominal Size: 6 in. | Thickness: 1/4 in. | OD: 6-5/8 in.	0.25	6.625			
1	150	270	Screen	Copper-Bearing Steel	Nominal Size: 6 in. | Thickness: 1/4 in. | OD: 6-5/8 in.	0.25	6.625	Louver	50	
1	270	290	Blank	Copper-Bearing Steel	Nominal Size: 6 in. | Thickness: 1/4 in. | OD: 6-5/8 in.	0.25	6.625			

Annular Material

Depth from Surface Feet to Feet		Fill	Fill Type Details	Filter Pack Size	Description
0	70	Cement	Portland Cement/Neat Cement		
70	75	Bentonite	Non Hydrated Bentonite		
75	290	Filter Pack	6 x 12		
290	310	Other Fill	See description.		Cuttings that would not clean out

Other Observations:

Borehole Specifications

Depth from Surface Feet to Feet		Borehole Diameter (inches)
0	75	15
75	310	12

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name ENLOE DRILLING AND PUMPS INC
Person, Firm or Corporation

6845 GRANADA DRIVE	REDDING	CA	96002
Address	City	State	Zip

Signed *electronic signature received* — C-57 Licensed Water Well Contractor; 11/06/2018 — Date Signed; 989728 — C-57 License Number

DWR Use Only

CSG #	State Well Number	Site Code	Local Well Number

N W

Latitude Deg/Min/Sec Longitude Deg/Min/Sec

TRS:

APN:

APPENDIX B

TEST-WELL SPECIFICATION DOCUMENT

EXHIBIT D

SECTION 1 WELL DRILLING AND INSTALLATION

A. GENERAL

(1) Except as noted, the CONTRACTOR shall furnish all materials, equipment, labor, and tools as required to complete the following work. The well is to be drilled by a method appropriate for the well size and conditions, as described herein. All final drilled depths, casing, screen, grout, and gravel pack intervals will be determined in the field following logging of the hole by the ENGINEER:

a. Mobilize, bond, provide insurance, demobilize, and permit well.

b. Drill and complete one 6-inch steel-cased production well (Sugarloaf Well #2) to a maximum of 300 feet below ground surface (bgs).

c. Develop well and conduct a minimum 8-hour stepped discharge test at rates of approximately 10, 20, and 50 gallons per minute (gpm).

d. Disinfect and cap well, complete, with site cleanup.

(2) OWNER will provide drivable access to the drill site. The location of the well is shown on **Figures 1** and **2**. Exact location of the well will be staked and marked in the field. **Figure 3** shows the proposed construction detail.

(3) The project site is located in the Sugarloaf area, near Lakehead, California. Sugarloaf Well #5, located approximately 1,650 feet north-northeast of the proposed Well #2 location showed the following stratigraphy; conditions at the well location are expected to be generally similar to those at the test hole location, although existing Well #5 is approximately 200 feet lower in elevation:

0 to 7 feet bgs	Fill, brown clay, and rock
7 to 179 feet bgs	Shale
179 to 190 feet bgs	Gray lava, hard
190 to 267 feet bgs	Shale

The static water level in the proposed Well #2 may be up to 200 feet bgs, or lower.

(4) The CONTRACTOR shall comply with all local sound control and noise level rules, regulations, and ordinances which may apply to any work performed pursuant to the contract. Internal combustion engines shall be operated only between the hours of 7:00 A.M. and 7:00 P.M., Monday through Friday. When installing the casing, screen, and sanitary seal, a 24-hour workday will be permitted.

EXHIBIT D

Each internal combustion engine, used for any purpose on the job or related to the job, shall be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine shall be operated on the project without said muffler.

(5) The CONTRACTOR shall provide to the ENGINEER the following submittals before drilling begins:

a. Manufacturer's sheets for all materials used in the construction of the well, including, but not limited to, blank casing, slotted casing, filter pack, sanitary-seal material

b. Written programs for proposed drilling method(s) and drilling mud/cuttings containment and disposal, as applicable.

c. Written program for well development and capacity-testing water dispersal, including testing protocol and best management practices (BMP).

B. MATERIALS

DRILLING

(1) Drilling fluid shall consist of potable water and a commercial-grade bentonite manufactured for the specific purpose for a drilling-fluid additive. Other additives used to stop lost-circulation or weight the mud shall be as recommended by the manufacturer for the particular use, National Sanitation Foundation (NSF) approved, and approved by the ENGINEER prior to use during drilling.

CASING

(2) Blank and slotted casing shall be copper-bearing carbon steel pipe. Blank casing shall be welded or seamless, either fabricated or mill-type. Steel for fabricated pipe will conform to ASTM Standard 139-Grade B, or better.

(3) Slotted casing shall be louvered-type, Super-Flo (Roscoe-Moss), or equivalent.

(4) Blank and slotted casing shall be minimum 6-inch I.D., and 0.250-inch wall thickness.

(5) Slot size shall be 0.050-inch (No. 50 slot), although final slot-size shall be determined after analysis of formation samples.

(6) Blank and slotted casing shall be of new, first-quality material and free of defects in workmanship and handling. No reject, subgrade or limited-use pipe will be acceptable.

(7) Blank casing shall be furnished in either-plain ends with beveled edges, or with collars. Plain ends shall be factory cut and beveled. Ends shall be cut perpendicular to the long axis of the casing.

(8) Blank and slotted casing shall be furnished in 20-foot or longer lengths, except as specified for making up designed sections.

(9) Centralizers for centering the casing in the hole shall be made from mild steel and welded in place.

FILTER PACK AND GROUT BARRIER

(10) The filter pack shall consist of clean, sound, durable, well-rounded, river-run or ocean-run rock containing no silt, clay, organic material anhydrite, gypsum, or calcareous material. Specific gravity shall not be less than 2.5.

(11) The gravel pack shall consist of SRI No. "6 x 12" sand, or equivalent, as approved by the ENGINEER, and shall have the following size distribution:

(12)

U.S. Sieve No.	Size (inches)	Cumulative Percent Passing
4	0.187	98 – 100
6	0.157	62 – 89
8	0.0937	20 – 39
12	0.0663	5 – 14
16	0.0469	0 – 4
20	0.0331	0 – 2

(13) The grout barrier shall consist of sodium bentonite pellets or chips hydrated in place.

(14) Bentonite shall be delivered to the site in commercially-prepared, unopened containers. Each container shall have a description of the material contained, and show the manufacturer.

(15) All materials used in the bentonite barrier shall be NSF approved; documentation of NSF approval for materials' use in potable water wells shall be submitted to the ENGINEER before work begins.

(16) CONTRACTOR shall provide an approved device to measure the level of the filter pack and bentonite in the hole during placement. An approved sounder

would consist of a fabric surveyor's tape with a weighted end, and having continuous markings in feet and inches. An unmarked line or line having markings every 5 to 10 feet will not be acceptable.

SURFACE SEAL

(17) Cement for the cement-gout shall be made from Portland Cement conforming to ASTM C150, Type I or II.

(18) The cement grout shall be a commercially prepared mixture of cement, sand, and water in the proportion of not more than two parts by weight of sand to one part of cement with not more than 6 gallons of clean water per bag of cement (one cubic foot or 94-pounds). The use of admixtures to reduce shrinkage, reduce permeability, increase fluidity, and/or control time of set must be approved by the ENGINEER.

(19) All materials used in the surface seal shall be NSF approved; documentation of NSF approval for materials' use in potable water wells shall be submitted to the ENGINEER before work begins.

C. WORKMANSHIP

DRILLING

(20) Well #2 shall be constructed in conformance with State of California Water Well Standards as described in Department of Water Resources Bulletin No. 74 (latest edition). The Contract Documents shall prevail where State standards recommend construction methodologies or materials different than set forth herein.

(21) The CONTRACTOR shall be licensed in accordance with the State of California CONTRACTORs License Law, Chapter 9, Division 3 of the business and Professional Code unless exempted by law.

(22) The CONTRACTOR shall file the required drilling logs with the California Department of Water Resources and other agencies as required, and provide the OWNER and ENGINEER with copies.

(23) The CONTRACTOR shall obtain and pay for all drilling permits as required, before commencement of work.

(24) CONTRACTOR shall provide pedestrian and vehicular traffic control near the job site when required, at no additional cost to OWNER.

SECTION 1 WELL DRILLING AND INSTALLATION

(25) The CONTRACTOR shall protect all existing fences, buildings, trees, and other culture during the progress of the work. After completion of the work, the CONTRACTOR shall remove from the site all material and debris, remove drilling mud and cuttings, fill in any excavations with dry compactable fill, and restore the drill site to its original condition as nearly as possible.

(26) Set up construction facilities in a neat and orderly manner within a designated area at the well site as approved. Handling of equipment and materials and the rigging of temporary utility facilities, as required, under this subsection shall all be in accordance with current guidelines as set forth by the Occupational Safety and Health Administration (OSHA).

(27) A CONTRACTOR's security fence may be constructed for safety and for the protection of materials, tools, and equipment of the CONTRACTOR, as approved. At completion of the work, remove fence from the site and restore the area.

(28) Drilling fluid discharged from the well shall be discharged to a shaker. Use of a mud pit will not be allowed. Drilling mud residue and cuttings shall be removed by the CONTRACTOR within one week of the completion of drilling.

(29) The CONTRACTOR shall provide on-site portable sanitary facilities.

(30) Water and 230-V power is available at the site. CONTRACTOR shall coordinate with the County to arrange water and power usage during drilling. CONTRACTOR shall maintain at least a 12-inch air gap between the water discharge hose and any appurtenance at all times.

(31) The CONTRACTOR shall maintain a Daily Construction Log in which is recorded each change in formation drilled for all holes, work in progress including but not limited to footage drilled, materials installed, hours of work, names of drilling crew, and equipment in operation. A copy of the daily log shall be submitted to the ENGINEER the following work day. The CONTRACTOR shall collect and bag cuttings samples every 10 feet and at changes in formation, and shall provide the ENGINEER with the samples upon request.

(32) Drill depth and completed intervals of Well #2 will be determined following the logging of the bore hole by the ENGINEER.

(33) The CONTRACTOR shall provide drilling equipment capable of drilling a 12-inch diameter or larger hole to 300 feet. If conductor casing is needed, the CONTRACTOR shall provide drilling equipment capable of drilling a 15-inch diameter or larger hole to the depth of the conductor casing installation.

(34) The CONTRACTOR shall set aside formation samples every 10 feet or at formation changes for the ENGINEER's inspection.

(35) The hole shall be drilled a minimum of 10 feet below the bottom of the screened section (bottom of screen anticipated to be at a depth of 290 feet bgs). The CONTRACTOR may drill additional over hole as he chooses, at his own cost.

(36) Abandoned hole - The CONTRACTOR shall be responsible for maintaining a head of water or mud in the drilled hole (pilot hole or reamed hole) to prevent the hole from collapsing. Any collapsed hole caused by a reduction of head in the hole from either lost circulation or interruption of makeup water to the recirculation mud pit, improper mud control, or other reasons, shall be abandoned and a new hole started, all at the CONTRACTOR's expense. The abandoned hole shall be filled and sealed by an approved method at the CONTRACTOR's expense.

(37) Straightness - The CONTRACTOR shall take necessary precautions and provide adequate equipment for drilling a straight and plumb 12-inch diameter hole. The ENGINEER shall require plumbness and alignment tests on the pilot hole or reamed hole at the CONTRACTOR's expense. See items 44 and 45, below, for descriptions of plumbness and alignment tests.

(38) Protection of drill hole at finish grade - The CONTRACTOR shall have the option of using whatever method is deemed necessary to prevent the top edge of the drill hole from collapsing or sloughing. Any type of pipe or sheeting placed around the top of the drill hole shall be either cemented in place with a minimum of a 4-inch-thick cement-grout seal, or removed prior to placement of the grout sanitary seal. Cemented in-place conductor pipe shall be cut off at least 18 inches below ground surface.

CASING

(39) The blank casing and screen shall be hung in tension in the hole during the gravel-packing operation. The casing string shall not be allowed to rest on the bottom of the hole.

(40) Casing shall be centered in the hole using centralizers. Centralizers on 90-degree centers shall be set in the middle and bottom part of the blank casing above the perforated interval, and in the middle and bottom part of the screened interval.

(41) Attach the bottom plate to the bottom of the screen by a full-circumference weld.

(42) All welding shall be in conformance with applicable provisions of the American Welding Society.

(43) Blank casing or screen which fails, collapses, separates, or does not pass the tests for plumbness and alignment shall be repaired or replaced at the CONTRACTOR's expense. In the event the defective or damaged casing cannot repaired or replaced to the satisfaction of the ENGINEER, the CONTRACTOR may be required to abandon the well and drill a new well. No additional compensation shall be allowed for the drilling of a new well or the placement of new casing in a new well required by the conditions noted in this section.

(44) Alignment test - The CONTRACTOR shall provide a 40-foot long section of pipe or a dummy of the same length to test alignment. The outside diameter of the test piece shall be one inch less than the inside diameter of the casing. The CONTRACTOR shall perform the alignment test in the presence of the ENGINEER. An approved dummy would consist of a rigid spindle with three rings attached to the spindle; one ring at each end and one ring in the center. Each ring to be 12 inches long in a direction parallel to the spindle.

(45) Plumbness test - The CONTRACTOR shall perform a plumbness test on the installed casing. The casing shall be plumb to within a maximum variation of two-thirds of the inside diameter of that part of the casing being tested per 100 feet. The CONTRACTOR shall perform the plumbness test in the presence of the ENGINEER.

(46) Departure from a straight line in the blank casing and screen shall not exceed that which will allow the passage thought the casing of the 40-ft pipe section or dummy without binding the side of the casing or screen.

GRAVEL PACK

(47) The CONTRACTOR shall have the responsibility and shall determine when the conditions with respect to drilling fluid and hole stability are satisfactory for gravel placement to begin without bridging of the gravel occurring during placement.

(48) The procedure for placing the gravel shall prevent segregation and bridging of graded material, and the entire gravel-packing operation shall continue without interruption from the bottom of the hole to the top of the gravel-packed interval.

(49) During placement of the gravel the top of the gravel shall be continuously sounded with the gravel-sounding device. Gravel brought above the intended

gravel-packed interval shall be removed from the hole. If the gravel bridges, or comes above the intended interval, the CONTRACTOR shall correct the problem with no damage to the well or drill a new well, complete, at his expense.

(50) The recommended procedure for placement of the gravel in the hole would be by a tremie running with clear water. Placement of gravel by end-dumping with a loader or shoveling directly into the hole will not be allowed. The CONTRACTOR shall submit a plan to the ENGINEER for approval for gravel-packing the well. Approval of such a plan does not relieve the CONTRACTOR from his responsibility to place the gravel in the annulus without bridging.

GROUT BARRIER

(51) The CONTRACTOR shall have the responsibility and shall determine when the conditions with respect to hole stability are satisfactory for placement of the grout barrier without bridging of the bentonite pellets occurring during placement.

(52) The procedure for placing the grout barrier shall prevent bridging of material, and the entire grout-barrier placement shall continue without interruption from the top of the gravel pack to the bottom of the sanitary-seal interval.

SURFACE SEAL

(53) The surface-seal grout shall be placed in the hole in one continuous operation from the bottom upwards by the use of a tremie pipe and pressure-grout pump. The grout seal shall be placed from the top of the grout barrier to within one foot of ground surface. Backfill to grade with local soil.

(54) The CONTRACTOR shall take necessary steps to prevent the casing from collapsing during placement of the grout sanitary seal. If the casing fails during grouting, the CONTRACTOR shall correct the problem with no damage to the well, or drill a new well, complete, at his expense.

(55) The CONTRACTOR shall allow 24 hours to pass before work commences on any well following installation of the sanitary seal. No later than 36 hours after the sanitary seal has been installed, development shall begin.

(56) All materials used in the surface seal shall be NSF approved; documentation of NSF approval for materials' use in potable water wells shall be submitted to the ENGINEER before work begins.

EXHIBIT D

<u>SECTION 1</u> <u>WELL DRILLING AND INSTALLATION</u>

SPECIFIC-CAPACITY & CONSTANT-DISCHARGE TESTING

(63) Specific-capacity testing will consist of a minimum 8-hour stepped-discharge test at rates of approximately 10, 20, and 50 gpm.

(64) Constant-discharge testing will consist of a minimum 72-hour constant-discharge test at a maximum rate of 50 gpm, and a minimum 72-hour recovery period (during which the pump cannot be removed from the well).

(65) After specific-capacity testing, the constant-discharge test may begin when the static water level recovery is at least 95% of drawdown.

(66) The CONTRACTOR may not disturb or remove test-pumping equipment after the constant-discharge test for at least 12 hours.

(67) The CONTRACTOR shall operate the test-pumping equipment either continuously or at various rates of discharge, as directed by the ENGINEER, and for such periods of time as directed by the ENGINEER.

(68) The CONTRACTOR shall be prepared to operate, uninterrupted, and monitor the test-pumping equipment over a minimum, continuous 72-hour period.

(69) The CONTRACTOR shall furnish an operator as needed during the test-pumping period to monitor the equipment. The ENGINEER will be on site periodically during the testing period to verify a constant discharge. Discharge rate will be set by the ENGINEER prior to the start of the test. The ENGINEER will provide and monitor downhole data-logging equipment during the pumping and recovery periods.

(70) Water from the pumping test can be discharged into a swale located adjacent to the drilling site, under a permit obtained by the County and after treatment with BMP to limit turbidity to less than 100 NTU. Multi-baffled settling tanks, or equivalent, shall be used, if necessary, to remove large particles and reduce turbidity to <100 NTU, or the water can be trucked to an offsite location suitable for disposal. If further management is needed to reduce turbidity to <100 NTU after settling, the CONTRACTOR shall filter the water using a filter-bag filtration system, or equivalent, before discharging to the swale. In addition to reducing the turbidity of discharged water, the CONTRACTOR shall employ appropriate BMP to prevent erosion and control sediment.

(71) During the test-pumping operation, the CONTRACTOR may utilize the speed of the prime mover to vary the discharge rate; however, a valve or butterfly valve shall also be installed on the discharge line to throttle the discharge.

AIR-LIFT AND PUMPING DEVELOPMENT

(57) The air pipe shall be run to the bottom of the perforated casing and screened sections of the well and alternately blown and surged to evacuate the well of drilling mud and other fine material entering the well during gravel packing.

(58) Pumping and surging shall consist of blowing for not more than 15 minutes followed by 3 surges. Each surge shall consist of shutting off the air, letting the water fall within the drop pipe, and injecting air to bring the water to ground surface, or as directed by the ENGINEER.

(59) Air development will continue in the above manner, or as directed by the ENGINEER, until the discharge water is visually clean and free from all drilling fluid and/or suspended material from the gravel pack and/or formation, or as terminated by the ENGINEER.

(60) Development water will be discharged to the drainage located immediately south to southwest of the drilling location. The County will obtain the appropriate permit for the discharge. The CONTRACTOR shall provide adequate erosion control measures to prevent erosion at the discharge location. Prior to construction, the CONTRACTOR shall submit to the ENGINEER a well-development and testing plan for approval. The plan shall include a testing protocol and description of BMP for erosion control.

(61) Following development by air in Well #2, the CONTRACTOR shall install a pump for additional development. The well shall be alternately pumped and surged, as directed by the ENGINEER, until the discharge water is clean and free from all drilling fluid and/or suspended material and turbidity is less than 5 NTU, or when terminated by the ENGINEER. Sand content of Well #2 during development pumping shall be measured using a Rossum sand tester or equivalent and recorded every 15 minutes.

(62) The CONTRACTOR shall test the well-development water when it is discharged after treatment (see **Item 70**), as follows:

First sample:	Once during the first 10 minutes of discharge.
Second sample:	Once during the next 50 minutes of discharge.
Third sample:	Within last 10 minutes of discharge.

The turbidity of the treated discharge shall not exceed 100 NTU at any time.

SECTION 1 WELL DRILLING AND INSTALLATION

(72) Although the ENGINEER will provide and monitor downhole data-logging equipment during the pumping and recovery periods, the CONTRACTOR shall make his own drawdown and discharge measurements, and these measurements shall become part of the CONTRACTOR's daily log. The CONTRACTOR shall submit the log to the ENGINEER after the test is completed.

(73) If either the 8-hour stepped-discharge or the 72-hour constant-discharge tests are interrupted through engine/pump failure, the CONTRACTOR shall let the well recover until the water level is within 2 feet of the static water level or a minimum of 95% of the total drawdown measured when the test was interrupted, whichever is more stringent, at no additional charge.

DISINFECTION

(74) Disinfection of Well #2 shall be performed in accordance with Appendix C of the Water Well Standards, Bulletin No. 74 (current edition), as published by the State of California, Department of Water Resources.

(75) Chlorine solution used for disinfection shall be pumped to a point of discharge in a manner that will not violate any discharge standards or cause any pollution in any watercourse. In no case shall the CONTRACTOR pump chlorinated water onto the ground.

(76) Upon completion of all work on the well, the CONTRACTOR shall install a lockable cap over the production casing. The OWNER will supply a lock.

WELL DESTRUCTION (IF NEEDED)

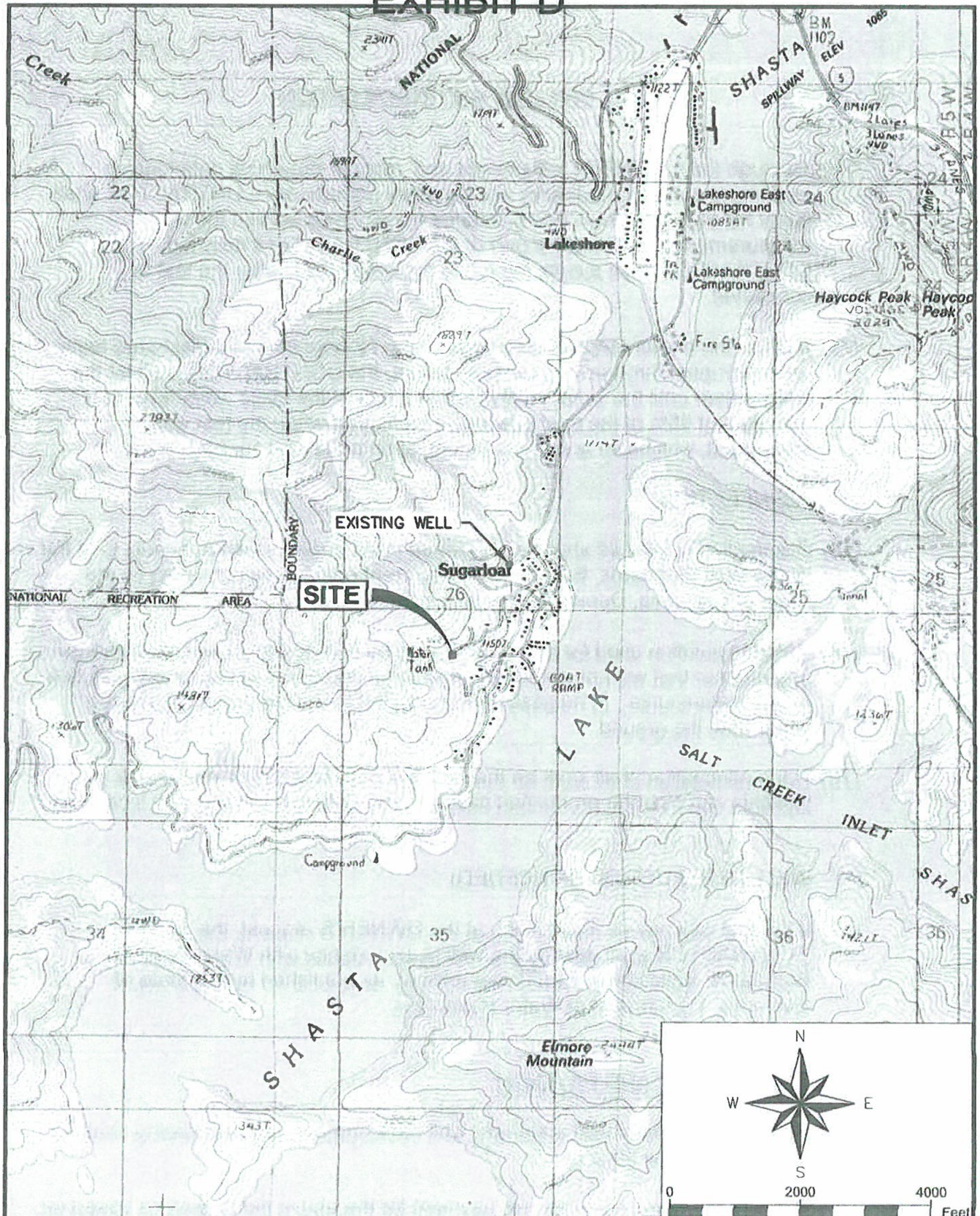
(77) If the test well proves insufficient, at the OWNER'S request, the CONTRACTOR shall destroy the well in accordance with Water Well Standards, Bulletin No. 74 (current edition), as published by the State of California, Department of Water Resources.

D. MEASUREMENT AND PAYMENT

(78) Payment for drilling, well materials, well development, and well testing shall be based on the unit price bid.

(79) Unless otherwise shown above, payment for the above items shall be based on the lump sum and unit prices set forth in the Proposal for each item.

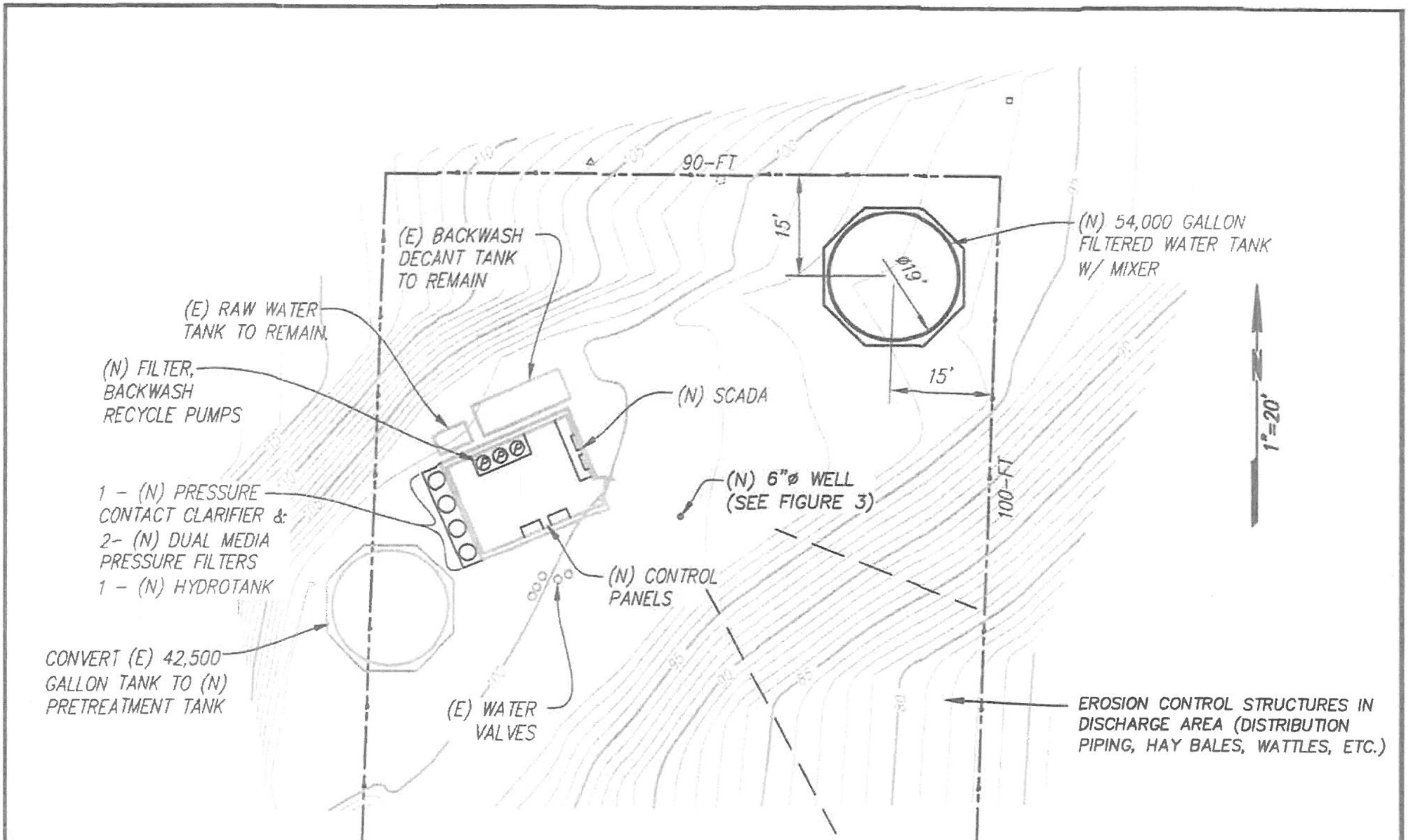
EXHIBIT D



LAWRENCE & ASSOCIATES ENGINEERS & GEOLOGISTS	SITE LOCATION MAP MAP ADAPTED FROM USGS 7.5-MINUTE TOPOGRAPHIC QUADS, LAMOINE, BOHEMOTASH MTN., HANLAND PEAK, & OBRIEN, CA.	PROJECT NAME: NEW WELL CLIENT: PACE ENG. SCALE: 1"=2,000'	PROJECT NO: 018024.00 DRAWN BY: J. BEERS CHECKED BY: B. LAMPLEY	DATE: 3/28/2018 FIGURE 1

p: \018024.00_pace\site_loc.dwg J.R.B. 3/28/2018

EXHIBIT D



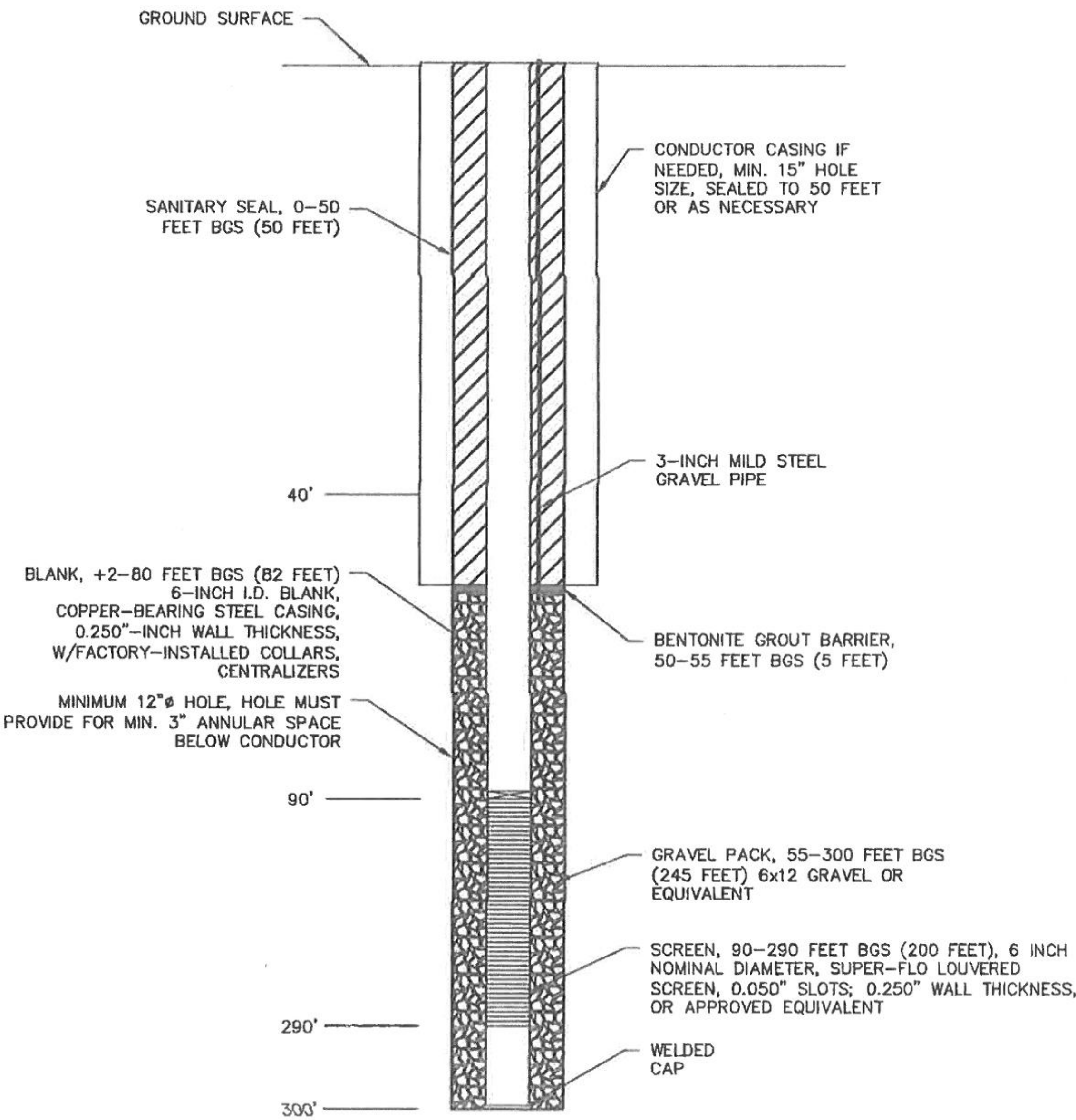
ADAPTED FROM: RECOMMENDED PROJECT SITE PLAN
BY PACE ENGINEERING,
DATED 4/3/18, JOB #199.95

LAWRENCE & ASSOCIATES ENGINEERS & GEOLOGISTS	SITE MAP SHASTA COUNTY SERVICE AREA NO. 2 SUGARLOAF	NEW WELL PACE ENGINEERING REDDING, CA.	PROJECT NO: 018024.00 DRAWN BY: J. BEERS CHECKED BY: B. LAMPLEY	SCALE: 1" = 20' DATE: 4/4/2018 FIGURE 2

p:\018024.00_pace\site_map.dwg J.R.B. 4/4/2018

EXHIBIT D

WELL CONSTRUCTION
(CASING, GRAVEL PACK, AND SURFACE SEAL ONLY)



TOTAL DEPTH, 300 FEET

QUANTITIES SHOWN FOR BIDDING PURPOSES ONLY;
FINAL QUANTITIES TO BE DETERMINED IN FIELD

300' WELL DETAIL
NTS

LAWRENCE & ASSOCIATES ENGINEERS & GEOLOGISTS	WELL CONSTRUCTION DETAIL	PROJECT NAME: NEW WELL	PROJECT NO: 018024.00	DATE: 4/2/2018
		CLIENT: PACE ENG.	DRAWN BY: J. BEERS	FIGURE 3
		SCALE: N.T.S.	CHECKED BY: B. LAMPLEY	

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APPENDIX C

L&A FIELD-DATA SHEETS, TRANSDUCER DATA CALIBRATION SHEETS, AND TRANSDUCER DATA SHEETS

Lawrence & Associates				Job No.:	Sugarloaf Well #2 Step Testing
Date	**Time**	**Depth to Water (feet)**	**Rate of Change (ft/min)**	**Discharge (gpm)**	**Comments**
10/23/18	10:19	109.15		10	Step Testing
	10:35	111.69			34648.5 totalizer
	10:36	111.75	.03		
	10:37	111.75	.00		Pump intake @ 260' bgs
	10:38	111.77	.01		
	10:39	111.77	.00		Transducer set @ ~195' bgs
	10:40	111.77	.00		
	10:43	111.79	.01		
	10:46	111.86	.02		
	10:47	111.83	.03		
	10:48	111.87	.04		
	10:50	111.86	.005		
	10:55	111.92	.012		
	11:00	111.92	0.00		
	11:05	111.98	0.012		
	11:06	112.02	0.04		
	11:07	112.04	0.02		
	11:08	112.05	0.01		
	11:12	112.08	0.0075		← New sounder
	11:13	112.10	0.02		
	11:15	112.11	0.005		
	11:17	112.20	0.045		
	11:21	112.18			
	11:23	112.18			
	11:25	112.16			
	11:30	112.21			
	11:31	112.17			
	11:32	112.22			
	11:35	112.24			
	11:40	112.30			
	11:45	112.28		20	
	11:46	113.85			
	11:47	114.53			

Lawrence & Associates				Job No.:	Step testing
Date	Time	Depth to Water (feet)	Rate of Change (ft/min)	Discharge (gpm)	Comments
10/23	11:48	114.87	.28	20	
	11:49	115.15			
	11:50	115.23	.08		
	11:52	115.47	.12		
	11:54	115.60	.065		
	11:56	115.70	.05		
	11:58	115.75	.025		
	12:00	115.79	.02		
	1202	115.85	.03		
	1206	115.97	.04		
	1208	116.09	.065		
	1210	116.12	.015		
	1212	116.20	.04		
	1215	116.21	.003		
	1220	116.31	.02		
	1225	116.36	.01		
	1230	116.45	.045		
	1240	116.60	.015		
	1250	116.74	.014		
	1300	116.87	.013		
	1315	117.10	.015		
	1330	117.36	.0	50	Wide open @
	1331	119.65			
	1332	124.71			
	1333	126.24			
	1334	127.18			
	1335	127.91			
	1336	128.33			
	1337	128.84			
	1338	129.13	0.29		
	1339	129.34	.21		
	1340	129.60	.26		
	1341	129.75			

Lawrence & Associates				Job No.:	Step testing
Date	Time	Depth to Water (feet)	Rate of Change (ft/min)	Discharge (gpm)	Comments
10/23/18	1342	129.89		50	
	1344	130.18	0.145		
	1346	130.44	0.13		
	1348	130.63	0.225		
	1350	130.83	0.1		
	1355	131.36	0.106		
	1400	131.66	0.06	49.77	
	1410	132.33	0.067		
	1420	132.88	0.055	49.83	
	1430	133.48	0.060		
	1440	133.93	0.045	49.80	
	1450	134.42	0.025	50.05	
	1500	134.89	0.047		
	1515	135.59	0.046	49.80	
	1530	136.15	0.037	49.80	
	1545	136.77	0.04	49.91	
	16:00	137.32	.03	49.86	
	1630	138.48	.03	49.88	
	1700	139.70	.04	50.18	
	1730	140.87	.039	50.02	
	1800	142.02	.038	49.99	

Sugarloaf Well #2 72-Hr Test (First Attempt)

Lawrence & Associates				Job No.:	27 hr test
Date	Time	Depth to Water (feet)	Rate of Change (ft/min)	Discharge (gpm)	Comments
10/24/18	0553	112.33'		0	51571.5 totalizer
	0600	112.33'		50	pump on
	0601	122.78'		50.52	
	0602	125.32'		50.29	
	0603	126.65		50.1	
	0604	127.73		50.02	
	0605	128.75		49.72	
	0606	129.06			
	0607	129.89			
	0608	130.32			
	0609	130.65			
	0610	131.03		50.63	
	0612	131.55		50.49	
	0614	131.94		50.74	
	0616	132.28	0.17	50.43	
	0618	132.53	0.125	50.38	
	0620	132.78	0.125	50.24	
	0625	133.32	0.108	50.27	
	0630	133.75	0.086	50.24	
	0635	134.21	0.092	50.10	
	0640	134.62	0.082	50.32	
	0650	135.27	0.065	50.13	
	0700	135.82	0.055	50.05	
	0715	136.71	0.059	50.10	55336.5 @ 7:19
	0730	137.34	0.042	50.24	55928.5 @ 7:31
	800	138.67	0.044	49.83	57410.0 @ 801
	0830	140.15	0.049	49.75	589420. 0831
	0900	141.49	0.045	49.61	60421.5 0901
	0931	142.88	0.045	50.43	
	1000	144.54	0.057	50.38	
	1100	148.38	0.064	50.16	
	1200	153.80		50.19	
	1300	159.20		50.66	

Lawrence & Associates				Job No.:	27 hr Test
Date	Time	Depth to Water (feet)	Rate of Change (ft/min)	Discharge (gpm)	Comments
10-24-18	1400	162.86		50.10	Stainless Steel
	1500	165.70		49.56	Pentair Pump - Berkeley
	1600	168.54		49.53	50 GPM 5HP 13 STG
	1700	171.30		50.35	@ 260' bgs
	1800	175.37		50.05	
	1900	178.23		50.16	
	2000	180.41		49.83	93518.5
	2100	183.55		50.07	
	2200	185.92		50.29	
10-25-18	0200	193.31		50.37	
	0600	206.28		49.99	
	0700	204.10		50.16	
	0800	261.80		49.91	
	0904				off 132,617.5 gallons
	0908				
	0915	261.70			
	0916				
	0928	150.39			
	0929	150.31	0.08		
	0930	150.24	0.07		
	0931	150.14	0.10		
	0932	150.03	0.11		
	0933	149.90	0.13		
	0934	149.74	0.16		
	0935	149.62	0.12		
	0937	149.42	0.10		
	0939	149.24	0.09		
	0940	149.15	0.09		
	0946	148.85	0.05		
	0950	148.49	0.09		
	0955	147.93	0.112		
	1000	147.43	0.10		
	1010	146.46	0.097		

Lawrence & Associates				Job No.:	27 hr test
Date	Time	Depth to Water (feet)	Rate of Change (ft/min)	Discharge (gpm)	Comments
10/25/18	1020	145.58'	0.088		
	1030	144.89'	0.069	0	
	1040	144.23'	0.066		112.33' static @ start
	1050	143.62	0.07		261.80' min measured
	1100	143.05	0.057		−149.47 total drawdown = Δh
	1124	141.71	0.056		x.90
					−134.52 + 261.8 =
					127.28' = 90% recovery
					Δh x 0.95 = 142.00
					119.80' = 95% recovery

Sugarloaf Well #2

72-Hr test (successful test)

Lawrence & Associates				Job No.:	
Date	**Time**	**Depth to Water (feet)**	**Rate of Change (ft/min)**	**Discharge (gpm)**	**Comments**
10/25/18	1124	141.71		0	
10/26/18	0601	120.39		0	
	1112	118.30		0	
	1642	116.81		0	
	1654	116.68		0	
	1659	116.67		0	
	1700			30 gpm	Pump On
	1701	121.82	5.15		Meter @ 132,617.5
	1702	123.03	1.21	30.29	
	1703	123.80	0.77		
	1704	124.47	0.67		
	1705	124.78	0.31	29.64	
	1706	125.46	0.68	31.90	
	1707	125.76	0.30	30.29	
	1708	126.05	0.29	30.25	
	1709	126.28	0.23	30.25	
	1710	126.55	0.27	30.20	
	1712	127.00	0.225	29.84	
	1714	127.46	0.23	30.65	
	1716	127.92	0.23	30.78	
	1718	128.19	0.13		
	1720	128.47	0.14	30.64	
	1722	128.67	0.10	30.75	
	1725	129.03	0.12	30.62	
	1730	129.46	0.086	30.61	
	1735	129.83	0.074	30.59	
	1740	130.16	0.066	30.68	
	1745	130.43	0.054	30.55	
	1750	130.67	0.048	30.54	
	1800	131.11	0.044	30.57	
	1810	131.47	0.036	30.50	
	1820	131.81	0.034	30.54	
	1830	132.16	0.035	30.53	

Sugar Loaf Well #2 72-hour test

Lawrence & Associates				Job No.:	
Date	**Time**	**Depth to Water (feet)**	**Rate of Change (ft/min)**	**Discharge (gpm)**	**Comments**
10/26/18	1845	132.62	0.031	30.33	
	1900	133.04	0.028	30.38	
	1915	133.47	0.029	30.34	
	1930	134.01	0.036	30.38	
	2000	134.77	0.025	30.33	
	2030	135.59	0.027	30.31	
	2100	136.13	0.018	30.19	
	2130	137.20	0.036	30.42	
	2200	137.95	0.025	30.41	
	2230	138.99	0.035	30.27	
	2300	139.96	0.032	30.26	
	2330	139.87	-0.003	30.09	
10/27/18	0000	140.38	0.017	30.29	
	100	142.00	0.027	30.31	
	200	143.20	0.020	30.30	
	300	144.75	0.026	30.10	
	400	146.11	0.023	30.55	
	500	147.45	0.022	30.37	
	600	148.80	0.022	30.32	
	700	149.40	0.010	30.26	
	800	150.48	0.018	30.19	
	900	151.85	0.023	30.29	
	1000	152.55	0.012	30.34	
	12:00	154.13	0.013	30.33	
	14:00	155.50	0.011	30.12	
	16:00	157.02	0.013	30.41	
	18:00	158.27	0.010	30.40	
	20:00	159.61	0.011	30.27	
	22:00	161.10	0.012	30.60	
10-28	0200	162.94	0.008	30.60	
	0600	164.11	0.005	30.56	
	1000	165.30	0.005	30.40	
	1400	166.34	0.004	30.41	

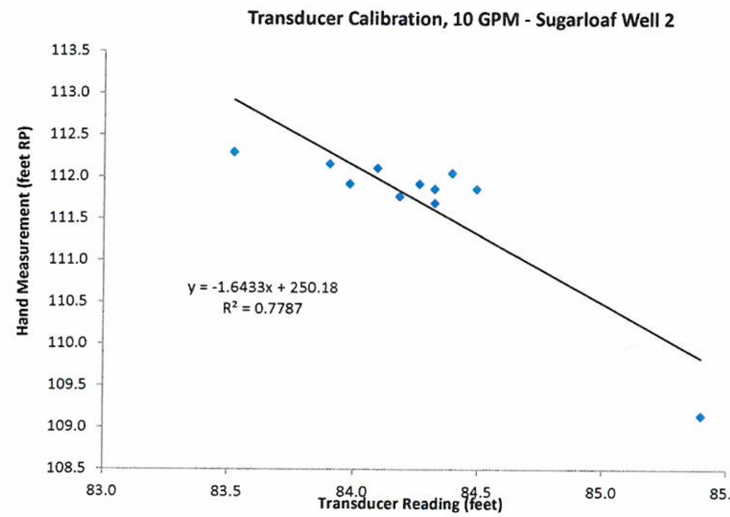
Lawrence & Associates				Job No.:	
Date	Time	Depth to Water (feet)	Rate of Change (ft/min)	Discharge (gpm)	Comments
10/28	1800	167.28		30.26	
	2200	167.97		30.19	
10/29	200	168.75		30.13	
	0600	169.34		30.05	
	1000	169.90		30.10	
	1400	170.30	0.0017	30.01	263605.5 meter @ end
off	1700	171.06		0	Pump OFF
	1701	163.95	7.11		
	1702	159.32	4.63		
	1703	156.19	3.13		
	1704	—			
	1705	152.72	1.735		
	1706	151.75	0.97		
	1707	151.13	0.62		
	1708	150.76	0.37		
	1709	150.47	0.29		
	1710	150.35	0.12		
	1712	150.06	0.145		
	1714	149.78	0.14		
	1716	149.48	0.15		
	1718	149.25	0.115		
	1720	149.10	0.075		
	1725	148.87	0.046		
	1730	148.53	0.068		
	1735	148.10	0.086		
	1740	147.74	0.072		
	1745	147.40	0.068		
	1750	147.07	0.066		
	1800	146.51	0.056		
	1810	145.95	0.059		
	1820	145.46			
	1840	144.52			
10/30	0800	128.27			

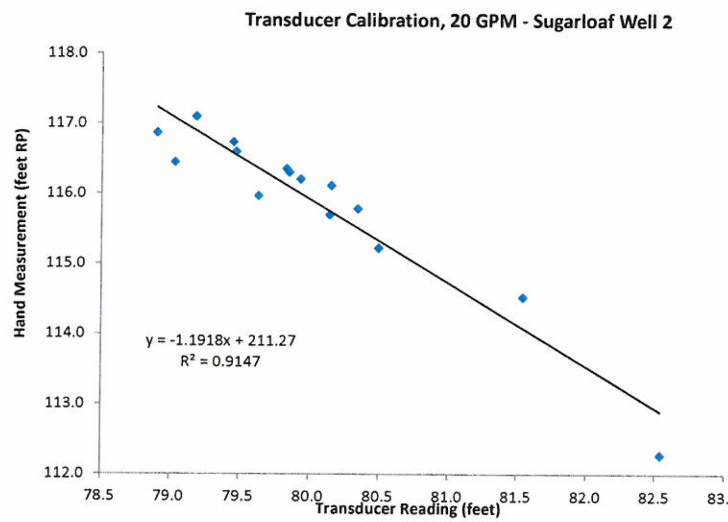
Lawrence & Associates				Job No.:	
Date	Time	Depth to Water (feet)	Rate of Change (ft/min)	Discharge (gpm)	Comments
10/30	0830	127.97	0.01		
	0840	127.89	0.08		
	1555	124.49			
	1600	124.45			
10/31	0930	119.72			
10/31	10:15	Field	Analyses		
		temp	15.3		
		pH	7,03		
		EC	232		

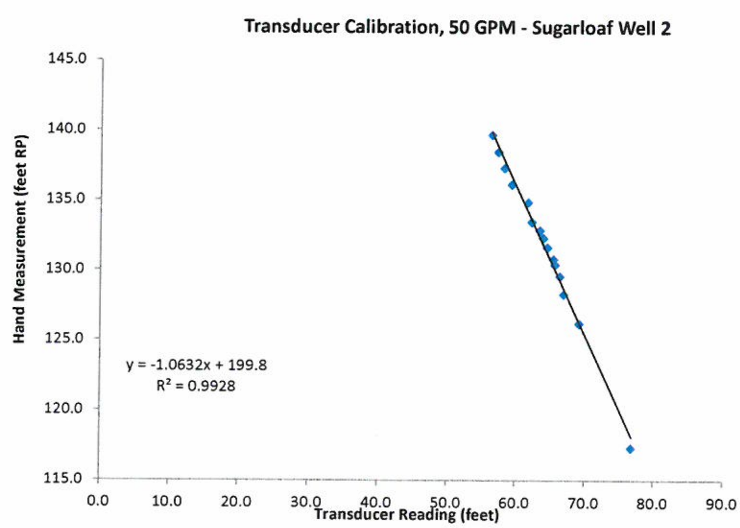
Sugarloaf Well #2
Variable Discharge (Step) Testing Data
October 23, 2018

Sugarloaf Well #2-Transducer Calibration

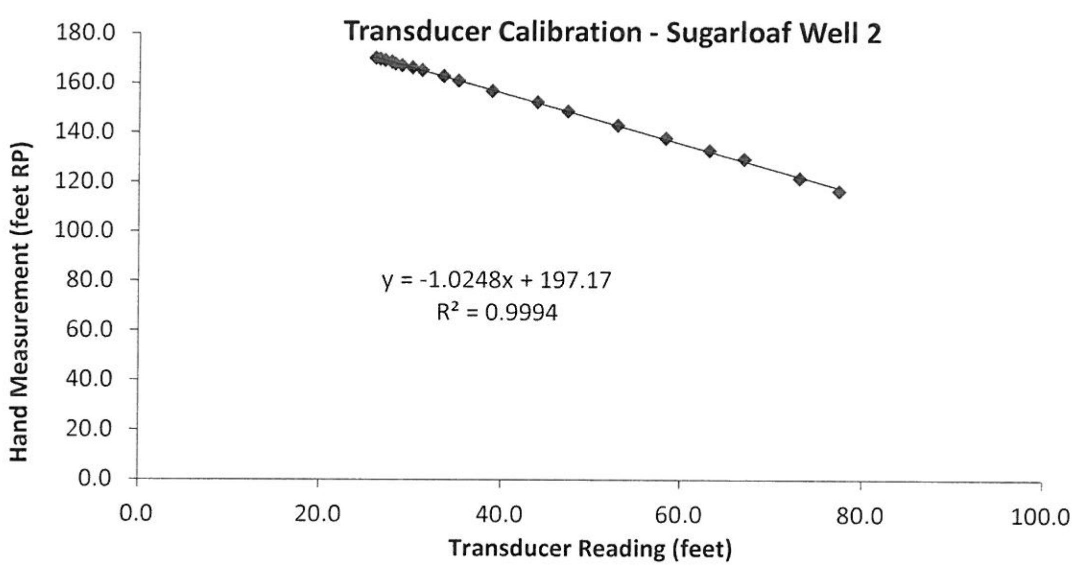
Time	Hand Measurement	Transducer Reading	Calculated DTW
10 GPM	feet RP	feet	feet RP
10/23/18 10:19	109.15	85.40	109.84
10/23/18 10:35	111.69	84.32	111.62
10/23/18 10:40	111.77	84.18	111.85
10/23/18 10:46	111.86	84.32	111.62
10/23/18 10:50	111.86	84.49	111.34
10/23/18 10:55	111.92	84.26	111.72
10/23/18 11:00	111.92	83.98	112.18
10/23/18 11:08	112.05	84.39	111.50
10/23/18 11:15	112.11	84.09	111.99
10/23/18 11:25	112.16	83.90	112.31
10/23/18 11:40	112.30	83.52	112.93
20 GPM			
10/23/18 11:45	112.28	82.54	112.90
10/23/18 11:47	114.53	81.54	114.09
10/23/18 11:50	115.23	80.49	115.34
10/23/18 11:56	115.70	80.14	115.76
10/23/18 12:00	115.79	80.34	115.52
10/23/18 12:06	115.97	79.63	116.37
10/23/18 12:10	116.12	80.15	115.75
10/23/18 12:15	116.21	79.93	116.01
10/23/18 12:20	116.31	79.85	116.10
10/23/18 12:25	116.36	79.83	116.13
10/23/18 12:30	116.45	79.03	117.08
10/23/18 12:40	116.60	79.47	116.56
10/23/18 12:50	116.74	79.45	116.58
10/23/2018 13:00:57 PM	116.87	78.90	117.24
10/23/2018 13:15:57 PM	117.10	79.18	116.90
50 GPM			
10/23/2018 13:30:57 PM	117.36	76.83	118.11
10/23/2018 13:33:57 PM	126.24	69.15	126.28
10/23/2018 13:36:57 PM	128.33	66.88	128.69
10/23/2018 13:40:57 PM	129.60	66.31	129.30
10/23/2018 13:46:57 PM	130.44	65.57	130.09
10/23/2018 13:50:57 PM	130.83	65.34	130.33
10/23/2018 14:00:57 PM	131.66	64.48	131.24
10/23/2018 14:10:57 PM	132.33	63.87	131.89
10/23/2018 14:20:57 PM	132.88	63.36	132.44
10/23/2018 14:30:57 PM	133.48	62.23	133.64
10/23/2018 15:00:57 PM	134.89	61.66	134.24
10/23/2018 15:30:57 PM	136.15	59.32	136.73
10/23/2018 16:00:57 PM	137.32	58.22	137.90
10/23/2018 16:30:57 PM	138.48	57.25	138.93
10/23/2018 17:00:57 PM	139.70	56.37	139.87







Sugarloaf Well #2 Transducer Calibration for 72-Hour Discharge Test			
Time	Hand Measurement	Transducer Reading	Calculated DTW
	feet RP	feet	feet RP
10/26/2018 16:59:00 PM	116.67	77.40	117.85
10/26/2018 17:01:00 PM	121.82	73.06	122.30
10/26/2018 17:30:00 PM	129.46	66.95	128.56
10/26/2018 19:00:00 PM	133.04	63.12	132.48
10/26/2018 22:00:00 PM	137.95	58.26	137.47
10/27/18 02:00	143.20	52.88	142.98
10/27/18 06:00	148.80	47.29	148.71
10/27/18 10:00	152.55	43.90	152.18
10/27/2018 16:00:00 PM	157.02	38.86	157.35
10/27/2018 22:00:00 PM	161.10	35.14	161.16
10/28/18 02:00	162.94	33.51	162.83
10/28/18 10:00	165.30	31.15	165.25
10/28/2018 14:00:00 PM	166.34	30.09	166.33
10/28/2018 18:00:00 PM	167.28	28.92	167.53
10/28/2018 22:00:00 PM	167.97	28.19	168.28
10/29/18 02:00	168.75	27.79	168.69
10/29/18 06:00	169.34	27.10	169.40
10/29/18 10:00	169.90	26.55	169.96
10/29/2018 14:00:00 pM	170.30	26.07	170.45



Sugarloaf Well #2
Variable Discharge (Step) Testing Data
October 23, 2018

Date and Time	Elapsed Test Time	Discharge (Q)	Hight of Water above Transducer	Calibrated DTW Transducer	Hand Measurment DTW	Drawdown
	minutes	GPM	feet	Depth (ft)	feet	feet
10/23/2018 10:01	-18.0	0	87.50	106.38		
10/23/2018 10:02	-17.0	0	87.49	106.40		
10/23/2018 10:03	-16.0	0	87.52	106.36		
10/23/2018 10:04	-15.0	0	87.54	106.33		
10/23/2018 10:05	-14.0	0	87.51	106.37		
10/23/2018 10:06	-13.0	0	87.51	106.37		
10/23/2018 10:07	-12.0	0	87.47	106.44		
10/23/2018 10:08	-11.0	0	87.50	106.38		
10/23/2018 10:09	-10.0	0	87.50	106.39		
10/23/2018 10:10	-9.0	0	87.50	106.39		
10/23/2018 10:11	-8.0	0	84.60	111.16		
10/23/2018 10:12	-7.0	0	86.04	108.80		
10/23/2018 10:13	-6.0	0	82.57	114.50		
10/23/2018 10:14	-5.0	0	83.66	112.70		
10/23/2018 10:15	-4.0	0	85.52	109.64		
10/23/2018 10:16	-3.0	0	86.41	108.18		
10/23/2018 10:17	-2.0	0	86.83	107.50		
10/23/2018 10:18	-1.0	0	87.04	107.14	109.15	
10/23/2018 10:19	0.0	10	85.40	109.84		2.70
10/23/2018 10:20	1.0	10	85.04	110.43		3.29
10/23/2018 10:21	2.0	10	84.62	111.13		3.99
10/23/2018 10:22	3.0	10	84.95	110.58		3.44
10/23/2018 10:23	4.0	10	85.22	110.13		2.99
10/23/2018 10:24	5.0	10	85.06	110.40		3.26
10/23/2018 10:25	6.0	10	84.76	110.90		3.76
10/23/2018 10:26	7.0	10	84.66	111.07		3.93
10/23/2018 10:27	8.0	10	84.76	110.89		3.75
10/23/2018 10:28	9.0	10	84.74	110.93		3.79
10/23/2018 10:29	10.0	10	84.63	111.11		3.97
10/23/2018 10:30	11.0	10	84.25	111.73		4.59
10/23/2018 10:31	12.0	10	84.50	111.32		4.18
10/23/2018 10:32	13.0	10	84.76	110.89		3.75
10/23/2018 10:33	14.0	10	84.27	111.70		4.56
10/23/2018 10:34	15.0	10	84.69	111.00	111.69	3.86
10/23/2018 10:35	16.0	10	84.32	111.62	111.75	4.47
10/23/2018 10:36	17.0	10	83.58	112.83	111.75	5.69
10/23/2018 10:37	18.0	10	84.54	111.25	111.77	4.11
10/23/2018 10:38	19.0	10	84.51	111.31	111.77	4.17
10/23/2018 10:39	20.0	10	84.31	111.63	111.77	4.49
10/23/2018 10:40	21.0	10	84.18	111.85		4.71
10/23/2018 10:41	22.0	10	84.24	111.75		4.61
10/23/2018 10:42	23.0	10	84.26	111.72	111.79	4.58
10/23/2018 10:43	24.0	10	84.54	111.26		4.12
10/23/2018 10:44	25.0	10	84.24	111.74		4.60
10/23/2018 10:45	26.0	10	84.10	111.98	111.86	4.84
10/23/2018 10:46	27.0	10	84.32	111.62	111.83	4.48
10/23/2018 10:47	28.0	10	84.07	112.03	111.87	4.89
10/23/2018 10:48	29.0	10	84.20	111.81		4.67
10/23/2018 10:49	30.0	10	84.21	111.80	111.86	4.66
10/23/2018 10:50	31.0	10	84.49	111.33		4.19
10/23/2018 10:51	32.0	10	84.27	111.70		4.56
10/23/2018 10:52	33.0	10	83.87	112.36		5.22
10/23/2018 10:53	34.0	10	83.89	112.33		5.18
10/23/2018 10:54	35.0	10	83.73	112.59	111.92	5.45
10/23/2018 10:55	36.0	10	84.26	111.72		4.57
10/23/2018 10:56	37.0	10	83.89	112.33		5.19
10/23/2018 10:57	38.0	10	83.86	112.37		5.23
10/23/2018 10:58	39.0	10	84.24	111.75		4.61
10/23/2018 10:59	40.0	10	84.06	112.04	111.92	4.90
10/23/2018 11:00	41.0	10	83.98	112.17		5.03
10/23/2018 11:01	42.0	10	83.97	112.20		5.06
10/23/2018 11:02	43.0	10	84.06	112.05		4.91
10/23/2018 11:03	44.0	10	83.98	112.18		5.04
10/23/2018 11:04	45.0	10	84.23	111.77	111.98	4.63
10/23/2018 11:05	46.0	10	84.46	111.38	112.02	4.24
10/23/2018 11:06	47.0	10	83.97	112.20	112.04	5.06
10/23/2018 11:07	48.0	10	84.17	111.87	112.08	4.73
10/23/2018 11:08	49.0	10	84.39	111.50		4.36
10/23/2018 11:09	50.0	10	84.13	111.93		4.79
10/23/2018 11:10	51.0	10	83.79	112.49		5.35
10/23/2018 11:11	52.0	10	84.09	112.00	112.08	4.86
10/23/2018 11:12	53.0	10	83.78	112.50	112.10	5.36
10/23/2018 11:13	54.0	10	84.13	111.93		4.79
10/23/2018 11:14	55.0	10	83.97	112.20	112.11	5.06
10/23/2018 11:15	56.0	10	84.09	112.00		4.86
10/23/2018 11:16	57.0	10	83.81	112.45	112.20	5.31
10/23/2018 11:17	58.0	10	84.25	111.73		4.59
10/23/2018 11:18	59.0	10	83.97	112.19		5.05
10/23/2018 11:19	60.0	10	84.05	112.06		4.92
10/23/2018 11:20	61.0	10	83.71	112.63	112.18	5.49
10/23/2018 11:21	62.0	10	83.88	112.34		5.20
10/23/2018 11:22	63.0	10	83.76	112.55	112.18	5.40
10/23/2018 11:23	64.0	10	84.22	111.78		4.64
10/23/2018 11:24	65.0	10	84.24	111.75	112.16	4.61
10/23/2018 11:25	66.0	10	83.90	112.31		5.17
10/23/2018 11:26	67.0	10	83.74	112.57		5.42

Sugarloaf Well #2
Variable Discharge (Step) Testing Data
October 23, 2018

Date and Time	Elapsed Test Time	Discharge (Q)	Hight of Water above Transducer	Calibrated DTW Transducer	Hand Measurment DTW	Drawdown
	minutes	GPM	feet	Depth (ft)	feet	feet
10/23/2018 11:27	68.0	10	83.92	112.28		5.14
10/23/2018 11:28	69.0	10	84.12	111.95		4.81
10/23/2018 11:29	70.0	10	84.00	112.14	112.21	5.00
10/23/2018 11:30	71.0	10	84.22	111.79	112.17	4.65
10/23/2018 11:31	72.0	10	84.03	112.10	112.22	4.96
10/23/2018 11:32	73.0	10	83.57	112.85		5.71
10/23/2018 11:33	74.0	10	84.01	112.13		4.99
10/23/2018 11:34	75.0	10	83.84	112.40	112.24	5.26
10/23/2018 11:35	76.0	10	83.32	113.25		6.11
10/23/2018 11:36	77.0	10	83.41	113.11		5.97
10/23/2018 11:37	78.0	10	83.48	113.00		5.86
10/23/2018 11:38	79.0	10	84.22	111.77		4.63
10/23/2018 11:39	80.0	10	84.42	111.45	112.30	4.31
10/23/2018 11:40	81.0	10	83.52	112.94		5.80
10/23/2018 11:41	82.0	10	83.96	112.21		5.06
10/23/2018 11:42	83.0	10	83.81	112.46		5.31
10/23/2018 11:43	84.0	10	83.77	112.53		5.39
10/23/2018 11:44	85.0	10	83.68	112.66	112.28	5.52
10/23/2018 11:45	86.0	20	82.54	112.90	113.86	5.76
10/23/2018 11:46	87.0	20	81.38	114.29	114.53	7.15
10/23/2018 11:47	88.0	20	81.54	114.10	114.87	6.96
10/23/2018 11:48	89.0	20	81.04	114.68	115.15	7.54
10/23/2018 11:49	90.0	20	80.82	114.95	115.23	7.81
10/23/2018 11:50	91.0	20	80.49	115.35		8.21
10/23/2018 11:51	92.0	20	80.58	115.23	115.47	8.09
10/23/2018 11:52	93.0	20	80.51	115.32		8.18
10/23/2018 11:53	94.0	20	80.73	115.05	115.60	7.91
10/23/2018 11:54	95.0	20	80.24	115.64		8.50
10/23/2018 11:55	96.0	20	80.27	115.60	115.70	8.46
10/23/2018 11:56	97.0	20	80.14	115.76		8.61
10/23/2018 11:57	98.0	20	80.36	115.49	115.75	8.35
10/23/2018 11:58	99.0	20	80.26	115.61		8.47
10/23/2018 11:59	100.0	20	80.58	115.23	115.79	8.09
10/23/2018 12:00	101.0	20	80.34	115.52		8.38
10/23/2018 12:01	102.0	20	80.29	115.58	115.85	8.44
10/23/2018 12:02	103.0	20	80.33	115.53		8.39
10/23/2018 12:03	104.0	20	80.25	115.63		8.49
10/23/2018 12:04	105.0	20	80.73	115.05		7.91
10/23/2018 12:05	106.0	20	80.25	115.62	115.97	8.48
10/23/2018 12:06	107.0	20	79.63	116.36		9.22
10/23/2018 12:07	108.0	20	79.72	116.26	116.09	9.12
10/23/2018 12:08	109.0	20	79.75	116.22		9.08
10/23/2018 12:09	110.0	20	80.13	115.77	116.12	8.63
10/23/2018 12:10	111.0	20	80.15	115.75		8.61
10/23/2018 12:11	112.0	20	79.72	116.26	116.20	9.12
10/23/2018 12:12	113.0	20	79.96	115.98		8.84
10/23/2018 12:13	114.0	20	79.74	116.23		9.09
10/23/2018 12:14	115.0	20	80.03	115.90	116.21	8.75
10/23/2018 12:15	116.0	20	79.93	116.01		8.87
10/23/2018 12:16	117.0	20	80.10	115.81		8.67
10/23/2018 12:17	118.0	20	79.87	116.08		8.94
10/23/2018 12:18	119.0	20	79.83	116.13		8.99
10/23/2018 12:19	120.0	20	79.94	116.00	116.31	8.85
10/23/2018 12:20	121.0	20	79.85	116.10		8.96
10/23/2018 12:21	122.0	20	79.75	116.22		9.08
10/23/2018 12:22	123.0	20	80.01	115.92		8.77
10/23/2018 12:23	124.0	20	79.84	116.12		8.98
10/23/2018 12:24	125.0	20	79.98	115.96	116.36	8.82
10/23/2018 12:25	126.0	20	79.83	116.13		8.99
10/23/2018 12:26	127.0	20	79.63	116.36		9.22
10/23/2018 12:27	128.0	20	79.80	116.16		9.02
10/23/2018 12:28	129.0	20	79.78	116.18		9.04
10/23/2018 12:29	130.0	20	79.50	116.52	116.45	9.38
10/23/2018 12:30	131.0	20	79.03	117.08		9.94
10/23/2018 12:31	132.0	20	79.87	116.08		8.94
10/23/2018 12:32	133.0	20	79.25	116.82		9.68
10/23/2018 12:33	134.0	20	79.40	116.64		9.50
10/23/2018 12:34	135.0	20	79.58	116.43		9.29
10/23/2018 12:35	136.0	20	79.41	116.63		9.48
10/23/2018 12:36	137.0	20	79.67	116.32		9.18
10/23/2018 12:37	138.0	20	79.41	116.63		9.49
10/23/2018 12:38	139.0	20	79.36	116.69		9.55
10/23/2018 12:39	140.0	20	79.76	116.21	116.60	9.07
10/23/2018 12:40	141.0	20	79.47	116.55		9.41
10/23/2018 12:41	142.0	20	79.62	116.38		9.24
10/23/2018 12:42	143.0	20	79.63	116.37		9.23
10/23/2018 12:43	144.0	20	79.15	116.93		9.79
10/23/2018 12:44	145.0	20	79.48	116.55		9.41
10/23/2018 12:45	146.0	20	79.55	116.46		9.32
10/23/2018 12:46	147.0	20	79.33	116.73		9.59
10/23/2018 12:47	148.0	20	79.37	116.68		9.54
10/23/2018 12:48	149.0	20	79.60	116.40		9.26
10/23/2018 12:49	150.0	20	79.02	117.10	116.74	9.95
10/23/2018 12:50	151.0	20	79.45	116.59		9.45
10/23/2018 12:51	152.0	20	79.16	116.93		9.79
10/23/2018 12:52	153.0	20	79.00	117.12		9.97
10/23/2018 12:53	154.0	20	78.97	117.15		10.01

Sugarloaf Well #2
Variable Discharge (Step) Testing Data
October 23, 2018

Date and Time	Elapsed Test Time	Discharge (Q)	Hight of Water above Transducer	Calibrated DTW Transducer Depth (ft)	Hand Measurment DTW	Drawdown
	minutes	GPM	feet	Depth (ft)	feet	feet
10/23/2018 12:54	155.0	20	79.36	116.69		9.55
10/23/2018 12:55	156.0	20	79.82	116.14		9.00
10/23/2018 12:56	157.0	20	79.11	116.99		9.85
10/23/2018 12:57	158.0	20	79.49	116.53		9.39
10/23/2018 12:58	159.0	20	79.22	116.85		9.71
10/23/2018 12:59	160.0	20	79.32	116.74	116.87	9.59
10/23/2018 13:00	161.0	20	78.90	117.24		10.10
10/23/2018 13:01	162.0	20	79.33	116.72		9.58
10/23/2018 13:02	163.0	20	78.95	117.18		10.04
10/23/2018 13:03	164.0	20	79.39	116.65		9.51
10/23/2018 13:04	165.0	20	79.21	116.87		9.73
10/23/2018 13:05	166.0	20	79.20	116.88		9.74
10/23/2018 13:06	167.0	20	79.08	117.02		9.88
10/23/2018 13:07	168.0	20	78.69	117.48		10.34
10/23/2018 13:08	169.0	20	79.39	116.66		9.52
10/23/2018 13:09	170.0	20	79.04	117.07		9.93
10/23/2018 13:10	171.0	20	78.97	117.15		10.01
10/23/2018 13:11	172.0	20	78.87	117.27		10.13
10/23/2018 13:12	173.0	20	78.78	117.38		10.24
10/23/2018 13:13	174.0	20	79.05	117.06		9.92
10/23/2018 13:14	175.0	20	78.96	117.17	117.10	10.03
10/23/2018 13:15	176.0	20	79.18	116.91		9.77
10/23/2018 13:16	177.0	20	78.54	117.67		10.53
10/23/2018 13:17	178.0	20	79.25	116.82		9.68
10/23/2018 13:18	179.0	20	79.24	116.84		9.69
10/23/2018 13:19	180.0	20	78.96	117.17		10.03
10/23/2018 13:20	181.0	20	78.97	117.16		10.02
10/23/2018 13:21	182.0	20	79.26	116.81		9.67
10/23/2018 13:22	183.0	20	78.84	117.31		10.17
10/23/2018 13:23	184.0	20	78.71	117.47		10.33
10/23/2018 13:24	185.0	20	78.71	117.46		10.32
10/23/2018 13:25	186.0	20	78.75	117.42		10.28
10/23/2018 13:26	187.0	20	78.89	117.25		10.11
10/23/2018 13:27	188.0	20	78.92	117.22		10.07
10/23/2018 13:28	189.0	20	78.95	117.18		10.04
10/23/2018 13:29	190.0	20	78.68	116.15	117.36	9.01
10/23/2018 13:30	191.0	50	76.83	118.12	119.65	10.98
10/23/2018 13:31	192.0	50	72.11	123.14	124.71	16.00
10/23/2018 13:32	193.0	50	69.53	125.88	126.24	18.74
10/23/2018 13:33	194.0	50	69.15	126.28	127.18	19.14
10/23/2018 13:34	195.0	50	67.16	128.40	127.91	21.26
10/23/2018 13:35	196.0	50	67.52	128.01	128.33	20.87
10/23/2018 13:36	197.0	50	66.88	128.70	128.84	21.56
10/23/2018 13:37	198.0	50	67.17	128.38	129.13	21.24
10/23/2018 13:38	199.0	50	66.91	128.66	129.34	21.52
10/23/2018 13:39	200.0	50	66.25	129.36	129.60	22.22
10/23/2018 13:40	201.0	50	66.31	129.30	129.75	22.16
10/23/2018 13:41	202.0	50	65.92	129.71	129.89	22.57
10/23/2018 13:42	203.0	50	66.04	129.59		22.44
10/23/2018 13:43	204.0	50	65.77	129.88	130.18	22.74
10/23/2018 13:44	205.0	50	65.53	130.13		22.99
10/23/2018 13:45	206.0	50	65.93	129.71	130.44	22.56
10/23/2018 13:46	207.0	50	65.57	130.08		22.94
10/23/2018 13:47	208.0	50	65.73	129.92	130.63	22.78
10/23/2018 13:48	209.0	50	65.44	130.23		23.08
10/23/2018 13:49	210.0	50	65.75	129.90	130.83	22.76
10/23/2018 13:50	211.0	50	65.34	130.33		23.19
10/23/2018 13:51	212.0	50	65.86	129.78		22.64
10/23/2018 13:52	213.0	50	65.16	130.53		23.39
10/23/2018 13:53	214.0	50	64.44	131.29		24.15
10/23/2018 13:54	215.0	50	64.62	131.09	131.36	23.95
10/23/2018 13:55	216.0	50	65.22	130.46		23.32
10/23/2018 13:56	217.0	50	64.98	130.72		23.58
10/23/2018 13:57	218.0	50	65.07	130.61		23.47
10/23/2018 13:58	219.0	50	64.60	131.12		23.97
10/23/2018 13:59	220.0	50	64.81	130.89	131.66	23.75
10/23/2018 14:00	221.0	50	64.48	131.25		24.11
10/23/2018 14:01	222.0	50	64.58	131.14		24.00
10/23/2018 14:02	223.0	50	65.08	130.61		23.47
10/23/2018 14:03	224.0	50	64.15	131.60		24.46
10/23/2018 14:04	225.0	50	63.75	132.02		24.88
10/23/2018 14:05	226.0	50	63.75	132.02		24.88
10/23/2018 14:06	227.0	50	63.61	132.17		25.03
10/23/2018 14:07	228.0	50	64.17	131.58		24.44
10/23/2018 14:08	229.0	50	64.35	131.38		24.24
10/23/2018 14:09	230.0	50	63.97	131.79	132.33	24.65
10/23/2018 14:10	231.0	50	63.87	131.90		24.76
10/23/2018 14:11	232.0	50	63.83	131.94		24.80
10/23/2018 14:12	233.0	50	63.23	132.58		25.44
10/23/2018 14:13	234.0	50	63.91	131.85		24.71
10/23/2018 14:14	235.0	50	63.60	132.19		25.05
10/23/2018 14:15	236.0	50	63.58	132.20		25.06
10/23/2018 14:16	237.0	50	62.91	132.92		25.78
10/23/2018 14:17	238.0	50	63.76	132.02		24.88
10/23/2018 14:18	239.0	50	64.16	131.58		24.44
10/23/2018 14:19	240.0	50	63.31	132.48	132.88	25.34
10/23/2018 14:20	241.0	50	63.36	132.43		25.29

Sugarloaf Well #2
Variable Discharge (Step) Testing Data
October 23, 2018

Date and Time	Elapsed Test Time	Discharge (Q)	Hight of Water above Transducer	Calibrated DTW Transducer Depth (ft)	Hand Measurment DTW	Drawdown
	minutes	GPM	feet		feet	feet
10/23/2018 14:21	242.0	50	63.56	132.22		25.08
10/23/2018 14:22	243.0	50	63.33	132.47		25.33
10/23/2018 14:23	244.0	50	62.74	133.10		25.96
10/23/2018 14:24	245.0	50	62.73	133.11		25.97
10/23/2018 14:25	246.0	50	63.23	132.58		25.44
10/23/2018 14:26	247.0	50	62.33	133.53		26.39
10/23/2018 14:27	248.0	50	62.90	132.93		25.79
10/23/2018 14:28	249.0	50	63.10	132.71		25.57
10/23/2018 14:29	250.0	50	62.38	133.48	133.48	26.33
10/23/2018 14:30	251.0	50	62.23	133.63		26.49
10/23/2018 14:31	252.0	50	62.12	133.75		26.61
10/23/2018 14:32	253.0	50	62.88	132.95		25.81
10/23/2018 14:33	254.0	50	62.32	133.54		26.40
10/23/2018 14:34	255.0	50	62.06	133.82		26.68
10/23/2018 14:35	256.0	50	62.55	133.30		26.16
10/23/2018 14:36	257.0	50	62.30	133.56		26.42
10/23/2018 14:37	258.0	50	62.26	133.60		26.46
10/23/2018 14:38	259.0	50	62.16	133.71		26.57
10/23/2018 14:39	260.0	50	61.61	134.30	133.93	27.16
10/23/2018 14:40	261.0	50	62.36	133.50		26.36
10/23/2018 14:41	262.0	50	61.79	134.11		26.97
10/23/2018 14:42	263.0	50	62.00	133.88		26.74
10/23/2018 14:43	264.0	50	62.04	133.83		26.69
10/23/2018 14:44	265.0	50	62.63	133.21		26.07
10/23/2018 14:45	266.0	50	61.91	133.98		26.83
10/23/2018 14:46	267.0	50	61.67	134.23		27.09
10/23/2018 14:47	268.0	50	62.26	133.61		26.47
10/23/2018 14:48	269.0	50	61.58	134.33		27.19
10/23/2018 14:49	270.0	50	61.41	134.51	134.42	27.37
10/23/2018 14:50	271.0	50	60.94	135.01		27.87
10/23/2018 14:51	272.0	50	61.62	134.29		27.15
10/23/2018 14:52	273.0	50	61.03	134.91		27.77
10/23/2018 14:53	274.0	50	60.71	135.25		28.11
10/23/2018 14:54	275.0	50	61.44	134.48		27.34
10/23/2018 14:55	276.0	50	61.62	134.28		27.14
10/23/2018 14:56	277.0	50	61.47	134.45		27.31
10/23/2018 14:57	278.0	50	60.72	135.24		28.10
10/23/2018 14:58	279.0	50	61.95	133.93		26.79
10/23/2018 14:59	280.0	50	60.97	134.98	134.89	27.84
10/23/2018 15:00	281.0	50	61.66	134.24		27.10
10/23/2018 15:01	282.0	50	60.96	134.99		27.84
10/23/2018 15:02	283.0	50	61.10	134.84		27.69
10/23/2018 15:03	284.0	50	61.42	134.50		27.36
10/23/2018 15:04	285.0	50	61.23	134.70		27.56
10/23/2018 15:05	286.0	50	60.71	135.26		28.12
10/23/2018 15:06	287.0	50	60.56	135.42		28.28
10/23/2018 15:07	288.0	50	60.47	135.50		28.36
10/23/2018 15:08	289.0	50	61.38	134.54		27.40
10/23/2018 15:09	290.0	50	59.98	136.03		28.88
10/23/2018 15:10	291.0	50	60.50	135.48		28.34
10/23/2018 15:11	292.0	50	60.33	135.66		28.52
10/23/2018 15:12	293.0	50	60.88	135.08		27.94
10/23/2018 15:13	294.0	50	60.25	135.74		28.60
10/23/2018 15:14	295.0	50	60.05	135.96	135.59	28.82
10/23/2018 15:15	296.0	50	59.82	136.20		29.06
10/23/2018 15:16	297.0	50	60.24	135.76		28.62
10/23/2018 15:17	298.0	50	60.42	135.57		28.43
10/23/2018 15:18	299.0	50	60.95	135.00		27.86
10/23/2018 15:19	300.0	50	59.85	136.17		29.03
10/23/2018 15:20	301.0	50	60.02	135.98		28.84
10/23/2018 15:21	302.0	50	60.18	135.81		28.67
10/23/2018 15:22	303.0	50	60.20	135.79		28.65
10/23/2018 15:23	304.0	50	60.53	135.45		28.31
10/23/2018 15:24	305.0	50	59.52	136.52		29.38
10/23/2018 15:25	306.0	50	59.48	136.56		29.42
10/23/2018 15:26	307.0	50	60.15	135.85		28.71
10/23/2018 15:27	308.0	50	59.90	136.12		28.98
10/23/2018 15:28	309.0	50	59.63	136.40		29.26
10/23/2018 15:29	310.0	50	59.92	136.09	136.15	28.95
10/23/2018 15:30	311.0	50	59.32	136.73		29.59
10/23/2018 15:31	312.0	50	59.99	136.02		28.88
10/23/2018 15:32	313.0	50	60.45	135.53		28.39
10/23/2018 15:33	314.0	50	59.16	136.90		29.76
10/23/2018 15:34	315.0	50	60.18	135.81		28.67
10/23/2018 15:35	316.0	50	59.45	136.59		29.45
10/23/2018 15:36	317.0	50	59.87	136.15		29.00
10/23/2018 15:37	318.0	50	59.99	136.02		28.88
10/23/2018 15:38	319.0	50	59.64	136.39		29.25
10/23/2018 15:39	320.0	50	59.87	136.15		29.01
10/23/2018 15:40	321.0	50	59.33	136.72		29.58
10/23/2018 15:41	322.0	50	59.12	136.95		29.81
10/23/2018 15:42	323.0	50	59.18	136.88		29.74
10/23/2018 15:43	324.0	50	59.29	136.76		29.62
10/23/2018 15:44	325.0	50	59.99	136.02	136.77	28.87
10/23/2018 15:45	326.0	50	58.90	137.18		30.04
10/23/2018 15:46	327.0	50	58.67	137.42		30.28
10/23/2018 15:47	328.0	50	58.88	137.20		30.06

Sugarloaf Well #2
Variable Discharge (Step) Testing Data
October 23, 2018

Date and Time	Elapsed Test Time	Discharge (Q)	Hight of Water above Transducer	Calibrated DTW Transducer Depth (ft)	Hand Measurment DTW	Drawdown
	minutes	GPM	feet		feet	feet
10/23/2018 15:48	329.0	50	59.63	136.40		29.26
10/23/2018 15:49	330.0	50	59.70	136.33		29.19
10/23/2018 15:50	331.0	50	59.39	136.66		29.52
10/23/2018 15:51	332.0	50	58.70	137.39		30.25
10/23/2018 15:52	333.0	50	58.88	137.20		30.06
10/23/2018 15:53	334.0	50	59.12	136.94		29.80
10/23/2018 15:54	335.0	50	58.69	137.40		30.26
10/23/2018 15:55	336.0	50	59.41	136.64		29.50
10/23/2018 15:56	337.0	50	57.84	138.31		31.17
10/23/2018 15:57	338.0	50	58.90	137.18		30.04
10/23/2018 15:58	339.0	50	58.48	137.63		30.49
10/23/2018 15:59	340.0	50	59.08	136.98	137.32	29.84
10/23/2018 16:00	341.0	50	58.22	137.90		30.76
10/23/2018 16:01	342.0	50	59.18	136.88		29.74
10/23/2018 16:02	343.0	50	58.82	137.27		30.13
10/23/2018 16:03	344.0	50	58.40	137.71		30.57
10/23/2018 16:04	345.0	50	58.39	137.72		30.58
10/23/2018 16:05	346.0	50	58.35	137.76		30.62
10/23/2018 16:06	347.0	50	58.32	137.80		30.66
10/23/2018 16:07	348.0	50	59.24	136.82		29.68
10/23/2018 16:08	349.0	50	57.88	138.26		31.12
10/23/2018 16:09	350.0	50	58.51	137.60		30.46
10/23/2018 16:10	351.0	50	58.21	137.91		30.77
10/23/2018 16:11	352.0	50	58.12	138.00		30.86
10/23/2018 16:12	353.0	50	58.29	137.83		30.69
10/23/2018 16:13	354.0	50	57.92	138.22		31.08
10/23/2018 16:14	355.0	50	58.08	138.05		30.91
10/23/2018 16:15	356.0	50	58.03	138.11		30.97
10/23/2018 16:16	357.0	50	58.06	138.07		30.93
10/23/2018 16:17	358.0	50	57.87	138.27		31.13
10/23/2018 16:18	359.0	50	58.25	137.87		30.73
10/23/2018 16:19	360.0	50	58.05	138.08		30.94
10/23/2018 16:20	361.0	50	58.45	137.66		30.52
10/23/2018 16:21	362.0	50	58.12	138.01		30.87
10/23/2018 16:22	363.0	50	58.30	137.82		30.68
10/23/2018 16:23	364.0	50	57.74	138.41		31.27
10/23/2018 16:24	365.0	50	57.83	138.32		31.18
10/23/2018 16:25	366.0	50	57.33	138.84		31.70
10/23/2018 16:26	367.0	50	57.70	138.46		31.32
10/23/2018 16:27	368.0	50	58.05	138.08		30.94
10/23/2018 16:28	369.0	50	57.21	138.98		31.83
10/23/2018 16:29	370.0	50	57.92	138.22	138.48	31.08
10/23/2018 16:30	371.0	50	57.25	138.93		31.79
10/23/2018 16:31	372.0	50	57.40	138.77		31.63
10/23/2018 16:32	373.0	50	57.02	139.17		32.03
10/23/2018 16:33	374.0	50	57.58	138.58		31.44
10/23/2018 16:34	375.0	50	58.04	138.09		30.95
10/23/2018 16:35	376.0	50	57.24	138.94		31.80
10/23/2018 16:36	377.0	50	57.14	139.05		31.91
10/23/2018 16:37	378.0	50	57.45	138.71		31.57
10/23/2018 16:38	379.0	50	57.25	138.93		31.79
10/23/2018 16:39	380.0	50	57.04	139.15		32.01
10/23/2018 16:40	381.0	50	57.36	138.81		31.67
10/23/2018 16:41	382.0	50	57.51	138.66		31.52
10/23/2018 16:42	383.0	50	57.12	139.07		31.93
10/23/2018 16:43	384.0	50	57.64	138.52		31.38
10/23/2018 16:44	385.0	50	57.51	138.66		31.52
10/23/2018 16:45	386.0	50	57.56	138.61		31.47
10/23/2018 16:46	387.0	50	57.45	138.72		31.58
10/23/2018 16:47	388.0	50	57.33	138.85		31.71
10/23/2018 16:48	389.0	50	56.89	139.32		32.18
10/23/2018 16:49	390.0	50	56.68	139.54		32.40
10/23/2018 16:50	391.0	50	56.85	139.36		32.22
10/23/2018 16:51	392.0	50	56.64	139.58		32.44
10/23/2018 16:52	393.0	50	56.92	139.28		32.14
10/23/2018 16:53	394.0	50	56.28	139.96		32.82
10/23/2018 16:54	395.0	50	56.78	139.43		32.29
10/23/2018 16:55	396.0	50	56.94	139.26		32.12
10/23/2018 16:56	397.0	50	56.44	139.79		32.65
10/23/2018 16:57	398.0	50	56.21	140.04		32.89
10/23/2018 16:58	399.0	50	56.66	139.56		32.42
10/23/2018 16:59	400.0	50	56.39	139.85	139.70	32.71
10/23/2018 17:00	401.0	50	56.37			
10/23/2018 17:01	402.0	50	56.06			
10/23/2018 17:02	403.0	50	56.92			
10/23/2018 17:03	404.0	50	55.99			

Sugarloaf Well #2
Drawdown/Recovery Data - 50 GPM Test
October 24 and 25, 2018

Date	Time	Date/Time	Elapsed Time (minutes)	Discharge (gpm)	Depth to Water (feet RP)	Drawdown (feet)
10/24/2018	0600.0	10/24/18 06:00	0.0	50.00	112.33	0.00
10/24/2018	0601.0	10/24/18 06:01	1.0	50.00	122.78	10.45
10/24/2018	0602.0	10/24/18 06:02	2.0	50.00	125.32	12.99
10/24/2018	0603.0	10/24/18 06:03	3.0	50.00	126.65	14.32
10/24/2018	0604.0	10/24/18 06:04	4.0	50.00	127.73	15.40
10/24/2018	0605.0	10/24/18 06:05	5.0	50.00	128.75	16.42
10/24/2018	0606.0	10/24/18 06:06	6.0	50.00	129.06	16.73
10/24/2018	0607.0	10/24/18 06:07	7.0	50.00	129.89	17.56
10/24/2018	0608.0	10/24/18 06:08	8.0	50.00	130.32	17.99
10/24/2018	0609.0	10/24/18 06:09	9.0	50.00	130.65	18.32
10/24/2018	0610.0	10/24/18 06:10	10.0	50.00	131.03	18.70
10/24/2018	0612.0	10/24/18 06:12	12.0	50.00	131.55	19.22
10/24/2018	0614.0	10/24/18 06:14	14.0	50.00	131.94	19.61
10/24/2018	0616.0	10/24/18 06:16	16.0	50.00	132.28	19.95
10/24/2018	0618.0	10/24/18 06:18	18.0	50.00	132.53	20.20
10/24/2018	0620.0	10/24/18 06:20	20.0	50.00	132.78	20.45
10/24/2018	0625.0	10/24/18 06:25	25.0	50.00	133.32	20.99
10/24/2018	0630.0	10/24/18 06:30	30.0	50.00	133.75	21.42
10/24/2018	0635.0	10/24/18 06:35	35.0	50.00	134.21	21.88
10/24/2018	0640.0	10/24/18 06:40	40.0	50.00	134.62	22.29
10/24/2018	0650.0	10/24/18 06:50	50.0	50.00	135.27	22.94
10/24/2018	0700.0	10/24/18 07:00	60.0	50.00	135.82	23.49
10/24/2018	0715.0	10/24/18 07:15	75.0	50.00	136.71	24.38
10/24/2018	0730.0	10/24/18 07:30	90.0	50.00	137.34	25.01
10/24/2018	0800.0	10/24/18 08:00	120.0	50.00	138.67	26.34
10/24/2018	0830.0	10/24/18 08:30	150.0	50.00	140.15	27.82
10/24/2018	0900.0	10/24/18 09:00	180.0	50.00	141.49	29.16
10/24/2018	0931.0	10/24/18 09:31	211.0	50.00	142.88	30.55
10/24/2018	1000.0	10/24/18 10:00	240.0	50.00	144.54	32.21
10/24/2018	1100.0	10/24/18 11:00	300.0	50.00	148.38	36.05
10/24/2018	1200.0	10/24/18 12:00	360.0	50.00	153.80	41.47
10/24/2018	1300.0	10/24/18 13:00	420.0	50.00	159.20	46.87
10/24/2018	1400.0	10/24/18 14:00	480.0	50.00	162.86	50.53
10/24/2018	1500.0	10/24/18 15:00	540.0	50.00	165.70	53.37
10/24/2018	1600.0	10/24/18 16:00	600.0	50.00	168.54	56.21
10/24/2018	1700.0	10/24/18 17:00	660.0	50.00	171.30	58.97
10/24/2018	1800.0	10/24/18 18:00	720.0	50.00	175.37	63.04
10/24/2018	1900.0	10/24/18 19:00	780.0	50.00	178.23	65.90
10/24/2018	2000.0	10/24/18 20:00	840.0	50.00	180.41	68.08
10/24/2018	2100.0	10/24/18 21:00	900.0	50.00	183.55	71.22

Sugarloaf Well #2
Drawdown/Recovery Data - 50 GPM Test
October 24 and 25, 2018

Date	Time	Date/Time	Elapsed Time (minutes)	Discharge (gpm)	Depth to Water (feet RP)	Drawdown (feet)
10/24/2018	2200.0	10/24/18 22:00	960.0	50.00	185.92	73.59
10/25/2018	0200.0	10/25/18 02:00	1200.0	50.00	193.31	80.98
10/25/2018	0600.0	10/25/18 06:00	1440.0	50.00	206.20	93.87
10/25/2018	0800.0	10/25/18 08:00	1560.0	50.00	261.80	149.47
10/25/2018	0904.0	10/25/18 09:04	1624.0	0.00	261.80	149.47
10/25/2018	0928.0	10/25/18 09:28	1648.0	0.00	150.39	38.06
10/25/2018	0929.0	10/25/18 09:29	1649.0	0.00	150.31	37.98
10/25/2018	0930.0	10/25/18 09:30	1650.0	0.00	150.24	37.91
10/25/2018	0931.0	10/25/18 09:31	1651.0	0.00	150.14	37.81
10/25/2018	0932.0	10/25/18 09:32	1652.0	0.00	150.03	37.70
10/25/2018	0933.0	10/25/18 09:33	1653.0	0.00	149.90	37.57
10/25/2018	0934.0	10/25/18 09:34	1654.0	0.00	149.74	37.41
10/25/2018	0935.0	10/25/18 09:35	1655.0	0.00	149.62	37.29
10/25/2018	0937.0	10/25/18 09:37	1657.0	0.00	144.42	32.09
10/25/2018	0939.0	10/25/18 09:39	1659.0	0.00	149.24	36.91
10/25/2018	0940.0	10/25/18 09:40	1660.0	0.00	149.15	36.82
10/25/2018	0946.0	10/25/18 09:46	1666.0	0.00	148.85	36.52
10/25/2018	0950.0	10/25/18 09:50	1670.0	0.00	148.49	36.16
10/25/2018	0955.0	10/25/18 09:55	1675.0	0.00	147.93	35.60
10/25/2018	1000.0	10/25/18 10:00	1680.0	0.00	147.43	35.10
10/25/2018	1010.0	10/25/18 10:10	1690.0	0.00	146.46	34.13
10/25/2018	1020.0	10/25/18 10:20	1700.0	0.00	145.58	33.25
10/25/2018	1030.0	10/25/18 10:30	1710.0	0.00	144.89	32.56
10/25/2018	1040.0	10/25/18 10:40	1720.0	0.00	144.23	31.90
10/25/2018	1050.0	10/25/18 10:50	1730.0	0.00	143.62	31.29
10/25/2018	1100.0	10/25/18 11:00	1740.0	0.00	143.05	30.72
10/25/2018	1124.0	10/25/18 11:24	1764.0	0.00	141.71	29.38
10/25/2018	1700.0	10/25/18 17:00	2100.0	0.00	130.00	17.67
10/26/2018	0601.0	10/26/18 06:01	2881.0	0.00	120.34	8.01

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/26/2018 16:50	-10	79.45	115.75	
10/26/2018 16:51	-9	79.50	115.70	
10/26/2018 16:52	-8	79.50	115.70	
10/26/2018 16:53	-7	79.52	115.68	
10/26/2018 16:54	-6	79.52	115.68	
10/26/2018 16:55	-5	79.51	115.69	
10/26/2018 16:56	-4	79.51	115.69	
10/26/2018 16:57	-3	79.44	115.77	
10/26/2018 16:58	-2	79.48	115.72	
10/26/2018 16:59	-1	77.40	117.85	
10/26/2018 17:00	0	74.11	121.22	0.00
10/26/2018 17:01	1	73.06	122.30	1.08
10/26/2018 17:02	2	72.45	122.93	1.71
10/26/2018 17:03	3	71.58	123.82	2.60
10/26/2018 17:04	4	71.33	124.07	2.85
10/26/2018 17:05	5	70.58	124.84	3.62
10/26/2018 17:06	6	70.33	125.09	3.87
10/26/2018 17:07	7	70.31	125.12	3.90
10/26/2018 17:08	8	70.04	125.39	4.17
10/26/2018 17:09	9	69.37	126.08	4.86
10/26/2018 17:10	10	69.12	126.34	5.12
10/26/2018 17:11	11	69.56	125.88	4.66
10/26/2018 17:12	12	69.21	126.25	5.03
10/26/2018 17:13	13	68.89	126.57	5.35
10/26/2018 17:14	14	68.47	127.00	5.78
10/26/2018 17:15	15	68.15	127.33	6.11
10/26/2018 17:16	16	68.07	127.41	6.20
10/26/2018 17:17	17	67.85	127.64	6.42
10/26/2018 17:18	18	67.90	127.59	6.37
10/26/2018 17:19	19	67.59	127.91	6.69
10/26/2018 17:20	20	67.70	127.79	6.57
10/26/2018 17:21	21	67.62	127.88	6.66
10/26/2018 17:22	22	67.64	127.86	6.64
10/26/2018 17:23	23	67.40	128.10	6.88
10/26/2018 17:24	24	67.06	128.45	7.23
10/26/2018 17:25	25	66.90	128.61	7.39
10/26/2018 17:26	26	66.89	128.62	7.40
10/26/2018 17:27	27	66.86	128.65	7.44
10/26/2018 17:28	28	66.88	128.63	7.41
10/26/2018 17:29	29	66.92	128.59	7.37
10/26/2018 17:30	30	66.95	128.56	7.34

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/26/2018 17:31	31	67.10	128.40	7.18
10/26/2018 17:32	32	66.72	128.79	7.57
10/26/2018 17:33	33	66.40	129.13	7.91
10/26/2018 17:34	34	66.66	128.86	7.64
10/26/2018 17:35	35	66.41	129.11	7.89
10/26/2018 17:36	36	66.22	129.31	8.09
10/26/2018 17:37	37	66.32	129.21	7.99
10/26/2018 17:38	38	66.12	129.41	8.19
10/26/2018 17:39	39	66.15	129.38	8.16
10/26/2018 17:40	40	65.95	129.59	8.37
10/26/2018 17:41	41	66.18	129.35	8.13
10/26/2018 17:42	42	65.24	130.31	9.09
10/26/2018 17:43	43	65.73	129.81	8.59
10/26/2018 17:44	44	65.72	129.82	8.60
10/26/2018 17:45	45	65.13	130.43	9.21
10/26/2018 17:46	46	65.88	129.66	8.44
10/26/2018 17:47	47	65.35	130.20	8.98
10/26/2018 17:48	48	65.33	130.22	9.00
10/26/2018 17:49	49	65.18	130.37	9.15
10/26/2018 17:50	50	65.90	129.64	8.42
10/26/2018 17:51	51	65.08	130.47	9.25
10/26/2018 17:52	52	65.24	130.32	9.10
10/26/2018 17:53	53	65.91	129.63	8.41
10/26/2018 17:54	54	65.62	129.92	8.71
10/26/2018 17:55	55	65.46	130.09	8.87
10/26/2018 17:56	56	65.44	130.11	8.89
10/26/2018 17:57	57	64.92	130.64	9.42
10/26/2018 17:58	58	64.71	130.85	9.63
10/26/2018 17:59	59	65.20	130.35	9.13
10/26/2018 18:00	60	64.70	130.86	9.64
10/26/2018 18:01	61	65.13	130.42	9.20
10/26/2018 18:02	62	64.87	130.69	9.47
10/26/2018 18:03	63	64.81	130.75	9.53
10/26/2018 18:04	64	65.03	130.52	9.30
10/26/2018 18:05	65	64.78	130.79	9.57
10/26/2018 18:06	66	65.10	130.46	9.24
10/26/2018 18:07	67	64.72	130.84	9.63
10/26/2018 18:08	68	64.38	131.19	9.97
10/26/2018 18:09	69	64.75	130.81	9.60
10/26/2018 18:10	70	64.40	131.17	9.95
10/26/2018 18:11	71	64.31	131.27	10.05

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/26/2018 18:12	72	64.68	130.89	9.67
10/26/2018 18:13	73	64.48	131.09	9.87
10/26/2018 18:14	74	64.50	131.08	9.86
10/26/2018 18:15	75	64.35	131.23	10.01
10/26/2018 18:16	76	64.27	131.30	10.08
10/26/2018 18:17	77	64.79	130.77	9.55
10/26/2018 18:18	78	64.27	131.31	10.09
10/26/2018 18:19	79	64.81	130.76	9.54
10/26/2018 18:20	80	64.34	131.24	10.02
10/26/2018 18:21	81	64.35	131.22	10.01
10/26/2018 18:22	82	64.67	130.90	9.68
10/26/2018 18:23	83	64.29	131.28	10.06
10/26/2018 18:24	84	63.77	131.82	10.60
10/26/2018 18:25	85	64.08	131.50	10.28
10/26/2018 18:26	86	64.03	131.55	10.33
10/26/2018 18:27	87	64.47	131.10	9.88
10/26/2018 18:28	88	63.98	131.60	10.38
10/26/2018 18:29	89	64.01	131.57	10.35
10/26/2018 18:30	90	64.11	131.47	10.25
10/26/2018 18:31	91	64.30	131.28	10.06
10/26/2018 18:32	92	63.65	131.94	10.72
10/26/2018 18:33	93	64.00	131.58	10.36
10/26/2018 18:34	94	63.62	131.97	10.75
10/26/2018 18:35	95	63.43	132.17	10.95
10/26/2018 18:36	96	63.90	131.68	10.46
10/26/2018 18:37	97	63.75	131.84	10.62
10/26/2018 18:38	98	63.63	131.97	10.75
10/26/2018 18:39	99	63.78	131.80	10.59
10/26/2018 18:40	100	63.83	131.76	10.54
10/26/2018 18:41	101	63.40	132.20	10.98
10/26/2018 18:42	102	63.64	131.95	10.73
10/26/2018 18:43	103	63.86	131.73	10.51
10/26/2018 18:44	104	63.44	132.16	10.94
10/26/2018 18:45	105	63.65	131.94	10.72
10/26/2018 18:46	106	63.66	131.93	10.71
10/26/2018 18:47	107	63.41	132.19	10.97
10/26/2018 18:48	108	63.52	132.08	10.86
10/26/2018 18:49	109	63.60	132.00	10.78
10/26/2018 18:50	110	63.36	132.24	11.02
10/26/2018 18:51	111	63.47	132.13	10.91
10/26/2018 18:52	112	62.94	132.67	11.45

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/26/2018 18:53	113	63.23	132.37	11.15
10/26/2018 18:54	114	63.56	132.03	10.81
10/26/2018 18:55	115	63.20	132.40	11.18
10/26/2018 18:56	116	63.76	131.83	10.61
10/26/2018 18:57	117	63.43	132.16	10.94
10/26/2018 18:58	118	63.53	132.07	10.85
10/26/2018 18:59	119	63.23	132.37	11.15
10/26/2018 19:00	120	63.12	132.49	11.27
10/26/2018 19:01	121	62.84	132.78	11.56
10/26/2018 19:02	122	63.13	132.47	11.25
10/26/2018 19:03	123	63.20	132.40	11.18
10/26/2018 19:04	124	62.60	133.02	11.80
10/26/2018 19:05	125	63.06	132.54	11.32
10/26/2018 19:06	126	62.81	132.80	11.58
10/26/2018 19:07	127	63.07	132.54	11.32
10/26/2018 19:08	128	62.98	132.63	11.41
10/26/2018 19:09	129	62.96	132.65	11.43
10/26/2018 19:10	130	62.93	132.68	11.46
10/26/2018 19:11	131	63.13	132.48	11.26
10/26/2018 19:12	132	62.55	133.07	11.85
10/26/2018 19:13	133	62.34	133.28	12.06
10/26/2018 19:14	134	62.68	132.93	11.71
10/26/2018 19:15	135	62.88	132.73	11.51
10/26/2018 19:16	136	62.53	133.09	11.87
10/26/2018 19:17	137	62.88	132.73	11.51
10/26/2018 19:18	138	62.20	133.43	12.21
10/26/2018 19:19	139	62.46	133.16	11.94
10/26/2018 19:20	140	62.73	132.89	11.67
10/26/2018 19:21	141	62.50	133.13	11.91
10/26/2018 19:22	142	62.36	133.27	12.05
10/26/2018 19:23	143	62.83	132.78	11.56
10/26/2018 19:24	144	62.10	133.53	12.31
10/26/2018 19:25	145	62.54	133.08	11.86
10/26/2018 19:26	146	62.15	133.48	12.26
10/26/2018 19:27	147	62.09	133.54	12.32
10/26/2018 19:28	148	62.50	133.12	11.90
10/26/2018 19:29	149	62.40	133.23	12.01
10/26/2018 19:30	150	62.29	133.34	12.12
10/26/2018 19:31	151	61.93	133.70	12.48
10/26/2018 19:32	152	62.16	133.47	12.25
10/26/2018 19:33	153	62.14	133.49	12.27

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/26/2018 19:34	154	62.02	133.61	12.39
10/26/2018 19:35	155	61.84	133.80	12.58
10/26/2018 19:36	156	62.31	133.32	12.10
10/26/2018 19:37	157	62.05	133.59	12.37
10/26/2018 19:38	158	61.93	133.70	12.49
10/26/2018 19:39	159	61.86	133.78	12.56
10/26/2018 19:40	160	62.30	133.32	12.10
10/26/2018 19:41	161	61.77	133.87	12.65
10/26/2018 19:42	162	61.39	134.26	13.04
10/26/2018 19:43	163	62.09	133.54	12.32
10/26/2018 19:44	164	62.06	133.57	12.35
10/26/2018 19:45	165	61.96	133.67	12.45
10/26/2018 19:46	166	62.12	133.51	12.29
10/26/2018 19:47	167	62.08	133.55	12.34
10/26/2018 19:48	168	61.70	133.94	12.72
10/26/2018 19:49	169	61.45	134.19	12.97
10/26/2018 19:50	170	61.90	133.73	12.52
10/26/2018 19:51	171	61.78	133.86	12.64
10/26/2018 19:52	172	61.63	134.01	12.79
10/26/2018 19:53	173	61.56	134.08	12.86
10/26/2018 19:54	174	61.40	134.25	13.03
10/26/2018 19:55	175	61.25	134.40	13.18
10/26/2018 19:56	176	61.38	134.27	13.05
10/26/2018 19:57	177	60.84	134.82	13.60
10/26/2018 19:58	178	61.78	133.86	12.64
10/26/2018 19:59	179	60.90	134.76	13.54
10/26/2018 20:00	180	61.27	134.38	13.16
10/26/2018 20:01	181	61.00	134.66	13.44
10/26/2018 20:02	182	61.44	134.21	12.99
10/26/2018 20:03	183	61.45	134.20	12.98
10/26/2018 20:04	184	60.94	134.72	13.50
10/26/2018 20:05	185	61.45	134.20	12.98
10/26/2018 20:06	186	61.11	134.54	13.32
10/26/2018 20:07	187	61.46	134.19	12.97
10/26/2018 20:08	188	61.29	134.36	13.14
10/26/2018 20:09	189	61.54	134.10	12.88
10/26/2018 20:10	190	61.08	134.58	13.36
10/26/2018 20:11	191	61.07	134.59	13.37
10/26/2018 20:12	192	61.50	134.15	12.93
10/26/2018 20:13	193	61.07	134.59	13.37
10/26/2018 20:14	194	60.68	134.99	13.77

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/26/2018 20:15	195	61.56	134.08	12.86
10/26/2018 20:16	196	60.91	134.75	13.53
10/26/2018 20:17	197	61.11	134.55	13.33
10/26/2018 20:18	198	60.83	134.83	13.61
10/26/2018 20:19	199	60.79	134.88	13.66
10/26/2018 20:20	200	60.69	134.97	13.75
10/26/2018 20:21	201	60.77	134.89	13.67
10/26/2018 20:22	202	60.64	135.03	13.81
10/26/2018 20:23	203	61.04	134.62	13.40
10/26/2018 20:24	204	60.56	135.11	13.89
10/26/2018 20:25	205	60.91	134.75	13.53
10/26/2018 20:26	206	60.83	134.83	13.61
10/26/2018 20:27	207	60.72	134.95	13.73
10/26/2018 20:28	208	60.70	134.96	13.74
10/26/2018 20:29	209	60.54	135.12	13.91
10/26/2018 20:30	210	60.51	135.16	13.94
10/26/2018 20:31	211	60.68	134.98	13.77
10/26/2018 20:32	212	60.73	134.93	13.71
10/26/2018 20:33	213	60.49	135.18	13.96
10/26/2018 20:34	214	60.72	134.94	13.73
10/26/2018 20:35	215	60.66	135.01	13.79
10/26/2018 20:36	216	60.22	135.45	14.24
10/26/2018 20:37	217	60.51	135.16	13.94
10/26/2018 20:38	218	60.78	134.88	13.66
10/26/2018 20:39	219	60.31	135.36	14.14
10/26/2018 20:40	220	60.67	135.00	13.78
10/26/2018 20:41	221	60.21	135.47	14.25
10/26/2018 20:42	222	60.44	135.24	14.02
10/26/2018 20:43	223	60.20	135.48	14.26
10/26/2018 20:44	224	60.13	135.54	14.33
10/26/2018 20:45	225	60.34	135.34	14.12
10/26/2018 20:46	226	60.71	134.95	13.73
10/26/2018 20:47	227	60.67	134.99	13.77
10/26/2018 20:48	228	60.34	135.33	14.11
10/26/2018 20:49	229	59.79	135.90	14.68
10/26/2018 20:50	230	60.14	135.54	14.32
10/26/2018 20:51	231	60.42	135.25	14.04
10/26/2018 20:52	232	60.17	135.50	14.29
10/26/2018 20:53	233	60.25	135.43	14.21
10/26/2018 20:54	234	60.38	135.29	14.08
10/26/2018 20:55	235	59.97	135.71	14.49

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/26/2018 20:56	236	60.12	135.56	14.34
10/26/2018 20:57	237	59.90	135.79	14.57
10/26/2018 20:58	238	59.56	136.13	14.91
10/26/2018 20:59	239	60.05	135.63	14.41
10/26/2018 21:00	240	59.93	135.75	14.53
10/26/2018 21:01	241	59.76	135.93	14.71
10/26/2018 21:02	242	59.94	135.75	14.53
10/26/2018 21:03	243	60.02	135.67	14.45
10/26/2018 21:04	244	59.91	135.78	14.56
10/26/2018 21:05	245	59.42	136.27	15.06
10/26/2018 21:06	246	59.76	135.93	14.71
10/26/2018 21:07	247	59.44	136.26	15.04
10/26/2018 21:08	248	59.04	136.66	15.44
10/26/2018 21:09	249	59.76	135.93	14.71
10/26/2018 21:10	250	59.55	136.15	14.93
10/26/2018 21:11	251	59.43	136.27	15.05
10/26/2018 21:12	252	59.61	136.08	14.86
10/26/2018 21:13	253	59.64	136.05	14.84
10/26/2018 21:14	254	59.37	136.33	15.11
10/26/2018 21:15	255	59.35	136.35	15.13
10/26/2018 21:16	256	59.62	136.07	14.85
10/26/2018 21:17	257	59.31	136.39	15.17
10/26/2018 21:18	258	59.43	136.27	15.05
10/26/2018 21:19	259	59.26	136.45	15.23
10/26/2018 21:20	260	59.26	136.44	15.22
10/26/2018 21:21	261	58.96	136.75	15.53
10/26/2018 21:22	262	59.59	136.11	14.89
10/26/2018 21:23	263	59.19	136.51	15.29
10/26/2018 21:24	264	59.60	136.09	14.87
10/26/2018 21:25	265	59.10	136.61	15.39
10/26/2018 21:26	266	59.12	136.58	15.36
10/26/2018 21:27	267	58.81	136.91	15.69
10/26/2018 21:28	268	58.51	137.21	15.99
10/26/2018 21:29	269	58.79	136.92	15.71
10/26/2018 21:30	270	59.09	136.62	15.40
10/26/2018 21:31	271	59.24	136.47	15.25
10/26/2018 21:32	272	58.77	136.94	15.72
10/26/2018 21:33	273	59.20	136.50	15.28
10/26/2018 21:34	274	59.18	136.52	15.30
10/26/2018 21:35	275	58.75	136.96	15.74
10/26/2018 21:36	276	58.91	136.80	15.58

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/26/2018 21:37	277	58.64	137.08	15.86
10/26/2018 21:38	278	58.90	136.81	15.59
10/26/2018 21:39	279	58.77	136.94	15.72
10/26/2018 21:40	280	58.79	136.92	15.70
10/26/2018 21:41	281	58.82	136.89	15.67
10/26/2018 21:42	282	58.98	136.73	15.51
10/26/2018 21:43	283	58.94	136.77	15.55
10/26/2018 21:44	284	58.81	136.90	15.68
10/26/2018 21:45	285	58.65	137.07	15.85
10/26/2018 21:46	286	58.77	136.95	15.73
10/26/2018 21:47	287	58.54	137.18	15.96
10/26/2018 21:48	288	58.51	137.21	15.99
10/26/2018 21:49	289	58.32	137.41	16.19
10/26/2018 21:50	290	59.14	136.57	15.35
10/26/2018 21:51	291	58.37	137.36	16.14
10/26/2018 21:52	292	58.75	136.96	15.74
10/26/2018 21:53	293	58.64	137.08	15.86
10/26/2018 21:54	294	58.40	137.32	16.10
10/26/2018 21:55	295	58.50	137.22	16.00
10/26/2018 21:56	296	58.61	137.11	15.89
10/26/2018 21:57	297	58.31	137.42	16.20
10/26/2018 21:58	298	58.57	137.15	15.93
10/26/2018 21:59	299	58.14	137.59	16.37
10/26/2018 22:00	300	58.26	137.47	16.25
10/26/2018 22:01	301	58.32	137.41	16.19
10/26/2018 22:02	302	58.13	137.60	16.38
10/26/2018 22:03	303	58.08	137.65	16.43
10/26/2018 22:04	304	58.32	137.40	16.18
10/26/2018 22:05	305	58.30	137.42	16.20
10/26/2018 22:06	306	58.56	137.16	15.94
10/26/2018 22:07	307	57.82	137.92	16.70
10/26/2018 22:08	308	58.23	137.49	16.27
10/26/2018 22:09	309	58.22	137.50	16.28
10/26/2018 22:10	310	58.17	137.56	16.34
10/26/2018 22:11	311	58.05	137.68	16.47
10/26/2018 22:12	312	58.08	137.65	16.44
10/26/2018 22:13	313	58.61	137.10	15.89
10/26/2018 22:14	314	57.90	137.83	16.61
10/26/2018 22:15	315	58.01	137.72	16.50
10/26/2018 22:16	316	57.84	137.90	16.68
10/26/2018 22:17	317	58.11	137.62	16.40

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/26/2018 22:18	318	58.04	137.69	16.47
10/26/2018 22:19	319	58.02	137.71	16.49
10/26/2018 22:20	320	58.06	137.68	16.46
10/26/2018 22:21	321	57.72	138.02	16.80
10/26/2018 22:22	322	57.65	138.09	16.87
10/26/2018 22:23	323	58.11	137.62	16.40
10/26/2018 22:24	324	57.69	138.05	16.83
10/26/2018 22:25	325	57.78	137.96	16.74
10/26/2018 22:26	326	57.76	137.97	16.76
10/26/2018 22:27	327	57.88	137.85	16.63
10/26/2018 22:28	328	57.79	137.94	16.72
10/26/2018 22:29	329	57.88	137.86	16.64
10/26/2018 22:30	330	57.63	138.12	16.90
10/26/2018 22:31	331	57.75	137.99	16.77
10/26/2018 22:32	332	57.82	137.92	16.70
10/26/2018 22:33	333	57.68	138.06	16.84
10/26/2018 22:34	334	57.66	138.08	16.86
10/26/2018 22:35	335	57.68	138.06	16.84
10/26/2018 22:36	336	57.57	138.17	16.95
10/26/2018 22:37	337	57.62	138.12	16.90
10/26/2018 22:38	338	57.61	138.13	16.91
10/26/2018 22:39	339	57.39	138.35	17.13
10/26/2018 22:40	340	57.21	138.54	17.32
10/26/2018 22:41	341	57.54	138.20	16.98
10/26/2018 22:42	342	57.37	138.37	17.15
10/26/2018 22:43	343	57.62	138.12	16.90
10/26/2018 22:44	344	57.50	138.24	17.02
10/26/2018 22:45	345	57.50	138.25	17.03
10/26/2018 22:46	346	57.32	138.43	17.21
10/26/2018 22:47	347	57.38	138.37	17.15
10/26/2018 22:48	348	57.11	138.64	17.42
10/26/2018 22:49	349	57.05	138.71	17.49
10/26/2018 22:50	350	57.14	138.61	17.39
10/26/2018 22:51	351	57.14	138.61	17.39
10/26/2018 22:52	352	57.06	138.69	17.47
10/26/2018 22:53	353	57.41	138.34	17.12
10/26/2018 22:54	354	57.23	138.52	17.30
10/26/2018 22:55	355	56.96	138.80	17.58
10/26/2018 22:56	356	57.16	138.59	17.37
10/26/2018 22:57	357	56.85	138.91	17.69
10/26/2018 22:58	358	57.12	138.64	17.42

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/26/2018 22:59	359	57.17	138.58	17.36
10/26/2018 23:00	360	57.02	138.74	17.52
10/26/2018 23:01	361	56.70	139.07	17.85
10/26/2018 23:02	362	56.92	138.84	17.62
10/26/2018 23:03	363	56.96	138.79	17.58
10/26/2018 23:04	364	56.65	139.12	17.90
10/26/2018 23:05	365	56.84	138.93	17.71
10/26/2018 23:06	366	56.71	139.05	17.83
10/26/2018 23:07	367	56.82	138.94	17.72
10/26/2018 23:08	368	56.92	138.84	17.62
10/26/2018 23:09	369	57.04	138.71	17.50
10/26/2018 23:10	370	56.60	139.17	17.95
10/26/2018 23:11	371	56.37	139.40	18.18
10/26/2018 23:12	372	56.76	139.00	17.78
10/26/2018 23:13	373	56.47	139.30	18.08
10/26/2018 23:14	374	56.35	139.42	18.20
10/26/2018 23:15	375	56.32	139.46	18.24
10/26/2018 23:16	376	56.54	139.23	18.01
10/26/2018 23:17	377	56.60	139.17	17.95
10/26/2018 23:18	378	56.93	138.83	17.61
10/26/2018 23:19	379	56.72	139.04	17.82
10/26/2018 23:20	380	56.14	139.63	18.42
10/26/2018 23:21	381	56.53	139.24	18.02
10/26/2018 23:22	382	56.33	139.44	18.23
10/26/2018 23:23	383	57.04	138.72	17.50
10/26/2018 23:24	384	56.34	139.43	18.21
10/26/2018 23:25	385	57.01	138.75	17.53
10/26/2018 23:26	386	56.42	139.35	18.13
10/26/2018 23:27	387	56.51	139.26	18.04
10/26/2018 23:28	388	56.41	139.36	18.14
10/26/2018 23:29	389	56.23	139.54	18.32
10/26/2018 23:30	390	55.96	139.82	18.60
10/26/2018 23:31	391	56.48	139.29	18.07
10/26/2018 23:32	392	56.42	139.35	18.13
10/26/2018 23:33	393	56.39	139.38	18.17
10/26/2018 23:34	394	56.69	139.07	17.85
10/26/2018 23:35	395	56.50	139.27	18.05
10/26/2018 23:36	396	56.01	139.77	18.55
10/26/2018 23:37	397	56.16	139.61	18.39
10/26/2018 23:38	398	55.82	139.96	18.74
10/26/2018 23:39	399	56.14	139.64	18.42

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/26/2018 23:40	400	55.83	139.96	18.74
10/26/2018 23:41	401	55.61	140.18	18.96
10/26/2018 23:42	402	56.24	139.54	18.32
10/26/2018 23:43	403	56.29	139.49	18.27
10/26/2018 23:44	404	55.99	139.79	18.57
10/26/2018 23:45	405	55.73	140.06	18.84
10/26/2018 23:46	406	55.55	140.25	19.03
10/26/2018 23:47	407	56.65	139.11	17.90
10/26/2018 23:48	408	55.96	139.82	18.60
10/26/2018 23:49	409	55.96	139.83	18.61
10/26/2018 23:50	410	55.90	139.88	18.66
10/26/2018 23:51	411	56.38	139.40	18.18
10/26/2018 23:52	412	55.62	140.18	18.96
10/26/2018 23:53	413	55.97	139.82	18.60
10/26/2018 23:54	414	55.78	140.01	18.79
10/26/2018 23:55	415	56.06	139.72	18.50
10/26/2018 23:56	416	55.82	139.97	18.75
10/26/2018 23:57	417	55.58	140.21	18.99
10/26/2018 23:58	418	55.43	140.36	19.14
10/26/2018 23:59	419	55.74	140.05	18.83
10/27/2018 0:00	420	55.59	140.20	18.98
10/27/2018 0:01	421	55.32	140.48	19.26
10/27/2018 0:02	422	56.04	139.75	18.53
10/27/2018 0:03	423	55.45	140.35	19.13
10/27/2018 0:04	424	55.70	140.09	18.87
10/27/2018 0:05	425	55.64	140.15	18.93
10/27/2018 0:06	426	55.64	140.15	18.93
10/27/2018 0:07	427	55.53	140.26	19.04
10/27/2018 0:08	428	55.61	140.18	18.96
10/27/2018 0:09	429	55.74	140.05	18.83
10/27/2018 0:10	430	55.85	139.93	18.71
10/27/2018 0:11	431	55.36	140.44	19.22
10/27/2018 0:12	432	55.49	140.30	19.08
10/27/2018 0:13	433	55.55	140.25	19.03
10/27/2018 0:14	434	55.39	140.40	19.18
10/27/2018 0:15	435	55.64	140.15	18.93
10/27/2018 0:16	436	55.50	140.29	19.07
10/27/2018 0:17	437	55.40	140.40	19.18
10/27/2018 0:18	438	54.93	140.88	19.66
10/27/2018 0:19	439	55.62	140.17	18.95
10/27/2018 0:20	440	55.07	140.74	19.52

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/27/2018 0:21	441	55.45	140.35	19.13
10/27/2018 0:22	442	55.07	140.73	19.51
10/27/2018 0:23	443	55.52	140.27	19.05
10/27/2018 0:24	444	54.94	140.86	19.64
10/27/2018 0:25	445	55.25	140.55	19.33
10/27/2018 0:26	446	55.21	140.59	19.37
10/27/2018 0:27	447	55.01	140.80	19.58
10/27/2018 0:28	448	54.53	141.29	20.07
10/27/2018 0:29	449	55.15	140.65	19.43
10/27/2018 0:30	450	54.47	141.35	20.13
10/27/2018 0:31	451	55.05	140.75	19.53
10/27/2018 0:32	452	55.10	140.70	19.48
10/27/2018 0:33	453	54.76	141.06	19.84
10/27/2018 0:34	454	55.21	140.59	19.37
10/27/2018 0:35	455	54.88	140.93	19.71
10/27/2018 0:36	456	54.71	141.10	19.89
10/27/2018 0:37	457	54.60	141.21	19.99
10/27/2018 0:38	458	54.86	140.95	19.73
10/27/2018 0:39	459	54.96	140.85	19.63
10/27/2018 0:40	460	54.82	140.99	19.77
10/27/2018 0:41	461	54.69	141.13	19.91
10/27/2018 0:42	462	54.87	140.94	19.72
10/27/2018 0:43	463	54.77	141.04	19.82
10/27/2018 0:44	464	55.11	140.70	19.48
10/27/2018 0:45	465	54.82	140.99	19.77
10/27/2018 0:46	466	54.50	141.32	20.10
10/27/2018 0:47	467	54.36	141.46	20.24
10/27/2018 0:48	468	54.12	141.71	20.49
10/27/2018 0:49	469	54.45	141.37	20.15
10/27/2018 0:50	470	54.31	141.51	20.29
10/27/2018 0:51	471	55.00	140.81	19.59
10/27/2018 0:52	472	54.57	141.25	20.03
10/27/2018 0:53	473	54.30	141.53	20.31
10/27/2018 0:54	474	54.13	141.70	20.48
10/27/2018 0:55	475	54.30	141.53	20.31
10/27/2018 0:56	476	54.35	141.47	20.25
10/27/2018 0:57	477	54.48	141.34	20.12
10/27/2018 0:58	478	54.23	141.60	20.38
10/27/2018 0:59	479	54.41	141.41	20.20
10/27/2018 1:00	480	53.99	141.84	20.62
10/27/2018 1:01	481	55.09	140.71	19.49

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/27/2018 1:02	482	54.39	141.43	20.21
10/27/2018 1:03	483	54.12	141.71	20.49
10/27/2018 1:04	484	54.21	141.62	20.40
10/27/2018 1:05	485	54.31	141.51	20.29
10/27/2018 1:06	486	53.92	141.91	20.69
10/27/2018 1:07	487	54.13	141.70	20.48
10/27/2018 1:08	488	54.16	141.67	20.45
10/27/2018 1:09	489	54.06	141.77	20.55
10/27/2018 1:10	490	54.16	141.67	20.45
10/27/2018 1:11	491	53.52	142.33	21.11
10/27/2018 1:12	492	53.99	141.85	20.63
10/27/2018 1:13	493	53.73	142.10	20.89
10/27/2018 1:14	494	53.75	142.09	20.87
10/27/2018 1:15	495	53.71	142.13	20.91
10/27/2018 1:16	496	54.13	141.69	20.47
10/27/2018 1:17	497	53.93	141.90	20.68
10/27/2018 1:18	498	53.93	141.91	20.69
10/27/2018 1:19	499	53.93	141.90	20.68
10/27/2018 1:20	500	53.68	142.16	20.94
10/27/2018 1:21	501	53.90	141.94	20.72
10/27/2018 1:22	502	54.12	141.71	20.49
10/27/2018 1:23	503	53.69	142.15	20.93
10/27/2018 1:24	504	53.85	141.99	20.77
10/27/2018 1:25	505	53.82	142.01	20.79
10/27/2018 1:26	506	53.90	141.93	20.71
10/27/2018 1:27	507	53.89	141.94	20.72
10/27/2018 1:28	508	52.91	142.95	21.73
10/27/2018 1:29	509	53.95	141.88	20.66
10/27/2018 1:30	510	53.84	142.00	20.78
10/27/2018 1:31	511	53.87	141.97	20.75
10/27/2018 1:32	512	53.81	142.03	20.81
10/27/2018 1:33	513	53.67	142.17	20.96
10/27/2018 1:34	514	53.52	142.32	21.10
10/27/2018 1:35	515	53.70	142.14	20.92
10/27/2018 1:36	516	52.97	142.89	21.67
10/27/2018 1:37	517	53.96	141.88	20.66
10/27/2018 1:38	518	53.46	142.39	21.17
10/27/2018 1:39	519	53.07	142.79	21.57
10/27/2018 1:40	520	53.56	142.28	21.06
10/27/2018 1:41	521	53.14	142.72	21.50
10/27/2018 1:42	522	53.75	142.09	20.87

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/27/2018 1:43	523	53.18	142.67	21.46
10/27/2018 1:44	524	53.47	142.38	21.16
10/27/2018 1:45	525	53.45	142.40	21.18
10/27/2018 1:46	526	53.42	142.42	21.21
10/27/2018 1:47	527	53.47	142.38	21.16
10/27/2018 1:48	528	53.64	142.20	20.98
10/27/2018 1:49	529	53.30	142.54	21.33
10/27/2018 1:50	530	53.26	142.59	21.37
10/27/2018 1:51	531	53.17	142.69	21.47
10/27/2018 1:52	532	53.17	142.68	21.47
10/27/2018 1:53	533	53.24	142.61	21.39
10/27/2018 1:54	534	53.26	142.59	21.37
10/27/2018 1:55	535	52.61	143.25	22.04
10/27/2018 1:56	536	52.89	142.97	21.75
10/27/2018 1:57	537	52.74	143.12	21.90
10/27/2018 1:58	538	53.27	142.58	21.36
10/27/2018 1:59	539	52.84	143.02	21.80
10/27/2018 2:00	540	52.88	142.98	21.76
10/27/2018 2:01	541	53.34	142.51	21.29
10/27/2018 2:02	542	53.18	142.67	21.45
10/27/2018 2:03	543	52.86	143.00	21.78
10/27/2018 2:04	544	52.90	142.96	21.74
10/27/2018 2:05	545	53.05	142.80	21.58
10/27/2018 2:06	546	52.48	143.39	22.17
10/27/2018 2:07	547	53.24	142.61	21.39
10/27/2018 2:08	548	52.87	142.98	21.77
10/27/2018 2:09	549	52.89	142.96	21.75
10/27/2018 2:10	550	52.81	143.05	21.83
10/27/2018 2:11	551	53.04	142.81	21.59
10/27/2018 2:12	552	53.10	142.75	21.53
10/27/2018 2:13	553	52.83	143.03	21.81
10/27/2018 2:14	554	52.80	143.06	21.85
10/27/2018 2:15	555	52.97	142.88	21.66
10/27/2018 2:16	556	52.40	143.47	22.25
10/27/2018 2:17	557	52.70	143.17	21.95
10/27/2018 2:18	558	52.49	143.38	22.16
10/27/2018 2:19	559	52.52	143.35	22.13
10/27/2018 2:20	560	52.97	142.89	21.67
10/27/2018 2:21	561	52.28	143.59	22.37
10/27/2018 2:22	562	52.68	143.19	21.97
10/27/2018 2:23	563	52.44	143.43	22.21

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/27/2018 2:24	564	52.57	143.30	22.08
10/27/2018 2:25	565	52.16	143.71	22.50
10/27/2018 2:26	566	52.54	143.33	22.11
10/27/2018 2:27	567	52.52	143.35	22.13
10/27/2018 2:28	568	52.57	143.29	22.08
10/27/2018 2:29	569	52.47	143.40	22.18
10/27/2018 2:30	570	52.62	143.24	22.02
10/27/2018 2:31	571	52.52	143.35	22.13
10/27/2018 2:32	572	51.69	144.20	22.98
10/27/2018 2:33	573	52.51	143.35	22.14
10/27/2018 2:34	574	52.36	143.52	22.30
10/27/2018 2:35	575	52.13	143.75	22.53
10/27/2018 2:36	576	52.23	143.65	22.43
10/27/2018 2:37	577	51.89	143.99	22.78
10/27/2018 2:38	578	51.80	144.09	22.87
10/27/2018 2:39	579	52.04	143.84	22.62
10/27/2018 2:40	580	51.87	144.01	22.79
10/27/2018 2:41	581	52.34	143.53	22.31
10/27/2018 2:42	582	52.06	143.82	22.60
10/27/2018 2:43	583	51.47	144.43	23.21
10/27/2018 2:44	584	51.62	144.27	23.06
10/27/2018 2:45	585	51.66	144.23	23.01
10/27/2018 2:46	586	51.63	144.26	23.04
10/27/2018 2:47	587	52.00	143.88	22.66
10/27/2018 2:48	588	51.73	144.16	22.94
10/27/2018 2:49	589	51.37	144.53	23.31
10/27/2018 2:50	590	51.82	144.06	22.84
10/27/2018 2:51	591	51.80	144.09	22.87
10/27/2018 2:52	592	51.65	144.24	23.02
10/27/2018 2:53	593	51.79	144.10	22.88
10/27/2018 2:54	594	51.79	144.09	22.87
10/27/2018 2:55	595	51.48	144.41	23.19
10/27/2018 2:56	596	51.44	144.46	23.24
10/27/2018 2:57	597	51.60	144.29	23.07
10/27/2018 2:58	598	51.57	144.32	23.11
10/27/2018 2:59	599	51.97	143.91	22.69
10/27/2018 3:00	600	51.18	144.72	23.51
10/27/2018 3:01	601	50.83	145.08	23.86
10/27/2018 3:02	602	51.74	144.15	22.93
10/27/2018 3:03	603	51.63	144.26	23.04
10/27/2018 3:04	604	51.53	144.37	23.15

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/27/2018 3:05	605	51.20	144.70	23.48
10/27/2018 3:06	606	51.49	144.40	23.19
10/27/2018 3:07	607	51.35	144.55	23.33
10/27/2018 3:08	608	51.22	144.68	23.46
10/27/2018 3:09	609	51.34	144.56	23.34
10/27/2018 3:10	610	51.51	144.39	23.17
10/27/2018 3:11	611	51.41	144.49	23.27
10/27/2018 3:12	612	50.99	144.91	23.69
10/27/2018 3:13	613	51.24	144.66	23.44
10/27/2018 3:14	614	51.49	144.40	23.18
10/27/2018 3:15	615	51.53	144.36	23.14
10/27/2018 3:16	616	51.29	144.61	23.39
10/27/2018 3:17	617	51.41	144.49	23.27
10/27/2018 3:18	618	51.01	144.90	23.68
10/27/2018 3:19	619	51.20	144.70	23.48
10/27/2018 3:20	620	51.12	144.78	23.56
10/27/2018 3:21	621	50.98	144.93	23.71
10/27/2018 3:22	622	51.29	144.61	23.39
10/27/2018 3:23	623	51.22	144.68	23.46
10/27/2018 3:24	624	51.41	144.48	23.26
10/27/2018 3:25	625	51.18	144.72	23.50
10/27/2018 3:26	626	50.73	145.18	23.96
10/27/2018 3:27	627	51.13	144.77	23.55
10/27/2018 3:28	628	50.94	144.97	23.75
10/27/2018 3:29	629	51.53	144.36	23.14
10/27/2018 3:30	630	50.75	145.17	23.95
10/27/2018 3:31	631	50.79	145.12	23.90
10/27/2018 3:32	632	50.51	145.41	24.19
10/27/2018 3:33	633	50.95	144.95	23.73
10/27/2018 3:34	634	50.79	145.12	23.90
10/27/2018 3:35	635	50.65	145.26	24.04
10/27/2018 3:36	636	51.15	144.75	23.53
10/27/2018 3:37	637	50.74	145.17	23.95
10/27/2018 3:38	638	50.59	145.32	24.10
10/27/2018 3:39	639	51.27	144.63	23.41
10/27/2018 3:40	640	50.72	145.19	23.97
10/27/2018 3:41	641	50.40	145.53	24.31
10/27/2018 3:42	642	50.61	145.31	24.09
10/27/2018 3:43	643	50.45	145.47	24.25
10/27/2018 3:44	644	50.37	145.55	24.33
10/27/2018 3:45	645	50.67	145.25	24.03

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/27/2018 3:46	646	50.59	145.32	24.10
10/27/2018 3:47	647	50.81	145.10	23.88
10/27/2018 3:48	648	50.28	145.64	24.43
10/27/2018 3:49	649	50.46	145.46	24.24
10/27/2018 3:50	650	50.36	145.57	24.35
10/27/2018 3:51	651	50.38	145.54	24.32
10/27/2018 3:52	652	50.76	145.15	23.93
10/27/2018 3:53	653	50.20	145.73	24.51
10/27/2018 3:54	654	50.28	145.64	24.42
10/27/2018 3:55	655	50.53	145.39	24.17
10/27/2018 3:56	656	50.42	145.50	24.28
10/27/2018 3:57	657	50.34	145.58	24.36
10/27/2018 3:58	658	50.08	145.85	24.63
10/27/2018 3:59	659	50.31	145.61	24.39
10/27/2018 4:00	660	50.31	145.62	24.40
10/27/2018 4:01	661	50.17	145.76	24.54
10/27/2018 4:02	662	50.65	145.26	24.05
10/27/2018 4:03	663	49.98	145.95	24.73
10/27/2018 4:04	664	49.96	145.97	24.75
10/27/2018 4:05	665	49.79	146.15	24.93
10/27/2018 4:06	666	49.94	146.00	24.78
10/27/2018 4:07	667	50.33	145.59	24.37
10/27/2018 4:08	668	49.93	146.00	24.78
10/27/2018 4:09	669	49.56	146.38	25.16
10/27/2018 4:10	670	50.03	145.90	24.68
10/27/2018 4:11	671	49.81	146.13	24.91
10/27/2018 4:12	672	49.56	146.39	25.17
10/27/2018 4:13	673	49.92	146.01	24.79
10/27/2018 4:14	674	50.32	145.61	24.39
10/27/2018 4:15	675	49.40	146.54	25.32
10/27/2018 4:16	676	49.68	146.26	25.04
10/27/2018 4:17	677	49.51	146.43	25.21
10/27/2018 4:18	678	49.88	146.06	24.84
10/27/2018 4:19	679	50.08	145.85	24.63
10/27/2018 4:20	680	49.68	146.26	25.04
10/27/2018 4:21	681	49.65	146.29	25.07
10/27/2018 4:22	682	49.97	145.96	24.74
10/27/2018 4:23	683	49.43	146.52	25.30
10/27/2018 4:24	684	49.88	146.05	24.83
10/27/2018 4:25	685	49.58	146.37	25.15
10/27/2018 4:26	686	49.83	146.11	24.89

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/27/2018 4:27	687	49.32	146.63	25.41
10/27/2018 4:28	688	49.09	146.86	25.65
10/27/2018 4:29	689	49.44	146.50	25.28
10/27/2018 4:30	690	49.38	146.56	25.35
10/27/2018 4:31	691	49.56	146.38	25.16
10/27/2018 4:32	692	49.31	146.64	25.42
10/27/2018 4:33	693	49.70	146.24	25.02
10/27/2018 4:34	694	49.64	146.30	25.08
10/27/2018 4:35	695	49.56	146.38	25.16
10/27/2018 4:36	696	49.29	146.66	25.44
10/27/2018 4:37	697	49.65	146.29	25.07
10/27/2018 4:38	698	49.11	146.84	25.62
10/27/2018 4:39	699	49.05	146.91	25.69
10/27/2018 4:40	700	49.39	146.56	25.34
10/27/2018 4:41	701	49.49	146.46	25.24
10/27/2018 4:42	702	48.87	147.09	25.87
10/27/2018 4:43	703	49.16	146.79	25.57
10/27/2018 4:44	704	49.43	146.51	25.29
10/27/2018 4:45	705	49.07	146.88	25.66
10/27/2018 4:46	706	49.42	146.52	25.30
10/27/2018 4:47	707	49.15	146.80	25.58
10/27/2018 4:48	708	48.80	147.16	25.94
10/27/2018 4:49	709	48.78	147.18	25.96
10/27/2018 4:50	710	48.93	147.03	25.81
10/27/2018 4:51	711	49.29	146.66	25.44
10/27/2018 4:52	712	49.17	146.78	25.56
10/27/2018 4:53	713	48.69	147.27	26.05
10/27/2018 4:54	714	48.63	147.33	26.11
10/27/2018 4:55	715	49.06	146.89	25.67
10/27/2018 4:56	716	48.92	147.04	25.82
10/27/2018 4:57	717	48.34	147.63	26.41
10/27/2018 4:58	718	48.68	147.29	26.07
10/27/2018 4:59	719	48.92	147.04	25.82
10/27/2018 5:00	720	48.94	147.02	25.80
10/27/2018 5:01	721	49.00	146.95	25.73
10/27/2018 5:02	722	48.99	146.97	25.75
10/27/2018 5:03	723	48.75	147.21	25.99
10/27/2018 5:04	724	48.19	147.78	26.56
10/27/2018 5:05	725	48.53	147.43	26.21
10/27/2018 5:06	726	48.72	147.24	26.02
10/27/2018 5:07	727	49.02	146.94	25.72

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/27/2018 5:08	728	48.60	147.37	26.15
10/27/2018 5:09	729	48.52	147.45	26.23
10/27/2018 5:10	730	48.65	147.31	26.09
10/27/2018 5:11	731	48.41	147.56	26.34
10/27/2018 5:12	732	48.88	147.08	25.86
10/27/2018 5:13	733	48.94	147.01	25.79
10/27/2018 5:14	734	48.63	147.34	26.12
10/27/2018 5:15	735	48.60	147.36	26.14
10/27/2018 5:16	736	49.06	146.90	25.68
10/27/2018 5:17	737	48.75	147.21	26.00
10/27/2018 5:18	738	48.67	147.30	26.08
10/27/2018 5:19	739	49.27	146.68	25.46
10/27/2018 5:20	740	48.88	147.07	25.86
10/27/2018 5:21	741	48.99	146.97	25.75
10/27/2018 5:22	742	48.61	147.36	26.14
10/27/2018 5:23	743	48.70	147.27	26.05
10/27/2018 5:24	744	48.06	147.91	26.70
10/27/2018 5:25	745	48.41	147.56	26.34
10/27/2018 5:26	746	48.32	147.65	26.43
10/27/2018 5:27	747	48.32	147.65	26.43
10/27/2018 5:28	748	48.61	147.35	26.13
10/27/2018 5:29	749	47.99	147.99	26.77
10/27/2018 5:30	750	48.70	147.26	26.04
10/27/2018 5:31	751	48.02	147.96	26.74
10/27/2018 5:32	752	47.87	148.11	26.89
10/27/2018 5:33	753	48.11	147.87	26.65
10/27/2018 5:34	754	48.05	147.92	26.71
10/27/2018 5:35	755	48.01	147.97	26.76
10/27/2018 5:36	756	47.64	148.34	27.13
10/27/2018 5:37	757	47.81	148.17	26.95
10/27/2018 5:38	758	48.34	147.63	26.41
10/27/2018 5:39	759	48.03	147.95	26.73
10/27/2018 5:40	760	47.99	147.99	26.77
10/27/2018 5:41	761	48.39	147.58	26.36
10/27/2018 5:42	762	48.67	147.30	26.08
10/27/2018 5:43	763	48.07	147.91	26.69
10/27/2018 5:44	764	48.08	147.90	26.68
10/27/2018 5:45	765	47.91	148.08	26.86
10/27/2018 5:46	766	48.19	147.78	26.56
10/27/2018 5:47	767	47.90	148.08	26.86
10/27/2018 5:48	768	48.12	147.86	26.64

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/27/2018 5:49	769	47.75	148.23	27.01
10/27/2018 5:50	770	47.66	148.33	27.11
10/27/2018 5:51	771	48.20	147.78	26.56
10/27/2018 5:52	772	48.02	147.96	26.75
10/27/2018 5:53	773	47.83	148.16	26.94
10/27/2018 5:54	774	48.00	147.98	26.76
10/27/2018 5:55	775	47.38	148.62	27.40
10/27/2018 5:56	776	47.83	148.15	26.93
10/27/2018 5:57	777	48.14	147.84	26.62
10/27/2018 5:58	778	47.87	148.12	26.90
10/27/2018 5:59	779	47.59	148.40	27.18
10/27/2018 6:00	780	47.92	148.06	26.84
10/27/2018 6:01	781	48.26	147.71	26.49
10/27/2018 6:02	782	47.57	148.42	27.20
10/27/2018 6:03	783	47.75	148.24	27.02
10/27/2018 6:04	784	47.13	148.87	27.65
10/27/2018 6:05	785	47.75	148.24	27.02
10/27/2018 6:06	786	47.53	148.46	27.25
10/27/2018 6:07	787	47.54	148.45	27.23
10/27/2018 6:08	788	47.67	148.32	27.10
10/27/2018 6:09	789	47.56	148.44	27.22
10/27/2018 6:10	790	47.56	148.43	27.21
10/27/2018 6:11	791	47.51	148.48	27.26
10/27/2018 6:12	792	47.72	148.26	27.04
10/27/2018 6:13	793	47.37	148.62	27.41
10/27/2018 6:14	794	47.77	148.21	27.00
10/27/2018 6:15	795	47.01	149.00	27.78
10/27/2018 6:16	796	48.23	147.74	26.52
10/27/2018 6:17	797	47.53	148.47	27.25
10/27/2018 6:18	798	47.05	148.96	27.74
10/27/2018 6:19	799	47.24	148.76	27.54
10/27/2018 6:20	800	47.68	148.30	27.08
10/27/2018 6:21	801	47.24	148.76	27.54
10/27/2018 6:22	802	47.45	148.54	27.32
10/27/2018 6:23	803	47.19	148.81	27.59
10/27/2018 6:24	804	47.67	148.32	27.10
10/27/2018 6:25	805	47.27	148.73	27.51
10/27/2018 6:26	806	47.80	148.19	26.97
10/27/2018 6:27	807	47.88	148.10	26.88
10/27/2018 6:28	808	47.48	148.51	27.29
10/27/2018 6:29	809	46.66	149.35	28.13

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/27/2018 6:30	810	47.24	148.76	27.54
10/27/2018 6:31	811	47.22	148.77	27.56
10/27/2018 6:32	812	47.41	148.58	27.36
10/27/2018 6:33	813	47.33	148.67	27.45
10/27/2018 6:34	814	47.45	148.54	27.32
10/27/2018 6:35	815	47.34	148.66	27.44
10/27/2018 6:36	816	47.31	148.69	27.47
10/27/2018 6:37	817	47.03	148.97	27.75
10/27/2018 6:38	818	47.47	148.52	27.30
10/27/2018 6:39	819	47.43	148.56	27.34
10/27/2018 6:40	820	46.88	149.13	27.91
10/27/2018 6:41	821	46.73	149.29	28.07
10/27/2018 6:42	822	46.90	149.10	27.88
10/27/2018 6:43	823	47.66	148.33	27.11
10/27/2018 6:44	824	47.13	148.87	27.65
10/27/2018 6:45	825	47.18	148.82	27.60
10/27/2018 6:46	826	46.86	149.15	27.93
10/27/2018 6:47	827	47.13	148.87	27.65
10/27/2018 6:48	828	46.53	149.49	28.27
10/27/2018 6:49	829	47.08	148.92	27.70
10/27/2018 6:50	830	46.68	149.33	28.11
10/27/2018 6:51	831	47.30	148.70	27.48
10/27/2018 6:52	832	46.93	149.08	27.86
10/27/2018 6:53	833	47.14	148.86	27.64
10/27/2018 6:54	834	46.24	149.79	28.57
10/27/2018 6:55	835	46.95	149.05	27.83
10/27/2018 6:56	836	46.52	149.50	28.28
10/27/2018 6:57	837	46.68	149.33	28.11
10/27/2018 6:58	838	47.05	148.95	27.73
10/27/2018 6:59	839	46.97	149.04	27.82
10/27/2018 7:00	840	46.72	149.29	28.07
10/27/2018 7:01	841	46.47	149.55	28.33
10/27/2018 7:02	842	46.56	149.46	28.24
10/27/2018 7:03	843	46.92	149.09	27.87
10/27/2018 7:04	844	46.92	149.09	27.87
10/27/2018 7:05	845	46.89	149.12	27.90
10/27/2018 7:06	846	46.75	149.26	28.04
10/27/2018 7:07	847	46.32	149.70	28.48
10/27/2018 7:08	848	46.65	149.37	28.15
10/27/2018 7:09	849	46.92	149.08	27.86
10/27/2018 7:10	850	46.77	149.24	28.02

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/27/2018 7:11	851	46.85	149.16	27.94
10/27/2018 7:12	852	46.28	149.74	28.52
10/27/2018 7:13	853	46.41	149.61	28.40
10/27/2018 7:14	854	47.08	148.92	27.70
10/27/2018 7:15	855	46.49	149.53	28.31
10/27/2018 7:16	856	46.82	149.19	27.97
10/27/2018 7:17	857	46.52	149.50	28.28
10/27/2018 7:18	858	46.75	149.26	28.04
10/27/2018 7:19	859	46.81	149.20	27.98
10/27/2018 7:20	860	46.38	149.64	28.42
10/27/2018 7:21	861	46.49	149.53	28.31
10/27/2018 7:22	862	46.28	149.75	28.53
10/27/2018 7:23	863	46.68	149.33	28.11
10/27/2018 7:24	864	46.41	149.61	28.39
10/27/2018 7:25	865	47.14	148.86	27.64
10/27/2018 7:26	866	46.25	149.77	28.55
10/27/2018 7:27	867	46.74	149.27	28.05
10/27/2018 7:28	868	46.05	149.98	28.76
10/27/2018 7:29	869	46.20	149.83	28.61
10/27/2018 7:30	870	46.31	149.71	28.49
10/27/2018 7:31	871	46.70	149.31	28.09
10/27/2018 7:32	872	46.30	149.72	28.50
10/27/2018 7:33	873	46.57	149.45	28.23
10/27/2018 7:34	874	45.97	150.06	28.84
10/27/2018 7:35	875	46.18	149.84	28.62
10/27/2018 7:36	876	45.97	150.06	28.84
10/27/2018 7:37	877	46.24	149.78	28.56
10/27/2018 7:38	878	46.15	149.87	28.66
10/27/2018 7:39	879	46.46	149.56	28.34
10/27/2018 7:40	880	46.29	149.74	28.52
10/27/2018 7:41	881	46.12	149.90	28.69
10/27/2018 7:42	882	46.20	149.83	28.61
10/27/2018 7:43	883	45.74	150.30	29.08
10/27/2018 7:44	884	46.19	149.84	28.62
10/27/2018 7:45	885	45.73	150.30	29.08
10/27/2018 7:46	886	45.92	150.11	28.89
10/27/2018 7:47	887	46.13	149.89	28.68
10/27/2018 7:48	888	46.06	149.97	28.75
10/27/2018 7:49	889	46.27	149.76	28.54
10/27/2018 7:50	890	46.00	150.03	28.82
10/27/2018 7:51	891	45.79	150.25	29.03

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/27/2018 7:52	892	45.94	150.09	28.87
10/27/2018 7:53	893	45.93	150.10	28.88
10/27/2018 7:54	894	46.11	149.92	28.70
10/27/2018 7:55	895	45.43	150.61	29.39
10/27/2018 7:56	896	46.12	149.90	28.68
10/27/2018 7:57	897	45.84	150.20	28.98
10/27/2018 7:58	898	45.99	150.04	28.82
10/27/2018 7:59	899	46.40	149.62	28.40
10/27/2018 8:00	900	45.79	150.25	29.03
10/27/2018 8:01	901	45.74	150.29	29.07
10/27/2018 8:02	902	45.49	150.55	29.33
10/27/2018 8:03	903	45.88	150.16	28.94
10/27/2018 8:04	904	45.84	150.19	28.97
10/27/2018 8:05	905	45.44	150.60	29.38
10/27/2018 8:06	906	45.44	150.60	29.38
10/27/2018 8:07	907	45.62	150.42	29.20
10/27/2018 8:08	908	45.29	150.75	29.53
10/27/2018 8:09	909	45.16	150.89	29.67
10/27/2018 8:10	910	44.96	151.09	29.87
10/27/2018 8:11	911	45.57	150.47	29.25
10/27/2018 8:12	912	45.34	150.71	29.49
10/27/2018 8:13	913	45.37	150.67	29.45
10/27/2018 8:14	914	45.75	150.29	29.07
10/27/2018 8:15	915	45.13	150.92	29.70
10/27/2018 8:16	916	45.03	151.02	29.80
10/27/2018 8:17	917	45.40	150.64	29.42
10/27/2018 8:18	918	45.41	150.64	29.42
10/27/2018 8:19	919	45.40	150.64	29.42
10/27/2018 8:20	920	45.71	150.32	29.10
10/27/2018 8:21	921	45.36	150.69	29.47
10/27/2018 8:22	922	45.11	150.94	29.72
10/27/2018 8:23	923	45.01	151.04	29.82
10/27/2018 8:24	924	44.87	151.19	29.97
10/27/2018 8:25	925	45.17	150.88	29.66
10/27/2018 8:26	926	44.84	151.22	30.00
10/27/2018 8:27	927	45.28	150.76	29.54
10/27/2018 8:28	928	45.31	150.74	29.52
10/27/2018 8:29	929	46.01	150.02	28.80
10/27/2018 8:30	930	44.71	151.35	30.13
10/27/2018 8:31	931	44.87	151.18	29.96
10/27/2018 8:32	932	45.33	150.72	29.50

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/27/2018 8:33	933	45.59	150.45	29.23
10/27/2018 8:34	934	45.49	150.55	29.33
10/27/2018 8:35	935	45.02	151.04	29.82
10/27/2018 8:36	936	45.40	150.64	29.43
10/27/2018 8:37	937	44.57	151.49	30.27
10/27/2018 8:38	938	44.81	151.25	30.03
10/27/2018 8:39	939	45.10	150.96	29.74
10/27/2018 8:40	940	45.16	150.89	29.68
10/27/2018 8:41	941	45.21	150.84	29.62
10/27/2018 8:42	942	44.81	151.25	30.03
10/27/2018 8:43	943	44.67	151.39	30.17
10/27/2018 8:44	944	45.57	150.47	29.25
10/27/2018 8:45	945	45.14	150.91	29.69
10/27/2018 8:46	946	44.71	151.35	30.13
10/27/2018 8:47	947	44.99	151.07	29.85
10/27/2018 8:48	948	44.96	151.10	29.88
10/27/2018 8:49	949	44.96	151.09	29.87
10/27/2018 8:50	950	44.90	151.15	29.93
10/27/2018 8:51	951	45.02	151.03	29.82
10/27/2018 8:52	952	44.80	151.26	30.04
10/27/2018 8:53	953	44.83	151.23	30.01
10/27/2018 8:54	954	44.45	151.62	30.40
10/27/2018 8:55	955	44.96	151.09	29.87
10/27/2018 8:56	956	44.90	151.16	29.94
10/27/2018 8:57	957	44.93	151.12	29.90
10/27/2018 8:58	958	45.04	151.02	29.80
10/27/2018 8:59	959	45.13	150.92	29.70
10/27/2018 9:00	960	44.50	151.56	30.35
10/27/2018 9:01	961	44.45	151.62	30.40
10/27/2018 9:02	962	45.04	151.01	29.79
10/27/2018 9:03	963	43.80	152.28	31.07
10/27/2018 9:04	964	44.67	151.40	30.18
10/27/2018 9:05	965	44.51	151.55	30.34
10/27/2018 9:06	966	44.27	151.80	30.58
10/27/2018 9:07	967	44.30	151.77	30.55
10/27/2018 9:08	968	44.41	151.66	30.44
10/27/2018 9:09	969	44.08	151.99	30.77
10/27/2018 9:10	970	44.29	151.78	30.56
10/27/2018 9:11	971	44.59	151.48	30.26
10/27/2018 9:12	972	44.22	151.85	30.63
10/27/2018 9:13	973	44.27	151.80	30.58

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/27/2018 9:14	974	44.65	151.41	30.19
10/27/2018 9:15	975	44.67	151.39	30.18
10/27/2018 9:16	976	44.35	151.72	30.50
10/27/2018 9:17	977	44.56	151.50	30.28
10/27/2018 9:18	978	44.44	151.63	30.41
10/27/2018 9:19	979	44.33	151.74	30.52
10/27/2018 9:20	980	44.26	151.81	30.59
10/27/2018 9:21	981	44.29	151.78	30.56
10/27/2018 9:22	982	43.82	152.26	31.04
10/27/2018 9:23	983	44.04	152.04	30.82
10/27/2018 9:24	984	44.22	151.86	30.64
10/27/2018 9:25	985	44.07	152.01	30.79
10/27/2018 9:26	986	44.29	151.79	30.57
10/27/2018 9:27	987	44.24	151.83	30.61
10/27/2018 9:28	988	43.88	152.20	30.98
10/27/2018 9:29	989	44.55	151.51	30.29
10/27/2018 9:30	990	43.99	152.08	30.87
10/27/2018 9:31	991	44.10	151.98	30.76
10/27/2018 9:32	992	43.97	152.11	30.89
10/27/2018 9:33	993	43.76	152.32	31.10
10/27/2018 9:34	994	43.55	152.54	31.32
10/27/2018 9:35	995	43.95	152.13	30.91
10/27/2018 9:36	996	44.22	151.86	30.64
10/27/2018 9:37	997	44.45	151.61	30.40
10/27/2018 9:38	998	44.20	151.88	30.66
10/27/2018 9:39	999	44.48	151.58	30.36
10/27/2018 9:40	1000	44.07	152.01	30.79
10/27/2018 9:41	1001	44.09	151.98	30.76
10/27/2018 9:42	1002	44.07	152.01	30.79
10/27/2018 9:43	1003	44.29	151.79	30.57
10/27/2018 9:44	1004	43.88	152.20	30.98
10/27/2018 9:45	1005	44.18	151.90	30.68
10/27/2018 9:46	1006	43.74	152.35	31.13
10/27/2018 9:47	1007	43.92	152.16	30.94
10/27/2018 9:48	1008	43.69	152.40	31.18
10/27/2018 9:49	1009	43.92	152.16	30.94
10/27/2018 9:50	1010	43.49	152.61	31.39
10/27/2018 9:51	1011	44.30	151.77	30.55
10/27/2018 9:52	1012	43.68	152.41	31.19
10/27/2018 9:53	1013	43.86	152.22	31.00
10/27/2018 9:54	1014	43.52	152.57	31.35

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/27/2018 9:55	1015	44.02	152.06	30.84
10/27/2018 9:56	1016	44.07	152.01	30.79
10/27/2018 9:57	1017	43.69	152.40	31.18
10/27/2018 9:58	1018	43.91	152.17	30.95
10/27/2018 9:59	1019	44.52	151.55	30.33
10/27/2018 10:00	1020	43.90	152.19	30.97
10/27/2018 10:01	1021	43.30	152.80	31.58
10/27/2018 10:02	1022	43.73	152.36	31.14
10/27/2018 10:03	1023	43.57	152.52	31.30
10/27/2018 10:04	1024	43.65	152.44	31.22
10/27/2018 10:05	1025	43.55	152.54	31.32
10/27/2018 10:06	1026	43.74	152.34	31.12
10/27/2018 10:07	1027	44.27	151.80	30.58
10/27/2018 10:08	1028	44.00	152.08	30.86
10/27/2018 10:09	1029	43.82	152.26	31.04
10/27/2018 10:10	1030	43.67	152.42	31.20
10/27/2018 10:11	1031	43.64	152.45	31.23
10/27/2018 10:12	1032	43.66	152.43	31.21
10/27/2018 10:13	1033	43.95	152.13	30.91
10/27/2018 10:14	1034	43.64	152.45	31.23
10/27/2018 10:15	1035	43.73	152.36	31.14
10/27/2018 10:16	1036	43.34	152.76	31.54
10/27/2018 10:17	1037	43.70	152.39	31.17
10/27/2018 10:18	1038	43.57	152.52	31.30
10/27/2018 10:19	1039	43.51	152.58	31.36
10/27/2018 10:20	1040	43.78	152.30	31.08
10/27/2018 10:21	1041	43.53	152.57	31.35
10/27/2018 10:22	1042	43.49	152.61	31.39
10/27/2018 10:23	1043	43.39	152.70	31.49
10/27/2018 10:24	1044	43.43	152.67	31.45
10/27/2018 10:25	1045	43.35	152.74	31.52
10/27/2018 10:26	1046	43.36	152.73	31.52
10/27/2018 10:27	1047	43.71	152.37	31.15
10/27/2018 10:28	1048	43.63	152.46	31.24
10/27/2018 10:29	1049	43.46	152.63	31.41
10/27/2018 10:30	1050	43.50	152.59	31.37
10/27/2018 10:31	1051	43.27	152.83	31.61
10/27/2018 10:32	1052	43.10	153.00	31.78
10/27/2018 10:33	1053	43.22	152.88	31.66
10/27/2018 10:34	1054	43.07	153.03	31.81
10/27/2018 10:35	1055	43.22	152.88	31.66

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/27/2018 10:36	1056	43.22	152.87	31.66
10/27/2018 10:37	1057	43.23	152.86	31.65
10/27/2018 10:38	1058	43.42	152.67	31.45
10/27/2018 10:39	1059	43.39	152.70	31.48
10/27/2018 10:40	1060	43.84	152.25	31.03
10/27/2018 10:41	1061	43.21	152.89	31.67
10/27/2018 10:42	1062	42.79	153.32	32.10
10/27/2018 10:43	1063	42.84	153.27	32.05
10/27/2018 10:44	1064	42.88	153.23	32.01
10/27/2018 10:45	1065	43.24	152.86	31.64
10/27/2018 10:46	1066	43.29	152.81	31.59
10/27/2018 10:47	1067	43.07	153.03	31.81
10/27/2018 10:48	1068	43.58	152.51	31.29
10/27/2018 10:49	1069	43.12	152.98	31.76
10/27/2018 10:50	1070	43.88	152.20	30.98
10/27/2018 10:51	1071	42.28	153.84	32.62
10/27/2018 10:52	1072	42.85	153.26	32.04
10/27/2018 10:53	1073	42.94	153.17	31.95
10/27/2018 10:54	1074	42.89	153.22	32.00
10/27/2018 10:55	1075	42.43	153.69	32.47
10/27/2018 10:56	1076	43.03	153.07	31.85
10/27/2018 10:57	1077	42.74	153.37	32.15
10/27/2018 10:58	1078	42.69	153.42	32.20
10/27/2018 10:59	1079	42.96	153.15	31.93
10/27/2018 11:00	1080	42.70	153.41	32.19
10/27/2018 11:01	1081	42.69	153.42	32.20
10/27/2018 11:02	1082	42.91	153.20	31.98
10/27/2018 11:03	1083	43.63	152.46	31.24
10/27/2018 11:04	1084	43.24	152.86	31.64
10/27/2018 11:05	1085	42.46	153.65	32.43
10/27/2018 11:06	1086	42.76	153.35	32.13
10/27/2018 11:07	1087	42.71	153.40	32.18
10/27/2018 11:08	1088	42.78	153.33	32.11
10/27/2018 11:09	1089	42.81	153.30	32.08
10/27/2018 11:10	1090	43.07	153.03	31.81
10/27/2018 11:11	1091	43.03	153.07	31.85
10/27/2018 11:12	1092	43.45	152.64	31.42
10/27/2018 11:13	1093	42.57	153.54	32.32
10/27/2018 11:14	1094	42.74	153.37	32.15
10/27/2018 11:15	1095	42.71	153.40	32.18
10/27/2018 11:16	1096	42.86	153.24	32.02

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/27/2018 11:17	1097	43.01	153.09	31.87
10/27/2018 11:18	1098	42.08	154.05	32.83
10/27/2018 11:19	1099	43.24	152.86	31.64
10/27/2018 11:20	1100	42.77	153.34	32.12
10/27/2018 11:21	1101	42.83	153.28	32.06
10/27/2018 11:22	1102	42.53	153.58	32.36
10/27/2018 11:23	1103	42.69	153.42	32.20
10/27/2018 11:24	1104	42.71	153.40	32.18
10/27/2018 11:25	1105	42.52	153.59	32.37
10/27/2018 11:26	1106	42.66	153.46	32.24
10/27/2018 11:27	1107	42.85	153.26	32.04
10/27/2018 11:28	1108	42.62	153.50	32.28
10/27/2018 11:29	1109	42.55	153.56	32.34
10/27/2018 11:30	1110	42.50	153.61	32.39
10/27/2018 11:31	1111	42.41	153.71	32.49
10/27/2018 11:32	1112	41.90	154.23	33.01
10/27/2018 11:33	1113	42.17	153.96	32.74
10/27/2018 11:34	1114	42.24	153.88	32.66
10/27/2018 11:35	1115	42.72	153.39	32.18
10/27/2018 11:36	1116	42.18	153.94	32.72
10/27/2018 11:37	1117	42.68	153.43	32.21
10/27/2018 11:38	1118	42.15	153.97	32.76
10/27/2018 11:39	1119	42.30	153.82	32.61
10/27/2018 11:40	1120	42.11	154.01	32.79
10/27/2018 11:41	1121	42.39	153.73	32.51
10/27/2018 11:42	1122	42.23	153.89	32.67
10/27/2018 11:43	1123	42.34	153.78	32.56
10/27/2018 11:44	1124	41.74	154.40	33.18
10/27/2018 11:45	1125	41.98	154.15	32.94
10/27/2018 11:46	1126	42.34	153.78	32.56
10/27/2018 11:47	1127	42.72	153.39	32.18
10/27/2018 11:48	1128	42.61	153.51	32.29
10/27/2018 11:49	1129	42.33	153.79	32.57
10/27/2018 11:50	1130	41.98	154.15	32.94
10/27/2018 11:51	1131	42.13	153.99	32.77
10/27/2018 11:52	1132	42.22	153.90	32.68
10/27/2018 11:53	1133	42.21	153.91	32.69
10/27/2018 11:54	1134	41.99	154.14	32.92
10/27/2018 11:55	1135	42.59	153.52	32.30
10/27/2018 11:56	1136	42.35	153.77	32.55
10/27/2018 11:57	1137	42.15	153.97	32.75

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/27/2018 11:58	1138	42.30	153.83	32.61
10/27/2018 11:59	1139	42.23	153.89	32.67
10/27/2018 12:00	1140	42.10	154.03	32.81
10/27/2018 12:01	1141	42.22	153.90	32.68
10/27/2018 12:02	1142	42.17	153.96	32.74
10/27/2018 12:03	1143	42.49	153.62	32.41
10/27/2018 12:04	1144	42.20	153.93	32.71
10/27/2018 12:05	1145	42.00	154.13	32.91
10/27/2018 12:06	1146	42.55	153.56	32.34
10/27/2018 12:07	1147	41.73	154.41	33.19
10/27/2018 12:08	1148	41.98	154.14	32.93
10/27/2018 12:09	1149	42.11	154.01	32.79
10/27/2018 12:10	1150	41.84	154.29	33.07
10/27/2018 12:11	1151	42.21	153.91	32.70
10/27/2018 12:12	1152	41.81	154.32	33.10
10/27/2018 12:13	1153	41.81	154.33	33.11
10/27/2018 12:14	1154	41.96	154.17	32.95
10/27/2018 12:15	1155	42.02	154.11	32.89
10/27/2018 12:16	1156	42.17	153.95	32.73
10/27/2018 12:17	1157	42.37	153.75	32.53
10/27/2018 12:18	1158	42.40	153.72	32.50
10/27/2018 12:19	1159	41.74	154.40	33.18
10/27/2018 12:20	1160	42.14	153.98	32.76
10/27/2018 12:21	1161	42.03	154.10	32.88
10/27/2018 12:22	1162	42.00	154.13	32.91
10/27/2018 12:23	1163	41.45	154.70	33.48
10/27/2018 12:24	1164	41.67	154.47	33.25
10/27/2018 12:25	1165	41.41	154.73	33.51
10/27/2018 12:26	1166	42.00	154.13	32.91
10/27/2018 12:27	1167	41.72	154.41	33.20
10/27/2018 12:28	1168	41.71	154.42	33.20
10/27/2018 12:29	1169	41.64	154.50	33.28
10/27/2018 12:30	1170	41.45	154.70	33.48
10/27/2018 12:31	1171	41.37	154.77	33.55
10/27/2018 12:32	1172	42.18	153.94	32.72
10/27/2018 12:33	1173	41.39	154.76	33.54
10/27/2018 12:34	1174	41.78	154.35	33.13
10/27/2018 12:35	1175	41.67	154.47	33.25
10/27/2018 12:36	1176	41.70	154.43	33.21
10/27/2018 12:37	1177	41.76	154.37	33.15
10/27/2018 12:38	1178	41.78	154.36	33.14

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/27/2018 12:39	1179	41.50	154.64	33.42
10/27/2018 12:40	1180	41.79	154.35	33.13
10/27/2018 12:41	1181	41.91	154.22	33.00
10/27/2018 12:42	1182	41.59	154.55	33.33
10/27/2018 12:43	1183	41.80	154.34	33.12
10/27/2018 12:44	1184	41.52	154.62	33.40
10/27/2018 12:45	1185	41.58	154.56	33.34
10/27/2018 12:46	1186	41.35	154.80	33.58
10/27/2018 12:47	1187	41.67	154.47	33.25
10/27/2018 12:48	1188	41.14	155.01	33.79
10/27/2018 12:49	1189	41.07	155.08	33.86
10/27/2018 12:50	1190	41.04	155.11	33.89
10/27/2018 12:51	1191	41.55	154.59	33.37
10/27/2018 12:52	1192	41.26	154.88	33.66
10/27/2018 12:53	1193	41.48	154.66	33.44
10/27/2018 12:54	1194	41.37	154.78	33.56
10/27/2018 12:55	1195	41.53	154.61	33.39
10/27/2018 12:56	1196	41.22	154.93	33.71
10/27/2018 12:57	1197	42.11	154.01	32.79
10/27/2018 12:58	1198	41.30	154.85	33.63
10/27/2018 12:59	1199	41.49	154.65	33.43
10/27/2018 13:00	1200	41.10	155.05	33.83
10/27/2018 13:01	1201	41.21	154.94	33.72
10/27/2018 13:02	1202	41.61	154.53	33.31
10/27/2018 13:03	1203	41.61	154.53	33.31
10/27/2018 13:04	1204	40.99	155.16	33.94
10/27/2018 13:05	1205	41.15	155.00	33.78
10/27/2018 13:06	1206	41.61	154.53	33.31
10/27/2018 13:07	1207	41.03	155.13	33.91
10/27/2018 13:08	1208	41.41	154.74	33.52
10/27/2018 13:09	1209	41.40	154.74	33.53
10/27/2018 13:10	1210	41.42	154.73	33.51
10/27/2018 13:11	1211	41.44	154.71	33.49
10/27/2018 13:12	1212	41.21	154.93	33.72
10/27/2018 13:13	1213	41.20	154.95	33.73
10/27/2018 13:14	1214	41.61	154.52	33.30
10/27/2018 13:15	1215	40.96	155.19	33.97
10/27/2018 13:16	1216	41.46	154.69	33.47
10/27/2018 13:17	1217	41.16	154.99	33.78
10/27/2018 13:18	1218	41.07	155.09	33.87
10/27/2018 13:19	1219	41.01	155.15	33.93

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/27/2018 13:20	1220	41.64	154.50	33.28
10/27/2018 13:21	1221	40.96	155.19	33.97
10/27/2018 13:22	1222	41.58	154.56	33.34
10/27/2018 13:23	1223	41.03	155.12	33.91
10/27/2018 13:24	1224	41.49	154.66	33.44
10/27/2018 13:25	1225	40.97	155.19	33.97
10/27/2018 13:26	1226	41.07	155.08	33.86
10/27/2018 13:27	1227	40.99	155.16	33.94
10/27/2018 13:28	1228	41.39	154.75	33.53
10/27/2018 13:29	1229	41.22	154.93	33.71
10/27/2018 13:30	1230	41.02	155.13	33.91
10/27/2018 13:31	1231	40.93	155.22	34.01
10/27/2018 13:32	1232	40.89	155.26	34.04
10/27/2018 13:33	1233	41.19	154.96	33.74
10/27/2018 13:34	1234	41.14	155.01	33.79
10/27/2018 13:35	1235	41.02	155.13	33.92
10/27/2018 13:36	1236	40.69	155.47	34.25
10/27/2018 13:37	1237	41.07	155.08	33.86
10/27/2018 13:38	1238	41.18	154.97	33.75
10/27/2018 13:39	1239	41.08	155.08	33.86
10/27/2018 13:40	1240	41.32	154.83	33.61
10/27/2018 13:41	1241	40.80	155.36	34.14
10/27/2018 13:42	1242	41.60	154.54	33.32
10/27/2018 13:43	1243	40.97	155.18	33.96
10/27/2018 13:44	1244	40.98	155.17	33.95
10/27/2018 13:45	1245	40.47	155.69	34.47
10/27/2018 13:46	1246	40.30	155.87	34.65
10/27/2018 13:47	1247	40.89	155.26	34.04
10/27/2018 13:48	1248	40.62	155.54	34.32
10/27/2018 13:49	1249	40.80	155.36	34.14
10/27/2018 13:50	1250	41.23	154.92	33.70
10/27/2018 13:51	1251	40.67	155.49	34.28
10/27/2018 13:52	1252	41.36	154.79	33.57
10/27/2018 13:53	1253	40.46	155.71	34.49
10/27/2018 13:54	1254	41.08	155.07	33.85
10/27/2018 13:55	1255	40.28	155.89	34.67
10/27/2018 13:56	1256	41.09	155.06	33.84
10/27/2018 13:57	1257	40.82	155.34	34.12
10/27/2018 13:58	1258	41.13	155.02	33.80
10/27/2018 13:59	1259	40.57	155.59	34.37
10/27/2018 14:00	1260	40.12	156.05	34.83

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/27/2018 14:01	1261	40.61	155.55	34.33
10/27/2018 14:02	1262	39.99	156.19	34.97
10/27/2018 14:03	1263	39.94	156.24	35.02
10/27/2018 14:04	1264	40.70	155.46	34.25
10/27/2018 14:05	1265	40.44	155.73	34.51
10/27/2018 14:06	1266	40.78	155.38	34.16
10/27/2018 14:07	1267	40.39	155.78	34.56
10/27/2018 14:08	1268	40.22	155.95	34.73
10/27/2018 14:09	1269	40.30	155.87	34.65
10/27/2018 14:10	1270	39.91	156.27	35.05
10/27/2018 14:11	1271	40.41	155.76	34.54
10/27/2018 14:12	1272	40.02	156.16	34.94
10/27/2018 14:13	1273	40.10	156.08	34.86
10/27/2018 14:14	1274	40.16	156.01	34.79
10/27/2018 14:15	1275	39.74	156.44	35.23
10/27/2018 14:16	1276	40.19	155.99	34.77
10/27/2018 14:17	1277	40.20	155.97	34.75
10/27/2018 14:18	1278	40.33	155.84	34.62
10/27/2018 14:19	1279	40.56	155.60	34.38
10/27/2018 14:20	1280	40.12	156.05	34.83
10/27/2018 14:21	1281	40.40	155.77	34.55
10/27/2018 14:22	1282	40.62	155.54	34.32
10/27/2018 14:23	1283	40.02	156.16	34.94
10/27/2018 14:24	1284	40.70	155.46	34.24
10/27/2018 14:25	1285	40.40	155.77	34.55
10/27/2018 14:26	1286	40.17	156.00	34.78
10/27/2018 14:27	1287	40.17	156.00	34.78
10/27/2018 14:28	1288	39.44	156.76	35.54
10/27/2018 14:29	1289	40.09	156.09	34.87
10/27/2018 14:30	1290	39.93	156.25	35.03
10/27/2018 14:31	1291	40.82	155.34	34.12
10/27/2018 14:32	1292	40.16	156.01	34.79
10/27/2018 14:33	1293	40.18	155.99	34.77
10/27/2018 14:34	1294	39.71	156.48	35.26
10/27/2018 14:35	1295	40.23	155.95	34.73
10/27/2018 14:36	1296	39.90	156.28	35.06
10/27/2018 14:37	1297	39.59	156.60	35.38
10/27/2018 14:38	1298	39.96	156.22	35.01
10/27/2018 14:39	1299	40.09	156.09	34.87
10/27/2018 14:40	1300	39.69	156.49	35.27
10/27/2018 14:41	1301	39.82	156.36	35.14

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/27/2018 14:42	1302	39.59	156.60	35.38
10/27/2018 14:43	1303	39.81	156.37	35.15
10/27/2018 14:44	1304	39.97	156.21	34.99
10/27/2018 14:45	1305	40.24	155.94	34.72
10/27/2018 14:46	1306	40.03	156.15	34.93
10/27/2018 14:47	1307	39.94	156.24	35.02
10/27/2018 14:48	1308	39.60	156.58	35.37
10/27/2018 14:49	1309	40.05	156.12	34.91
10/27/2018 14:50	1310	39.86	156.32	35.11
10/27/2018 14:51	1311	39.94	156.24	35.02
10/27/2018 14:52	1312	39.92	156.26	35.04
10/27/2018 14:53	1313	39.61	156.57	35.35
10/27/2018 14:54	1314	40.17	156.01	34.79
10/27/2018 14:55	1315	39.97	156.21	34.99
10/27/2018 14:56	1316	39.53	156.66	35.44
10/27/2018 14:57	1317	39.61	156.58	35.36
10/27/2018 14:58	1318	39.65	156.54	35.32
10/27/2018 14:59	1319	39.94	156.24	35.02
10/27/2018 15:00	1320	39.43	156.77	35.55
10/27/2018 15:01	1321	39.72	156.47	35.25
10/27/2018 15:02	1322	39.41	156.78	35.56
10/27/2018 15:03	1323	40.07	156.10	34.88
10/27/2018 15:04	1324	39.76	156.42	35.21
10/27/2018 15:05	1325	39.56	156.63	35.41
10/27/2018 15:06	1326	38.94	157.27	36.05
10/27/2018 15:07	1327	39.70	156.49	35.27
10/27/2018 15:08	1328	39.77	156.42	35.20
10/27/2018 15:09	1329	39.72	156.47	35.25
10/27/2018 15:10	1330	39.65	156.54	35.32
10/27/2018 15:11	1331	39.50	156.69	35.47
10/27/2018 15:12	1332	39.75	156.43	35.21
10/27/2018 15:13	1333	39.10	157.10	35.88
10/27/2018 15:14	1334	39.45	156.74	35.52
10/27/2018 15:15	1335	39.97	156.21	34.99
10/27/2018 15:16	1336	39.70	156.49	35.27
10/27/2018 15:17	1337	39.47	156.72	35.50
10/27/2018 15:18	1338	39.19	157.01	35.79
10/27/2018 15:19	1339	39.89	156.29	35.07
10/27/2018 15:20	1340	39.22	156.98	35.76
10/27/2018 15:21	1341	38.91	157.30	36.08
10/27/2018 15:22	1342	39.52	156.67	35.45

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/27/2018 15:23	1343	39.45	156.75	35.53
10/27/2018 15:24	1344	39.56	156.63	35.41
10/27/2018 15:25	1345	39.86	156.32	35.10
10/27/2018 15:26	1346	39.60	156.59	35.37
10/27/2018 15:27	1347	39.16	157.04	35.82
10/27/2018 15:28	1348	39.53	156.66	35.44
10/27/2018 15:29	1349	39.58	156.61	35.39
10/27/2018 15:30	1350	39.76	156.42	35.21
10/27/2018 15:31	1351	39.47	156.72	35.50
10/27/2018 15:32	1352	39.31	156.88	35.66
10/27/2018 15:33	1353	39.12	157.08	35.86
10/27/2018 15:34	1354	39.64	156.55	35.33
10/27/2018 15:35	1355	39.03	157.17	35.95
10/27/2018 15:36	1356	39.57	156.62	35.40
10/27/2018 15:37	1357	39.26	156.93	35.72
10/27/2018 15:38	1358	39.39	156.80	35.58
10/27/2018 15:39	1359	38.93	157.27	36.05
10/27/2018 15:40	1360	39.33	156.86	35.64
10/27/2018 15:41	1361	40.00	156.17	34.96
10/27/2018 15:42	1362	39.30	156.90	35.68
10/27/2018 15:43	1363	39.11	157.09	35.87
10/27/2018 15:44	1364	39.59	156.60	35.38
10/27/2018 15:45	1365	38.96	157.24	36.02
10/27/2018 15:46	1366	39.07	157.13	35.91
10/27/2018 15:47	1367	39.06	157.14	35.92
10/27/2018 15:48	1368	39.56	156.63	35.41
10/27/2018 15:49	1369	39.32	156.87	35.65
10/27/2018 15:50	1370	38.94	157.27	36.05
10/27/2018 15:51	1371	38.95	157.25	36.03
10/27/2018 15:52	1372	39.00	157.20	35.98
10/27/2018 15:53	1373	39.32	156.88	35.66
10/27/2018 15:54	1374	38.93	157.28	36.06
10/27/2018 15:55	1375	39.23	156.97	35.75
10/27/2018 15:56	1376	39.97	156.21	34.99
10/27/2018 15:57	1377	39.26	156.94	35.72
10/27/2018 15:58	1378	39.15	157.05	35.83
10/27/2018 15:59	1379	38.85	157.36	36.14
10/27/2018 16:00	1380	38.86	157.34	36.13
10/27/2018 16:01	1381	38.95	157.25	36.03
10/27/2018 16:02	1382	39.17	157.03	35.81
10/27/2018 16:03	1383	39.32	156.87	35.65

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/27/2018 16:04	1384	39.23	156.96	35.75
10/27/2018 16:05	1385	39.03	157.17	35.95
10/27/2018 16:06	1386	39.00	157.20	35.98
10/27/2018 16:07	1387	38.94	157.26	36.04
10/27/2018 16:08	1388	38.77	157.44	36.22
10/27/2018 16:09	1389	38.84	157.37	36.15
10/27/2018 16:10	1390	38.85	157.36	36.14
10/27/2018 16:11	1391	39.32	156.88	35.66
10/27/2018 16:12	1392	38.81	157.40	36.18
10/27/2018 16:13	1393	39.13	157.07	35.85
10/27/2018 16:14	1394	38.67	157.55	36.33
10/27/2018 16:15	1395	38.78	157.43	36.21
10/27/2018 16:16	1396	38.58	157.64	36.42
10/27/2018 16:17	1397	38.74	157.47	36.25
10/27/2018 16:18	1398	39.07	157.14	35.92
10/27/2018 16:19	1399	38.57	157.64	36.42
10/27/2018 16:20	1400	38.95	157.26	36.04
10/27/2018 16:21	1401	39.14	157.06	35.84
10/27/2018 16:22	1402	38.47	157.75	36.53
10/27/2018 16:23	1403	38.26	157.96	36.74
10/27/2018 16:24	1404	38.94	157.27	36.05
10/27/2018 16:25	1405	38.94	157.27	36.05
10/27/2018 16:26	1406	38.94	157.26	36.05
10/27/2018 16:27	1407	38.37	157.85	36.63
10/27/2018 16:28	1408	38.71	157.50	36.28
10/27/2018 16:29	1409	39.23	156.97	35.75
10/27/2018 16:30	1410	38.80	157.41	36.19
10/27/2018 16:31	1411	38.88	157.32	36.10
10/27/2018 16:32	1412	38.88	157.33	36.11
10/27/2018 16:33	1413	38.34	157.88	36.66
10/27/2018 16:34	1414	39.09	157.11	35.89
10/27/2018 16:35	1415	38.41	157.81	36.59
10/27/2018 16:36	1416	38.64	157.57	36.35
10/27/2018 16:37	1417	38.60	157.61	36.39
10/27/2018 16:38	1418	38.30	157.92	36.70
10/27/2018 16:39	1419	38.70	157.51	36.29
10/27/2018 16:40	1420	38.34	157.88	36.66
10/27/2018 16:41	1421	38.73	157.48	36.26
10/27/2018 16:42	1422	38.88	157.32	36.10
10/27/2018 16:43	1423	38.38	157.84	36.62
10/27/2018 16:44	1424	38.67	157.54	36.32

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/27/2018 16:45	1425	38.62	157.60	36.38
10/27/2018 16:46	1426	37.88	158.35	37.13
10/27/2018 16:47	1427	38.47	157.75	36.53
10/27/2018 16:48	1428	38.78	157.42	36.21
10/27/2018 16:49	1429	38.63	157.58	36.36
10/27/2018 16:50	1430	38.27	157.95	36.73
10/27/2018 16:51	1431	38.61	157.60	36.38
10/27/2018 16:52	1432	38.20	158.02	36.80
10/27/2018 16:53	1433	38.96	157.25	36.03
10/27/2018 16:54	1434	39.15	157.05	35.83
10/27/2018 16:55	1435	38.69	157.52	36.30
10/27/2018 16:56	1436	38.06	158.17	36.95
10/27/2018 16:57	1437	38.13	158.10	36.88
10/27/2018 16:58	1438	38.55	157.67	36.45
10/27/2018 16:59	1439	37.90	158.33	37.11
10/27/2018 17:00	1440	38.80	157.40	36.19
10/27/2018 17:01	1441	38.23	157.99	36.77
10/27/2018 17:02	1442	38.83	157.37	36.15
10/27/2018 17:03	1443	38.96	157.24	36.02
10/27/2018 17:04	1444	38.45	157.77	36.55
10/27/2018 17:05	1445	38.50	157.71	36.49
10/27/2018 17:06	1446	38.88	157.32	36.11
10/27/2018 17:07	1447	38.75	157.46	36.24
10/27/2018 17:08	1448	38.92	157.28	36.06
10/27/2018 17:09	1449	38.37	157.85	36.63
10/27/2018 17:10	1450	38.37	157.85	36.63
10/27/2018 17:11	1451	38.37	157.85	36.63
10/27/2018 17:12	1452	38.45	157.77	36.55
10/27/2018 17:13	1453	38.17	158.05	36.83
10/27/2018 17:14	1454	38.37	157.85	36.63
10/27/2018 17:15	1455	37.95	158.28	37.06
10/27/2018 17:16	1456	38.63	157.58	36.36
10/27/2018 17:17	1457	38.87	157.34	36.12
10/27/2018 17:18	1458	38.33	157.89	36.67
10/27/2018 17:19	1459	38.43	157.79	36.57
10/27/2018 17:20	1460	38.24	157.99	36.77
10/27/2018 17:21	1461	39.06	157.14	35.92
10/27/2018 17:22	1462	38.10	158.12	36.90
10/27/2018 17:23	1463	37.88	158.35	37.13
10/27/2018 17:24	1464	38.01	158.21	36.99
10/27/2018 17:25	1465	37.66	158.58	37.36

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/27/2018 17:26	1466	38.12	158.10	36.89
10/27/2018 17:27	1467	38.20	158.03	36.81
10/27/2018 17:28	1468	38.54	157.68	36.46
10/27/2018 17:29	1469	38.32	157.90	36.68
10/27/2018 17:30	1470	38.54	157.67	36.45
10/27/2018 17:31	1471	38.12	158.11	36.89
10/27/2018 17:32	1472	38.04	158.19	36.97
10/27/2018 17:33	1473	38.32	157.90	36.68
10/27/2018 17:34	1474	38.10	158.12	36.91
10/27/2018 17:35	1475	38.35	157.86	36.65
10/27/2018 17:36	1476	38.06	158.16	36.94
10/27/2018 17:37	1477	38.21	158.01	36.79
10/27/2018 17:38	1478	37.90	158.33	37.11
10/27/2018 17:39	1479	38.29	157.93	36.71
10/27/2018 17:40	1480	37.73	158.50	37.28
10/27/2018 17:41	1481	38.13	158.09	36.87
10/27/2018 17:42	1482	37.64	158.59	37.38
10/27/2018 17:43	1483	38.04	158.19	36.97
10/27/2018 17:44	1484	37.62	158.62	37.40
10/27/2018 17:45	1485	37.82	158.41	37.19
10/27/2018 17:46	1486	38.16	158.07	36.85
10/27/2018 17:47	1487	37.88	158.35	37.13
10/27/2018 17:48	1488	37.48	158.76	37.54
10/27/2018 17:49	1489	38.15	158.08	36.86
10/27/2018 17:50	1490	38.05	158.17	36.95
10/27/2018 17:51	1491	38.08	158.14	36.92
10/27/2018 17:52	1492	37.75	158.49	37.27
10/27/2018 17:53	1493	37.27	158.98	37.76
10/27/2018 17:54	1494	38.07	158.16	36.94
10/27/2018 17:55	1495	37.82	158.41	37.19
10/27/2018 17:56	1496	37.54	158.70	37.48
10/27/2018 17:57	1497	37.84	158.39	37.17
10/27/2018 17:58	1498	37.89	158.34	37.12
10/27/2018 17:59	1499	37.75	158.49	37.27
10/27/2018 18:00	1500	37.62	158.62	37.40
10/27/2018 18:01	1501	37.63	158.61	37.39
10/27/2018 18:02	1502	37.85	158.38	37.16
10/27/2018 18:03	1503	37.72	158.52	37.30
10/27/2018 18:04	1504	37.92	158.31	37.10
10/27/2018 18:05	1505	37.55	158.69	37.47
10/27/2018 18:06	1506	37.79	158.44	37.23

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/27/2018 18:07	1507	38.27	157.95	36.73
10/27/2018 18:08	1508	37.50	158.74	37.52
10/27/2018 18:09	1509	37.66	158.58	37.36
10/27/2018 18:10	1510	37.28	158.97	37.75
10/27/2018 18:11	1511	37.60	158.64	37.42
10/27/2018 18:12	1512	37.36	158.89	37.67
10/27/2018 18:13	1513	37.73	158.51	37.29
10/27/2018 18:14	1514	37.67	158.56	37.34
10/27/2018 18:15	1515	38.00	158.23	37.01
10/27/2018 18:16	1516	37.62	158.61	37.40
10/27/2018 18:17	1517	38.20	158.02	36.80
10/27/2018 18:18	1518	38.29	157.93	36.71
10/27/2018 18:19	1519	37.67	158.57	37.35
10/27/2018 18:20	1520	38.00	158.23	37.01
10/27/2018 18:21	1521	37.36	158.88	37.67
10/27/2018 18:22	1522	37.77	158.46	37.25
10/27/2018 18:23	1523	37.69	158.55	37.33
10/27/2018 18:24	1524	37.83	158.40	37.18
10/27/2018 18:25	1525	37.60	158.64	37.42
10/27/2018 18:26	1526	37.95	158.28	37.06
10/27/2018 18:27	1527	37.44	158.80	37.58
10/27/2018 18:28	1528	38.25	157.97	36.75
10/27/2018 18:29	1529	37.72	158.52	37.30
10/27/2018 18:30	1530	37.93	158.30	37.08
10/27/2018 18:31	1531	37.88	158.35	37.13
10/27/2018 18:32	1532	37.68	158.55	37.33
10/27/2018 18:33	1533	37.46	158.79	37.57
10/27/2018 18:34	1534	37.25	159.00	37.78
10/27/2018 18:35	1535	37.30	158.95	37.73
10/27/2018 18:36	1536	37.16	159.08	37.87
10/27/2018 18:37	1537	37.42	158.82	37.60
10/27/2018 18:38	1538	37.51	158.73	37.51
10/27/2018 18:39	1539	37.23	159.02	37.80
10/27/2018 18:40	1540	37.20	159.05	37.83
10/27/2018 18:41	1541	37.48	158.76	37.54
10/27/2018 18:42	1542	37.14	159.11	37.89
10/27/2018 18:43	1543	37.45	158.79	37.57
10/27/2018 18:44	1544	37.63	158.60	37.38
10/27/2018 18:45	1545	37.41	158.83	37.61
10/27/2018 18:46	1546	37.68	158.56	37.34
10/27/2018 18:47	1547	37.57	158.66	37.45

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/27/2018 18:48	1548	38.10	158.13	36.91
10/27/2018 18:49	1549	37.44	158.80	37.58
10/27/2018 18:50	1550	36.84	159.42	38.20
10/27/2018 18:51	1551	36.97	159.29	38.07
10/27/2018 18:52	1552	37.21	159.04	37.82
10/27/2018 18:53	1553	37.39	158.85	37.63
10/27/2018 18:54	1554	37.31	158.94	37.72
10/27/2018 18:55	1555	37.33	158.92	37.70
10/27/2018 18:56	1556	37.34	158.91	37.69
10/27/2018 18:57	1557	37.32	158.93	37.71
10/27/2018 18:58	1558	37.44	158.80	37.58
10/27/2018 18:59	1559	37.31	158.93	37.71
10/27/2018 19:00	1560	37.63	158.61	37.39
10/27/2018 19:01	1561	36.81	159.45	38.23
10/27/2018 19:02	1562	37.36	158.88	37.66
10/27/2018 19:03	1563	36.87	159.38	38.17
10/27/2018 19:04	1564	37.16	159.08	37.87
10/27/2018 19:05	1565	37.25	158.99	37.77
10/27/2018 19:06	1566	37.32	158.92	37.70
10/27/2018 19:07	1567	37.39	158.86	37.64
10/27/2018 19:08	1568	37.54	158.70	37.48
10/27/2018 19:09	1569	37.49	158.75	37.53
10/27/2018 19:10	1570	37.11	159.14	37.92
10/27/2018 19:11	1571	37.35	158.89	37.67
10/27/2018 19:12	1572	37.02	159.24	38.02
10/27/2018 19:13	1573	37.32	158.92	37.70
10/27/2018 19:14	1574	36.90	159.35	38.13
10/27/2018 19:15	1575	36.81	159.45	38.23
10/27/2018 19:16	1576	37.45	158.79	37.57
10/27/2018 19:17	1577	37.27	158.98	37.76
10/27/2018 19:18	1578	37.07	159.19	37.97
10/27/2018 19:19	1579	37.32	158.92	37.70
10/27/2018 19:20	1580	37.15	159.10	37.88
10/27/2018 19:21	1581	36.91	159.35	38.13
10/27/2018 19:22	1582	36.93	159.32	38.10
10/27/2018 19:23	1583	36.50	159.76	38.54
10/27/2018 19:24	1584	36.74	159.52	38.30
10/27/2018 19:25	1585	37.31	158.94	37.72
10/27/2018 19:26	1586	37.33	158.91	37.69
10/27/2018 19:27	1587	36.91	159.34	38.12
10/27/2018 19:28	1588	37.05	159.20	37.99

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/27/2018 19:29	1589	36.74	159.51	38.30
10/27/2018 19:30	1590	36.86	159.39	38.17
10/27/2018 19:31	1591	36.71	159.55	38.33
10/27/2018 19:32	1592	36.93	159.33	38.11
10/27/2018 19:33	1593	36.76	159.49	38.28
10/27/2018 19:34	1594	37.01	159.24	38.02
10/27/2018 19:35	1595	36.75	159.51	38.29
10/27/2018 19:36	1596	37.25	159.00	37.78
10/27/2018 19:37	1597	37.12	159.13	37.91
10/27/2018 19:38	1598	36.33	159.94	38.72
10/27/2018 19:39	1599	36.70	159.56	38.35
10/27/2018 19:40	1600	36.83	159.42	38.20
10/27/2018 19:41	1601	36.93	159.32	38.10
10/27/2018 19:42	1602	37.17	159.08	37.86
10/27/2018 19:43	1603	36.58	159.68	38.46
10/27/2018 19:44	1604	36.98	159.27	38.05
10/27/2018 19:45	1605	37.20	159.04	37.82
10/27/2018 19:46	1606	36.87	159.39	38.17
10/27/2018 19:47	1607	36.94	159.31	38.09
10/27/2018 19:48	1608	36.69	159.57	38.35
10/27/2018 19:49	1609	36.57	159.70	38.48
10/27/2018 19:50	1610	37.01	159.24	38.02
10/27/2018 19:51	1611	36.58	159.68	38.47
10/27/2018 19:52	1612	36.75	159.51	38.29
10/27/2018 19:53	1613	37.03	159.23	38.01
10/27/2018 19:54	1614	36.60	159.66	38.44
10/27/2018 19:55	1615	37.11	159.14	37.92
10/27/2018 19:56	1616	36.66	159.60	38.38
10/27/2018 19:57	1617	37.09	159.16	37.94
10/27/2018 19:58	1618	36.29	159.98	38.76
10/27/2018 19:59	1619	37.10	159.15	37.93
10/27/2018 20:00	1620	36.85	159.40	38.18
10/27/2018 20:01	1621	36.39	159.88	38.66
10/27/2018 20:02	1622	36.96	159.29	38.07
10/27/2018 20:03	1623	36.16	160.11	38.90
10/27/2018 20:04	1624	36.53	159.74	38.52
10/27/2018 20:05	1625	36.47	159.79	38.57
10/27/2018 20:06	1626	36.88	159.38	38.16
10/27/2018 20:07	1627	36.58	159.68	38.47
10/27/2018 20:08	1628	36.58	159.68	38.47
10/27/2018 20:09	1629	35.83	160.45	39.23

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/27/2018 20:10	1630	36.89	159.37	38.15
10/27/2018 20:11	1631	36.56	159.71	38.49
10/27/2018 20:12	1632	36.67	159.59	38.37
10/27/2018 20:13	1633	36.55	159.71	38.50
10/27/2018 20:14	1634	36.49	159.78	38.56
10/27/2018 20:15	1635	36.37	159.90	38.68
10/27/2018 20:16	1636	36.03	160.24	39.02
10/27/2018 20:17	1637	36.23	160.04	38.82
10/27/2018 20:18	1638	36.81	159.45	38.23
10/27/2018 20:19	1639	36.73	159.53	38.31
10/27/2018 20:20	1640	36.49	159.77	38.55
10/27/2018 20:21	1641	35.94	160.33	39.12
10/27/2018 20:22	1642	36.61	159.65	38.43
10/27/2018 20:23	1643	36.26	160.01	38.79
10/27/2018 20:24	1644	36.30	159.97	38.75
10/27/2018 20:25	1645	37.07	159.19	37.97
10/27/2018 20:26	1646	36.63	159.63	38.41
10/27/2018 20:27	1647	36.80	159.46	38.24
10/27/2018 20:28	1648	36.35	159.92	38.70
10/27/2018 20:29	1649	36.60	159.66	38.44
10/27/2018 20:30	1650	36.12	160.16	38.94
10/27/2018 20:31	1651	36.50	159.76	38.54
10/27/2018 20:32	1652	36.17	160.11	38.89
10/27/2018 20:33	1653	36.71	159.55	38.33
10/27/2018 20:34	1654	36.21	160.07	38.85
10/27/2018 20:35	1655	36.18	160.10	38.88
10/27/2018 20:36	1656	36.20	160.07	38.85
10/27/2018 20:37	1657	35.88	160.40	39.18
10/27/2018 20:38	1658	36.26	160.01	38.79
10/27/2018 20:39	1659	36.17	160.10	38.88
10/27/2018 20:40	1660	36.38	159.88	38.66
10/27/2018 20:41	1661	36.17	160.10	38.88
10/27/2018 20:42	1662	36.47	159.79	38.57
10/27/2018 20:43	1663	36.03	160.24	39.02
10/27/2018 20:44	1664	36.19	160.08	38.87
10/27/2018 20:45	1665	36.09	160.19	38.97
10/27/2018 20:46	1666	35.69	160.60	39.38
10/27/2018 20:47	1667	36.12	160.15	38.93
10/27/2018 20:48	1668	36.29	159.98	38.76
10/27/2018 20:49	1669	36.37	159.90	38.68
10/27/2018 20:50	1670	36.24	160.03	38.81

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/27/2018 20:51	1671	36.03	160.25	39.03
10/27/2018 20:52	1672	35.78	160.51	39.29
10/27/2018 20:53	1673	35.97	160.31	39.09
10/27/2018 20:54	1674	36.14	160.13	38.91
10/27/2018 20:55	1675	36.62	159.64	38.42
10/27/2018 20:56	1676	36.14	160.13	38.91
10/27/2018 20:57	1677	36.44	159.82	38.60
10/27/2018 20:58	1678	35.95	160.33	39.11
10/27/2018 20:59	1679	36.08	160.19	38.97
10/27/2018 21:00	1680	35.89	160.39	39.17
10/27/2018 21:01	1681	36.52	159.74	38.53
10/27/2018 21:02	1682	36.03	160.25	39.03
10/27/2018 21:03	1683	36.31	159.96	38.74
10/27/2018 21:04	1684	36.47	159.80	38.58
10/27/2018 21:05	1685	36.61	159.65	38.43
10/27/2018 21:06	1686	36.25	160.02	38.80
10/27/2018 21:07	1687	36.58	159.68	38.46
10/27/2018 21:08	1688	36.52	159.75	38.53
10/27/2018 21:09	1689	36.42	159.84	38.62
10/27/2018 21:10	1690	35.83	160.45	39.23
10/27/2018 21:11	1691	35.95	160.33	39.11
10/27/2018 21:12	1692	36.03	160.25	39.03
10/27/2018 21:13	1693	36.05	160.23	39.01
10/27/2018 21:14	1694	35.70	160.58	39.36
10/27/2018 21:15	1695	35.94	160.33	39.12
10/27/2018 21:16	1696	35.75	160.54	39.32
10/27/2018 21:17	1697	35.37	160.93	39.71
10/27/2018 21:18	1698	35.90	160.38	39.17
10/27/2018 21:19	1699	35.82	160.46	39.24
10/27/2018 21:20	1700	35.41	160.88	39.66
10/27/2018 21:21	1701	36.34	159.93	38.71
10/27/2018 21:22	1702	35.56	160.73	39.51
10/27/2018 21:23	1703	35.73	160.55	39.33
10/27/2018 21:24	1704	35.43	160.86	39.64
10/27/2018 21:25	1705	35.79	160.49	39.27
10/27/2018 21:26	1706	36.11	160.16	38.94
10/27/2018 21:27	1707	35.49	160.80	39.58
10/27/2018 21:28	1708	35.37	160.92	39.70
10/27/2018 21:29	1709	35.46	160.83	39.61
10/27/2018 21:30	1710	35.36	160.94	39.72
10/27/2018 21:31	1711	35.92	160.36	39.14

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/27/2018 21:32	1712	35.39	160.90	39.68
10/27/2018 21:33	1713	35.74	160.55	39.33
10/27/2018 21:34	1714	35.28	161.02	39.80
10/27/2018 21:35	1715	35.71	160.58	39.36
10/27/2018 21:36	1716	35.21	161.08	39.86
10/27/2018 21:37	1717	35.29	161.01	39.79
10/27/2018 21:38	1718	35.68	160.61	39.39
10/27/2018 21:39	1719	35.12	161.18	39.96
10/27/2018 21:40	1720	35.31	160.98	39.76
10/27/2018 21:41	1721	35.53	160.76	39.54
10/27/2018 21:42	1722	35.43	160.86	39.65
10/27/2018 21:43	1723	35.25	161.05	39.83
10/27/2018 21:44	1724	35.48	160.81	39.59
10/27/2018 21:45	1725	35.30	160.99	39.77
10/27/2018 21:46	1726	35.57	160.72	39.50
10/27/2018 21:47	1727	35.29	161.00	39.78
10/27/2018 21:48	1728	35.40	160.89	39.67
10/27/2018 21:49	1729	35.91	160.37	39.15
10/27/2018 21:50	1730	35.12	161.18	39.97
10/27/2018 21:51	1731	35.40	160.90	39.68
10/27/2018 21:52	1732	34.63	161.68	40.46
10/27/2018 21:53	1733	35.18	161.12	39.90
10/27/2018 21:54	1734	35.09	161.21	39.99
10/27/2018 21:55	1735	35.57	160.71	39.49
10/27/2018 21:56	1736	35.70	160.59	39.37
10/27/2018 21:57	1737	35.33	160.96	39.74
10/27/2018 21:58	1738	35.23	161.07	39.85
10/27/2018 21:59	1739	35.13	161.17	39.95
10/27/2018 22:00	1740	35.14	161.16	39.94
10/27/2018 22:01	1741	34.87	161.43	40.21
10/27/2018 22:02	1742	35.47	160.83	39.61
10/27/2018 22:03	1743	35.00	161.31	40.09
10/27/2018 22:04	1744	35.14	161.16	39.94
10/27/2018 22:05	1745	35.24	161.06	39.84
10/27/2018 22:06	1746	35.31	160.98	39.76
10/27/2018 22:07	1747	35.28	161.01	39.80
10/27/2018 22:08	1748	34.94	161.37	40.15
10/27/2018 22:09	1749	35.20	161.10	39.88
10/27/2018 22:10	1750	35.06	161.24	40.03
10/27/2018 22:11	1751	35.26	161.03	39.81
10/27/2018 22:12	1752	35.80	160.48	39.26

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/27/2018 22:13	1753	35.33	160.96	39.74
10/27/2018 22:14	1754	34.79	161.52	40.30
10/27/2018 22:15	1755	35.44	160.85	39.63
10/27/2018 22:16	1756	35.39	160.90	39.68
10/27/2018 22:17	1757	35.03	161.27	40.06
10/27/2018 22:18	1758	34.86	161.45	40.23
10/27/2018 22:19	1759	35.13	161.17	39.95
10/27/2018 22:20	1760	35.00	161.31	40.09
10/27/2018 22:21	1761	34.62	161.69	40.47
10/27/2018 22:22	1762	34.85	161.46	40.24
10/27/2018 22:23	1763	35.28	161.01	39.80
10/27/2018 22:24	1764	35.05	161.25	40.03
10/27/2018 22:25	1765	34.72	161.59	40.37
10/27/2018 22:26	1766	35.04	161.26	40.04
10/27/2018 22:27	1767	35.06	161.24	40.02
10/27/2018 22:28	1768	34.96	161.35	40.13
10/27/2018 22:29	1769	34.99	161.31	40.09
10/27/2018 22:30	1770	35.38	160.91	39.69
10/27/2018 22:31	1771	34.82	161.49	40.27
10/27/2018 22:32	1772	34.44	161.88	40.66
10/27/2018 22:33	1773	34.76	161.55	40.33
10/27/2018 22:34	1774	35.32	160.98	39.76
10/27/2018 22:35	1775	35.27	161.03	39.81
10/27/2018 22:36	1776	34.69	161.62	40.40
10/27/2018 22:37	1777	34.91	161.40	40.18
10/27/2018 22:38	1778	35.03	161.27	40.05
10/27/2018 22:39	1779	35.04	161.26	40.04
10/27/2018 22:40	1780	35.37	160.93	39.71
10/27/2018 22:41	1781	35.09	161.21	39.99
10/27/2018 22:42	1782	35.37	160.93	39.71
10/27/2018 22:43	1783	35.22	161.08	39.86
10/27/2018 22:44	1784	34.88	161.42	40.20
10/27/2018 22:45	1785	35.04	161.26	40.04
10/27/2018 22:46	1786	34.69	161.62	40.40
10/27/2018 22:47	1787	35.03	161.28	40.06
10/27/2018 22:48	1788	34.92	161.39	40.17
10/27/2018 22:49	1789	34.98	161.32	40.10
10/27/2018 22:50	1790	34.87	161.43	40.22
10/27/2018 22:51	1791	34.72	161.59	40.37
10/27/2018 22:52	1792	34.81	161.49	40.28
10/27/2018 22:53	1793	35.07	161.23	40.01

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/27/2018 22:54	1794	34.72	161.59	40.37
10/27/2018 22:55	1795	34.82	161.49	40.27
10/27/2018 22:56	1796	34.83	161.48	40.26
10/27/2018 22:57	1797	34.42	161.89	40.67
10/27/2018 22:58	1798	34.71	161.60	40.38
10/27/2018 22:59	1799	35.12	161.18	39.96
10/27/2018 23:00	1800	34.61	161.70	40.48
10/27/2018 23:01	1801	34.70	161.61	40.39
10/27/2018 23:02	1802	34.63	161.68	40.46
10/27/2018 23:03	1803	34.38	161.94	40.72
10/27/2018 23:04	1804	34.64	161.67	40.45
10/27/2018 23:05	1805	35.07	161.23	40.01
10/27/2018 23:06	1806	35.06	161.24	40.02
10/27/2018 23:07	1807	34.69	161.62	40.40
10/27/2018 23:08	1808	34.69	161.62	40.40
10/27/2018 23:09	1809	34.61	161.70	40.49
10/27/2018 23:10	1810	34.59	161.72	40.50
10/27/2018 23:11	1811	34.70	161.61	40.39
10/27/2018 23:12	1812	34.82	161.49	40.27
10/27/2018 23:13	1813	34.46	161.86	40.64
10/27/2018 23:14	1814	34.81	161.49	40.27
10/27/2018 23:15	1815	34.52	161.80	40.58
10/27/2018 23:16	1816	34.32	162.00	40.78
10/27/2018 23:17	1817	34.47	161.85	40.63
10/27/2018 23:18	1818	34.56	161.75	40.54
10/27/2018 23:19	1819	34.33	161.99	40.77
10/27/2018 23:20	1820	34.62	161.69	40.47
10/27/2018 23:21	1821	34.75	161.56	40.34
10/27/2018 23:22	1822	34.68	161.63	40.41
10/27/2018 23:23	1823	34.70	161.61	40.40
10/27/2018 23:24	1824	34.72	161.59	40.37
10/27/2018 23:25	1825	34.25	162.07	40.85
10/27/2018 23:26	1826	34.47	161.85	40.63
10/27/2018 23:27	1827	34.71	161.60	40.38
10/27/2018 23:28	1828	34.66	161.65	40.44
10/27/2018 23:29	1829	34.86	161.44	40.23
10/27/2018 23:30	1830	34.98	161.33	40.11
10/27/2018 23:31	1831	34.79	161.52	40.30
10/27/2018 23:32	1832	34.35	161.97	40.75
10/27/2018 23:33	1833	34.36	161.95	40.74
10/27/2018 23:34	1834	34.82	161.49	40.27

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/27/2018 23:35	1835	34.12	162.21	40.99
10/27/2018 23:36	1836	34.44	161.87	40.65
10/27/2018 23:37	1837	34.53	161.78	40.56
10/27/2018 23:38	1838	34.72	161.59	40.37
10/27/2018 23:39	1839	33.99	162.33	41.12
10/27/2018 23:40	1840	34.74	161.56	40.35
10/27/2018 23:41	1841	34.38	161.94	40.72
10/27/2018 23:42	1842	34.28	162.04	40.82
10/27/2018 23:43	1843	34.65	161.66	40.44
10/27/2018 23:44	1844	34.23	162.09	40.88
10/27/2018 23:45	1845	34.35	161.96	40.75
10/27/2018 23:46	1846	34.38	161.94	40.72
10/27/2018 23:47	1847	33.73	162.61	41.39
10/27/2018 23:48	1848	34.11	162.21	40.99
10/27/2018 23:49	1849	34.23	162.09	40.87
10/27/2018 23:50	1850	34.20	162.12	40.90
10/27/2018 23:51	1851	34.63	161.68	40.46
10/27/2018 23:52	1852	34.04	162.29	41.07
10/27/2018 23:53	1853	34.27	162.05	40.83
10/27/2018 23:54	1854	34.38	161.93	40.71
10/27/2018 23:55	1855	34.04	162.28	41.06
10/27/2018 23:56	1856	34.46	161.85	40.63
10/27/2018 23:57	1857	34.33	161.99	40.77
10/27/2018 23:58	1858	34.07	162.26	41.04
10/27/2018 23:59	1859	34.28	162.04	40.82
10/28/2018 0:00	1860	34.10	162.22	41.00
10/28/2018 0:01	1861	34.40	161.92	40.70
10/28/2018 0:02	1862	34.43	161.89	40.67
10/28/2018 0:03	1863	34.44	161.88	40.66
10/28/2018 0:04	1864	34.49	161.82	40.60
10/28/2018 0:05	1865	34.04	162.29	41.07
10/28/2018 0:06	1866	34.49	161.82	40.60
10/28/2018 0:07	1867	33.93	162.40	41.18
10/28/2018 0:08	1868	33.95	162.38	41.16
10/28/2018 0:09	1869	34.37	161.95	40.73
10/28/2018 0:10	1870	34.34	161.98	40.76
10/28/2018 0:11	1871	34.53	161.79	40.57
10/28/2018 0:12	1872	34.20	162.12	40.90
10/28/2018 0:13	1873	34.36	161.96	40.74
10/28/2018 0:14	1874	34.06	162.26	41.04
10/28/2018 0:15	1875	34.02	162.31	41.09

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/28/2018 0:16	1876	33.78	162.55	41.33
10/28/2018 0:17	1877	34.30	162.02	40.80
10/28/2018 0:18	1878	34.14	162.18	40.96
10/28/2018 0:19	1879	33.89	162.44	41.22
10/28/2018 0:20	1880	33.96	162.36	41.14
10/28/2018 0:21	1881	34.25	162.07	40.85
10/28/2018 0:22	1882	34.30	162.02	40.80
10/28/2018 0:23	1883	34.09	162.23	41.01
10/28/2018 0:24	1884	34.08	162.24	41.02
10/28/2018 0:25	1885	34.35	161.96	40.75
10/28/2018 0:26	1886	33.98	162.35	41.13
10/28/2018 0:27	1887	34.09	162.23	41.01
10/28/2018 0:28	1888	33.96	162.37	41.15
10/28/2018 0:29	1889	33.86	162.47	41.25
10/28/2018 0:30	1890	34.06	162.26	41.04
10/28/2018 0:31	1891	34.00	162.32	41.10
10/28/2018 0:32	1892	33.98	162.35	41.13
10/28/2018 0:33	1893	33.73	162.60	41.38
10/28/2018 0:34	1894	34.17	162.16	40.94
10/28/2018 0:35	1895	33.78	162.56	41.34
10/28/2018 0:36	1896	33.82	162.51	41.30
10/28/2018 0:37	1897	33.83	162.50	41.28
10/28/2018 0:38	1898	34.20	162.12	40.90
10/28/2018 0:39	1899	34.28	162.04	40.82
10/28/2018 0:40	1900	33.88	162.45	41.23
10/28/2018 0:41	1901	34.18	162.14	40.92
10/28/2018 0:42	1902	34.37	161.95	40.73
10/28/2018 0:43	1903	33.89	162.44	41.22
10/28/2018 0:44	1904	33.91	162.42	41.20
10/28/2018 0:45	1905	34.37	161.95	40.73
10/28/2018 0:46	1906	34.39	161.92	40.70
10/28/2018 0:47	1907	34.26	162.06	40.84
10/28/2018 0:48	1908	33.91	162.42	41.20
10/28/2018 0:49	1909	33.94	162.39	41.17
10/28/2018 0:50	1910	34.05	162.28	41.06
10/28/2018 0:51	1911	33.89	162.44	41.22
10/28/2018 0:52	1912	33.82	162.51	41.29
10/28/2018 0:53	1913	33.82	162.51	41.30
10/28/2018 0:54	1914	33.93	162.40	41.18
10/28/2018 0:55	1915	33.78	162.55	41.33
10/28/2018 0:56	1916	33.93	162.40	41.18

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/28/2018 0:57	1917	33.92	162.41	41.19
10/28/2018 0:58	1918	33.66	162.67	41.45
10/28/2018 0:59	1919	34.28	162.04	40.82
10/28/2018 1:00	1920	34.12	162.21	40.99
10/28/2018 1:01	1921	33.35	162.99	41.78
10/28/2018 1:02	1922	34.05	162.28	41.06
10/28/2018 1:03	1923	33.47	162.87	41.65
10/28/2018 1:04	1924	33.39	162.96	41.74
10/28/2018 1:05	1925	34.08	162.24	41.03
10/28/2018 1:06	1926	33.80	162.53	41.31
10/28/2018 1:07	1927	34.15	162.18	40.96
10/28/2018 1:08	1928	34.11	162.22	41.00
10/28/2018 1:09	1929	33.99	162.34	41.12
10/28/2018 1:10	1930	34.43	161.88	40.66
10/28/2018 1:11	1931	34.07	162.26	41.04
10/28/2018 1:12	1932	33.75	162.59	41.37
10/28/2018 1:13	1933	33.96	162.36	41.15
10/28/2018 1:14	1934	33.93	162.40	41.18
10/28/2018 1:15	1935	34.08	162.25	41.03
10/28/2018 1:16	1936	33.76	162.57	41.35
10/28/2018 1:17	1937	34.10	162.23	41.01
10/28/2018 1:18	1938	33.75	162.59	41.37
10/28/2018 1:19	1939	33.74	162.59	41.38
10/28/2018 1:20	1940	33.73	162.61	41.39
10/28/2018 1:21	1941	33.85	162.48	41.26
10/28/2018 1:22	1942	33.76	162.58	41.36
10/28/2018 1:23	1943	33.61	162.73	41.51
10/28/2018 1:24	1944	34.13	162.19	40.97
10/28/2018 1:25	1945	33.38	162.96	41.75
10/28/2018 1:26	1946	34.06	162.27	41.05
10/28/2018 1:27	1947	33.57	162.77	41.55
10/28/2018 1:28	1948	34.01	162.31	41.09
10/28/2018 1:29	1949	33.49	162.85	41.63
10/28/2018 1:30	1950	33.16	163.19	41.97
10/28/2018 1:31	1951	33.16	163.19	41.97
10/28/2018 1:32	1952	33.54	162.79	41.58
10/28/2018 1:33	1953	33.85	162.48	41.26
10/28/2018 1:34	1954	33.10	163.25	42.03
10/28/2018 1:35	1955	33.88	162.45	41.23
10/28/2018 1:36	1956	33.61	162.72	41.50
10/28/2018 1:37	1957	33.74	162.60	41.38

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/28/2018 1:38	1958	33.64	162.70	41.48
10/28/2018 1:39	1959	33.57	162.77	41.55
10/28/2018 1:40	1960	33.77	162.56	41.34
10/28/2018 1:41	1961	34.03	162.29	41.08
10/28/2018 1:42	1962	33.43	162.91	41.69
10/28/2018 1:43	1963	33.47	162.87	41.65
10/28/2018 1:44	1964	33.76	162.58	41.36
10/28/2018 1:45	1965	33.41	162.93	41.71
10/28/2018 1:46	1966	33.47	162.87	41.65
10/28/2018 1:47	1967	33.46	162.88	41.66
10/28/2018 1:48	1968	33.71	162.62	41.40
10/28/2018 1:49	1969	33.87	162.46	41.24
10/28/2018 1:50	1970	33.45	162.89	41.67
10/28/2018 1:51	1971	33.61	162.73	41.51
10/28/2018 1:52	1972	33.37	162.98	41.76
10/28/2018 1:53	1973	33.93	162.40	41.18
10/28/2018 1:54	1974	33.41	162.93	41.71
10/28/2018 1:55	1975	33.46	162.88	41.67
10/28/2018 1:56	1976	33.68	162.66	41.44
10/28/2018 1:57	1977	33.43	162.91	41.69
10/28/2018 1:58	1978	33.31	163.03	41.81
10/28/2018 1:59	1979	34.09	162.23	41.01
10/28/2018 2:00	1980	33.51	162.82	41.61
10/28/2018 2:01	1981	33.48	162.86	41.64
10/28/2018 2:02	1982	33.85	162.48	41.26
10/28/2018 2:03	1983	33.35	163.00	41.78
10/28/2018 2:04	1984	33.30	163.05	41.83
10/28/2018 2:05	1985	33.61	162.73	41.51
10/28/2018 2:06	1986	33.18	163.16	41.94
10/28/2018 2:07	1987	33.21	163.14	41.92
10/28/2018 2:08	1988	33.24	163.10	41.89
10/28/2018 2:09	1989	33.30	163.04	41.82
10/28/2018 2:10	1990	33.18	163.17	41.95
10/28/2018 2:11	1991	33.32	163.02	41.80
10/28/2018 2:12	1992	33.39	162.95	41.73
10/28/2018 2:13	1993	33.26	163.08	41.86
10/28/2018 2:14	1994	33.19	163.16	41.94
10/28/2018 2:15	1995	33.57	162.77	41.55
10/28/2018 2:16	1996	33.28	163.07	41.85
10/28/2018 2:17	1997	33.15	163.20	41.98
10/28/2018 2:18	1998	33.53	162.81	41.59

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/28/2018 2:19	1999	33.26	163.08	41.86
10/28/2018 2:20	2000	33.54	162.80	41.58
10/28/2018 2:21	2001	32.65	163.71	42.49
10/28/2018 2:22	2002	33.67	162.66	41.44
10/28/2018 2:23	2003	33.42	162.92	41.70
10/28/2018 2:24	2004	32.81	163.54	42.32
10/28/2018 2:25	2005	33.28	163.07	41.85
10/28/2018 2:26	2006	33.75	162.58	41.36
10/28/2018 2:27	2007	32.95	163.40	42.18
10/28/2018 2:28	2008	32.84	163.52	42.30
10/28/2018 2:29	2009	33.50	162.84	41.62
10/28/2018 2:30	2010	33.86	162.47	41.26
10/28/2018 2:31	2011	33.20	163.15	41.93
10/28/2018 2:32	2012	33.21	163.13	41.91
10/28/2018 2:33	2013	33.37	162.98	41.76
10/28/2018 2:34	2014	33.12	163.23	42.01
10/28/2018 2:35	2015	33.51	162.83	41.61
10/28/2018 2:36	2016	33.34	163.00	41.79
10/28/2018 2:37	2017	33.33	163.01	41.80
10/28/2018 2:38	2018	33.35	163.00	41.78
10/28/2018 2:39	2019	33.20	163.15	41.93
10/28/2018 2:40	2020	33.22	163.13	41.91
10/28/2018 2:41	2021	33.00	163.35	42.13
10/28/2018 2:42	2022	33.32	163.02	41.80
10/28/2018 2:43	2023	33.29	163.05	41.83
10/28/2018 2:44	2024	33.62	162.72	41.50
10/28/2018 2:45	2025	33.36	162.98	41.76
10/28/2018 2:46	2026	33.23	163.12	41.90
10/28/2018 2:47	2027	33.67	162.67	41.45
10/28/2018 2:48	2028	33.11	163.24	42.02
10/28/2018 2:49	2029	33.67	162.67	41.45
10/28/2018 2:50	2030	32.60	163.76	42.54
10/28/2018 2:51	2031	33.17	163.18	41.96
10/28/2018 2:52	2032	33.03	163.32	42.10
10/28/2018 2:53	2033	33.27	163.08	41.86
10/28/2018 2:54	2034	33.57	162.77	41.55
10/28/2018 2:55	2035	33.02	163.33	42.11
10/28/2018 2:56	2036	33.00	163.36	42.14
10/28/2018 2:57	2037	33.07	163.28	42.06
10/28/2018 2:58	2038	33.39	162.95	41.73
10/28/2018 2:59	2039	32.79	163.56	42.34

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/28/2018 3:00	2040	33.14	163.21	41.99
10/28/2018 3:01	2041	33.16	163.19	41.97
10/28/2018 3:02	2042	33.00	163.35	42.13
10/28/2018 3:03	2043	33.30	163.04	41.82
10/28/2018 3:04	2044	33.21	163.13	41.91
10/28/2018 3:05	2045	33.27	163.08	41.86
10/28/2018 3:06	2046	33.21	163.14	41.92
10/28/2018 3:07	2047	33.18	163.17	41.95
10/28/2018 3:08	2048	33.22	163.12	41.90
10/28/2018 3:09	2049	33.33	163.02	41.80
10/28/2018 3:10	2050	33.21	163.13	41.91
10/28/2018 3:11	2051	33.00	163.35	42.13
10/28/2018 3:12	2052	33.25	163.09	41.87
10/28/2018 3:13	2053	32.74	163.62	42.40
10/28/2018 3:14	2054	33.18	163.17	41.95
10/28/2018 3:15	2055	33.24	163.10	41.88
10/28/2018 3:16	2056	32.86	163.50	42.28
10/28/2018 3:17	2057	33.11	163.24	42.02
10/28/2018 3:18	2058	33.02	163.33	42.11
10/28/2018 3:19	2059	33.45	162.89	41.67
10/28/2018 3:20	2060	32.99	163.36	42.14
10/28/2018 3:21	2061	33.19	163.15	41.93
10/28/2018 3:22	2062	33.30	163.05	41.83
10/28/2018 3:23	2063	32.63	163.74	42.52
10/28/2018 3:24	2064	33.02	163.33	42.11
10/28/2018 3:25	2065	32.87	163.48	42.26
10/28/2018 3:26	2066	32.87	163.49	42.27
10/28/2018 3:27	2067	33.00	163.35	42.13
10/28/2018 3:28	2068	32.82	163.54	42.32
10/28/2018 3:29	2069	33.20	163.15	41.93
10/28/2018 3:30	2070	32.85	163.51	42.29
10/28/2018 3:31	2071	32.86	163.50	42.28
10/28/2018 3:32	2072	32.58	163.78	42.56
10/28/2018 3:33	2073	33.09	163.26	42.04
10/28/2018 3:34	2074	33.25	163.09	41.88
10/28/2018 3:35	2075	32.38	163.99	42.77
10/28/2018 3:36	2076	32.84	163.52	42.30
10/28/2018 3:37	2077	33.10	163.25	42.03
10/28/2018 3:38	2078	32.85	163.50	42.28
10/28/2018 3:39	2079	32.72	163.64	42.42
10/28/2018 3:40	2080	33.14	163.21	41.99

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/28/2018 3:41	2081	32.83	163.52	42.30
10/28/2018 3:42	2082	33.26	163.09	41.87
10/28/2018 3:43	2083	32.45	163.91	42.69
10/28/2018 3:44	2084	33.15	163.20	41.98
10/28/2018 3:45	2085	32.52	163.84	42.62
10/28/2018 3:46	2086	32.91	163.44	42.22
10/28/2018 3:47	2087	32.63	163.73	42.51
10/28/2018 3:48	2088	32.67	163.69	42.47
10/28/2018 3:49	2089	32.76	163.60	42.38
10/28/2018 3:50	2090	32.97	163.38	42.16
10/28/2018 3:51	2091	32.85	163.51	42.29
10/28/2018 3:52	2092	32.85	163.50	42.29
10/28/2018 3:53	2093	32.61	163.75	42.53
10/28/2018 3:54	2094	32.35	164.02	42.80
10/28/2018 3:55	2095	32.83	163.53	42.31
10/28/2018 3:56	2096	32.92	163.43	42.21
10/28/2018 3:57	2097	32.96	163.39	42.17
10/28/2018 3:58	2098	32.99	163.36	42.14
10/28/2018 3:59	2099	32.85	163.50	42.28
10/28/2018 4:00	2100	32.63	163.73	42.51
10/28/2018 4:01	2101	32.89	163.47	42.25
10/28/2018 4:02	2102	32.92	163.43	42.21
10/28/2018 4:03	2103	32.91	163.45	42.23
10/28/2018 4:04	2104	32.38	163.99	42.77
10/28/2018 4:05	2105	32.74	163.62	42.40
10/28/2018 4:06	2106	32.90	163.46	42.24
10/28/2018 4:07	2107	32.88	163.48	42.26
10/28/2018 4:08	2108	32.77	163.59	42.37
10/28/2018 4:09	2109	32.99	163.36	42.14
10/28/2018 4:10	2110	32.56	163.81	42.59
10/28/2018 4:11	2111	32.74	163.61	42.39
10/28/2018 4:12	2112	32.42	163.95	42.73
10/28/2018 4:13	2113	32.58	163.78	42.57
10/28/2018 4:14	2114	33.24	163.10	41.89
10/28/2018 4:15	2115	32.48	163.88	42.67
10/28/2018 4:16	2116	32.78	163.58	42.36
10/28/2018 4:17	2117	33.00	163.35	42.13
10/28/2018 4:18	2118	33.08	163.27	42.05
10/28/2018 4:19	2119	32.69	163.67	42.45
10/28/2018 4:20	2120	32.49	163.88	42.66
10/28/2018 4:21	2121	32.72	163.64	42.42

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/28/2018 4:22	2122	32.67	163.69	42.47
10/28/2018 4:23	2123	33.05	163.31	42.09
10/28/2018 4:24	2124	32.44	163.93	42.71
10/28/2018 4:25	2125	32.40	163.97	42.75
10/28/2018 4:26	2126	32.23	164.14	42.92
10/28/2018 4:27	2127	33.08	163.27	42.06
10/28/2018 4:28	2128	32.53	163.83	42.61
10/28/2018 4:29	2129	32.99	163.36	42.14
10/28/2018 4:30	2130	32.73	163.63	42.41
10/28/2018 4:31	2131	32.90	163.46	42.24
10/28/2018 4:32	2132	32.90	163.46	42.24
10/28/2018 4:33	2133	32.83	163.52	42.30
10/28/2018 4:34	2134	32.11	164.27	43.05
10/28/2018 4:35	2135	32.67	163.69	42.47
10/28/2018 4:36	2136	32.51	163.85	42.63
10/28/2018 4:37	2137	32.51	163.85	42.63
10/28/2018 4:38	2138	32.75	163.61	42.39
10/28/2018 4:39	2139	33.04	163.32	42.10
10/28/2018 4:40	2140	32.93	163.43	42.21
10/28/2018 4:41	2141	32.77	163.58	42.37
10/28/2018 4:42	2142	32.26	164.11	42.90
10/28/2018 4:43	2143	32.61	163.76	42.54
10/28/2018 4:44	2144	32.64	163.72	42.50
10/28/2018 4:45	2145	32.62	163.74	42.53
10/28/2018 4:46	2146	32.81	163.55	42.33
10/28/2018 4:47	2147	32.70	163.66	42.44
10/28/2018 4:48	2148	32.52	163.84	42.62
10/28/2018 4:49	2149	32.33	164.04	42.82
10/28/2018 4:50	2150	32.57	163.79	42.57
10/28/2018 4:51	2151	32.04	164.33	43.11
10/28/2018 4:52	2152	32.62	163.74	42.52
10/28/2018 4:53	2153	32.23	164.14	42.92
10/28/2018 4:54	2154	32.53	163.83	42.61
10/28/2018 4:55	2155	32.31	164.06	42.84
10/28/2018 4:56	2156	32.28	164.09	42.87
10/28/2018 4:57	2157	32.61	163.75	42.53
10/28/2018 4:58	2158	32.41	163.96	42.74
10/28/2018 4:59	2159	32.34	164.02	42.80
10/28/2018 5:00	2160	32.39	163.97	42.75
10/28/2018 5:01	2161	32.63	163.74	42.52
10/28/2018 5:02	2162	32.70	163.66	42.44

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/28/2018 5:03	2163	32.46	163.91	42.69
10/28/2018 5:04	2164	32.58	163.78	42.56
10/28/2018 5:05	2165	32.68	163.68	42.46
10/28/2018 5:06	2166	32.07	164.30	43.08
10/28/2018 5:07	2167	32.47	163.89	42.67
10/28/2018 5:08	2168	32.34	164.03	42.81
10/28/2018 5:09	2169	32.20	164.17	42.95
10/28/2018 5:10	2170	31.78	164.60	43.38
10/28/2018 5:11	2171	32.78	163.58	42.36
10/28/2018 5:12	2172	32.17	164.20	42.98
10/28/2018 5:13	2173	32.43	163.93	42.71
10/28/2018 5:14	2174	32.32	164.04	42.83
10/28/2018 5:15	2175	32.28	164.09	42.87
10/28/2018 5:16	2176	32.84	163.51	42.29
10/28/2018 5:17	2177	32.19	164.18	42.96
10/28/2018 5:18	2178	32.27	164.10	42.88
10/28/2018 5:19	2179	32.47	163.90	42.68
10/28/2018 5:20	2180	32.20	164.17	42.95
10/28/2018 5:21	2181	32.44	163.92	42.70
10/28/2018 5:22	2182	32.57	163.79	42.57
10/28/2018 5:23	2183	32.34	164.02	42.81
10/28/2018 5:24	2184	32.54	163.82	42.60
10/28/2018 5:25	2185	32.35	164.02	42.80
10/28/2018 5:26	2186	32.29	164.08	42.86
10/28/2018 5:27	2187	32.32	164.05	42.83
10/28/2018 5:28	2188	32.49	163.87	42.65
10/28/2018 5:29	2189	32.36	164.01	42.79
10/28/2018 5:30	2190	31.92	164.46	43.24
10/28/2018 5:31	2191	32.60	163.76	42.55
10/28/2018 5:32	2192	32.17	164.21	42.99
10/28/2018 5:33	2193	31.86	164.52	43.30
10/28/2018 5:34	2194	32.41	163.96	42.74
10/28/2018 5:35	2195	32.48	163.88	42.66
10/28/2018 5:36	2196	32.51	163.85	42.63
10/28/2018 5:37	2197	32.84	163.51	42.29
10/28/2018 5:38	2198	31.97	164.41	43.19
10/28/2018 5:39	2199	32.60	163.76	42.54
10/28/2018 5:40	2200	31.96	164.42	43.20
10/28/2018 5:41	2201	32.23	164.15	42.93
10/28/2018 5:42	2202	32.13	164.24	43.02
10/28/2018 5:43	2203	32.36	164.01	42.79

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/28/2018 5:44	2204	32.41	163.96	42.74
10/28/2018 5:45	2205	32.59	163.77	42.55
10/28/2018 5:46	2206	32.59	163.77	42.55
10/28/2018 5:47	2207	32.06	164.31	43.09
10/28/2018 5:48	2208	32.37	164.00	42.78
10/28/2018 5:49	2209	32.52	163.85	42.63
10/28/2018 5:50	2210	32.09	164.28	43.06
10/28/2018 5:51	2211	32.57	163.80	42.58
10/28/2018 5:52	2212	32.50	163.87	42.65
10/28/2018 5:53	2213	32.07	164.31	43.09
10/28/2018 5:54	2214	32.31	164.06	42.84
10/28/2018 5:55	2215	31.83	164.55	43.33
10/28/2018 5:56	2216	32.20	164.17	42.95
10/28/2018 5:57	2217	32.26	164.11	42.89
10/28/2018 5:58	2218	32.49	163.88	42.66
10/28/2018 5:59	2219	31.82	164.56	43.34
10/28/2018 6:00	2220	32.01	164.37	43.15
10/28/2018 6:01	2221	32.06	164.32	43.10
10/28/2018 6:02	2222	32.29	164.08	42.86
10/28/2018 6:03	2223	31.94	164.44	43.22
10/28/2018 6:04	2224	32.21	164.17	42.95
10/28/2018 6:05	2225	32.02	164.36	43.14
10/28/2018 6:06	2226	32.54	163.83	42.61
10/28/2018 6:07	2227	31.64	164.75	43.53
10/28/2018 6:08	2228	32.07	164.30	43.08
10/28/2018 6:09	2229	32.47	163.90	42.68
10/28/2018 6:10	2230	31.76	164.62	43.40
10/28/2018 6:11	2231	32.08	164.30	43.08
10/28/2018 6:12	2232	32.06	164.31	43.10
10/28/2018 6:13	2233	32.68	163.68	42.46
10/28/2018 6:14	2234	31.82	164.56	43.34
10/28/2018 6:15	2235	32.10	164.27	43.05
10/28/2018 6:16	2236	31.94	164.43	43.22
10/28/2018 6:17	2237	32.25	164.12	42.90
10/28/2018 6:18	2238	31.96	164.42	43.20
10/28/2018 6:19	2239	32.10	164.27	43.05
10/28/2018 6:20	2240	31.95	164.43	43.21
10/28/2018 6:21	2241	32.05	164.33	43.11
10/28/2018 6:22	2242	32.04	164.34	43.12
10/28/2018 6:23	2243	31.83	164.55	43.33
10/28/2018 6:24	2244	31.57	164.82	43.60

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/28/2018 6:25	2245	32.15	164.23	43.01
10/28/2018 6:26	2246	32.23	164.14	42.92
10/28/2018 6:27	2247	32.14	164.23	43.01
10/28/2018 6:28	2248	31.96	164.42	43.20
10/28/2018 6:29	2249	31.84	164.55	43.33
10/28/2018 6:30	2250	32.27	164.10	42.88
10/28/2018 6:31	2251	32.01	164.37	43.15
10/28/2018 6:32	2252	31.88	164.50	43.28
10/28/2018 6:33	2253	32.01	164.37	43.15
10/28/2018 6:34	2254	31.96	164.41	43.20
10/28/2018 6:35	2255	31.78	164.61	43.39
10/28/2018 6:36	2256	32.06	164.32	43.10
10/28/2018 6:37	2257	31.69	164.70	43.48
10/28/2018 6:38	2258	32.15	164.22	43.00
10/28/2018 6:39	2259	32.49	163.87	42.65
10/28/2018 6:40	2260	31.76	164.63	43.41
10/28/2018 6:41	2261	32.29	164.08	42.86
10/28/2018 6:42	2262	32.01	164.37	43.15
10/28/2018 6:43	2263	32.00	164.38	43.16
10/28/2018 6:44	2264	31.80	164.58	43.36
10/28/2018 6:45	2265	31.80	164.58	43.36
10/28/2018 6:46	2266	31.92	164.46	43.24
10/28/2018 6:47	2267	32.09	164.29	43.07
10/28/2018 6:48	2268	31.93	164.44	43.23
10/28/2018 6:49	2269	32.34	164.03	42.81
10/28/2018 6:50	2270	32.22	164.15	42.93
10/28/2018 6:51	2271	32.21	164.17	42.95
10/28/2018 6:52	2272	31.91	164.46	43.25
10/28/2018 6:53	2273	32.14	164.23	43.01
10/28/2018 6:54	2274	31.87	164.51	43.29
10/28/2018 6:55	2275	31.84	164.54	43.32
10/28/2018 6:56	2276	31.51	164.88	43.66
10/28/2018 6:57	2277	31.70	164.69	43.47
10/28/2018 6:58	2278	31.33	165.06	43.84
10/28/2018 6:59	2279	31.72	164.67	43.45
10/28/2018 7:00	2280	32.26	164.11	42.89
10/28/2018 7:01	2281	32.07	164.30	43.08
10/28/2018 7:02	2282	32.17	164.20	42.98
10/28/2018 7:03	2283	31.32	165.08	43.86
10/28/2018 7:04	2284	31.92	164.46	43.24
10/28/2018 7:05	2285	31.74	164.65	43.43

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/28/2018 7:06	2286	32.33	164.04	42.82
10/28/2018 7:07	2287	32.14	164.23	43.01
10/28/2018 7:08	2288	31.92	164.46	43.24
10/28/2018 7:09	2289	31.93	164.45	43.23
10/28/2018 7:10	2290	32.21	164.17	42.95
10/28/2018 7:11	2291	31.56	164.83	43.61
10/28/2018 7:12	2292	31.72	164.66	43.44
10/28/2018 7:13	2293	31.59	164.80	43.58
10/28/2018 7:14	2294	32.07	164.31	43.09
10/28/2018 7:15	2295	32.08	164.30	43.08
10/28/2018 7:16	2296	31.89	164.49	43.27
10/28/2018 7:17	2297	31.56	164.83	43.61
10/28/2018 7:18	2298	31.87	164.51	43.29
10/28/2018 7:19	2299	31.84	164.54	43.32
10/28/2018 7:20	2300	31.77	164.61	43.39
10/28/2018 7:21	2301	31.97	164.41	43.19
10/28/2018 7:22	2302	31.76	164.62	43.40
10/28/2018 7:23	2303	31.81	164.57	43.35
10/28/2018 7:24	2304	31.82	164.57	43.35
10/28/2018 7:25	2305	31.72	164.66	43.44
10/28/2018 7:26	2306	32.07	164.30	43.08
10/28/2018 7:27	2307	31.26	165.13	43.91
10/28/2018 7:28	2308	31.98	164.40	43.18
10/28/2018 7:29	2309	31.16	165.24	44.02
10/28/2018 7:30	2310	31.74	164.65	43.43
10/28/2018 7:31	2311	31.61	164.78	43.56
10/28/2018 7:32	2312	32.11	164.27	43.05
10/28/2018 7:33	2313	31.70	164.68	43.46
10/28/2018 7:34	2314	31.41	164.98	43.76
10/28/2018 7:35	2315	31.67	164.72	43.50
10/28/2018 7:36	2316	31.73	164.65	43.43
10/28/2018 7:37	2317	31.65	164.74	43.52
10/28/2018 7:38	2318	31.57	164.82	43.60
10/28/2018 7:39	2319	31.64	164.74	43.52
10/28/2018 7:40	2320	31.44	164.95	43.73
10/28/2018 7:41	2321	31.94	164.43	43.22
10/28/2018 7:42	2322	31.95	164.43	43.21
10/28/2018 7:43	2323	31.73	164.65	43.43
10/28/2018 7:44	2324	31.99	164.39	43.17
10/28/2018 7:45	2325	31.69	164.70	43.48
10/28/2018 7:46	2326	31.64	164.74	43.53

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/28/2018 7:47	2327	31.99	164.39	43.17
10/28/2018 7:48	2328	31.15	165.25	44.03
10/28/2018 7:49	2329	31.89	164.49	43.27
10/28/2018 7:50	2330	31.55	164.83	43.62
10/28/2018 7:51	2331	31.54	164.85	43.63
10/28/2018 7:52	2332	31.82	164.56	43.34
10/28/2018 7:53	2333	31.44	164.95	43.73
10/28/2018 7:54	2334	31.51	164.88	43.66
10/28/2018 7:55	2335	31.94	164.44	43.22
10/28/2018 7:56	2336	31.80	164.58	43.36
10/28/2018 7:57	2337	31.71	164.67	43.45
10/28/2018 7:58	2338	31.53	164.86	43.64
10/28/2018 7:59	2339	31.64	164.75	43.53
10/28/2018 8:00	2340	31.32	165.07	43.86
10/28/2018 8:01	2341	31.58	164.81	43.59
10/28/2018 8:02	2342	31.39	165.00	43.78
10/28/2018 8:03	2343	31.23	165.17	43.95
10/28/2018 8:04	2344	31.72	164.66	43.44
10/28/2018 8:05	2345	31.76	164.62	43.40
10/28/2018 8:06	2346	31.46	164.93	43.72
10/28/2018 8:07	2347	31.05	165.35	44.13
10/28/2018 8:08	2348	31.42	164.97	43.75
10/28/2018 8:09	2349	31.55	164.83	43.62
10/28/2018 8:10	2350	31.65	164.74	43.52
10/28/2018 8:11	2351	31.27	165.12	43.90
10/28/2018 8:12	2352	31.49	164.90	43.69
10/28/2018 8:13	2353	31.32	165.07	43.85
10/28/2018 8:14	2354	31.80	164.58	43.37
10/28/2018 8:15	2355	31.28	165.12	43.90
10/28/2018 8:16	2356	31.27	165.13	43.91
10/28/2018 8:17	2357	31.33	165.06	43.84
10/28/2018 8:18	2358	31.39	165.00	43.79
10/28/2018 8:19	2359	31.94	164.44	43.22
10/28/2018 8:20	2360	30.77	165.63	44.41
10/28/2018 8:21	2361	31.18	165.22	44.00
10/28/2018 8:22	2362	31.61	164.77	43.55
10/28/2018 8:23	2363	31.72	164.67	43.45
10/28/2018 8:24	2364	31.25	165.14	43.92
10/28/2018 8:25	2365	31.55	164.84	43.62
10/28/2018 8:26	2366	31.32	165.07	43.85
10/28/2018 8:27	2367	31.34	165.06	43.84

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/28/2018 8:28	2368	31.37	165.03	43.81
10/28/2018 8:29	2369	31.32	165.08	43.86
10/28/2018 8:30	2370	31.65	164.74	43.52
10/28/2018 8:31	2371	31.48	164.91	43.69
10/28/2018 8:32	2372	31.14	165.26	44.04
10/28/2018 8:33	2373	31.31	165.09	43.87
10/28/2018 8:34	2374	31.39	165.01	43.79
10/28/2018 8:35	2375	31.48	164.91	43.69
10/28/2018 8:36	2376	31.54	164.85	43.63
10/28/2018 8:37	2377	31.82	164.56	43.34
10/28/2018 8:38	2378	31.20	165.20	43.98
10/28/2018 8:39	2379	30.80	165.61	44.39
10/28/2018 8:40	2380	31.45	164.94	43.72
10/28/2018 8:41	2381	31.23	165.16	43.94
10/28/2018 8:42	2382	31.96	164.42	43.20
10/28/2018 8:43	2383	31.31	165.08	43.86
10/28/2018 8:44	2384	31.39	165.00	43.78
10/28/2018 8:45	2385	31.70	164.69	43.47
10/28/2018 8:46	2386	31.53	164.86	43.64
10/28/2018 8:47	2387	31.35	165.04	43.82
10/28/2018 8:48	2388	31.10	165.30	44.08
10/28/2018 8:49	2389	31.59	164.80	43.58
10/28/2018 8:50	2390	31.67	164.71	43.49
10/28/2018 8:51	2391	31.29	165.10	43.88
10/28/2018 8:52	2392	31.57	164.82	43.60
10/28/2018 8:53	2393	31.60	164.79	43.57
10/28/2018 8:54	2394	31.76	164.62	43.40
10/28/2018 8:55	2395	31.61	164.77	43.55
10/28/2018 8:56	2396	31.38	165.01	43.79
10/28/2018 8:57	2397	31.43	164.96	43.75
10/28/2018 8:58	2398	30.94	165.47	44.25
10/28/2018 8:59	2399	31.49	164.90	43.68
10/28/2018 9:00	2400	31.42	164.97	43.75
10/28/2018 9:01	2401	31.37	165.02	43.80
10/28/2018 9:02	2402	31.17	165.23	44.01
10/28/2018 9:03	2403	31.23	165.17	43.95
10/28/2018 9:04	2404	31.30	165.10	43.88
10/28/2018 9:05	2405	30.82	165.59	44.37
10/28/2018 9:06	2406	31.44	164.95	43.73
10/28/2018 9:07	2407	31.38	165.01	43.79
10/28/2018 9:08	2408	31.28	165.12	43.90

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/28/2018 9:09	2409	31.28	165.11	43.89
10/28/2018 9:10	2410	30.96	165.44	44.22
10/28/2018 9:11	2411	30.86	165.54	44.32
10/28/2018 9:12	2412	31.20	165.20	43.98
10/28/2018 9:13	2413	31.04	165.36	44.14
10/28/2018 9:14	2414	31.35	165.04	43.82
10/28/2018 9:15	2415	31.48	164.91	43.69
10/28/2018 9:16	2416	30.80	165.61	44.39
10/28/2018 9:17	2417	31.03	165.37	44.15
10/28/2018 9:18	2418	31.36	165.03	43.81
10/28/2018 9:19	2419	31.07	165.33	44.11
10/28/2018 9:20	2420	30.92	165.49	44.27
10/28/2018 9:21	2421	31.14	165.26	44.04
10/28/2018 9:22	2422	31.26	165.14	43.92
10/28/2018 9:23	2423	30.88	165.52	44.30
10/28/2018 9:24	2424	31.23	165.17	43.95
10/28/2018 9:25	2425	31.29	165.11	43.89
10/28/2018 9:26	2426	30.94	165.46	44.24
10/28/2018 9:27	2427	31.27	165.13	43.91
10/28/2018 9:28	2428	30.88	165.52	44.31
10/28/2018 9:29	2429	31.08	165.32	44.10
10/28/2018 9:30	2430	31.47	164.92	43.70
10/28/2018 9:31	2431	31.42	164.97	43.75
10/28/2018 9:32	2432	30.97	165.44	44.22
10/28/2018 9:33	2433	30.91	165.50	44.28
10/28/2018 9:34	2434	30.81	165.59	44.37
10/28/2018 9:35	2435	30.87	165.54	44.32
10/28/2018 9:36	2436	31.33	165.07	43.85
10/28/2018 9:37	2437	31.40	164.99	43.77
10/28/2018 9:38	2438	31.64	164.74	43.52
10/28/2018 9:39	2439	31.23	165.17	43.95
10/28/2018 9:40	2440	30.64	165.77	44.56
10/28/2018 9:41	2441	31.07	165.33	44.11
10/28/2018 9:42	2442	30.83	165.58	44.36
10/28/2018 9:43	2443	31.09	165.31	44.09
10/28/2018 9:44	2444	31.07	165.33	44.11
10/28/2018 9:45	2445	30.83	165.58	44.36
10/28/2018 9:46	2446	31.18	165.22	44.00
10/28/2018 9:47	2447	31.24	165.16	43.94
10/28/2018 9:48	2448	30.52	165.89	44.67
10/28/2018 9:49	2449	31.37	165.03	43.81

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/28/2018 9:50	2450	30.88	165.52	44.30
10/28/2018 9:51	2451	30.84	165.56	44.34
10/28/2018 9:52	2452	30.55	165.87	44.65
10/28/2018 9:53	2453	30.80	165.60	44.38
10/28/2018 9:54	2454	31.17	165.23	44.01
10/28/2018 9:55	2455	31.24	165.15	43.93
10/28/2018 9:56	2456	31.14	165.26	44.04
10/28/2018 9:57	2457	31.08	165.32	44.10
10/28/2018 9:58	2458	30.98	165.43	44.21
10/28/2018 9:59	2459	30.41	166.01	44.79
10/28/2018 10:00	2460	31.15	165.24	44.02
10/28/2018 10:01	2461	31.01	165.39	44.17
10/28/2018 10:02	2462	31.04	165.36	44.15
10/28/2018 10:03	2463	30.94	165.46	44.24
10/28/2018 10:04	2464	30.90	165.50	44.28
10/28/2018 10:05	2465	30.89	165.51	44.29
10/28/2018 10:06	2466	31.27	165.12	43.90
10/28/2018 10:07	2467	31.04	165.36	44.14
10/28/2018 10:08	2468	30.96	165.45	44.23
10/28/2018 10:09	2469	31.14	165.26	44.04
10/28/2018 10:10	2470	30.63	165.78	44.56
10/28/2018 10:11	2471	30.77	165.64	44.42
10/28/2018 10:12	2472	31.23	165.16	43.94
10/28/2018 10:13	2473	30.41	166.01	44.79
10/28/2018 10:14	2474	31.28	165.11	43.89
10/28/2018 10:15	2475	30.84	165.57	44.35
10/28/2018 10:16	2476	30.96	165.44	44.22
10/28/2018 10:17	2477	31.05	165.35	44.13
10/28/2018 10:18	2478	31.07	165.33	44.11
10/28/2018 10:19	2479	31.03	165.38	44.16
10/28/2018 10:20	2480	31.00	165.40	44.18
10/28/2018 10:21	2481	31.15	165.25	44.03
10/28/2018 10:22	2482	30.96	165.44	44.22
10/28/2018 10:23	2483	30.83	165.57	44.35
10/28/2018 10:24	2484	30.92	165.49	44.27
10/28/2018 10:25	2485	31.14	165.25	44.04
10/28/2018 10:26	2486	31.13	165.27	44.05
10/28/2018 10:27	2487	31.34	165.06	43.84
10/28/2018 10:28	2488	30.57	165.84	44.62
10/28/2018 10:29	2489	30.97	165.43	44.21
10/28/2018 10:30	2490	30.81	165.59	44.37

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/28/2018 10:31	2491	30.65	165.77	44.55
10/28/2018 10:32	2492	30.80	165.61	44.39
10/28/2018 10:33	2493	31.08	165.32	44.10
10/28/2018 10:34	2494	30.86	165.54	44.32
10/28/2018 10:35	2495	31.14	165.26	44.04
10/28/2018 10:36	2496	30.85	165.56	44.34
10/28/2018 10:37	2497	30.59	165.82	44.61
10/28/2018 10:38	2498	30.65	165.76	44.54
10/28/2018 10:39	2499	31.14	165.26	44.04
10/28/2018 10:40	2500	31.02	165.38	44.16
10/28/2018 10:41	2501	31.02	165.38	44.16
10/28/2018 10:42	2502	31.39	165.00	43.78
10/28/2018 10:43	2503	30.80	165.61	44.39
10/28/2018 10:44	2504	31.02	165.38	44.16
10/28/2018 10:45	2505	31.03	165.37	44.15
10/28/2018 10:46	2506	30.65	165.77	44.55
10/28/2018 10:47	2507	30.97	165.43	44.21
10/28/2018 10:48	2508	31.02	165.38	44.16
10/28/2018 10:49	2509	31.11	165.29	44.07
10/28/2018 10:50	2510	30.90	165.51	44.29
10/28/2018 10:51	2511	31.00	165.40	44.18
10/28/2018 10:52	2512	30.00	166.42	45.20
10/28/2018 10:53	2513	31.07	165.33	44.11
10/28/2018 10:54	2514	30.61	165.80	44.58
10/28/2018 10:55	2515	31.07	165.33	44.11
10/28/2018 10:56	2516	30.91	165.49	44.27
10/28/2018 10:57	2517	30.59	165.82	44.61
10/28/2018 10:58	2518	31.22	165.17	43.95
10/28/2018 10:59	2519	30.80	165.61	44.39
10/28/2018 11:00	2520	31.02	165.38	44.16
10/28/2018 11:01	2521	31.07	165.33	44.12
10/28/2018 11:02	2522	30.97	165.44	44.22
10/28/2018 11:03	2523	30.95	165.46	44.24
10/28/2018 11:04	2524	30.84	165.57	44.35
10/28/2018 11:05	2525	30.88	165.52	44.31
10/28/2018 11:06	2526	30.88	165.52	44.30
10/28/2018 11:07	2527	31.07	165.33	44.11
10/28/2018 11:08	2528	30.42	165.99	44.77
10/28/2018 11:09	2529	30.48	165.94	44.72
10/28/2018 11:10	2530	30.81	165.59	44.37
10/28/2018 11:11	2531	30.70	165.71	44.49

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/28/2018 11:12	2532	30.80	165.60	44.38
10/28/2018 11:13	2533	30.51	165.90	44.68
10/28/2018 11:14	2534	31.02	165.38	44.16
10/28/2018 11:15	2535	30.71	165.70	44.48
10/28/2018 11:16	2536	31.00	165.40	44.18
10/28/2018 11:17	2537	30.95	165.45	44.23
10/28/2018 11:18	2538	30.69	165.72	44.51
10/28/2018 11:19	2539	30.31	166.11	44.89
10/28/2018 11:20	2540	30.93	165.48	44.26
10/28/2018 11:21	2541	30.75	165.65	44.44
10/28/2018 11:22	2542	30.70	165.71	44.49
10/28/2018 11:23	2543	30.71	165.70	44.48
10/28/2018 11:24	2544	30.68	165.73	44.52
10/28/2018 11:25	2545	30.60	165.81	44.59
10/28/2018 11:26	2546	30.88	165.52	44.30
10/28/2018 11:27	2547	30.72	165.69	44.47
10/28/2018 11:28	2548	30.58	165.83	44.62
10/28/2018 11:29	2549	31.05	165.35	44.13
10/28/2018 11:30	2550	30.80	165.60	44.38
10/28/2018 11:31	2551	30.88	165.53	44.31
10/28/2018 11:32	2552	30.62	165.79	44.57
10/28/2018 11:33	2553	30.27	166.15	44.93
10/28/2018 11:34	2554	30.48	165.94	44.72
10/28/2018 11:35	2555	30.81	165.60	44.38
10/28/2018 11:36	2556	30.84	165.57	44.35
10/28/2018 11:37	2557	30.65	165.76	44.54
10/28/2018 11:38	2558	30.11	166.31	45.09
10/28/2018 11:39	2559	30.60	165.81	44.59
10/28/2018 11:40	2560	30.43	165.99	44.77
10/28/2018 11:41	2561	30.77	165.64	44.42
10/28/2018 11:42	2562	30.52	165.90	44.68
10/28/2018 11:43	2563	30.70	165.70	44.49
10/28/2018 11:44	2564	30.88	165.53	44.31
10/28/2018 11:45	2565	30.77	165.64	44.42
10/28/2018 11:46	2566	30.89	165.51	44.29
10/28/2018 11:47	2567	30.62	165.79	44.57
10/28/2018 11:48	2568	31.14	165.25	44.03
10/28/2018 11:49	2569	30.53	165.88	44.66
10/28/2018 11:50	2570	30.96	165.45	44.23
10/28/2018 11:51	2571	30.66	165.75	44.53
10/28/2018 11:52	2572	30.55	165.86	44.64

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/28/2018 11:53	2573	30.38	166.04	44.82
10/28/2018 11:54	2574	30.42	165.99	44.77
10/28/2018 11:55	2575	30.36	166.05	44.84
10/28/2018 11:56	2576	30.48	165.93	44.71
10/28/2018 11:57	2577	30.57	165.84	44.62
10/28/2018 11:58	2578	30.56	165.85	44.63
10/28/2018 11:59	2579	30.41	166.01	44.79
10/28/2018 12:00	2580	30.51	165.90	44.68
10/28/2018 12:01	2581	30.78	165.63	44.41
10/28/2018 12:02	2582	30.55	165.87	44.65
10/28/2018 12:03	2583	30.46	165.95	44.73
10/28/2018 12:04	2584	30.85	165.56	44.34
10/28/2018 12:05	2585	30.29	166.13	44.91
10/28/2018 12:06	2586	30.50	165.92	44.70
10/28/2018 12:07	2587	30.04	166.39	45.17
10/28/2018 12:08	2588	30.13	166.29	45.08
10/28/2018 12:09	2589	30.72	165.69	44.47
10/28/2018 12:10	2590	30.78	165.63	44.41
10/28/2018 12:11	2591	30.78	165.63	44.41
10/28/2018 12:12	2592	30.51	165.90	44.68
10/28/2018 12:13	2593	30.41	166.00	44.78
10/28/2018 12:14	2594	30.58	165.83	44.62
10/28/2018 12:15	2595	30.70	165.71	44.49
10/28/2018 12:16	2596	30.59	165.83	44.61
10/28/2018 12:17	2597	30.74	165.67	44.45
10/28/2018 12:18	2598	30.44	165.97	44.75
10/28/2018 12:19	2599	30.97	165.43	44.21
10/28/2018 12:20	2600	30.59	165.82	44.60
10/28/2018 12:21	2601	30.18	166.25	45.03
10/28/2018 12:22	2602	30.19	166.23	45.02
10/28/2018 12:23	2603	30.55	165.87	44.65
10/28/2018 12:24	2604	30.49	165.92	44.70
10/28/2018 12:25	2605	30.42	165.99	44.77
10/28/2018 12:26	2606	30.31	166.11	44.89
10/28/2018 12:27	2607	30.20	166.22	45.00
10/28/2018 12:28	2608	30.80	165.61	44.39
10/28/2018 12:29	2609	30.45	165.97	44.75
10/28/2018 12:30	2610	30.35	166.07	44.85
10/28/2018 12:31	2611	30.70	165.71	44.49
10/28/2018 12:32	2612	30.42	166.00	44.78
10/28/2018 12:33	2613	30.96	165.45	44.23

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/28/2018 12:34	2614	30.19	166.23	45.01
10/28/2018 12:35	2615	30.49	165.93	44.71
10/28/2018 12:36	2616	29.97	166.46	45.24
10/28/2018 12:37	2617	30.61	165.80	44.58
10/28/2018 12:38	2618	30.20	166.23	45.01
10/28/2018 12:39	2619	30.39	166.03	44.81
10/28/2018 12:40	2620	30.11	166.32	45.10
10/28/2018 12:41	2621	29.92	166.51	45.29
10/28/2018 12:42	2622	30.30	166.12	44.90
10/28/2018 12:43	2623	30.56	165.86	44.64
10/28/2018 12:44	2624	30.50	165.91	44.69
10/28/2018 12:45	2625	30.18	166.24	45.02
10/28/2018 12:46	2626	30.32	166.10	44.88
10/28/2018 12:47	2627	30.32	166.10	44.88
10/28/2018 12:48	2628	30.29	166.13	44.91
10/28/2018 12:49	2629	30.21	166.21	44.99
10/28/2018 12:50	2630	30.36	166.06	44.84
10/28/2018 12:51	2631	30.17	166.25	45.03
10/28/2018 12:52	2632	30.62	165.79	44.57
10/28/2018 12:53	2633	30.03	166.39	45.18
10/28/2018 12:54	2634	30.14	166.28	45.06
10/28/2018 12:55	2635	30.47	165.94	44.73
10/28/2018 12:56	2636	30.21	166.21	44.99
10/28/2018 12:57	2637	30.05	166.38	45.16
10/28/2018 12:58	2638	30.52	165.89	44.68
10/28/2018 12:59	2639	29.91	166.52	45.30
10/28/2018 13:00	2640	30.46	165.96	44.74
10/28/2018 13:01	2641	29.90	166.53	45.31
10/28/2018 13:02	2642	30.47	165.94	44.72
10/28/2018 13:03	2643	30.19	166.23	45.01
10/28/2018 13:04	2644	30.06	166.37	45.15
10/28/2018 13:05	2645	30.42	166.00	44.78
10/28/2018 13:06	2646	30.38	166.04	44.82
10/28/2018 13:07	2647	30.07	166.36	45.14
10/28/2018 13:08	2648	30.28	166.14	44.92
10/28/2018 13:09	2649	29.87	166.56	45.35
10/28/2018 13:10	2650	30.53	165.89	44.67
10/28/2018 13:11	2651	30.04	166.39	45.17
10/28/2018 13:12	2652	30.45	165.96	44.74
10/28/2018 13:13	2653	30.17	166.25	45.03
10/28/2018 13:14	2654	30.34	166.08	44.86

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/28/2018 13:15	2655	30.47	165.95	44.73
10/28/2018 13:16	2656	29.85	166.58	45.36
10/28/2018 13:17	2657	30.33	166.08	44.86
10/28/2018 13:18	2658	30.38	166.04	44.82
10/28/2018 13:19	2659	30.59	165.83	44.61
10/28/2018 13:20	2660	30.12	166.30	45.08
10/28/2018 13:21	2661	30.11	166.32	45.10
10/28/2018 13:22	2662	30.28	166.14	44.92
10/28/2018 13:23	2663	30.24	166.18	44.96
10/28/2018 13:24	2664	30.09	166.33	45.12
10/28/2018 13:25	2665	30.10	166.32	45.10
10/28/2018 13:26	2666	30.04	166.39	45.17
10/28/2018 13:27	2667	30.22	166.20	44.98
10/28/2018 13:28	2668	30.57	165.85	44.63
10/28/2018 13:29	2669	30.17	166.25	45.03
10/28/2018 13:30	2670	30.21	166.21	44.99
10/28/2018 13:31	2671	30.09	166.34	45.12
10/28/2018 13:32	2672	30.06	166.36	45.15
10/28/2018 13:33	2673	30.45	165.96	44.74
10/28/2018 13:34	2674	29.77	166.66	45.44
10/28/2018 13:35	2675	29.95	166.48	45.26
10/28/2018 13:36	2676	30.03	166.39	45.17
10/28/2018 13:37	2677	30.02	166.40	45.18
10/28/2018 13:38	2678	30.11	166.32	45.10
10/28/2018 13:39	2679	30.57	165.84	44.62
10/28/2018 13:40	2680	30.18	166.24	45.02
10/28/2018 13:41	2681	30.02	166.41	45.19
10/28/2018 13:42	2682	30.25	166.17	44.95
10/28/2018 13:43	2683	30.02	166.41	45.19
10/28/2018 13:44	2684	30.17	166.25	45.03
10/28/2018 13:45	2685	30.19	166.24	45.02
10/28/2018 13:46	2686	30.30	166.12	44.90
10/28/2018 13:47	2687	30.07	166.35	45.14
10/28/2018 13:48	2688	30.51	165.91	44.69
10/28/2018 13:49	2689	30.53	165.89	44.67
10/28/2018 13:50	2690	30.00	166.43	45.21
10/28/2018 13:51	2691	30.40	166.02	44.80
10/28/2018 13:52	2692	30.04	166.39	45.17
10/28/2018 13:53	2693	29.80	166.64	45.42
10/28/2018 13:54	2694	30.18	166.24	45.02
10/28/2018 13:55	2695	30.20	166.22	45.00

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/28/2018 13:56	2696	30.00	166.42	45.20
10/28/2018 13:57	2697	30.09	166.34	45.12
10/28/2018 13:58	2698	29.86	166.57	45.35
10/28/2018 13:59	2699	29.97	166.46	45.24
10/28/2018 14:00	2700	30.09	166.33	45.11
10/28/2018 14:01	2701	29.92	166.51	45.29
10/28/2018 14:02	2702	30.06	166.36	45.15
10/28/2018 14:03	2703	30.54	165.87	44.65
10/28/2018 14:04	2704	29.92	166.51	45.29
10/28/2018 14:05	2705	30.34	166.08	44.86
10/28/2018 14:06	2706	30.11	166.31	45.09
10/28/2018 14:07	2707	30.54	165.87	44.65
10/28/2018 14:08	2708	29.97	166.46	45.24
10/28/2018 14:09	2709	30.15	166.28	45.06
10/28/2018 14:10	2710	30.14	166.28	45.06
10/28/2018 14:11	2711	29.96	166.47	45.25
10/28/2018 14:12	2712	29.83	166.60	45.38
10/28/2018 14:13	2713	29.60	166.84	45.62
10/28/2018 14:14	2714	30.45	165.97	44.75
10/28/2018 14:15	2715	30.00	166.42	45.21
10/28/2018 14:16	2716	30.03	166.40	45.18
10/28/2018 14:17	2717	29.91	166.52	45.30
10/28/2018 14:18	2718	29.89	166.54	45.32
10/28/2018 14:19	2719	30.18	166.24	45.02
10/28/2018 14:20	2720	29.88	166.55	45.33
10/28/2018 14:21	2721	29.83	166.61	45.39
10/28/2018 14:22	2722	29.79	166.64	45.42
10/28/2018 14:23	2723	29.82	166.61	45.39
10/28/2018 14:24	2724	29.74	166.69	45.47
10/28/2018 14:25	2725	29.94	166.48	45.27
10/28/2018 14:26	2726	30.06	166.37	45.15
10/28/2018 14:27	2727	30.31	166.11	44.89
10/28/2018 14:28	2728	29.89	166.54	45.32
10/28/2018 14:29	2729	29.79	166.64	45.42
10/28/2018 14:30	2730	30.03	166.39	45.17
10/28/2018 14:31	2731	29.89	166.54	45.32
10/28/2018 14:32	2732	30.11	166.32	45.10
10/28/2018 14:33	2733	29.76	166.67	45.45
10/28/2018 14:34	2734	29.65	166.79	45.57
10/28/2018 14:35	2735	29.78	166.65	45.43
10/28/2018 14:36	2736	30.07	166.35	45.13

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/28/2018 14:37	2737	30.12	166.30	45.08
10/28/2018 14:38	2738	30.04	166.38	45.16
10/28/2018 14:39	2739	29.94	166.48	45.27
10/28/2018 14:40	2740	30.16	166.26	45.04
10/28/2018 14:41	2741	30.30	166.12	44.90
10/28/2018 14:42	2742	30.01	166.41	45.19
10/28/2018 14:43	2743	30.11	166.31	45.09
10/28/2018 14:44	2744	29.94	166.49	45.27
10/28/2018 14:45	2745	29.79	166.64	45.42
10/28/2018 14:46	2746	30.31	166.11	44.89
10/28/2018 14:47	2747	30.35	166.07	44.85
10/28/2018 14:48	2748	29.69	166.74	45.52
10/28/2018 14:49	2749	29.71	166.72	45.50
10/28/2018 14:50	2750	30.26	166.16	44.94
10/28/2018 14:51	2751	29.92	166.51	45.29
10/28/2018 14:52	2752	29.74	166.70	45.48
10/28/2018 14:53	2753	29.69	166.75	45.53
10/28/2018 14:54	2754	29.59	166.84	45.62
10/28/2018 14:55	2755	30.38	166.04	44.82
10/28/2018 14:56	2756	29.94	166.48	45.27
10/28/2018 14:57	2757	29.87	166.56	45.34
10/28/2018 14:58	2758	29.80	166.64	45.42
10/28/2018 14:59	2759	29.89	166.54	45.32
10/28/2018 15:00	2760	29.95	166.48	45.26
10/28/2018 15:01	2761	29.81	166.62	45.41
10/28/2018 15:02	2762	30.12	166.31	45.09
10/28/2018 15:03	2763	29.83	166.60	45.38
10/28/2018 15:04	2764	29.75	166.69	45.47
10/28/2018 15:05	2765	29.36	167.08	45.86
10/28/2018 15:06	2766	29.99	166.44	45.22
10/28/2018 15:07	2767	30.08	166.34	45.13
10/28/2018 15:08	2768	30.09	166.33	45.11
10/28/2018 15:09	2769	29.81	166.62	45.40
10/28/2018 15:10	2770	29.49	166.95	45.73
10/28/2018 15:11	2771	29.39	167.05	45.83
10/28/2018 15:12	2772	29.83	166.60	45.38
10/28/2018 15:13	2773	29.73	166.70	45.48
10/28/2018 15:14	2774	30.12	166.30	45.08
10/28/2018 15:15	2775	29.64	166.80	45.58
10/28/2018 15:16	2776	29.63	166.81	45.59
10/28/2018 15:17	2777	30.02	166.41	45.19

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/28/2018 15:18	2778	29.82	166.61	45.39
10/28/2018 15:19	2779	29.82	166.61	45.39
10/28/2018 15:20	2780	29.47	166.97	45.75
10/28/2018 15:21	2781	30.12	166.30	45.08
10/28/2018 15:22	2782	29.92	166.51	45.29
10/28/2018 15:23	2783	29.49	166.95	45.73
10/28/2018 15:24	2784	30.07	166.35	45.13
10/28/2018 15:25	2785	30.02	166.41	45.19
10/28/2018 15:26	2786	29.66	166.78	45.56
10/28/2018 15:27	2787	30.15	166.27	45.05
10/28/2018 15:28	2788	29.55	166.88	45.67
10/28/2018 15:29	2789	29.74	166.69	45.47
10/28/2018 15:30	2790	29.75	166.68	45.47
10/28/2018 15:31	2791	30.10	166.32	45.10
10/28/2018 15:32	2792	29.91	166.52	45.30
10/28/2018 15:33	2793	29.04	167.41	46.20
10/28/2018 15:34	2794	29.93	166.49	45.28
10/28/2018 15:35	2795	29.85	166.58	45.36
10/28/2018 15:36	2796	29.92	166.51	45.29
10/28/2018 15:37	2797	29.58	166.85	45.64
10/28/2018 15:38	2798	29.73	166.71	45.49
10/28/2018 15:39	2799	29.70	166.74	45.52
10/28/2018 15:40	2800	29.42	167.02	45.80
10/28/2018 15:41	2801	29.50	166.94	45.72
10/28/2018 15:42	2802	29.56	166.88	45.66
10/28/2018 15:43	2803	29.68	166.75	45.53
10/28/2018 15:44	2804	29.83	166.61	45.39
10/28/2018 15:45	2805	29.75	166.68	45.47
10/28/2018 15:46	2806	29.31	167.13	45.91
10/28/2018 15:47	2807	29.80	166.63	45.41
10/28/2018 15:48	2808	29.57	166.87	45.65
10/28/2018 15:49	2809	29.32	167.12	45.90
10/28/2018 15:50	2810	29.68	166.75	45.53
10/28/2018 15:51	2811	29.86	166.57	45.35
10/28/2018 15:52	2812	29.52	166.92	45.70
10/28/2018 15:53	2813	29.39	167.05	45.83
10/28/2018 15:54	2814	29.33	167.11	45.89
10/28/2018 15:55	2815	28.85	167.61	46.39
10/28/2018 15:56	2816	29.93	166.50	45.28
10/28/2018 15:57	2817	29.58	166.85	45.63
10/28/2018 15:58	2818	29.53	166.91	45.69

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/28/2018 15:59	2819	29.78	166.65	45.43
10/28/2018 16:00	2820	29.28	167.16	45.94
10/28/2018 16:01	2821	29.41	167.03	45.81
10/28/2018 16:02	2822	29.44	167.00	45.78
10/28/2018 16:03	2823	29.86	166.57	45.36
10/28/2018 16:04	2824	29.48	166.96	45.74
10/28/2018 16:05	2825	29.47	166.97	45.75
10/28/2018 16:06	2826	29.81	166.62	45.40
10/28/2018 16:07	2827	29.63	166.80	45.58
10/28/2018 16:08	2828	29.93	166.50	45.28
10/28/2018 16:09	2829	29.37	167.07	45.85
10/28/2018 16:10	2830	29.43	167.01	45.79
10/28/2018 16:11	2831	29.62	166.81	45.59
10/28/2018 16:12	2832	29.34	167.10	45.88
10/28/2018 16:13	2833	29.44	167.00	45.78
10/28/2018 16:14	2834	29.57	166.86	45.64
10/28/2018 16:15	2835	29.86	166.57	45.35
10/28/2018 16:16	2836	29.66	166.78	45.56
10/28/2018 16:17	2837	29.43	167.01	45.79
10/28/2018 16:18	2838	29.52	166.92	45.70
10/28/2018 16:19	2839	29.68	166.75	45.53
10/28/2018 16:20	2840	29.44	167.01	45.79
10/28/2018 16:21	2841	29.09	167.36	46.14
10/28/2018 16:22	2842	29.58	166.86	45.64
10/28/2018 16:23	2843	29.15	167.29	46.08
10/28/2018 16:24	2844	29.44	167.00	45.78
10/28/2018 16:25	2845	29.22	167.23	46.01
10/28/2018 16:26	2846	29.51	166.93	45.71
10/28/2018 16:27	2847	29.63	166.80	45.58
10/28/2018 16:28	2848	29.38	167.06	45.85
10/28/2018 16:29	2849	30.25	166.17	44.95
10/28/2018 16:30	2850	29.51	166.93	45.71
10/28/2018 16:31	2851	29.46	166.98	45.76
10/28/2018 16:32	2852	29.47	166.97	45.75
10/28/2018 16:33	2853	29.58	166.86	45.64
10/28/2018 16:34	2854	29.44	167.01	45.79
10/28/2018 16:35	2855	29.32	167.13	45.91
10/28/2018 16:36	2856	29.16	167.28	46.06
10/28/2018 16:37	2857	29.68	166.75	45.53
10/28/2018 16:38	2858	29.29	167.16	45.94
10/28/2018 16:39	2859	29.31	167.14	45.92

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/28/2018 16:40	2860	29.84	166.59	45.37
10/28/2018 16:41	2861	29.49	166.95	45.73
10/28/2018 16:42	2862	29.39	167.05	45.83
10/28/2018 16:43	2863	29.15	167.30	46.08
10/28/2018 16:44	2864	29.08	167.37	46.15
10/28/2018 16:45	2865	29.24	167.20	45.99
10/28/2018 16:46	2866	29.60	166.83	45.61
10/28/2018 16:47	2867	29.51	166.93	45.71
10/28/2018 16:48	2868	29.71	166.72	45.50
10/28/2018 16:49	2869	29.79	166.64	45.42
10/28/2018 16:50	2870	29.76	166.67	45.45
10/28/2018 16:51	2871	29.50	166.94	45.72
10/28/2018 16:52	2872	29.43	167.01	45.79
10/28/2018 16:53	2873	29.50	166.94	45.72
10/28/2018 16:54	2874	29.57	166.87	45.65
10/28/2018 16:55	2875	29.30	167.14	45.92
10/28/2018 16:56	2876	29.47	166.97	45.75
10/28/2018 16:57	2877	29.05	167.40	46.18
10/28/2018 16:58	2878	29.21	167.23	46.01
10/28/2018 16:59	2879	29.65	166.79	45.57
10/28/2018 17:00	2880	29.52	166.92	45.70
10/28/2018 17:01	2881	29.52	166.92	45.70
10/28/2018 17:02	2882	29.37	167.07	45.85
10/28/2018 17:03	2883	29.42	167.02	45.80
10/28/2018 17:04	2884	29.62	166.82	45.60
10/28/2018 17:05	2885	29.45	166.99	45.77
10/28/2018 17:06	2886	29.51	166.93	45.71
10/28/2018 17:07	2887	28.90	167.55	46.33
10/28/2018 17:08	2888	29.28	167.16	45.94
10/28/2018 17:09	2889	28.94	167.51	46.29
10/28/2018 17:10	2890	29.33	167.12	45.90
10/28/2018 17:11	2891	28.99	167.46	46.24
10/28/2018 17:12	2892	29.50	166.93	45.72
10/28/2018 17:13	2893	29.54	166.90	45.68
10/28/2018 17:14	2894	29.16	167.28	46.07
10/28/2018 17:15	2895	29.41	167.03	45.81
10/28/2018 17:16	2896	28.92	167.53	46.31
10/28/2018 17:17	2897	29.42	167.02	45.80
10/28/2018 17:18	2898	29.32	167.12	45.90
10/28/2018 17:19	2899	29.33	167.12	45.90
10/28/2018 17:20	2900	29.41	167.03	45.81

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/28/2018 17:21	2901	29.13	167.31	46.10
10/28/2018 17:22	2902	28.94	167.52	46.30
10/28/2018 17:23	2903	29.65	166.78	45.56
10/28/2018 17:24	2904	29.35	167.09	45.87
10/28/2018 17:25	2905	29.64	166.80	45.58
10/28/2018 17:26	2906	29.62	166.82	45.60
10/28/2018 17:27	2907	29.06	167.39	46.17
10/28/2018 17:28	2908	29.39	167.05	45.83
10/28/2018 17:29	2909	29.21	167.23	46.01
10/28/2018 17:30	2910	29.17	167.28	46.06
10/28/2018 17:31	2911	29.28	167.17	45.95
10/28/2018 17:32	2912	29.07	167.38	46.17
10/28/2018 17:33	2913	29.25	167.19	45.97
10/28/2018 17:34	2914	28.99	167.46	46.24
10/28/2018 17:35	2915	28.90	167.55	46.34
10/28/2018 17:36	2916	29.26	167.19	45.97
10/28/2018 17:37	2917	29.46	166.98	45.77
10/28/2018 17:38	2918	29.01	167.44	46.22
10/28/2018 17:39	2919	29.22	167.23	46.01
10/28/2018 17:40	2920	28.83	167.63	46.41
10/28/2018 17:41	2921	29.55	166.89	45.67
10/28/2018 17:42	2922	29.57	166.87	45.65
10/28/2018 17:43	2923	29.01	167.44	46.23
10/28/2018 17:44	2924	29.47	166.97	45.75
10/28/2018 17:45	2925	29.30	167.15	45.93
10/28/2018 17:46	2926	29.26	167.18	45.96
10/28/2018 17:47	2927	29.29	167.15	45.93
10/28/2018 17:48	2928	28.94	167.52	46.30
10/28/2018 17:49	2929	29.12	167.33	46.11
10/28/2018 17:50	2930	29.04	167.41	46.19
10/28/2018 17:51	2931	29.40	167.05	45.83
10/28/2018 17:52	2932	29.12	167.32	46.10
10/28/2018 17:53	2933	29.34	167.11	45.89
10/28/2018 17:54	2934	29.16	167.28	46.07
10/28/2018 17:55	2935	29.19	167.26	46.04
10/28/2018 17:56	2936	29.03	167.42	46.20
10/28/2018 17:57	2937	29.36	167.08	45.86
10/28/2018 17:58	2938	29.43	167.01	45.79
10/28/2018 17:59	2939	29.19	167.26	46.04
10/28/2018 18:00	2940	28.92	167.53	46.31
10/28/2018 18:01	2941	29.12	167.33	46.11

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/28/2018 18:02	2942	29.53	166.91	45.69
10/28/2018 18:03	2943	29.31	167.13	45.91
10/28/2018 18:04	2944	29.18	167.27	46.05
10/28/2018 18:05	2945	28.88	167.58	46.36
10/28/2018 18:06	2946	28.68	167.78	46.56
10/28/2018 18:07	2947	28.65	167.81	46.59
10/28/2018 18:08	2948	29.10	167.35	46.13
10/28/2018 18:09	2949	28.92	167.53	46.31
10/28/2018 18:10	2950	29.19	167.26	46.04
10/28/2018 18:11	2951	29.41	167.03	45.81
10/28/2018 18:12	2952	29.25	167.19	45.97
10/28/2018 18:13	2953	29.29	167.15	45.93
10/28/2018 18:14	2954	29.30	167.14	45.93
10/28/2018 18:15	2955	29.37	167.07	45.85
10/28/2018 18:16	2956	28.99	167.47	46.25
10/28/2018 18:17	2957	28.97	167.48	46.26
10/28/2018 18:18	2958	29.40	167.04	45.83
10/28/2018 18:19	2959	28.96	167.50	46.28
10/28/2018 18:20	2960	29.26	167.18	45.97
10/28/2018 18:21	2961	29.23	167.22	46.00
10/28/2018 18:22	2962	29.01	167.44	46.22
10/28/2018 18:23	2963	29.38	167.06	45.84
10/28/2018 18:24	2964	29.22	167.23	46.01
10/28/2018 18:25	2965	29.28	167.16	45.94
10/28/2018 18:26	2966	28.87	167.59	46.37
10/28/2018 18:27	2967	28.94	167.51	46.29
10/28/2018 18:28	2968	29.26	167.18	45.96
10/28/2018 18:29	2969	28.92	167.54	46.32
10/28/2018 18:30	2970	28.64	167.82	46.60
10/28/2018 18:31	2971	28.80	167.65	46.43
10/28/2018 18:32	2972	28.92	167.53	46.31
10/28/2018 18:33	2973	29.57	166.87	45.65
10/28/2018 18:34	2974	28.95	167.50	46.28
10/28/2018 18:35	2975	28.94	167.51	46.29
10/28/2018 18:36	2976	29.18	167.27	46.05
10/28/2018 18:37	2977	28.93	167.52	46.31
10/28/2018 18:38	2978	28.79	167.66	46.44
10/28/2018 18:39	2979	29.19	167.26	46.04
10/28/2018 18:40	2980	28.89	167.56	46.34
10/28/2018 18:41	2981	29.34	167.11	45.89
10/28/2018 18:42	2982	28.82	167.63	46.41

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/28/2018 18:43	2983	29.12	167.33	46.11
10/28/2018 18:44	2984	29.33	167.11	45.89
10/28/2018 18:45	2985	28.93	167.52	46.30
10/28/2018 18:46	2986	29.26	167.19	45.97
10/28/2018 18:47	2987	28.90	167.56	46.34
10/28/2018 18:48	2988	29.64	166.79	45.57
10/28/2018 18:49	2989	29.56	166.88	45.66
10/28/2018 18:50	2990	29.05	167.40	46.19
10/28/2018 18:51	2991	29.08	167.37	46.15
10/28/2018 18:52	2992	29.19	167.26	46.04
10/28/2018 18:53	2993	29.57	166.86	45.65
10/28/2018 18:54	2994	29.03	167.42	46.20
10/28/2018 18:55	2995	29.17	167.28	46.06
10/28/2018 18:56	2996	28.93	167.52	46.30
10/28/2018 18:57	2997	28.53	167.93	46.71
10/28/2018 18:58	2998	28.51	167.96	46.74
10/28/2018 18:59	2999	29.06	167.39	46.17
10/28/2018 19:00	3000	29.00	167.45	46.23
10/28/2018 19:01	3001	28.80	167.66	46.44
10/28/2018 19:02	3002	28.97	167.49	46.27
10/28/2018 19:03	3003	28.75	167.71	46.49
10/28/2018 19:04	3004	28.91	167.55	46.33
10/28/2018 19:05	3005	28.82	167.63	46.42
10/28/2018 19:06	3006	29.20	167.25	46.03
10/28/2018 19:07	3007	29.14	167.31	46.09
10/28/2018 19:08	3008	29.48	166.96	45.74
10/28/2018 19:09	3009	28.68	167.77	46.56
10/28/2018 19:10	3010	29.05	167.40	46.18
10/28/2018 19:11	3011	29.46	166.98	45.76
10/28/2018 19:12	3012	29.42	167.02	45.80
10/28/2018 19:13	3013	28.95	167.50	46.29
10/28/2018 19:14	3014	28.80	167.65	46.43
10/28/2018 19:15	3015	28.71	167.75	46.53
10/28/2018 19:16	3016	28.93	167.52	46.30
10/28/2018 19:17	3017	29.13	167.31	46.10
10/28/2018 19:18	3018	28.33	168.14	46.92
10/28/2018 19:19	3019	29.29	167.16	45.94
10/28/2018 19:20	3020	28.75	167.71	46.49
10/28/2018 19:21	3021	28.96	167.49	46.27
10/28/2018 19:22	3022	28.89	167.57	46.35
10/28/2018 19:23	3023	28.69	167.77	46.55

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/28/2018 19:24	3024	29.01	167.44	46.22
10/28/2018 19:25	3025	29.08	167.37	46.15
10/28/2018 19:26	3026	29.35	167.09	45.87
10/28/2018 19:27	3027	29.14	167.31	46.09
10/28/2018 19:28	3028	28.95	167.50	46.28
10/28/2018 19:29	3029	28.56	167.90	46.68
10/28/2018 19:30	3030	29.06	167.39	46.17
10/28/2018 19:31	3031	29.04	167.41	46.19
10/28/2018 19:32	3032	28.67	167.79	46.57
10/28/2018 19:33	3033	28.92	167.53	46.31
10/28/2018 19:34	3034	29.07	167.38	46.16
10/28/2018 19:35	3035	28.88	167.57	46.35
10/28/2018 19:36	3036	29.36	167.08	45.86
10/28/2018 19:37	3037	28.96	167.49	46.28
10/28/2018 19:38	3038	28.86	167.59	46.37
10/28/2018 19:39	3039	28.79	167.67	46.45
10/28/2018 19:40	3040	28.96	167.50	46.28
10/28/2018 19:41	3041	28.45	168.02	46.80
10/28/2018 19:42	3042	28.36	168.11	46.89
10/28/2018 19:43	3043	28.93	167.52	46.30
10/28/2018 19:44	3044	28.44	168.03	46.81
10/28/2018 19:45	3045	29.10	167.35	46.13
10/28/2018 19:46	3046	28.95	167.50	46.28
10/28/2018 19:47	3047	28.86	167.59	46.37
10/28/2018 19:48	3048	28.68	167.78	46.56
10/28/2018 19:49	3049	29.26	167.19	45.97
10/28/2018 19:50	3050	28.70	167.76	46.54
10/28/2018 19:51	3051	29.09	167.36	46.14
10/28/2018 19:52	3052	28.66	167.80	46.58
10/28/2018 19:53	3053	28.73	167.72	46.50
10/28/2018 19:54	3054	28.66	167.80	46.58
10/28/2018 19:55	3055	28.83	167.63	46.41
10/28/2018 19:56	3056	28.87	167.59	46.37
10/28/2018 19:57	3057	28.56	167.90	46.68
10/28/2018 19:58	3058	28.59	167.87	46.65
10/28/2018 19:59	3059	28.56	167.90	46.68
10/28/2018 20:00	3060	28.34	168.13	46.91
10/28/2018 20:01	3061	29.10	167.35	46.13
10/28/2018 20:02	3062	28.19	168.28	47.06
10/28/2018 20:03	3063	28.54	167.92	46.70
10/28/2018 20:04	3064	29.12	167.33	46.11

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/28/2018 20:05	3065	28.65	167.81	46.59
10/28/2018 20:06	3066	28.77	167.69	46.47
10/28/2018 20:07	3067	28.59	167.87	46.65
10/28/2018 20:08	3068	28.61	167.85	46.64
10/28/2018 20:09	3069	28.46	168.00	46.78
10/28/2018 20:10	3070	29.20	167.25	46.03
10/28/2018 20:11	3071	28.44	168.02	46.80
10/28/2018 20:12	3072	28.28	168.19	46.97
10/28/2018 20:13	3073	28.86	167.60	46.38
10/28/2018 20:14	3074	28.79	167.66	46.45
10/28/2018 20:15	3075	28.69	167.77	46.55
10/28/2018 20:16	3076	28.92	167.54	46.32
10/28/2018 20:17	3077	28.44	168.02	46.80
10/28/2018 20:18	3078	28.69	167.77	46.55
10/28/2018 20:19	3079	29.08	167.37	46.15
10/28/2018 20:20	3080	28.85	167.60	46.38
10/28/2018 20:21	3081	29.58	166.86	45.64
10/28/2018 20:22	3082	28.29	168.18	46.96
10/28/2018 20:23	3083	28.30	168.17	46.95
10/28/2018 20:24	3084	28.68	167.78	46.56
10/28/2018 20:25	3085	28.53	167.93	46.71
10/28/2018 20:26	3086	28.70	167.76	46.54
10/28/2018 20:27	3087	28.59	167.88	46.66
10/28/2018 20:28	3088	28.28	168.19	46.97
10/28/2018 20:29	3089	28.71	167.75	46.53
10/28/2018 20:30	3090	28.61	167.85	46.63
10/28/2018 20:31	3091	28.23	168.24	47.02
10/28/2018 20:32	3092	28.43	168.04	46.82
10/28/2018 20:33	3093	28.81	167.65	46.43
10/28/2018 20:34	3094	28.64	167.82	46.60
10/28/2018 20:35	3095	28.77	167.69	46.47
10/28/2018 20:36	3096	28.68	167.78	46.56
10/28/2018 20:37	3097	28.61	167.85	46.63
10/28/2018 20:38	3098	28.70	167.76	46.54
10/28/2018 20:39	3099	28.40	168.07	46.85
10/28/2018 20:40	3100	28.88	167.57	46.35
10/28/2018 20:41	3101	28.92	167.53	46.31
10/28/2018 20:42	3102	28.65	167.81	46.59
10/28/2018 20:43	3103	29.19	167.26	46.04
10/28/2018 20:44	3104	28.15	168.33	47.11
10/28/2018 20:45	3105	28.38	168.09	46.87

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/28/2018 20:46	3106	28.30	168.17	46.95
10/28/2018 20:47	3107	28.69	167.77	46.55
10/28/2018 20:48	3108	28.83	167.62	46.40
10/28/2018 20:49	3109	28.41	168.06	46.84
10/28/2018 20:50	3110	28.53	167.93	46.72
10/28/2018 20:51	3111	28.63	167.83	46.62
10/28/2018 20:52	3112	28.71	167.75	46.53
10/28/2018 20:53	3113	28.12	168.35	47.13
10/28/2018 20:54	3114	29.03	167.42	46.20
10/28/2018 20:55	3115	28.68	167.77	46.56
10/28/2018 20:56	3116	28.61	167.85	46.64
10/28/2018 20:57	3117	28.86	167.59	46.37
10/28/2018 20:58	3118	28.77	167.69	46.47
10/28/2018 20:59	3119	28.23	168.24	47.02
10/28/2018 21:00	3120	28.36	168.11	46.89
10/28/2018 21:01	3121	28.21	168.26	47.04
10/28/2018 21:02	3122	28.97	167.48	46.26
10/28/2018 21:03	3123	28.27	168.20	46.98
10/28/2018 21:04	3124	28.78	167.68	46.46
10/28/2018 21:05	3125	28.32	168.15	46.93
10/28/2018 21:06	3126	28.59	167.87	46.66
10/28/2018 21:07	3127	28.80	167.65	46.43
10/28/2018 21:08	3128	28.59	167.88	46.66
10/28/2018 21:09	3129	28.34	168.13	46.91
10/28/2018 21:10	3130	28.34	168.12	46.90
10/28/2018 21:11	3131	28.65	167.81	46.59
10/28/2018 21:12	3132	28.44	168.02	46.80
10/28/2018 21:13	3133	28.61	167.85	46.63
10/28/2018 21:14	3134	28.14	168.33	47.11
10/28/2018 21:15	3135	28.47	167.99	46.77
10/28/2018 21:16	3136	28.49	167.97	46.75
10/28/2018 21:17	3137	28.44	168.03	46.81
10/28/2018 21:18	3138	28.88	167.57	46.35
10/28/2018 21:19	3139	28.41	168.06	46.84
10/28/2018 21:20	3140	28.46	168.00	46.79
10/28/2018 21:21	3141	28.57	167.89	46.67
10/28/2018 21:22	3142	28.45	168.01	46.80
10/28/2018 21:23	3143	28.93	167.52	46.30
10/28/2018 21:24	3144	28.93	167.52	46.30
10/28/2018 21:25	3145	28.39	168.08	46.86
10/28/2018 21:26	3146	28.17	168.31	47.09

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/28/2018 21:27	3147	28.15	168.32	47.10
10/28/2018 21:28	3148	28.35	168.11	46.90
10/28/2018 21:29	3149	28.54	167.92	46.70
10/28/2018 21:30	3150	28.49	167.98	46.76
10/28/2018 21:31	3151	28.89	167.57	46.35
10/28/2018 21:32	3152	28.38	168.09	46.87
10/28/2018 21:33	3153	28.48	167.98	46.77
10/28/2018 21:34	3154	28.27	168.20	46.98
10/28/2018 21:35	3155	28.06	168.42	47.20
10/28/2018 21:36	3156	28.43	168.03	46.81
10/28/2018 21:37	3157	28.37	168.10	46.88
10/28/2018 21:38	3158	28.52	167.95	46.73
10/28/2018 21:39	3159	28.74	167.72	46.50
10/28/2018 21:40	3160	27.96	168.52	47.30
10/28/2018 21:41	3161	28.48	167.99	46.77
10/28/2018 21:42	3162	28.04	168.43	47.21
10/28/2018 21:43	3163	28.49	167.97	46.75
10/28/2018 21:44	3164	27.94	168.53	47.31
10/28/2018 21:45	3165	28.54	167.93	46.71
10/28/2018 21:46	3166	28.16	168.31	47.09
10/28/2018 21:47	3167	28.42	168.05	46.83
10/28/2018 21:48	3168	28.33	168.14	46.92
10/28/2018 21:49	3169	28.24	168.23	47.01
10/28/2018 21:50	3170	27.79	168.69	47.47
10/28/2018 21:51	3171	28.64	167.82	46.60
10/28/2018 21:52	3172	28.37	168.10	46.88
10/28/2018 21:53	3173	28.35	168.11	46.90
10/28/2018 21:54	3174	28.28	168.19	46.97
10/28/2018 21:55	3175	28.22	168.25	47.03
10/28/2018 21:56	3176	28.22	168.25	47.03
10/28/2018 21:57	3177	28.58	167.88	46.66
10/28/2018 21:58	3178	28.56	167.90	46.68
10/28/2018 21:59	3179	28.75	167.71	46.49
10/28/2018 22:00	3180	28.19	168.29	47.07
10/28/2018 22:01	3181	28.51	167.96	46.74
10/28/2018 22:02	3182	27.90	168.57	47.35
10/28/2018 22:03	3183	28.80	167.66	46.44
10/28/2018 22:04	3184	28.33	168.14	46.92
10/28/2018 22:05	3185	28.62	167.84	46.62
10/28/2018 22:06	3186	28.28	168.19	46.97
10/28/2018 22:07	3187	28.21	168.26	47.04

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/28/2018 22:08	3188	28.57	167.90	46.68
10/28/2018 22:09	3189	28.33	168.14	46.92
10/28/2018 22:10	3190	28.25	168.22	47.00
10/28/2018 22:11	3191	28.16	168.32	47.10
10/28/2018 22:12	3192	28.93	167.52	46.31
10/28/2018 22:13	3193	28.63	167.83	46.61
10/28/2018 22:14	3194	27.99	168.48	47.26
10/28/2018 22:15	3195	28.37	168.09	46.88
10/28/2018 22:16	3196	28.81	167.64	46.42
10/28/2018 22:17	3197	28.02	168.46	47.24
10/28/2018 22:18	3198	28.44	168.03	46.81
10/28/2018 22:19	3199	28.45	168.01	46.79
10/28/2018 22:20	3200	28.53	167.94	46.72
10/28/2018 22:21	3201	28.36	168.10	46.88
10/28/2018 22:22	3202	28.36	168.11	46.89
10/28/2018 22:23	3203	28.31	168.16	46.94
10/28/2018 22:24	3204	28.49	167.97	46.75
10/28/2018 22:25	3205	28.44	168.03	46.81
10/28/2018 22:26	3206	27.96	168.51	47.29
10/28/2018 22:27	3207	28.78	167.68	46.46
10/28/2018 22:28	3208	28.07	168.41	47.19
10/28/2018 22:29	3209	28.47	167.99	46.78
10/28/2018 22:30	3210	28.07	168.40	47.18
10/28/2018 22:31	3211	28.51	167.95	46.73
10/28/2018 22:32	3212	28.25	168.22	47.00
10/28/2018 22:33	3213	28.27	168.19	46.98
10/28/2018 22:34	3214	28.34	168.13	46.91
10/28/2018 22:35	3215	28.14	168.33	47.11
10/28/2018 22:36	3216	28.35	168.12	46.90
10/28/2018 22:37	3217	28.55	167.92	46.70
10/28/2018 22:38	3218	27.92	168.56	47.34
10/28/2018 22:39	3219	28.65	167.81	46.59
10/28/2018 22:40	3220	28.40	168.07	46.85
10/28/2018 22:41	3221	27.92	168.55	47.34
10/28/2018 22:42	3222	28.53	167.94	46.72
10/28/2018 22:43	3223	28.25	168.22	47.00
10/28/2018 22:44	3224	28.34	168.12	46.90
10/28/2018 22:45	3225	28.62	167.85	46.63
10/28/2018 22:46	3226	28.61	167.85	46.63
10/28/2018 22:47	3227	28.41	168.06	46.84
10/28/2018 22:48	3228	28.23	168.24	47.02

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/28/2018 22:49	3229	28.35	168.12	46.90
10/28/2018 22:50	3230	28.46	168.01	46.79
10/28/2018 22:51	3231	28.01	168.46	47.24
10/28/2018 22:52	3232	28.31	168.16	46.94
10/28/2018 22:53	3233	28.32	168.15	46.93
10/28/2018 22:54	3234	27.82	168.66	47.44
10/28/2018 22:55	3235	27.97	168.51	47.29
10/28/2018 22:56	3236	28.34	168.13	46.91
10/28/2018 22:57	3237	28.17	168.30	47.08
10/28/2018 22:58	3238	28.51	167.95	46.73
10/28/2018 22:59	3239	27.75	168.73	47.51
10/28/2018 23:00	3240	28.32	168.15	46.93
10/28/2018 23:01	3241	28.51	167.95	46.73
10/28/2018 23:02	3242	27.72	168.77	47.55
10/28/2018 23:03	3243	28.51	167.96	46.74
10/28/2018 23:04	3244	28.11	168.36	47.14
10/28/2018 23:05	3245	28.31	168.16	46.94
10/28/2018 23:06	3246	28.32	168.14	46.93
10/28/2018 23:07	3247	27.60	168.88	47.66
10/28/2018 23:08	3248	28.07	168.41	47.19
10/28/2018 23:09	3249	28.37	168.10	46.88
10/28/2018 23:10	3250	27.80	168.68	47.46
10/28/2018 23:11	3251	28.60	167.86	46.64
10/28/2018 23:12	3252	28.26	168.21	46.99
10/28/2018 23:13	3253	28.18	168.30	47.08
10/28/2018 23:14	3254	28.09	168.39	47.17
10/28/2018 23:15	3255	28.15	168.32	47.10
10/28/2018 23:16	3256	28.43	168.04	46.82
10/28/2018 23:17	3257	28.32	168.15	46.93
10/28/2018 23:18	3258	27.33	169.17	47.95
10/28/2018 23:19	3259	28.35	168.12	46.90
10/28/2018 23:20	3260	28.22	168.25	47.03
10/28/2018 23:21	3261	28.06	168.42	47.20
10/28/2018 23:22	3262	28.26	168.21	46.99
10/28/2018 23:23	3263	28.10	168.38	47.16
10/28/2018 23:24	3264	28.06	168.42	47.20
10/28/2018 23:25	3265	27.97	168.51	47.29
10/28/2018 23:26	3266	28.59	167.88	46.66
10/28/2018 23:27	3267	27.73	168.75	47.53
10/28/2018 23:28	3268	27.87	168.61	47.39
10/28/2018 23:29	3269	28.33	168.14	46.92

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/28/2018 23:30	3270	27.96	168.52	47.30
10/28/2018 23:31	3271	28.31	168.16	46.94
10/28/2018 23:32	3272	28.16	168.31	47.09
10/28/2018 23:33	3273	27.84	168.64	47.42
10/28/2018 23:34	3274	27.83	168.65	47.43
10/28/2018 23:35	3275	28.54	167.92	46.70
10/28/2018 23:36	3276	28.14	168.33	47.11
10/28/2018 23:37	3277	28.54	167.93	46.71
10/28/2018 23:38	3278	28.10	168.37	47.16
10/28/2018 23:39	3279	27.66	168.83	47.61
10/28/2018 23:40	3280	27.83	168.65	47.43
10/28/2018 23:41	3281	27.93	168.55	47.33
10/28/2018 23:42	3282	28.44	168.03	46.81
10/28/2018 23:43	3283	27.98	168.50	47.28
10/28/2018 23:44	3284	28.04	168.43	47.21
10/28/2018 23:45	3285	28.20	168.27	47.05
10/28/2018 23:46	3286	28.01	168.46	47.24
10/28/2018 23:47	3287	28.05	168.43	47.21
10/28/2018 23:48	3288	28.19	168.28	47.06
10/28/2018 23:49	3289	28.12	168.36	47.14
10/28/2018 23:50	3290	28.31	168.15	46.94
10/28/2018 23:51	3291	28.11	168.37	47.15
10/28/2018 23:52	3292	28.20	168.27	47.05
10/28/2018 23:53	3293	28.00	168.48	47.26
10/28/2018 23:54	3294	28.01	168.47	47.25
10/28/2018 23:55	3295	28.02	168.45	47.23
10/28/2018 23:56	3296	27.71	168.78	47.56
10/28/2018 23:57	3297	28.25	168.22	47.00
10/28/2018 23:58	3298	28.12	168.35	47.13
10/28/2018 23:59	3299	27.47	169.02	47.80
10/29/2018 0:00	3300	28.16	168.31	47.09
10/29/2018 0:01	3301	28.14	168.33	47.11
10/29/2018 0:02	3302	28.16	168.31	47.09
10/29/2018 0:03	3303	28.17	168.31	47.09
10/29/2018 0:04	3304	28.09	168.38	47.17
10/29/2018 0:05	3305	27.62	168.86	47.65
10/29/2018 0:06	3306	27.96	168.51	47.30
10/29/2018 0:07	3307	28.20	168.27	47.05
10/29/2018 0:08	3308	28.08	168.40	47.18
10/29/2018 0:09	3309	28.23	168.24	47.02
10/29/2018 0:10	3310	28.13	168.35	47.13

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/29/2018 0:11	3311	28.23	168.25	47.03
10/29/2018 0:12	3312	27.43	169.06	47.84
10/29/2018 0:13	3313	28.37	168.10	46.88
10/29/2018 0:14	3314	28.45	168.01	46.79
10/29/2018 0:15	3315	28.19	168.28	47.06
10/29/2018 0:16	3316	28.20	168.27	47.05
10/29/2018 0:17	3317	27.84	168.64	47.43
10/29/2018 0:18	3318	27.46	169.02	47.81
10/29/2018 0:19	3319	27.89	168.59	47.37
10/29/2018 0:20	3320	27.70	168.78	47.56
10/29/2018 0:21	3321	28.15	168.32	47.11
10/29/2018 0:22	3322	28.07	168.40	47.18
10/29/2018 0:23	3323	28.41	168.06	46.84
10/29/2018 0:24	3324	28.27	168.20	46.98
10/29/2018 0:25	3325	27.74	168.74	47.52
10/29/2018 0:26	3326	28.29	168.18	46.96
10/29/2018 0:27	3327	28.23	168.24	47.02
10/29/2018 0:28	3328	28.05	168.43	47.21
10/29/2018 0:29	3329	27.78	168.71	47.49
10/29/2018 0:30	3330	28.09	168.38	47.16
10/29/2018 0:31	3331	28.10	168.37	47.16
10/29/2018 0:32	3332	27.86	168.62	47.40
10/29/2018 0:33	3333	27.79	168.69	47.47
10/29/2018 0:34	3334	27.76	168.72	47.50
10/29/2018 0:35	3335	27.95	168.53	47.31
10/29/2018 0:36	3336	28.33	168.13	46.92
10/29/2018 0:37	3337	27.96	168.51	47.29
10/29/2018 0:38	3338	28.28	168.19	46.97
10/29/2018 0:39	3339	28.14	168.34	47.12
10/29/2018 0:40	3340	28.54	167.92	46.70
10/29/2018 0:41	3341	27.63	168.86	47.64
10/29/2018 0:42	3342	28.03	168.45	47.23
10/29/2018 0:43	3343	27.97	168.50	47.28
10/29/2018 0:44	3344	28.10	168.37	47.15
10/29/2018 0:45	3345	28.03	168.44	47.22
10/29/2018 0:46	3346	27.97	168.51	47.29
10/29/2018 0:47	3347	27.78	168.70	47.48
10/29/2018 0:48	3348	27.93	168.55	47.33
10/29/2018 0:49	3349	27.88	168.60	47.38
10/29/2018 0:50	3350	27.74	168.74	47.52
10/29/2018 0:51	3351	27.56	168.93	47.71

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/29/2018 0:52	3352	27.77	168.71	47.49
10/29/2018 0:53	3353	27.70	168.78	47.57
10/29/2018 0:54	3354	27.84	168.64	47.42
10/29/2018 0:55	3355	27.94	168.54	47.32
10/29/2018 0:56	3356	27.56	168.93	47.71
10/29/2018 0:57	3357	28.19	168.28	47.06
10/29/2018 0:58	3358	28.00	168.48	47.26
10/29/2018 0:59	3359	27.68	168.80	47.58
10/29/2018 1:00	3360	27.76	168.72	47.50
10/29/2018 1:01	3361	28.21	168.26	47.04
10/29/2018 1:02	3362	27.85	168.63	47.41
10/29/2018 1:03	3363	27.79	168.69	47.47
10/29/2018 1:04	3364	28.05	168.42	47.21
10/29/2018 1:05	3365	27.50	168.99	47.77
10/29/2018 1:06	3366	28.58	167.88	46.66
10/29/2018 1:07	3367	28.28	168.19	46.97
10/29/2018 1:08	3368	27.37	169.12	47.90
10/29/2018 1:09	3369	27.74	168.75	47.53
10/29/2018 1:10	3370	27.44	169.05	47.83
10/29/2018 1:11	3371	27.93	168.55	47.33
10/29/2018 1:12	3372	27.69	168.79	47.57
10/29/2018 1:13	3373	27.60	168.89	47.67
10/29/2018 1:14	3374	27.85	168.63	47.41
10/29/2018 1:15	3375	27.31	169.18	47.97
10/29/2018 1:16	3376	27.94	168.54	47.32
10/29/2018 1:17	3377	27.72	168.77	47.55
10/29/2018 1:18	3378	28.22	168.26	47.04
10/29/2018 1:19	3379	27.37	169.12	47.90
10/29/2018 1:20	3380	27.67	168.82	47.60
10/29/2018 1:21	3381	27.71	168.77	47.56
10/29/2018 1:22	3382	27.98	168.50	47.28
10/29/2018 1:23	3383	27.82	168.66	47.44
10/29/2018 1:24	3384	28.12	168.35	47.13
10/29/2018 1:25	3385	27.89	168.59	47.37
10/29/2018 1:26	3386	27.48	169.01	47.79
10/29/2018 1:27	3387	28.32	168.15	46.93
10/29/2018 1:28	3388	28.25	168.22	47.00
10/29/2018 1:29	3389	27.83	168.65	47.43
10/29/2018 1:30	3390	28.16	168.31	47.09
10/29/2018 1:31	3391	27.62	168.86	47.64
10/29/2018 1:32	3392	27.83	168.65	47.43

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/29/2018 1:33	3393	27.48	169.01	47.79
10/29/2018 1:34	3394	27.88	168.60	47.38
10/29/2018 1:35	3395	27.62	168.86	47.64
10/29/2018 1:36	3396	27.77	168.71	47.49
10/29/2018 1:37	3397	27.68	168.81	47.59
10/29/2018 1:38	3398	27.95	168.52	47.30
10/29/2018 1:39	3399	27.87	168.60	47.39
10/29/2018 1:40	3400	27.95	168.52	47.30
10/29/2018 1:41	3401	27.71	168.77	47.55
10/29/2018 1:42	3402	27.77	168.71	47.49
10/29/2018 1:43	3403	27.39	169.10	47.89
10/29/2018 1:44	3404	27.99	168.49	47.27
10/29/2018 1:45	3405	27.65	168.83	47.61
10/29/2018 1:46	3406	27.84	168.64	47.42
10/29/2018 1:47	3407	27.82	168.66	47.44
10/29/2018 1:48	3408	28.01	168.47	47.25
10/29/2018 1:49	3409	27.86	168.62	47.40
10/29/2018 1:50	3410	27.70	168.78	47.56
10/29/2018 1:51	3411	27.64	168.84	47.63
10/29/2018 1:52	3412	27.78	168.70	47.48
10/29/2018 1:53	3413	27.27	169.22	48.00
10/29/2018 1:54	3414	28.03	168.44	47.23
10/29/2018 1:55	3415	27.61	168.88	47.66
10/29/2018 1:56	3416	27.74	168.74	47.52
10/29/2018 1:57	3417	27.94	168.54	47.32
10/29/2018 1:58	3418	27.40	169.09	47.87
10/29/2018 1:59	3419	27.46	169.03	47.81
10/29/2018 2:00	3420	27.79	168.70	47.48
10/29/2018 2:01	3421	27.74	168.74	47.53
10/29/2018 2:02	3422	28.44	168.02	46.80
10/29/2018 2:03	3423	28.01	168.47	47.25
10/29/2018 2:04	3424	27.42	169.07	47.85
10/29/2018 2:05	3425	27.74	168.74	47.52
10/29/2018 2:06	3426	27.91	168.57	47.35
10/29/2018 2:07	3427	27.67	168.81	47.59
10/29/2018 2:08	3428	27.48	169.01	47.79
10/29/2018 2:09	3429	28.08	168.39	47.17
10/29/2018 2:10	3430	27.63	168.86	47.64
10/29/2018 2:11	3431	27.60	168.88	47.66
10/29/2018 2:12	3432	28.06	168.41	47.19
10/29/2018 2:13	3433	27.71	168.78	47.56

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/29/2018 2:14	3434	27.56	168.93	47.71
10/29/2018 2:15	3435	27.45	169.04	47.82
10/29/2018 2:16	3436	27.61	168.88	47.66
10/29/2018 2:17	3437	27.42	169.07	47.85
10/29/2018 2:18	3438	27.77	168.71	47.49
10/29/2018 2:19	3439	27.60	168.89	47.67
10/29/2018 2:20	3440	27.63	168.86	47.64
10/29/2018 2:21	3441	27.38	169.11	47.89
10/29/2018 2:22	3442	27.62	168.87	47.65
10/29/2018 2:23	3443	27.30	169.19	47.97
10/29/2018 2:24	3444	27.42	169.07	47.85
10/29/2018 2:25	3445	28.00	168.47	47.25
10/29/2018 2:26	3446	27.54	168.95	47.73
10/29/2018 2:27	3447	27.77	168.71	47.49
10/29/2018 2:28	3448	27.49	169.00	47.78
10/29/2018 2:29	3449	27.77	168.71	47.49
10/29/2018 2:30	3450	27.84	168.64	47.42
10/29/2018 2:31	3451	27.65	168.84	47.62
10/29/2018 2:32	3452	27.65	168.84	47.62
10/29/2018 2:33	3453	27.13	169.37	48.15
10/29/2018 2:34	3454	27.94	168.54	47.32
10/29/2018 2:35	3455	27.89	168.59	47.37
10/29/2018 2:36	3456	27.84	168.64	47.42
10/29/2018 2:37	3457	27.53	168.95	47.73
10/29/2018 2:38	3458	27.31	169.18	47.96
10/29/2018 2:39	3459	27.73	168.75	47.53
10/29/2018 2:40	3460	27.24	169.26	48.04
10/29/2018 2:41	3461	27.45	169.04	47.82
10/29/2018 2:42	3462	27.72	168.76	47.54
10/29/2018 2:43	3463	27.99	168.49	47.27
10/29/2018 2:44	3464	27.45	169.04	47.82
10/29/2018 2:45	3465	27.90	168.58	47.36
10/29/2018 2:46	3466	27.77	168.71	47.49
10/29/2018 2:47	3467	28.05	168.43	47.21
10/29/2018 2:48	3468	27.80	168.68	47.46
10/29/2018 2:49	3469	27.15	169.34	48.12
10/29/2018 2:50	3470	27.19	169.31	48.09
10/29/2018 2:51	3471	27.75	168.73	47.52
10/29/2018 2:52	3472	27.91	168.56	47.34
10/29/2018 2:53	3473	27.31	169.18	47.96
10/29/2018 2:54	3474	27.79	168.70	47.48

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/29/2018 2:55	3475	27.97	168.51	47.29
10/29/2018 2:56	3476	27.61	168.87	47.65
10/29/2018 2:57	3477	27.57	168.92	47.70
10/29/2018 2:58	3478	27.29	169.21	47.99
10/29/2018 2:59	3479	27.91	168.57	47.35
10/29/2018 3:00	3480	27.48	169.01	47.79
10/29/2018 3:01	3481	27.60	168.89	47.67
10/29/2018 3:02	3482	27.52	168.97	47.75
10/29/2018 3:03	3483	27.28	169.22	48.00
10/29/2018 3:04	3484	27.63	168.85	47.63
10/29/2018 3:05	3485	27.61	168.88	47.66
10/29/2018 3:06	3486	27.63	168.86	47.64
10/29/2018 3:07	3487	27.63	168.85	47.63
10/29/2018 3:08	3488	27.34	169.16	47.94
10/29/2018 3:09	3489	27.52	168.97	47.75
10/29/2018 3:10	3490	27.26	169.24	48.02
10/29/2018 3:11	3491	27.42	169.07	47.85
10/29/2018 3:12	3492	27.34	169.16	47.94
10/29/2018 3:13	3493	27.32	169.17	47.95
10/29/2018 3:14	3494	27.38	169.11	47.89
10/29/2018 3:15	3495	27.72	168.76	47.54
10/29/2018 3:16	3496	27.29	169.21	47.99
10/29/2018 3:17	3497	27.47	169.02	47.80
10/29/2018 3:18	3498	27.41	169.08	47.86
10/29/2018 3:19	3499	27.13	169.37	48.15
10/29/2018 3:20	3500	27.11	169.39	48.17
10/29/2018 3:21	3501	27.63	168.85	47.63
10/29/2018 3:22	3502	27.19	169.31	48.09
10/29/2018 3:23	3503	27.32	169.17	47.95
10/29/2018 3:24	3504	27.98	168.49	47.27
10/29/2018 3:25	3505	27.45	169.04	47.82
10/29/2018 3:26	3506	27.35	169.14	47.92
10/29/2018 3:27	3507	27.47	169.02	47.80
10/29/2018 3:28	3508	27.27	169.23	48.01
10/29/2018 3:29	3509	27.56	168.92	47.70
10/29/2018 3:30	3510	27.05	169.45	48.23
10/29/2018 3:31	3511	27.57	168.92	47.70
10/29/2018 3:32	3512	27.21	169.29	48.07
10/29/2018 3:33	3513	27.43	169.06	47.84
10/29/2018 3:34	3514	27.16	169.33	48.11
10/29/2018 3:35	3515	27.50	168.99	47.77

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/29/2018 3:36	3516	27.36	169.13	47.91
10/29/2018 3:37	3517	27.31	169.18	47.96
10/29/2018 3:38	3518	27.39	169.10	47.88
10/29/2018 3:39	3519	27.81	168.67	47.45
10/29/2018 3:40	3520	26.92	169.58	48.37
10/29/2018 3:41	3521	27.53	168.96	47.74
10/29/2018 3:42	3522	27.73	168.75	47.54
10/29/2018 3:43	3523	27.48	169.01	47.79
10/29/2018 3:44	3524	27.64	168.85	47.63
10/29/2018 3:45	3525	27.59	168.90	47.68
10/29/2018 3:46	3526	27.28	169.21	47.99
10/29/2018 3:47	3527	27.80	168.68	47.46
10/29/2018 3:48	3528	27.47	169.01	47.80
10/29/2018 3:49	3529	28.14	168.34	47.12
10/29/2018 3:50	3530	27.78	168.70	47.48
10/29/2018 3:51	3531	27.61	168.88	47.66
10/29/2018 3:52	3532	27.56	168.93	47.71
10/29/2018 3:53	3533	27.41	169.08	47.87
10/29/2018 3:54	3534	27.20	169.29	48.07
10/29/2018 3:55	3535	27.15	169.35	48.13
10/29/2018 3:56	3536	27.90	168.58	47.36
10/29/2018 3:57	3537	27.77	168.71	47.49
10/29/2018 3:58	3538	28.12	168.35	47.13
10/29/2018 3:59	3539	27.12	169.38	48.16
10/29/2018 4:00	3540	27.14	169.35	48.14
10/29/2018 4:01	3541	27.62	168.87	47.65
10/29/2018 4:02	3542	27.30	169.19	47.97
10/29/2018 4:03	3543	27.76	168.72	47.50
10/29/2018 4:04	3544	27.48	169.01	47.79
10/29/2018 4:05	3545	27.20	169.30	48.08
10/29/2018 4:06	3546	27.12	169.38	48.16
10/29/2018 4:07	3547	27.56	168.93	47.71
10/29/2018 4:08	3548	27.69	168.79	47.57
10/29/2018 4:09	3549	27.53	168.96	47.74
10/29/2018 4:10	3550	27.53	168.96	47.74
10/29/2018 4:11	3551	27.37	169.12	47.90
10/29/2018 4:12	3552	26.96	169.54	48.32
10/29/2018 4:13	3553	27.91	168.56	47.35
10/29/2018 4:14	3554	26.77	169.74	48.52
10/29/2018 4:15	3555	27.37	169.12	47.90
10/29/2018 4:16	3556	27.08	169.42	48.20

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/29/2018 4:17	3557	27.83	168.65	47.43
10/29/2018 4:18	3558	27.30	169.19	47.97
10/29/2018 4:19	3559	27.42	169.07	47.85
10/29/2018 4:20	3560	27.70	168.79	47.57
10/29/2018 4:21	3561	27.47	169.02	47.80
10/29/2018 4:22	3562	27.44	169.05	47.83
10/29/2018 4:23	3563	27.20	169.30	48.08
10/29/2018 4:24	3564	27.47	169.02	47.80
10/29/2018 4:25	3565	27.73	168.75	47.53
10/29/2018 4:26	3566	28.18	168.29	47.08
10/29/2018 4:27	3567	27.14	169.36	48.14
10/29/2018 4:28	3568	27.15	169.35	48.13
10/29/2018 4:29	3569	27.51	168.98	47.76
10/29/2018 4:30	3570	27.13	169.37	48.15
10/29/2018 4:31	3571	27.29	169.21	47.99
10/29/2018 4:32	3572	27.20	169.29	48.08
10/29/2018 4:33	3573	28.07	168.41	47.19
10/29/2018 4:34	3574	27.52	168.96	47.75
10/29/2018 4:35	3575	27.40	169.09	47.87
10/29/2018 4:36	3576	27.10	169.40	48.18
10/29/2018 4:37	3577	27.60	168.88	47.66
10/29/2018 4:38	3578	27.28	169.22	48.00
10/29/2018 4:39	3579	27.97	168.51	47.29
10/29/2018 4:40	3580	27.78	168.70	47.48
10/29/2018 4:41	3581	27.45	169.04	47.82
10/29/2018 4:42	3582	27.53	168.96	47.74
10/29/2018 4:43	3583	27.17	169.32	48.11
10/29/2018 4:44	3584	27.76	168.72	47.50
10/29/2018 4:45	3585	26.93	169.57	48.35
10/29/2018 4:46	3586	27.39	169.10	47.89
10/29/2018 4:47	3587	27.28	169.22	48.00
10/29/2018 4:48	3588	26.73	169.77	48.56
10/29/2018 4:49	3589	26.89	169.61	48.39
10/29/2018 4:50	3590	27.25	169.25	48.03
10/29/2018 4:51	3591	27.04	169.46	48.24
10/29/2018 4:52	3592	26.91	169.59	48.37
10/29/2018 4:53	3593	27.42	169.07	47.85
10/29/2018 4:54	3594	26.98	169.52	48.30
10/29/2018 4:55	3595	27.52	168.96	47.75
10/29/2018 4:56	3596	27.56	168.93	47.71
10/29/2018 4:57	3597	27.37	169.12	47.90

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/29/2018 4:58	3598	27.45	169.04	47.83
10/29/2018 4:59	3599	27.40	169.09	47.87
10/29/2018 5:00	3600	27.28	169.21	47.99
10/29/2018 5:01	3601	27.32	169.17	47.95
10/29/2018 5:02	3602	26.97	169.53	48.31
10/29/2018 5:03	3603	27.71	168.78	47.56
10/29/2018 5:04	3604	27.09	169.41	48.19
10/29/2018 5:05	3605	27.38	169.11	47.89
10/29/2018 5:06	3606	27.04	169.46	48.24
10/29/2018 5:07	3607	27.75	168.73	47.51
10/29/2018 5:08	3608	27.19	169.31	48.09
10/29/2018 5:09	3609	27.02	169.48	48.26
10/29/2018 5:10	3610	27.01	169.49	48.27
10/29/2018 5:11	3611	26.93	169.57	48.35
10/29/2018 5:12	3612	27.19	169.31	48.09
10/29/2018 5:13	3613	27.33	169.17	47.95
10/29/2018 5:14	3614	27.07	169.43	48.21
10/29/2018 5:15	3615	27.57	168.92	47.70
10/29/2018 5:16	3616	26.88	169.62	48.40
10/29/2018 5:17	3617	27.18	169.32	48.10
10/29/2018 5:18	3618	27.15	169.35	48.13
10/29/2018 5:19	3619	26.95	169.55	48.33
10/29/2018 5:20	3620	27.99	168.49	47.27
10/29/2018 5:21	3621	27.18	169.32	48.10
10/29/2018 5:22	3622	26.89	169.62	48.40
10/29/2018 5:23	3623	27.03	169.47	48.25
10/29/2018 5:24	3624	27.43	169.06	47.84
10/29/2018 5:25	3625	27.20	169.29	48.07
10/29/2018 5:26	3626	26.89	169.62	48.40
10/29/2018 5:27	3627	27.18	169.31	48.10
10/29/2018 5:28	3628	27.28	169.22	48.00
10/29/2018 5:29	3629	27.16	169.34	48.12
10/29/2018 5:30	3630	26.99	169.51	48.29
10/29/2018 5:31	3631	27.06	169.44	48.22
10/29/2018 5:32	3632	27.06	169.44	48.22
10/29/2018 5:33	3633	27.17	169.32	48.10
10/29/2018 5:34	3634	27.38	169.11	47.89
10/29/2018 5:35	3635	26.88	169.62	48.40
10/29/2018 5:36	3636	27.28	169.22	48.00
10/29/2018 5:37	3637	27.47	169.02	47.80
10/29/2018 5:38	3638	27.09	169.41	48.19

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/29/2018 5:39	3639	27.40	169.09	47.87
10/29/2018 5:40	3640	26.99	169.51	48.29
10/29/2018 5:41	3641	27.24	169.25	48.03
10/29/2018 5:42	3642	26.55	169.96	48.74
10/29/2018 5:43	3643	26.95	169.55	48.34
10/29/2018 5:44	3644	27.15	169.35	48.13
10/29/2018 5:45	3645	26.89	169.62	48.40
10/29/2018 5:46	3646	27.59	168.90	47.68
10/29/2018 5:47	3647	27.08	169.42	48.20
10/29/2018 5:48	3648	27.64	168.85	47.63
10/29/2018 5:49	3649	27.17	169.33	48.11
10/29/2018 5:50	3650	27.47	169.02	47.80
10/29/2018 5:51	3651	27.52	168.97	47.75
10/29/2018 5:52	3652	27.59	168.90	47.68
10/29/2018 5:53	3653	27.40	169.09	47.87
10/29/2018 5:54	3654	27.13	169.37	48.15
10/29/2018 5:55	3655	26.65	169.86	48.64
10/29/2018 5:56	3656	27.49	168.99	47.78
10/29/2018 5:57	3657	27.31	169.18	47.96
10/29/2018 5:58	3658	27.23	169.27	48.05
10/29/2018 5:59	3659	27.22	169.28	48.06
10/29/2018 6:00	3660	27.10	169.40	48.18
10/29/2018 6:01	3661	27.03	169.47	48.25
10/29/2018 6:02	3662	26.85	169.66	48.44
10/29/2018 6:03	3663	27.40	169.10	47.88
10/29/2018 6:04	3664	27.37	169.12	47.90
10/29/2018 6:05	3665	26.78	169.72	48.51
10/29/2018 6:06	3666	27.04	169.46	48.24
10/29/2018 6:07	3667	26.99	169.52	48.30
10/29/2018 6:08	3668	27.51	168.97	47.76
10/29/2018 6:09	3669	26.46	170.06	48.84
10/29/2018 6:10	3670	27.69	168.79	47.57
10/29/2018 6:11	3671	26.89	169.62	48.40
10/29/2018 6:12	3672	27.49	169.00	47.78
10/29/2018 6:13	3673	27.26	169.23	48.02
10/29/2018 6:14	3674	26.77	169.73	48.51
10/29/2018 6:15	3675	27.10	169.39	48.18
10/29/2018 6:16	3676	27.05	169.45	48.23
10/29/2018 6:17	3677	26.54	169.97	48.75
10/29/2018 6:18	3678	26.87	169.63	48.42
10/29/2018 6:19	3679	27.25	169.25	48.03

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/29/2018 6:20	3680	27.09	169.41	48.19
10/29/2018 6:21	3681	26.92	169.58	48.36
10/29/2018 6:22	3682	27.39	169.10	47.88
10/29/2018 6:23	3683	27.01	169.49	48.28
10/29/2018 6:24	3684	27.24	169.25	48.03
10/29/2018 6:25	3685	27.36	169.13	47.91
10/29/2018 6:26	3686	27.37	169.12	47.90
10/29/2018 6:27	3687	26.81	169.70	48.48
10/29/2018 6:28	3688	27.05	169.45	48.24
10/29/2018 6:29	3689	27.41	169.08	47.86
10/29/2018 6:30	3690	27.26	169.23	48.02
10/29/2018 6:31	3691	26.87	169.63	48.41
10/29/2018 6:32	3692	27.12	169.37	48.15
10/29/2018 6:33	3693	27.11	169.39	48.17
10/29/2018 6:34	3694	27.19	169.31	48.09
10/29/2018 6:35	3695	26.58	169.93	48.71
10/29/2018 6:36	3696	27.22	169.28	48.06
10/29/2018 6:37	3697	27.18	169.32	48.10
10/29/2018 6:38	3698	26.45	170.06	48.84
10/29/2018 6:39	3699	27.10	169.40	48.18
10/29/2018 6:40	3700	27.07	169.43	48.21
10/29/2018 6:41	3701	27.12	169.38	48.16
10/29/2018 6:42	3702	27.18	169.31	48.10
10/29/2018 6:43	3703	27.15	169.35	48.13
10/29/2018 6:44	3704	27.08	169.42	48.20
10/29/2018 6:45	3705	27.40	169.09	47.87
10/29/2018 6:46	3706	27.20	169.29	48.07
10/29/2018 6:47	3707	27.08	169.42	48.20
10/29/2018 6:48	3708	26.88	169.62	48.41
10/29/2018 6:49	3709	27.04	169.46	48.24
10/29/2018 6:50	3710	27.51	168.98	47.76
10/29/2018 6:51	3711	27.31	169.18	47.97
10/29/2018 6:52	3712	27.23	169.26	48.04
10/29/2018 6:53	3713	26.56	169.95	48.73
10/29/2018 6:54	3714	26.79	169.72	48.50
10/29/2018 6:55	3715	26.88	169.62	48.40
10/29/2018 6:56	3716	27.31	169.18	47.96
10/29/2018 6:57	3717	26.89	169.62	48.40
10/29/2018 6:58	3718	27.57	168.92	47.70
10/29/2018 6:59	3719	26.86	169.64	48.42
10/29/2018 7:00	3720	26.94	169.56	48.34

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/29/2018 7:01	3721	27.08	169.42	48.20
10/29/2018 7:02	3722	27.00	169.50	48.28
10/29/2018 7:03	3723	27.25	169.24	48.02
10/29/2018 7:04	3724	26.69	169.82	48.60
10/29/2018 7:05	3725	27.20	169.30	48.08
10/29/2018 7:06	3726	27.17	169.32	48.10
10/29/2018 7:07	3727	26.83	169.67	48.45
10/29/2018 7:08	3728	27.61	168.88	47.66
10/29/2018 7:09	3729	26.65	169.86	48.64
10/29/2018 7:10	3730	26.86	169.64	48.42
10/29/2018 7:11	3731	26.99	169.52	48.30
10/29/2018 7:12	3732	27.01	169.49	48.27
10/29/2018 7:13	3733	27.37	169.12	47.90
10/29/2018 7:14	3734	26.76	169.74	48.53
10/29/2018 7:15	3735	27.10	169.40	48.18
10/29/2018 7:16	3736	27.06	169.44	48.22
10/29/2018 7:17	3737	27.17	169.33	48.11
10/29/2018 7:18	3738	27.07	169.43	48.21
10/29/2018 7:19	3739	27.27	169.23	48.01
10/29/2018 7:20	3740	27.24	169.26	48.04
10/29/2018 7:21	3741	27.25	169.25	48.03
10/29/2018 7:22	3742	27.04	169.46	48.25
10/29/2018 7:23	3743	26.65	169.86	48.64
10/29/2018 7:24	3744	27.25	169.24	48.02
10/29/2018 7:25	3745	26.68	169.83	48.61
10/29/2018 7:26	3746	26.95	169.55	48.33
10/29/2018 7:27	3747	27.09	169.41	48.19
10/29/2018 7:28	3748	27.35	169.14	47.92
10/29/2018 7:29	3749	26.82	169.68	48.46
10/29/2018 7:30	3750	26.59	169.92	48.70
10/29/2018 7:31	3751	26.43	170.09	48.87
10/29/2018 7:32	3752	26.80	169.71	48.49
10/29/2018 7:33	3753	27.16	169.34	48.12
10/29/2018 7:34	3754	26.52	169.99	48.77
10/29/2018 7:35	3755	27.27	169.22	48.00
10/29/2018 7:36	3756	27.21	169.29	48.07
10/29/2018 7:37	3757	27.13	169.36	48.14
10/29/2018 7:38	3758	27.14	169.36	48.14
10/29/2018 7:39	3759	27.20	169.29	48.07
10/29/2018 7:40	3760	26.38	170.13	48.91
10/29/2018 7:41	3761	26.82	169.68	48.46

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/29/2018 7:42	3762	27.16	169.34	48.12
10/29/2018 7:43	3763	26.57	169.94	48.72
10/29/2018 7:44	3764	27.05	169.45	48.23
10/29/2018 7:45	3765	27.03	169.47	48.25
10/29/2018 7:46	3766	26.71	169.80	48.58
10/29/2018 7:47	3767	27.07	169.42	48.21
10/29/2018 7:48	3768	26.85	169.66	48.44
10/29/2018 7:49	3769	26.19	170.33	49.11
10/29/2018 7:50	3770	27.11	169.39	48.17
10/29/2018 7:51	3771	26.24	170.28	49.06
10/29/2018 7:52	3772	26.70	169.81	48.59
10/29/2018 7:53	3773	27.06	169.44	48.22
10/29/2018 7:54	3774	26.78	169.73	48.51
10/29/2018 7:55	3775	27.49	169.00	47.78
10/29/2018 7:56	3776	27.31	169.19	47.97
10/29/2018 7:57	3777	26.84	169.66	48.44
10/29/2018 7:58	3778	26.49	170.02	48.80
10/29/2018 7:59	3779	27.17	169.33	48.11
10/29/2018 8:00	3780	27.08	169.42	48.20
10/29/2018 8:01	3781	26.93	169.58	48.36
10/29/2018 8:02	3782	26.90	169.60	48.38
10/29/2018 8:03	3783	27.07	169.43	48.21
10/29/2018 8:04	3784	26.95	169.55	48.33
10/29/2018 8:05	3785	26.92	169.58	48.36
10/29/2018 8:06	3786	26.56	169.95	48.73
10/29/2018 8:07	3787	26.93	169.58	48.36
10/29/2018 8:08	3788	27.10	169.39	48.18
10/29/2018 8:09	3789	26.82	169.69	48.47
10/29/2018 8:10	3790	26.84	169.67	48.45
10/29/2018 8:11	3791	26.51	170.01	48.79
10/29/2018 8:12	3792	26.72	169.79	48.57
10/29/2018 8:13	3793	27.31	169.18	47.96
10/29/2018 8:14	3794	26.88	169.62	48.40
10/29/2018 8:15	3795	27.31	169.18	47.96
10/29/2018 8:16	3796	27.00	169.50	48.28
10/29/2018 8:17	3797	27.05	169.45	48.23
10/29/2018 8:18	3798	27.03	169.47	48.25
10/29/2018 8:19	3799	26.55	169.97	48.75
10/29/2018 8:20	3800	26.95	169.56	48.34
10/29/2018 8:21	3801	26.72	169.79	48.57
10/29/2018 8:22	3802	27.00	169.50	48.28

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/29/2018 8:23	3803	27.22	169.28	48.06
10/29/2018 8:24	3804	26.81	169.69	48.47
10/29/2018 8:25	3805	26.84	169.67	48.45
10/29/2018 8:26	3806	26.75	169.75	48.53
10/29/2018 8:27	3807	26.91	169.59	48.37
10/29/2018 8:28	3808	26.49	170.02	48.80
10/29/2018 8:29	3809	26.70	169.81	48.59
10/29/2018 8:30	3810	26.34	170.18	48.96
10/29/2018 8:31	3811	26.96	169.54	48.32
10/29/2018 8:32	3812	26.52	170.00	48.78
10/29/2018 8:33	3813	26.58	169.93	48.71
10/29/2018 8:34	3814	26.98	169.52	48.30
10/29/2018 8:35	3815	26.75	169.76	48.54
10/29/2018 8:36	3816	27.39	169.10	47.88
10/29/2018 8:37	3817	26.73	169.78	48.56
10/29/2018 8:38	3818	26.92	169.59	48.37
10/29/2018 8:39	3819	26.56	169.95	48.73
10/29/2018 8:40	3820	27.11	169.38	48.17
10/29/2018 8:41	3821	26.04	170.48	49.26
10/29/2018 8:42	3822	27.08	169.42	48.20
10/29/2018 8:43	3823	26.52	170.00	48.78
10/29/2018 8:44	3824	26.43	170.09	48.87
10/29/2018 8:45	3825	26.57	169.95	48.73
10/29/2018 8:46	3826	27.12	169.38	48.16
10/29/2018 8:47	3827	26.90	169.60	48.38
10/29/2018 8:48	3828	26.82	169.68	48.47
10/29/2018 8:49	3829	26.16	170.36	49.14
10/29/2018 8:50	3830	26.56	169.95	48.73
10/29/2018 8:51	3831	26.78	169.73	48.51
10/29/2018 8:52	3832	26.66	169.85	48.63
10/29/2018 8:53	3833	26.46	170.06	48.84
10/29/2018 8:54	3834	26.79	169.72	48.50
10/29/2018 8:55	3835	26.81	169.70	48.48
10/29/2018 8:56	3836	26.56	169.95	48.73
10/29/2018 8:57	3837	26.91	169.59	48.37
10/29/2018 8:58	3838	26.56	169.95	48.73
10/29/2018 8:59	3839	26.53	169.98	48.76
10/29/2018 9:00	3840	26.74	169.77	48.55
10/29/2018 9:01	3841	26.52	169.99	48.77
10/29/2018 9:02	3842	26.38	170.14	48.92
10/29/2018 9:03	3843	26.62	169.89	48.67

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/29/2018 9:04	3844	26.85	169.65	48.43
10/29/2018 9:05	3845	26.88	169.63	48.41
10/29/2018 9:06	3846	26.43	170.08	48.87
10/29/2018 9:07	3847	26.98	169.52	48.30
10/29/2018 9:08	3848	26.55	169.96	48.74
10/29/2018 9:09	3849	26.81	169.70	48.48
10/29/2018 9:10	3850	26.95	169.56	48.34
10/29/2018 9:11	3851	26.52	170.00	48.78
10/29/2018 9:12	3852	27.08	169.42	48.20
10/29/2018 9:13	3853	26.29	170.23	49.01
10/29/2018 9:14	3854	26.75	169.76	48.54
10/29/2018 9:15	3855	26.57	169.94	48.72
10/29/2018 9:16	3856	27.02	169.48	48.26
10/29/2018 9:17	3857	26.38	170.13	48.91
10/29/2018 9:18	3858	26.08	170.44	49.22
10/29/2018 9:19	3859	26.73	169.77	48.56
10/29/2018 9:20	3860	26.62	169.89	48.67
10/29/2018 9:21	3861	26.89	169.62	48.40
10/29/2018 9:22	3862	26.69	169.82	48.60
10/29/2018 9:23	3863	26.33	170.19	48.97
10/29/2018 9:24	3864	27.00	169.50	48.29
10/29/2018 9:25	3865	26.52	169.99	48.77
10/29/2018 9:26	3866	26.42	170.10	48.88
10/29/2018 9:27	3867	26.44	170.07	48.86
10/29/2018 9:28	3868	26.70	169.81	48.59
10/29/2018 9:29	3869	26.49	170.02	48.80
10/29/2018 9:30	3870	26.39	170.13	48.91
10/29/2018 9:31	3871	26.57	169.95	48.73
10/29/2018 9:32	3872	26.75	169.76	48.54
10/29/2018 9:33	3873	25.97	170.56	49.34
10/29/2018 9:34	3874	26.69	169.82	48.60
10/29/2018 9:35	3875	26.62	169.89	48.67
10/29/2018 9:36	3876	26.72	169.79	48.57
10/29/2018 9:37	3877	26.01	170.51	49.29
10/29/2018 9:38	3878	26.30	170.22	49.00
10/29/2018 9:39	3879	26.88	169.62	48.40
10/29/2018 9:40	3880	26.51	170.01	48.79
10/29/2018 9:41	3881	26.71	169.80	48.58
10/29/2018 9:42	3882	26.52	170.00	48.78
10/29/2018 9:43	3883	27.01	169.49	48.28
10/29/2018 9:44	3884	26.27	170.25	49.03

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/29/2018 9:45	3885	26.64	169.87	48.65
10/29/2018 9:46	3886	26.30	170.22	49.00
10/29/2018 9:47	3887	26.54	169.97	48.75
10/29/2018 9:48	3888	26.29	170.23	49.01
10/29/2018 9:49	3889	26.43	170.08	48.86
10/29/2018 9:50	3890	26.35	170.17	48.95
10/29/2018 9:51	3891	26.71	169.80	48.58
10/29/2018 9:52	3892	26.99	169.51	48.29
10/29/2018 9:53	3893	26.88	169.62	48.40
10/29/2018 9:54	3894	26.63	169.88	48.66
10/29/2018 9:55	3895	26.88	169.63	48.41
10/29/2018 9:56	3896	27.14	169.36	48.14
10/29/2018 9:57	3897	26.46	170.05	48.84
10/29/2018 9:58	3898	26.57	169.94	48.72
10/29/2018 9:59	3899	26.68	169.83	48.61
10/29/2018 10:00	3900	26.55	169.96	48.74
10/29/2018 10:01	3901	26.45	170.06	48.84
10/29/2018 10:02	3902	26.87	169.64	48.42
10/29/2018 10:03	3903	26.45	170.06	48.85
10/29/2018 10:04	3904	26.82	169.68	48.47
10/29/2018 10:05	3905	26.40	170.11	48.89
10/29/2018 10:06	3906	26.72	169.78	48.57
10/29/2018 10:07	3907	26.17	170.35	49.13
10/29/2018 10:08	3908	26.44	170.07	48.85
10/29/2018 10:09	3909	26.43	170.09	48.87
10/29/2018 10:10	3910	26.57	169.95	48.73
10/29/2018 10:11	3911	26.40	170.11	48.89
10/29/2018 10:12	3912	26.58	169.93	48.71
10/29/2018 10:13	3913	26.65	169.86	48.64
10/29/2018 10:14	3914	26.21	170.31	49.09
10/29/2018 10:15	3915	26.39	170.13	48.91
10/29/2018 10:16	3916	26.28	170.24	49.02
10/29/2018 10:17	3917	26.32	170.19	48.98
10/29/2018 10:18	3918	26.58	169.93	48.71
10/29/2018 10:19	3919	26.65	169.85	48.64
10/29/2018 10:20	3920	26.59	169.92	48.70
10/29/2018 10:21	3921	26.40	170.12	48.90
10/29/2018 10:22	3922	26.96	169.54	48.32
10/29/2018 10:23	3923	27.09	169.41	48.19
10/29/2018 10:24	3924	26.71	169.80	48.58
10/29/2018 10:25	3925	26.76	169.74	48.52

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/29/2018 10:26	3926	26.01	170.51	49.29
10/29/2018 10:27	3927	26.89	169.61	48.39
10/29/2018 10:28	3928	27.00	169.50	48.28
10/29/2018 10:29	3929	26.13	170.40	49.18
10/29/2018 10:30	3930	26.19	170.33	49.11
10/29/2018 10:31	3931	26.70	169.81	48.59
10/29/2018 10:32	3932	26.55	169.96	48.74
10/29/2018 10:33	3933	26.60	169.91	48.69
10/29/2018 10:34	3934	25.97	170.55	49.33
10/29/2018 10:35	3935	26.04	170.48	49.26
10/29/2018 10:36	3936	26.90	169.60	48.38
10/29/2018 10:37	3937	26.50	170.02	48.80
10/29/2018 10:38	3938	26.53	169.98	48.76
10/29/2018 10:39	3939	26.66	169.85	48.63
10/29/2018 10:40	3940	26.67	169.84	48.62
10/29/2018 10:41	3941	26.72	169.79	48.57
10/29/2018 10:42	3942	26.80	169.70	48.48
10/29/2018 10:43	3943	26.83	169.67	48.45
10/29/2018 10:44	3944	26.76	169.75	48.53
10/29/2018 10:45	3945	26.32	170.20	48.98
10/29/2018 10:46	3946	26.36	170.16	48.94
10/29/2018 10:47	3947	26.90	169.60	48.38
10/29/2018 10:48	3948	26.55	169.96	48.74
10/29/2018 10:49	3949	26.64	169.87	48.65
10/29/2018 10:50	3950	26.49	170.02	48.80
10/29/2018 10:51	3951	26.43	170.08	48.86
10/29/2018 10:52	3952	26.82	169.68	48.47
10/29/2018 10:53	3953	26.20	170.32	49.10
10/29/2018 10:54	3954	26.90	169.60	48.38
10/29/2018 10:55	3955	26.58	169.93	48.71
10/29/2018 10:56	3956	26.70	169.80	48.59
10/29/2018 10:57	3957	26.67	169.84	48.62
10/29/2018 10:58	3958	26.30	170.21	48.99
10/29/2018 10:59	3959	26.30	170.22	49.00
10/29/2018 11:00	3960	26.40	170.11	48.89
10/29/2018 11:01	3961	26.16	170.36	49.14
10/29/2018 11:02	3962	26.58	169.93	48.71
10/29/2018 11:03	3963	26.25	170.27	49.05
10/29/2018 11:04	3964	26.74	169.77	48.55
10/29/2018 11:05	3965	26.15	170.37	49.15
10/29/2018 11:06	3966	26.40	170.12	48.90

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/29/2018 11:07	3967	26.42	170.09	48.87
10/29/2018 11:08	3968	26.73	169.78	48.56
10/29/2018 11:09	3969	26.17	170.35	49.13
10/29/2018 11:10	3970	26.07	170.45	49.23
10/29/2018 11:11	3971	26.18	170.34	49.12
10/29/2018 11:12	3972	26.69	169.82	48.60
10/29/2018 11:13	3973	26.38	170.14	48.92
10/29/2018 11:14	3974	26.79	169.72	48.50
10/29/2018 11:15	3975	26.28	170.23	49.02
10/29/2018 11:16	3976	26.59	169.92	48.70
10/29/2018 11:17	3977	26.40	170.11	48.89
10/29/2018 11:18	3978	26.31	170.21	48.99
10/29/2018 11:19	3979	26.27	170.25	49.03
10/29/2018 11:20	3980	26.33	170.19	48.97
10/29/2018 11:21	3981	26.62	169.89	48.67
10/29/2018 11:22	3982	26.06	170.46	49.24
10/29/2018 11:23	3983	26.41	170.10	48.88
10/29/2018 11:24	3984	26.21	170.31	49.09
10/29/2018 11:25	3985	26.49	170.02	48.80
10/29/2018 11:26	3986	26.54	169.97	48.75
10/29/2018 11:27	3987	26.31	170.21	48.99
10/29/2018 11:28	3988	26.19	170.33	49.11
10/29/2018 11:29	3989	26.21	170.31	49.09
10/29/2018 11:30	3990	26.26	170.26	49.04
10/29/2018 11:31	3991	26.53	169.98	48.76
10/29/2018 11:32	3992	26.28	170.23	49.02
10/29/2018 11:33	3993	26.65	169.86	48.64
10/29/2018 11:34	3994	26.19	170.33	49.11
10/29/2018 11:35	3995	26.42	170.09	48.87
10/29/2018 11:36	3996	26.21	170.31	49.09
10/29/2018 11:37	3997	26.75	169.76	48.54
10/29/2018 11:38	3998	26.41	170.11	48.89
10/29/2018 11:39	3999	26.51	170.00	48.78
10/29/2018 11:40	4000	26.09	170.44	49.22
10/29/2018 11:41	4001	26.24	170.28	49.06
10/29/2018 11:42	4002	26.53	169.98	48.76
10/29/2018 11:43	4003	26.42	170.10	48.88
10/29/2018 11:44	4004	26.34	170.17	48.95
10/29/2018 11:45	4005	26.20	170.32	49.10
10/29/2018 11:46	4006	26.54	169.97	48.75
10/29/2018 11:47	4007	26.69	169.82	48.60

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/29/2018 11:48	4008	26.67	169.84	48.62
10/29/2018 11:49	4009	26.40	170.11	48.89
10/29/2018 11:50	4010	26.16	170.36	49.14
10/29/2018 11:51	4011	26.43	170.08	48.86
10/29/2018 11:52	4012	26.61	169.91	48.69
10/29/2018 11:53	4013	26.37	170.14	48.93
10/29/2018 11:54	4014	26.36	170.15	48.93
10/29/2018 11:55	4015	26.54	169.97	48.76
10/29/2018 11:56	4016	26.48	170.03	48.82
10/29/2018 11:57	4017	26.52	169.99	48.77
10/29/2018 11:58	4018	26.26	170.26	49.04
10/29/2018 11:59	4019	26.18	170.34	49.12
10/29/2018 12:00	4020	26.83	169.67	48.46
10/29/2018 12:01	4021	26.52	169.99	48.77
10/29/2018 12:02	4022	26.15	170.38	49.16
10/29/2018 12:03	4023	26.07	170.45	49.23
10/29/2018 12:04	4024	26.40	170.11	48.89
10/29/2018 12:05	4025	26.57	169.94	48.72
10/29/2018 12:06	4026	26.37	170.14	48.92
10/29/2018 12:07	4027	26.56	169.95	48.73
10/29/2018 12:08	4028	26.81	169.70	48.48
10/29/2018 12:09	4029	25.63	170.90	49.68
10/29/2018 12:10	4030	26.13	170.39	49.17
10/29/2018 12:11	4031	25.98	170.54	49.32
10/29/2018 12:12	4032	26.83	169.68	48.46
10/29/2018 12:13	4033	26.56	169.95	48.73
10/29/2018 12:14	4034	26.34	170.17	48.95
10/29/2018 12:15	4035	26.13	170.39	49.17
10/29/2018 12:16	4036	26.11	170.42	49.20
10/29/2018 12:17	4037	26.20	170.32	49.10
10/29/2018 12:18	4038	26.40	170.11	48.89
10/29/2018 12:19	4039	26.44	170.08	48.86
10/29/2018 12:20	4040	26.27	170.24	49.03
10/29/2018 12:21	4041	26.53	169.98	48.77
10/29/2018 12:22	4042	26.46	170.05	48.83
10/29/2018 12:23	4043	26.72	169.79	48.57
10/29/2018 12:24	4044	26.11	170.41	49.19
10/29/2018 12:25	4045	26.22	170.30	49.08
10/29/2018 12:26	4046	26.32	170.20	48.98
10/29/2018 12:27	4047	26.31	170.21	48.99
10/29/2018 12:28	4048	26.47	170.05	48.83

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/29/2018 12:29	4049	26.58	169.93	48.71
10/29/2018 12:30	4050	26.05	170.47	49.26
10/29/2018 12:31	4051	26.54	169.98	48.76
10/29/2018 12:32	4052	26.23	170.29	49.07
10/29/2018 12:33	4053	26.31	170.21	48.99
10/29/2018 12:34	4054	26.12	170.40	49.18
10/29/2018 12:35	4055	26.07	170.45	49.23
10/29/2018 12:36	4056	26.07	170.46	49.24
10/29/2018 12:37	4057	26.52	169.99	48.77
10/29/2018 12:38	4058	26.43	170.09	48.87
10/29/2018 12:39	4059	26.65	169.86	48.65
10/29/2018 12:40	4060	26.37	170.15	48.93
10/29/2018 12:41	4061	26.04	170.49	49.27
10/29/2018 12:42	4062	25.86	170.67	49.45
10/29/2018 12:43	4063	26.27	170.25	49.03
10/29/2018 12:44	4064	26.65	169.86	48.64
10/29/2018 12:45	4065	26.28	170.24	49.02
10/29/2018 12:46	4066	26.40	170.12	48.90
10/29/2018 12:47	4067	25.86	170.67	49.45
10/29/2018 12:48	4068	26.48	170.03	48.82
10/29/2018 12:49	4069	26.55	169.97	48.75
10/29/2018 12:50	4070	26.22	170.30	49.09
10/29/2018 12:51	4071	26.44	170.08	48.86
10/29/2018 12:52	4072	26.58	169.93	48.71
10/29/2018 12:53	4073	26.41	170.11	48.89
10/29/2018 12:54	4074	26.13	170.39	49.17
10/29/2018 12:55	4075	26.41	170.11	48.89
10/29/2018 12:56	4076	26.18	170.34	49.12
10/29/2018 12:57	4077	26.18	170.34	49.13
10/29/2018 12:58	4078	26.25	170.27	49.05
10/29/2018 12:59	4079	26.27	170.25	49.03
10/29/2018 13:00	4080	26.01	170.52	49.30
10/29/2018 13:01	4081	26.57	169.94	48.72
10/29/2018 13:02	4082	26.46	170.05	48.83
10/29/2018 13:03	4083	26.36	170.16	48.94
10/29/2018 13:04	4084	26.11	170.41	49.19
10/29/2018 13:05	4085	25.92	170.61	49.39
10/29/2018 13:06	4086	26.76	169.75	48.53
10/29/2018 13:07	4087	26.47	170.04	48.82
10/29/2018 13:08	4088	26.07	170.45	49.23
10/29/2018 13:09	4089	26.00	170.52	49.30

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/29/2018 13:10	4090	26.25	170.27	49.05
10/29/2018 13:11	4091	26.20	170.32	49.10
10/29/2018 13:12	4092	25.84	170.69	49.47
10/29/2018 13:13	4093	26.35	170.17	48.95
10/29/2018 13:14	4094	26.37	170.15	48.93
10/29/2018 13:15	4095	26.05	170.48	49.26
10/29/2018 13:16	4096	26.36	170.16	48.94
10/29/2018 13:17	4097	26.31	170.21	48.99
10/29/2018 13:18	4098	25.90	170.63	49.41
10/29/2018 13:19	4099	26.10	170.42	49.20
10/29/2018 13:20	4100	26.66	169.84	48.63
10/29/2018 13:21	4101	25.93	170.60	49.38
10/29/2018 13:22	4102	26.42	170.09	48.87
10/29/2018 13:23	4103	26.27	170.25	49.03
10/29/2018 13:24	4104	26.56	169.95	48.74
10/29/2018 13:25	4105	26.21	170.31	49.09
10/29/2018 13:26	4106	25.97	170.56	49.34
10/29/2018 13:27	4107	26.44	170.08	48.86
10/29/2018 13:28	4108	26.38	170.13	48.91
10/29/2018 13:29	4109	26.04	170.48	49.26
10/29/2018 13:30	4110	26.57	169.94	48.72
10/29/2018 13:31	4111	26.35	170.17	48.95
10/29/2018 13:32	4112	26.00	170.53	49.31
10/29/2018 13:33	4113	26.53	169.98	48.76
10/29/2018 13:34	4114	25.93	170.60	49.38
10/29/2018 13:35	4115	26.26	170.26	49.04
10/29/2018 13:36	4116	26.27	170.25	49.03
10/29/2018 13:37	4117	26.19	170.33	49.11
10/29/2018 13:38	4118	26.17	170.35	49.13
10/29/2018 13:39	4119	26.11	170.41	49.19
10/29/2018 13:40	4120	26.42	170.09	48.87
10/29/2018 13:41	4121	26.03	170.49	49.28
10/29/2018 13:42	4122	25.36	171.18	49.96
10/29/2018 13:43	4123	26.36	170.16	48.94
10/29/2018 13:44	4124	25.90	170.63	49.41
10/29/2018 13:45	4125	25.92	170.61	49.39
10/29/2018 13:46	4126	26.18	170.34	49.12
10/29/2018 13:47	4127	25.94	170.58	49.37
10/29/2018 13:48	4128	26.12	170.40	49.18
10/29/2018 13:49	4129	25.46	171.08	49.86
10/29/2018 13:50	4130	25.98	170.54	49.32

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/29/2018 13:51	4131	25.97	170.56	49.34
10/29/2018 13:52	4132	26.20	170.33	49.11
10/29/2018 13:53	4133	25.81	170.72	49.51
10/29/2018 13:54	4134	26.53	169.99	48.77
10/29/2018 13:55	4135	26.23	170.29	49.07
10/29/2018 13:56	4136	26.31	170.21	48.99
10/29/2018 13:57	4137	26.24	170.28	49.06
10/29/2018 13:58	4138	25.80	170.73	49.51
10/29/2018 13:59	4139	26.01	170.52	49.30
10/29/2018 14:00	4140	26.07	170.45	49.23
10/29/2018 14:01	4141	25.92	170.61	49.39
10/29/2018 14:02	4142	25.79	170.74	49.52
10/29/2018 14:03	4143	25.91	170.62	49.40
10/29/2018 14:04	4144	26.21	170.31	49.09
10/29/2018 14:05	4145	25.66	170.88	49.66
10/29/2018 14:06	4146	26.30	170.21	49.00
10/29/2018 14:07	4147	25.78	170.76	49.54
10/29/2018 14:08	4148	25.86	170.66	49.45
10/29/2018 14:09	4149	26.08	170.44	49.22
10/29/2018 14:10	4150	26.30	170.22	49.00
10/29/2018 14:11	4151	25.68	170.85	49.63
10/29/2018 14:12	4152	25.98	170.55	49.33
10/29/2018 14:13	4153	26.06	170.46	49.24
10/29/2018 14:14	4154	25.39	171.15	49.93
10/29/2018 14:15	4155	25.80	170.73	49.51
10/29/2018 14:16	4156	25.90	170.63	49.41
10/29/2018 14:17	4157	26.31	170.21	48.99
10/29/2018 14:18	4158	25.96	170.57	49.35
10/29/2018 14:19	4159	26.00	170.53	49.31
10/29/2018 14:20	4160	26.11	170.41	49.19
10/29/2018 14:21	4161	25.23	171.31	50.09
10/29/2018 14:22	4162	26.08	170.44	49.22
10/29/2018 14:23	4163	25.81	170.73	49.51
10/29/2018 14:24	4164	25.75	170.78	49.56
10/29/2018 14:25	4165	25.76	170.77	49.55
10/29/2018 14:26	4166	26.33	170.19	48.97
10/29/2018 14:27	4167	25.97	170.56	49.34
10/29/2018 14:28	4168	26.09	170.44	49.22
10/29/2018 14:29	4169	25.98	170.55	49.33
10/29/2018 14:30	4170	26.19	170.33	49.11
10/29/2018 14:31	4171	25.67	170.87	49.65

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/29/2018 14:32	4172	25.94	170.59	49.37
10/29/2018 14:33	4173	26.22	170.30	49.08
10/29/2018 14:34	4174	25.79	170.74	49.52
10/29/2018 14:35	4175	26.00	170.53	49.31
10/29/2018 14:36	4176	25.53	171.01	49.79
10/29/2018 14:37	4177	25.77	170.76	49.54
10/29/2018 14:38	4178	26.10	170.42	49.20
10/29/2018 14:39	4179	25.23	171.31	50.09
10/29/2018 14:40	4180	25.72	170.81	49.59
10/29/2018 14:41	4181	25.41	171.13	49.91
10/29/2018 14:42	4182	26.40	170.12	48.90
10/29/2018 14:43	4183	26.37	170.15	48.93
10/29/2018 14:44	4184	25.70	170.83	49.61
10/29/2018 14:45	4185	26.08	170.45	49.23
10/29/2018 14:46	4186	26.49	170.02	48.81
10/29/2018 14:47	4187	25.87	170.66	49.44
10/29/2018 14:48	4188	26.03	170.49	49.27
10/29/2018 14:49	4189	25.88	170.65	49.43
10/29/2018 14:50	4190	26.20	170.32	49.10
10/29/2018 14:51	4191	25.45	171.09	49.87
10/29/2018 14:52	4192	25.69	170.84	49.62
10/29/2018 14:53	4193	25.76	170.77	49.55
10/29/2018 14:54	4194	25.80	170.73	49.51
10/29/2018 14:55	4195	25.97	170.55	49.33
10/29/2018 14:56	4196	25.98	170.54	49.32
10/29/2018 14:57	4197	25.72	170.81	49.59
10/29/2018 14:58	4198	25.93	170.60	49.38
10/29/2018 14:59	4199	26.02	170.51	49.29
10/29/2018 15:00	4200	26.25	170.27	49.05
10/29/2018 15:01	4201	25.76	170.77	49.56
10/29/2018 15:02	4202	25.78	170.75	49.53
10/29/2018 15:03	4203	26.22	170.30	49.08
10/29/2018 15:04	4204	26.18	170.34	49.12
10/29/2018 15:05	4205	25.98	170.55	49.33
10/29/2018 15:06	4206	26.12	170.40	49.18
10/29/2018 15:07	4207	25.99	170.54	49.32
10/29/2018 15:08	4208	25.96	170.56	49.35
10/29/2018 15:09	4209	25.69	170.84	49.62
10/29/2018 15:10	4210	26.14	170.38	49.16
10/29/2018 15:11	4211	25.39	171.16	49.94
10/29/2018 15:12	4212	25.64	170.89	49.67

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/29/2018 15:13	4213	25.61	170.93	49.71
10/29/2018 15:14	4214	25.81	170.72	49.50
10/29/2018 15:15	4215	25.29	171.26	50.04
10/29/2018 15:16	4216	25.88	170.65	49.43
10/29/2018 15:17	4217	25.75	170.78	49.56
10/29/2018 15:18	4218	26.11	170.42	49.20
10/29/2018 15:19	4219	25.60	170.94	49.72
10/29/2018 15:20	4220	26.23	170.29	49.07
10/29/2018 15:21	4221	25.76	170.77	49.56
10/29/2018 15:22	4222	25.82	170.71	49.49
10/29/2018 15:23	4223	26.07	170.45	49.23
10/29/2018 15:24	4224	25.69	170.85	49.63
10/29/2018 15:25	4225	26.26	170.26	49.04
10/29/2018 15:26	4226	25.24	171.30	50.08
10/29/2018 15:27	4227	25.82	170.71	49.49
10/29/2018 15:28	4228	25.94	170.59	49.37
10/29/2018 15:29	4229	25.81	170.72	49.50
10/29/2018 15:30	4230	25.61	170.93	49.71
10/29/2018 15:31	4231	25.69	170.84	49.62
10/29/2018 15:32	4232	26.16	170.36	49.14
10/29/2018 15:33	4233	25.53	171.00	49.78
10/29/2018 15:34	4234	25.96	170.56	49.35
10/29/2018 15:35	4235	25.66	170.87	49.65
10/29/2018 15:36	4236	25.64	170.90	49.68
10/29/2018 15:37	4237	25.79	170.74	49.52
10/29/2018 15:38	4238	25.68	170.86	49.64
10/29/2018 15:39	4239	26.27	170.25	49.03
10/29/2018 15:40	4240	25.68	170.85	49.63
10/29/2018 15:41	4241	25.99	170.54	49.32
10/29/2018 15:42	4242	25.80	170.73	49.51
10/29/2018 15:43	4243	25.75	170.78	49.56
10/29/2018 15:44	4244	26.05	170.48	49.26
10/29/2018 15:45	4245	25.63	170.91	49.69
10/29/2018 15:46	4246	25.55	170.99	49.77
10/29/2018 15:47	4247	25.45	171.09	49.87
10/29/2018 15:48	4248	25.55	170.98	49.77
10/29/2018 15:49	4249	25.76	170.77	49.55
10/29/2018 15:50	4250	25.71	170.82	49.60
10/29/2018 15:51	4251	25.82	170.71	49.50
10/29/2018 15:52	4252	25.53	171.00	49.79
10/29/2018 15:53	4253	25.55	170.99	49.77

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/29/2018 15:54	4254	25.90	170.63	49.41
10/29/2018 15:55	4255	25.08	171.46	50.25
10/29/2018 15:56	4256	25.60	170.94	49.72
10/29/2018 15:57	4257	25.52	171.02	49.80
10/29/2018 15:58	4258	25.49	171.05	49.83
10/29/2018 15:59	4259	25.09	171.45	50.24
10/29/2018 16:00	4260	25.71	170.82	49.60
10/29/2018 16:01	4261	25.49	171.05	49.83
10/29/2018 16:02	4262	25.24	171.30	50.08
10/29/2018 16:03	4263	25.74	170.80	49.58
10/29/2018 16:04	4264	25.05	171.50	50.28
10/29/2018 16:05	4265	26.00	170.52	49.31
10/29/2018 16:06	4266	25.79	170.74	49.52
10/29/2018 16:07	4267	25.39	171.15	49.93
10/29/2018 16:08	4268	25.74	170.80	49.58
10/29/2018 16:09	4269	25.47	171.07	49.85
10/29/2018 16:10	4270	25.86	170.67	49.45
10/29/2018 16:11	4271	25.60	170.93	49.71
10/29/2018 16:12	4272	25.51	171.03	49.81
10/29/2018 16:13	4273	25.60	170.94	49.72
10/29/2018 16:14	4274	25.58	170.96	49.74
10/29/2018 16:15	4275	25.90	170.63	49.41
10/29/2018 16:16	4276	25.12	171.43	50.21
10/29/2018 16:17	4277	25.75	170.78	49.56
10/29/2018 16:18	4278	25.82	170.71	49.49
10/29/2018 16:19	4279	25.63	170.91	49.69
10/29/2018 16:20	4280	25.59	170.95	49.73
10/29/2018 16:21	4281	25.36	171.18	49.96
10/29/2018 16:22	4282	25.83	170.70	49.48
10/29/2018 16:23	4283	25.42	171.12	49.90
10/29/2018 16:24	4284	25.95	170.57	49.36
10/29/2018 16:25	4285	25.55	170.99	49.77
10/29/2018 16:26	4286	25.71	170.82	49.60
10/29/2018 16:27	4287	25.59	170.95	49.73
10/29/2018 16:28	4288	25.21	171.33	50.11
10/29/2018 16:29	4289	25.48	171.06	49.84
10/29/2018 16:30	4290	25.41	171.13	49.91
10/29/2018 16:31	4291	25.76	170.77	49.55
10/29/2018 16:32	4292	25.17	171.38	50.16
10/29/2018 16:33	4293	26.04	170.49	49.27
10/29/2018 16:34	4294	25.82	170.71	49.49

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/29/2018 16:35	4295	25.43	171.11	49.89
10/29/2018 16:36	4296	25.39	171.15	49.93
10/29/2018 16:37	4297	25.61	170.92	49.70
10/29/2018 16:38	4298	25.31	171.24	50.02
10/29/2018 16:39	4299	25.21	171.34	50.12
10/29/2018 16:40	4300	24.94	171.61	50.40
10/29/2018 16:41	4301	25.72	170.81	49.59
10/29/2018 16:42	4302	25.71	170.82	49.61
10/29/2018 16:43	4303	25.70	170.83	49.61
10/29/2018 16:44	4304	25.60	170.94	49.72
10/29/2018 16:45	4305	25.64	170.90	49.68
10/29/2018 16:46	4306	24.91	171.64	50.42
10/29/2018 16:47	4307	25.67	170.87	49.65
10/29/2018 16:48	4308	24.77	171.78	50.57
10/29/2018 16:49	4309	24.87	171.68	50.46
10/29/2018 16:50	4310	25.61	170.93	49.71
10/29/2018 16:51	4311	25.37	171.17	49.95
10/29/2018 16:52	4312	25.80	170.73	49.51
10/29/2018 16:53	4313	25.66	170.87	49.65
10/29/2018 16:54	4314	25.09	171.46	50.24
10/29/2018 16:55	4315	25.11	171.43	50.21
10/29/2018 16:56	4316	25.13	171.42	50.20
10/29/2018 16:57	4317	24.89	171.66	50.44
10/29/2018 16:58	4318	24.84	171.71	50.50
10/29/2018 16:59	4319	26.56	169.95	48.73
10/29/2018 17:00	4320	33.43	162.92	41.70
10/29/2018 17:01	4321	37.79	158.44	37.22
10/29/2018 17:02	4322	40.59	155.57	34.35
10/29/2018 17:03	4323	42.48	153.64	32.42
10/29/2018 17:04	4324	43.80	152.28	31.06
10/29/2018 17:05	4325	44.69	151.37	30.15
10/29/2018 17:06	4326	45.23	150.81	29.60
10/29/2018 17:07	4327	45.62	150.42	29.20
10/29/2018 17:08	4328	45.82	150.21	28.99
10/29/2018 17:09	4329	45.94	150.09	28.87
10/29/2018 17:10	4330	46.14	149.89	28.67
10/29/2018 17:11	4331	46.29	149.73	28.51
10/29/2018 17:12	4332	46.40	149.62	28.40
10/29/2018 17:13	4333	46.53	149.49	28.27
10/29/2018 17:14	4334	46.70	149.32	28.10
10/29/2018 17:15	4335	46.82	149.19	27.97

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/29/2018 17:16	4336	47.06	148.94	27.72
10/29/2018 17:17	4337	47.16	148.84	27.62
10/29/2018 17:18	4338	47.15	148.85	27.63
10/29/2018 17:19	4339	47.14	148.86	27.64
10/29/2018 17:20	4340	47.26	148.74	27.52
10/29/2018 17:21	4341	47.33	148.67	27.45
10/29/2018 17:22	4342	47.34	148.66	27.44
10/29/2018 17:23	4343	47.38	148.61	27.40
10/29/2018 17:24	4344	47.41	148.59	27.37
10/29/2018 17:25	4345	47.53	148.47	27.25
10/29/2018 17:26	4346	47.58	148.41	27.19
10/29/2018 17:27	4347	47.64	148.35	27.13
10/29/2018 17:28	4348	47.74	148.25	27.03
10/29/2018 17:29	4349	47.77	148.21	26.99
10/29/2018 17:30	4350	47.90	148.08	26.87
10/29/2018 17:31	4351	47.98	148.00	26.78
10/29/2018 17:32	4352	48.03	147.95	26.73
10/29/2018 17:33	4353	48.15	147.83	26.61
10/29/2018 17:34	4354	48.17	147.80	26.58
10/29/2018 17:35	4355	48.30	147.67	26.45
10/29/2018 17:36	4356	48.36	147.61	26.39
10/29/2018 17:37	4357	48.46	147.51	26.29
10/29/2018 17:38	4358	48.53	147.44	26.22
10/29/2018 17:39	4359	48.54	147.43	26.21
10/29/2018 17:40	4360	48.62	147.34	26.12
10/29/2018 17:41	4361	48.74	147.22	26.00
10/29/2018 17:42	4362	48.80	147.16	25.94
10/29/2018 17:43	4363	48.82	147.14	25.92
10/29/2018 17:44	4364	48.91	147.04	25.82
10/29/2018 17:45	4365	48.99	146.96	25.75
10/29/2018 17:46	4366	49.08	146.87	25.65
10/29/2018 17:47	4367	49.11	146.84	25.62
10/29/2018 17:48	4368	49.16	146.79	25.57
10/29/2018 17:49	4369	49.17	146.78	25.56
10/29/2018 17:50	4370	49.32	146.63	25.41
10/29/2018 17:51	4371	49.38	146.56	25.35
10/29/2018 17:52	4372	49.44	146.50	25.29
10/29/2018 17:53	4373	49.51	146.43	25.22
10/29/2018 17:54	4374	49.54	146.40	25.19
10/29/2018 17:55	4375	49.61	146.33	25.11
10/29/2018 17:56	4376	49.65	146.29	25.07

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/29/2018 17:57	4377	49.70	146.24	25.02
10/29/2018 17:58	4378	49.74	146.20	24.98
10/29/2018 17:59	4379	49.78	146.16	24.94
10/29/2018 18:00	4380	49.89	146.04	24.82
10/29/2018 18:01	4381	49.95	145.98	24.76
10/29/2018 18:02	4382	49.96	145.97	24.75
10/29/2018 18:03	4383	50.06	145.87	24.65
10/29/2018 18:04	4384	50.12	145.80	24.58
10/29/2018 18:05	4385	50.16	145.77	24.55
10/29/2018 18:06	4386	50.22	145.71	24.49
10/29/2018 18:07	4387	50.24	145.69	24.47
10/29/2018 18:08	4388	50.29	145.63	24.41
10/29/2018 18:09	4389	50.35	145.57	24.35
10/29/2018 18:10	4390	50.42	145.50	24.28
10/29/2018 18:11	4391	50.48	145.44	24.22
10/29/2018 18:12	4392	50.51	145.40	24.19
10/29/2018 18:13	4393	50.55	145.36	24.14
10/29/2018 18:14	4394	50.61	145.30	24.08
10/29/2018 18:15	4395	50.64	145.28	24.06
10/29/2018 18:16	4396	50.70	145.22	24.00
10/29/2018 18:17	4397	50.75	145.16	23.94
10/29/2018 18:18	4398	50.80	145.11	23.89
10/29/2018 18:19	4399	50.80	145.11	23.89
10/29/2018 18:20	4400	50.88	145.03	23.81
10/29/2018 18:21	4401	51.01	144.90	23.68
10/29/2018 18:22	4402	51.00	144.90	23.68
10/29/2018 18:23	4403	51.03	144.88	23.66
10/29/2018 18:24	4404	51.12	144.79	23.57
10/29/2018 18:25	4405	51.15	144.76	23.54
10/29/2018 18:26	4406	51.21	144.69	23.47
10/29/2018 18:27	4407	51.23	144.67	23.45
10/29/2018 18:28	4408	51.31	144.58	23.37
10/29/2018 18:29	4409	51.33	144.57	23.35
10/29/2018 18:30	4410	51.35	144.55	23.33
10/29/2018 18:31	4411	51.37	144.53	23.31
10/29/2018 18:32	4412	51.44	144.45	23.23
10/29/2018 18:33	4413	51.50	144.40	23.18
10/29/2018 18:34	4414	51.57	144.32	23.10
10/29/2018 18:35	4415	51.60	144.29	23.08
10/29/2018 18:36	4416	51.62	144.27	23.06
10/29/2018 18:37	4417	51.68	144.21	22.99

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/29/2018 18:38	4418	51.76	144.12	22.91
10/29/2018 18:39	4419	51.80	144.09	22.87
10/29/2018 18:40	4420	51.83	144.06	22.84
10/29/2018 18:41	4421	51.86	144.03	22.81
10/29/2018 18:42	4422	51.93	143.95	22.74
10/29/2018 18:43	4423	51.95	143.93	22.71
10/29/2018 18:44	4424	52.02	143.86	22.64
10/29/2018 18:45	4425	52.08	143.80	22.58
10/29/2018 18:46	4426	52.08	143.80	22.58
10/29/2018 18:47	4427	52.10	143.78	22.56
10/29/2018 18:48	4428	52.17	143.70	22.48
10/29/2018 18:49	4429	52.22	143.66	22.44
10/29/2018 18:50	4430	52.27	143.60	22.38
10/29/2018 18:51	4431	52.29	143.58	22.36
10/29/2018 18:52	4432	52.35	143.52	22.30
10/29/2018 18:53	4433	52.37	143.51	22.29
10/29/2018 18:54	4434	52.42	143.45	22.23
10/29/2018 18:55	4435	52.45	143.42	22.20
10/29/2018 18:56	4436	52.50	143.37	22.15
10/29/2018 18:57	4437	52.57	143.30	22.08
10/29/2018 18:58	4438	52.59	143.27	22.05
10/29/2018 18:59	4439	52.60	143.26	22.04
10/29/2018 19:00	4440	52.69	143.17	21.95
10/29/2018 19:01	4441	52.70	143.17	21.95
10/29/2018 19:02	4442	52.75	143.11	21.89
10/29/2018 19:03	4443	52.80	143.06	21.85
10/29/2018 19:04	4444	52.88	142.98	21.76
10/29/2018 19:05	4445	52.83	143.03	21.81
10/29/2018 19:06	4446	52.90	142.96	21.74
10/29/2018 19:07	4447	52.96	142.89	21.67
10/29/2018 19:08	4448	52.96	142.90	21.68
10/29/2018 19:09	4449	53.02	142.84	21.62
10/29/2018 19:10	4450	53.09	142.77	21.55
10/29/2018 19:11	4451	53.14	142.72	21.50
10/29/2018 19:12	4452	53.17	142.68	21.46
10/29/2018 19:13	4453	53.21	142.64	21.42
10/29/2018 19:14	4454	53.26	142.59	21.37
10/29/2018 19:15	4455	53.30	142.55	21.33
10/29/2018 19:16	4456	53.34	142.51	21.29
10/29/2018 19:17	4457	53.36	142.49	21.27
10/29/2018 19:18	4458	53.39	142.46	21.24

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/29/2018 19:19	4459	53.48	142.37	21.15
10/29/2018 19:20	4460	53.48	142.37	21.15
10/29/2018 19:21	4461	53.52	142.32	21.11
10/29/2018 19:22	4462	53.58	142.26	21.04
10/29/2018 19:23	4463	53.59	142.25	21.04
10/29/2018 19:24	4464	53.66	142.18	20.96
10/29/2018 19:25	4465	53.69	142.15	20.93
10/29/2018 19:26	4466	53.72	142.12	20.90
10/29/2018 19:27	4467	53.76	142.08	20.86
10/29/2018 19:28	4468	53.81	142.02	20.80
10/29/2018 19:29	4469	53.89	141.95	20.73
10/29/2018 19:30	4470	53.89	141.95	20.73
10/29/2018 19:31	4471	53.95	141.88	20.66
10/29/2018 19:32	4472	53.97	141.86	20.64
10/29/2018 19:33	4473	54.02	141.81	20.59
10/29/2018 19:34	4474	54.04	141.79	20.57
10/29/2018 19:35	4475	54.07	141.76	20.54
10/29/2018 19:36	4476	54.12	141.71	20.49
10/29/2018 19:37	4477	54.18	141.65	20.43
10/29/2018 19:38	4478	54.20	141.63	20.41
10/29/2018 19:39	4479	54.23	141.59	20.37
10/29/2018 19:40	4480	54.28	141.54	20.32
10/29/2018 19:41	4481	54.31	141.52	20.30
10/29/2018 19:42	4482	54.31	141.51	20.29
10/29/2018 19:43	4483	54.38	141.44	20.22
10/29/2018 19:44	4484	54.40	141.42	20.20
10/29/2018 19:45	4485	54.49	141.32	20.11
10/29/2018 19:46	4486	54.53	141.29	20.07
10/29/2018 19:47	4487	54.55	141.27	20.05
10/29/2018 19:48	4488	54.58	141.24	20.02
10/29/2018 19:49	4489	54.58	141.23	20.02
10/29/2018 19:50	4490	54.66	141.16	19.94
10/29/2018 19:51	4491	54.62	141.20	19.98
10/29/2018 19:52	4492	54.68	141.14	19.92
10/29/2018 19:53	4493	54.71	141.10	19.89
10/29/2018 19:54	4494	54.78	141.04	19.82
10/29/2018 19:55	4495	54.75	141.06	19.84
10/29/2018 19:56	4496	54.79	141.03	19.81
10/29/2018 19:57	4497	54.85	140.96	19.74
10/29/2018 19:58	4498	54.87	140.94	19.72
10/29/2018 19:59	4499	54.87	140.94	19.72

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/29/2018 20:00	4500	54.93	140.88	19.66
10/29/2018 20:01	4501	54.95	140.86	19.64
10/29/2018 20:02	4502	54.96	140.84	19.62
10/29/2018 20:03	4503	55.06	140.75	19.53
10/29/2018 20:04	4504	55.02	140.78	19.56
10/29/2018 20:05	4505	55.07	140.74	19.52
10/29/2018 20:06	4506	55.09	140.71	19.49
10/29/2018 20:07	4507	55.16	140.64	19.42
10/29/2018 20:08	4508	55.17	140.63	19.42
10/29/2018 20:09	4509	55.18	140.62	19.40
10/29/2018 20:10	4510	55.21	140.60	19.38
10/29/2018 20:11	4511	55.22	140.58	19.36
10/29/2018 20:12	4512	55.24	140.56	19.34
10/29/2018 20:13	4513	55.32	140.48	19.26
10/29/2018 20:14	4514	55.32	140.47	19.25
10/29/2018 20:15	4515	55.36	140.44	19.22
10/29/2018 20:16	4516	55.35	140.45	19.23
10/29/2018 20:17	4517	55.42	140.38	19.16
10/29/2018 20:18	4518	55.44	140.35	19.13
10/29/2018 20:19	4519	55.46	140.33	19.11
10/29/2018 20:20	4520	55.44	140.35	19.13
10/29/2018 20:21	4521	55.47	140.32	19.10
10/29/2018 20:22	4522	55.54	140.25	19.03
10/29/2018 20:23	4523	55.53	140.27	19.05
10/29/2018 20:24	4524	55.59	140.20	18.99
10/29/2018 20:25	4525	55.60	140.19	18.97
10/29/2018 20:26	4526	55.63	140.16	18.94
10/29/2018 20:27	4527	55.67	140.12	18.91
10/29/2018 20:28	4528	55.69	140.10	18.88
10/29/2018 20:29	4529	55.73	140.06	18.84
10/29/2018 20:30	4530	55.72	140.07	18.85
10/29/2018 20:31	4531	55.75	140.04	18.82
10/29/2018 20:32	4532	55.78	140.00	18.78
10/29/2018 20:33	4533	55.83	139.96	18.74
10/29/2018 20:34	4534	55.85	139.93	18.71
10/29/2018 20:35	4535	55.84	139.95	18.73
10/29/2018 20:36	4536	55.89	139.89	18.67
10/29/2018 20:37	4537	55.90	139.88	18.66
10/29/2018 20:38	4538	55.94	139.85	18.63
10/29/2018 20:39	4539	55.97	139.81	18.59
10/29/2018 20:40	4540	55.97	139.81	18.59

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/29/2018 20:41	4541	56.02	139.77	18.55
10/29/2018 20:42	4542	56.06	139.72	18.50
10/29/2018 20:43	4543	56.02	139.76	18.54
10/29/2018 20:44	4544	56.12	139.66	18.44
10/29/2018 20:45	4545	56.16	139.61	18.40
10/29/2018 20:46	4546	56.17	139.61	18.39
10/29/2018 20:47	4547	56.18	139.60	18.38
10/29/2018 20:48	4548	56.23	139.55	18.33
10/29/2018 20:49	4549	56.22	139.56	18.34
10/29/2018 20:50	4550	56.32	139.46	18.24
10/29/2018 20:51	4551	56.28	139.49	18.27
10/29/2018 20:52	4552	56.29	139.49	18.27
10/29/2018 20:53	4553	56.35	139.42	18.20
10/29/2018 20:54	4554	56.40	139.37	18.15
10/29/2018 20:55	4555	56.40	139.37	18.15
10/29/2018 20:56	4556	56.45	139.33	18.11
10/29/2018 20:57	4557	56.44	139.33	18.11
10/29/2018 20:58	4558	56.47	139.30	18.08
10/29/2018 20:59	4559	56.51	139.26	18.04
10/29/2018 21:00	4560	56.56	139.21	17.99
10/29/2018 21:01	4561	56.56	139.21	17.99
10/29/2018 21:02	4562	56.59	139.18	17.96
10/29/2018 21:03	4563	56.63	139.14	17.92
10/29/2018 21:04	4564	56.62	139.15	17.93
10/29/2018 21:05	4565	56.68	139.09	17.87
10/29/2018 21:06	4566	56.72	139.04	17.82
10/29/2018 21:07	4567	56.72	139.05	17.83
10/29/2018 21:08	4568	56.78	138.98	17.76
10/29/2018 21:09	4569	56.78	138.98	17.76
10/29/2018 21:10	4570	56.78	138.98	17.77
10/29/2018 21:11	4571	56.86	138.90	17.68
10/29/2018 21:12	4572	56.90	138.86	17.65
10/29/2018 21:13	4573	56.93	138.83	17.61
10/29/2018 21:14	4574	56.93	138.83	17.61
10/29/2018 21:15	4575	56.99	138.76	17.54
10/29/2018 21:16	4576	57.00	138.76	17.54
10/29/2018 21:17	4577	57.02	138.73	17.51
10/29/2018 21:18	4578	57.06	138.69	17.47
10/29/2018 21:19	4579	57.10	138.65	17.44
10/29/2018 21:20	4580	57.11	138.64	17.42
10/29/2018 21:21	4581	57.13	138.62	17.40

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/29/2018 21:22	4582	57.18	138.58	17.36
10/29/2018 21:23	4583	57.17	138.58	17.36
10/29/2018 21:24	4584	57.22	138.53	17.31
10/29/2018 21:25	4585	57.29	138.46	17.24
10/29/2018 21:26	4586	57.31	138.44	17.22
10/29/2018 21:27	4587	57.34	138.41	17.19
10/29/2018 21:28	4588	57.32	138.42	17.21
10/29/2018 21:29	4589	57.36	138.38	17.17
10/29/2018 21:30	4590	57.43	138.31	17.09
10/29/2018 21:31	4591	57.43	138.32	17.10
10/29/2018 21:32	4592	57.46	138.28	17.06
10/29/2018 21:33	4593	57.52	138.22	17.01
10/29/2018 21:34	4594	57.50	138.25	17.03
10/29/2018 21:35	4595	57.55	138.19	16.97
10/29/2018 21:36	4596	57.55	138.19	16.97
10/29/2018 21:37	4597	57.63	138.11	16.89
10/29/2018 21:38	4598	57.62	138.12	16.90
10/29/2018 21:39	4599	57.69	138.05	16.84
10/29/2018 21:40	4600	57.68	138.06	16.84
10/29/2018 21:41	4601	57.74	137.99	16.77
10/29/2018 21:42	4602	57.75	137.99	16.77
10/29/2018 21:43	4603	57.78	137.96	16.74
10/29/2018 21:44	4604	57.79	137.95	16.73
10/29/2018 21:45	4605	57.87	137.86	16.64
10/29/2018 21:46	4606	57.89	137.85	16.63
10/29/2018 21:47	4607	57.93	137.81	16.59
10/29/2018 21:48	4608	57.93	137.80	16.58
10/29/2018 21:49	4609	57.96	137.77	16.55
10/29/2018 21:50	4610	57.97	137.76	16.54
10/29/2018 21:51	4611	57.98	137.76	16.54
10/29/2018 21:52	4612	58.05	137.68	16.46
10/29/2018 21:53	4613	58.10	137.63	16.41
10/29/2018 21:54	4614	58.11	137.62	16.40
10/29/2018 21:55	4615	58.16	137.57	16.35
10/29/2018 21:56	4616	58.16	137.56	16.34
10/29/2018 21:57	4617	58.16	137.57	16.35
10/29/2018 21:58	4618	58.21	137.52	16.30
10/29/2018 21:59	4619	58.21	137.51	16.29
10/29/2018 22:00	4620	58.28	137.45	16.23
10/29/2018 22:01	4621	58.30	137.43	16.21
10/29/2018 22:02	4622	58.32	137.40	16.18

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/29/2018 22:03	4623	58.35	137.37	16.15
10/29/2018 22:04	4624	58.35	137.38	16.16
10/29/2018 22:05	4625	58.42	137.30	16.08
10/29/2018 22:06	4626	58.41	137.31	16.09
10/29/2018 22:07	4627	58.46	137.26	16.04
10/29/2018 22:08	4628	58.48	137.24	16.02
10/29/2018 22:09	4629	58.52	137.20	15.98
10/29/2018 22:10	4630	58.51	137.21	15.99
10/29/2018 22:11	4631	58.56	137.15	15.94
10/29/2018 22:12	4632	58.63	137.09	15.87
10/29/2018 22:13	4633	58.61	137.11	15.89
10/29/2018 22:14	4634	58.66	137.05	15.83
10/29/2018 22:15	4635	58.67	137.05	15.83
10/29/2018 22:16	4636	58.73	136.98	15.76
10/29/2018 22:17	4637	58.77	136.95	15.73
10/29/2018 22:18	4638	58.75	136.96	15.74
10/29/2018 22:19	4639	58.79	136.92	15.70
10/29/2018 22:20	4640	58.80	136.91	15.69
10/29/2018 22:21	4641	58.84	136.88	15.66
10/29/2018 22:22	4642	58.84	136.87	15.65
10/29/2018 22:23	4643	58.89	136.82	15.60
10/29/2018 22:24	4644	58.94	136.77	15.55
10/29/2018 22:25	4645	58.92	136.79	15.57
10/29/2018 22:26	4646	58.99	136.71	15.49
10/29/2018 22:27	4647	59.00	136.70	15.49
10/29/2018 22:28	4648	59.00	136.71	15.49
10/29/2018 22:29	4649	59.06	136.65	15.43
10/29/2018 22:30	4650	59.05	136.66	15.44
10/29/2018 22:31	4651	59.09	136.62	15.40
10/29/2018 22:32	4652	59.12	136.59	15.37
10/29/2018 22:33	4653	59.17	136.53	15.32
10/29/2018 22:34	4654	59.19	136.52	15.30
10/29/2018 22:35	4655	59.21	136.50	15.28
10/29/2018 22:36	4656	59.25	136.45	15.23
10/29/2018 22:37	4657	59.25	136.45	15.23
10/29/2018 22:38	4658	59.26	136.44	15.22
10/29/2018 22:39	4659	59.31	136.39	15.17
10/29/2018 22:40	4660	59.34	136.36	15.14
10/29/2018 22:41	4661	59.38	136.32	15.10
10/29/2018 22:42	4662	59.41	136.29	15.07
10/29/2018 22:43	4663	59.40	136.30	15.08

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/29/2018 22:44	4664	59.46	136.24	15.02
10/29/2018 22:45	4665	59.47	136.22	15.01
10/29/2018 22:46	4666	59.50	136.20	14.98
10/29/2018 22:47	4667	59.50	136.19	14.97
10/29/2018 22:48	4668	59.53	136.16	14.94
10/29/2018 22:49	4669	59.60	136.10	14.88
10/29/2018 22:50	4670	59.57	136.12	14.90
10/29/2018 22:51	4671	59.63	136.07	14.85
10/29/2018 22:52	4672	59.66	136.03	14.81
10/29/2018 22:53	4673	59.68	136.01	14.79
10/29/2018 22:54	4674	59.71	135.98	14.76
10/29/2018 22:55	4675	59.71	135.98	14.76
10/29/2018 22:56	4676	59.73	135.96	14.74
10/29/2018 22:57	4677	59.78	135.91	14.69
10/29/2018 22:58	4678	59.81	135.87	14.65
10/29/2018 22:59	4679	59.80	135.89	14.67
10/29/2018 23:00	4680	59.87	135.81	14.60
10/29/2018 23:01	4681	59.86	135.83	14.61
10/29/2018 23:02	4682	59.90	135.79	14.57
10/29/2018 23:03	4683	59.91	135.78	14.56
10/29/2018 23:04	4684	59.95	135.73	14.52
10/29/2018 23:05	4685	59.97	135.71	14.49
10/29/2018 23:06	4686	60.01	135.68	14.46
10/29/2018 23:07	4687	60.02	135.66	14.44
10/29/2018 23:08	4688	60.06	135.62	14.40
10/29/2018 23:09	4689	60.06	135.62	14.40
10/29/2018 23:10	4690	60.06	135.62	14.40
10/29/2018 23:11	4691	60.11	135.57	14.35
10/29/2018 23:12	4692	60.12	135.56	14.34
10/29/2018 23:13	4693	60.17	135.50	14.29
10/29/2018 23:14	4694	60.22	135.46	14.24
10/29/2018 23:15	4695	60.21	135.47	14.25
10/29/2018 23:16	4696	60.24	135.44	14.22
10/29/2018 23:17	4697	60.28	135.40	14.18
10/29/2018 23:18	4698	60.31	135.36	14.15
10/29/2018 23:19	4699	60.28	135.40	14.18
10/29/2018 23:20	4700	60.32	135.36	14.14
10/29/2018 23:21	4701	60.35	135.33	14.11
10/29/2018 23:22	4702	60.41	135.27	14.05
10/29/2018 23:23	4703	60.43	135.24	14.02
10/29/2018 23:24	4704	60.44	135.23	14.01

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/29/2018 23:25	4705	60.46	135.22	14.00
10/29/2018 23:26	4706	60.50	135.17	13.95
10/29/2018 23:27	4707	60.53	135.14	13.92
10/29/2018 23:28	4708	60.54	135.13	13.91
10/29/2018 23:29	4709	60.52	135.15	13.93
10/29/2018 23:30	4710	60.59	135.08	13.86
10/29/2018 23:31	4711	60.62	135.04	13.82
10/29/2018 23:32	4712	60.64	135.02	13.80
10/29/2018 23:33	4713	60.66	135.00	13.78
10/29/2018 23:34	4714	60.70	134.96	13.74
10/29/2018 23:35	4715	60.71	134.95	13.73
10/29/2018 23:36	4716	60.75	134.92	13.70
10/29/2018 23:37	4717	60.77	134.89	13.67
10/29/2018 23:38	4718	60.80	134.87	13.65
10/29/2018 23:39	4719	60.81	134.85	13.63
10/29/2018 23:40	4720	60.82	134.84	13.62
10/29/2018 23:41	4721	60.87	134.79	13.57
10/29/2018 23:42	4722	60.86	134.80	13.58
10/29/2018 23:43	4723	60.90	134.76	13.54
10/29/2018 23:44	4724	60.91	134.75	13.53
10/29/2018 23:45	4725	60.91	134.75	13.53
10/29/2018 23:46	4726	60.98	134.68	13.46
10/29/2018 23:47	4727	61.00	134.66	13.44
10/29/2018 23:48	4728	61.03	134.63	13.41
10/29/2018 23:49	4729	61.02	134.64	13.42
10/29/2018 23:50	4730	61.04	134.62	13.40
10/29/2018 23:51	4731	61.08	134.57	13.35
10/29/2018 23:52	4732	61.09	134.56	13.34
10/29/2018 23:53	4733	61.12	134.53	13.32
10/29/2018 23:54	4734	61.18	134.48	13.26
10/29/2018 23:55	4735	61.15	134.50	13.29
10/29/2018 23:56	4736	61.19	134.46	13.24
10/29/2018 23:57	4737	61.20	134.46	13.24
10/29/2018 23:58	4738	61.21	134.44	13.22
10/29/2018 23:59	4739	61.26	134.39	13.17
10/30/2018 0:00	4740	61.26	134.39	13.17
10/30/2018 0:01	4741	61.30	134.35	13.13
10/30/2018 0:02	4742	61.31	134.34	13.12
10/30/2018 0:03	4743	61.35	134.30	13.08
10/30/2018 0:04	4744	61.36	134.29	13.07
10/30/2018 0:05	4745	61.40	134.25	13.03

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/30/2018 0:06	4746	61.44	134.20	12.98
10/30/2018 0:07	4747	61.41	134.24	13.02
10/30/2018 0:08	4748	61.43	134.22	13.00
10/30/2018 0:09	4749	61.47	134.18	12.96
10/30/2018 0:10	4750	61.47	134.18	12.96
10/30/2018 0:11	4751	61.46	134.19	12.97
10/30/2018 0:12	4752	61.53	134.12	12.90
10/30/2018 0:13	4753	61.50	134.15	12.93
10/30/2018 0:14	4754	61.53	134.12	12.90
10/30/2018 0:15	4755	61.55	134.10	12.88
10/30/2018 0:16	4756	61.59	134.05	12.83
10/30/2018 0:17	4757	61.56	134.08	12.87
10/30/2018 0:18	4758	61.61	134.04	12.82
10/30/2018 0:19	4759	61.68	133.96	12.74
10/30/2018 0:20	4760	61.70	133.94	12.72
10/30/2018 0:21	4761	61.67	133.97	12.75
10/30/2018 0:22	4762	61.68	133.96	12.75
10/30/2018 0:23	4763	61.71	133.93	12.71
10/30/2018 0:24	4764	61.75	133.88	12.67
10/30/2018 0:25	4765	61.76	133.88	12.66
10/30/2018 0:26	4766	61.74	133.90	12.68
10/30/2018 0:27	4767	61.83	133.81	12.59
10/30/2018 0:28	4768	61.82	133.81	12.59
10/30/2018 0:29	4769	61.82	133.82	12.60
10/30/2018 0:30	4770	61.87	133.76	12.54
10/30/2018 0:31	4771	61.80	133.83	12.61
10/30/2018 0:32	4772	61.91	133.73	12.51
10/30/2018 0:33	4773	61.94	133.69	12.47
10/30/2018 0:34	4774	61.92	133.71	12.49
10/30/2018 0:35	4775	61.98	133.66	12.44
10/30/2018 0:36	4776	61.99	133.64	12.42
10/30/2018 0:37	4777	61.96	133.68	12.46
10/30/2018 0:38	4778	62.00	133.63	12.41
10/30/2018 0:39	4779	62.00	133.63	12.41
10/30/2018 0:40	4780	62.04	133.59	12.37
10/30/2018 0:41	4781	62.07	133.56	12.35
10/30/2018 0:42	4782	62.13	133.50	12.28
10/30/2018 0:43	4783	62.09	133.54	12.32
10/30/2018 0:44	4784	62.11	133.52	12.30
10/30/2018 0:45	4785	62.19	133.44	12.22
10/30/2018 0:46	4786	62.14	133.49	12.27

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/30/2018 0:47	4787	62.16	133.47	12.25
10/30/2018 0:48	4788	62.22	133.41	12.19
10/30/2018 0:49	4789	62.18	133.45	12.23
10/30/2018 0:50	4790	62.23	133.40	12.18
10/30/2018 0:51	4791	62.25	133.38	12.16
10/30/2018 0:52	4792	62.28	133.34	12.12
10/30/2018 0:53	4793	62.29	133.34	12.12
10/30/2018 0:54	4794	62.32	133.30	12.09
10/30/2018 0:55	4795	62.32	133.30	12.08
10/30/2018 0:56	4796	62.37	133.26	12.04
10/30/2018 0:57	4797	62.37	133.25	12.03
10/30/2018 0:58	4798	62.40	133.22	12.01
10/30/2018 0:59	4799	62.37	133.25	12.04
10/30/2018 1:00	4800	62.39	133.24	12.02
10/30/2018 1:01	4801	62.46	133.17	11.95
10/30/2018 1:02	4802	62.44	133.19	11.97
10/30/2018 1:03	4803	62.45	133.17	11.95
10/30/2018 1:04	4804	62.49	133.13	11.91
10/30/2018 1:05	4805	62.46	133.16	11.95
10/30/2018 1:06	4806	62.50	133.12	11.90
10/30/2018 1:07	4807	62.55	133.07	11.85
10/30/2018 1:08	4808	62.58	133.04	11.82
10/30/2018 1:09	4809	62.58	133.04	11.82
10/30/2018 1:10	4810	62.58	133.04	11.82
10/30/2018 1:11	4811	62.58	133.03	11.81
10/30/2018 1:12	4812	62.61	133.01	11.79
10/30/2018 1:13	4813	62.62	133.00	11.78
10/30/2018 1:14	4814	62.63	132.99	11.77
10/30/2018 1:15	4815	62.68	132.94	11.72
10/30/2018 1:16	4816	62.70	132.92	11.70
10/30/2018 1:17	4817	62.75	132.86	11.65
10/30/2018 1:18	4818	62.75	132.87	11.65
10/30/2018 1:19	4819	62.73	132.89	11.67
10/30/2018 1:20	4820	62.73	132.88	11.66
10/30/2018 1:21	4821	62.80	132.81	11.59
10/30/2018 1:22	4822	62.75	132.86	11.64
10/30/2018 1:23	4823	62.81	132.80	11.58
10/30/2018 1:24	4824	62.80	132.81	11.59
10/30/2018 1:25	4825	62.85	132.76	11.54
10/30/2018 1:26	4826	62.85	132.76	11.54
10/30/2018 1:27	4827	62.89	132.72	11.50

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/30/2018 1:28	4828	62.85	132.77	11.55
10/30/2018 1:29	4829	62.95	132.66	11.44
10/30/2018 1:30	4830	62.94	132.67	11.45
10/30/2018 1:31	4831	62.98	132.63	11.41
10/30/2018 1:32	4832	62.95	132.65	11.44
10/30/2018 1:33	4833	62.99	132.62	11.40
10/30/2018 1:34	4834	62.99	132.62	11.40
10/30/2018 1:35	4835	63.03	132.58	11.36
10/30/2018 1:36	4836	63.04	132.56	11.34
10/30/2018 1:37	4837	63.04	132.57	11.35
10/30/2018 1:38	4838	63.06	132.55	11.33
10/30/2018 1:39	4839	63.12	132.49	11.27
10/30/2018 1:40	4840	63.09	132.52	11.30
10/30/2018 1:41	4841	63.15	132.45	11.23
10/30/2018 1:42	4842	63.12	132.49	11.27
10/30/2018 1:43	4843	63.13	132.48	11.26
10/30/2018 1:44	4844	63.16	132.44	11.22
10/30/2018 1:45	4845	63.15	132.45	11.23
10/30/2018 1:46	4846	63.19	132.42	11.20
10/30/2018 1:47	4847	63.23	132.37	11.15
10/30/2018 1:48	4848	63.21	132.39	11.17
10/30/2018 1:49	4849	63.23	132.37	11.15
10/30/2018 1:50	4850	63.26	132.34	11.12
10/30/2018 1:51	4851	63.31	132.30	11.08
10/30/2018 1:52	4852	63.32	132.28	11.06
10/30/2018 1:53	4853	63.32	132.28	11.06
10/30/2018 1:54	4854	63.32	132.28	11.07
10/30/2018 1:55	4855	63.33	132.27	11.05
10/30/2018 1:56	4856	63.36	132.24	11.02
10/30/2018 1:57	4857	63.39	132.21	10.99
10/30/2018 1:58	4858	63.37	132.23	11.01
10/30/2018 1:59	4859	63.43	132.16	10.94
10/30/2018 2:00	4860	63.43	132.17	10.95
10/30/2018 2:01	4861	63.43	132.17	10.95
10/30/2018 2:02	4862	63.45	132.14	10.93
10/30/2018 2:03	4863	63.52	132.08	10.86
10/30/2018 2:04	4864	63.51	132.08	10.86
10/30/2018 2:05	4865	63.53	132.07	10.85
10/30/2018 2:06	4866	63.51	132.08	10.86
10/30/2018 2:07	4867	63.59	132.01	10.79
10/30/2018 2:08	4868	63.53	132.07	10.85

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/30/2018 2:09	4869	63.57	132.02	10.80
10/30/2018 2:10	4870	63.55	132.05	10.83
10/30/2018 2:11	4871	63.60	132.00	10.78
10/30/2018 2:12	4872	63.66	131.93	10.71
10/30/2018 2:13	4873	63.67	131.92	10.70
10/30/2018 2:14	4874	63.67	131.92	10.70
10/30/2018 2:15	4875	63.71	131.88	10.67
10/30/2018 2:16	4876	63.71	131.88	10.66
10/30/2018 2:17	4877	63.69	131.90	10.68
10/30/2018 2:18	4878	63.77	131.82	10.60
10/30/2018 2:19	4879	63.75	131.84	10.62
10/30/2018 2:20	4880	63.77	131.81	10.60
10/30/2018 2:21	4881	63.77	131.82	10.60
10/30/2018 2:22	4882	63.82	131.76	10.54
10/30/2018 2:23	4883	63.88	131.70	10.49
10/30/2018 2:24	4884	63.82	131.77	10.55
10/30/2018 2:25	4885	63.85	131.74	10.52
10/30/2018 2:26	4886	63.86	131.72	10.50
10/30/2018 2:27	4887	63.90	131.69	10.47
10/30/2018 2:28	4888	63.90	131.68	10.47
10/30/2018 2:29	4889	63.89	131.70	10.48
10/30/2018 2:30	4890	63.93	131.66	10.44
10/30/2018 2:31	4891	64.02	131.57	10.35
10/30/2018 2:32	4892	63.96	131.62	10.40
10/30/2018 2:33	4893	64.00	131.59	10.37
10/30/2018 2:34	4894	63.97	131.62	10.40
10/30/2018 2:35	4895	64.02	131.56	10.34
10/30/2018 2:36	4896	64.03	131.55	10.33
10/30/2018 2:37	4897	64.04	131.54	10.32
10/30/2018 2:38	4898	64.07	131.51	10.29
10/30/2018 2:39	4899	64.08	131.50	10.28
10/30/2018 2:40	4900	64.15	131.43	10.21
10/30/2018 2:41	4901	64.10	131.48	10.26
10/30/2018 2:42	4902	64.17	131.41	10.19
10/30/2018 2:43	4903	64.14	131.44	10.22
10/30/2018 2:44	4904	64.15	131.43	10.21
10/30/2018 2:45	4905	64.16	131.42	10.20
10/30/2018 2:46	4906	64.21	131.37	10.15
10/30/2018 2:47	4907	64.18	131.40	10.18
10/30/2018 2:48	4908	64.24	131.34	10.12
10/30/2018 2:49	4909	64.27	131.31	10.09

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/30/2018 2:50	4910	64.24	131.33	10.12
10/30/2018 2:51	4911	64.29	131.28	10.06
10/30/2018 2:52	4912	64.30	131.28	10.06
10/30/2018 2:53	4913	64.34	131.23	10.01
10/30/2018 2:54	4914	64.34	131.23	10.01
10/30/2018 2:55	4915	64.36	131.22	10.00
10/30/2018 2:56	4916	64.42	131.15	9.93
10/30/2018 2:57	4917	64.35	131.23	10.01
10/30/2018 2:58	4918	64.36	131.21	9.99
10/30/2018 2:59	4919	64.44	131.13	9.91
10/30/2018 3:00	4920	64.41	131.16	9.94
10/30/2018 3:01	4921	64.43	131.14	9.92
10/30/2018 3:02	4922	64.45	131.12	9.90
10/30/2018 3:03	4923	64.46	131.11	9.90
10/30/2018 3:04	4924	64.48	131.09	9.87
10/30/2018 3:05	4925	64.51	131.06	9.84
10/30/2018 3:06	4926	64.52	131.05	9.84
10/30/2018 3:07	4927	64.52	131.05	9.83
10/30/2018 3:08	4928	64.55	131.02	9.80
10/30/2018 3:09	4929	64.54	131.03	9.81
10/30/2018 3:10	4930	64.58	130.99	9.77
10/30/2018 3:11	4931	64.61	130.96	9.74
10/30/2018 3:12	4932	64.63	130.93	9.71
10/30/2018 3:13	4933	64.66	130.91	9.69
10/30/2018 3:14	4934	64.63	130.94	9.72
10/30/2018 3:15	4935	64.62	130.95	9.73
10/30/2018 3:16	4936	64.64	130.93	9.71
10/30/2018 3:17	4937	64.66	130.91	9.69
10/30/2018 3:18	4938	64.71	130.86	9.64
10/30/2018 3:19	4939	64.74	130.83	9.61
10/30/2018 3:20	4940	64.70	130.87	9.65
10/30/2018 3:21	4941	64.74	130.83	9.61
10/30/2018 3:22	4942	64.75	130.81	9.59
10/30/2018 3:23	4943	64.81	130.76	9.54
10/30/2018 3:24	4944	64.75	130.81	9.59
10/30/2018 3:25	4945	64.80	130.76	9.54
10/30/2018 3:26	4946	64.83	130.73	9.51
10/30/2018 3:27	4947	64.82	130.75	9.53
10/30/2018 3:28	4948	64.84	130.72	9.50
10/30/2018 3:29	4949	64.86	130.70	9.48
10/30/2018 3:30	4950	64.85	130.71	9.49

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/30/2018 3:31	4951	64.91	130.65	9.43
10/30/2018 3:32	4952	64.88	130.68	9.46
10/30/2018 3:33	4953	64.90	130.66	9.44
10/30/2018 3:34	4954	64.92	130.65	9.43
10/30/2018 3:35	4955	64.98	130.58	9.36
10/30/2018 3:36	4956	64.98	130.58	9.36
10/30/2018 3:37	4957	64.94	130.62	9.40
10/30/2018 3:38	4958	64.98	130.58	9.36
10/30/2018 3:39	4959	65.01	130.55	9.33
10/30/2018 3:40	4960	64.98	130.58	9.36
10/30/2018 3:41	4961	65.03	130.53	9.31
10/30/2018 3:42	4962	65.04	130.52	9.30
10/30/2018 3:43	4963	65.09	130.47	9.25
10/30/2018 3:44	4964	65.07	130.48	9.27
10/30/2018 3:45	4965	65.06	130.49	9.27
10/30/2018 3:46	4966	65.11	130.45	9.23
10/30/2018 3:47	4967	65.14	130.41	9.19
10/30/2018 3:48	4968	65.13	130.43	9.21
10/30/2018 3:49	4969	65.16	130.40	9.18
10/30/2018 3:50	4970	65.16	130.39	9.17
10/30/2018 3:51	4971	65.16	130.39	9.17
10/30/2018 3:52	4972	65.20	130.36	9.14
10/30/2018 3:53	4973	65.23	130.32	9.10
10/30/2018 3:54	4974	65.22	130.34	9.12
10/30/2018 3:55	4975	65.24	130.32	9.10
10/30/2018 3:56	4976	65.25	130.30	9.08
10/30/2018 3:57	4977	65.23	130.32	9.10
10/30/2018 3:58	4978	65.26	130.30	9.08
10/30/2018 3:59	4979	65.27	130.29	9.07
10/30/2018 4:00	4980	65.30	130.25	9.03
10/30/2018 4:01	4981	65.33	130.22	9.00
10/30/2018 4:02	4982	65.32	130.23	9.01
10/30/2018 4:03	4983	65.32	130.24	9.02
10/30/2018 4:04	4984	65.34	130.21	8.99
10/30/2018 4:05	4985	65.38	130.17	8.95
10/30/2018 4:06	4986	65.36	130.19	8.97
10/30/2018 4:07	4987	65.39	130.15	8.94
10/30/2018 4:08	4988	65.40	130.15	8.93
10/30/2018 4:09	4989	65.47	130.07	8.86
10/30/2018 4:10	4990	65.45	130.10	8.88
10/30/2018 4:11	4991	65.50	130.05	8.83

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/30/2018 4:12	4992	65.42	130.13	8.91
10/30/2018 4:13	4993	65.46	130.08	8.86
10/30/2018 4:14	4994	65.47	130.08	8.86
10/30/2018 4:15	4995	65.51	130.04	8.82
10/30/2018 4:16	4996	65.56	129.98	8.76
10/30/2018 4:17	4997	65.52	130.03	8.81
10/30/2018 4:18	4998	65.55	129.99	8.77
10/30/2018 4:19	4999	65.54	130.00	8.78
10/30/2018 4:20	5000	65.59	129.96	8.74
10/30/2018 4:21	5001	65.57	129.98	8.76
10/30/2018 4:22	5002	65.59	129.95	8.74
10/30/2018 4:23	5003	65.60	129.94	8.72
10/30/2018 4:24	5004	65.65	129.89	8.67
10/30/2018 4:25	5005	65.67	129.87	8.65
10/30/2018 4:26	5006	65.66	129.88	8.66
10/30/2018 4:27	5007	65.65	129.89	8.67
10/30/2018 4:28	5008	65.68	129.86	8.64
10/30/2018 4:29	5009	65.70	129.84	8.63
10/30/2018 4:30	5010	65.70	129.84	8.62
10/30/2018 4:31	5011	65.76	129.78	8.56
10/30/2018 4:32	5012	65.70	129.84	8.62
10/30/2018 4:33	5013	65.72	129.82	8.60
10/30/2018 4:34	5014	65.75	129.79	8.57
10/30/2018 4:35	5015	65.76	129.78	8.56
10/30/2018 4:36	5016	65.80	129.74	8.52
10/30/2018 4:37	5017	65.80	129.74	8.52
10/30/2018 4:38	5018	65.79	129.75	8.53
10/30/2018 4:39	5019	65.83	129.71	8.49
10/30/2018 4:40	5020	65.82	129.72	8.50
10/30/2018 4:41	5021	65.84	129.69	8.47
10/30/2018 4:42	5022	65.85	129.69	8.47
10/30/2018 4:43	5023	65.85	129.69	8.47
10/30/2018 4:44	5024	65.86	129.68	8.46
10/30/2018 4:45	5025	65.87	129.67	8.45
10/30/2018 4:46	5026	65.91	129.63	8.41
10/30/2018 4:47	5027	65.95	129.59	8.37
10/30/2018 4:48	5028	65.93	129.60	8.38
10/30/2018 4:49	5029	65.97	129.57	8.35
10/30/2018 4:50	5030	65.95	129.58	8.37
10/30/2018 4:51	5031	65.94	129.60	8.38
10/30/2018 4:52	5032	65.99	129.54	8.32

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/30/2018 4:53	5033	66.00	129.53	8.31
10/30/2018 4:54	5034	66.02	129.51	8.29
10/30/2018 4:55	5035	66.00	129.53	8.31
10/30/2018 4:56	5036	66.03	129.50	8.28
10/30/2018 4:57	5037	66.01	129.52	8.30
10/30/2018 4:58	5038	66.06	129.47	8.25
10/30/2018 4:59	5039	66.05	129.49	8.27
10/30/2018 5:00	5040	66.10	129.44	8.22
10/30/2018 5:01	5041	66.05	129.48	8.26
10/30/2018 5:02	5042	66.11	129.42	8.20
10/30/2018 5:03	5043	66.15	129.38	8.16
10/30/2018 5:04	5044	66.12	129.41	8.19
10/30/2018 5:05	5045	66.12	129.41	8.19
10/30/2018 5:06	5046	66.13	129.40	8.18
10/30/2018 5:07	5047	66.16	129.37	8.15
10/30/2018 5:08	5048	66.22	129.30	8.08
10/30/2018 5:09	5049	66.20	129.33	8.11
10/30/2018 5:10	5050	66.17	129.36	8.15
10/30/2018 5:11	5051	66.22	129.31	8.09
10/30/2018 5:12	5052	66.21	129.32	8.10
10/30/2018 5:13	5053	66.29	129.24	8.02
10/30/2018 5:14	5054	66.24	129.29	8.07
10/30/2018 5:15	5055	66.30	129.23	8.01
10/30/2018 5:16	5056	66.28	129.25	8.03
10/30/2018 5:17	5057	66.28	129.25	8.03
10/30/2018 5:18	5058	66.29	129.24	8.02
10/30/2018 5:19	5059	66.33	129.20	7.98
10/30/2018 5:20	5060	66.35	129.18	7.96
10/30/2018 5:21	5061	66.36	129.16	7.94
10/30/2018 5:22	5062	66.34	129.18	7.96
10/30/2018 5:23	5063	66.36	129.16	7.94
10/30/2018 5:24	5064	66.39	129.13	7.91
10/30/2018 5:25	5065	66.40	129.12	7.90
10/30/2018 5:26	5066	66.43	129.10	7.88
10/30/2018 5:27	5067	66.44	129.08	7.87
10/30/2018 5:28	5068	66.47	129.05	7.83
10/30/2018 5:29	5069	66.48	129.04	7.82
10/30/2018 5:30	5070	66.43	129.09	7.87
10/30/2018 5:31	5071	66.49	129.03	7.81
10/30/2018 5:32	5072	66.47	129.05	7.83
10/30/2018 5:33	5073	66.50	129.02	7.80

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/30/2018 5:34	5074	66.50	129.02	7.80
10/30/2018 5:35	5075	66.48	129.04	7.83
10/30/2018 5:36	5076	66.48	129.04	7.83
10/30/2018 5:37	5077	66.55	128.97	7.76
10/30/2018 5:38	5078	66.53	128.99	7.77
10/30/2018 5:39	5079	66.53	128.99	7.77
10/30/2018 5:40	5080	66.56	128.96	7.75
10/30/2018 5:41	5081	66.59	128.93	7.71
10/30/2018 5:42	5082	66.58	128.94	7.72
10/30/2018 5:43	5083	66.59	128.93	7.71
10/30/2018 5:44	5084	66.63	128.89	7.67
10/30/2018 5:45	5085	66.66	128.86	7.64
10/30/2018 5:46	5086	66.66	128.86	7.64
10/30/2018 5:47	5087	66.66	128.86	7.64
10/30/2018 5:48	5088	66.65	128.87	7.65
10/30/2018 5:49	5089	66.67	128.84	7.62
10/30/2018 5:50	5090	66.68	128.84	7.62
10/30/2018 5:51	5091	66.69	128.82	7.61
10/30/2018 5:52	5092	66.72	128.80	7.58
10/30/2018 5:53	5093	66.70	128.82	7.60
10/30/2018 5:54	5094	66.74	128.77	7.55
10/30/2018 5:55	5095	66.74	128.77	7.55
10/30/2018 5:56	5096	66.79	128.72	7.50
10/30/2018 5:57	5097	66.75	128.76	7.54
10/30/2018 5:58	5098	66.79	128.72	7.50
10/30/2018 5:59	5099	66.81	128.70	7.48
10/30/2018 6:00	5100	66.83	128.68	7.46
10/30/2018 6:01	5101	66.83	128.68	7.46
10/30/2018 6:02	5102	66.85	128.67	7.45
10/30/2018 6:03	5103	66.88	128.64	7.42
10/30/2018 6:04	5104	66.84	128.67	7.45
10/30/2018 6:05	5105	66.87	128.65	7.43
10/30/2018 6:06	5106	66.88	128.64	7.42
10/30/2018 6:07	5107	66.88	128.63	7.41
10/30/2018 6:08	5108	66.89	128.62	7.40
10/30/2018 6:09	5109	66.86	128.65	7.43
10/30/2018 6:10	5110	66.93	128.58	7.36
10/30/2018 6:11	5111	66.91	128.60	7.38
10/30/2018 6:12	5112	66.98	128.53	7.31
10/30/2018 6:13	5113	66.96	128.55	7.33
10/30/2018 6:14	5114	66.92	128.59	7.37

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/30/2018 6:15	5115	66.99	128.52	7.30
10/30/2018 6:16	5116	66.98	128.53	7.31
10/30/2018 6:17	5117	66.98	128.53	7.31
10/30/2018 6:18	5118	67.03	128.48	7.26
10/30/2018 6:19	5119	67.05	128.46	7.24
10/30/2018 6:20	5120	67.03	128.48	7.26
10/30/2018 6:21	5121	67.07	128.43	7.21
10/30/2018 6:22	5122	67.09	128.42	7.20
10/30/2018 6:23	5123	67.09	128.42	7.20
10/30/2018 6:24	5124	67.08	128.42	7.20
10/30/2018 6:25	5125	67.05	128.46	7.24
10/30/2018 6:26	5126	67.13	128.38	7.16
10/30/2018 6:27	5127	67.09	128.41	7.20
10/30/2018 6:28	5128	67.18	128.33	7.11
10/30/2018 6:29	5129	67.12	128.39	7.17
10/30/2018 6:30	5130	67.16	128.34	7.12
10/30/2018 6:31	5131	67.16	128.34	7.12
10/30/2018 6:32	5132	67.11	128.40	7.18
10/30/2018 6:33	5133	67.18	128.32	7.10
10/30/2018 6:34	5134	67.21	128.29	7.07
10/30/2018 6:35	5135	67.23	128.28	7.06
10/30/2018 6:36	5136	67.19	128.31	7.09
10/30/2018 6:37	5137	67.19	128.31	7.10
10/30/2018 6:38	5138	67.24	128.26	7.04
10/30/2018 6:39	5139	67.23	128.27	7.05
10/30/2018 6:40	5140	67.26	128.24	7.02
10/30/2018 6:41	5141	67.26	128.24	7.02
10/30/2018 6:42	5142	67.26	128.25	7.03
10/30/2018 6:43	5143	67.27	128.23	7.01
10/30/2018 6:44	5144	67.29	128.21	6.99
10/30/2018 6:45	5145	67.31	128.20	6.98
10/30/2018 6:46	5146	67.30	128.20	6.98
10/30/2018 6:47	5147	67.36	128.14	6.92
10/30/2018 6:48	5148	67.35	128.15	6.94
10/30/2018 6:49	5149	67.37	128.13	6.91
10/30/2018 6:50	5150	67.41	128.09	6.87
10/30/2018 6:51	5151	67.37	128.13	6.91
10/30/2018 6:52	5152	67.42	128.08	6.86
10/30/2018 6:53	5153	67.42	128.08	6.86
10/30/2018 6:54	5154	67.39	128.11	6.89
10/30/2018 6:55	5155	67.44	128.06	6.84

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/30/2018 6:56	5156	67.44	128.06	6.84
10/30/2018 6:57	5157	67.43	128.06	6.85
10/30/2018 6:58	5158	67.48	128.01	6.79
10/30/2018 6:59	5159	67.47	128.03	6.81
10/30/2018 7:00	5160	67.47	128.03	6.81
10/30/2018 7:01	5161	67.52	127.98	6.76
10/30/2018 7:02	5162	67.48	128.02	6.80
10/30/2018 7:03	5163	67.47	128.02	6.80
10/30/2018 7:04	5164	67.53	127.97	6.75
10/30/2018 7:05	5165	67.55	127.95	6.73
10/30/2018 7:06	5166	67.50	127.99	6.77
10/30/2018 7:07	5167	67.56	127.93	6.71
10/30/2018 7:08	5168	67.52	127.97	6.75
10/30/2018 7:09	5169	67.52	127.97	6.76
10/30/2018 7:10	5170	67.59	127.90	6.68
10/30/2018 7:11	5171	67.60	127.89	6.67
10/30/2018 7:12	5172	67.61	127.88	6.66
10/30/2018 7:13	5173	67.64	127.86	6.64
10/30/2018 7:14	5174	67.59	127.90	6.68
10/30/2018 7:15	5175	67.60	127.89	6.67
10/30/2018 7:16	5176	67.63	127.87	6.65
10/30/2018 7:17	5177	67.62	127.87	6.65
10/30/2018 7:18	5178	67.67	127.82	6.60
10/30/2018 7:19	5179	67.65	127.84	6.62
10/30/2018 7:20	5180	67.66	127.83	6.61
10/30/2018 7:21	5181	67.68	127.81	6.59
10/30/2018 7:22	5182	67.71	127.79	6.57
10/30/2018 7:23	5183	67.71	127.78	6.56
10/30/2018 7:24	5184	67.70	127.80	6.58
10/30/2018 7:25	5185	67.72	127.77	6.55
10/30/2018 7:26	5186	67.74	127.75	6.53
10/30/2018 7:27	5187	67.75	127.74	6.52
10/30/2018 7:28	5188	67.75	127.74	6.52
10/30/2018 7:29	5189	67.75	127.74	6.52
10/30/2018 7:30	5190	67.74	127.75	6.53
10/30/2018 7:31	5191	67.77	127.72	6.50
10/30/2018 7:32	5192	67.78	127.71	6.49
10/30/2018 7:33	5193	67.79	127.70	6.48
10/30/2018 7:34	5194	67.78	127.71	6.49
10/30/2018 7:35	5195	67.77	127.72	6.50
10/30/2018 7:36	5196	67.83	127.65	6.44

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/30/2018 7:37	5197	67.89	127.60	6.38
10/30/2018 7:38	5198	67.85	127.63	6.41
10/30/2018 7:39	5199	67.85	127.64	6.42
10/30/2018 7:40	5200	67.88	127.61	6.39
10/30/2018 7:41	5201	67.88	127.61	6.39
10/30/2018 7:42	5202	67.89	127.59	6.37
10/30/2018 7:43	5203	67.89	127.60	6.38
10/30/2018 7:44	5204	67.90	127.58	6.37
10/30/2018 7:45	5205	67.90	127.59	6.37
10/30/2018 7:46	5206	67.89	127.60	6.38
10/30/2018 7:47	5207	67.96	127.53	6.31
10/30/2018 7:48	5208	67.94	127.55	6.33
10/30/2018 7:49	5209	67.94	127.55	6.33
10/30/2018 7:50	5210	67.94	127.54	6.33
10/30/2018 7:51	5211	67.95	127.54	6.32
10/30/2018 7:52	5212	67.96	127.53	6.31
10/30/2018 7:53	5213	68.02	127.47	6.25
10/30/2018 7:54	5214	68.00	127.49	6.27
10/30/2018 7:55	5215	67.96	127.53	6.31
10/30/2018 7:56	5216	68.00	127.48	6.26
10/30/2018 7:57	5217	68.03	127.46	6.24
10/30/2018 7:58	5218	68.01	127.47	6.26
10/30/2018 7:59	5219	67.94	127.55	6.33
10/30/2018 8:00	5220	68.07	127.42	6.20
10/30/2018 8:01	5221	68.03	127.45	6.23
10/30/2018 8:02	5222	68.03	127.46	6.24
10/30/2018 8:03	5223	68.08	127.41	6.19
10/30/2018 8:04	5224	68.07	127.41	6.20
10/30/2018 8:05	5225	68.11	127.37	6.15
10/30/2018 8:06	5226	68.08	127.41	6.19
10/30/2018 8:07	5227	68.10	127.38	6.16
10/30/2018 8:08	5228	68.10	127.38	6.16
10/30/2018 8:09	5229	68.10	127.38	6.16
10/30/2018 8:10	5230	68.12	127.36	6.14
10/30/2018 8:11	5231	68.18	127.30	6.08
10/30/2018 8:12	5232	68.17	127.31	6.09
10/30/2018 8:13	5233	68.15	127.33	6.11
10/30/2018 8:14	5234	68.18	127.30	6.08
10/30/2018 8:15	5235	68.20	127.28	6.06
10/30/2018 8:16	5236	68.19	127.29	6.07
10/30/2018 8:17	5237	68.22	127.26	6.04

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/30/2018 8:18	5238	68.18	127.30	6.08
10/30/2018 8:19	5239	68.17	127.31	6.09
10/30/2018 8:20	5240	68.20	127.28	6.06
10/30/2018 8:21	5241	68.23	127.25	6.03
10/30/2018 8:22	5242	68.22	127.26	6.04
10/30/2018 8:23	5243	68.29	127.18	5.96
10/30/2018 8:24	5244	68.26	127.21	6.00
10/30/2018 8:25	5245	68.25	127.23	6.01
10/30/2018 8:26	5246	68.29	127.18	5.96
10/30/2018 8:27	5247	68.31	127.17	5.95
10/30/2018 8:28	5248	68.28	127.19	5.97
10/30/2018 8:29	5249	68.30	127.18	5.96
10/30/2018 8:30	5250	68.28	127.20	5.98
10/30/2018 8:31	5251	68.34	127.14	5.92
10/30/2018 8:32	5252	68.36	127.11	5.89
10/30/2018 8:33	5253	68.32	127.16	5.94
10/30/2018 8:34	5254	68.33	127.15	5.93
10/30/2018 8:35	5255	68.36	127.12	5.90
10/30/2018 8:36	5256	68.35	127.13	5.91
10/30/2018 8:37	5257	68.32	127.16	5.94
10/30/2018 8:38	5258	68.39	127.08	5.87
10/30/2018 8:39	5259	68.43	127.05	5.83
10/30/2018 8:40	5260	68.37	127.11	5.89
10/30/2018 8:41	5261	68.40	127.07	5.86
10/30/2018 8:42	5262	68.42	127.05	5.84
10/30/2018 8:43	5263	68.42	127.06	5.84
10/30/2018 8:44	5264	68.43	127.04	5.82
10/30/2018 8:45	5265	68.41	127.06	5.85
10/30/2018 8:46	5266	68.43	127.04	5.82
10/30/2018 8:47	5267	68.43	127.04	5.82
10/30/2018 8:48	5268	68.43	127.05	5.83
10/30/2018 8:49	5269	68.45	127.02	5.80
10/30/2018 8:50	5270	68.50	126.98	5.76
10/30/2018 8:51	5271	68.45	127.02	5.80
10/30/2018 8:52	5272	68.49	126.98	5.76
10/30/2018 8:53	5273	68.53	126.94	5.72
10/30/2018 8:54	5274	68.49	126.98	5.76
10/30/2018 8:55	5275	68.51	126.96	5.74
10/30/2018 8:56	5276	68.53	126.94	5.72
10/30/2018 8:57	5277	68.56	126.91	5.69
10/30/2018 8:58	5278	68.55	126.92	5.70

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/30/2018 8:59	5279	68.55	126.92	5.70
10/30/2018 9:00	5280	68.53	126.94	5.72
10/30/2018 9:01	5281	68.56	126.91	5.69
10/30/2018 9:02	5282	68.56	126.91	5.69
10/30/2018 9:03	5283	68.56	126.91	5.69
10/30/2018 9:04	5284	68.60	126.87	5.65
10/30/2018 9:05	5285	68.61	126.85	5.64
10/30/2018 9:06	5286	68.61	126.86	5.64
10/30/2018 9:07	5287	68.61	126.86	5.64
10/30/2018 9:08	5288	68.66	126.81	5.59
10/30/2018 9:09	5289	68.63	126.84	5.62
10/30/2018 9:10	5290	68.65	126.82	5.60
10/30/2018 9:11	5291	68.64	126.83	5.61
10/30/2018 9:12	5292	68.66	126.81	5.59
10/30/2018 9:13	5293	68.67	126.80	5.58
10/30/2018 9:14	5294	68.70	126.77	5.55
10/30/2018 9:15	5295	68.62	126.85	5.63
10/30/2018 9:16	5296	68.70	126.77	5.55
10/30/2018 9:17	5297	68.69	126.77	5.55
10/30/2018 9:18	5298	68.74	126.73	5.51
10/30/2018 9:19	5299	68.72	126.75	5.53
10/30/2018 9:20	5300	68.77	126.69	5.47
10/30/2018 9:21	5301	68.72	126.74	5.52
10/30/2018 9:22	5302	68.76	126.71	5.49
10/30/2018 9:23	5303	68.79	126.67	5.46
10/30/2018 9:24	5304	68.80	126.66	5.44
10/30/2018 9:25	5305	68.78	126.69	5.47
10/30/2018 9:26	5306	68.83	126.63	5.41
10/30/2018 9:27	5307	68.81	126.66	5.44
10/30/2018 9:28	5308	68.82	126.65	5.43
10/30/2018 9:29	5309	68.79	126.68	5.46
10/30/2018 9:30	5310	68.83	126.63	5.42
10/30/2018 9:31	5311	68.84	126.62	5.40
10/30/2018 9:32	5312	68.83	126.63	5.41
10/30/2018 9:33	5313	68.88	126.58	5.36
10/30/2018 9:34	5314	68.87	126.59	5.38
10/30/2018 9:35	5315	68.89	126.57	5.35
10/30/2018 9:36	5316	68.87	126.59	5.37
10/30/2018 9:37	5317	68.88	126.58	5.36
10/30/2018 9:38	5318	68.91	126.55	5.33
10/30/2018 9:39	5319	68.93	126.53	5.31

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/30/2018 9:40	5320	68.91	126.55	5.33
10/30/2018 9:41	5321	68.92	126.55	5.33
10/30/2018 9:42	5322	68.91	126.55	5.33
10/30/2018 9:43	5323	68.96	126.50	5.28
10/30/2018 9:44	5324	68.95	126.51	5.29
10/30/2018 9:45	5325	68.92	126.54	5.32
10/30/2018 9:46	5326	68.96	126.50	5.28
10/30/2018 9:47	5327	69.02	126.44	5.22
10/30/2018 9:48	5328	68.99	126.47	5.26
10/30/2018 9:49	5329	69.04	126.42	5.20
10/30/2018 9:50	5330	69.01	126.45	5.23
10/30/2018 9:51	5331	69.00	126.46	5.24
10/30/2018 9:52	5332	69.04	126.42	5.20
10/30/2018 9:53	5333	69.01	126.45	5.23
10/30/2018 9:54	5334	69.05	126.40	5.18
10/30/2018 9:55	5335	69.04	126.42	5.20
10/30/2018 9:56	5336	69.05	126.41	5.19
10/30/2018 9:57	5337	69.07	126.39	5.17
10/30/2018 9:58	5338	69.05	126.40	5.18
10/30/2018 9:59	5339	69.06	126.40	5.18
10/30/2018 10:00	5340	69.10	126.36	5.14
10/30/2018 10:01	5341	69.08	126.38	5.16
10/30/2018 10:02	5342	69.08	126.38	5.16
10/30/2018 10:03	5343	69.13	126.33	5.11
10/30/2018 10:04	5344	69.16	126.30	5.08
10/30/2018 10:05	5345	69.13	126.32	5.10
10/30/2018 10:06	5346	69.18	126.27	5.05
10/30/2018 10:07	5347	69.15	126.31	5.09
10/30/2018 10:08	5348	69.16	126.29	5.07
10/30/2018 10:09	5349	69.20	126.25	5.03
10/30/2018 10:10	5350	69.20	126.25	5.03
10/30/2018 10:11	5351	69.18	126.27	5.05
10/30/2018 10:12	5352	69.19	126.26	5.04
10/30/2018 10:13	5353	69.17	126.29	5.07
10/30/2018 10:14	5354	69.23	126.23	5.01
10/30/2018 10:15	5355	69.21	126.24	5.02
10/30/2018 10:16	5356	69.23	126.22	5.00
10/30/2018 10:17	5357	69.21	126.24	5.03
10/30/2018 10:18	5358	69.30	126.15	4.93
10/30/2018 10:19	5359	69.27	126.18	4.97
10/30/2018 10:20	5360	69.30	126.15	4.93

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/30/2018 10:21	5361	69.28	126.17	4.95
10/30/2018 10:22	5362	69.30	126.16	4.94
10/30/2018 10:23	5363	69.32	126.14	4.92
10/30/2018 10:24	5364	69.32	126.13	4.91
10/30/2018 10:25	5365	69.32	126.13	4.91
10/30/2018 10:26	5366	69.29	126.16	4.94
10/30/2018 10:27	5367	69.35	126.10	4.88
10/30/2018 10:28	5368	69.33	126.12	4.90
10/30/2018 10:29	5369	69.36	126.09	4.87
10/30/2018 10:30	5370	69.36	126.09	4.88
10/30/2018 10:31	5371	69.38	126.07	4.85
10/30/2018 10:32	5372	69.41	126.04	4.82
10/30/2018 10:33	5373	69.35	126.10	4.88
10/30/2018 10:34	5374	69.39	126.06	4.84
10/30/2018 10:35	5375	69.38	126.07	4.85
10/30/2018 10:36	5376	69.40	126.05	4.83
10/30/2018 10:37	5377	69.40	126.05	4.83
10/30/2018 10:38	5378	69.43	126.02	4.80
10/30/2018 10:39	5379	69.43	126.02	4.80
10/30/2018 10:40	5380	69.48	125.97	4.75
10/30/2018 10:41	5381	69.45	126.00	4.78
10/30/2018 10:42	5382	69.48	125.96	4.74
10/30/2018 10:43	5383	69.44	126.01	4.79
10/30/2018 10:44	5384	69.49	125.95	4.73
10/30/2018 10:45	5385	69.49	125.96	4.74
10/30/2018 10:46	5386	69.50	125.95	4.73
10/30/2018 10:47	5387	69.48	125.97	4.75
10/30/2018 10:48	5388	69.50	125.95	4.73
10/30/2018 10:49	5389	69.53	125.92	4.70
10/30/2018 10:50	5390	69.53	125.92	4.70
10/30/2018 10:51	5391	69.54	125.91	4.69
10/30/2018 10:52	5392	69.55	125.90	4.68
10/30/2018 10:53	5393	69.51	125.94	4.72
10/30/2018 10:54	5394	69.56	125.88	4.66
10/30/2018 10:55	5395	69.57	125.87	4.65
10/30/2018 10:56	5396	69.58	125.86	4.64
10/30/2018 10:57	5397	69.57	125.87	4.66
10/30/2018 10:58	5398	69.59	125.86	4.64
10/30/2018 10:59	5399	69.61	125.83	4.61
10/30/2018 11:00	5400	69.59	125.85	4.63
10/30/2018 11:01	5401	69.60	125.84	4.62

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/30/2018 11:02	5402	69.67	125.78	4.56
10/30/2018 11:03	5403	69.64	125.80	4.59
10/30/2018 11:04	5404	69.60	125.84	4.62
10/30/2018 11:05	5405	69.61	125.83	4.61
10/30/2018 11:06	5406	69.70	125.75	4.53
10/30/2018 11:07	5407	69.64	125.80	4.58
10/30/2018 11:08	5408	69.69	125.76	4.54
10/30/2018 11:09	5409	69.64	125.80	4.59
10/30/2018 11:10	5410	69.67	125.77	4.55
10/30/2018 11:11	5411	69.66	125.78	4.56
10/30/2018 11:12	5412	69.70	125.74	4.52
10/30/2018 11:13	5413	69.69	125.75	4.53
10/30/2018 11:14	5414	69.70	125.74	4.52
10/30/2018 11:15	5415	69.71	125.73	4.51
10/30/2018 11:16	5416	69.76	125.68	4.46
10/30/2018 11:17	5417	69.76	125.68	4.46
10/30/2018 11:18	5418	69.76	125.68	4.46
10/30/2018 11:19	5419	69.72	125.72	4.50
10/30/2018 11:20	5420	69.75	125.69	4.47
10/30/2018 11:21	5421	69.78	125.66	4.45
10/30/2018 11:22	5422	69.74	125.70	4.49
10/30/2018 11:23	5423	69.75	125.69	4.47
10/30/2018 11:24	5424	69.81	125.63	4.41
10/30/2018 11:25	5425	69.81	125.63	4.41
10/30/2018 11:26	5426	69.80	125.64	4.42
10/30/2018 11:27	5427	69.83	125.61	4.39
10/30/2018 11:28	5428	69.87	125.57	4.35
10/30/2018 11:29	5429	69.85	125.59	4.37
10/30/2018 11:30	5430	69.86	125.58	4.36
10/30/2018 11:31	5431	69.84	125.60	4.38
10/30/2018 11:32	5432	69.82	125.62	4.40
10/30/2018 11:33	5433	69.86	125.58	4.36
10/30/2018 11:34	5434	69.89	125.54	4.33
10/30/2018 11:35	5435	69.89	125.54	4.32
10/30/2018 11:36	5436	69.89	125.54	4.33
10/30/2018 11:37	5437	69.87	125.57	4.35
10/30/2018 11:38	5438	69.90	125.54	4.32
10/30/2018 11:39	5439	69.95	125.48	4.27
10/30/2018 11:40	5440	69.89	125.55	4.33
10/30/2018 11:41	5441	69.93	125.51	4.29
10/30/2018 11:42	5442	69.93	125.50	4.29

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/30/2018 11:43	5443	69.94	125.50	4.28
10/30/2018 11:44	5444	69.92	125.52	4.30
10/30/2018 11:45	5445	69.96	125.48	4.26
10/30/2018 11:46	5446	69.95	125.48	4.26
10/30/2018 11:47	5447	69.94	125.49	4.27
10/30/2018 11:48	5448	70.02	125.42	4.20
10/30/2018 11:49	5449	70.00	125.44	4.22
10/30/2018 11:50	5450	70.04	125.40	4.18
10/30/2018 11:51	5451	70.00	125.43	4.21
10/30/2018 11:52	5452	70.03	125.41	4.19
10/30/2018 11:53	5453	70.02	125.41	4.19
10/30/2018 11:54	5454	70.05	125.38	4.16
10/30/2018 11:55	5455	70.02	125.41	4.19
10/30/2018 11:56	5456	70.04	125.39	4.17
10/30/2018 11:57	5457	70.05	125.38	4.16
10/30/2018 11:58	5458	70.05	125.38	4.16
10/30/2018 11:59	5459	70.07	125.36	4.14
10/30/2018 12:00	5460	70.09	125.35	4.13
10/30/2018 12:01	5461	70.07	125.36	4.14
10/30/2018 12:02	5462	70.09	125.34	4.12
10/30/2018 12:03	5463	70.09	125.34	4.12
10/30/2018 12:04	5464	70.16	125.27	4.06
10/30/2018 12:05	5465	70.10	125.33	4.11
10/30/2018 12:06	5466	70.11	125.33	4.11
10/30/2018 12:07	5467	70.14	125.29	4.08
10/30/2018 12:08	5468	70.16	125.27	4.05
10/30/2018 12:09	5469	70.13	125.30	4.08
10/30/2018 12:10	5470	70.14	125.29	4.07
10/30/2018 12:11	5471	70.15	125.28	4.06
10/30/2018 12:12	5472	70.15	125.28	4.06
10/30/2018 12:13	5473	70.14	125.29	4.07
10/30/2018 12:14	5474	70.19	125.24	4.02
10/30/2018 12:15	5475	70.18	125.25	4.03
10/30/2018 12:16	5476	70.19	125.24	4.03
10/30/2018 12:17	5477	70.23	125.20	3.98
10/30/2018 12:18	5478	70.21	125.21	4.00
10/30/2018 12:19	5479	70.19	125.24	4.02
10/30/2018 12:20	5480	70.25	125.18	3.96
10/30/2018 12:21	5481	70.22	125.21	3.99
10/30/2018 12:22	5482	70.26	125.17	3.95
10/30/2018 12:23	5483	70.26	125.17	3.95

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/30/2018 12:24	5484	70.24	125.18	3.97
10/30/2018 12:25	5485	70.28	125.15	3.93
10/30/2018 12:26	5486	70.28	125.15	3.93
10/30/2018 12:27	5487	70.28	125.15	3.93
10/30/2018 12:28	5488	70.29	125.14	3.92
10/30/2018 12:29	5489	70.30	125.13	3.91
10/30/2018 12:30	5490	70.32	125.11	3.89
10/30/2018 12:31	5491	70.32	125.11	3.89
10/30/2018 12:32	5492	70.32	125.11	3.89
10/30/2018 12:33	5493	70.32	125.11	3.89
10/30/2018 12:34	5494	70.34	125.09	3.87
10/30/2018 12:35	5495	70.38	125.04	3.82
10/30/2018 12:36	5496	70.38	125.04	3.83
10/30/2018 12:37	5497	70.37	125.06	3.84
10/30/2018 12:38	5498	70.41	125.02	3.80
10/30/2018 12:39	5499	70.42	125.01	3.79
10/30/2018 12:40	5500	70.40	125.03	3.81
10/30/2018 12:41	5501	70.37	125.06	3.84
10/30/2018 12:42	5502	70.44	124.98	3.76
10/30/2018 12:43	5503	70.40	125.02	3.80
10/30/2018 12:44	5504	70.43	125.00	3.78
10/30/2018 12:45	5505	70.41	125.01	3.79
10/30/2018 12:46	5506	70.43	124.99	3.77
10/30/2018 12:47	5507	70.49	124.93	3.71
10/30/2018 12:48	5508	70.43	124.99	3.77
10/30/2018 12:49	5509	70.47	124.95	3.74
10/30/2018 12:50	5510	70.49	124.93	3.71
10/30/2018 12:51	5511	70.46	124.97	3.75
10/30/2018 12:52	5512	70.49	124.94	3.72
10/30/2018 12:53	5513	70.47	124.95	3.73
10/30/2018 12:54	5514	70.51	124.91	3.69
10/30/2018 12:55	5515	70.51	124.91	3.69
10/30/2018 12:56	5516	70.50	124.92	3.70
10/30/2018 12:57	5517	70.51	124.91	3.69
10/30/2018 12:58	5518	70.53	124.89	3.67
10/30/2018 12:59	5519	70.54	124.89	3.67
10/30/2018 13:00	5520	70.53	124.89	3.67
10/30/2018 13:01	5521	70.52	124.90	3.68
10/30/2018 13:02	5522	70.60	124.82	3.61
10/30/2018 13:03	5523	70.57	124.85	3.63
10/30/2018 13:04	5524	70.59	124.83	3.62

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/30/2018 13:05	5525	70.61	124.81	3.59
10/30/2018 13:06	5526	70.61	124.81	3.59
10/30/2018 13:07	5527	70.60	124.82	3.61
10/30/2018 13:08	5528	70.61	124.80	3.59
10/30/2018 13:09	5529	70.61	124.81	3.59
10/30/2018 13:10	5530	70.66	124.76	3.54
10/30/2018 13:11	5531	70.63	124.79	3.57
10/30/2018 13:12	5532	70.64	124.77	3.56
10/30/2018 13:13	5533	70.67	124.75	3.53
10/30/2018 13:14	5534	70.72	124.70	3.48
10/30/2018 13:15	5535	70.65	124.77	3.55
10/30/2018 13:16	5536	70.68	124.74	3.52
10/30/2018 13:17	5537	70.68	124.74	3.52
10/30/2018 13:18	5538	70.69	124.73	3.51
10/30/2018 13:19	5539	70.71	124.70	3.48
10/30/2018 13:20	5540	70.67	124.74	3.53
10/30/2018 13:21	5541	70.73	124.69	3.47
10/30/2018 13:22	5542	70.70	124.72	3.50
10/30/2018 13:23	5543	70.71	124.70	3.48
10/30/2018 13:24	5544	70.72	124.69	3.47
10/30/2018 13:25	5545	70.76	124.66	3.44
10/30/2018 13:26	5546	70.78	124.64	3.42
10/30/2018 13:27	5547	70.76	124.66	3.44
10/30/2018 13:28	5548	70.76	124.65	3.43
10/30/2018 13:29	5549	70.75	124.67	3.45
10/30/2018 13:30	5550	70.83	124.59	3.37
10/30/2018 13:31	5551	70.79	124.63	3.41
10/30/2018 13:32	5552	70.81	124.60	3.38
10/30/2018 13:33	5553	70.78	124.64	3.42
10/30/2018 13:34	5554	70.80	124.62	3.40
10/30/2018 13:35	5555	70.80	124.61	3.39
10/30/2018 13:36	5556	70.83	124.58	3.36
10/30/2018 13:37	5557	70.87	124.54	3.32
10/30/2018 13:38	5558	70.85	124.57	3.35
10/30/2018 13:39	5559	70.85	124.56	3.34
10/30/2018 13:40	5560	70.86	124.55	3.33
10/30/2018 13:41	5561	70.88	124.54	3.32
10/30/2018 13:42	5562	70.87	124.54	3.32
10/30/2018 13:43	5563	70.88	124.53	3.31
10/30/2018 13:44	5564	70.91	124.50	3.28
10/30/2018 13:45	5565	70.90	124.51	3.30

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/30/2018 13:46	5566	70.89	124.52	3.30
10/30/2018 13:47	5567	70.91	124.50	3.28
10/30/2018 13:48	5568	70.95	124.46	3.24
10/30/2018 13:49	5569	70.91	124.50	3.28
10/30/2018 13:50	5570	70.94	124.47	3.25
10/30/2018 13:51	5571	70.97	124.44	3.22
10/30/2018 13:52	5572	70.94	124.47	3.26
10/30/2018 13:53	5573	70.95	124.46	3.24
10/30/2018 13:54	5574	70.99	124.42	3.20
10/30/2018 13:55	5575	71.01	124.40	3.18
10/30/2018 13:56	5576	70.97	124.44	3.23
10/30/2018 13:57	5577	70.97	124.44	3.22
10/30/2018 13:58	5578	71.02	124.39	3.17
10/30/2018 13:59	5579	70.99	124.42	3.20
10/30/2018 14:00	5580	71.02	124.39	3.17
10/30/2018 14:01	5581	71.00	124.41	3.19
10/30/2018 14:02	5582	71.04	124.37	3.15
10/30/2018 14:03	5583	71.07	124.34	3.12
10/30/2018 14:04	5584	71.03	124.38	3.16
10/30/2018 14:05	5585	71.07	124.34	3.12
10/30/2018 14:06	5586	71.06	124.35	3.13
10/30/2018 14:07	5587	71.05	124.36	3.14
10/30/2018 14:08	5588	71.04	124.37	3.15
10/30/2018 14:09	5589	71.08	124.33	3.11
10/30/2018 14:10	5590	71.12	124.29	3.07
10/30/2018 14:11	5591	71.14	124.27	3.05
10/30/2018 14:12	5592	71.09	124.32	3.10
10/30/2018 14:13	5593	71.12	124.29	3.07
10/30/2018 14:14	5594	71.13	124.28	3.06
10/30/2018 14:15	5595	71.11	124.30	3.08
10/30/2018 14:16	5596	71.11	124.30	3.08
10/30/2018 14:17	5597	71.09	124.32	3.10
10/30/2018 14:18	5598	71.16	124.25	3.03
10/30/2018 14:19	5599	71.15	124.25	3.03
10/30/2018 14:20	5600	71.18	124.23	3.01
10/30/2018 14:21	5601	71.18	124.22	3.00
10/30/2018 14:22	5602	71.16	124.25	3.03
10/30/2018 14:23	5603	71.19	124.22	3.00
10/30/2018 14:24	5604	71.15	124.26	3.04
10/30/2018 14:25	5605	71.18	124.22	3.00
10/30/2018 14:26	5606	71.18	124.22	3.00

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/30/2018 14:27	5607	71.21	124.20	2.98
10/30/2018 14:28	5608	71.21	124.20	2.98
10/30/2018 14:29	5609	71.22	124.18	2.97
10/30/2018 14:30	5610	71.23	124.18	2.96
10/30/2018 14:31	5611	71.25	124.15	2.93
10/30/2018 14:32	5612	71.26	124.14	2.92
10/30/2018 14:33	5613	71.22	124.18	2.96
10/30/2018 14:34	5614	71.28	124.12	2.90
10/30/2018 14:35	5615	71.25	124.16	2.94
10/30/2018 14:36	5616	71.28	124.12	2.90
10/30/2018 14:37	5617	71.32	124.08	2.86
10/30/2018 14:38	5618	71.31	124.09	2.88
10/30/2018 14:39	5619	71.30	124.10	2.88
10/30/2018 14:40	5620	71.30	124.10	2.89
10/30/2018 14:41	5621	71.31	124.10	2.88
10/30/2018 14:42	5622	71.31	124.09	2.87
10/30/2018 14:43	5623	71.33	124.07	2.85
10/30/2018 14:44	5624	71.29	124.11	2.89
10/30/2018 14:45	5625	71.35	124.05	2.83
10/30/2018 14:46	5626	71.35	124.05	2.83
10/30/2018 14:47	5627	71.36	124.04	2.82
10/30/2018 14:48	5628	71.37	124.03	2.81
10/30/2018 14:49	5629	71.39	124.01	2.80
10/30/2018 14:50	5630	71.38	124.02	2.80
10/30/2018 14:51	5631	71.37	124.03	2.81
10/30/2018 14:52	5632	71.37	124.03	2.81
10/30/2018 14:53	5633	71.40	124.00	2.78
10/30/2018 14:54	5634	71.38	124.02	2.80
10/30/2018 14:55	5635	71.45	123.95	2.73
10/30/2018 14:56	5636	71.41	123.99	2.77
10/30/2018 14:57	5637	71.41	123.99	2.77
10/30/2018 14:58	5638	71.45	123.95	2.73
10/30/2018 14:59	5639	71.45	123.95	2.73
10/30/2018 15:00	5640	71.42	123.98	2.76
10/30/2018 15:01	5641	71.43	123.97	2.75
10/30/2018 15:02	5642	71.49	123.91	2.69
10/30/2018 15:03	5643	71.46	123.94	2.72
10/30/2018 15:04	5644	71.46	123.94	2.72
10/30/2018 15:05	5645	71.45	123.94	2.72
10/30/2018 15:06	5646	71.47	123.93	2.71
10/30/2018 15:07	5647	71.50	123.90	2.68

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/30/2018 15:08	5648	71.49	123.90	2.68
10/30/2018 15:09	5649	71.50	123.90	2.68
10/30/2018 15:10	5650	71.50	123.90	2.68
10/30/2018 15:11	5651	71.52	123.87	2.65
10/30/2018 15:12	5652	71.52	123.87	2.65
10/30/2018 15:13	5653	71.51	123.88	2.66
10/30/2018 15:14	5654	71.52	123.87	2.65
10/30/2018 15:15	5655	71.54	123.86	2.64
10/30/2018 15:16	5656	71.55	123.85	2.63
10/30/2018 15:17	5657	71.53	123.87	2.65
10/30/2018 15:18	5658	71.52	123.87	2.65
10/30/2018 15:19	5659	71.55	123.85	2.63
10/30/2018 15:20	5660	71.56	123.83	2.62
10/30/2018 15:21	5661	71.59	123.81	2.59
10/30/2018 15:22	5662	71.62	123.78	2.56
10/30/2018 15:23	5663	71.59	123.81	2.59
10/30/2018 15:24	5664	71.57	123.82	2.60
10/30/2018 15:25	5665	71.63	123.77	2.55
10/30/2018 15:26	5666	71.62	123.77	2.55
10/30/2018 15:27	5667	71.61	123.78	2.56
10/30/2018 15:28	5668	71.62	123.78	2.56
10/30/2018 15:29	5669	71.61	123.78	2.57
10/30/2018 15:30	5670	71.62	123.78	2.56
10/30/2018 15:31	5671	71.65	123.74	2.52
10/30/2018 15:32	5672	71.66	123.74	2.52
10/30/2018 15:33	5673	71.69	123.70	2.48
10/30/2018 15:34	5674	71.61	123.79	2.57
10/30/2018 15:35	5675	71.67	123.72	2.50
10/30/2018 15:36	5676	71.65	123.74	2.52
10/30/2018 15:37	5677	71.67	123.73	2.51
10/30/2018 15:38	5678	71.65	123.74	2.53
10/30/2018 15:39	5679	71.70	123.69	2.48
10/30/2018 15:40	5680	71.71	123.68	2.47
10/30/2018 15:41	5681	71.69	123.70	2.48
10/30/2018 15:42	5682	71.71	123.68	2.47
10/30/2018 15:43	5683	71.77	123.62	2.40
10/30/2018 15:44	5684	71.73	123.66	2.44
10/30/2018 15:45	5685	71.74	123.65	2.43
10/30/2018 15:46	5686	71.73	123.66	2.44
10/30/2018 15:47	5687	71.73	123.66	2.44
10/30/2018 15:48	5688	71.74	123.65	2.43

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/30/2018 15:49	5689	71.75	123.64	2.43
10/30/2018 15:50	5690	71.77	123.62	2.40
10/30/2018 15:51	5691	71.80	123.59	2.37
10/30/2018 15:52	5692	71.78	123.61	2.39
10/30/2018 15:53	5693	71.82	123.57	2.35
10/30/2018 15:54	5694	71.73	123.67	2.45
10/30/2018 15:55	5695	71.78	123.61	2.39
10/30/2018 15:56	5696	71.75	123.64	2.42
10/30/2018 15:57	5697	71.78	123.61	2.39
10/30/2018 15:58	5698	71.80	123.59	2.37
10/30/2018 15:59	5699	71.76	123.63	2.41
10/30/2018 16:00	5700	71.82	123.57	2.35
10/30/2018 16:01	5701	71.81	123.58	2.36
10/30/2018 16:02	5702	71.86	123.53	2.31
10/30/2018 16:03	5703	71.83	123.55	2.34
10/30/2018 16:04	5704	71.89	123.50	2.28
10/30/2018 16:05	5705	71.85	123.53	2.32
10/30/2018 16:06	5706	71.89	123.50	2.28
10/30/2018 16:07	5707	71.85	123.54	2.32
10/30/2018 16:08	5708	71.88	123.51	2.29
10/30/2018 16:09	5709	71.92	123.47	2.25
10/30/2018 16:10	5710	71.90	123.49	2.27
10/30/2018 16:11	5711	71.86	123.53	2.31
10/30/2018 16:12	5712	71.85	123.54	2.32
10/30/2018 16:13	5713	71.87	123.51	2.30
10/30/2018 16:14	5714	71.92	123.47	2.25
10/30/2018 16:15	5715	71.93	123.45	2.23
10/30/2018 16:16	5716	71.92	123.46	2.25
10/30/2018 16:17	5717	71.91	123.48	2.26
10/30/2018 16:18	5718	71.91	123.47	2.25
10/30/2018 16:19	5719	71.91	123.48	2.26
10/30/2018 16:20	5720	71.92	123.46	2.25
10/30/2018 16:21	5721	71.94	123.45	2.23
10/30/2018 16:22	5722	71.95	123.44	2.22
10/30/2018 16:23	5723	71.95	123.43	2.22
10/30/2018 16:24	5724	71.94	123.45	2.23
10/30/2018 16:25	5725	71.98	123.41	2.19
10/30/2018 16:26	5726	72.06	123.32	2.10
10/30/2018 16:27	5727	71.95	123.44	2.22
10/30/2018 16:28	5728	72.04	123.35	2.13
10/30/2018 16:29	5729	72.02	123.37	2.15

Sugarloaf Well #2
Drawdown/Recovery Data - 30 GPM Test

Date and Time	Elapsed Time (minutes)	Water Column Over Transducer (ft)	Calculated Depth To Water (feet RP)	Drawdown (feet)
10/30/2018 16:30	5730	72.00	123.39	2.17
10/30/2018 16:31	5731	71.99	123.39	2.17
10/30/2018 16:32	5732	72.06	123.33	2.11
10/30/2018 16:33	5733	72.02	123.36	2.15
10/30/2018 16:34	5734	72.03	123.35	2.13
10/30/2018 16:35	5735	72.03	123.35	2.14
10/30/2018 16:36	5736	72.01	123.37	2.15
10/30/2018 16:37	5737	72.05	123.33	2.11
10/30/2018 16:38	5738	72.07	123.32	2.10
10/30/2018 16:39	5739	72.06	123.32	2.10
10/30/2018 16:40	5740	72.06	123.33	2.11
10/30/2018 16:41	5741	72.06	123.33	2.11
10/30/2018 16:42	5742	72.06	123.32	2.10
10/30/2018 16:43	5743	72.09	123.29	2.08
10/30/2018 16:44	5744	72.11	123.27	2.05
10/30/2018 16:45	5745	72.09	123.29	2.07
10/30/2018 16:46	5746	72.11	123.27	2.05
10/30/2018 16:47	5747	72.07	123.32	2.10
10/30/2018 16:48	5748	72.11	123.27	2.05
10/30/2018 16:49	5749	72.10	123.28	2.07
10/30/2018 16:50	5750	72.11	123.27	2.05
10/30/2018 16:51	5751	72.14	123.24	2.03
10/30/2018 16:52	5752	72.14	123.24	2.02
10/30/2018 16:53	5753	72.14	123.25	2.03
10/30/2018 16:54	5754	72.14	123.24	2.02
10/30/2018 16:55	5755	72.13	123.25	2.03
10/30/2018 16:56	5756	72.18	123.20	1.98
10/30/2018 16:57	5757	72.17	123.21	1.99
10/30/2018 16:58	5758	72.22	123.16	1.94
10/30/2018 16:59	5759	72.17	123.21	1.99
10/30/2018 17:00	5760	72.17	123.21	1.99

APPENDIX D

LABORATORY DATA SHEETS

Date of Report: 12/07/2018

David Kirk

Lawrence & Associates
3590 Iron Court
Shasta Lake City, CA 96019

Client Project:	018.024.00 Sugarloaf Well #2
BCL Project:	General Quotation
BCL Work Order:	1834269
Invoice ID:	B324173, B324490

Enclosed are the results of analyses for samples received by the laboratory on 11/1/2018. If you have any questions concerning this report, please feel free to contact me.

Revised Report: This report supercedes Report ID 1000825703

Sincerely,

Contact Person: Felicia Johnson
Client Service Rep

Stuart Buttram
Technical Director

Certifications: CA ELAP #1186; NV #CA00014; OR ELAP #4032-001; AK UST101

Table of Contents

Chain of Custody and Cooler Receipt Form for 1834269 Page 1 of 2

LAWRENCE & ASSOCIATES
3590 Iron Ct.
Shasta Lake, CA 96019
(530) 275-4800
fax: (530) 275-7970

CHAIN-OF-CUSTODY FORM

18-34269

PROJECT Sugarloaf Well #2
JOB NUMBER 018024.00
CONTACT David Kirk

LABORATORY BC Laboratories
4100 Atlas Ct
Bakersfield, CA 93308

PLEASE RETURN ORIGINAL

ANALYSIS REQUESTED

Ca, Mg, Na, K, HCO_3	CO_3, OH, Alkalinity as $CaCO_3$	Hardness, Aggressive index	Langelier index, Cl, F,	nitrate as NO_3, SO_4	nitrate + nitrite as N,	TDS, MBAS, color,	Perchlorate, Organics by EPA 524.2, Gross Alpha, Radium 228	hexCr,	Metals*
X	X	X	X	X	X	X	X	X	X

MATRIX: WATER	SOIL	WASTE	GAS	# CONTAINERS	H_2SO_4	HNO_3	ICE	HCL	OTHER	SAMPLE NUMBER	YEAR	MO.	DAY	TIME	NOTE #	LABORATORY I.D. #
X				9			X			Well #2	18	10	31	1015		-1
								X		Vots (3)						
					X					Nitrite (1)						
						X				Metals (3)						

SHORT HOLDING TIME
Cr^{+6} NO_2 NO_3 OP SS
DO Cl_2 BOD MBAS COT

CHK BY DISTRIBUTION
SUB-OUT ☒

COMMENTS AND NOTES
L & A GLOBAL ID#
SITE ID #

* = Al, Sb, As, Ba, Be, Cd, Cr, Cu, Fe, Pb, Mn, Hg, Ni, Se, Ag, Ti and Zn

email results to dkirk@lwrnc.com

PAGE 1 OF 1 BILL TO: L&A ☒ CLIENT ☐

CHAIN OF CUSTODY RECORD

SAMPLED BY: (Signature) Date/Hour: David L Kirk 10/31/18 10:15	
RELINQUISHED BY: (Signature) Date/Hour	RECEIVED BY: (Signature) Date/Hour
RELINQUISHED BY: (Signature) Date/Hour	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature) Date/Hour	RECEIVED BY: (Signature)
DISPATCHED BY: (Signature) Date/Hour: David L Kirk 10/31/18 1400	RECEIVED BY: (Signature) 11.1.18 10:50

Chain of Custody and Cooler Receipt Form for 1834269 Page 2 of 2

BC LABORATORIES INC.

COOLER RECEIPT FORM

Page 1 Of 1

Submission #: 18-34269

SHIPPING INFORMATION

Fed Ex ☐ UPS ☐ Ontrac ☒ Hand Delivery ☐
BC Lab Field Service ☐ Other ☐ (Specify)

SHIPPING CONTAINER

Ice Chest ☒ None ☐ Box ☐
Other ☐ (Specify)

FREE LIQUID

YES ☐ NO ☐
W / S

Refrigerant: Ice ☒ Blue Ice ☐ None ☐ Other ☐ Comments:

Custody Seals: Ice Chest ☐ Intact? Yes ☐ No ☐ Containers ☐ Intact? Yes ☐ No ☐ None ☒ Comments:

All samples received? Yes ☒ No ☐ All samples containers intact? Yes ☒ No ☐ Description(s) match COC? Yes ☒ No ☐

COC Received ☒ YES ☐ NO

Emissivity: .97 Container: PPE Thermometer ID: 274 Date/Time 11.1.18

Temperature: (A) 0.0 °C / (C) 0.0 °C Analyst Init 10:50

SAMPLE CONTAINERS	1	2	3	4	5	6	7	8	9	10
QT PE UNPRES	C,A(B)									
4oz / 8oz / 16oz PE UNPRES										
2oz Cr+6	K									
QT INORGANIC CHEMICAL METALS	FG									
INORGANIC CHEMICAL METALS 4oz / 8oz / 16oz	E									
PT CYANIDE										
PT NITROGEN FORMS										
PT TOTAL SULFIDE										
2oz. NITRATE / NITRITE	T									
PT TOTAL ORGANIC CARBON										
PT CHEMICAL OXYGEN DEMAND										
PtA PHENOLICS										
40ml VOA VIAL TRAVEL BLANK										
40ml VOA VIAL	M(3)									
QT EPA 1664										
PT ODOR										
RADIOLOGICAL										
BACTERIOLOGICAL										
40 ml VOA VIAL- 504										
QT EPA 508/608/8080										
QT EPA 515.1/8150										
QT EPA 525										
QT EPA 525 TRAVEL BLANK										
40ml EPA 547										
40ml EPA 531.1										
8oz EPA 548										
QT EPA 549										
QT EPA 8015M										
QT EPA 8270										
8oz / 16oz / 32oz AMBER										
8oz / 16oz / 32oz JAR										
SOIL SLEEVE										
PCB VIAL										
PLASTIC BAG										
TEDLAR BAG										
FERROUS IRON										
ENCORE										
SMART KIT										
SUMMA CANISTER										

Comments:

Sample Numbering Completed By: M Date/Time: 11/01 1200

A = Actual / C = Corrected

Rev 21 05/23/2016

[S:\WPDocs\WordPerfect\LAB_DOCS\FORMS\SAMREC rev 21]

Lawrence & Associates		**Reported:**	12/07/2018 10:28
3590 Iron Court		Project:	General Quotation
Shasta Lake City, CA 96019		Project Number:	018.024.00 Sugarloaf Well #2
		Project Manager:	David Kirk

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
1834269-01	**COC Number:**	---	**Receive Date:**	11/01/2018 10:50
	Project Number:	---	**Sampling Date:**	10/31/2018 10:15
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	Well #2	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water

Lawrence & Associates 3590 Iron Court Shasta Lake City, CA 96019	**Reported:** 12/07/2018 10:28 Project: General Quotation Project Number: 018.024.00 Sugarloaf Well #2 Project Manager: David Kirk

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID: 1834269-01 **Client Sample Name:** Well #2, 10/31/2018 10:15:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Benzene	ND	ug/L	0.50	0.11	EPA-524.2	ND		1
Bromobenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
Bromochloromethane	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
Bromodichloromethane	ND	ug/L	0.50	0.20	EPA-524.2	ND		1
Bromoform	ND	ug/L	0.50	0.46	EPA-524.2	ND		1
Bromomethane	ND	ug/L	0.50	0.20	EPA-524.2	ND	V11	1
n-Butylbenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
sec-Butylbenzene	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
tert-Butylbenzene	ND	ug/L	0.50	0.18	EPA-524.2	ND		1
Carbon tetrachloride	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
Chlorobenzene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Chloroethane	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
Chloroform	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Chloromethane	ND	ug/L	0.50	0.11	EPA-524.2	ND		1
2-Chlorotoluene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
4-Chlorotoluene	ND	ug/L	0.50	0.093	EPA-524.2	ND		1
Dibromochloromethane	ND	ug/L	0.50	0.22	EPA-524.2	ND		1
1,2-Dibromo-3-chloropropane	ND	ug/L	1.0	0.89	EPA-524.2	ND		1
1,2-Dibromoethane	ND	ug/L	0.50	0.22	EPA-524.2	ND		1
Dibromomethane	ND	ug/L	0.50	0.23	EPA-524.2	ND		1
1,2-Dichlorobenzene	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
1,3-Dichlorobenzene	ND	ug/L	0.50	0.16	EPA-524.2	ND		1
1,4-Dichlorobenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
Dichlorodifluoromethane	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
1,1-Dichloroethane	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
1,2-Dichloroethane	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,1-Dichloroethene	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
cis-1,2-Dichloroethene	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
trans-1,2-Dichloroethene	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,2-Dichloropropane	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
1,3-Dichloropropane	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
2,2-Dichloropropane	ND	ug/L	0.50	0.18	EPA-524.2	ND		1
1,1-Dichloropropene	ND	ug/L	0.50	0.19	EPA-524.2	ND		1

Lawrence & Associates 3590 Iron Court Shasta Lake City, CA 96019	**Reported:** 12/07/2018 10:28 Project: General Quotation Project Number: 018.024.00 Sugarloaf Well #2 Project Manager: David Kirk

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID: 1834269-01 **Client Sample Name:** Well #2, 10/31/2018 10:15:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
cis-1,3-Dichloropropene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
trans-1,3-Dichloropropene	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
Total 1,3-Dichloropropene	ND	ug/L	0.50	0.27	EPA-524.2	ND		1
Ethylbenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND		1
Hexachlorobutadiene	ND	ug/L	0.50	0.20	EPA-524.2	ND		1
Isopropylbenzene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
p-Isopropyltoluene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Methylene chloride	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
Methyl t-butyl ether	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Naphthalene	ND	ug/L	0.50	0.16	EPA-524.2	ND		1
n-Propylbenzene	ND	ug/L	0.50	0.12	EPA-524.2	ND		1
Styrene	ND	ug/L	0.50	0.12	EPA-524.2	ND		1
1,1,1,2-Tetrachloroethane	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
1,1,2,2-Tetrachloroethane	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
Tetrachloroethene	ND	ug/L	0.50	0.23	EPA-524.2	ND		1
Toluene	**4.5**	**ug/L**	**0.50**	**0.17**	**EPA-524.2**	ND		1
1,2,3-Trichlorobenzene	ND	ug/L	0.50	0.19	EPA-524.2	ND	V11	1
1,2,4-Trichlorobenzene	ND	ug/L	0.50	0.15	EPA-524.2	ND	V11	1
1,1,1-Trichloroethane	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
1,1,2-Trichloroethane	ND	ug/L	0.50	0.21	EPA-524.2	ND		1
Trichloroethene	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
Trichlorofluoromethane	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
1,2,3-Trichloropropane	ND	ug/L	1.0	0.78	EPA-524.2	ND		1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
1,2,4-Trimethylbenzene	ND	ug/L	0.50	0.17	EPA-524.2	ND		1
1,3,5-Trimethylbenzene	ND	ug/L	0.50	0.14	EPA-524.2	ND		1
Vinyl chloride	ND	ug/L	0.50	0.18	EPA-524.2	ND		1
Total Xylenes	ND	ug/L	0.50	0.47	EPA-524.2	ND		1
Total Trihalomethanes	ND	ug/L	2.0	0.97	EPA-524.2	ND		1
t-Amyl Methyl ether	ND	ug/L	0.50	0.19	EPA-524.2	ND		1
t-Butyl alcohol	ND	ug/L	10	9.4	EPA-524.2	ND		1
Diisopropyl ether	ND	ug/L	0.50	0.36	EPA-524.2	ND		1
Ethyl t-butyl ether	ND	ug/L	0.50	0.32	EPA-524.2	ND		1

Lawrence & Associates	**Reported:**	12/07/2018 10:28
3590 Iron Court	Project:	General Quotation
Shasta Lake City, CA 96019	Project Number:	018.024.00 Sugarloaf Well #2
	Project Manager:	David Kirk

Volatile Organic Analysis (EPA Method 524.2)

BCL Sample ID: 1834269-01 **Client Sample Name:** Well #2, 10/31/2018 10:15:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
p- & m-Xylenes	ND	ug/L	0.50	0.34	EPA-524.2	ND		1
o-Xylene	ND	ug/L	0.50	0.13	EPA-524.2	ND		1
1,2-Dichloroethane-d4 (Surrogate)	147	%	75 - 125 (LCL - UCL)		EPA-524.2		S09	1
Toluene-d8 (Surrogate)	111	%	80 - 120 (LCL - UCL)		EPA-524.2			1
4-Bromofluorobenzene (Surrogate)	87.1	%	80 - 120 (LCL - UCL)		EPA-524.2			1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-524.2	11/01/18 06:00	11/02/18 01:09	ADC	MS-V15	1	B029007

Lawrence & Associates 3590 Iron Court Shasta Lake City, CA 96019	**Reported:** 12/07/2018 10:28 Project: General Quotation Project Number: 018.024.00 Sugarloaf Well #2 Project Manager: David Kirk

Water Analysis (General Chemistry)

BCL Sample ID: 1834269-01 **Client Sample Name:** Well #2, 10/31/2018 10:15:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Total Recoverable Calcium	**31**	**mg/L**	**0.10**	**0.014**	**EPA-200.7**	ND		1
Total Recoverable Magnesium	**5.3**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Total Recoverable Sodium	**6.3**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	ND		1
Total Recoverable Potassium	**0.41**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	ND	**J**	1
Bicarbonate	**120**	**mg/L**	**5.0**	**5.0**	**EPA-310.1**	ND		2
Carbonate	ND	mg/L	2.5	2.5	EPA-310.1	ND		2
Hydroxide	ND	mg/L	1.4	1.4	EPA-310.1	ND		2
Total Alkalinity as CaCO3	**95**	**mg/L**	**4.1**	**4.1**	**EPA-310.1**	ND		2
Chloride	**0.64**	**mg/L**	**0.50**	**0.077**	**EPA-300.0**	ND		3
Fluoride	**0.075**	**mg/L**	**0.050**	**0.012**	**EPA-300.0**	ND		3
Nitrate/Nitrite as N	ND	mg/L	0.10	0.029	EPA-353.2	ND		4
Nitrate as NO3	ND	mg/L	0.44	0.092	EPA-300.0	ND		3
Sulfate	**7.5**	**mg/L**	**1.0**	**0.13**	**EPA-300.0**	ND		3
Hardness as CaCO3	**100**	**mg/L**	**0.50**	**0.10**	**Calc**	ND		5
Aggressive Index	**11.4**	**NA**	**0**	**0**	**Calc**	0		6
Langlier Index	**-0.49**	**NA**	**-2.00**	**-2.00**	**Calc**	0		6
pH	**7.51**	**pH Units**	**0.05**	**0.05**	**EPA-150.1**		**S05**	7
Total Dissolved Solids @ 180 C	**140**	**mg/L**	**10**	**10**	**EPA-160.1**	ND		8
Color	**3.0**	**Color Units**	**1.0**	**1.0**	**EPA-110.2**			9
MBAS	ND	mg/L	0.10	0.015	EPA-425.1	ND		10
Perchlorate	ND	mg/L	0.0040	0.00092	EPA-314.0	ND		11

Lawrence & Associates 3590 Iron Court Shasta Lake City, CA 96019	**Reported:** 12/07/2018 10:28 Project: General Quotation Project Number: 018.024.00 Sugarloaf Well #2 Project Manager: David Kirk

Water Analysis (General Chemistry)

BCL Sample ID: 1834269-01 **Client Sample Name:** Well #2, 10/31/2018 10:15:00AM

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	11/07/18 08:10	11/07/18 19:05	JRG	PE-OP2	1	B029397
2	EPA-310.1	11/05/18 12:00	11/05/18 16:54	MEV	MET-1	1	B022138
3	EPA-300.0	11/01/18 13:00	11/01/18 19:08	MIG	IC1	1	B029026
4	EPA-353.2	11/26/18 09:42	11/26/18 15:51	JMH	SC-1	1	B030723
5	Calc	11/05/18 11:01	11/14/18 13:29	MSA	Calc	1	B\K0043
6	Calc	11/05/18 12:01	11/14/18 13:29	MSA	Calc	1	B\K0043
7	EPA-150.1	11/05/18 12:00	11/05/18 16:54	MEV	MET-1	1	B022138
8	EPA-160.1	11/06/18 13:00	11/06/18 13:00	CAD	MANUAL	1	B029326
9	EPA-110.2	11/02/18 08:30	11/02/18 08:30	TMT	MANUAL	1	B029464
10	EPA-425.1	11/02/18 07:00	11/02/18 07:00	JMN	SPEC06	1	B029063
11	EPA-314.0	11/10/18 14:00	11/10/18 15:53	TMS	IC6	1	B029769

Lawrence & Associates 3590 Iron Court Shasta Lake City, CA 96019		**Reported:**	12/07/2018 10:28
		Project:	General Quotation
		Project Number:	018.024.00 Sugarloaf Well #2
		Project Manager:	David Kirk

Metals Analysis

BCL Sample ID: 1834269-01 **Client Sample Name:** Well #2, 10/31/2018 10:15:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Hexavalent Chromium	**0.045**	**ug/L**	**0.20**	**0.031**	**EPA-218.6**	ND	**J**	1
Total Recoverable Aluminum	**160**	**ug/L**	**50**	**26**	**EPA-200.7**	ND		2
Total Recoverable Antimony	**20**	**ug/L**	**100**	**5.0**	**EPA-200.7**	ND	**J**	2
Total Recoverable Arsenic	ND	ug/L	10	3.5	EPA-200.8	ND	A07	3
Total Recoverable Barium	**90**	**ug/L**	**10**	**3.5**	**EPA-200.7**	ND		2
Total Recoverable Beryllium	**2.2**	**ug/L**	**5.0**	**0.70**	**EPA-200.8**	1.7	**J,A07**	3
Total Recoverable Cadmium	ND	ug/L	1.0	0.11	EPA-200.8	ND		4
Total Recoverable Chromium	ND	ug/L	10	1.2	EPA-200.7	ND		2
Total Recoverable Copper	**1.5**	**ug/L**	**10**	**1.2**	**EPA-200.7**	ND	**J**	2
Total Recoverable Iron	**850**	**ug/L**	**50**	**30**	**EPA-200.7**	ND		2
Total Recoverable Lead	**0.39**	**ug/L**	**1.0**	**0.10**	**EPA-200.8**	ND	**J**	4
Total Recoverable Manganese	**130**	**ug/L**	**1.0**	**0.45**	**EPA-200.8**	0.46		4
Total Recoverable Mercury	**0.000048**	**mg/L**	**0.00020**	**0.000029**	**EPA-245.1**	0.000032	**J**	5
Total Recoverable Nickel	**2.5**	**ug/L**	**10**	**2.3**	**EPA-200.7**	ND	**J**	2
Total Recoverable Selenium	ND	ug/L	2.0	0.19	EPA-200.8	ND		4
Total Recoverable Silver	ND	ug/L	1.0	0.10	EPA-200.8	ND		4
Total Recoverable Thallium	ND	ug/L	100	11	EPA-200.7	ND		2
Total Recoverable Zinc	**30**	**ug/L**	**10**	**1.7**	**EPA-200.8**	ND		4

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-218.6	11/01/18 20:00	11/01/18 22:51	MIG	IC-4	1	B029024
2	EPA-200.7	11/07/18 08:10	11/07/18 19:05	JRG	PE-OP2	1	B029397
3	EPA-200.8	11/07/18 08:00	11/09/18 19:07	ARD	PE-EL4	5	B029394
4	EPA-200.8	11/07/18 08:00	11/08/18 23:21	ARD	PE-EL4	1	B029394
5	EPA-245.1	11/06/18 15:00	11/07/18 08:45	JP1	CETAC2	1	B029365

Lawrence & Associates 3590 Iron Court Shasta Lake City, CA 96019	**Reported:** 12/07/2018 10:28 Project: General Quotation Project Number: 018.024.00 Sugarloaf Well #2 Project Manager: David Kirk

Volatile Organic Analysis (EPA Method 524.2)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B029007						
Benzene	B029007-BLK1	ND	ug/L	0.50	0.11	
Bromobenzene	B029007-BLK1	ND	ug/L	0.50	0.15	
Bromochloromethane	B029007-BLK1	ND	ug/L	0.50	0.27	
Bromodichloromethane	B029007-BLK1	ND	ug/L	0.50	0.20	
Bromoform	B029007-BLK1	ND	ug/L	0.50	0.46	
Bromomethane	B029007-BLK1	ND	ug/L	0.50	0.20	
n-Butylbenzene	B029007-BLK1	ND	ug/L	0.50	0.15	
sec-Butylbenzene	B029007-BLK1	ND	ug/L	0.50	0.13	
tert-Butylbenzene	B029007-BLK1	ND	ug/L	0.50	0.18	
Carbon tetrachloride	B029007-BLK1	ND	ug/L	0.50	0.17	
Chlorobenzene	B029007-BLK1	ND	ug/L	0.50	0.14	
Chloroethane	B029007-BLK1	ND	ug/L	0.50	0.17	
Chloroform	B029007-BLK1	ND	ug/L	0.50	0.14	
Chloromethane	B029007-BLK1	ND	ug/L	0.50	0.11	
2-Chlorotoluene	B029007-BLK1	ND	ug/L	0.50	0.14	
4-Chlorotoluene	B029007-BLK1	ND	ug/L	0.50	0.093	
Dibromochloromethane	B029007-BLK1	ND	ug/L	0.50	0.22	
1,2-Dibromo-3-chloropropane	B029007-BLK1	ND	ug/L	1.0	0.89	
1,2-Dibromoethane	B029007-BLK1	ND	ug/L	0.50	0.22	
Dibromomethane	B029007-BLK1	ND	ug/L	0.50	0.23	
1,2-Dichlorobenzene	B029007-BLK1	ND	ug/L	0.50	0.21	
1,3-Dichlorobenzene	B029007-BLK1	ND	ug/L	0.50	0.16	
1,4-Dichlorobenzene	B029007-BLK1	ND	ug/L	0.50	0.15	
Dichlorodifluoromethane	B029007-BLK1	ND	ug/L	0.50	0.15	
1,1-Dichloroethane	B029007-BLK1	ND	ug/L	0.50	0.15	
1,2-Dichloroethane	B029007-BLK1	ND	ug/L	0.50	0.17	
1,1-Dichloroethene	B029007-BLK1	ND	ug/L	0.50	0.27	
cis-1,2-Dichloroethene	B029007-BLK1	ND	ug/L	0.50	0.27	
trans-1,2-Dichloroethene	B029007-BLK1	ND	ug/L	0.50	0.17	
1,2-Dichloropropane	B029007-BLK1	ND	ug/L	0.50	0.15	
1,3-Dichloropropane	B029007-BLK1	ND	ug/L	0.50	0.13	
2,2-Dichloropropane	B029007-BLK1	ND	ug/L	0.50	0.18	
1,1-Dichloropropene	B029007-BLK1	ND	ug/L	0.50	0.19	
cis-1,3-Dichloropropene	B029007-BLK1	ND	ug/L	0.50	0.14	

Lawrence & Associates		**Reported:**	12/07/2018 10:28
3590 Iron Court		Project:	General Quotation
Shasta Lake City, CA 96019		Project Number:	018.024.00 Sugarloaf Well #2
		Project Manager:	David Kirk

Volatile Organic Analysis (EPA Method 524.2)

Quality Control Report - Method Blank Analysis

QC Batch ID: B029007

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
trans-1,3-Dichloropropene	B029007-BLK1	ND	ug/L	0.50	0.13	
Total 1,3-Dichloropropene	B029007-BLK1	ND	ug/L	0.50	0.27	
Ethylbenzene	B029007-BLK1	ND	ug/L	0.50	0.15	
Hexachlorobutadiene	B029007-BLK1	ND	ug/L	0.50	0.20	
Isopropylbenzene	B029007-BLK1	ND	ug/L	0.50	0.14	
p-Isopropyltoluene	B029007-BLK1	ND	ug/L	0.50	0.14	
Methylene chloride	B029007-BLK1	ND	ug/L	0.50	0.21	
Methyl t-butyl ether	B029007-BLK1	ND	ug/L	0.50	0.14	
Naphthalene	B029007-BLK1	ND	ug/L	0.50	0.16	
n-Propylbenzene	B029007-BLK1	ND	ug/L	0.50	0.12	
Styrene	B029007-BLK1	ND	ug/L	0.50	0.12	
1,1,1,2-Tetrachloroethane	B029007-BLK1	ND	ug/L	0.50	0.21	
1,1,2,2-Tetrachloroethane	B029007-BLK1	ND	ug/L	0.50	0.17	
Tetrachloroethene	B029007-BLK1	ND	ug/L	0.50	0.23	
Toluene	B029007-BLK1	ND	ug/L	0.50	0.17	
1,2,3-Trichlorobenzene	B029007-BLK1	ND	ug/L	0.50	0.19	
1,2,4-Trichlorobenzene	B029007-BLK1	ND	ug/L	0.50	0.15	
1,1,1-Trichloroethane	B029007-BLK1	ND	ug/L	0.50	0.21	
1,1,2-Trichloroethane	B029007-BLK1	ND	ug/L	0.50	0.21	
Trichloroethene	B029007-BLK1	ND	ug/L	0.50	0.19	
Trichlorofluoromethane	B029007-BLK1	ND	ug/L	0.50	0.14	
1,2,3-Trichloropropane	B029007-BLK1	ND	ug/L	1.0	0.78	
1,1,2-Trichloro-1,2,2-trifluoroethane	B029007-BLK1	ND	ug/L	0.50	0.19	
1,2,4-Trimethylbenzene	B029007-BLK1	ND	ug/L	0.50	0.17	
1,3,5-Trimethylbenzene	B029007-BLK1	ND	ug/L	0.50	0.14	
Vinyl chloride	B029007-BLK1	ND	ug/L	0.50	0.18	
Total Xylenes	B029007-BLK1	ND	ug/L	0.50	0.47	
Total Trihalomethanes	B029007-BLK1	ND	ug/L	2.0	0.97	
t-Amyl Methyl ether	B029007-BLK1	ND	ug/L	0.50	0.19	
t-Butyl alcohol	B029007-BLK1	ND	ug/L	10	9.4	
Diisopropyl ether	B029007-BLK1	ND	ug/L	0.50	0.36	
Ethyl t-butyl ether	B029007-BLK1	ND	ug/L	0.50	0.32	
p- & m-Xylenes	B029007-BLK1	ND	ug/L	0.50	0.34	
o-Xylene	B029007-BLK1	ND	ug/L	0.50	0.13	

Lawrence & Associates 3590 Iron Court Shasta Lake City, CA 96019	**Reported:** Project: Project Number: Project Manager:	12/07/2018 10:28 General Quotation 018.024.00 Sugarloaf Well #2 David Kirk

Volatile Organic Analysis (EPA Method 524.2)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B029007						
1,2-Dichloroethane-d4 (Surrogate)	**B029007-BLK1**	**93.3**	%	**75 - 125 (LCL - UCL)**		
Toluene-d8 (Surrogate)	**B029007-BLK1**	**96.0**	%	**80 - 120 (LCL - UCL)**		
4-Bromofluorobenzene (Surrogate)	**B029007-BLK1**	**73.7**	%	**80 - 120 (LCL - UCL)**		**S09**

Lawrence & Associates 3590 Iron Court Shasta Lake City, CA 96019	**Reported:** 12/07/2018 10:28 Project: General Quotation Project Number: 018.024.00 Sugarloaf Well #2 Project Manager: David Kirk

Volatile Organic Analysis (EPA Method 524.2)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: B029007										
Benzene	B029007-BS1	LCS	23.920	25.000	ug/L	95.7		70 - 130		
Bromodichloromethane	B029007-BS1	LCS	23.980	25.000	ug/L	95.9		70 - 130		
Chlorobenzene	B029007-BS1	LCS	23.070	25.000	ug/L	92.3		70 - 130		
Chloroethane	B029007-BS1	LCS	22.800	25.000	ug/L	91.2		70 - 130		
1,4-Dichlorobenzene	B029007-BS1	LCS	22.570	25.000	ug/L	90.3		70 - 130		
1,1-Dichloroethane	B029007-BS1	LCS	22.340	25.000	ug/L	89.4		70 - 130		
1,1-Dichloroethene	B029007-BS1	LCS	22.370	25.000	ug/L	89.5		70 - 130		
Toluene	B029007-BS1	LCS	23.870	25.000	ug/L	95.5		70 - 130		
Trichloroethene	B029007-BS1	LCS	22.240	25.000	ug/L	89.0		70 - 130		
1,2-Dichloroethane-d4 (Surrogate)	B029007-BS1	LCS	10.290	10.000	ug/L	103		75 - 125		
Toluene-d8 (Surrogate)	B029007-BS1	LCS	10.380	10.000	ug/L	104		80 - 120		
4-Bromofluorobenzene (Surrogate)	B029007-BS1	LCS	11.030	10.000	ug/L	110		80 - 120		

Lawrence & Associates
3590 Iron Court
Shasta Lake City, CA 96019

Reported: 12/07/2018 10:28
Project: General Quotation
Project Number: 018.024.00 Sugarloaf Well #2
Project Manager: David Kirk

Volatile Organic Analysis (EPA Method 524.2)

Quality Control Report - Precision & Accuracy

QC Batch ID: B029007 Used client sample: N

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
Benzene	MS	1833163-31	ND	24.750	25.000	ug/L		99.0		70 - 130	
	MSD	1833163-31	ND	24.980	25.000	ug/L	0.9	99.9	20	70 - 130	
Bromodichloromethane	MS	1833163-31	ND	24.390	25.000	ug/L		97.6		70 - 130	
	MSD	1833163-31	ND	24.290	25.000	ug/L	0.4	97.2	20	70 - 130	
Chlorobenzene	MS	1833163-31	ND	24.660	25.000	ug/L		98.6		70 - 130	
	MSD	1833163-31	ND	25.000	25.000	ug/L	1.4	100	20	70 - 130	
Chloroethane	MS	1833163-31	ND	24.400	25.000	ug/L		97.6		70 - 130	
	MSD	1833163-31	ND	25.230	25.000	ug/L	3.3	101	20	70 - 130	
1,4-Dichlorobenzene	MS	1833163-31	ND	23.820	25.000	ug/L		95.3		70 - 130	
	MSD	1833163-31	ND	23.230	25.000	ug/L	2.5	92.9	20	70 - 130	
1,1-Dichloroethane	MS	1833163-31	ND	23.340	25.000	ug/L		93.4		70 - 130	
	MSD	1833163-31	ND	23.780	25.000	ug/L	1.9	95.1	20	70 - 130	
1,1-Dichloroethene	MS	1833163-31	ND	25.250	25.000	ug/L		101		70 - 130	
	MSD	1833163-31	ND	25.710	25.000	ug/L	1.8	103	20	70 - 130	
Toluene	MS	1833163-31	ND	25.480	25.000	ug/L		102		70 - 130	
	MSD	1833163-31	ND	25.590	25.000	ug/L	0.4	102	20	70 - 130	
Trichloroethene	MS	1833163-31	ND	24.350	25.000	ug/L		97.4		70 - 130	
	MSD	1833163-31	ND	24.740	25.000	ug/L	1.6	99.0	20	70 - 130	
1,2-Dichloroethane-d4 (Surrogate)	MS	1833163-31	ND	9.4900	10.000	ug/L		94.9		75 - 125	
	MSD	1833163-31	ND	9.5700	10.000	ug/L	0.8	95.7		75 - 125	
Toluene-d8 (Surrogate)	MS	1833163-31	ND	10.410	10.000	ug/L		104		80 - 120	
	MSD	1833163-31	ND	10.170	10.000	ug/L	2.3	102		80 - 120	
4-Bromofluorobenzene (Surrogate)	MS	1833163-31	ND	11.000	10.000	ug/L		110		80 - 120	
	MSD	1833163-31	ND	11.090	10.000	ug/L	0.8	111		80 - 120	

Lawrence & Associates		**Reported:**	12/07/2018 10:28
3590 Iron Court		Project:	General Quotation
Shasta Lake City, CA 96019		Project Number:	018.024.00 Sugarloaf Well #2
		Project Manager:	David Kirk

Water Analysis (General Chemistry)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B\K0043						
Hardness as CaCO3	B\K0043-BLK1	ND	mg/L	0.50	0.10	
Aggressive Index	**B\K0043-BLK1**	**0**	**NA**	**0**	**0**	
Langlier Index	**B\K0043-BLK1**	**0**	**NA**	**-2.00**	**-2.00**	
QC Batch ID: B022138						
Bicarbonate	B022138-BLK1	ND	mg/L	5.0	5.0	
Carbonate	B022138-BLK1	ND	mg/L	2.5	2.5	
Hydroxide	B022138-BLK1	ND	mg/L	1.4	1.4	
Total Alkalinity as CaCO3	B022138-BLK1	ND	mg/L	4.1	4.1	
QC Batch ID: B029026						
Chloride	B029026-BLK1	ND	mg/L	0.50	0.077	
Fluoride	B029026-BLK1	ND	mg/L	0.050	0.012	
Nitrate as NO3	B029026-BLK1	ND	mg/L	0.44	0.092	
Sulfate	B029026-BLK1	ND	mg/L	1.0	0.13	
QC Batch ID: B029063						
MBAS	B029063-BLK1	ND	mg/L	0.10	0.015	
QC Batch ID: B029326						
Total Dissolved Solids @ 180 C	B029326-BLK1	ND	mg/L	6.7	6.7	
QC Batch ID: B029397						
Total Recoverable Calcium	B029397-BLK1	ND	mg/L	0.10	0.014	
Total Recoverable Magnesium	B029397-BLK1	ND	mg/L	0.050	0.019	
Total Recoverable Sodium	B029397-BLK1	ND	mg/L	0.50	0.051	
Total Recoverable Potassium	B029397-BLK1	ND	mg/L	1.0	0.10	
QC Batch ID: B029769						
Perchlorate	B029769-BLK1	ND	mg/L	0.0040	0.00092	
QC Batch ID: B030723						
Nitrate/Nitrite as N	B030723-BLK1	ND	mg/L	0.10	0.029	

Lawrence & Associates 3590 Iron Court Shasta Lake City, CA 96019	**Reported:** 12/07/2018 10:28 Project: General Quotation Project Number: 018.024.00 Sugarloaf Well #2 Project Manager: David Kirk

Water Analysis (General Chemistry)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: B022138										
Total Alkalinity as CaCO3	B022138-BS3	LCS	102.99	100.00	mg/L	103		90 - 110		
pH	B022138-BS2	LCS	7.0300	7.0000	pH Units	100		95 - 105		
QC Batch ID: B029026										
Chloride	B029026-BS1	LCS	52.153	50.000	mg/L	104		90 - 110		
Fluoride	B029026-BS1	LCS	1.0590	1.0000	mg/L	106		90 - 110		
Nitrate as NO3	B029026-BS1	LCS	22.745	22.134	mg/L	103		90 - 110		
Sulfate	B029026-BS1	LCS	101.05	100.00	mg/L	101		90 - 110		
QC Batch ID: B029063										
MBAS	B029063-BS1	LCS	0.20030	0.20000	mg/L	100		85 - 115		
QC Batch ID: B029326										
Total Dissolved Solids @ 180 C	B029326-BS1	LCS	595.00	586.00	mg/L	102		90 - 110		
QC Batch ID: B029397										
Total Recoverable Calcium	B029397-BS1	LCS	10.466	10.000	mg/L	105		85 - 115		
Total Recoverable Magnesium	B029397-BS1	LCS	10.169	10.000	mg/L	102		85 - 115		
Total Recoverable Sodium	B029397-BS1	LCS	10.419	10.000	mg/L	104		85 - 115		
Total Recoverable Potassium	B029397-BS1	LCS	10.476	10.000	mg/L	105		85 - 115		
QC Batch ID: B029769										
Perchlorate	B029769-BS1	LCS	0.010586	0.010000	mg/L	106		85 - 115		
QC Batch ID: B030723										
Nitrate/Nitrite as N	B030723-BS1	LCS	1.9805	2.0000	mg/L	99.0		90 - 110		

Lawrence & Associates	**Reported:**	12/07/2018 10:28
3590 Iron Court	Project:	General Quotation
Shasta Lake City, CA 96019	Project Number:	018.024.00 Sugarloaf Well #2
	Project Manager:	David Kirk

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: B022138	Used client sample: N										
Bicarbonate	DUP	1834306-01	196.06	194.95		mg/L	0.6		10		
Carbonate	DUP	1834306-01	ND	ND		mg/L			10		
Hydroxide	DUP	1834306-01	ND	ND		mg/L			10		
Total Alkalinity as CaCO3	DUP	1834306-01	160.80	159.89		mg/L	0.6		10		
pH	DUP	1834306-01	7.8900	7.9200		pH Units	0.4		20		
QC Batch ID: B029026	Used client sample: N										
Chloride	DUP	1834238-01	4.5280	4.5270		mg/L	0.0		10		
	MS	1834238-01	4.5280	58.314	50.505	mg/L		106		80 - 120	
	MSD	1834238-01	4.5280	58.291	50.505	mg/L	0.0	106	10	80 - 120	
Fluoride	DUP	1834238-01	0.11500	0.11400		mg/L	0.9		10		
	MS	1834238-01	0.11500	1.2182	1.0101	mg/L		109		80 - 120	
	MSD	1834238-01	0.11500	1.2152	1.0101	mg/L	0.2	109	10	80 - 120	
Nitrate as NO3	DUP	1834238-01	4.7234	4.7101		mg/L	0.3		10		
	MS	1834238-01	4.7234	27.853	22.358	mg/L		103		80 - 120	
	MSD	1834238-01	4.7234	27.495	22.358	mg/L	1.3	102	10	80 - 120	
Sulfate	DUP	1834238-01	4.3640	4.3720		mg/L	0.2		10		
	MS	1834238-01	4.3640	107.31	101.01	mg/L		102		80 - 120	
	MSD	1834238-01	4.3640	107.50	101.01	mg/L	0.2	102	10	80 - 120	
QC Batch ID: B029063	Used client sample: N										
MBAS	DUP	1834161-01	0.031200	0.031200		mg/L	0		20		J
	MS	1834161-01	0.031200	0.44060	0.40000	mg/L		102		80 - 120	
	MSD	1834161-01	0.031200	0.42340	0.40000	mg/L	4.0	98.0	20	80 - 120	
QC Batch ID: B029326	Used client sample: N										
Total Dissolved Solids @ 180 C	DUP	1834309-01	238.00	232.00		mg/L	2.6		10		
QC Batch ID: B029397	Used client sample: N										
Total Recoverable Calcium	DUP	1834462-03	19.453	19.160		mg/L	1.5		20		
	MS	1834462-03	19.453	29.569	10.000	mg/L		101		75 - 125	
	MSD	1834462-03	19.453	30.647	10.000	mg/L	3.6	112	20	75 - 125	
Total Recoverable Magnesium	DUP	1834462-03	15.216	14.956		mg/L	1.7		20		
	MS	1834462-03	15.216	25.485	10.000	mg/L		103		75 - 125	
	MSD	1834462-03	15.216	26.199	10.000	mg/L	2.8	110	20	75 - 125	
Total Recoverable Sodium	DUP	1834462-03	63.085	62.020		mg/L	1.7		20		
	MS	1834462-03	63.085	75.518	10.000	mg/L		124		75 - 125	
	MSD	1834462-03	63.085	74.319	10.000	mg/L	1.6	112	20	75 - 125	
Total Recoverable Potassium	DUP	1834462-03	3.0420	3.0621		mg/L	0.7		20		
	MS	1834462-03	3.0420	13.025	10.000	mg/L		99.8		75 - 125	
	MSD	1834462-03	3.0420	13.535	10.000	mg/L	3.8	105	20	75 - 125	

Lawrence & Associates
3590 Iron Court
Shasta Lake City, CA 96019

Reported: 12/07/2018 10:28
Project: General Quotation
Project Number: 018.024.00 Sugarloaf Well #2
Project Manager: David Kirk

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: B029464	Used client sample: N										
Color	DUP	1834309-09	1.0000	1.0000		Color Units	0		20		
QC Batch ID: B029769	Used client sample: Y - Description: Well #2, 10/31/2018 10:15										
Perchlorate	DUP	1834269-01	ND	ND		mg/L			15		
	MS	1834269-01	ND	0.011849	0.010101	mg/L		117		80 - 120	
	MSD	1834269-01	ND	0.011442	0.010101	mg/L	3.5	113	15	80 - 120	
QC Batch ID: B030723	Used client sample: N										
Nitrate/Nitrite as N	DUP	1836482-01	0.029600	0.032700		mg/L	10.0		10		J
	MS	1836482-01	0.029600	4.1817	4.2105	mg/L		98.6		90 - 110	
	MSD	1836482-01	0.029600	4.1777	4.2105	mg/L	0.1	98.5	10	90 - 110	

Lawrence & Associates		**Reported:**	12/07/2018 10:28
3590 Iron Court		Project:	General Quotation
Shasta Lake City, CA 96019		Project Number:	018.024.00 Sugarloaf Well #2
		Project Manager:	David Kirk

Metals Analysis

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B029024						
Hexavalent Chromium	B029024-BLK1	ND	ug/L	0.20	0.031	
QC Batch ID: B029365						
Total Recoverable Mercury	**B029365-BLK1**	**0.000032500**	**mg/L**	**0.00020**	**0.000029**	**J**
QC Batch ID: B029394						
Total Recoverable Arsenic	B029394-BLK2	ND	ug/L	2.0	0.70	
Total Recoverable Beryllium	**B029394-BLK2**	**0.33700**	**ug/L**	**1.0**	**0.14**	**J**
Total Recoverable Cadmium	B029394-BLK1	ND	ug/L	1.0	0.11	
Total Recoverable Lead	B029394-BLK1	ND	ug/L	1.0	0.10	
Total Recoverable Manganese	**B029394-BLK1**	**0.46300**	**ug/L**	**1.0**	**0.45**	**J**
Total Recoverable Selenium	B029394-BLK1	ND	ug/L	2.0	0.19	
Total Recoverable Silver	B029394-BLK1	ND	ug/L	1.0	0.10	
Total Recoverable Zinc	B029394-BLK1	ND	ug/L	10	1.7	
QC Batch ID: B029397						
Total Recoverable Aluminum	B029397-BLK1	ND	ug/L	50	26	
Total Recoverable Antimony	B029397-BLK1	ND	ug/L	100	5.0	
Total Recoverable Barium	B029397-BLK1	ND	ug/L	10	3.5	
Total Recoverable Chromium	B029397-BLK1	ND	ug/L	10	1.2	
Total Recoverable Copper	B029397-BLK1	ND	ug/L	10	1.2	
Total Recoverable Iron	B029397-BLK1	ND	ug/L	50	30	
Total Recoverable Nickel	B029397-BLK1	ND	ug/L	10	2.3	
Total Recoverable Thallium	B029397-BLK2	ND	ug/L	100	11	

Lawrence & Associates
3590 Iron Court
Shasta Lake City, CA 96019

Reported: 12/07/2018 10:28
Project: General Quotation
Project Number: 018.024.00 Sugarloaf Well #2
Project Manager: David Kirk

Metals Analysis

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: B029024										
Hexavalent Chromium	B029024-BS1	LCS	19.879	20.000	ug/L	99.4		90 - 110		
QC Batch ID: B029365										
Total Recoverable Mercury	B029365-BS1	LCS	0.0011125	0.0010000	mg/L	111		85 - 115		
QC Batch ID: B029394										
Total Recoverable Arsenic	B029394-BS2	LCS	109.27	100.00	ug/L	109		85 - 115		
Total Recoverable Beryllium	B029394-BS2	LCS	43.378	40.000	ug/L	108		85 - 115		
Total Recoverable Cadmium	B029394-BS1	LCS	41.602	40.000	ug/L	104		85 - 115		
Total Recoverable Lead	B029394-BS1	LCS	102.96	100.00	ug/L	103		85 - 115		
Total Recoverable Manganese	B029394-BS1	LCS	108.48	100.00	ug/L	108		85 - 115		
Total Recoverable Selenium	B029394-BS1	LCS	99.598	100.00	ug/L	99.6		85 - 115		
Total Recoverable Silver	B029394-BS1	LCS	41.530	40.000	ug/L	104		85 - 115		
Total Recoverable Zinc	B029394-BS1	LCS	101.44	100.00	ug/L	101		85 - 115		
QC Batch ID: B029397										
Total Recoverable Aluminum	B029397-BS1	LCS	1038.2	1000.0	ug/L	104		85 - 115		
Total Recoverable Antimony	B029397-BS1	LCS	391.63	400.00	ug/L	97.9		85 - 115		
Total Recoverable Barium	B029397-BS1	LCS	406.48	400.00	ug/L	102		85 - 115		
Total Recoverable Chromium	B029397-BS1	LCS	204.65	200.00	ug/L	102		85 - 115		
Total Recoverable Copper	B029397-BS1	LCS	403.33	400.00	ug/L	101		85 - 115		
Total Recoverable Iron	B029397-BS1	LCS	1033.2	1000.0	ug/L	103		85 - 115		
Total Recoverable Nickel	B029397-BS1	LCS	426.40	400.00	ug/L	107		85 - 115		
Total Recoverable Thallium	B029397-BS2	LCS	437.83	400.00	ug/L	109		85 - 115		

Lawrence & Associates		**Reported:**	12/07/2018 10:28
3590 Iron Court		Project:	General Quotation
Shasta Lake City, CA 96019		Project Number:	018.024.00 Sugarloaf Well #2
		Project Manager:	David Kirk

Metals Analysis

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: B029024	Used client sample: Y - Description: Well #2, 10/31/2018 10:15										
Hexavalent Chromium	DUP	**1834269-01**	**0.045000**	**0.032000**		**ug/L**	**33.8**		**10**		**J,A02**
	MS	**1834269-01**	**0.045000**	**19.843**	**20.202**	**ug/L**		**98.0**		**90 - 110**	
	MSD	**1834269-01**	**0.045000**	**19.701**	**20.202**	**ug/L**	**0.7**	**97.3**	**10**	**90 - 110**	
QC Batch ID: B029365	Used client sample: Y - Description: Well #2, 10/31/2018 10:15										
Total Recoverable Mercury	DUP	1834269-01	0.000047500	ND		mg/L			20		
	MS	1834269-01	0.000047500	0.0011825	0.0010000	mg/L		114		70 - 130	
	MSD	1834269-01	0.000047500	0.0010850	0.0010000	mg/L	8.6	104	20	70 - 130	
QC Batch ID: B029394	Used client sample: N										
Total Recoverable Arsenic	DUP	**1834338-02**	**1.4150**	**1.0790**		**ug/L**	**26.9**		**20**		**J,A02**
	MS	**1834338-02**	**1.4150**	**108.26**	**100.00**	**ug/L**		**107**		**70 - 130**	
	MSD	**1834338-02**	**1.4150**	**108.08**	**100.00**	**ug/L**	**0.2**	**107**	**20**	**70 - 130**	
Total Recoverable Beryllium	DUP	1834338-02	ND	0.14100		ug/L			20		J
	MS	1834338-02	ND	45.095	40.000	ug/L		113		70 - 130	
	MSD	1834338-02	ND	39.318	40.000	ug/L	13.7	98.3	20	70 - 130	
Total Recoverable Cadmium	DUP	**1834338-02**	**0.21700**	**0.15400**		**ug/L**	**34.0**		**20**		**J,A02**
	MS	**1834338-02**	**0.21700**	**42.564**	**40.000**	**ug/L**		**106**		**70 - 130**	
	MSD	**1834338-02**	**0.21700**	**40.167**	**40.000**	**ug/L**	**5.8**	**99.9**	**20**	**70 - 130**	
Total Recoverable Lead	DUP	1834338-02	0.27000	0.26700		ug/L	1.1		20		J
	MS	1834338-02	0.27000	106.75	100.00	ug/L		106		70 - 130	
	MSD	1834338-02	0.27000	101.26	100.00	ug/L	5.3	101	20	70 - 130	
Total Recoverable Manganese	DUP	**1834338-02**	**0.95400**	**0.67700**		**ug/L**	**34.0**		**20**		**J,A02**
	MS	**1834338-02**	**0.95400**	**106.06**	**100.00**	**ug/L**		**105**		**70 - 130**	
	MSD	**1834338-02**	**0.95400**	**103.13**	**100.00**	**ug/L**	**2.8**	**102**	**20**	**70 - 130**	
Total Recoverable Selenium	DUP	1834338-02	ND	ND		ug/L			20		
	MS	1834338-02	ND	99.513	100.00	ug/L		99.5		70 - 130	
	MSD	1834338-02	ND	96.115	100.00	ug/L	3.5	96.1	20	70 - 130	
Total Recoverable Silver	DUP	1834338-02	ND	ND		ug/L			20		
	MS	1834338-02	ND	42.570	40.000	ug/L		106		70 - 130	
	MSD	1834338-02	ND	42.204	40.000	ug/L	0.9	106	20	70 - 130	
Total Recoverable Zinc	DUP	1834338-02	2.8150	ND		ug/L			20		
	MS	1834338-02	2.8150	102.78	100.00	ug/L		100		70 - 130	
	MSD	1834338-02	2.8150	102.26	100.00	ug/L	0.5	99.4	20	70 - 130	
QC Batch ID: B029397	Used client sample: N										
Total Recoverable Aluminum	DUP	1834462-03	391.10	352.99		ug/L	10.2		20		
	MS	1834462-03	391.10	1466.4	1000.0	ug/L		108		75 - 125	
	MSD	1834462-03	391.10	1505.3	1000.0	ug/L	2.6	111	20	75 - 125	

Lawrence & Associates		**Reported:**	12/07/2018 10:28
3590 Iron Court		Project:	General Quotation
Shasta Lake City, CA 96019		Project Number:	018.024.00 Sugarloaf Well #2
		Project Manager:	David Kirk

Metals Analysis

Quality Control Report - Precision & Accuracy

QC Batch ID: B029397 Used client sample: N

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
Total Recoverable Antimony	DUP	1834462-03	ND	ND		ug/L			20		
	MS	1834462-03	ND	383.48	400.00	ug/L		95.9		75 - 125	
	MSD	1834462-03	ND	433.16	400.00	ug/L	12.2	108	20	75 - 125	
Total Recoverable Barium	DUP	1834462-03	34.729	34.084		ug/L	1.9		20		
	MS	1834462-03	34.729	439.83	400.00	ug/L		101		75 - 125	
	MSD	1834462-03	34.729	448.21	400.00	ug/L	1.9	103	20	75 - 125	
Total Recoverable Chromium	DUP	1834462-03	43.016	38.385		ug/L	11.4		20		
	MS	1834462-03	43.016	241.76	200.00	ug/L		99.4		75 - 125	
	MSD	1834462-03	43.016	256.18	200.00	ug/L	5.8	107	20	75 - 125	
Total Recoverable Copper	DUP	1834462-03	8.7996	7.4676		ug/L	16.4		20		J
	MS	1834462-03	8.7996	404.33	400.00	ug/L		98.9		75 - 125	
	MSD	1834462-03	8.7996	438.62	400.00	ug/L	8.1	107	20	75 - 125	
Total Recoverable Iron	DUP	1834462-03	1480.2	1329.3		ug/L	10.7		20		
	MS	1834462-03	1480.2	2326.2	1000.0	ug/L		84.6		75 - 125	
	MSD	1834462-03	1480.2	2364.3	1000.0	ug/L	1.6	88.4	20	75 - 125	
Total Recoverable Nickel	DUP	1834462-03	48.432	42.219		ug/L	13.7		20		
	MS	1834462-03	48.432	458.55	400.00	ug/L		103		75 - 125	
	MSD	1834462-03	48.432	488.41	400.00	ug/L	6.3	110	20	75 - 125	
Total Recoverable Thallium	DUP	1834462-03	ND	ND		ug/L			20		
	MS	1834462-03	ND	424.13	400.00	ug/L		106		75 - 125	
	MSD	1834462-03	ND	433.48	400.00	ug/L	2.2	108	20	75 - 125	

BSK Associates Laboratory Fresno
1414 Stanislaus St
Fresno, CA 93706
559-497-2888 (Main)
559-485-6935 (FAX)

A8K0568
11/16/2018
Invoice: A834247

Felicia Johnson
BC Laboratories
4100 Atlas Court
Bakersfield, CA 93308

RE: Report for A8K0568 General: Project Manager-Felicia Johnson

Dear Felicia Johnson,

Thank you for using BSK Associates for your analytical testing needs. In the following pages, you will find the test results for the samples submitted to our laboratory on 11/6/2018. The results have been approved for release by our Laboratory Director as indicated by the authorizing signature below.

The samples were analyzed for the test(s) indicated on the Chain of Custody (see attached) and the results relate only to the samples analyzed. BSK certifies that the testing was performed in accordance with the quality system requirements specified in the 2009 TNI Standard. Any deviations from this standard or from the method requirements for each test procedure performed will be annotated alongside the analytical result or noted in the Case Narrative. Unless otherwise noted, the sample results are reported on an "as received" basis.

This certificate of analysis shall not be reproduced except in full, without written approval of the laboratory.

If additional clarification of any information is required, please contact your Project Manager, Sarah K. Guenther , at 559-497-2888.

Thank you again for using BSK Associates. We value your business and appreciate your loyalty.

Sincerely,

Sarah Guenther

Sarah K. Guenther, Project Manager

Accredited in Accordance with NELAP
ORELAP #4021-009

BSK ASSOCIATES

A8K0568

General: Project Manager-Felicia Johnson

Case Narrative

Project and Report Details		Invoice Details	
Client:	BC Laboratories	**Invoice To:**	BC Laboratories
Report To:	Felicia Johnson	**Invoice Attn:**	Felicia Johnson
Project #:	1834269	**Project PO#:**	-
Received:	11/06/2018 - 16:40		
Report Due:	11/20/2018		

Sample Receipt Conditions

Cooler: Default Cooler
Temperature on Receipt °C: 4.2

Containers Intact
COC/Labels Agree
Received On Wet Ice
Packing Material - Bubble Wrap
Packing Material - Other
Sample(s) were received in temperature range.
Initial receipt at BSK-FAL

Data Qualifiers

The following qualifiers have been applied to one or more analytical results:

None applied

Report Distribution

Recipient(s)	Report Format	CC:
Felicia Johnson	FINAL.RPT	
Felicia Johnson	FINAL.RPT	sguenther@bskassociates.com;johnw@bclabs.com

BSK ASSOCIATES

A8K0568

General: Project Manager-Felicia Johnson
1834269

Certificate of Analysis

Sample ID: A8K0568-01
Sampled By: Client
Sample Description: 1834269-01

Sample Date - Time: 10/31/18 - 10:15
Matrix: Water
Sample Type: Grab

BSK Associates Laboratory Fresno
Radiological

Analyte	Method	Result	Units	Batch	Prepared	Analyzed	Qual
Gross Alpha	SM 7110C	ND	pCi/L	A816851	11/09/18	11/12/18	
Gross Alpha 1.65 Sigma Uncertainty	SM 7110C	0.156	pCi/L	A816851	11/09/18	11/12/18	
Gross Alpha MDA95	SM 7110C	1.06	pCi/L	A816851	11/09/18	11/12/18	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

A8K0568 FINAL 11162018 1629

BSK ASSOCIATES

A8K0568

General: Project Manager-Felicia Johnson

BSK Associates Laboratory Fresno

Radiological Quality Control Report

SM 7110C - Quality Control

Batch: A816851 — Prepared: 11/9/2018
Prep Method: EPA 00-02 — Analyst: TSY

Analyte	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Date Analyzed	Qual
Blank (A816851-BLK1)											
Gross Alpha	ND	3	pCi/L							11/12/18	
Gross Alpha 1.65 Sigma Uncertainty	ND	0.00	pCi/L							11/12/18	
Gross Alpha MDA95	ND	0.00	pCi/L							11/12/18	
Blank Spike (A816851-BS1)											
Gross Alpha	27.2	3	pCi/L	30	ND	91	73-127			11/12/18	
Blank Spike Dup (A816851-BSD1)											
Gross Alpha	30.7	3	pCi/L	30	ND	102	73-127	12	50	11/12/18	
Matrix Spike (A816851-MS1), Source: A8K0440-04											
Gross Alpha	112	3	pCi/L	120	ND	92	70-130			11/12/18	
Matrix Spike Dup (A816851-MSD1), Source: A8K0440-04											
Gross Alpha	119	3	pCi/L	120	ND	98	70-130	6	50	11/12/18	

BSK ASSOCIATES

A8K0568

General: Project Manager-Felicia Johnson

Certificate of Analysis

Notes:

- The Chain of Custody document and Sample Integrity Sheet are part of the analytical report.
- Any remaining sample(s) for testing will be disposed of according to BSK's sample retention policy unless other arrangements are made in advance.
- All positive results for EPA Methods 504.1 and 524.2 require the analysis of a Field Reagent Blank (FRB) to confirm that the results are not a contamination error from field sampling steps. If Field Reagent Blanks were not submitted with the samples, this method requirement has not been performed.
- Samples collected by BSK Analytical Laboratories were collected in accordance with the BSK Sampling and Collection Standard Operating Procedures.
- J-value is equivalent to DNQ (Detected, not quantified) which is a trace value. A trace value is an analyte detected between the MDL and the laboratory reporting limit. This result is of an unknown data quality and is only qualitative (estimated). Baseline noise, calibration curve extrapolation below the lowest calibrator, method blank detections, and integration artifacts can all produce apparent DNQ values, which contribute to the un-reliability of these values.
- (1) - Residual chlorine and pH analysis have a 15 minute holding time for both drinking and waste water samples as defined by the EPA and 40 CFR 136. Waste water and ground water (monitoring well) samples must be field filtered to meet the 15 minute holding time for dissolved metals.
- Summations of analytes (i.e. Total Trihalomethanes) may appear to add individual amounts incorrectly, due to rounding of analyte values occurring before or after the total value is calculated, as well as rounding of the total value.
- RL Multiplier is the factor used to adjust the reporting limit (RL) due to variations in sample preparation procedures and dilutions required for matrix interferences.
- Due to the subjective nature of the Threshold Odor Method, all characterizations of the detected odor are the opinion of the panel of analysts. The characterizations can be found in Standard Methods 2170B Figure 2170:1.
- The MCLs provided in this report (if applicable) represent the primary MCLs for that analyte.

Definitions

mg/L:	Milligrams/Liter (ppm)	MDL:	Method Detection Limit	MDA95:	Min. Detected Activity
mg/Kg:	Milligrams/Kilogram (ppm)	RL:	Reporting Limit: DL x Dilution	MPN:	Most Probable Number
µg/L:	Micrograms/Liter (ppb)	ND:	None Detected at RL	CFU:	Colony Forming Unit
µg/Kg:	Micrograms/Kilogram (ppb)	pCi/L:	PicoCuries per Liter	Absent:	Less than 1 CFU/100mLs
%:	Percent	RL Mult:	RL Multiplier	Present:	1 or more CFU/100mLs
NR:	Non-Reportable	MCL:	Maximum Contaminant Limit		

Please see the individual Subcontract Lab's report for applicable certifications.

BSK is not accredited under the NELAP program for the following parameters: **NA**

Certifications: Please refer to our website for a copy of our Accredited Fields of Testing under each certification.

Fresno					
EPA - UCMR4	CA00079	Los Angeles CSD	9254479	NELAP certified	4021-010
State of California - ELAP	1180	State of Hawaii	4021	State of Nevada	CA000792019-1
State of Oregon - NELAP	4021-010	State of Washington	C997-18		
Sacramento					
State of California - ELAP	2435				
San Bernardino					
Los Angeles CSD	9254478	NELAP certified	4119-003	State of California - ELAP	2993
State of Oregon - NELAP	4119-003				
Vancouver					
NELAP certified	WA100008-011	State of Oregon - NELAP	WA100008-011	State of Washington	C824-18b

A8K0568

11062018

BCLab4911

Turnaround: Standard
Due Date: 11/20/2018

BC Laboratories

Printed: 11/7/2018 5:55:42PM
Page 1 of 1

SUBCONTRACT ORDER
BC Laboratories
1834269

#53
4.2

SENDING LABORATORY:	RECEIVING LABORATORY:	BSKSA
BC Laboratories 4100 Atlas Court Bakersfield, CA 93308 Phone: 661-327-4911 FAX: 661-327-1918 Project Manager: Felicia Johnson	BSK Analytical Labs 1414 Stanislaus Street Fresno, CA 93706 Phone: (800) 877-8310 FAX: (559) 485-6935	A8K0568 BCLab4911 11/06/2018 10

Analysis		Due	Expires	Comments
Sample ID: 1834269-01	**Water**	**Sampled:**	**10/31/18 10:15**	
EPA 900.0 Gross Alpha		11/15/18 17:00	04/30/19 10:15	
Containers supplied:				

Released By	Date	Received By	Date
	11-6-18		
Released By	Date	Received By	Date
			11-6-18 1040

BSKSA

w/BW/pms

Page 1 of 1
Page 7 of 8

A8K0568 11/06/2018
BCLab4911 10

BSK Associates SR-FL-0002-19

Sample Integrity

BSK Bottles: Yes No Page 1 of 1

COC Info

Was temperature within range? Chemistry ≤ 6°C Micro < 8°C	Yes No NA	Were correct containers and preservatives received for the tests requested?	Yes No NA
If samples were taken today, is there evidence that chilling has begun?	Yes No NA	Bubbles Present VOAs (524.2/TCP/TTHM)? TB Received? (Check Method Below)	Yes No NA Yes No NA
Did all bottles arrive unbroken and intact?	Yes No	Was a sufficient amount of sample received?	Yes No
Did all bottle labels agree with COC?	Yes No	Do samples have a hold time <72 hours?	Yes No
Was sodium thiosulfate added to CN sample(s) until chlorine was no longer present?	Yes No NA	Was PM notified of discrepancies? PM: By/Time:	Yes No NA

Bottles Received — "—" means preservation/chlorine checks are either N/A or are performed in the lab

250ml(A) 500ml(B) 1Liter(C) 40ml VOA(V)	Checks	Passed?	1					
Bact Na₂S₂O₃	—	—						
None (P) White Cap	—	—						
Cr6 (P) Lt. Green Label/Blue Cap NH4OH(NH4)2SO4 DW	Cl, pH > 8	P F						
Cr6 (P) Pink Label/Blue Cap NH4OH(NH4)2SO4 WW	pH 9.3-9.7	P F						
Cr6 (P) Black Label/Blue Cap NH4OH(NH4)2SO4 7199 ***24 HOUR HOLD TIME***	pH 9.0-9.5	P F				11-6-18		
HNO3 (P) Red Cap or HCl (P) Purple Cap/Lt. Blue Label	—	—	1C					
H2SO4 (P) or (AG) Yellow Cap/Label	pH < 2	P F					RR	
NaOH (P) Green Cap	Cl, pH >10	P F						
NaOH + ZnAc (P)	pH > 9	P F						
Dissolved Oxygen 300ml (g)	—	—						
None (AG) 608/8081/8082, 625, 632/8321, 8151, 8270	—	—						
HCl (AG) Lt. Blue Label O&G, Diesel, TCP	—	—						
Ascorbic, EDTA, KH2Ct (AG) Pink Label 525	—	—						
Na2SO3 250mL (AG) Neon Green Label 515	—	—						
Na2S2O3 1 Liter (Brown P) 549	—	—						
Na2S2O3 (AG) Blue Label 548, THM, 524	—	—						
Na2S2O3 (CG) Blue Label 504, 505, 547	—	—						
Na2S2O3 + MCAA (CG) Orange Label 531	pH < 3	P F						
NH4Cl (AG) Purple Label 552	—	—						
EDA (AG) Brown Label DBPs	—	—						
HCL (CG) 524.2,BTEX,Gas, MTBE, 8260/624	—	—						
Buffer pH 4 (CG)	—	—						
H3PO4 (CG) Salmon Label	—	—						
Other:								
Asbestos 1L (P) w/ Foil / LL Metals Bottle	—	—						
Bottled Water	—	—						
Clear Glass 250mL / 500mL / 1 Liter	—	—						
Solids: Brass / Steel / Plastic Bag	—	—						

Split

	Container	Preservative	Date/Time/Initials		Container	Preservative	Date/Time/Initials
S P				S P			
S P				S P			

Comments

11/7/18

✓ Indicates Blanks Received

504 __ 524.2 __ TCP __ TTHM __ 537 __

8260/624 __

Labeled by: 8B @ 1137 Labels checked by: [signature] @ [illegible] RUSH Paged by:_______@_______

Page 8 of 8

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

December 04, 2018

Felicia Johnson
BC Laboratories
4100 Atlas Ct.
Bakersfield, CA 93308

RE: Project: 1834269
Pace Project No.: 30271393

Dear Felicia Johnson:

Enclosed are the analytical results for sample(s) received by the laboratory on November 12, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Carin a. Ferris

Carin Ferris
carin.ferris@pacelabs.com
724-850-5615
Project Manager

Enclosures

REPORT OF LABORATORY ANALYSIS

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: 1834269
Pace Project No.: 30271393

Pennsylvania Certification IDs
- 1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
- ANAB DOD-ELAP Rad Accreditation #: L2417
- Alabama Certification #: 41590
- Arizona Certification #: AZ0734
- Arkansas Certification
- California Certification #: 04222CA
- Colorado Certification #: PA01547
- Connecticut Certification #: PH-0694
- Delaware Certification
- EPA Region 4 DW Rad
- Florida/TNI Certification #: E87683
- Georgia Certification #: C040
- Guam Certification
- Hawaii Certification
- Idaho Certification
- Illinois Certification
- Indiana Certification
- Iowa Certification #: 391
- Kansas/TNI Certification #: E-10358
- Kentucky Certification #: KY90133
- KY WW Permit #: KY0098221
- KY WW Permit #: KY0000221
- Louisiana DHH/TNI Certification #: LA180012
- Louisiana DEQ/TNI Certification #: 4086
- Maine Certification #: 2017020
- Maryland Certification #: 308
- Massachusetts Certification #: M-PA1457
- Michigan/PADEP Certification #: 9991
- Missouri Certification #: 235
- Montana Certification #: Cert0082
- Nebraska Certification #: NE-OS-29-14
- Nevada Certification #: PA014572018-1
- New Hampshire/TNI Certification #: 297617
- New Jersey/TNI Certification #: PA051
- New Mexico Certification #: PA01457
- New York/TNI Certification #: 10888
- North Carolina Certification #: 42706
- North Dakota Certification #: R-190
- Ohio EPA Rad Approval: #41249
- Oregon/TNI Certification #: PA200002-010
- Pennsylvania/TNI Certification #: 65-00282
- Puerto Rico Certification #: PA01457
- Rhode Island Certification #: 65-00282
- South Dakota Certification
- Tennessee Certification #: 02867
- Texas/TNI Certification #: T104704188-17-3
- Utah/TNI Certification #: PA014572017-9
- USDA Soil Permit #: P330-17-00091
- Vermont Dept. of Health: ID# VT-0282
- Virgin Island/PADEP Certification
- Virginia/VELAP Certification #: 9526
- Washington Certification #: C868
- West Virginia DEP Certification #: 143
- West Virginia DHHR Certification #: 9964C
- Wisconsin Approve List for Rad
- Wyoming Certification #: 8TMS-L

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1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: 1834269
Pace Project No.: 30271393

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30271393001	1834269-01	Water	10/31/18 10:15	11/12/18 10:10

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Greensburg, PA 15601
(724)850-5600

SAMPLE ANALYTE COUNT

Project: 1834269
Pace Project No.: 30271393

Lab ID	Sample ID	Method	Analysts	Analytes Reported
30271393001	1834269-01	EPA 904.0	JLW	1

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Greensburg, PA 15601
(724)850-5600

PROJECT NARRATIVE

Project: 1834269
Pace Project No.: 30271393

Method: EPA 904.0
Description: 904.0 Radium 228
Client: BC Laboratories
Date: December 04, 2018

General Information:
1 sample was analyzed for EPA 904.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 1834269
Pace Project No.: 30271393

Sample: 1834269-01 Lab ID: 30271393001 Collected: 10/31/18 10:15 Received: 11/12/18 10:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-228	EPA 904.0	0.916 ± 0.471 (0.839) C:68% T:86%	pCi/L	12/03/18 14:35	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1834269
Pace Project No.: 30271393

QC Batch: 320560 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 30271393001

METHOD BLANK: 1563543 Matrix: Water
Associated Lab Samples: 30271393001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.0132 ± 0.286 (0.667) C:76% T:98%	pCi/L	12/03/18 14:34	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
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Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 1834269
Pace Project No.: 30271393

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

REPORT OF LABORATORY ANALYSIS

SUBCONTRACT ORDER
BC Laboratories
1834269

SENDING LABORATORY:
BC Laboratories
4100 Atlas Court
Bakersfield, CA 93308
Phone: 661-327-4911
FAX: 661-327-1918
Project Manager: Felicia Johnson

RECEIVING LABORATORY: PACEA
PACE Analytical
1638 Roseytown Road, Ste 2,3 &4
Greensburg, PA 15601
Phone: (724) 850-5600
FAX: (724) 850-5601

Analysis		Due	Expires	Comments
Sample ID: 1834269-01	**Water**	**Sampled:**	**10/31/18 10:15**	001
EPA 904.0 Radium 228		11/15/18 17:00	04/30/19 10:15	CA GW
Containers supplied:				

WO#:30271393
30271393

Released By	Date	Received By	Date
[signature]	11-6-18	[signature]	11-12-18 1010

Released By Date Received By Date

PACEA

Page 1 of 1
Page 9 of 10

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical Client Name: BC Laboratories Project # 30271393

Label MJS
LIMS Login MJS

Courier: ☐ Fed Ex ☒ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other ______

Tracking #: 1Z9653760340330831

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no

Thermometer Used N/A Type of Ice: Wet Blue None

Cooler Temperature Observed Temp — °C Correction Factor: — °C Final Temp: — °C

Temp should be above freezing to 6°C

pH paper Lot# 10D4671

Date and Initials of person examining contents: MJS 11-12-18

Comments:	Yes	No	N/A	
Chain of Custody Present:	/			1.
Chain of Custody Filled Out:	/			2.
Chain of Custody Relinquished:	/			3.
Sampler Name & Signature on COC:		/		4.
Sample Labels match COC:	/			5.
-Includes date/time/ID Matrix: WT				
Samples Arrived within Hold Time:	/			6.
Short Hold Time Analysis (<72hr remaining):		/		7.
Rush Turn Around Time Requested:		/		8.
Sufficient Volume:	/			9.
Correct Containers Used:	/			10.
-Pace Containers Used:		/		
Containers Intact:	/			11.
Orthophosphate field filtered			/	12.
Hex Cr Aqueous Compliance/NPDES sample field filtered			/	13.
Organic Samples checked for dechlorination:			/	14.
Filtered volume received for Dissolved tests			/	15.
All containers have been checked for preservation.	/			16. pH<2
All containers needing preservation are found to be in compliance with EPA recommendation.	/			
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed MJS; Date/time of preservation; Lot # of added preservative
Headspace in VOA Vials (>6mm):			/	17.
Trip Blank Present:			/	18.
Trip Blank Custody Seals Present			/	
Rad Aqueous Samples Screened > 0.5 mrem/hr		/		Initial when completed: MJS Date: 11-12-18

Client Notification/ Resolution:

Person Contacted: ______ Date/Time: ______ Contacted By: ______

Comments/ Resolution: ______

☐ A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)
*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

J:\QAQC\Master\Document Management\Sample Mgt\Sample Condition Upon Receipt Pittsburgh (C056-7 16Feb2018)

Page 10 of 10

Lawrence & Associates		**Reported:**	12/07/2018 10:28
3590 Iron Court		Project:	General Quotation
Shasta Lake City, CA 96019		Project Number:	018.024.00 Sugarloaf Well #2
		Project Manager:	David Kirk

Notes And Definitions

J	Estimated Value (CLP Flag)
MDL	Method Detection Limit
ND	Analyte Not Detected
PQL	Practical Quantitation Limit
A02	The difference between duplicate readings is less than the quantitation limit.
A07	Detection and quantitation limits were raised due to sample dilution caused by high analyte concentration or matrix interference.
S05	The sample holding time was exceeded.
S09	The surrogate recovery for this compound was not within the control limits.
V11	The Continuing Calibration Verification (CCV) recovery was not within established control limits.

APPENDIX H

TEST WELL SAMPLING RESULTS AND FIELD NOTES

basic laboratory
www.basiclab.com
2218 Railroad Avenue
Redding, California 96001
voice 530.243.7234
fax 530.243.7494

3860 Morrow Lane, Suite F
Chico, California 95928
voice 530.894.8966
fax 530.894.5143

April 01, 2019

Lab ID: 19C0728

TOM WARNOCK
PACE ENGINEERING
1730 SOUTH STREET
REDDING, CA 96001
RE: GENERAL TESTING

Dear TOM WARNOCK ,

Enclosed are the analysis results for Work Order number 19C0728. All analyses were performed under strict adherence to our established Quality Assurance Plan. Any abnormalities are listed in the qualifier section of this report.

If you have any questions regarding these results, please feel free to contact us at any time. We appreciate the opportunity to service your environmental testing needs.

Sincerely,

Ricky Jensen
For

Ricky Jensen

Ricky D. Jensen
Laboratory Director
California ELAP Certification Number 1677

basic laboratory
www.basiclab.com
2218 Railroad Avenue
Redding, California 96001
voice 530.243.7234
fax 530.243.7494
3860 Morrow Lane, Suite F
Chico, California 95928
voice 530.894.8966
fax 530.894.5143

Report To: PACE ENGINEERING
1730 SOUTH STREET
REDDING, CA 96001
Attention: TOM WARNOCK
Project: GENERAL TESTING

Lab No: 19C0728
Reported: 04/01/19
Phone: 244-0202 x309
P.O. #

Metals - Total

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
POST ~~PRE~~ FILTER 3 - Grab Water (19C0728-03)		Sampled:03/15/19 14:40		Received:03/15/19 15:44					
Antimony	ug/l	ND		0.17	0.50	EPA 200.8	03/28/19	03/20/19	B9C1454
Iron	"	**31.9**		7.5	15.0	"	"	"	"
Manganese	"	**3.97**		0.19	0.50	"	"	"	"
PRE ~~POST~~ FILTER 4 - Grab Water (19C0728-04)		Sampled:03/15/19 14:40		Received:03/15/19 15:44					
Antimony	ug/l	ND		0.17	0.50	EPA 200.8	03/28/19	03/20/19	B9C1454
Iron	"	**346**		7.5	15.0	"	"	"	"
Manganese	"	**51.5**		0.19	0.50	"	"	"	"

Approved By
Basic Laboratory Inc
California ELAP Cert #1677 and #2718

basic laboratory

www.basiclab.com

2218 Railroad Avenue
Redding, California 96001
voice 530.243.7234
fax 530.243.7494

3860 Morrow Lane, Suite F
Chico, California 95928
voice 530.894.8966
fax 530.894.5143

Report To: PACE ENGINEERING
1730 SOUTH STREET
REDDING, CA 96001
Attention: TOM WARNOCK
Project: GENERAL TESTING 199.XX

Lab No: 19C0728
Reported: 04/01/19
Phone: 244-0202 x309
P.O. #

Metals - Dissolved

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
PRE FILTER 1 - Grab Water (19C0728-01)		**Sampled:03/15/19 14:45**		**Received:03/15/19 15:44**					
Antimony	ug/l	ND		0.17	0.50	EPA 200.8	03/28/19	03/28/19	B9C1682
Iron	"	**281**		7.5	15.0	"	"	"	"
Manganese	"	**50.4**		0.19	0.50	"	"	"	"
POST FILTER 2 - Grab Water (19C0728-02)		**Sampled:03/15/19 14:45**		**Received:03/15/19 15:44**					
Antimony	ug/l	ND		0.17	0.50	EPA 200.8	03/28/19	03/28/19	B9C1682
Iron	"	**12.9**	J	7.5	15.0	"	"	"	"
Manganese	"	**4.54**		0.19	0.50	"	"	"	"

Notes and Definitions

J	Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag). The J flag is equivalent to the DNQ Estimated Concentration flag.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the detection limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
<	Less than reporting limit
≤	Less than or equal to reporting limit
>	Greater than reporting limit
≥	Greater than or equal to reporting limit
MDL	Method Detection Limit
RL/ML	Minimum Level of Quantitation
MCL/AL	Maxium Contaminant Level/Action Level
mg/kg	Results reported as wet weight
TTLC	Total Threshold Limit Concentration
STLC	Soluble Threshold Limit Concentration
TCLP	Toxicity Characteristic Leachate Procedure
Note 1	Received Temperature - according to EPA guidelines, samples for most chemistry methods should be held at ≤6 degrees C after collection, including during transportation, unless the time from sampling to delivery is <2 hours. Regulating agencies may invalidate results if temperature requirements are not met.
Note 2	According to 40 CFR Part 136 Table II, the following tests should be analyzed in the field within 15 minutes of sampling: pH, chlorine, dissolved oxygen, and sulfite.

Approved By
Basic Laboratory Inc
California ELAP Cert #1677 and #2718

19C0728

1

BASIC LABORATORY CHAIN OF CUSTODY RECORD

2218 Railroad Avenue, Redding, CA 96001 (530) 243-7234 FAX (530) 243-7494

LAB #: 19C0728

CLIENT NAME: PACE Eng

PROJECT NAME: CSA 2 Well 6

PROJECT #: 199.XX

PAGE 1 OF 1

MAILING ADDRESS: 1730 South St Redding CA 96001

REPORT DUE DATE: 4.1.19

TURN AROUND TIME: Standard Rush

\# OF SAMPLES: 2

MATRIX / TYPE: Water

PROJECT MANAGER: Laurie McCollum

CUSTODY SEAL INTACT? Yes No N/A

PHONE: 244-0202

EMAIL: lmccullam@pace eng....

SYSTEM #:

FAX: 244-1978

RESULTS SENT: Email Fax EDD Mail

EDD TYPE:

INVOICE TO: L. McCullam

PO#:

QC: Standard Level II

ANALYSIS REQUESTED

SAMPLE DATE	SAMPLE TIME	WATER	COMP	SOLID	SAMPLE LOCATION / IDENTIFICATION	NUMBER OF BOTTLES	Total Metals: Fe, Mn, Sb	Diss. Metals: Fe, Mn, Sb								LAB ID	CHLORINE RESIDUAL OR COMMENTS
3/15/19	2:45pm	X			Pre Filter ①			X								1	20.5°C
3/15/19	2:45pm	X			Post Filter ②			X								2	20.3°C
3/15/19	2:40	X			?Pre Filter ? ③		X									3	20.7°C
3/15/19	2:40	X			?Post Filter ? ④		X									4	20.8°C

COC Recieved w/ white out applied

Client request: return bottles

pH 3.15.19 @ 1650

PRESERVED WITH: HNO3 H_2SO_4 NaOH ZnAce/NaOH HCL NaThio OTHER______

SAMPLED BY (PRINT): Tom Warnock	SAMPLE DATE/TIME: 3/15/19/2:45 PM	RELINQUISHED BY: [signature]	DATE/TIME: 3/15/19/15:43
RECEIVED BY:	DATE/TIME:	RELINQUISHED BY:	DATE/TIME:
RECEIVED BY (LAB): Ethan S	DATE/TIME: 3.15.19 1544	PROCESSED AND VERIFIED BY: Ethan S	DATE/TIME: 3.15.19 1554
LOGGED IN BY: Ethan S	DATE/TIME: 3.15.19 1652	CARRIER: ______	COOLER TEMPERATURE: ______°c

INSTRUCTIONS, TERMS AND CONDITIONS ON BACK.

SAMPLE TYPE: 1 = ROUTINE, 2 = REPEAT, 3 = REPLACEMENT, 4 = SPECIAL 5 = RAW

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voice 530.243.7234
fax 530.243.7494

3860 Morrow Lane, Suite F
Chico, California 95928
voice 530.894.8966
fax 530.894.5143

April 02, 2019

Lab ID: 19C0784

LAURIE McCOLLUM
PACE ENGINEERING
1730 SOUTH STREET
REDDING, CA 96001
RE: GENERAL TESTING CSA 2 199

Dear LAURIE McCOLLUM ,

Enclosed are the analysis results for Work Order number 19C0784. All analyses were performed under strict adherence to our established Quality Assurance Plan. Any abnormalities are listed in the qualifier section of this report.

If you have any questions regarding these results, please feel free to contact us at any time. We appreciate the opportunity to service your environmental testing needs.

Sincerely,

For Ricky Jensen

Ricky Jensen

Ricky D. Jensen
Laboratory Director
California ELAP Certification Number 1677

www.basiclab.com

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fax 530.894.5143

Report To: PACE ENGINEERING
1730 SOUTH STREET
REDDING, CA 96001
Attention: LAURIE McCOLLUM
Project: GENERAL TESTING CSA 2 199

Lab No: 19C0784
Reported: 04/02/19
Phone: 244-0202
P.O. #

Metals - Total

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
PRE FILTER - Grab Water (19C0784-01)		**Sampled:03/16/19 16:21**		**Received:03/18/19 13:24**					
Antimony	ug/l	ND		0.17	0.50	EPA 200.8	03/28/19	03/20/19	B9C1454
Iron	"	**156**		7.5	15.0	"	"	"	"
Manganese	"	**48.5**		0.19	0.50	"	"	"	"
POST FILTER - Grab Water (19C0784-02)		**Sampled:03/16/19 16:30**		**Received:03/18/19 13:24**					
Antimony	ug/l	ND		0.17	0.50	EPA 200.8	03/28/19	03/20/19	B9C1454
Iron	"	**18.4**		7.5	15.0	"	"	"	"
Manganese	"	**2.24**		0.19	0.50	"	"	"	"

Approved By
Basic Laboratory Inc
California ELAP Cert #1677 and #2718

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Report To: PACE ENGINEERING
1730 SOUTH STREET
REDDING, CA 96001
Attention: LAURIE McCOLLUM
Project: GENERAL TESTING CSA 2 199

Lab No: 19C0784
Reported: 04/02/19
Phone: 244-0202
P.O. #

Metals - Dissolved

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
PRE FILTER - Grab Water	**(19C0784-01)**	**Sampled:03/16/19 16:21**		**Received:03/18/19 13:24**					
Antimony	ug/l	ND		0.17	0.50	EPA 200.8	03/29/19	03/29/19	B9C1683
Iron	"	**18.5**		7.5	15.0	"	"	"	"
Manganese	"	**44.5**		0.19	0.50	"	"	"	"
POST FILTER - Grab Water	**(19C0784-02)**	**Sampled:03/16/19 16:30**		**Received:03/18/19 13:24**					
Antimony	ug/l	ND		0.17	0.50	EPA 200.8	03/28/19	03/28/19	B9C1682
Iron	"	ND		7.5	15.0	"	"	"	"
Manganese	"	**0.72**		0.19	0.50	"	"	"	"

Notes and Definitions

J	Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag). The J flag is equivalent to the DNQ Estimated Concentration flag.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the detection limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
<	Less than reporting limit
≤	Less than or equal to reporting limit
>	Greater than reporting limit
≥	Greater than or equal to reporting limit
MDL	Method Detection Limit
RL/ML	Minimum Level of Quantitation
MCL/AL	Maxium Contaminant Level/Action Level
mg/kg	Results reported as wet weight
TTLC	Total Threshold Limit Concentration
STLC	Soluble Threshold Limit Concentration
TCLP	Toxicity Characteristic Leachate Procedure
Note 1	Received Temperature - according to EPA guidelines, samples for most chemistry methods should be held at ≤6 degrees C after collection, including during transportation, unless the time from sampling to delivery is <2 hours. Regulating agencies may invalidate results if temperature requirements are not met.
Note 2	According to 40 CFR Part 136 Table II, the following tests should be analyzed in the field within 15 minutes of sampling: pH, chlorine, dissolved oxygen, and sulfite.

Approved By
Basic Laboratory Inc
California ELAP Cert #1677 and #2718

19C0784

1

BASIC LABORATORY CHAIN OF CUSTODY RECORD

2218 Railroad Avenue, Redding, CA 96001 (530) 243-7234 FAX (530) 243-7494

LAB #: 19C0784

CLIENT NAME: PACE Engineering	PROJECT NAME: CDA 2	PROJECT #: 159	PAGE 1 OF 1
MAILING ADDRESS: " "	REPORT DUE DATE:	TURN AROUND TIME: Standard Rush	# OF SAMPLES: 2
	ANALYSIS REQUESTED		MATRIX / TYPE: W
PROJECT MANAGER: Laurie McCullom			CUSTODY SEAL INTACT? Yes No N/A
PHONE: 244-0202 EMAIL: Lmccullom@paceengineering.us			SYSTEM #:
FAX: 244-1978 RESULTS SENT: Email Fax EDD Mail			EDD TYPE:
INVOICE TO: PACE PO#:			QC: Standard Level II

SAMPLE DATE	SAMPLE TIME	WATER	COMP	SOLID	SAMPLE LOCATION / IDENTIFICATION	NUMBER OF BOTTLES	Total (Mn, Fe) SD	Dissolved (Mn, Fe) SD								LAB ID	CHLORINE RESIDUAL OR COMMENTS
3/16/19	4:21p	X			PreFilter		X	X								1	20.2°C
3/16/19	4:30p	X			PostFilter		X	X								2	19.0°C

pH<2 3-18-19 15:02

PRESERVED WITH: HNO$_3$ H$_2$SO$_4$ NaOH ZnAce/NaOH HCL NaThio OTHER______

SAMPLED BY (PRINT): Tom Warnock	SAMPLE DATE/TIME: 3/16/19/4:20p	RELINQUISHED BY: Tom Warnock	DATE/TIME: 3/18/19/13:23
RECEIVED BY:	DATE/TIME:	RELINQUISHED BY:	DATE/TIME:
RECEIVED BY (LAB): P. Olla	DATE/TIME: 3-18-19 13:24	PROCESSED AND VERIFIED BY: P. Olla	DATE/TIME: 3-18-19 13:25
LOGGED IN BY: P. Olla	DATE/TIME: 3-18-19 15:18	CARRIER: ______	COOLER TEMPERATURE: ____°c

INSTRUCTIONS, TERMS AND CONDITIONS ON BACK.

SAMPLE TYPE: 1 = ROUTINE, 2 = REPEAT, 3 = REPLACEMENT, 4 = SPECIAL 5 = RAW

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voice 530.894.8966
fax 530.894.5143

April 03, 2019

Lab ID: 19C0918

LAURIE McCOLLUM
PACE ENGINEERING
1730 SOUTH STREET
REDDING, CA 96001
RE: GENERAL TESTING CSA WELL 6

Dear LAURIE McCOLLUM ,

Enclosed are the analysis results for Work Order number 19C0918. All analyses were performed under strict adherence to our established Quality Assurance Plan. Any abnormalities are listed in the qualifier section of this report.

If you have any questions regarding these results, please feel free to contact us at any time. We appreciate the opportunity to service your environmental testing needs.

Sincerely,

For

Ricky Jensen

Ricky D. Jensen
Laboratory Director
California ELAP Certification Number 1677

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fax 530.894.5143

Report To: PACE ENGINEERING
1730 SOUTH STREET
REDDING, CA 96001
Attention: LAURIE McCOLLUM
Project: GENERAL TESTING CSA WELL 6

Lab No: 19C0918
Reported: 04/03/19
Phone: 244-0202
P.O. #

Metals - Total

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
POST FILTER 5 - Grab Water (19C0918-01) Sampled:03/19/19 12:55 Received:03/20/19 14:16									
Antimony	ug/l	ND		0.17	0.50	EPA 200.8	03/29/19	03/26/19	B9C1455
Iron	"	**40.8**		7.5	15.0	"	"	"	"
Manganese	"	**4.86**		0.19	0.50	"	"	"	"
6 RAW WELL WATER - Grab Water (19C0918-02) Sampled:03/19/19 12:50 Received:03/20/19 14:16									
Antimony	ug/l	ND		0.17	0.50	EPA 200.8	03/29/19	03/26/19	B9C1455
Iron	"	**309**		7.5	15.0	"	"	"	"
Manganese	"	**45.9**		0.19	0.50	"	"	"	"
7 RAW WELL WATER - Grab Water (19C0918-03) Sampled:03/19/19 15:10 Received:03/20/19 14:16									
Antimony	ug/l	ND		0.17	0.50	EPA 200.8	03/29/19	03/26/19	B9C1455
Iron	"	**186**		7.5	15.0	"	"	"	"
Manganese	"	**42.9**		0.19	0.50	"	"	"	"
8 POST FILTER - Grab Water (19C0918-04) Sampled:03/19/19 15:55 Received:03/20/19 14:16									
Antimony	ug/l	ND		0.17	0.50	EPA 200.8	03/29/19	03/26/19	B9C1455
Iron	"	**131**		7.5	15.0	"	"	"	"
Manganese	"	**15.2**		0.19	0.50	"	"	"	"
9 POST FILTER - Grab Water (19C0918-05) Sampled:03/19/19 15:55 Received:03/20/19 14:16									
Antimony	ug/l	ND		0.17	0.50	EPA 200.8	03/29/19	03/26/19	B9C1455
Iron	"	**122**		7.5	15.0	"	"	"	"
Manganese	"	**15.4**		0.19	0.50	"	"	"	"
10 RAW WELL WATER - Grab Water (19C0918-06) Sampled:03/19/19 15:55 Received:03/20/19 14:16									
Antimony	ug/l	ND		0.17	0.50	EPA 200.8	03/29/19	03/26/19	B9C1455
Iron	"	**159**		7.5	15.0	"	"	"	"
Manganese	"	**42.1**		0.19	0.50	"	"	"	"
BACKWASH - Grab Water (19C0918-07) Sampled:03/19/19 00:00 Received:03/20/19 14:16									
Antimony	ug/l	ND	R-08	4.25	12.5	EPA 200.8	03/29/19	03/26/19	B9C1455
Arsenic	"	**221**	R-08	4.75	12.5	"	"	"	"
Barium	"	**1640**	R-08	2.50	12.5	"	"	"	"
Beryllium	"	ND	R-08	2.00	12.5	"	"	"	"
Cadmium	"	ND	R-08	2.00	5.00	"	"	"	"
Chromium	"	**17.3**	R-08	3.25	12.5	"	"	"	"
Cobalt	"	**36.6**	R-08	2.00	12.5	"	"	"	"
Copper	"	**733**	R-08	4.25	12.5	"	"	"	"
Lead	"	**51.4**	R-08	1.75	12.5	"	"	"	"
Mercury	"	ND	R-08	0.70	2.00	EPA 245.2	03/26/19	03/26/19	B9C1559
Molybdenum	"	**12.1**	J, R-08	4.75	12.5	EPA 200.8	03/29/19	03/26/19	B9C1455
Nickel	"	**38.8**	R-08	4.00	12.5	"	"	"	"
Selenium	"	**12.4**	R-08, J	7.5	50.0	"	"	"	"
Silver	"	ND	R-08	1.00	5.00	"	03/26/19	03/21/19	B9C1472
Thallium	"	ND	R-08	1.50	12.5	"	03/29/19	03/26/19	B9C1455
Vanadium	"	**94.9**	R-08	6.50	12.5	"	"	"	"
Zinc	"	**2360**	R-08	12.5	50.0	"	"	"	"

Approved By
Basic Laboratory Inc
California ELAP Cert #1677 and #2718

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Chico, California 95928
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fax 530.894.5143

Report To: PACE ENGINEERING
1730 SOUTH STREET
REDDING, CA 96001
Attention: LAURIE McCOLLUM
Project: GENERAL TESTING CSA WELL 6

Lab No: 19C0918
Reported: 04/03/19
Phone: 244-0202
P.O. #

Metals - Dissolved

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
POST FILTER 5 - Grab Water (19C0918-01) Sampled:03/19/19 12:55 Received:03/20/19 14:16									
Antimony	ug/l	ND		0.17	0.50	EPA 200.8	03/29/19	03/29/19	B9C1683
Iron	"	ND		7.5	15.0	"	"	"	"
Manganese	"	**2.06**		0.19	0.50	"	"	"	"
6 RAW WELL WATER - Grab Water (19C0918-02) Sampled:03/19/19 12:50 Received:03/20/19 14:16									
Antimony	ug/l	ND		0.17	0.50	EPA 200.8	03/29/19	03/29/19	B9C1683
Iron	"	**78.1**		7.5	15.0	"	"	"	"
Manganese	"	**44.6**		0.19	0.50	"	"	"	"
7 RAW WELL WATER - Grab Water (19C0918-03) Sampled:03/19/19 15:10 Received:03/20/19 14:16									
Antimony	ug/l	ND		0.17	0.50	EPA 200.8	03/29/19	03/29/19	B9C1683
Iron	"	**70.5**		7.5	15.0	"	"	"	"
Manganese	"	**44.1**		0.19	0.50	"	"	"	"
8 POST FILTER - Grab Water (19C0918-04) Sampled:03/19/19 15:55 Received:03/20/19 14:16									
Antimony	ug/l	ND		0.17	0.50	EPA 200.8	03/29/19	03/29/19	B9C1683
Iron	"	**57.7**		7.5	15.0	"	"	"	"
Manganese	"	**8.11**		0.19	0.50	"	"	"	"
9 POST FILTER - Grab Water (19C0918-05) Sampled:03/19/19 15:55 Received:03/20/19 14:16									
Antimony	ug/l	ND		0.17	0.50	EPA 200.8	03/29/19	03/29/19	B9C1683
Iron	"	**79.6**		7.5	15.0	"	"	"	"
Manganese	"	**11.1**		0.19	0.50	"	"	"	"
10 RAW WELL WATER - Grab Water (19C0918-06) Sampled:03/19/19 15:55 Received:03/20/19 14:16									
Antimony	ug/l	ND		0.17	0.50	EPA 200.8	03/29/19	03/29/19	B9C1683
Iron	"	**64.7**		7.5	15.0	"	"	"	"
Manganese	"	**41.5**		0.19	0.50	"	"	"	"

Approved By
Basic Laboratory Inc
California ELAP Cert #1677 and #2718

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fax 530.894.5143

Report To:	PACE ENGINEERING 1730 SOUTH STREET REDDING, CA 96001	**Lab No:**	19C0918
		Reported:	04/03/19
		Phone:	244-0202
Attention:	LAURIE McCOLLUM	**P.O. #**	
Project:	GENERAL TESTING CSA WELL 6		

Notes and Definitions

R-08	The sample was diluted due to sample matrix resulting in elevated reporting limits.
QR-04	Duplicate results are within one reporting limit and pass all necessary QC criteria.
J	Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag). The J flag is equivalent to the DNQ Estimated Concentration flag.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the detection limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
<	Less than reporting limit
≤	Less than or equal to reporting limit
>	Greater than reporting limit
≥	Greater than or equal to reporting limit
MDL	Method Detection Limit
RL/ML	Minimum Level of Quantitation
MCL/AL	Maxium Contaminant Level/Action Level
mg/kg	Results reported as wet weight
TTLC	Total Threshold Limit Concentration
STLC	Soluble Threshold Limit Concentration
TCLP	Toxicity Characteristic Leachate Procedure
Note 1	Received Temperature - according to EPA guidelines, samples for most chemistry methods should be held at ≤6 degrees C after collection, including during transportation, unless the time from sampling to delivery is <2 hours. Regulating agencies may invalidate results if temperature requirements are not met.
Note 2	According to 40 CFR Part 136 Table II, the following tests should be analyzed in the field within 15 minutes of sampling: pH, chlorine, dissolved oxygen, and sulfite.

Approved By
Basic Laboratory Inc
California ELAP Cert #1677 and #2718

19C0918

1

BASIC LABORATORY CHAIN OF CUSTODY RECORD

2218 Railroad Avenue, Redding, CA 96001 (530) 243-7234 FAX (530) 243-7494

LAB #: 19C0918

CLIENT NAME: PACE CSA2 Well 6

PROJECT NAME: CSA2 Well 6

PROJECT #:

PAGE 1 OF 1

MAILING ADDRESS: PACE

REPORT DUE DATE: 4-3-19

TURN AROUND TIME: Standard Rush

OF SAMPLES: ~~20~~ ~~13~~ 7

MATRIX / TYPE:

PROJECT MANAGER: Laurie McCullom

CUSTODY SEAL INTACT? Yes No N/A

PHONE: 244-0202

EMAIL: Lmccallom@pace...

SYSTEM #:

FAX:

RESULTS SENT: Email Fax EDD Mail

EDD TYPE:

INVOICE TO: LmcCullom

PO#:

QC: Standard Level II

ANALYSIS REQUESTED

SAMPLE DATE	SAMPLE TIME	WATER	COMP	SOLID	SAMPLE LOCATION / IDENTIFICATION	NUMBER OF BOTTLES	Fe Mn Sb Total	Fe Mn Sb Soluble	CAM 17	LAB ID	CHLORINE RESIDUAL OR COMMENTS
3/19/19	12:55p	X			Post Filter (5)		X	X		1	12.3°C
3/19/19	12:50p	X			(6) Raw Well Water		X	X		2	12.2°C
3/19/19	3:10p	X			(7) Raw Well " "		X	X		3	12.2°C
3/19/19	3:20p	X			(8) Post Filter		X	X		4	10.6°C
3/19/19	3:55p	X			(9) Post Filter		X	X		5	12.0°C
3/19/19	3:55p	X			(10) Raw Well		X	X		6	12.9°C
3/19/19	Various				Backwash				X	7	16.2°C

pH<2 3.20.19 16:21

PRESERVED WITH: HNO3 H_2SO_4 NaOH ZnAce/NaOH HCL NaThio OTHER________

SAMPLED BY (PRINT): Thomas W. Warnock	SAMPLE DATE/TIME: 3/19/19 / Various	RELINQUISHED BY: [signature]	DATE/TIME: 3/20/19 / 14:18
RECEIVED BY:	DATE/TIME:	RELINQUISHED BY:	DATE/TIME:
RECEIVED BY (LAB): P. Oll	DATE/TIME: 3.20.19 14:16	PROCESSED AND VERIFIED BY: P. Oll	DATE/TIME: 3.20.19 14:20
LOGGED IN BY: P. Oll	DATE/TIME: 3.20.19 16:59	CARRIER: ________	COOLER TEMPERATURE: ______°c

INSTRUCTIONS, TERMS AND CONDITIONS ON BACK.

SAMPLE TYPE: 1 = ROUTINE, 2 = REPEAT, 3 = REPLACEMENT, 4 = SPECIAL 5 = RAW

PACE ENGINEERING

Subject: Sugarloaf WTP Pilot Study

By: DWD Date: 3/15/19

Sheet No. 1 of 2

Project No. 199.55

Determine NaOCl stock solution concentration.

$Q_{\text{PILOT FILTER}} = 1.5 \text{ GPM}$

$Q_{\text{NaOCl Pump}} = 1.5 \text{ GPH max}$. Runtime = 24 hrs to Return

$\forall_{\text{NaOCl STOCK}} = 4 \text{ gallons}$

$Q_{\text{NaOCl Set}} = \frac{4 \text{ gallons}}{24 \text{ hours}} = 0.17 \frac{\text{gallon}}{\text{hour}} = 0.0028 \text{ GPM}$

$Q_{\text{NaOCl}} \% = \frac{0.17 \text{ gph}}{1.5 \text{ gph}} \cdot 11\%$

$$(CQ)_{\text{STOCK}} = (CQ)_{\text{DOSE}}$$

$$C_{\text{STOCK}} * 0.0028 \text{ GPM} = 2 \frac{\text{mg}}{\text{L}} * 1.5 \text{ GPM}$$

$$C_{\text{STOCK}} = 1071 \frac{\text{mg}}{\text{L}}$$

$$(C\forall)_{\text{NEAT}} = (C\forall)_{\text{STOCK}}$$

$$\frac{1.2 \text{ gm}}{\text{mL}} * \frac{1000 \text{ mg}}{1 \text{ gm}} * \frac{1000 \text{ mL}}{1 \text{ L}} * \forall_{\text{NEAT}} = 1071 \frac{\text{mg}}{\text{L}} * 4 \text{ gallons} * \frac{3785 \text{ mL}}{1 \text{ gall}}$$

$$\forall_{\text{NEAT}} = 13.5 \text{ mL}$$

(OVER)

PACE ENGINEERING

Subject: Sugarloaf CSA2 Pilot Study

By: TWD Date: 3/15/17

Sheet No. 2 of 2

Project No. 177.95

Time	Free Chlorine (mg/L) PreFilter	Free Chlorine (mg/L) PostFilter	Mn (mg/L) Pre	Mn (mg/L) Post	Fe (mg/L) Pre	Fe (mg/L) Post
12:43	0.5	0.6				
12:50	0.4	0.7				
13:10			.061			
13:15				.007		
13:20						0.060
13:27					0.346	
13:39	0.7				0.344	0.029
13:45		0.9				
14:09	0.6	0.6				
14:16					0.43	0.05
14:25						0.06
14:31						0.09

Samples taken for Basic Lab. Sample ID will take some interpretation between pre- and post-filter. Post filter should have small amount of Fe & Mn.

Date 3/16/19. Arrive and chlorine stock solution empty w/ no chlorine residual. Backwashed filter and collected sample. Prepared new stock solution w/ 30 mL neat to 5 gallon water.

Time	Free Cl_2 (mg/L)		Fe (mg/L)		Mn (mg/L)	
	Pre	Post	Pre	Post	Pre	Post
12:00 pm	1.2	1.0	0.180	0.029	0.054	0.003
12:15	System operational					
4:10	1.3	1.1	0.107	0.015	0.053	0.003
	Samples grabbed					
4:43	New batch chlorine					

$$\frac{25\ \text{mL}}{5\ \text{gall}} * 15\ \text{gallons} = \underline{75\ \text{mL}}\ \text{Neat NaOCl}$$

Date 3/17/19 @ 0830 arrived on site, generator out of fuel. Discontinued run w/ no samples taken. Contacted County staff, Scott S. & Levi D., to get refueled on Monday.

PACE ENGINEERING

Subject: Sugarloaf CSA2 Pilot Filter Study w/ Coagulant

By: [illegible] Date: 3/15/19

Sheet No. 1 of ____

Project No. 199

Time	Cl_2 (mg/L) Pre	Cl_2 (mg/L) Post	Fe (mg/L) Pre	Fe (mg/L) Post	Mn (mg/L) Pre	Mn (mg/L) Post	Comments
10:58	Started well/generator						
11:00	Started backwash of filter						
12:13	New batch NaOCl, running Q_{FILTER} = 1.5 GPM						
12:15	0.7						Adj Q_{NaOCl} 8 - 16 %
12:22	0.6						
12:27	0.8						
12:29	0.6						
12:30		0.5					
12:40							$Q_{POLY} = \frac{61 mL}{5 min} = 12.2 \frac{mL}{min}$
12:43	0.9						
12:46		1.1					
12:47		1.4					
12:56							Start Coag.
1:04							Filter Air Locked Backwash
1:15							Q_{FILTER} = 1.5 GPM
1:18			0.330	0.279 ?			$Q_{POLY} = \frac{57 mL}{5 min} = 11.4 \frac{mL}{min}$
1:29			0.158	0.062			
1:34	0.8	0.9?	0.155	0.044			
1:51							Numerous adjustments leak repairs, systems go!
1:52	1.1	1.1					Q_{FILTER} = 1.5 GPM
2:02			0.135	0.003			Preprimed filter w/ coag x3
2:07							
2:14					0.051	0.011	$Q_{POLY} = \frac{57 mL}{5 min}$

Determine stock chlorine and coagulant solutions.

$$Q_{FILTER} = 1.5\ \frac{Gall}{min} * \frac{3785\ mL}{1\ gall} = 5678\ \frac{mL}{min}$$

$$C_{DOSE\ COAGULANT/NaOCl} = 2\ mg/L$$

$$Q_{DOSE} = \frac{4\ gallons}{24\ hours} * \frac{3785\ mL}{1\ gall} * \frac{1\ hr}{60\ min} = 10.5\ \frac{mL}{min}$$

C_{STOCK} :

$$(CQ)_{STOCK} = (CQ)_{DOSE}$$

$$C_{STOCK} * 10.5\ \frac{mL}{min} = 2\ \frac{mg}{L} * 5678\ \frac{mL}{min}$$

$$C_{STOCK} = 1082\ \frac{mg}{L}$$

Determine neat dilutions:

Coagulant :

$$(C V)_{NEAT} = (C V)_{STOCK}$$

$$\frac{11.25\ gm}{10\ mL} * \frac{1000\ mL}{1\ L} * \frac{1000\ mg}{1\ gm} * V_{NEAT} = 1082\ \frac{mg}{L} * 4\ gall * \frac{3785\ mL}{1\ gall}$$

$$V_{NEAT} = \boxed{14.6\ mL}$$

NaOCl

$$1.2\ \frac{gm}{mL} * \frac{1000\ mL}{1\ L} * \frac{1000\ mg}{1\ gm} * V_{NEAT} = 1082\ \frac{mg}{L} * 4\ gall \times \frac{3785\ mL}{1\ gall}$$

$$V_{NEAT} = \boxed{13.7\ mL}$$

PACE ENGINEERING

Subject

By Date

Sheet No. 3 of

Project No.

Time	Cl_2 (mg/L) Pre	Cl_2 (mg/L) Post	Fe (mg/L) Pre	Fe (mg/L) Post	Mn (mg/L) Pre	Mn (mg/L) Post	Comments
3:02	0.9	0.7					Systems OK
3:06						0.016	
3:15					0.057		
3:10							Grab Basz Samples
3:20							Doubled Q Poly
3:28			0.146	0.104 ?			Q Poly = 52 mL / 3 min
3:34				0.083			= 17.3 mL/min
3:41	1.1	0.7					

pH

Raw	Post
6.7	6.3

3:55 Basz Lab samples collected again

APPENDIX I

MHI SURVEY

Shasta County CSA—Sugarloaf #2
Median Household Income
Final Report • March 2019

State of California State Water Resources Control Board
Proposition 1 Water Bond
Comprehensive Assistance to Tribal and Small Systems Project
Agreement Number: D1612801
TA Workplan Number: 5662-A

Presented by: Rural Community Assistance Corporation (RCAC)

Funded by: State Water Resources Control Board

March 26, 2019

Andrew Lawrence
Division of Financial Assistance
State Water Resources Control Board
1001 I St. 16th Floor
Sacramento, CA 95814

Subject: Shasta County CSA – Sugarloaf #2 Median Household Income Survey Results
Prop 1 Agreement No. D1612801 / TA Work Plan No. 5662-A

Dear Andrew:

Enclosed please find the printed final report for the Shasta County CSA – Sugarloaf #2 Median Household Income (MHI) Survey.

The report consists of documentation to determine the MHI for the water company. The report is categorized into the following sections:

If you have additional questions, please feel free to contact me at 707/489-6994.

Sincerely,

Brian Phillips

Brian Phillips
Regional Manager
RCAC – Community & Environmental Services

Enclosure: Income Survey Report, MHI Data
CC. Eric Wedemeyer, PE, Supervising Engineer, Shasta County Public Works
Montarat (Bow) Reilly, Project Manager, SWRCB – Division of Financial Assistance
Jean Thompson-Ibbeson, Rural Development Specialist III, RCAC – Community & Environmental Services

Shasta County CSA – Sugarloaf #2
1855 Placer Street
Redding, CA 96001-1759
Prop 1 Agreement No. D1612801
TA Work Plan No. 5662-A

Median Household Income Survey Final Report

Date: March 26, 2019

Submitted to: *Andrew Lawrence,* Water Resource Control Engineer
State Water Resources Control Board - Division of Financial Assistance

Eric Wedemeyer, PE, Supervising Engineer
Shasta County Public Works

Montarat (Bow) Reilly, Project Manager
State Water Resources Control Board - Division of Financial Assistance

Submitted by: *Jean Thompson-Ibbeson,* Rural Development Specialist III
Rural Community Assistance Corporation - Community & Environmental Services

Introduction: Shasta County CSA – Sugarloaf #2 is a public water system (CA4500006), and is a public entity managed and operated by Shasta County Public Works Department. Shasta County CSA – Sugarloaf #2 is located in Lakehead, an unincorporated area of Shasta County, and is approximately 20 miles north of Shasta Lake.

Shasta County CSA – Sugarloaf #2 has 81 parcels: Nineteen (19) are vacant homes/lots, 35 vacation homes, and three (3) are commercial; leaving 24 parcels (households) to survey. CSA #2 – Sugarloaf has received planning and design funding to determine the best alternatives for a water improvement project to meet drinking water standards. The planning project will address the surface water treatment, groundwater, and disinfection byproduct rule deficiencies as well as an evaluation of existing facilities to identify infrastructure improvements needed to comply with drinking water standards. These improvements would allow CSA #2 – Sugarloaf to provide safe and reliable drinking water in compliance with the Safe Drinking Water Act.

Survey Rationale: The current census data encompassed a larger area than the proposed project boundaries (see Area Maps, Exhibit A, pages 5-9). Therefore, Shasta County felt the census numbers did not adequately reflect the customers' household income. The addresses of those surveyed are attached and titled "Residents' List of Shasta County CSA – Sugarloaf #2" (see Exhibit B, pages 10-13).

Income Survey Methodology:

A unique survey number is randomly assigned to each household receiving a survey questionnaire to maintain the respondent's anonymity. The customer's personal information (name, phone, etc.) is considered confidential and is not provided to any funding agency or other entity. RCAC will retain the original survey forms containing personal information on file at their corporate office, 3120 Freeboard Drive, Suite 201, West Sacramento, California, 95691 for seven (7) years.

A letter of explanation was mailed and/or delivered on October 15, 2018 to all households within the survey area. The first survey letters and forms, and a corresponding postage-paid reply envelope were mailed and/or delivered to each household on October 22, 2018. A second survey letter and form, and a corresponding postage-paid reply envelope were mailed and/or delivered on November 5, 2018 to each household that did not respond to the first survey (see Exhibit C, pages 14-19). A door to door survey was performed on December 8, 2018 at the residences that did not respond to the two mailings. The surveys were mailed back to RCAC to maintain customer privacy.

Shasta County provided RCAC with addresses for the parcels used in the survey (see Exhibit B, pages 10-13). RCAC developed the letters and survey form based on the Multi Agency Guidelines for Median Household Income Surveys established for the State Water Resources Control Board – Clean Water/Drinking Water State Revolving Fund (SRF), and United States Department of Agriculture – Rural Development dated June 2014 (see Exhibit C, pages 14-19).

The income survey form listed income categories and requested respondents to provide the households total gross annual income from 2017 Federal tax filing. It also asked if the respondent had lived in the residence more than six months out of the year; if the residence was a vacation home, rental or commercial property; and how many people reside at the residence more than six months out of the year.

Funding agency guidelines require that an impartial agency conduct the income survey using an approved format. The median household incomes for the project service area survey was calculated by RCAC as follows:

The median income is defined as that income in the middle of the data collected from the universe after all incomes are ranked in order from lowest to highest incomes. For example, if there are nine houses surveyed, and the five ranks of income are $10k, $13k, **$14k**, $19k, $150k, then **$14k** is the median income because it is two from the top rank and two from the bottom rank. The median may require averaging if you have an even number of universe data available, and the two incomes in the middle are different.

Upon receiving the completed surveys, RCAC calculated the MHI for the project service area community. This number was submitted to the State Water Resources Control Board – Division of Financial Assistance (DFA) and State Revolving Fund administrators, and Shasta County Public Works.

The definition of household income is the total gross income in the previous calendar year, in this case calendar year 2017, from **all sources**, by all members of one single residence. The final results of the survey will be used by DFA to measure the community's ability to finance the project and to determine whether or not assistance in the form of a special low interest loan rate or grant is needed.

Survey Results:

An income survey was conducted within the Shasta County CSA – Sugarloaf #2 service boundaries. A summary of the results are listed below with more detailed information in the exhibits. The MHI for this survey only counted residences occupied for more than six months of the year.

Shasta County CSA – Sugarloaf #2 has 81 parcels: Nineteen (19) are vacant homes/lots, 35 vacation homes, and three (3) are commercial; leaving 24 parcels (households) to survey. The 20 responses account for an **83.33 percent response rate**. The number of households in a range between 1 – 55 requires a sample size of 90 percent to meet State and Federal guidelines.

Normally, a 90 percent response rate is required for systems of this size. RCAC contacted the State Water Resources Control Board – Division of Financial Assistance and together they determined that even if the remaining two (2) households (needed to obtain the 90 percent response rate) had responded with an income of $120,000 (the highest income reported), the system would still have an MHI of no higher than $41,000. The MHI of $41,000 is based on 22 responses with a 91.6 percent response rate.

The Median Household Income for is $41,000 (see Exhibit D, pages 20-22).

Response Rate:

Total number of parcels	81
Total number of vacant homes/lots, vacation homes, or commercial	57
Total number of residential parcels surveyed	24
Total number of surveys returned	20
Total number of default responses	2
Total number of non-response	4
Response rate calculation	**22 ÷ 24 = 91.6%**

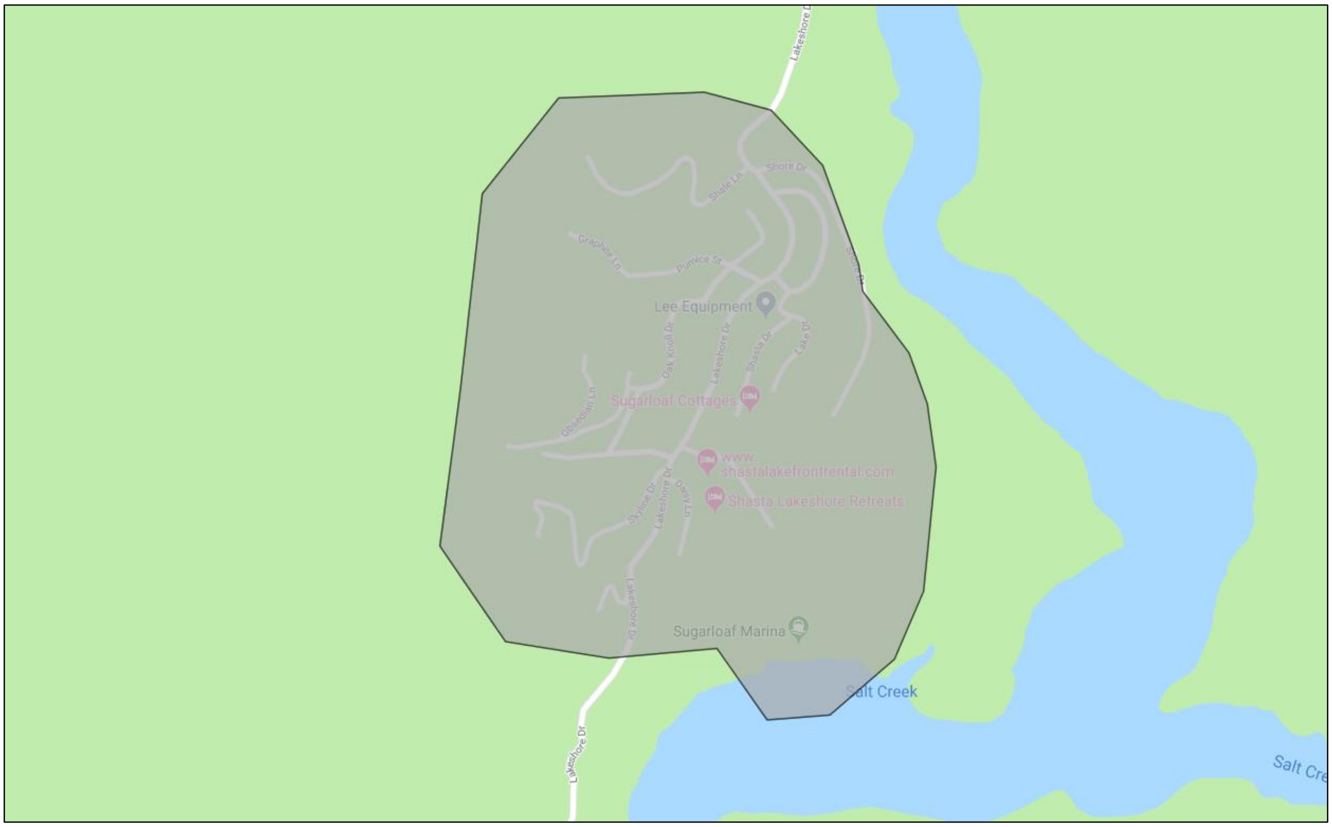
The results of this survey may be used to support loans and or grant applications to multiple funding agencies, for multiple types of projects benefiting residents within the survey area. Each funding agency has unique criteria for determining funding awards. A funding agency may look at the survey in terms of whether a community is disadvantaged, the percentage of low to moderate income people in the survey area, the MHI of the survey area in relation to State non-metro MHI's, or other criteria. These factors help a funder determine whether a project is eligible for funding, whether it is eligible for grants, what percentage of grant is available in a grant loan package, or what interest rates the project qualifies for in a loan. Eligibility of a project for funding changes with time, so the funding package available to a project this year might not be the same package available next year.

RCAC makes no claims regarding funding eligibility of any projects the system may be considering, now and in the future. Further, funding agencies generally use the most recent and accurate income survey results available when funding projects. RCAC makes no claims about how long the results of this survey will remain valid before being superseded by other newer surveys. It is recommended that the system contact any funding agencies under consideration directly to discuss funding eligibility.

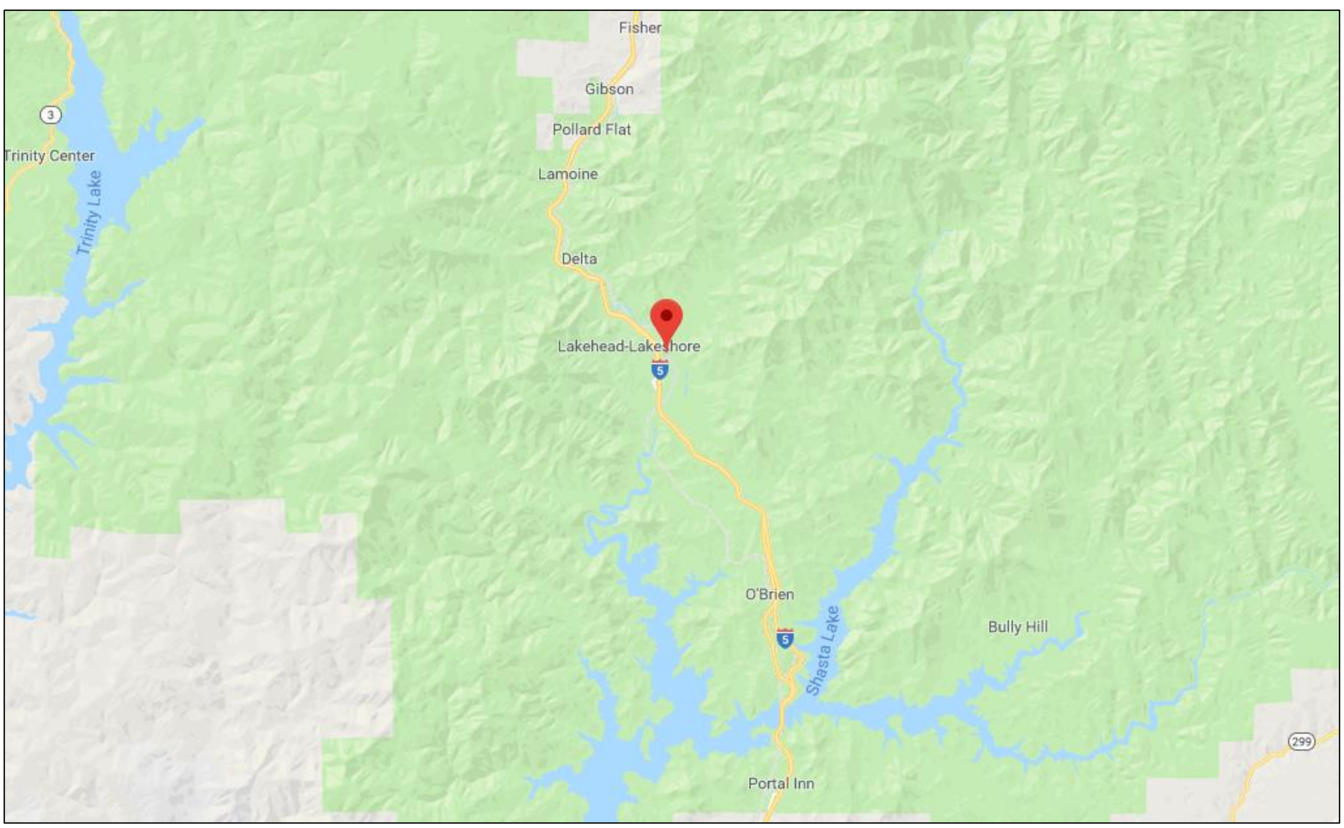
Exhibit A

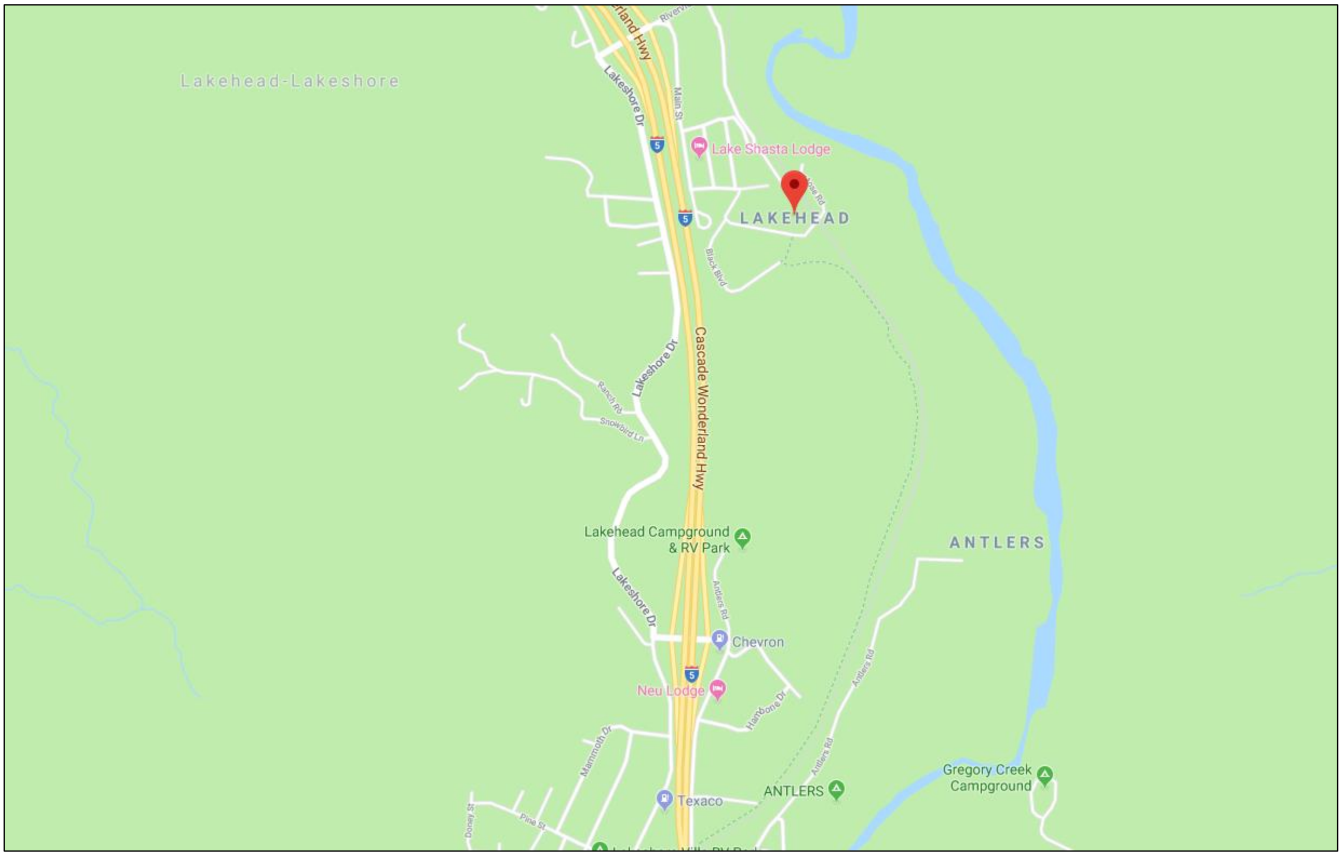
Shasta County CSA – Sugarloaf #2
Service Boundary Maps, Area and Location Maps
and Area Photos

Shasta County CSA – Sugarloaf #2 – Boundary Map



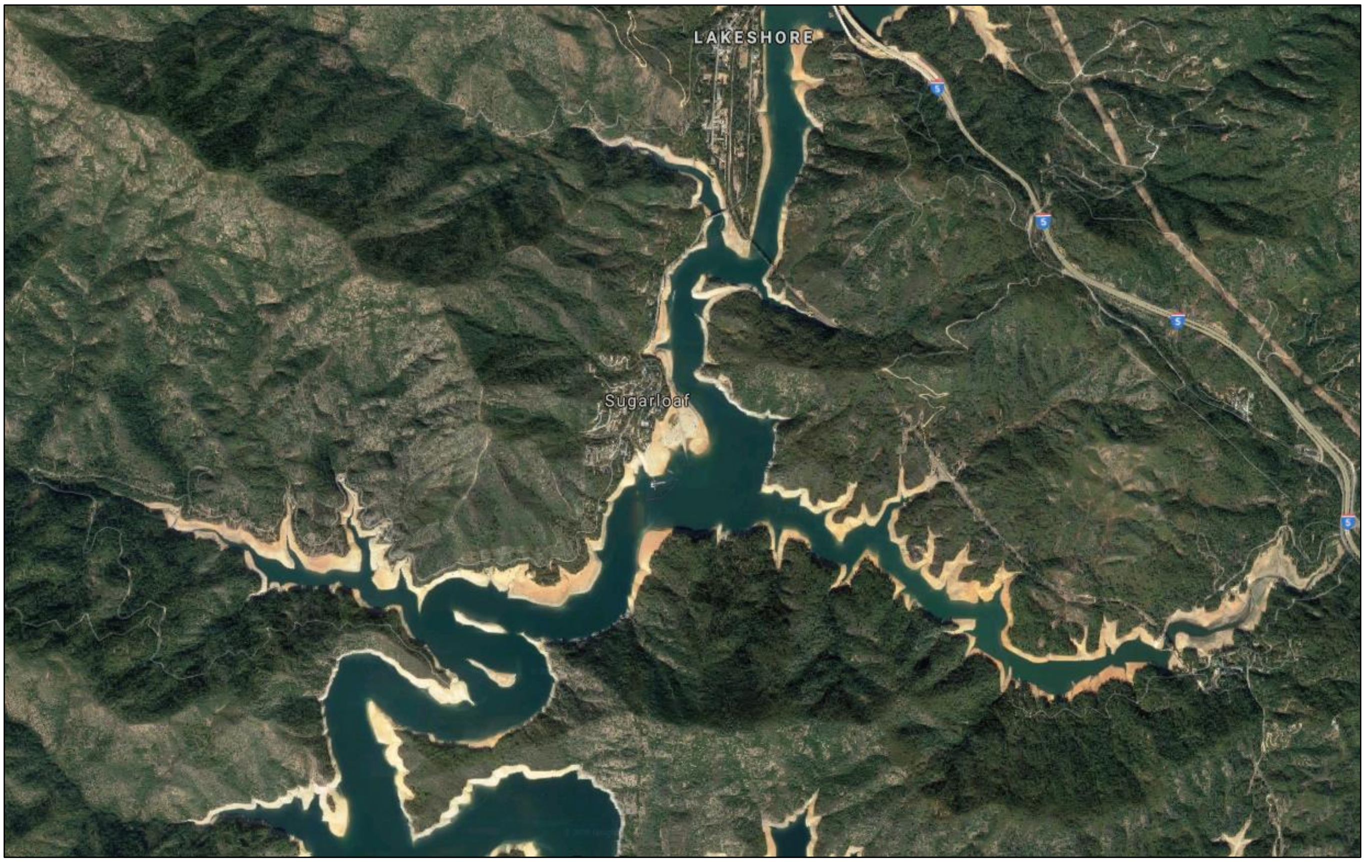
Shasta County CSA – Sugarloaf #2 – Area Maps





Shasta County CSA – Sugarloaf #2 – Street Map

Shasta County CSA – Sugarloaf #2 – Satellite Maps



Shasta County CSA – Sugarloaf #2 – Area Photos

Exhibit B

Residents List for Shasta County CSA – Sugarloaf #2

- Response
- No Response
- Vacant Homes/Lots
- Vacation Homes
- Commercial

SHASTA COUNTY CSA – SUGARLOAF #2 RESIDENTS LIST				
Permanent Resident/Response				
Property Address		***City***	***State***	***Zip***
17750	GRAPHITE LANE	LAKEHEAD	CA	96051
17824	LAKE DRIVE	LAKEHEAD	CA	96051
19729	LAKESHORE DRIVE	LAKEHEAD	CA	96051
19745	LAKESHORE DRIVE	LAKEHEAD	CA	96051
19767	LAKESHORE DRIVE	LAKEHEAD	CA	96051
19775	LAKESHORE DRIVE	LAKEHEAD	CA	96051
19793	OAK KNOLL DRIVE	LAKEHEAD	CA	96051
19797	OAK KNOLL DRIVE	LAKEHEAD	CA	96051
19807	OAK KNOLL DRIVE	LAKEHEAD	CA	96051
19811	OAK KNOLL DRIVE	LAKEHEAD	CA	96051
19812	OAK KNOLL DRIVE	LAKEHEAD	CA	96051
19817	OAK KNOLL DRIVE	LAKEHEAD	CA	96051
19825	OAK KNOLL DRIVE	LAKEHEAD	CA	96051
19826	OAK KNOLL DRIVE	LAKEHEAD	CA	96051
19722	OBSEDIAN LANE	LAKEHEAD	CA	96051
17817	SHALE LANE	LAKEHEAD	CA	96051
19692	SHASTA DRIVE	LAKEHEAD	CA	96051
19703	SHASTA DRIVE	LAKEHEAD	CA	96051
19704	SHASTA DRIVE	LAKEHEAD	CA	96051
19742	SHASTA DRIVE	LAKEHEAD	CA	96051

NO RESPONSE				
PROPERTY ADDRESS		***CITY***	***STATE***	***ZIP***
17878	LAKE DRIVE	LAKEHEAD	CA	96051
19672	LAKESHORE DRIVE	LAKEHEAD	CA	96051
19759	LAKESHORE DRIVE	LAKEHEAD	CA	96051
19775	OAK KNOLL DRIVE	LAKEHEAD	CA	96051

VACANT HOMES/LOTS				
PROPERTY ADDRESS		***CITY***	***STATE***	***ZIP***
	APN 085-020-011	LAKEHEAD	CA	96051
	APN 085-020-023	LAKEHEAD	CA	96051
	APN 085-020-029	LAKEHEAD	CA	96051
	APN 085-020-047	LAKEHEAD	CA	96051
	APN 085-020-050	LAKEHEAD	CA	96051
	APN 085-030-008	LAKEHEAD	CA	96051
	APN 085-030-013	LAKEHEAD	CA	96051
	APN 085-030-014	LAKEHEAD	CA	96051
	APN 085-030-020	LAKEHEAD	CA	96051
	APN 085-030-026	LAKEHEAD	CA	96051
	APN 086-060-033	LAKEHEAD	CA	96051
17898	LAKE DRIVE	LAKEHEAD	CA	96051
19759	OAK KNOLL DRIVE	LAKEHEAD	CA	96051

19767	OAK KNOLL DRIVE	LAKEHEAD	CA	96051
17790	SHALE LANE	LAKEHEAD	CA	96051
17800	SHALE LANE	LAKEHEAD	CA	96051
17824	SHALE LANE	LAKEHEAD	CA	96051
19693	SHASTA DRIVE	LAKEHEAD	CA	96051
19747	SHORE DRIVE	LAKEHEAD	CA	96051

VACATION HOMES				
PROPERTY ADDRESS		***CITY***	***STATE***	***ZIP***
17788	LAKE DRIVE	LAKEHEAD	CA	96051
17799	LAKE DRIVE	LAKEHEAD	CA	96051
17817	LAKE DRIVE	LAKEHEAD	CA	96051
17822	LAKE DRIVE	LAKEHEAD	CA	96051
17856	LAKE DRIVE	LAKEHEAD	CA	96051
17872	LAKE DRIVE	LAKEHEAD	CA	96051
17877	LAKE DRIVE	LAKEHEAD	CA	96051
17880	LAKE DRIVE	LAKEHEAD	CA	96051
17881	LAKE DRIVE	LAKEHEAD	CA	96051
19724	LAKESHORE DRIVE	LAKEHEAD	CA	96051
19727	LAKESHORE DRIVE	LAKEHEAD	CA	96051
19772	LAKESHORE DRIVE	LAKEHEAD	CA	96051
19811	LAKESHORE DRIVE	LAKEHEAD	CA	96051
19818	LAKESHORE DRIVE	LAKEHEAD	CA	96051
19700	OAK KNOLL DRIVE	LAKEHEAD	CA	96051
19720	OAK KNOLL DRIVE	LAKEHEAD	CA	96051
19732	OAK KNOLL DRIVE	LAKEHEAD	CA	96051
19792	OAK KNOLL DRIVE	LAKEHEAD	CA	96051
19805	OAK KNOLL DRIVE	LAKEHEAD	CA	96051
19806	OAK KNOLL DRIVE	LAKEHEAD	CA	96051
19824	OAK KNOLL DRIVE	LAKEHEAD	CA	96051
19713	OBSEDIAN LANE	LAKEHEAD	CA	96051
17805	PUMICE STREET	LAKEHEAD	CA	96051
17780	SHALE LANE	LAKEHEAD	CA	96051
17790	SHALE LANE	LAKEHEAD	CA	96051
17800	SHALE LANE	LAKEHEAD	CA	96051
19696	SHASTA DRIVE	LAKEHEAD	CA	96051
19741	SHASTA DRIVE	LAKEHEAD	CA	96051
19772	SHASTA DRIVE	LAKEHEAD	CA	96051
19786	SHORE DRIVE	LAKEHEAD	CA	96051
19790	SHORE DRIVE	LAKEHEAD	CA	96051
19798	SHORE DRIVE	LAKEHEAD	CA	96051
19816	SHORE DRIVE	LAKEHEAD	CA	96051
19824	SHORE DRIVE	LAKEHEAD	CA	96051
17814	SHOREHAVEN LANE	LAKEHEAD	CA	96051

COMMERCIAL				
PROPERTY ADDRESS		CITY	STATE	ZIP
17860	LAKE DRIVE	LAKEHEAD	CA	96051
19673	LAKESHORE DRIVE	LAKEHEAD	CA	96051
	SUGARLOAF MARINA	LAKEHEAD	CA	96051

Exhibit C

Explanation Letters
Survey Letters
Survey Forms

Shasta County

DEPARTMENT OF PUBLIC WORKS

1855 PLACER STREET
REDDING, CA 96001-1759
530.225.5661 530.225.5667 FAX
800.479.8022 California Relay Service at 700 or 800.735.2922

PATRICK J. MINTURN, DIRECTOR
C. TROY BARTOLOMEI, DEPUTY
KEN D. CRISTOBAL, DEPUTY
SCOTT G. WAHL, DEPUTY

October 15, 2018

Dear Resident:

Shasta County CSA #2 – Sugarloaf is trying to determine eligibility to apply for state funding programs for water system improvements and upgrades. We want to find the lowest customer cost funding opportunities for the following improvement project:

CSA #2 – Sugarloaf has received planning and design funding to determine the best alternatives for a water improvement project to meet drinking water standards. The planning project will address the surface water treatment, groundwater, and disinfection byproduct rule deficiencies as well as an evaluation of existing facilities to identify infrastructure improvements needed to comply with drinking water standards. These improvements would allow CSA #2 – Sugarloaf to provide safe and reliable drinking water in compliance with the Safe Drinking Water Act.

As part of the funding application process and to determine the water system's eligibility for funding, we have an impartial third party contractor performing a household income survey of our customers. This income survey will be used by the State Water Resources Board (SWRCB) to determine Shasta County CSA #2 – Sugarloaf's eligibility for optimal funding alternatives.

The Rural Community Assistance Corporation (RCAC), is a non-profit corporation approved by the SWRCB – Division of Financial Assistance (DFA) to conduct the survey. An income survey letter and form will be mailed to you in the next few days from RCAC. Please complete the information and return it to RCAC in the postage-paid envelope that will be included. The water system needs a high response rate to be considered for the best funding alternatives. **No identifying information will be provided to the funding agency or Shasta County or the DFA. Responses to this survey are confidential.**

You can help your water system get the best possible funding from state funding agencies by completing and returning the survey form, so that needed improvements can be made. Thank you for your assistance. For more information please feel free to contact:

> Jean Thompson-Ibbeson, Rural Development Specialist III – Environmental, RCAC, 3120 Freeboard Dr., Ste. 201, W. Sacramento, CA 95691, Phone: 916/207-8814, Email address: jthompson@rcac.org
>
> Eric Wedemeyer, PE, Supervising Engineer, Shasta County Public Works, Phone: 530/225 - 5181, Email address: ewedemeyer@co.shasta.ca.us

We Appreciate Your Cooperation,

Eric Wedemeyer

Eric Wedemeyer, PE, Shasta County Public Works

Corporate Office:
3120 Freeboard Drive, Suite 201
West Sacramento, CA 95691
(916) 447-2854 • Fax (916) 447-2878

ATTENTION: RESIDENTS OF
SHASTA COUNTY CSA #2 – SUGARLOAF

October 22, 2018

Shasta County CSA #2 – Sugarloaf has authorized the Rural Community Assistance Corporation to conduct a confidential income survey of the residents served by the water system. Attached is the survey form that will be used to obtain the needed information. Please complete the survey to the best of your ability. The information on this survey is necessary to assist the water system obtain funding from state funding programs.

CSA #2 – Sugarloaf has received planning and design funding to determine the best alternatives for a water improvement project to meet drinking water standards. The planning project will address the surface water treatment, groundwater, and disinfection byproduct rule deficiencies as well as an evaluation of existing facilities to identify infrastructure improvements needed to comply with drinking water standards. These improvements would allow CSA #2 – Sugarloaf to provide safe and reliable drinking water in compliance with the Safe Drinking Water Act.

This survey is being conducted to establish an accurate Median Household Income (MHI) of the CSA #2 – Sugarloaf's permanent residents (renters and owners) served by the water system. **This information will not be made public. It is important that the information you provide is an accurate representation of the questions asked. Please take the minute or two that it takes to complete the survey now.** The Rural Community Assistance Corporation has enclosed a self-addressed postage paid envelope for you to return the completed survey form. If you request it, assistance can be arranged to help you fill it out. The envelopes are provided to maintain confidentiality of your information. The envelopes are numbered to keep track of who has turned in completed survey forms.

If a response is not received within 10 days, you will receive an additional notice with a second copy of the form for your response. A high response rate is needed for the water system's project to be considered for the lowest customer cost funding alternatives. No identifying information will be given to Shasta County or the Division of Financial Assistance (DFA) to maintain confidentiality.

Once the completed surveys have been received, the Rural Community Assistance Corporation will analyze the responses, determine the MHI for your community, and report the results to the funding agency's that disburses the various state funds. **Responses to this survey form are confidential**.

If you would like more information about the survey and how the information will be utilized to assist the residents of the Shasta County CSA #2 – Sugarloaf, please feel free to contact:

Jean Thompson-Ibbeson, Rural Development Specialist III – Environmental, RCAC, Phone: 916/207-8814, Email address: jthompson@rcac.org

Eric Wedemeyer, PE, Supervising Engineer, Shasta County Public Works, Phone: 530/225 - 5181, Email address: ewedemeyer@co.shasta.ca.us

Montarat (Bow) Reilly, Project Manager, SWRCB, Division of Financial Assistance, Phone: 916/449 - 5973, Email address: montarat.reilly@waterboards.ca.gov

Serving Rural Communities In: Alaska • Arizona • California • Colorado • Hawaii & other Pacific Islands
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Corporate Office:
3120 Freeboard Drive, Suite 201
West Sacramento, CA 95691
(916) 447-2854 • Fax (916) 447-2878

ATTENTION: RESIDENTS OF SHASTA COUNTY CSA #2 – SUGARLOAF

November 5, 2018

Shasta County CSA #2 – Sugarloaf has authorized the Rural Community Assistance Corporation to conduct a confidential income survey of the residents served by the water system. Attached is the survey form that will be used to obtain the needed information. Please complete the survey to the best of your ability. The information on this survey is necessary to assist the water system obtain funding from state funding programs.

CSA #2 – Sugarloaf has received planning and design funding to determine the best alternatives for a water improvement project to meet drinking water standards. The planning project will address the surface water treatment, groundwater, and disinfection byproduct rule deficiencies as well as an evaluation of existing facilities to identify infrastructure improvements needed to comply with drinking water standards. These improvements would allow CSA #2 – Sugarloaf to provide safe and reliable drinking water in compliance with the Safe Drinking Water Act.

This survey is being conducted to establish an accurate Median Household Income (MHI) of the CSA #2 – Sugarloaf's permanent residents (renters and owners) served by the water system. **This information will not be made public. It is important that the information you provide is an accurate representation of the questions asked. Please take the minute or two that it takes to complete the survey now.** The Rural Community Assistance Corporation has enclosed a self-addressed postage paid envelope for you to return the completed survey form. If you request it, assistance can be arranged to help you fill it out. The envelopes are provided to maintain confidentiality of your information. The envelopes are numbered to keep track of who has turned in completed survey forms.

If a response is not received within 10 days, you will receive an additional notice with a second copy of the form for your response. If you have already completed and mailed the first survey please disregard this notice. A high response rate is needed for the water system's project to be considered for the lowest customer cost funding alternatives. No identifying information will be given to Shasta County or the Division of Financial Assistance (DFA) to maintain confidentiality.

Once the completed surveys have been received, the Rural Community Assistance Corporation will analyze the responses, determine the MHI for your community, and report the results to the funding agency's that disburses the various state funds. **Responses to this survey form are confidential.**

If you would like more information about the survey and how the information will be utilized to assist the residents of the Shasta County CSA #2 – Sugarloaf, please feel free to contact:

Jean Thompson-Ibbeson, Rural Development Specialist III – Environmental, RCAC, Phone: 916/207-8814, Email address: jthompson@rcac.org

Eric Wedemeyer, PE, Supervising Engineer, Shasta County Public Works, Phone: 530/225 - 5181, Email address: ewedemeyer@co.shasta.ca.us

Montarat (Bow) Reilly, Project Manager, SWRCB, Division of Financial Assistance, Phone: 916/449 - 5973, Email address: montarat.reilly@waterboards.ca.gov

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Median Household Income (MHI) Survey for Special Funding Eligibility
Verifiable Income from 2017 Federal Income Tax Filing

Residential Address ______________________________ **Survey Number** ___________

1. **Was this survey sent to a commercial business?**

   Yes ☐ Stop and return this form in the envelope provided.
   No ☐ Complete the survey.

2. **Is this your primary residence? (please check box)**

   A primary residence is a household that is occupied more than 6 months out of the year or is occupied by migrant farm workers.

   ☐ **Yes** ☐ **No** If yes, please complete Questions 3 & 4 and return this form in the envelope provided.
   ☐ **Yes** ☐ **No** Is this a **vacation home** (if yes, stop and return this form in the envelope provided)?
   ☐ **Yes** ☐ **No** Is this a **vacant home** (if yes, stop and return this form in the envelope provided)?
   ☐ **Yes** ☐ **No** Is this a **vacant lot** (if yes, stop and return this form in the envelope provided)?
   ☐ **Yes** ☐ **No** Is this home rental property, and **you are the owner** (if yes, please complete the information on the back (Section 2a) of this form and return in the envelope provided)?

3. **How many people reside at this household,** including children and adults? ☐

4. **What was the household income in 2017?** (see below what is considered household income)

$ ____________ /MONTH

OR

$ ____________ /YEAR

Income includes:

1. *Gross wages, salary, commissions, and bonuses from all jobs of residents 15 or older (prior to state and federal taxes).*
2. *Farm or non-farm business, professional practice, or partnership net income*
3. *Social Security or supplemental security income, public assistance, retirement plans, veteran's payments, child support, alimony, unemployment benefits, interest income, survivor or disability pensions, or any other source of income received regularly.*

____
Printed Name

____
Property Address

____
Signature Date

2a. (*Continued from front page*) If property is a rental, please complete the information below:

Property Rental Information

Renter's Name:	______
Mailing Address:	______ ______ ______
Service Address:	______ ______ ______

Please return this survey in the enclosed postage-paid envelope.

Exhibit D

Median Household Income Data for Shasta County CSA – Sugarloaf #2

Exhibit D: Median Household Income (MHI) Data for Shasta County CSA – Sugarloaf #2					
Survey Ascending Order	**Survey Number**	**Primary Residence**	**# of People in Residence**	**Annual Income Dollars**	**Survey Date**
1	SGL-78	YES	1	$12,000	10/30/18
2	SGL-58	YES	2	$16,800	10/30/18
3	SGL-64	YES	1	$16,896	12/12/18
4	SGL-65	YES	2	$18,000	10/30/18
5	SGL-28	YES	1	$20,304	3/12/19
6	SGL-05	YES	2	$20,610	1/30/19
7	SGL-47	YES	1	$22,500	11/26/19
8	SGL-80	YES	2	$23,500	11/6/18
9	SGL-02	YES	1	$30,000	1/24/19
10	SGL-18	YES	1	$30,000	11/19/18
11	SGL-46	YES	6	$40,000	11/6/18
12	SGL-01	YES	2	$42,000	2/4/19
13	SGL-49	YES	2	$42,500	3/13/19
14	SGL-27	YES	1	$50,400	1/24/19
15	SGL-26	YES	2	$57,264	10/30/18
16	SGL-44	YES	2	$65,000	11/9/18
17	SGL-23	YES	2	$71,000	10/30/18
18	SGL-16	YES	1	$75,600	11/1/18
19	SGL-63	YES	2	$80,000	11/19/18
20	SGL-21	YES	3	$120,000	11/19/18
21		DEFAULT		$120,000	
22		DEFAULT		$120,000	
Ascending Order Numbers 11 & 12, the average of Survey Numbers SGL-46 and SGL-01 = ($40,000 + $42, 000) = $82,000 / 2 = $41,000. The Median Household Income for Shasta County - Sugarloaf #2 is $41,000.					

The 20 responses account for an **83.33 percent response rate**. The Median Household Income for Shasta County CSA – Sugarloaf #2 is on lines 11 and 12 (in ascending order), the average of Survey Numbers SGL-46 and SGL-01 = ***($40,000 + $42, 000) = $82,000 / 2 = $41,000.*** The Median Household Income for Shasta County CSA – Sugarloaf #2 is $41,000.

***Normally, a 90 percent response rate is required for systems of this size. RCAC contacted the State Water Resources Control Board – Division of Financial Assistance and together they determined that even if the remaining two (2) households (needed to obtain the 90 percent response rate) had responded with an income of $120,000 (the highest income reported), the system would still have an MHI of no higher than $41,000. The MHI of $41,000 is based on 22 responses with a 91.6 percent response rate.**

The Median Household Income for Shasta County CSA – Sugarloaf #2 is $41,000.

APPENDIX J

2019 LEAK DETECTION REPORT

Technical Assistance
Leak Detection

California

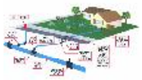
Rural Water Association

Date	Water System
8/20/2019 Tim Healy Leak Detection Specialist ll Full System Survey AR#5943	Shasta CSA - Sugarloaf #2 Scott Sealander 530-949-6768

Quality On Tap!

Our Commitment Our Profession

Water System Resources



Water Loss %	Unknown
System PSI	40-100
Pressure Zones	1
MHI (< $53,735)	
Population Served	268
Connections	67
Year Est.	Early 1970's
Flat/Tiered Rates	Flat/Tiered
Maps/As-builts/GIS	Maps
Dirt/Paved Roads	Dirt/Paved
Sewer/Septic	Septic
System Operator	Levi Duncan

Wells	Qty.	Avg. Depth	Surface Water		Treatment Plant	
	1	100'				

Main Pipe	Size	Miles	Asbestos	Ductile Iron	Steel	Cast Iron	PVC (C-900)	CMLC
	2",3",4",6",8"				✓	✓	✓	

Service	Size	Poly	Copper	Galvanized	HDPE	PVC	Driscoll	Other
	5/8",.75",1"		✓	✓				

Valve	Size	Qty.	Gate	Butterfly	Globe	Check	Ball	Plug
	2",3",4",6",8"	12	✓					

Hydrant	Size	Qty.	Wharf-Head	Blow-Off	Commercial	Residential	Meter
	1.5",2"		✓				

Meter	Size	Qty.	AMR/AMI	P/D	Smart	Turbine	Compound	Mag
	5/8",.75",1"	67		✓				

Air Relief &Vacuum	Size	Qty.	Booster Pump & Hydro Pneumatic	Qty.	Storage Tanks	Qty.
	1"			2/2		1

Backflow Valve	Size	Qty.	Pressure Reducing Valve	Size	Qty.
		0			0

Comments/Recommended:

The community of Sugarloaf is part of the Shasta CSA who over see the potable water system built sometime in the late 60"s to early 70's. The majority of the water system dates back to this time with only a few improvements. The main trunk line that comes from the water tank is made of steel with many areas of repairs bands from leaks on the line. This water main runs on the slope side of the road which has about 2 feet deep of cover. The water system has only 12 known valves for isolation with a few broken ones. The water meters are Rockwells from the 1970's which are most likely inaccurate due to their age. The operator did not know the water loss percent for the water system.

Needs:

New water main trunk line in the road with isolation valves.

New smart meters for water accountability .

Well rehab.

New tank or tank cleaning.

Water System Age

Typical Equipment		Life Expectancy Years
Source of supply		
Intake Structures	Late 60's-Early 70's	**35 – 45**
Wells and Springs	Late 60's-Early 70's	**25 – 35**
Transmission mains	Late 60's-Early 70's	**35 – 40**
Pumping Plants		
Pumping Equipment	Late 80's-Early 90's	**10 – 15**
Treatment Plants		
Structures	N/A	**30 - 60**
Equipment	N/A	**10 – 15**
CL2 Equipment	Early 2000's	**10 – 15**
Distribution		
Reservoirs and Tanks	70's	**30 – 60**
Distribution Pipes	Old 60's-Early 70's-New 2014	**35 – 40**
Services	Old 60's-Early 70's-New 2014	**30 – 50**
Valves	60's-Early 70's	**35 – 40**
Backflow Prevention	N/A	**35 – 40**
Blow-off valves	60's-Early 70's	**35 – 40**
Meters	80's	**10 – 15**
Hydrants	N/A	**40 – 60**

Leak Report

Date:	8/20/2019
System:	Shasta CSA - Sugarloaf #2
Leak Detection members:	Tim Healy
Equipment Used:	FCS Correlator/Acoustic Ground Mic/DXmic Pro
Map Reference:	Diamond Maps/Google/GPS/GIS Map

Street and/or Block Numbers:

Lake Dr, Lakeshore Drive, Shorehaven Ln, Oak Knoll Dr, Shasta Dr, Obsidian Ln, Deir Way

Leak Number	Address of Suspected Leak	Utility or Customer (U or C)	Leak Pinpointed (Y or N)	Leak to be Rechecked (Y or N)	Leak Repaired (Y or N)	Not a Leak? (Date)
1	19817 Oak Knoll	C	N	N	N	
2	19818 Lakeshore	C	Y	Y	N	

	Meters / Curb Stop	Hydrants	Valves	Test Rods	Other
Indicate Number of Manual Listening Points Used	35	3	3	0	
Indicate Number of Leak Noise Loggers Listening Points Used	0	0	0	0	

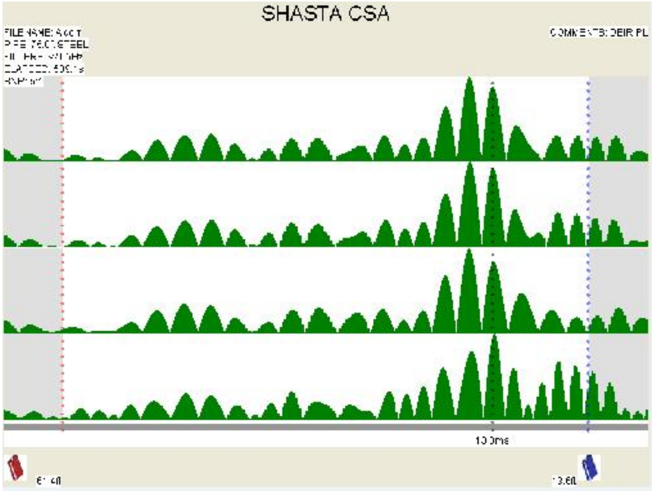
Miles of Mains Surveyed:	.78	Survey Time: (Hours)	6
Number of Leaks Suspected:	2	Rechecked: (Numbers)	1
Number of Leaks Pinpointed:	1	Pinpointing Time: (Hours)	.50

Remarks:

The water Operator (Levi Duncan) was not familiar with where all the meters were located.

Leak Detection Survey Results

Survey #1



Survey Graph

The Correlator program allows for a "***Snapshot Option***". When the snapshot button is pressed during a correlation, the snapshot feature effectively enables the operator to compare noise levels at different points during the correlation process. When a leak is detected, the graph will have a peak in the same spot and will be located in the same spot on all snapshots. This will indicate the presence of a leak.

The correlation has detected a "Leak(s)".

✓

The Correlator displays a peak in all snapshots graphs in the same spot but is not leak due too:

Water passing through a meter. Running pumps. Pressure Reducing Valve.

Electrical (Transformer). Illegal service. Underground Sewer, Power, Cable lines.

Gas Service

The correlation has detected "No leak(s)".

The Correlator program snapshots are all differ in graph peaks, this indicates flow due to pumping, pressure surges or momentary use of water through meter(s).

The correlation has detected "No leak(s)".

The Correlator program displays a "***Center Correlation***". The graph peak is in the center of the screen with equal footage on each side indicates the program sensor at a 50/50 point hears no sounds.

The correlation has detected "No leaks".

Remarks:

Area on graph shows what appears to be a leak but it is where the mainline has a 90 degree turn.

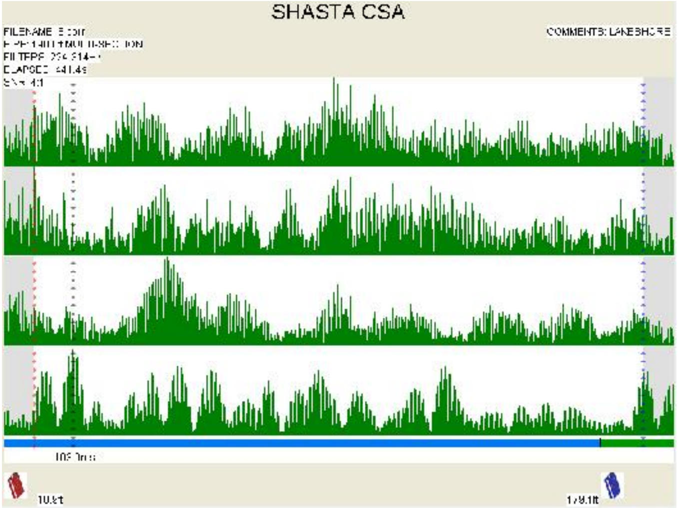
Location:

From just below tank to Obsedian lane/Oak Knoll

Hydrant	*System Valve*	*Curb Stop*	*Diameter*	*Material*	*Length*
	2		6"	steel	512'

Leak Detection Survey Results

Survey #2



Survey Graph

The Correlator program allows for a "***Snapshot Option***". When the snapshot button is pressed during a correlation, the snapshot feature effectively enables the operator to compare noise levels at different points during the correlation process. When a leak is detected, the graph will have a peak in the same spot and will be located in the same spot on all snapshots. This will indicate the presence of a leak.

The correlation has detected a "Leak(s)".

The Correlator displays a peak in all snapshots graphs in the same spot but is not leak due too:

Water passing through a meter.	Running pumps.	Pressure Reducing Valve.
Electrical (Transformer).	Illegal service.	Underground Sewer, Power, Cable lines.
		Gas Service

The correlation has detected "No leak(s)".

✓ The Correlator program snapshots all differ in graph peaks, this indicates flow due to pumping, pressure surges or momentary use of water through meter(s).

The correlation has detected "No leak(s)".

The Correlator program displays a "***Center Correlation***". The graph peak is in the center of the screen with equal footage on each side indicates the program sensor at a 50/50 point hears no sounds.

The correlation has detected "No leaks".

Remarks:

No leaks found

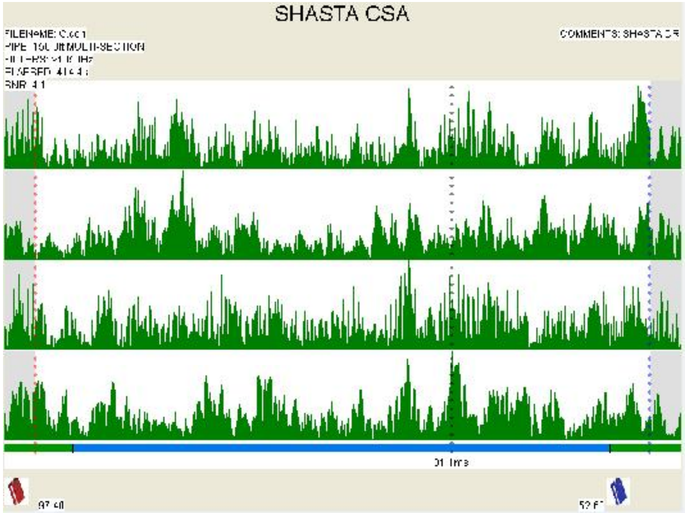
Location:

Obsedian/Oak Knoll to the air release valve above 19672 Lakeshore Dr

Hydrant	*System Valve*	*Curb stop*	*Diameter*	*Material*	*Length*
	2		6"	Steel	289'

Leak Detection Survey Results

Survey #3



Survey Graph

The Correlator program allows for a "***Snapshot Option***". When the snapshot button is pressed during a correlation, the snapshot feature effectively enables the operator to compare noise levels at different points during the correlation process. When a leak is detected, the graph will have a peak in the same spot and will be located in the same spot on all snapshots. This will indicate the presence of a leak.

The correlation has detected a "Leak(s)".

The Correlator displays a peak in all snapshots graphs in the same spot but is not leak due too:

Water passing through a meter.	Running pumps.	Pressure reducing Valve.
Electrical (Transformer).	Illegal service.	Underground Sewer, Power, Cable lines.
		Gas Service

The correlation has detected "No leak(s)".

✓

The Correlator program snapshots all differ in graph peaks, this indicates flow due to pumping, pressure surges or momentary use of water through meter(s).

The correlation has detected "No leak(s)".

The Correlator program displays a "***Center Correlation***". The graph peak is in the center of the screen with equal footage on each side indicates the program sensor at a 50/50 point hears no sounds.

The correlation has detected "No leaks".

Remarks:

No leaks found

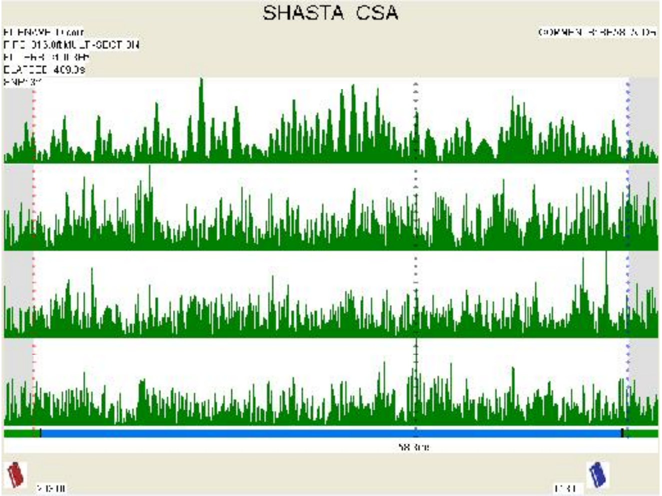
Location:

19672 Lakeshore Dr to 19704 Shasta Dr

Hydrant	*System Valve*	*Curb Stop*	*Diameter*	*Material*	*Length*
	2		6"	Steel/PVC	339'

Leak Detection Survey Results

Survey #4



Survey Graph

The Correlator program allows for a "***Snapshot Option***". When the snapshot button is pressed during a correlation, the snapshot feature effectively enables the operator to compare noise levels at different points during the correlation process. When a leak is detected, the graph will have a peak in the same spot and will be located in the same spot on all snapshots. This will indicate the presence of a leak.

The correlation has detected a "Leak(s)".

The Correlator displays a peak in all snapshots graphs in the same spot but is not leak due too:

Water passing through a meter. Running pumps. Pressure Reducing Valve.

Electrical (Transformer). Illegal service. Underground Sewer, Power, Cable lines.

Gas Service

The correlation has detected "No leak(s)".

✓ The Correlator program snapshots all differ in graph peaks, this indicates flow due to pumping, pressure surges or momentary use of water through meter(s).

The correlation has detected "No leak(s)".

The Correlator program displays a "***Center Correlation***". The graph peak is in the center of the screen with equal footage on each side indicates the program sensor at a 50/50 point hears no sounds.

The correlation has detected "No leaks".

Remarks:

No leaks found

Location:

19704 Shasta Dr 19742 Shasta Dr

Hydrant	***System Valve***	***Curb Stop***	***Diameter***	***Material***	***Length***
	2		6"	PVC	255'

Ground Mic Log

Address	Meter	Hydrant/WF	Valve	Blowoff	Other	Leak Detected	Notes
19703 Shasta Drive	X						
19731 Shasta Drive	X						
19742 Shasta Drive	X						
19772 Shasta Drive	X						
19704 Shasta Drive	X						
19696 Shasta Drive	X						
19692 Shasta Drive	X						
19667 Shasta Drive	X						
19685 Shasta Drive	X						
19671 Shasta Drive	X						
19673 Lakeshore Drive	X						
19672 Lakeshore Drive	X						
19754 Lakeshore Drive	X						
19767 Lakeshore Drive	X						
19772 Lakeshore Drive	X						
17814 Shorehaven Lane	X						
17817 Lake Drive	X						
17872 Lake Drive	X						
17878 Lake Drive	X						
17881 Lake Drive	X						
17877 Lake Drive	X						
17800 Lake Drive	X						
17880 Lake Drive	X						
17822 Lake Drive	X						
19797 Oak Knoll Drive	X						

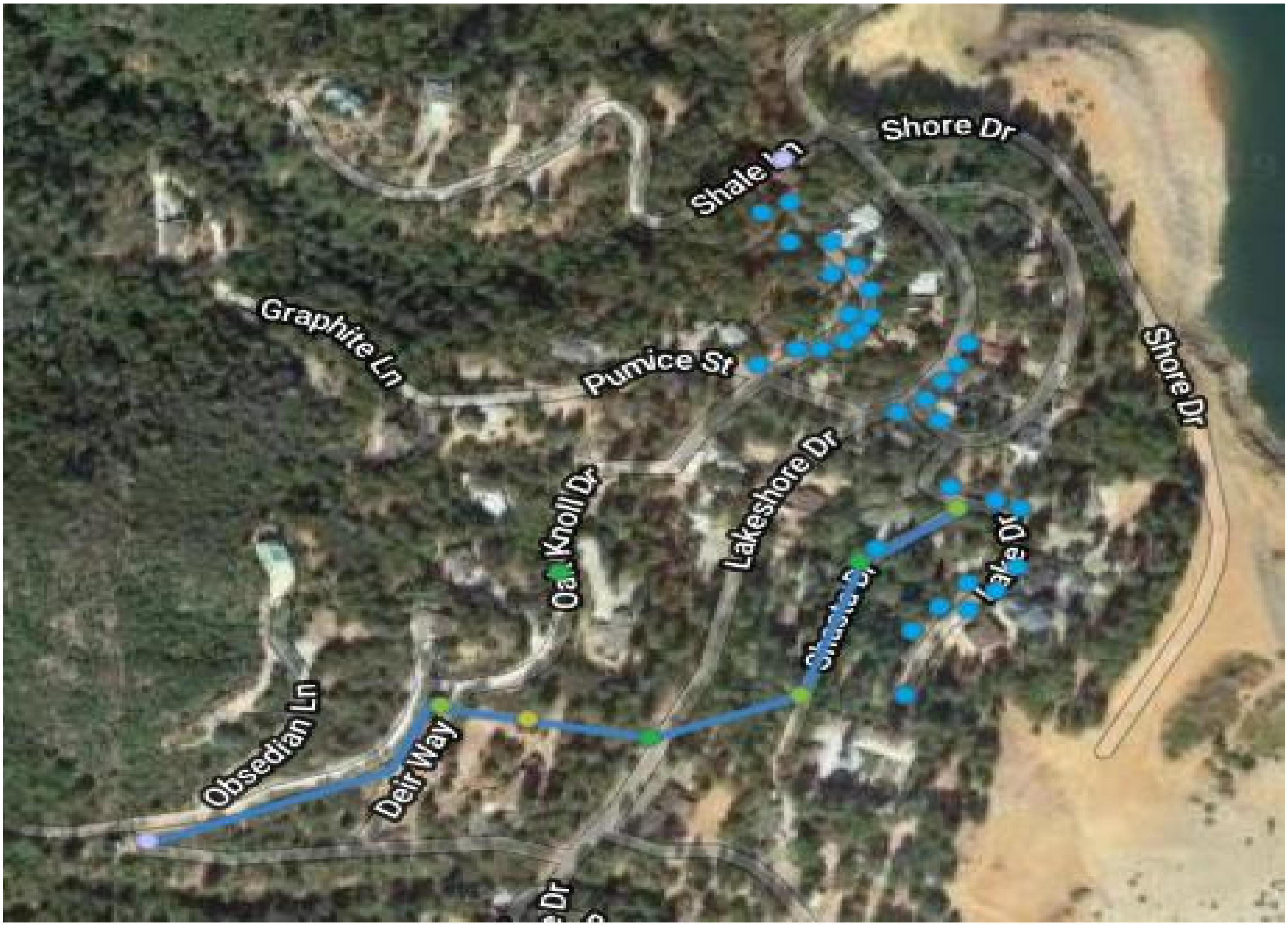
Quality On Tap!

Ground Mic Log

California Rural Water Association

Address	Meter	Hydrant/WF	Valve	Blowoff	Other	Leak Detected	Notes
19793 Oak Knoll Drive	X						
19803 Oak Knoll Drive	X						
19807 Oak Knoll Drive	X						
19812 Oak Knoll Drive	X						
19811 Oak Knoll Drive	X						
19817 Oak Knoll Drive	X					X	
19825 Oak Knoll Drive	X						
19824 Oak Knoll Drive	X						
19826 Oak Knoll Drive	X						
19818 Lakeshore Drive	X				X		

Water System Map



Water System Pictures

Water System Pictures


VENTED CAP
KEEP THIS SIDE UP AT ALL TIMES