November 15, 2022

306.44

SENT BY EMAIL ONLY

dzevely@burneywater.org

David Zevely, District Manager
Burney Water District
20222 Hudson Street
Burney, CA 96013

Dear Dave,

Subject: Burney Water District (District)
Solids Work Plan

Current Waste Discharge Requirements (WDRs) Order R5-2017-0050 for the District Wastewater Treatment Plant (WWTP) requires that a Solids Management and Storage Work Plan (Solids Work Plan) be submitted. The Solids Work Plan must propose upgrades to the current solids management practices and identify alternatives for (1) sludge processing and (2) sludge lagoon supernatant management. An assessment of the viability, effectiveness, and cost of each alternative must be included as well as a time schedule for implementing a preferred alternative. Effectiveness will be measured by the degree to which each alternative will reduce impacts to groundwater.

Current WWTP sludge handling and disposal practices are to waste from the secondary clarifier to the sludge lagoon. While this allows for daily wasting, which is ideal from an operations and treatment standpoint, it does not readily allow for routine sludge disposal practices. Historically, the sludge that accumulates in the sludge lagoon is not disposed of until the sludge lagoon is nearly full. This is primarily due to there being only one sludge lagoon to waste to, so it cannot be offline for any significant period of time.

The District received a Clean Water State Revolving Funding (CWSRF) Proposition 1 Planning Grant from the State Water Resources Control Board (SWRCB), which funded planning and design of a Wastewater Collection and Treatment Improvement Project. A Planning Grant Project Report was completed by PACE Engineering, Inc. (PACE) September 28, 2017 (2017 Project Report) as part of that effort. As described therein, several alternatives were considered to improve the existing inadequate sludge handling and disposal process. Applicable pages of the 2017 Project Report detailing the considered sludge processing and disposal alternatives and associated preferred recommended alternative are attached hereto as Appendix A for ease of reference.

As described in Appendix A, the sludge processing alternatives considered included the following:

- Applying sludge to land.
- Pumping to and drying sludge in the existing unused oxidation pond.
- Constructing a second sludge storage lagoon.
- Converting the existing secondary clarifier into an aerobic digester.

As described in the attached pages, applying sludge to land and drying sludge in existing unused oxidation ponds were both ruled out as feasible alternatives. The extensive timing and permitting required for land disposal approval was infeasible. Discussions with the Central Valley Regional Water Quality Control Board (CVRWQCB) indicated drying sludge in the existing unused oxidation ponds each year for subsequent removal would not be an acceptable alternative for sludge processing. As such this sludge processing alternative was also determined to be infeasible.

As shown in Appendix A, project cost, operations and maintenance (O&M) cost, short-lived assets reserve cost, and life cycle cost (LCC) analyses were completed for the two considered feasible alternatives, which included constructing a second sludge storage lagoon and converting the existing secondary clarifier into an aerobic digester. Tables 8 and 9 show anticipated project costs in August 2017 dollars. Table 11 compares O&M costs, and Table 14 compares short-lived assets reserve costs. As shown in Tables 19 and 20, the LCCs for a second sludge lagoon and an aerobic digester were projected to be $3,810,000 and $3,333,000, respectively, in August 2017 dollars. Although costs have since drastically increased, the LCC of an aerobic digester is still projected to be lower than that of a second sludge storage lagoon.

In addition to a lower anticipated project LCC, construction of an aerobic digester was preferred over a second sludge storage lagoon for several non-monetary reasons. While a second sludge lagoon is relatively simple in terms of operation, sludge removal must be completed in a timely manner for it to be effective. This has historically been an issue for the District. Ultimately, sludge from the aerobic digester would be wasted to a sludge press and hauled off on a regular basis. Although more costly from an O&M standpoint, this eliminates the concern of stored sludge on-site for a significant period. Additionally, a concrete aerobic digester is much preferred in meeting future CVRWQCB regulations. Lined ponds, as opposed to a concrete basin, typically allow for more potential for groundwater contamination as their useful lives are met.

Due to a new, deeper clarifier being needed at the WWTP, together with the results of the alternatives analysis, it was recommended the existing clarifier be converted into an aerobic digester. This will allow for daily wasting directly into the digester rather than to the sludge storage lagoon. Sludge from the digester will eventually be processed through a sludge press and placed into a dumpster and/or onto the sludge drying beds for routine drying and hauling. A rotary fan press was the recommended alternative as described in the applicable attached pages.

Since completion of the 2017 Project Report, the District applied for and received a CWSRF Construction Funding Agreement for $6,148,000 executed in June 2020. Construction of the WWTP Improvement Project began in April of this year and is currently projected to be complete in August 2023. Unfortunately, due to limited grant funding initially available during the time of construction funding acquisition, together with the enormous increases in construction costs that have since occurred due to the COVID-19 pandemic, not all sludge handling improvements were able to be included in the construction project currently underway. The following sludge handling and disposal improvements will be completed as part of the current project:

- Prepare the sludge lagoon subgrade, install groundwater drain and monitoring well, and replace the high-density polyethylene liner.
- Reroute sludge lagoon supernatant to headworks and upgrade supernatant pump station.
- Install sludge lagoon aerators.
- Convert existing secondary clarifier to aerobic sludge digester.
- Install return pump station.

Installation of the rotary fan sludge press and building will be completed as part of the next WWTP Improvement Project phase when funding is acquired. The District anticipates applying for this CWSRF planning grant as soon as the Final Budget Approval process for the current construction project is approved and received. Median household income (MHI) of the District is such that the entire service area boundary is a small, severely disadvantaged community. According to the American Community Survey 2016 to 2020 Five-Year Estimate, the District MHI is $40,147, or only 51% of that of the State. As such, grant funding is expected to be available in the near future to fund the project through construction.

A preliminary project schedule of the next sludge disposal improvement phase is included in attached Table 1. As shown therein, the schedule assumes the Final Budget Approval process for the current construction project will be received by the end of this year. It also assumes the CWSRF planning grant will be executed one year after a complete application is submitted.

Additional improvements to the sludge handling and disposal process may also be considered in the future. Burney Bioenergy is a proposed bioenergy facility that may be able to provide heat and/or power to the WWTP if/when it is constructed. This may open the District to the option of pasteurization or a similar process in the future. This alternative and any others that may be applicable will be considered in an update to the 2017 Project Report, which will be completed as part of the CWSRF planning grant.

Funding to complete an update to the Wastewater Rate Study is included in the current CWSRF Collection System Improvement Project grant. Until this next sludge disposal improvement phase is complete, the District will budget in the Wastewater Rate Study for mechanical drying of the sludge lagoon sludge every two years.

Sincerely,

Laurie McCollum, P.E.
Principal Engineer

Enclosures
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TABLE 1
BURNEY WATER DISTRICT
WASTEWATER TREATMENT PLANT IMPROVEMENT PROJECT - PHASE 3
PRELIMINARY PROJECT SCHEDULE

Item No.	Action	Target Date	Completion Date
1	District receives current CWSRF Construction Project Final Budget Approval	Dec-22	
2	District authorizes PACE to proceed with CWSRF Planning Grant Application	Jan-23	
3	PACE submits CWSRF Planning Grant Application	Apr-23	
4	CWSRF executes Planning Funding Agreement	Apr-24	
5	District authorizes PACE to begin planning work	May-24	
6	PACE provides draft Project Report to District	Aug-24	
7	ENPLAN starts environmental review	Aug-24	
8	District provides comments on draft Project Report	Sep-24	
9	Improvement areas surveyed	Oct-24	
10	PACE finalizes Project Report	Nov-24	
11	Draft environmental document completed	Dec-24	
12	ENPLAN completes environmental package	Jan-25	
13	Draft 50% drawings submitted to District and CWSRF	Jun-25	
14	Comments on draft 50% drawings received	Jul-25	
15	Final 90% drawings and specifications submitted to District, CWSRF, & CVRWQCB	Oct-25	
16	PACE submits application for construction funding to CWSRF	Oct-25	
17	CWSRF Construction Funding Agreement executed	Oct-26	
18	PACE finalizes drawings and specifications	Jan-27	
19	District approves advertising for bids	Mar-27	
20	District invites construction bids	Apr-27	
21	Construction bids received	Jun-27	
22	Construction contracts awarded	Jul-27	
23	Begin construction	Sep-27	
24	Construction complete	Sep-28	
25	Complete WWTP testing and adjustment of system	Mar-29	

APPENDIX A

WASTEWATER COLLECTION AND TREATMENT IMPROVEMENT PROJECT

STATE WATER RESOURCES CONTROL BOARD

CWSRF & PROP 1 PROJECT NO.: C-06-8108-110

AGREEMENT NO.: D15-04005

PLANNING GRANT PROJECT REPORT

FOR

BURNEY WATER DISTRICT

SEPTEMBER 2017

JOB NO. 306.29

PACE ENGINEERING
REDDING, CALIFORNIA

BURNEY WATER DISTRICT
BURNEY, CA

PACE ENGINEERING

September 28, 2017

306.29

SENT BY EMAIL ONLY
districtmanager@burneywater.org

William M. Rodriguez, District Manager
Burney Water District
20222 Hudson Street
Burney, CA 96013

We are pleased to present the final Project Report entitled:

BURNEY WATER DISTRICT
WASTEWATER COLLECTION AND TREATMENT IMPROVEMENT PROJECT
PLANNING GRANT PROJECT REPORT

This Project Report format follows requirements of the State Water Resources Control Board (SWRCB) Clean Water State Revolving Fund (CWSRF), Proposition 1 Grant Project No. C-06-8108-110 and is a necessary attachment to submit a complete Financial Assistance Application (FAA) for construction funding. Other FAA submittal requirements have been completed and uploaded to the SWRCB Financial Assistance Application Submittal Tool (FAAST) website.

Funding for this Project Report has been provided in full through Agreement No. D15-04005 with the 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 would like to thank District staff for their able assistance in its preparation. Please contact us with any questions.

Sincerely,

Laurie McCollum
Associate Engineer

Enclosures
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WASTEWATER COLLECTION AND TREATMENT IMPROVEMENT PROJECT

PLANNING GRANT PROJECT REPORT

FOR

BURNEY WATER DISTRICT

9/28/17

REGISTERED PROFESSIONAL ENGINEER
LAURIE E. McCOLLUM
No. 77274
CIVIL
STATE OF CALIFORNIA

SEPTEMBER 2017

JOB NO. 306.29

PACE ENGINEERING
REDDING, CALIFORNIA

BURNEY WATER DISTRICT
BURNEY, CA

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FIGURES – AT END OF TEXT

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ABBREVIATIONS

The following abbreviations are used in this report:

AC	Acre
ADWF	Average Dry Weather Flow
ATS	Automatic Transfer Switch
AWWF	Average Wet Weather Flow
BOD5	Biochemical Oxygen Demand
BWD	Burney Water District
CCI	Construction Cost Index
CCTV	Closed Circuit Television
CDP	Census Designated Place
CEQA	California Environmental Quality Act
CF	Cubic Feet
CIPP	Cured-In-Place Pipe
CVRWQCB	Central Valley Regional Water Quality Control Board
CWSRF	Clean Water State Revolving Fund
DBE	Disadvantaged Business Enterprise
DCB	Density Current Baffle
District	Burney Water District
DO	Dissolved Oxygen
DSMH	Downstream Manhole
ENR	Engineering News Record
EPA	Environmental Protection Agency
GCI Study	Geotechnical Consultants, Inc. Hydrogeological Assessment
GFE	Good Faith Effort
GPD	Gallons per Day
GPM	Gallons per Minute
HDPE	High Density Polyethylene Pipe
HE	Household Equivalents
HP	Horsepower

I&I	Infiltration and Inflow
Lbs	Pounds
LCC	Life Cycle Cost
LS	Lift Station
M&E	Metcalf & Eddy
MACP	Manhole Assessment and Certification Program
MCC	Motor Control Center
MCL	Maximum Contaminant Level
MGD	Million Gallons per Day
MHI	Median Household Income
MLSS	Mixed Liquor Suspended Solids
MTS	Manual Transfer Switch
NASSCO	National Association of Sewer Service Companies
NEMA	National Electrical Manufacturers Association
NEPA	National Environmental Policy Act
NPV	Net Present Value
NRCS	USDA Natural Resources Conservation Service
O&M	Operations and Maintenance
PACP	Pipeline Assessment and Certification Program
PD	Positive Displacement
PVC	Polyvinyl Chloride
PWWF	Peak Wet Weather Flow
RAS	Return Activated Sludge
RCAC	Rural Community Assistance Corporation
SCADA	Supervisory Control and Data Acquisition
SDP	Sludge Disposal Plan
SF	Square Feet
SMP	Sewer Master Plan
SOTE	Standard Oxygen Transfer Efficiency
SSMP	Sewer System Management Plan
SWRCB	State Water Resources Control Board

TDH	Total Dynamic Head
TSS	Total Dissolved Solids
USGS	United State Geological Survey
USMH	Upstream Manhole
UV	Ultraviolet
VCP	Vitrified Clay Pipe
VFD	Variable Frequency Drives
WAS	Waste Activated Sludge
WDRs	Waste Discharge Requirements
WWTP	Wastewater Treatment Plant

WWTP Headworks Screening would include replacement of the existing static screen and installation of an insulated, enclosed, self-cleaning screening unit in the existing screening building. The Enviro-Care/FSM perforated plate belt screen with wash press, the Huber Rotomat® Fine Screen, and the JWC TLS Spiral Screening Unit were all considered as units that screen, wash, convey, and dewater screenings in an enclosed tank. These units are all self-contained and would allow for the existing static screen to remain online while the new screen is being constructed. Refer to Appendix K for details of these alternatives. As shown therein, the equipment cost of an enclosed self-contained WWTP headworks screening unit is approximately $120,000. This alternative would allow for the most ease of O&M while still maintaining the desired screening. It is likely possible the same headworks screening unit could also be utilized to screen RAS in the future if it is needed.

Photo 15 – Enviro-Care FSM Filter Screen
Photo courtesy of Enviro-Care

To improve the existing sludge handling and disposal process, several alternatives were considered including: 1) applying sludge to land, 2) pumping to and drying sludge in existing unused oxidation ponds; 3) constructing a second sludge storage lagoon; and, 4) converting the existing secondary clarifier into an aerobic digester.

Applying sludge to land was a considered alternative given that the WWTP is immediately surrounded by large areas of farmland possibly making it a prime location for land disposal of sludge. A preliminary review of the possibility of land application of municipal sewage sludge near the WWTP was conducted utilizing the USDA Natural Resources Conservation Service (NRCS) Web Soil Survey. As shown in Appendix L, results indicate 95% of the area is very limited for land application primarily due to slow

water movement, depth to saturated zone, and flooding. The other 5% of areas are only somewhat limited and may be better suited for sludge land application than others.

Approval from the CVRWQCB would be required for use of biosolids as a soil amendment. Typically, such activities must comply with SWRCB Order No. 2004-0012-DWQ, General Waste Discharge Requirements for the Discharge of Biosolids to Land for Use as a Soil Amendment in Agricultural, Silvicultural, Horticultural, and Land Reclamation Activities (Biosolids General Order). As required per current WDRs, any proposed change in biosolids use or disposal practices from the current practice must be reported to the CVRWQCB and United States Environmental Protection Agency (EPA) at least 90 days in advance of the change. However, land application of biosolids requires a complete environmental review process be done prior to site approval, and EPA Part 503 Rule regulations would also need to be adhered to. Additionally, the sludge would still have to be treated on-site and dewatered prior to land application. Getting an area approved for land disposal of sludge is a very time intensive process. Given the need to develop a better sludge processing and disposal method sooner rather than later, this is not considered a feasible alternative at this time; therefore, a cost estimate is not given. However, the District will consider this alternative in the future for long-term sludge processing.

Pumping to and drying sludge in existing oxidation ponds in the near future was a considered alternative. The District has been removing sludge from the existing sludge storage basin and drying it in existing unused oxidation ponds for the last three years. This was also the recommended alternative identified in the SDP included in Appendix F. However, subsequent discussions with the CVRWQCB have resulted in this not being an acceptable long-term solution for the District. Therefore, due to regulatory restrictions, this is no longer a viable alternative, and a cost estimate is not given.

Construction of a second sludge storage lagoon was another alternative discussed in the SDP. As discussed therein, this alternative would involve dewatering Percolation Pond 1 to Stabilization Pond 6 and then converting Percolation Pond 1 into Sludge Lagoon 2. For the District to be able to dry the sludge in-place on a regular basis as part of typical O&M, the ponds would likely need to be paved as well as lined with HDPE below the pavement to protect groundwater, and a brown bear tractor would be purchased. Operation of the two sludge storage basins would be rotated every two years to keep sludge depths manageable and allow one to be taken offline, emptied, and cleaned while the other is operational. Aerators would be installed in each basin to reduce odors as needed. Consideration was given to solar aerators; however, these do not typically provide enough aeration in a pond to keep rising sludge from clumping together and/or duckweed and algae from blinding off the ponds. As such, costs herein are for surface aerators requiring electrical power. Refer to Table 8 for details of the preliminary project cost of $1,730,000 associated with this sludge processing improvement alternative.

This alternative is relatively simple in terms of operation; however, sludge removal must be completed in a timely manner for it to be effective. Similar to the current problem at the sludge drying beds which are no longer used, the available drying season in Burney is very short. Unless sludge lifts are placed very thin, which is not conducive to a sludge storage lagoon application, it is very possible there would not be adequate drying time for removal of the sludge. Therefore, mechanical dewatering would be required each time a sludge lagoon is taken out of service. This would put the District back in their current situation of being unable to afford sludge removal.

More important than the possible problems described above, are the concerns associated with this alternative meeting future CVRWQCB regulations. The CVRWQCB has already expressed concerns regarding drying sludge in ponds and the District maintaining adequate sludge removal each year from past experience. There is substantially more potential for groundwater contamination issues associated with a pond system for sludge storage, even with an HDPE and paved liner, as opposed to a

concrete wasting tank. An underdrain system and dewatering wells would likely be required as would installation of groundwater monitoring wells to ensure groundwater contamination does not occur.

The uncertainties accompanying this alternative, together with preference from the CVRWQCB to stay away from ponds due to groundwater contamination issues and other associated regulatory costs and issues, results in this not being a recommended alternative.

Converting the existing secondary clarifier into an aerobic digester would allow for daily wasting into a concrete enclosed tank. The existing 35-foot clarifier is too shallow to support effective settling of existing flows, so a new clarifier is recommended regardless. This alternative would effectively utilize the existing clarifier to limit the use of the existing sludge storage basin primarily to only when the aerobic digester was taken offline for maintenance. This would also ensure sludge processing and disposal is done in a timely manner rather than allowing years of sludge storage basin buildup. Operators could waste daily thus having better process control specifically with respect to nitrate without upsetting process biology. Diffused air would be cycled off/on to remove nitrate and minimize odors. Supernatant and a small amount of sludge from the digester would be returned to the headworks to bio-augment the mixed liquor with nitrifiers. A new pump station would be required to transport settled sludge from the digester to the sludge press.

Aeration alternatives considered include fine-bubble and coarse-bubble diffused air as well as an Invent HyperClassic® Mixer/Aerator. Fine-bubble porous diffusers have improved oxygen transfer and system energy efficiency over coarse-bubble nonporous diffusers. As described by Metcalf and Eddy (M&E) in *Wastewater Engineering Treatment and Reuse*, Fourth Edition, standard oxygen transfer efficiency (SOTE) at 15 feet of submergence for coarse-bubble is typically about 12% versus 30% for fine-bubble, or 2.5 times more. Fine-bubble requires the air supplied to be clean and free of particles that might clog the diffusers. As such, blower inlets are recommended

to have filters. Coarse-bubble diffusers have lower aeration efficiency but also typically have lower cost, less maintenance, and little to no air purity requirements. The equipment cost of fine-bubble versus coarse-bubble for a 65-foot-diameter circular tank as provided by Sanitaire is $35,000 and $51,000, respectively. Sanitaire recommended the fine-bubble diffuser over coarse-bubble diffusers as described in their preliminary design proposal given for another similar aerobic digester project included in Appendix M.

Also included in Appendix M are details of an Invent HyperClassic® Mixer/Aerator, which was also considered. This mixer/aerator would utilize the existing clarifier bridge with a dry mounted drive and vertical shaft. The design SOTE would be about 20%, which is less efficient than fine-bubble by about 10%; however, as detailed in Appendix M, this alternative provides consistent aeration efficiency with no deterioration in performance as is typical with fine-bubble diffused systems. Energy costs are greater for this alternative, and the upfront capital cost is approximately $100,000 for a mixer/aerator sized for the existing 35-foot clarifier tank. This capital cost is nearly three times more expensive than fine-bubble diffused air costs. Given the lower upfront capital costs and lower ongoing energy costs as well as increased efficiency, costs included in the recommended alternative herein are for fine-bubble diffused air.

Blower alternatives were also considered including centrifugal, rotary lobe positive displacement, and inlet guide vane-variable diffuser. As described by M&E, centrifugal blowers are almost universally used where the unit capacity is greater than 15,000 cubic feet per minute (CF/MIN) of free air. This is much larger than the 420 CF/MIN required for the District's 35-foot digester. For capacities smaller than 15,000 CF/MIN of free air per unit, rotary lobe positive displacement (PD) blowers are commonly used. Unlike centrifugal units, PD blowers cannot be throttled but are instead typically controlled via multiple units or variable frequency drives (VFD). The inlet guide vane-variable diffuser is a relatively new blower design based on a single-stage centrifugal that incorporates actuators to vary flowrate and optimize efficiency. They are well suited to applications with medium to high fluctuations in inlet temperature, discharge pressure, and flowrate.

However, upfront capital costs are higher for inlet guide vane-variable diffuser blowers, and a sophisticated computer control system is required to ensure efficient operation. It is recommended PD blowers with VFDs be installed given the capital cost, application, and required air flow for the District's situation. Refer to Table 9 for details of the preliminary project cost of $786,000 for conversion of the existing clarifier into an aerobic digester.

Given that conversion of the existing clarifier into an aerobic digester is the preferred sludge processing alternative, several options were considered for further solids dewatering and disposal from the digester including a centrifuge, belt press, screw press, and rotary fan press. All alternatives considered would include sludge pumping facilities, a polymer blending system to achieve optimal solids concentrations, return of supernatant back to the headworks for further treatment, conveyors to drop sludge in storage bins prior to hauling, a scale to weigh sludge before it is hauled off-site for final disposal at a landfill, and all enclosed in a building to protect the equipment and electrical/control facilities. The following advantages and disadvantages associated with each alternative considered are applicable to the District's size and needs:

Centrifuge Advantages:

- Minimal odors
- Fast startup and shutdown
- Produces very dry sludge cake (18-25%)
- Very high solids capture (95%)

Centrifuge Disadvantages:

- Requires grit removal and possible sludge grinder
- Skilled maintenance personnel required
- Cannot observe dewatering zone to optimize/adjust performance
- High capital and energy operating costs
- High polymer usage (10-15 g/kg dry solids)

Belt Press Advantages:

- Low energy requirement
- Relatively low capital and operating cost
- Less complex mechanically for easier maintenance
- Minimal effort required for system shut down
- Lower polymer usage (6-10 g/kg dry solids)

Belt Press Disadvantages:

- Hydraulically limited in throughput
- Requires sludge grinder
- Produces lower solids cake (12-22%)
- Very sensitive to incoming sludge feed characteristics
- Relatively short media life
- Automatic operation generally not advised

Screw Press Advantages:

- Low noise and revolution speeds
- Low odors
- Low energy
- Low shear reduces odors in dewatered cake
- Overdosing polymer does not clog screen or hinder dewatering

Screw Press Disadvantages:

- Washwater used periodically throughout operating cycle
- Cannot observe dewatering zone to optimize/adjust performance
- High polymer usage (9-18 g/kg dry solids)
- Produces lower solids cake (15-20%)

Rotary Fan Press Advantages:

- Low noise and revolution speeds
- Low odors
- Low energy
- Produces very dry sludge cake (28-45%)
- High solids capture (90-95%)
- Low shear reduces odors in dewatered cake
- Overdosing polymer does not clog screen or hinder dewatering
- Washwater only used during shut down of system

Rotary Fan Press Disadvantages:

- Cannot observe dewatering zone to optimize/adjust performance
- High polymer usage (9-18 g/kg dry solids)

As shown in the comparison above, the belt press produces the least dry cake and would be the most odorous of all alternatives considered. The quality of sludge cake is very sensitive to incoming sludge feed characteristics and automatic operation is not easily achievable with a belt press. Given the limited manpower currently available for WWTP operations at the District, adding another process that requires constant attention when in operation is not preferred or recommended.

Similarly, while the centrifuge would produce a very dry sludge cake, it requires highly skilled maintenance personnel to keep the equipment operating efficiently. The District does not have such personnel available and therefore this alternative is also not preferred or recommended.

Of all the alternatives considered above, the rotary fan press produces the driest sludge cake and highest solids capture with minimal odors. Additionally, it has the most advantages and least disadvantages of all the alternatives. As such, the rotary press is

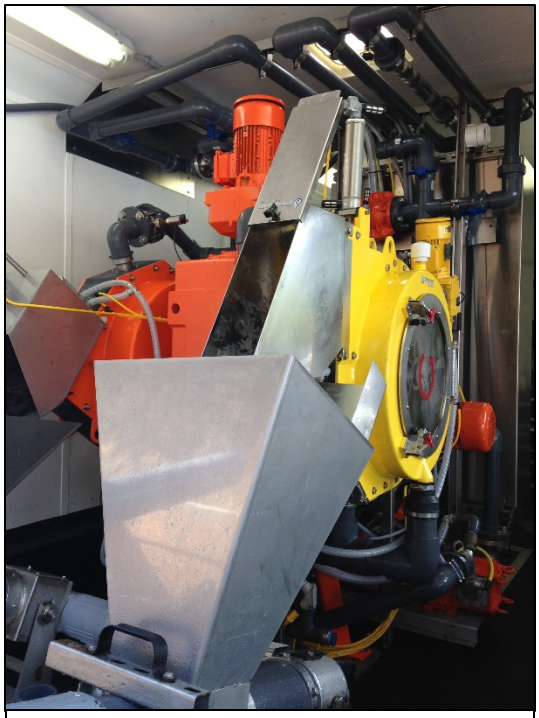


Photo 16 – Prime Solution Rotary Fan Press

the preferred alternative. Refer to Appendix N for details of sludge processing equipment considered for both the rotary fan press and a screw press. As shown therein, the recommended Prime Solution rotary fan press skid system equipment cost is approximately $355,000.

O&M Cost Estimate

Anticipated annual O&M costs for the screening and sludge processing and dewatering alternatives are itemized in Tables 10 through 12. These costs take into account consumables such as power and chemicals, plus labor, benefits, training, and administration. As shown therein, installation of a WWTP headworks screening unit, conversion of the existing clarifier into an aerobic digester, and installation of a screw press are anticipated to have the lowest O&M costs.

Short-Lived Asset Reserve

Short-lived assets, which require significant maintenance or full replacement within 5 to 15 years, are itemized for screening and sludge processing and dewatering alternatives in Tables 13 through 15. As shown therein, installation of a Main LS screening unit, construction of a second sludge storage lagoon, and installation of a rotary fan press are anticipated to have the lowest short-lived asset reserve costs.

Life Cycle Cost

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 value (NPV) or present worth. LCC estimates are based on time

of construction and include costs for construction, indirect costs, O&M, short-lived asset replacement, and salvage value.

LCC was not carried through for all pipeline collection system alternatives. Aside from open-cut trenching, all other alternatives considered are trenchless technologies that are not feasible to implement in most all cases due to the presence of collapsed, severely broken pipes or heavy root blockages. Pipe bursting, directional drilling, and CIPP all have the possibility of resulting in inadequate final grades when these existing conditions are present, and therefore, these alternatives may result in additional problems and are not recommended. LCC for open-cut trenching is included in Table 31. As shown therein, no additional O&M or short-lived assets are expected as a result of the pipeline improvements.

LCC was not carried through for all sludge process alternatives considered due to non-monetary concerns. Applying sludge to land was considered; however, this alternative would still require sludge to be processed and dewatered to some degree prior to land application, so it would not solve the District's current sludge processing issues. Additionally, environmental regulations and approvals associated with land application of sludge are extremely time intensive and the District needs to complete improvements sooner rather than later as required by the CVRWQCB. Therefore, this alternative was not considered feasible, and LCC was not determined.

Similarly, LCC analysis was not completed for the considered alternative of drying sludge in existing unused oxidation ponds. This is due to the CVRWQCB not allowing sludge to be placed in the unlined ponds as part of future operations.

LCC analysis for the belt filter press and centrifuge sludge dewatering alternatives was also not completed for non-monetary reasons. The belt filter press would require constant attention to adjust incoming sludge characteristics. The District has limited staff that cannot afford this additional time. Similarly, the level of staff expertise the advanced technology of a centrifuge would require for O&M is not conducive to that of

the District. Therefore, these alternatives were not considered feasible, and LCC was not determined.

The LCC for feasible screening and sludge processing and dewatering alternatives are summarized in Tables 16 through 22. As shown therein, installation of a WWTP headworks screening unit, conversion of the existing clarifier into an aerobic digester, and installation of a screw press are all anticipated to have the lowest NPV. However, the NPV of the screw press and rotary fan press are nearly identical. Given the additional advantages of the fan press over the screw press it is recommended the rotary fan press be installed. It is also recommended a WWTP headworks screening unit be installed and the existing clarifier be converted into an aerobic digester.

All project alternatives considered have the same opportunities for water and energy efficiency and integrate climate change considerations as follows:

1. Proposed alternatives further seek to integrate energy efficiency goals and minimize ongoing costs to taxpayers by requiring the use of National Electrical Manufacturers Association (NEMA) Premium motors and generators. NEMA Premium motors and optimized systems reduce electrical consumption thereby reducing pollution associated with electrical power generation. Based on U.S. Department of Energy data, it is estimated that the NEMA Premium motor program will save 5,800 gigawatts of electricity and prevent the release of nearly 80 million metric tons of carbon into the atmosphere over the next ten years. This is equivalent to keeping 16 million cars off the road. (NEMA 2015).

   These measures will reduce the net capital and operations cost of the project and are consistent with State Revolving Fund climate change goals. Power consumption for all alternatives was included in O&M and life cycle comparisons.

WWTP Improvement Project:

As shown in the alternatives analysis section above, cost of construction, O&M, and replacement were all considered when selecting recommended treatment process alternatives. All project alternatives will upgrade motors, generators, and electrical to those of premium efficiencies and meet current electrical code. As such, the recommended WWTP Improvement Project was primarily selected due to existing infrastructure, site, regulatory and funding limitations, and ease of O&M.

The recommended WWTP Improvement Project will include the following components:

- Construction of a 50-foot secondary clarifier with DCB
- Conversion of existing clarifier into aerobic sludge digester complete with digester pumps, blowers, and aeration equipment
- Installation of sludge press and building
- Installation of new influent screening unit and influent flow meter
- Replacement of RAS/WAS pumps and installation of freeze protection for RAS vault
- Sludge lagoon subgrade preparation and replacement of HDPE liner
- Installation of sludge lagoon aerator
- Rerouting of sludge lagoon supernatant
- Replacement of all controls and alarms
- Installation of permanent generator and ATS

Refer to Figures 3 and 7 for the WWTP site plan and process flow diagram with proposed improvements, respectively.

Following project completion, it is anticipated sludge from the aerobic digester will be fed to the rotary fan press at about 1% to 3%. Dried sludge from the fan press will be at about 25% to 30%. It will then either be placed directly into a disposal bin for weekly hauling or moved to the sludge drying beds via a tractor for further drying to about 80% prior to hauling to the Anderson Landfill in Shasta County. No improvements to the

sludge drying beds will be required for these operations. To be conservative, O&M costs included herein assumed the sludge would be hauled weekly from the disposal bin to the landfill, as this will be costlier than drying the sludge further on-site prior to disposal. Future operations will ultimately depend on District finances available for sludge disposal and/or time available by District staff for moving sludge to the drying beds.

California Governmental Code Section 65041.1 addresses state planning priorities and sustainable water resources management priorities. These policies are intended to promote equity, strengthen the economy, protect the environment, and promote public health and safety in the state including in urban, suburban, and rural communities.

Both recommended projects comply with these priorities as follows:

a) Promote infill development and equity by rehabilitating, maintaining, and improving existing infrastructure that supports infill development and appropriate reuse and redevelopment of previously developed, underutilized land that is presently served by transit, streets, water, sewer, and other essential services, particularly in underserved areas, and to preserving cultural and historic resources.

Both recommended projects efficiently utilize land already occupied by existing facilities. Proposed facilities will serve only those areas within the existing Sewer Service Area already receiving service.

b) Protect environmental and agricultural resources by protecting, preserving, and enhancing the state's most valuable natural resources, including working landscapes such as farm, range, and forest lands, natural lands such as wetlands, watersheds, wildlife habitats, and other wildlands, recreation lands such as parks, trails, greenbelts, and other open space, and landscapes with locally unique features and areas identified by the state as deserving special protection.

Both recommended projects protect environmental resources including wildlife habitat and recreational activities by removing contaminants from the wastewater prior to discharge. Collection system improvements will reduce the potential for sanitary sewer overflows and contamination to groundwater. All environmental impacts will be analyzed and mitigated per CEQA and NEPA requirements in the environmental document currently being developed separate from this report.

Both recommended projects incorporate energy and water conservation measures by installing premium efficiency pumps and motors.

c) Encourage efficient development patterns by ensuring that any infrastructure associated with development, other than infill development, supports new development that does all of the following:

(1) Uses land efficiently.
(2) Is built adjacent to existing developed areas to the extent consistent with the priorities specified pursuant to subdivision b).
(3) Is located in an area appropriately planned for growth.
(4) Is served by adequate transportation and other essential utilities and services.
(5) Minimizes ongoing costs to taxpayers.

As noted above, both recommended projects will efficiently utilize land already occupied by existing facilities. Proposed facilities will serve only those areas within the proposed Sewer Service Area already receiving service. No components of this project are growth inducing, and no new users will result from this project.

B. Design Criteria and Useful Life of the Project

Both of the recommended projects' design criteria to meet regulatory requirements and useful life of project components are presented in the following locations:

Table 4:	WWTP Design Criteria
Table 5:	Equipment Useful Service Lives
Appendices B & C:	Effluent limits and monitoring requirements after and prior to April 7, 2017, respectively

C. Life Cycle Cost Estimate

Collection System Improvement Project:

The recommended project cost breakdown is included in Table 23. As shown therein, construction costs are approximately $1,117,000, with indirect costs of $546,000, for a total project cost of $1,775,000. This cost includes $30,000 for interim financing, which is not a CWSRF eligible cost. The total project cost requested for CWSRF financing is $1,745,000. The estimated annual O&M and short-lived assets of the recommended project components will be nearly identical to those currently in place. Apart from a larger pump at the Main LS, which slightly increases yearly O&M and short-lived asset costs as shown in Tables 26A and 27A, respectively, most all of the collection system improvements are to repair existing infrastructure. The increase in annual O&M costs of about $2,500 will result from increased power costs due to a larger horsepower pump. As such, the life cycle cost estimate for the recommended project is itemized in Table 24 with a project NPV of $1,682,000. This includes a replacement salvage value of $250,000 as shown in Table 32.

WWTP Improvement Project:

The recommended project cost breakdown is included in Table 25. As shown therein, construction costs are approximately $4,377,000, with indirect costs of $1,333,000, for a total project cost of $6,148,000. This cost includes $60,000 for interim financing which is not a CWSRF eligible cost. The total project cost requested for CWSRF financing is $6,088,000. The estimated annual O&M and short-lived assets of the recommended project components, in addition to those currently in place, are $90,700 and $59,300 as shown in Tables 26B and 27B, respectively. As such, the life cycle cost estimate for the recommended project is itemized in Table 28 with a project NPV of $9,513,000. This includes a replacement salvage value of $491,000 as shown in Table 33.

TABLES

TABLE 6
BURNEY WATER DISTRICT
WASTEWATER COLLECTION AND TREATMENT IMPROVEMENT PROJECT
GENERAL PROJECT ALTERNATIVES CONSIDERED

Collection	Treatment
Open Cut Pipe Bursting Directional Drill Cured in Place	Screening: Main LS Screening RAS Screening WWTP Headworks Screening Sludge Processing: Land apply sludge Pump to and dry sludge in unused oxidation ponds Construct second sludge storage lagoon Convert existing clarifier to aerobic digester Aeration Alternatives: Fine-Bubble Diffusers Coarse-Bubble Diffusers Invent Mixer/Aerator Blower Alternatives: Centrifugal Rotary Lobe Positive Displacement Inlet Guide Vane-Variable Diffuser Sludge Drying: Centrifuge Belt Press Screw Press Rotary Fan Press

TABLE 8
BURNEY WATER DISTRICT
WASTEWATER COLLECTION AND TREATMENT IMPROVEMENT PROJECT
CONSTRUCT SECOND SLUDGE STORAGE LAGOON
PRELIMINARY PROJECT COST ESTIMATE

No.	Item	Quantity	Unit	Unit Cost	Total Cost[1]
Construction Costs					
1	AC Pavement (3-2" lifts)	36,000	SF	$4.50	$162,000
2	AB (12" thick)	1,333	CY	$65	$86,700
3	Shotcrete	1,067	CY	$500	$533,400
4	HDPE Liner	93,600	SF	$1.00	$93,600
5	Earthwork Cut	5,200	CY	$3.00	$15,600
6	Earthwork Fill	3,467	CY	$3.75	$13,000
7	Surface Aerators	2	EA	$20,000	$40,000
8	6-inch Pond Piping	600	LF	$150	$90,000
9	Dewatering Well and Underdrain, complete	1	LS	$75,000	$75,000
10	Groundwater Monitoring Well	2	LS	$10,000	$20,000
11				***Subtotal Construction Cost***	$1,129,300
12				Inflation adder for construction in 2020 @ 3% per year	$105,000
13				***Contractor Overhead and Profit @ 8%***	$99,000
14				***TOTAL CONSTRUCTION COSTS***	***$1,333,300***
15	***Indirect Costs***				
16	Bidding/Contract Award Services				$20,000
17	Engineering Design @ 8% of construction costs				$107,000
18	Engineering Construction Administration @ 6% of construction costs				$80,000
19	Inflation Adder for Engineering & Construction Administration in 2019/2020 @ 3% per year				$11,000
20	Construction Observation				$41,000
21	Record Drawings				$3,000
22				***TOTAL INDIRECT COSTS***	***$262,000***
23				***Project Contingencies @ 10% of Construction Costs***	$134,000
24				***TOTAL PROJECT COST***	***$1,730,000***

1. Costs in August 2017 dollars.

TABLE 9
BURNEY WATER DISTRICT
WASTEWATER COLLECTION AND TREATMENT IMPROVEMENT PROJECT
CONVERT SECONDARY CLARIFIER INTO AEROBIC DIGESTER
PRELIMINARY PROJECT COST ESTIMATE

No.	Item	Quantity	Unit	Unit Cost	Total Cost[1]
Construction Costs					
1	Existing Clarifier Mechanical Demo	1	LS	$20,000	$20,000
2	Digester Sludge and Supernatant Pumps	4	EA	$15,000	$60,000
3	Blowers	2	EA	$40,000	$80,000
4	Aeration Equipment	1	LS	$100,000	$100,000
5	Misc WWTP Piping	1	LS	$50,000	$50,000
6	AD Pumping/Blower/Sludge Press Building	576	SF	$300	$173,000
7				***Subtotal Construction Cost***	$483,000
8				Inflation adder for construction in 2020 @ 3% per year	$45,000
9				***Contractor Overhead and Profit @ 8%***	$42,000
10				***TOTAL CONSTRUCTION COSTS***	***$570,000***
11	***Indirect Costs***				
12	Bidding/Contract Award Services				$20,000
13	Engineering Design @ 8% of construction costs				$46,000
14	Engineering Construction Administration @ 6% of construction costs				$34,000
15	Inflation Adder for Engineering & Construction Administration in 2019/2020 @ 3% per year				$5,000
16	Construction Observation				$41,000
17	Startup Services				$10,000
18	Record Drawings				$3,000
19				***TOTAL INDIRECT COSTS***	***$159,000***
20				***Project Contingencies @ 10% of Construction Costs***	$57,000
21				***TOTAL PROJECT COST***	***$786,000***

1. Costs in August 2017 dollars.

TABLE 11
BURNEY WATER DISTRICT
WASTEWATER COLLECTION AND TREATMENT IMPROVEMENT PROJECT
SLUDGE PROCESSING ALTERNATIVES ANNUAL O&M COST ESTIMATE

No.	Item	Quantity	Unit	Unit Cost	Total Cost[1]
Convert Clarifier into Aerobic Digester					
1	Labor including benefits	730	Hrs	$40	$29,200
2	Digester Pumps Power[2]	7,758	Kw-Hrs	$0.15	$1,164
3	Digester Pumps Cleaning/Repair/Lubrication/Replacement	1	LS	$500	$500
4	Blowers Power[3]	65,171	Kw-Hrs	$0.20	$13,034
5	Blowers Cleaning/Repair/Lubrication/Replacement	1	LS	$500	$500
6	Aeration Equipment Cleaning/Repair/Replacement	1	LS	$500	$500
7	Fan Press Polymer	1.2	55-Gal Barrel	$1,350	$1,620
8	Fan Press Power[4]	3,200	Kw-Hrs	$0.15	$480
9	Fan Press Cleaning/Repair/Lubrication/Replacement	1	LS	$1,000	$1,000
10	Sludge Disposal[5]	130	Ton	$100	$13,000
11	Subtotal				$60,998
Aerobic Digester Total Estimated Annual O&M Costs					**$61,000**
Construct Second Sludge Storage Lagoon					
1	Labor including benefits	826	Hrs	$40	$33,040
2	Surface Aerators Power[6]	130,699	Kw-Hrs	$0.15	$19,605
3	Surface Aerators Cleaning/Repair/Lubrication/Replacement	1	LS	$500	$500
4	Sludge Removal, Drying, and Disposal[7]	100	DT	$260	$26,000
5	Subtotal				$79,145
Second Sludge Lagoon Total Estimated Annual O&M Costs					**$79,200**

1. Costs in August 2017 dollars.
2. Assumes digester pumping for 4 hours per day, 5 days a week.
3. Assumes one blower operating 12 hours per day, 7 days a week.
4. Assumes fan press operating 5 hours per day, 3 days a week.
5. Assumes similar sludge production to that demonstrated during City of Dunsmuir October 2016 Rotary Fan Press Pilot Study.
6. Assumes two surface aerators operating 24 hours per day, 7 days a week.
7. Based on 2014 Synagro cost to dry and remove sludge.

TABLE 12
BURNEY WATER DISTRICT
WASTEWATER COLLECTION AND TREATMENT IMPROVEMENT PROJECT
SLUDGE DEWATERING ALTERNATIVES ANNUAL O&M COST ESTIMATE

No.	Item	Quantity	Unit	Unit Cost	Total Cost[1]
Rotary Fan Press					
1	Labor including benefits	365	Hrs	$40	$14,600
2	Fan Press Polymer	1.2	55-Gal Barrel	$1,350	$1,620
3	Fan Press Power[2]	3,200	Kw-Hrs	$0.15	$480
4	Fan Press Cleaning/Repair/Lubrication/Replacement	1	LS	$1,000	$1,000
5	Sludge Disposal[3]	130	Ton	$100	$13,000
6	Subtotal				$30,700
Rotary Fan Press Total Estimated Annual O&M Costs					**$30,800**
Screw Press					
1	Labor including benefits	183	Hrs	$40	$7,300
2	Screw Press Polymer	1.2	55-Gal Barrel	$1,350	$1,620
3	Screw Press Power[2]	1,804	Kw-Hrs	$0.15	$271
4	Screw Press Cleaning/Repair/Lubrication/Replacement	1	LS	$1,000	$1,000
5	Sludge Disposal[4]	143	Ton	$100	$14,300
6	Subtotal				$24,491
Screw Press Total Estimated Annual O&M Costs					**$24,500**

1. Costs in August 2017 dollars.
2. Assumes press operating 5 hours per day, 3 days a week.
3. Assumes similar sludge production to that demonstrated during City of Dunsmuir October 2016 Rotary Fan Press Pilot Study.
4. Assumes producing sludge that is approximately 10% less dry than that from the Rotary Fan Press.

TABLE 14
BURNEY WATER DISTRICT
WASTEWATER COLLECTION AND TREATMENT IMPROVEMENT PROJECT
SLUDGE PROCESSING ALTERNATIVES
SHORT-LIVED ASSETS RESERVE ESTIMATE

Equipment	Period	Estimated Cost	Annual Reserve
Convert Clarifier into Aerobic Digester			
Replace Digester Pumps	15	$60,000	$4,000
Replace Blowers	15	$50,000	$3,333
Replace Aeration Equipment	15	$80,000	$5,333
Replace Fan Press	15	$380,000	$25,333
Replace Surface Aerator	15	$20,000	$1,333
		Total Annual Cost	$39,300
Construct Second Sludge Storage Lagoon			
Replace Surface Aerators	15	$40,000	$2,667
		Total Annual Cost	$2,700

1. Costs in August 2017 dollars.

TABLE 15
BURNEY WATER DISTRICT
WASTEWATER COLLECTION AND TREATMENT IMPROVEMENT PROJECT
SLUDGE DEWATERING ALTERNATIVES
SHORT-LIVED ASSETS RESERVE ESTIMATE

Equipment	Period	Estimated Cost	Annual Reserve
Rotary Fan Press			
Replace Fan Press	15	$380,000	$25,333
		Total Annual Cost	$25,300
Screw Press			
Replace Screw Press	15	$430,000	$28,667
		Total Annual Cost	$28,700

1. Costs in August 2017 dollars.

TABLE 19
BURNEY WATER DISTRICT
WASTEWATER COLLECTION AND TREATMENT IMPROVEMENT PROJECT
CONSTRUCT SECOND SLUDGE STORAGE LAGOON - LIFE CYCLE COST ESTIMATE

Year	Design & Construction $ /a/	O&M Costs, $		Salvage Value $ /c/	Present Worth Factor = 0.5%	Present Worth of Costs, $				
		Fixed O&M /b/	Variable Short-Lived Assets /b/			Design & Construction	O & M		Salvage Value	Total
							Fixed	Variable		
2018										
2019	127,000				1.00500	127,635				127,635
2020	1,603,000				1.00000	1,603,000				1,603,000
2021		79,200	2,700		0.99502		78,806	2,687		81,493
2022		81,576	2,781		0.99007		80,766	2,753		83,520
2023		84,023	2,864		0.98515		82,775	2,822		85,597
2024		86,544	2,950		0.98025		84,835	2,892		87,727
2025		89,140	3,039		0.97537		86,945	2,964		89,909
2026		91,815	3,130		0.97052		89,108	3,038		92,145
2027		94,569	3,224		0.96569		91,324	3,113		94,438
2028		97,406	3,321		0.96089		93,596	3,191		96,787
2029		100,328	3,420		0.95610		95,924	3,270		99,194
2030		103,338	3,523		0.95135		98,310	3,351		101,662
2031		106,438	3,629		0.94661		100,756	3,435		104,191
2032		109,631	3,737		0.94191		103,262	3,520		106,783
2033		112,920	3,850		0.93722		105,831	3,608		109,439
2034		116,308	3,965		0.93256		108,464	3,698		112,161
2035		119,797	4,084		0.92792		111,162	3,790		114,951
2036		123,391	4,207		0.92330		113,927	3,884		117,811
2037		127,093	4,333		0.91871		116,761	3,980		120,741
2038		130,906	4,463		0.91414		119,665	4,080		123,745
2039		134,833	4,597		0.90959		122,642	4,181		126,823
2040		138,878	4,734	0	0.90506		125,693	4,285	0	129,978
Total	1,730,000					1,730,635	2,010,553	68,542		3,809,730

Recommended Project Present Worth Cost = $3,810,000

a) All costs are August 2017 dollars.

b) Fixed costs equals O&M costs and variable equal short-lived assets reserve.

c) Service lives are as presented in Table 5.

TABLE 20
BURNEY WATER DISTRICT
WASTEWATER COLLECTION AND TREATMENT IMPROVEMENT PROJECT
CONVERT CLARIFIER INTO AEROBIC DIGESTER - LIFE CYCLE COST ESTIMATE

Year	Design & Construction $ /a/	O&M Costs, $		Salvage Value $ /c/	Present Worth Factor = 0.5%	Present Worth of Costs, $				
		Fixed O&M /b/	Variable Short-Lived Assets /b/			Design & Construction	O & M		Salvage Value	Total
							Fixed	Variable		
2018										
2019	66,000				1.00500	66,330				66,330
2020	720,000				1.00000	720,000				720,000
2021		61,000	39,300		0.99502		60,697	39,104		99,801
2022		62,830	40,479		0.99007		62,206	40,077		102,284
2023		64,715	41,693		0.98515		63,754	41,074		104,828
2024		66,656	42,944		0.98025		65,340	42,096		107,436
2025		68,656	44,232		0.97537		66,965	43,143		110,108
2026		70,716	45,559		0.97052		68,631	44,216		112,847
2027		72,837	46,926		0.96569		70,338	45,316		115,654
2028		75,022	48,334		0.96089		72,088	46,443		118,531
2029		77,273	49,784		0.95610		73,881	47,599		121,480
2030		79,591	51,278		0.95135		75,719	48,783		124,502
2031		81,979	52,816		0.94661		77,602	49,996		127,599
2032		84,438	54,400		0.94191		79,533	51,240		130,773
2033		86,971	56,032		0.93722		81,511	52,515		134,026
2034		89,581	57,713		0.93256		83,539	53,821		137,360
2035		92,268	59,445		0.92792		85,617	55,160		140,777
2036		95,036	61,228		0.92330		87,747	56,532		144,279
2037		97,887	63,065		0.91871		89,930	57,938		147,868
2038		100,824	64,957		0.91414		92,167	59,379		151,546
2039		103,848	66,906		0.90959		94,459	60,857		155,316
2040		106,964	68,913	0	0.90506		96,809	62,370	0	159,179
Total	786,000					786,330	1,548,532	997,661		3,332,523

Recommended Project Present Worth Cost = $3,333,000

a) All costs are August 2017 dollars.

b) Fixed costs equals O&M costs and variable equal short-lived assets reserve.

c) Service lives are as presented in Table 5.

TABLE 21
BURNEY WATER DISTRICT
WASTEWATER COLLECTION AND TREATMENT IMPROVEMENT PROJECT
ROTARY FAN PRESS - LIFE CYCLE COST ESTIMATE

Year	Design & Construction $ /a/	O&M Costs, $		Salvage Value $ /c/	Present Worth Factor = 0.5%	Present Worth of Costs, $				
		Fixed O&M /b/	Variable Short-Lived Assets /b/			Design & Construction	O & M		Salvage Value	Total
							Fixed	Variable		
2018										
2019	68,000				1.00500	68,340				68,340
2020	458,000				1.00000	458,000				458,000
2021		30,800	25,300		0.99502		30,647	25,174		55,821
2022		31,724	26,059		0.99007		31,409	25,800		57,209
2023		32,676	26,841		0.98515		32,190	26,442		58,633
2024		33,656	27,646		0.98025		32,991	27,100		60,091
2025		34,666	28,475		0.97537		33,812	27,774		61,586
2026		35,706	29,330		0.97052		34,653	28,465		63,118
2027		36,777	30,210		0.96569		35,515	29,173		64,688
2028		37,880	31,116		0.96089		36,398	29,899		66,297
2029		39,017	32,049		0.95610		37,304	30,642		67,946
2030		40,187	33,011		0.95135		38,232	31,405		69,637
2031		41,393	34,001		0.94661		39,183	32,186		71,369
2032		42,634	35,021		0.94191		40,158	32,987		73,144
2033		43,913	36,072		0.93722		41,157	33,807		74,964
2034		45,231	37,154		0.93256		42,180	34,648		76,828
2035		46,588	38,269		0.92792		43,230	35,510		78,740
2036		47,985	39,417		0.92330		44,305	36,393		80,698
2037		49,425	40,599		0.91871		45,407	37,299		82,706
2038		50,908	41,817		0.91414		46,537	38,226		84,763
2039		52,435	43,072		0.90959		47,694	39,177		86,872
2040		54,008	44,364	0	0.90506		48,881	40,152	0	89,033
Total	526,000					526,340	781,882	642,260		1,950,482

Recommended Project Present Worth Cost = $1,950,000

a) All costs are August 2017 dollars.

b) Fixed costs equals O&M costs and variable equal short-lived assets reserve.

c) Service lives are as presented in Table 5.

TABLE 22
BURNEY WATER DISTRICT
WASTEWATER COLLECTION AND TREATMENT IMPROVEMENT PROJECT
SCREW PRESS - LIFE CYCLE COST ESTIMATE

Year	Design & Construction $ /a/	O&M Costs, $		Salvage Value $ /c/	Present Worth Factor = 0.5%	Present Worth of Costs, $				
		Fixed O&M /b/	Variable Short-Lived Assets /b/			Design & Construction	O & M		Salvage Value	Total
							Fixed	Variable		
2018										
2019	76,000				1.00500	76,380				76,380
2020	515,000				1.00000	515,000				515,000
2021		24,500	28,700		0.99502		24,378	28,557		52,935
2022		25,235	29,561		0.99007		24,985	29,268		54,252
2023		25,992	30,448		0.98515		25,606	29,996		55,602
2024		26,772	31,361		0.98025		26,243	30,742		56,985
2025		27,575	32,302		0.97537		26,896	31,507		58,402
2026		28,402	33,271		0.97052		27,565	32,290		59,855
2027		29,254	34,269		0.96569		28,251	33,094		61,344
2028		30,132	35,297		0.96089		28,953	33,917		62,870
2029		31,036	36,356		0.95610		29,674	34,760		64,434
2030		31,967	37,447		0.95135		30,412	35,625		66,037
2031		32,926	38,570		0.94661		31,168	36,511		67,680
2032		33,914	39,728		0.94191		31,944	37,420		69,363
2033		34,931	40,919		0.93722		32,738	38,350		71,089
2034		35,979	42,147		0.93256		33,553	39,304		72,857
2035		37,058	43,411		0.92792		34,387	40,282		74,669
2036		38,170	44,714		0.92330		35,243	41,284		76,527
2037		39,315	46,055		0.91871		36,119	42,311		78,430
2038		40,495	47,437		0.91414		37,018	43,364		80,381
2039		41,710	48,860		0.90959		37,939	44,442		82,381
2040		42,961	50,326	0	0.90506		38,882	45,548	0	84,430
Total	591,000					591,380	621,951	728,572		1,941,903

Recommended Project Present Worth Cost = $1,942,000

a) All costs are August 2017 dollars.

b) Fixed costs equals O&M costs and variable equal short-lived assets reserve.

c) Service lives are as presented in Table 5.

TABLE 25
BURNEY WATER DISTRICT
WASTEWATER COLLECTION AND TREATMENT IMPROVEMENT PROJECT
WWTP IMPROVEMENT PROJECT PRELIMINARY COST ESTIMATE

No.	Item	Quantity	Unit	Unit Cost	Total Cost[1]
WWTP Construction Costs					
1	50-foot Clarifier	1	EA	$1,000,000	$1,000,000
2	Blasting for clarifier excavation	727	CY	$100	$73,000
3	Density Current Baffle	1	EA	$35,000	$35,000
4	Existing Clarifier Mechanical Demo	1	LS	$20,000	$20,000
5	Digester Sludge and Supernatant Pumps	4	EA	$15,000	$60,000
6	Blowers	2	EA	$50,000	$100,000
7	Aeration Equipment	1	LS	$100,000	$100,000
8	AD Pumping/Blower/Sludge Press Building	576	SF	$300	$173,000
9	Misc WWTP Piping	1	LS	$50,000	$50,000
10	Influent Screening Unit	1	EA	$220,000	$220,000
11	15 Hp RAS/WAS Pump	2	EA	$30,000	$60,000
12	Freeze Protection for RAS Vault	1	LS	$10,000	$10,000
13	Sludge lagoon subgrade preparation/Pond 8 dike repair	3000	CY	$40	$120,000
14	Install 60 mil HDPE liner	1	LS	$100,000	$100,000
15	Sludge Press	1	LS	$500,000	$500,000
16	Sludge Conveyance Improvements	1	LS	$50,000	$50,000
17	Reroute 4-inch Sludge Lagoon Supernatant	1000	LF	$75	$75,000
18	8-inch and 4-inch Magnetic Flow Meter	1	LS	$20,000	$20,000
19	Sludge Pumping and Hauling	300	DT	$260	$78,000
20	Sludge Lagoon Aerator	1	LS	$20,000	$20,000
21	Sludge Lagoon Supernatant Pump	1	LS	$15,000	$15,000
22	Control Panel	1	LS	$100,000	$100,000
23	WWTP MCC	1	LS	$180,000	$180,000
24	WWTP Generator & ATS	1	LS	$120,000	$120,000
25	Dewatering	1	LS	$50,000	$50,000
26	Mobilization/Demobilization	1	LS	$200,000	$200,000
27	Testing	1	LS	$50,000	$50,000
28	Submittals	1	LS	$50,000	$50,000
29	Bonds	1	LS	$40,000	$40,000
30	Insurance	1	LS	$40,000	$40,000
31				***Subtotal Construction Cost***	$3,709,000
32				Inflation adder for construction in 2020 @ 3% per year	$344,000
33				***Contractor Overhead and Profit @ 8%***	$324,000
34				***TOTAL CONSTRUCTION COSTS***	***$4,377,000***
35	***Indirect Costs***				
36	***Engineering Services***				
37	Bidding/Contract Award Services				$20,000
38	Engineering Design @ 8% of construction costs				$350,000
39	Engineering Construction Administration @ 6% of construction costs				$263,000
40	Inflation Adder for Engineering & Construction Administration in 2019/2020 @ 3% per year				$37,000
41	Electrical Programming Integration with Collection System Improvements				$10,000
42	Construction Observation				$363,000
43	Construction Phase Surveying				$20,000
44	Startup Services				$20,000
45	Record Drawings				$10,000
46				***Total Engineering Services***	***$1,093,000***
47	***Other Indirect Services***				
48	Interim Financing[2]				$60,000
49	Replace Existing Lab Equipment				$30,000
50	O&M Manual				$50,000
51	ROWD and WDR Permit Renewal				$20,000
52	Environmental Construction Administration				$15,000
53	CWSRF Funding Administration				$15,000
54	Labor Code Compliance				$40,000
55	Administration and Legal				$10,000
56				***Total Other Indirect Services***	***$240,000***
57				***TOTAL INDIRECT COSTS***	***$1,333,000***
58				***Project Contingencies @ 10% of Construction Costs***	$438,000
59				***TOTAL PROJECT COST***	***$6,148,000***
60				***TOTAL CWSRF ELIGIBLE PROJECT COST***	***$6,088,000***

1. Costs in August 2017 dollars.
2. Interim financing is for $1,000,000 loan at 5% interest for one year including a 1% loan origination fee, but is not a CWSRF eligible cost.

TABLE 26A
BURNEY WATER DISTRICT
WASTEWATER COLLECTION AND TREATMENT IMPROVEMENT PROJECT
COLLECTION SYSTEM IMPROVEMENT PROJECT ESTIMATED ANNUAL O&M COSTS

No.	Item	Amount	Units	Unit Cost	Total Cost[1]
1	Main LS 50 HP Pump	16114	kWHr	$0.15	$2,500
				Total Annual Cost:	$2,500

TABLE 26B
BURNEY WATER DISTRICT
WASTEWATER COLLECTION AND TREATMENT IMPROVEMENT PROJECT
WWTP IMPROVEMENT PROJECT ESTIMATED ANNUAL O&M COSTS

No.	Item	Amount	Units	Unit Cost	Total Cost[1]
WWTP Headworks Screening					
1	Labor including benefits	91	Hrs	$40	$3,650
2	Power Consumption	29,407	Kw-Hrs	$0.15	$4,411
3	Screen Cleaning/Repair/Lubrication/Replacement	1	LS	$2,500	$2,500
4	Grinder Cleaning/Repair/Lubrication/Replacement	1	LS	$500	$500
5	Screenings Disposal	156	Yard	$25	$3,900
6	Subtotal				$15,000
Convert Clarifier into Aerobic Digester					
7	Labor including benefits	730	Hrs	$40	$29,200
8	Digester Pumps Power[2]	7,758	Kw-Hrs	$0.15	$1,164
9	Digester Pumps Cleaning/Repair/Lubrication/Replacement	1	LS	$500	$500
10	Blowers Power[3]	65,171	Kw-Hrs	$0.20	$13,034
11	Blowers Cleaning/Repair/Lubrication/Replacement	1	LS	$500	$500
12	Aeration Equipment Cleaning/Repair/Replacement	1	LS	$500	$500
13	Subtotal				$44,900
Rotary Fan Press					
14	Labor including benefits	365	Hrs	$40	$14,600
15	Fan Press Polymer	1.2	55-Gal Barrel	$1,350	$1,620
16	Fan Press Power[4]	3,200	Kw-Hrs	$0.15	$480
17	Fan Press Cleaning/Repair/Lubrication/Replacement	1	LS	$1,000	$1,000
18	Sludge Disposal[5]	130	Ton	$100	$13,000
19	Subtotal				$30,800
				Total Annual Cost:	$90,700

1. Costs in August 2017 dollars.
2. Assumes digester pumping for 4 hours per day, 5 days a week.
3. Assumes one blower operating 12 hours per day, 7 days a week.
4. Assumes fan press operating 5 hours per day, 3 days a week.
5. Assumes similar sludge production to that demonstrated during City of Dunsmuir October 2016 Rotary Fan Press Pilot Study.

TABLE 27A
BURNEY WATER DISTRICT
WASTEWATER COLLECTION AND TREATMENT IMPROVEMENT PROJECT
COLLECTION SYSTEM IMPROVEMENT PROJECT SHORT-LIVED ASSETS RESERVE ESTIMATE

Equipment	Period	Estimated Cost[1]	Annual Reserve
Collection System			
Replace Main LS Pump	15	$40,000	$2,667
		Total Annual Cost	$2,700

TABLE 27B
BURNEY WATER DISTRICT
WASTEWATER COLLECTION AND TREATMENT IMPROVEMENT PROJECT
WWTP IMPROVEMENT PROJECT SHORT-LIVED ASSETS RESERVE ESTIMATE

Equipment	Period	Estimated Cost[1]	Annual Reserve
Wastewater Treatment Plant			
Replace Density Current Baffle	15	$35,000	$2,333
Replace RAS/WAS Pumps	15	$60,000	$4,000
Replace Sludge Conveyance Improvements	15	$50,000	$3,333
Replace Flow Meters	15	$20,000	$1,333
Replace Sludge Lagoon Aerator	15	$20,000	$1,333
Replace Sludge Lagoon Supernatant Pump	15	$15,000	$1,000
Replace Influent Screening Unit	15	$120,000	$8,000
Replace Digester Pumps	15	$60,000	$4,000
Replace Blowers	15	$50,000	$3,333
Replace Aeration Equipment	15	$80,000	$5,333
Replace Sludge Press	15	$380,000	$25,333
		Total Annual Cost	$59,300

1. Costs in August 2017 dollars.

TABLE 28
BURNEY WATER DISTRICT
WASTEWATER COLLECTION AND TREATMENT IMPROVEMENT PROJECT
WWTP IMPROVEMENT PROJECT - LIFE CYCLE COST ESTIMATE

Year	Design & Construction $ /a/	O&M Costs, $ Fixed O&M /b/	O&M Costs, $ Variable Short-Lived Assets /b/	Salvage Value $ /c/	Present Worth Factor = 0.5%	Present Worth of Costs, $ Design & Construction	Present Worth of Costs, $ O & M Fixed	Present Worth of Costs, $ O & M Variable	Present Worth of Costs, $ Salvage Value	Present Worth of Costs, $ Total
2018										
2019	350,000				1.00500	351,750				351,750
2020	5,798,000				1.00000	5,798,000				5,798,000
2021		90,700	59,300		0.99502		90,249	59,005		149,254
2022		93,421	61,079		0.99007		92,494	60,473		152,967
2023		96,224	62,911		0.98515		94,795	61,977		156,772
2024		99,110	64,799		0.98025		97,153	63,519		160,671
2025		102,084	66,743		0.97537		99,569	65,099		164,668
2026		105,146	68,745		0.97052		102,046	66,718		168,764
2027		108,301	70,807		0.96569		104,585	68,378		172,963
2028		111,550	72,932		0.96089		107,186	70,079		177,265
2029		114,896	75,119		0.95610		109,853	71,822		181,675
2030		118,343	77,373		0.95135		112,585	73,609		186,194
2031		121,893	79,694		0.94661		115,386	75,440		190,826
2032		125,550	82,085		0.94191		118,256	77,316		195,573
2033		129,317	84,548		0.93722		121,198	79,240		200,438
2034		133,196	87,084		0.93256		124,213	81,211		205,424
2035		137,192	89,697		0.92792		127,303	83,231		210,534
2036		141,308	92,387		0.92330		130,469	85,301		215,771
2037		145,547	95,159		0.91871		133,715	87,423		221,138
2038		149,913	98,014		0.91414		137,041	89,598		226,639
2039		154,411	100,954		0.90959		140,450	91,827		232,277
2040		159,043	103,983	491,000	0.90506		143,944	94,111	444,386	(206,331)
Total	6,148,000					6,149,750	2,302,489	1,505,376		9,513,230

Recommended Project Present Worth Cost = $9,513,000

a) All costs are August 2017 dollars.

b) Fixed costs equals O&M costs and variable equal short-lived assets reserve.

c) Service lives are as presented in Table 5.

d) No salvage value for engineering, legal & administration costs.

TABLE 33
BURNEY WATER DISTRICT
WASTEWATER COLLECTION AND TREATMENT IMPROVEMENT PROJECT
WWTP IMPROVEMENT PROJECT - REPLACEMENT COSTS

Item		Cost[1]	Useful Life[2]	Salvage Value[3]
1	50-foot Clarifier Concrete	$400,000	50	$240,000
2	Density Current Baffle	$35,000	15	$0
3	Digester Sludge and Supernatant Pumps	$60,000	15	$0
4	Blowers	$50,000	15	$0
5	Aeration Equipment	$80,000	15	$0
6	AD Pumping/Blower/Sludge Press Building	$173,000	50	$103,800
7	Misc WWTP Piping	$50,000	50	$30,000
8	Influent Screening Unit	$120,000	15	$0
9	15 Hp RAS/WAS Pump	$60,000	15	$0
10	Freeze Protection for RAS Vault	$10,000	20	$0
11	Sludge Lagoon Subgrade Preparation/Pond 8 Dike Repair	$120,000	50	$72,000
12	Install 60 mil HDPE Liner	$100,000	20	$0
13	Sludge Press	$380,000	15	$0
14	Sludge Conveyance Improvements	$50,000	15	$0
15	Reroute 4-inch Sludge Lagoon Supernatant	$75,000	50	$45,000
16	8-inch and 4-inch Magnetic Flow Meter	$20,000	15	$0
17	Sludge Lagoon Aerator	$20,000	15	$0
18	Sludge Lagoon Supernatant Pump	$15,000	15	$0
19	Control Panel	$100,000	20	$0
20	WWTP MCC	$180,000	20	$0
21	WWTP Generator & ATS	$120,000	20	$0
			Total Replacement Cost	$491,000

1. All costs are August 2017 dollars.
2. Service lives are as presented in Table 5.
3. No salvage value for engineering, legal & administration costs.

FIGURES

REDUCED SCALE 50%

BAR IS ONE INCH ON ORIGINAL DRAWING

0" 1"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

REVISIONS

NO	DATE	

PACE ENGINEERING
REDDING, CALIFORNIA

DES. LM	CKD TWW	JOB NO.
DRN LM	DATE 07/24/17	306.29

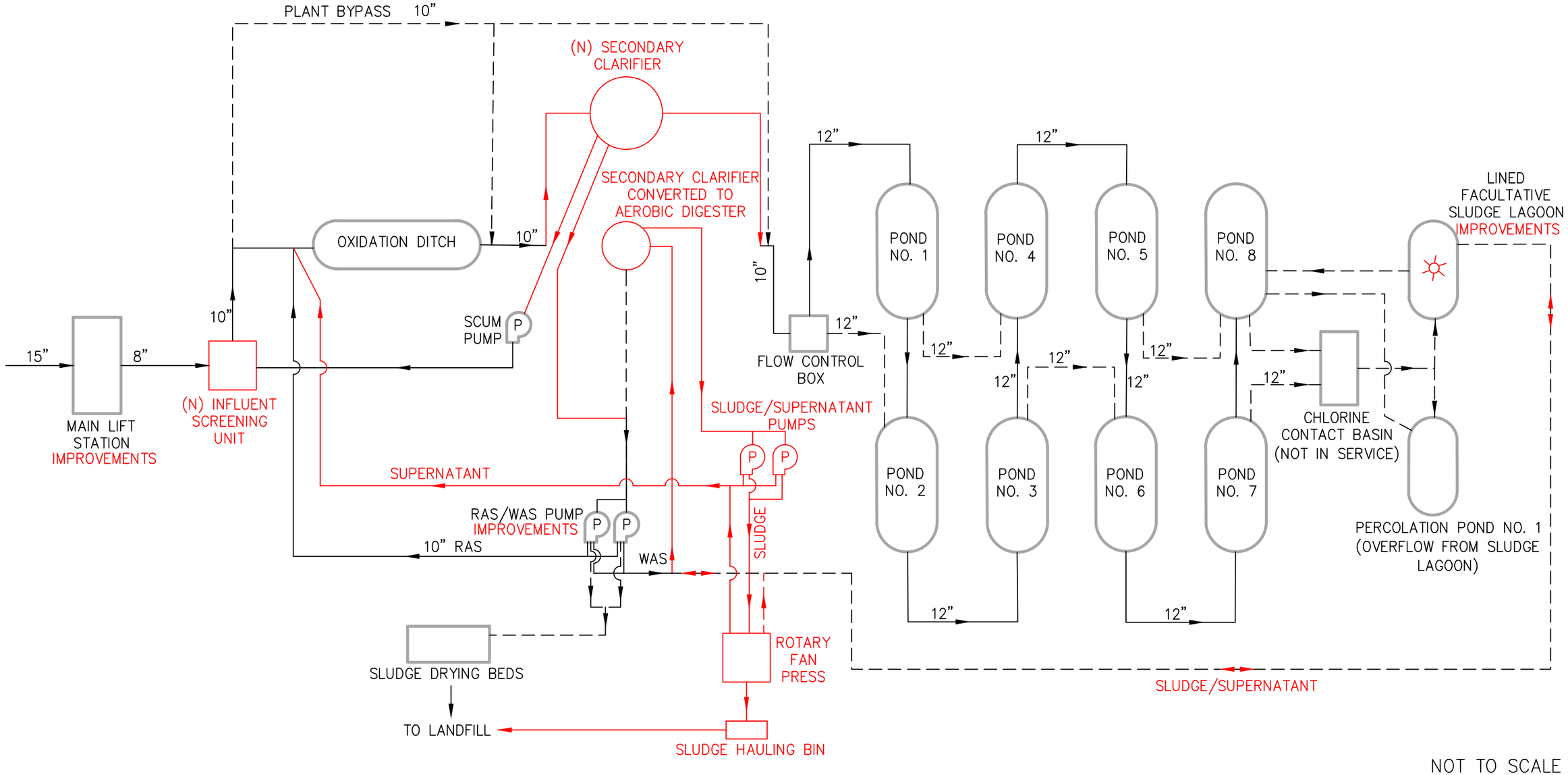
SIGNED

BURNEY WATER DISTRICT
WASTEWATER COLLECTION AND TREATMENT IMPROVEMENT PROJECT

WWTP SITE PLAN WITH PROPOSED IMPROVEMENTS

FIGURE 3

Plot Date: July 24, 2017 – 2:57 pm Login Name: lmcollum
File Name: M:\Land Projects\0306.29 WW Collection, Treatment, and Disposal Project CWSRF Planning Documents\DWG\WWTP Site Plan Updated 7-24-17.dwg, Layout: PACE 22X34



NOT TO SCALE

PACE ENGINEERING
REDDING, CALIFORNIA

BURNEY WATER DISTRICT
WASTEWATER COLLECTION AND TREATMENT
IMPROVEMENT PROJECT

WWTP PROPOSED PROCESS FLOW DIAGRAM

FIGURE 7

DATE: 6/17

JOB # 306.29

Plot Date: June 20, 2017 - 3:26 pm Login Name: nhumphreys
File Name: M:\Land Projects\0306\29 WW Collection, Treatment, and Disposal Project CWSRF Planning Documents\DWG\WWTP Flow Diagram.dwg, Layout: Improvements

APPENDICES

APPENDIX F

PACE ENGINEERING

January 8, 2014

306.08.200

SENT BY MAIL AND EMAIL
dwarner@waterboards.ca.gov

Daniel Warner
Water Resources Control Engineer
Central Valley Regional Water Quality Control Board
Redding Branch Office
364 Knollcrest Drive, Suite 205
Redding, CA 96002

Dear Dan,

Subject: Burney Water District Sludge Disposal Plan

The unincorporated town of Burney is located approximately 50 miles east of Redding in Shasta County, California. Burney Water District (District) provides water and sewer services, and owns the community pool and parks in the town of Burney. The District owns, operates, and maintains the wastewater collection system and wastewater treatment plant (WWTP).

In 2012, the District authorized PACE Engineering (PACE) to work jointly with District staff to prepare a Sewer Master Plan (SMP). The SMP will be finalized by the end of February 2014. The emphasis of this planning effort was to review and analyze the existing wastewater collection system, and develop a computer model that could be used to determine the need for future improvements. Projection of future peak wet weather wastewater flows was made, and a master plan of improvements was developed to meet sewage collection, treatment, and disposal needs at current and future flows. Burney is experiencing its own economic downturn with proposed subdivisions put on hold or eliminated completely, and a static if not declining number of sewer connections. Improvements needed to accommodate growth are expected to be minimal in the upcoming years. As such, many improvements recommended are needed to correct existing system deficiencies.

One such deficiency is that of the existing sludge handling process. The District's original extended aeration system was constructed in 1974. The system includes a static screen, headworks, oxidation ditch, secondary clarifier, sludge lagoon, sludge drying beds, and 8 stabilization ponds. California Regional Water Quality Control Board (CRWQCB) Waste Discharge Requirements (WDRs) Order No. 94-017 for the WWTP indicates a current maximum permitted ADWF of 0.44 MGD to unlined or partially lined stabilization ponds. Four sludge drying beds totaling approximately 4,700 square feet (SF) are no longer in service. Historically, the beds were ineffective for sludge drying

due to undersized beds requiring thick sludge lifts, together with too short of drying seasons and trees shading much of the beds. As such, a facultative sludge lagoon with an HDPE liner was constructed in 1989 which stores WAS from the clarifier. HDPE liners typically have a 20-year life. This liner is 25 years old and exhibiting signs it has met its useful service life; therefore, it needs to be replaced in the next 5 years. The lagoon is also currently full of more than 12 years of sludge buildup.

Sludge Sampling

PACE collected samples from the sludge lagoon October 21, 2013, which were analyzed at Basic Lab. Lab results indicated all constituents to be well within limits for disposal to the Shasta County West Central Landfill, with the exception of bis (2-ethylhexyl) phthalate which measured 1.73 mg/kg. This is above the Total Threshold Limit Concentration (TTLC) limit for designated waste of 0.17 mg/kg. Lab results are attached to this plan.

During the site visit, exposed sludge was observed in some areas of the lagoon surface. Depth measurements with a sludge judge in numerous areas revealed an uneven distribution of sludge throughout the lagoon, as well as a varied sludge thickness ranging from about 5% to 12% solids. As such, calculations of sludge removal herein assume a full lagoon totaling approximately 292,300 cubic feet (CF) of wet sludge. Cost comparisons were made assuming both 5% and 12% solids, resulting in 460 and 1,100 dry tons of sludge, respectively. Lab results indicated the sludge sample to be 12.9% solids; therefore, actual costs will likely be on the higher side of those estimated herein.

Discussions with District and CRWQCB staff resulted in a few alternatives considered to remove sludge from the lagoon and allow for liner inspection as requested by the CRWQCB.

Discussions between the District and Mr. Ron Hathaway, the farm owner of Hathaway Ranch, located immediately west of the WWTP across Black Ranch Road, resulted in the owner being interested in land applying WWTP biosolids to approximately 20 or 30 acres on his land. It is anticipated each drying season the District could haul treated and dried biosolids to this location once the sludge met requirements such that there would be no regulatory issues associated with land application at this location. However, land application of biosolids requires a complete environmental review process be done prior to site approval, and EPA Part 503 Rule regulations would also need to be adhered to. Additionally, the sludge would still have to be treated on-site and dewatered prior to land application. As such, this alternative will not be pursued at this time, but may be reconsidered in the future.

TenCate Geotubes®

Another considered alternative was to mechanically dewater the sludge using a centrifuge. The City of Lakeport is in the process of completing such a project for their oxidation ponds which require improvements and sludge removal. The City intends to issue a contract to dredge the lagoon, use a centrifuge to achieve adequate solids for land application, and haul the dried sludge away. Synagro has provided an approximate cost of $700 per dry ton to complete this same process for the District. Assuming 5% solids would result in approximately $322,000, while 12% solids would cost about $770,000.

Drying sludge in place and then hauling it to a nearby landfill is much less expensive than using centrifuges ($200 versus $700 per dry ton). As such, a considered alternative to contracting with Synagro is to utilize Geotubes® from TenCate to allow the sludge to further dry in place. Sludge would be pumped into a Geotube® container made of a high strength permeable geotextile. Polymer addition and effluent water draining through the small pores in the engineered textile results in dewatering and volume reduction. This volume reduction allows for repeated filling of the Geotube® container. However, discussion with Mr. Dave Burns at Hidden Valley Community Services District (CSD), who uses the Geotubes® as part of their everyday wasting process, indicated performance slows over time due to clogged pores. Clear filtrate can often be collected and recirculated through the WWTP if desired; however, this would require careful process control to ensure the recycle stream is not such that it causes WWTP upsets. Mr. Burns also indicated odors produced from the Geotubes® have been a problem at Hidden Valley CSD.

WaterSolve, LLC, is the distributor of TenCate Geotubes®; however, they are not licensed to install or operate the necessary equipment in California. As such, only the materials would be provided, including required hoses and mixing manifolds. Due to the lack of installation and operational support, together with undesirable odors that may be caused, this is not the preferred alternative. Considerable costs would be spent on materials and installation, and the sludge would then still have to be trucked to a landfill.

More recent discussions with the CRWQCB have resulted in the understanding the District can place dredged sludge in the existing unused stabilization ponds, as long as the sludge is then allowed to dry through only one drying season before being hauled away. This is a result of a subsurface study conducted in 1985 and 1986 by Geotechnical Consultants, Inc. which found the following to be true:

a. Ponds 1 through 7 have percolation rates slower than five minutes per inch.

b. There was no evidence of lava tubes or other open fractures without benefit of soil filtration.

c. Secondary pathways (jointing) were clearly present in the subsurface; however, these fractures were typically clay-filled and vertically discontinuous.

d. The interlaying of fresh rock and highly weathered zones appears to fulfill the five feet of soil horizon on a cumulative basis.

Percolation Pond No. 1

Pond 8 was found to have seepage at the base of its berm; therefore, a French drain was installed. This drain runs to unlined Percolation Pond No. 1, located to the north of the existing sludge lagoon. This pond also contains Sludge Lagoon No. 1 supernatant.

One alternative the District could pursue is to rent a dredge and move as much sludge as possible to Stabilization Ponds No. 7 and 8. A dredge can be rented from SRS Crissafulli or an equivalent company. A FLUMP (floating lagoon pumper) 4-inch severe duty dredge would be required at an initial month rental charge of $16,700, and $12,700 monthly thereafter, in addition to a damage deposit and round-trip freight. If, after the first month, the District decided to purchase the dredge, 100% of the initial month rental cost could be applied toward the purchase of the dredge, which is estimated to be approximately $150,000. Applying dredged sludge in 1-foot thick lifts would allow approximately 112,000 CF of sludge be removed in one drying season. It is estimated this would require approximately two months of dredge rental.

However, Synagro has indicated an approximately cost of $200 per dry ton to dredge the lagoon in the spring of 2014, then come back at the end of the summer drying season and haul away the dried sludge. This would cost the District approximately $35,000 at 5% solids, and $84,000 at 12% solids to remove 112,000 CF of sludge from the sludge lagoon in one drying season. Due to the complexities associated with dredging, and the relatively low cost provided by Synagro, it is recommended the District contract with Synagro for the first year of sludge dredging. This will allow the District to see proper dredging techniques, and possibly complete the process themselves in subsequent years. Odor control may be required via mechanical means or chemical addition as needed until the sludge cakes over.

To allow for liner inspection and replacement, Sludge Lagoon No. 1 must be taken out of service. Therefore, the District intends to dewater Percolation Pond No. 1 to Stabilization Pond No. 6, and convert it into Sludge Lagoon No. 2. Future operation of

the two sludge lagoons would be rotated to keep sludge depths manageable and allow one to be taken offline, emptied, and cleaned while the other is operational.

Sludge Lagoon No. 1 had to be lined in 1989 due to the presence of lava rock beneath it that would not hold water, even when lined with bentonite clay. The CRWQCB has indicated Sludge Lagoon No. 2 may not need to be lined, as it has been in operation unlined for numerous years and appears to hold supernatant for long periods of time. Quarterly total coliform groundwater tests taken downgradient of the WWTP at the Hathaway Ranch have all been absent with the exception of one test sampled March 25, 2013. However, this test was resampled with a result of less than 1.1 MPN/100 mL. These test results are attached. As such, the need for a liner is presently unknown and the cost to convert Percolation Pond No. 1 into Sludge Lagoon No. 2 cannot be estimated at this time. Further analysis must be completed to determine the soil characteristics at this location and subsequently what the CRWQCB will require in terms of a liner, monitoring wells, etc.

The District does not currently have the funds available to take on additional analyses and a significant sludge disposal project at this time. A sewer rate increase of $5 just went into effect October 1, 2013, and both sewer and water rate studies are being completed by PACE to ensure rates will be adequate to allow for improvements necessary to correct existing deficiencies. Operations and maintenance costs for additional staff time will likely be included in the rate studies, as this is needed for increased process control regardless of improvements completed. Due to lack of current funds, planned construction of Sludge Lagoon No. 2 has been included in the immediate term improvements in the SMP. The District intends to submit an application for funding from the State Water Resources Control Board (SWRCB) to complete a number of needed wastewater system improvements, including those for sludge disposal, as soon as the SMP is finalized and this sludge disposal plan and schedule is approved. The proposed project schedule is summarized in attached Table 1.

At this time, the District would appreciate the CRWQCB granting this plan and schedule request. In the meantime, the District will solicit bids for the sludge dredging project. Please call with any questions you might have regarding this letter.

Sincerely,

Laurie McCollum
Staff Engineer

LM
Enclosures
c w/enc: Willie Rodriguez, Burney Water District Manager, burneywd@yahoo.com
M:\Jobs\0306\0306.08 General Services\Sludge Storage Basin Planning\Sludge Diposal Plan.doc

TABLE 1
Burney Water District
Sludge Disposal Plan
Proposed Schedule

Item No.	Action	Target Date	Completion Date
1	Submit proposed plan and schedule to CRWQCB	Jan-14	8-Jan-14
2	Receive approval of plan and schedule from CRWQCB	Mar-14	
3	Dredge project out to bid	Mar-14	
4	Sludge dredging & begin 1st round of sludge drying in Stabilization Ponds No. 7 & 8	May-14	
5	Submit application for funding to SWRCB	Jul-14	
6	Haul dried sludge to landfill	Oct-14*	
7	Begin sludge dredging/drying & repeat every subsequent year	May-15*	
8	Haul dried sludge to landfill & repeat every subsequent year	Oct-15*	
9	Receive funding commitment from SWRCB	Jul-16	
10	Complete project design	Apr-17	
11	Begin project construction	Aug-17	
12	Complete project construction and startup	Jan-20	

* Tentative dates depend on weather determining allowable sludge drying season lengths.

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

November 14, 2013

Lab ID: 13J0945

TOM WARNOCK
PACE ENGINEERING
1730 SOUTH STREET
REDDING, CA 96001
RE: GENERAL TESTING BURNEY SSB

Dear TOM WARNOCK ,

Enclosed are the analysis results for Work Order number 13J0945. All analysis 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

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 BURNEY SSB

Lab No: 13J0945
Reported: 11/14/13
Phone: 244-0202 x309
P.O. #

General Chemistry

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
SLUDGE STORAGE BASIN Sludge (13J0945-01) Sampled:10/21/13 12:00 Received:10/24/13 10:36 Temp (C): 12.9									
Total Suspended Solids	mg/l	**41600**		2.0	6.0	SM 2540D	10/25/13	10/25/13	B3J1249
Total Volatile Solids	"	**24900**		3	9	EPA 160.4	10/25/13	10/25/13	B3J1259

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P.O. #

General Chemistry - Solid

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
DEWATERED SLUDGE Sludge (13J0945-02) Sampled:10/21/13 12:00 Received:10/24/13 10:36 Temp (C): 14.5									
% Moisture	%	**87.1**		0.02	0.06	SM 2540G	10/31/13	10/31/13	B3J1397
% Solids	"	**12.9**		0.02	0.06	"	"	"	"

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Metals - TTLC

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
DEWATERED SLUDGE Sludge (13J0945-02) Sampled:10/21/13 12:00 Received:10/24/13 10:36 Temp (C): 14.5									
Antimony	mg/kg	ND		2.0	8.0	EPA 6010B	10/30/13	10/23/13	B3J1193
Arsenic	"	ND		1.6	8.0	"	"	"	"
Barium	"	**45.2**		0.8	4.0	"	"	"	"
Beryllium	"	ND		0.8	4.0	"	"	"	"
Cadmium	"	ND		0.8	4.0	"	"	"	"
Chromium	"	**6.0**		0.8	4.0	"	"	"	"
Cobalt	"	ND		4.00	20.0	"	"	"	"
Copper	"	**49.8**		0.4	2.0	"	"	"	"
Lead	"	**7.1**		1.0	5.0	"	"	"	"
Mercury	"	**0.45**		0.07	0.33	EPA 7471A	10/24/13	10/24/13	B3J1258
Molybdenum	"	ND		2.0	10.0	EPA 6010B	10/30/13	10/23/13	B3J1193
Nickel	"	**3.6**	J	1.0	4.0	"	"	"	"
Selenium	"	ND		1.0	4.0	"	"	"	"
Silver	"	**2.4**	J	1.6	8.0	"	"	"	"
Thallium	"	ND		2.0	8.0	"	"	"	"
Vanadium	"	ND		8.0	40.0	"	"	"	"
Zinc	"	**104**		4.0	20.0	"	"	"	"

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Volatile Organic Compounds - Solid

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
DEWATERED SLUDGE Sludge (13J0945-02) Sampled:10/21/13 12:00 Received:10/24/13 10:36 Temp (C): 14.5									
Acetone	ug/kg	ND	R-08	12.5	50.0	EPA 8260B	10/28/13	10/28/13	B3J1308
Acrylonitrile	"	ND	R-08	5.0	10.0	"	"	"	"
Benzene	"	ND	R-08	4.0	10.0	"	"	"	"
Bromobenzene	"	ND	R-08	4.0	10.0	"	"	"	"
Bromochloromethane	"	ND	R-08	4.0	10.0	"	"	"	"
Bromodichloromethane	"	ND	R-08	4.0	10.0	"	"	"	"
Bromoform	"	ND	R-08	3.0	10.0	"	"	"	"
Bromomethane	"	ND	R-08	5.0	10.0	"	"	"	"
2-Butanone (MEK)	"	ND	R-08	15.0	25.0	"	"	"	"
n-Butylbenzene	"	ND	R-08	4.0	10.0	"	"	"	"
sec-Butylbenzene	"	ND	R-08	4.0	10.0	"	"	"	"
tert-Butylbenzene	"	ND	R-08	4.0	10.0	"	"	"	"
Carbon disulfide	"	ND	R-08	4.0	10.0	"	"	"	"
Carbon tetrachloride	"	ND	R-08	4.0	10.0	"	"	"	"
Chlorobenzene	"	ND	R-08	4.0	10.0	"	"	"	"
Chloroethane	"	ND	R-08	4.0	10.0	"	"	"	"
2-Chloroethylvinyl ether	"	ND	R-08	4.0	10.0	"	"	"	"
Chloroform	"	ND	R-08	4.0	10.0	"	"	"	"
Chloromethane	"	ND	R-08	4.0	10.0	"	"	"	"
2-Chlorotoluene	"	ND	R-08	4.0	10.0	"	"	"	"
4-Chlorotoluene	"	ND	R-08	4.0	10.0	"	"	"	"
Dibromochloromethane	"	ND	R-08	4.0	10.0	"	"	"	"
1,2-Dibromo-3-chloropropane (DBCP)	"	ND	R-08	4.0	10.0	"	"	"	"
1,2-Dibromoethane (EDB)	"	ND	R-08	4.0	10.0	"	"	"	"
Dibromomethane	"	ND	R-08	4.0	10.0	"	"	"	"
1,2-Dichlorobenzene (o-DCB)	"	ND	R-08	4.0	10.0	"	"	"	"
1,3-Dichlorobenzene (m-DCB)	"	ND	R-08	4.0	10.0	"	"	"	"
1,4-Dichlorobenzene (p-DCB)	"	ND	R-08	4.0	10.0	"	"	"	"
Dichlorodifluoromethane (CFC 12)	"	ND	R-08	4.0	10.0	"	"	"	"
1,1-Dichloroethane (1,1-DCA)	"	ND	R-08	4.0	10.0	"	"	"	"
1,2-Dichloroethane (1,2-DCA)	"	ND	R-08	4.0	10.0	"	"	"	"
1,1-Dichloroethene (1,1-DCE)	"	ND	R-08	4.0	10.0	"	"	"	"
cis-1,2-Dichloroethene (c-1,2-DCE)	"	ND	R-08	4.0	10.0	"	"	"	"
trans-1,2-Dichloroethene (t-1,2-DCE)	"	ND	R-08	4.0	10.0	"	"	"	"
Dichloromethane (Methylene Chloride)	"	ND	R-08	10.0	50.0	"	"	"	"
1,2-Dichloropropane	"	ND	R-08	4.0	10.0	"	"	"	"
1,3-Dichloropropane	"	ND	R-08	4.0	10.0	"	"	"	"
2,2-Dichloropropane	"	ND	R-08	4.0	10.0	"	"	"	"
1,1-Dichloropropene	"	ND	R-08	4.0	10.0	"	"	"	"
cis-1,3-Dichloropropene	"	ND	R-08	4.0	10.0	"	"	"	"
trans-1,3-Dichloropropene	"	ND	R-08	4.0	10.0	"	"	"	"
1,4-Dioxane	"	ND	R-08	200	500	"	"	"	"
Ethylbenzene	"	ND	R-08	4.0	10.0	"	"	"	"
Ethyl tert-Butyl Ether (ETBE)	"	ND	R-08	4.0	10.0	"	"	"	"
Hexachlorobutadiene	"	ND	R-08	4.0	10.0	"	"	"	"
2-Hexanone	"	ND	R-08	20.0	50.0	"	"	"	"
Isopropylbenzene	"	ND	R-08	4.0	10.0	"	"	"	"
Di-Isopropyl Ether (DIPE)	"	ND	R-08	4.0	10.0	"	"	"	"
p-Isopropyltoluene	"	ND	R-08	4.0	10.0	"	"	"	"
4-Methyl-2-pentanone (MIBK)	"	ND	R-08	10.0	50.0	"	"	"	"
Methyl tert-Butyl Ether (MTBE)	"	ND	R-08	4.0	10.0	"	"	"	"
Naphthalene	"	ND	R-08	4.0	10.0	"	"	"	"

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Lab No: 13J0945
Reported: 11/14/13
Phone: 244-0202 x309
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Volatile Organic Compounds - Solid

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
DEWATERED SLUDGE Sludge (13J0945-02) Sampled:10/21/13 12:00 Received:10/24/13 10:36 Temp (C): 14.5									
n-Propylbenzene	"	ND	R-08	4.0	10.0	"	"	10/28/13	"
Styrene	"	ND	R-08	4.0	10.0	"	"	"	"
tert-Amyl Methyl Ether (TAME)	"	ND	R-08	4.0	10.0	"	"	"	"
1,1,1,2-Tetrachloroethane	"	ND	R-08	4.0	10.0	"	"	"	"
1,1,2,2-Tetrachloroethane	"	ND	R-08	4.0	10.0	"	"	"	"
Tetrachloroethene (PCE)	"	ND	R-08	4.0	10.0	"	"	"	"
Tetrahydrofuran	"	ND	R-08	40.0	100	"	"	"	"
tert-Butyl Alcohol (TBA)	"	ND	R-08	30.0	100	"	"	"	"
Toluene	"	ND	R-08	4.0	10.0	"	"	"	"
1,2,3-Trichlorobenzene	"	ND	R-08	4.0	10.0	"	"	"	"
1,2,4-Trichlorobenzene	"	ND	R-08	4.0	10.0	"	"	"	"
1,1,1-Trichloroethane (1,1,1-TCA)	"	ND	R-08	4.0	10.0	"	"	"	"
1,1,2-Trichloroethane (1,1,2-TCA)	"	ND	R-08	4.0	10.0	"	"	"	"
Trichloroethene (TCE)	"	ND	R-08	4.0	10.0	"	"	"	"
Trichlorotrifluoroethane (Freon 113)	"	ND	R-08	4.0	10.0	"	"	"	"
Trichlorofluoromethane (Freon 11)	"	ND	R-08	4.0	10.0	"	"	"	"
1,2,3-Trichloropropane	"	ND	R-08	4.0	10.0	"	"	"	"
1,2,4-Trimethylbenzene	"	ND	R-08	4.0	10.0	"	"	"	"
1,3,5-Trimethylbenzene	"	ND	R-08	4.0	10.0	"	"	"	"
Vinyl acetate	"	ND	R-08	4.0	10.0	"	"	"	"
Vinyl chloride	"	ND	R-08	4.0	10.0	"	"	"	"
m,p-Xylene	"	ND	R-08	6.0	20.0	"	"	"	"
o-Xylene	"	ND	R-08	4.0	5.0	"	"	"	"
Xylenes (total)	"	ND	R-08	10.0	50.0	"	"	"	"
Surrogate: 1,2-Dichloroethane-d4		*97.7 %*	*R-08*		*53.6-162*	"	"	"	"
Surrogate: Toluene-d8		*99.7 %*	*R-08*		*51.2-146*	"	"	"	"
Surrogate: 4-Bromofluorobenzene		*97.6 %*	*R-08*		*50.2-117*	"	"	"	"

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Semi Volatile Organic Compounds

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
DEWATERED SLUDGE Sludge (13J0945-02) Sampled:10/21/13 12:00 Received:10/24/13 10:36 Temp (C): 14.5									
Acenaphthene	mg/kg	ND	R-08	0.990	9.90	EPA 8270C	10/30/13	10/29/13	B3J1319
Acenaphthylene	"	ND	R-08	0.990	9.90	"	"	"	"
Aniline	"	ND	R-08	0.990	9.90	"	"	"	"
Anthracene	"	ND	R-08	0.990	9.90	"	"	"	"
Benzidine	"	ND	R-08	0.990	9.90	"	"	"	"
Benzo (a) anthracene	"	ND	R-08	0.990	9.90	"	"	"	"
Benzo (a) pyrene	"	ND	R-08	0.990	9.90	"	"	"	"
Benzo (b) fluoranthene	"	ND	R-08	0.990	9.90	"	"	"	"
Benzo (g,h,i) perylene	"	ND	R-08	0.990	9.90	"	"	"	"
Benzo (k) fluoranthene	"	ND	R-08	0.990	9.90	"	"	"	"
Benzyl alcohol	"	ND	R-08	0.990	9.90	"	"	"	"
Bis(2-chloroethoxy)methane	"	ND	R-08	0.990	9.90	"	"	"	"
Bis(2-chloroethyl)ether	"	ND	R-08	0.990	9.90	"	"	"	"
Bis(2-chloroisopropyl)ether	"	ND	R-08	0.990	9.90	"	"	"	"
Bis(2-ethylhexyl)adipate	"	ND	R-08	0.990	9.90	"	"	"	"
Bis(2-ethylhexyl)phthalate (DEHP)	"	**1.73**	J, R-08	0.990	9.90	"	"	"	"
4-Bromophenyl phenyl ether	"	ND	R-08	0.990	9.90	"	"	"	"
Butyl benzyl phthalate	"	ND	R-08	0.990	9.90	"	"	"	"
4-Chloro-3-methylphenol	"	ND	R-08	0.990	9.90	"	"	"	"
4-Chloroaniline	"	ND	R-08	0.990	9.90	"	"	"	"
2-Chloronaphthalene	"	ND	R-08	0.990	9.90	"	"	"	"
2-Chlorophenol	"	ND	R-08	0.990	9.90	"	"	"	"
4-Chlorophenyl phenyl ether	"	ND	R-08	0.990	9.90	"	"	"	"
Chrysene	"	ND	R-08	0.990	9.90	"	"	"	"
Dibenz (a,h) anthracene	"	ND	R-08	0.990	9.90	"	"	"	"
Dibenzofuran	"	ND	R-08	0.990	9.90	"	"	"	"
1,2-Dichlorobenzene (o-DCB)	"	ND	R-08	0.990	9.90	"	"	"	"
1,3-Dichlorobenzene (m-DCB)	"	ND	R-08	0.990	9.90	"	"	"	"
1,4-Dichlorobenzene (p-DCB)	"	ND	R-08	0.990	9.90	"	"	"	"
3,3´-Dichlorobenzidine	"	ND	R-08	0.990	9.90	"	"	"	"
2,4-Dichlorophenol	"	ND	R-08	0.990	9.90	"	"	"	"
Diethyl phthalate	"	ND	R-08	0.990	9.90	"	"	"	"
2,4-Dimethylphenol	"	ND	R-08	0.990	9.90	"	"	"	"
Dimethyl phthalate	"	ND	R-08	0.990	9.90	"	"	"	"
Di-n-butyl phthalate	"	ND	R-08	0.990	9.90	"	"	"	"
Di-n-octyl phthalate	"	ND	R-08	0.990	9.90	"	"	"	"
4,6-Dinitro-2-methylphenol	"	ND	R-08	0.990	9.90	"	"	"	"
2,4-Dinitrophenol	"	ND	R-08	0.990	9.90	"	"	"	"
2,4-Dinitrotoluene	"	ND	R-08	0.990	9.90	"	"	"	"
2,6-Dinitrotoluene	"	ND	R-08	0.990	9.90	"	"	"	"
Fluoranthene	"	ND	R-08	0.990	9.90	"	"	"	"
Fluorene	"	ND	R-08	0.990	9.90	"	"	"	"
Hexachlorobenzene	"	ND	R-08	0.990	9.90	"	"	"	"
Hexachlorobutadiene	"	ND	R-08	0.990	9.90	"	"	"	"
Hexachlorocyclopentadiene	"	ND	R-08	0.990	9.90	"	"	"	"
Hexachloroethane	"	ND	R-08	0.990	9.90	"	"	"	"
Indeno (1,2,3-cd) pyrene	"	ND	R-08	0.990	9.90	"	"	"	"
Isophorone	"	ND	R-08	0.990	9.90	"	"	"	"
2-Methylnaphthalene	"	ND	R-08	0.990	9.90	"	"	"	"
2-Methylphenol	"	ND	R-08	0.990	9.90	"	"	"	"
3 & 4-Methylphenol	"	ND	R-08	0.990	9.90	"	"	"	"
Naphthalene	"	ND	R-08	0.990	9.90	"	"	"	"

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Semi Volatile Organic Compounds

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
DEWATERED SLUDGE Sludge (13J0945-02) Sampled:10/21/13 12:00 Received:10/24/13 10:36 Temp (C): 14.5									
2-Nitroaniline	"	ND	R-08	0.990	9.90	"	"	10/29/13	"
3-Nitroaniline	"	ND	R-08	0.990	9.90	"	"	"	"
4-Nitroaniline	"	ND	R-08	0.990	9.90	"	"	"	"
Nitrobenzene	"	ND	R-08	0.990	9.90	"	"	"	"
2-Nitrophenol	"	ND	R-08	0.990	9.90	"	"	"	"
4-Nitrophenol	"	ND	R-08	0.990	9.90	"	"	"	"
N-Nitrosodiethylamine	"	ND	R-08	0.990	9.90	"	"	"	"
N-Nitrosodimethylamine	"	ND	R-08	0.990	9.90	"	"	"	"
N-Nitrosomethylethylamine	"	ND	R-08	0.990	9.90	"	"	"	"
N-Nitrosodi-n-butylamine	"	ND	R-08	0.990	9.90	"	"	"	"
N-Nitrosodi-n-propylamine	"	ND	R-08	0.990	9.90	"	"	"	"
N-Nitrosodiphenylamine	"	ND	R-08	0.990	9.90	"	"	"	"
N-Nitrosomorpholine	"	ND	R-08	0.990	9.90	"	"	"	"
N-Nitrosopiperidine	"	ND	R-08	0.990	9.90	"	"	"	"
N-Nitrosopyrrolidine	"	ND	R-08	0.990	9.90	"	"	"	"
Pentachlorophenol (PCP)	"	ND	R-08	0.990	9.90	"	"	"	"
Phenanthrene	"	ND	R-08	0.990	9.90	"	"	"	"
Phenol	"	ND	R-08	0.990	9.90	"	"	"	"
Pyrene	"	ND	R-08	0.990	9.90	"	"	"	"
Pyridine	"	ND	R-08	0.990	9.90	"	"	"	"
2,3,4,6-Tetrachlorophenol	"	ND	R-08	0.990	9.90	"	"	"	"
1,2,4-Trichlorobenzene	"	ND	R-08	0.990	9.90	"	"	"	"
2,4,5-Trichlorophenol	"	ND	R-08	0.990	9.90	"	"	"	"
2,4,6-Trichlorophenol	"	ND	R-08	0.990	9.90	"	"	"	"
Surrogate: 2-Fluorophenol		*55.0 %*	*R-08*	*18-97.9*		"	"	"	"
Surrogate: Phenol-d5		*52.0 %*	*R-08*	*30.8-106*		"	"	"	"
Surrogate: 2,4,6-Tribromophenol		*107 %*	*R-08*	*48.6-152*		"	"	"	"
Surrogate: Nitrobenzene-d5		*66.0 %*	*R-08*	*17.7-119*		"	"	"	"
Surrogate: 2-Fluorobiphenyl		*59.0 %*	*R-08*	*26.2-110*		"	"	"	"
Surrogate: Terphenyl-dl4		*101 %*	*R-08*	*31.7-134*		"	"	"	"

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Report To: PACE ENGINEERING
1730 SOUTH STREET
REDDING, CA 96001
Attention: TOM WARNOCK
Project: GENERAL TESTING BURNEY SSB

Lab No: 13J0945
Reported: 11/14/13
Phone: 244-0202 x309
P.O. #

Quality Control Data

Analyte	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
General Chemistry										
Batch B3J1249 - General Prep - GC										
Blank										
Total Suspended Solids	ND	6.0	mg/l							
LCS										
Total Suspended Solids	174	6.0	mg/l	200		87.0	80-120			
Duplicate **Source: 13J0898-01**										
Total Suspended Solids	15.3	6.0	mg/l		15.8			3.22	5	
Duplicate **Source: 13J0912-02**										
Total Suspended Solids	5.0	6.0	mg/l		5.0			0.00	5	J
Batch B3J1259 - General Prep - GC										
Blank										
Total Volatile Solids	ND	9	mg/l							
Duplicate **Source: 13J0945-01**										
Total Volatile Solids	24200	9	mg/l		24900			2.85	5	
General Chemistry - Solid										
Batch B3J1397 - General Prep - GC										
Duplicate **Source: 13J0945-02**										
% Moisture	88.3	0.06	%		87.1			1.37	30	
% Solids	11.7	0.06	%		12.9			9.76	30	
Metals - TTLC										
Batch B3J1193 - EPA 3050A										
Blank										
Antimony	ND	8.0	mg/kg							
Arsenic	ND	8.0	mg/kg							
Barium	ND	4.0	mg/kg							
Beryllium	ND	4.0	mg/kg							
Cadmium	ND	4.0	mg/kg							
Chromium	ND	4.0	mg/kg							
Cobalt	ND	20.0	mg/kg							
Copper	ND	2.0	mg/kg							
Lead	ND	5.0	mg/kg							
Molybdenum	ND	10.0	mg/kg							
Nickel	ND	4.0	mg/kg							
Selenium	ND	4.0	mg/kg							
Silver	ND	8.0	mg/kg							
Thallium	ND	8.0	mg/kg							
Vanadium	ND	40.0	mg/kg							
Zinc	ND	20.0	mg/kg							
LCS										
Antimony	100	8.0	mg/kg	100		100	80-120			
Arsenic	95.2	8.0	mg/kg	100		95.2	80-120			

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Quality Control Data

Metals - TTLC

Analyte	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch B3J1193 - EPA 3050A										
Barium	93.8	4.0	mg/kg	100		93.8	80-120			
Beryllium	103	4.0	mg/kg	100		103	80-120			
Cadmium	95.0	4.0	mg/kg	100		95.0	80-120			
Chromium	97.4	4.0	mg/kg	100		97.4	80-120			
Cobalt	94.4	20.0	mg/kg	100		94.4	80-120			
Copper	89.2	2.0	mg/kg	100		89.2	80-120			
Lead	94.0	5.0	mg/kg	100		94.0	80-120			
Molybdenum	95.0	10.0	mg/kg	100		95.0	80-120			
Nickel	92.8	4.0	mg/kg	100		92.8	80-120			
Selenium	101	4.0	mg/kg	100		101	80-120			
Silver	93.6	8.0	mg/kg	100		93.6	80-120			
Thallium	95.8	8.0	mg/kg	100		95.8	80-120			
Vanadium	103	40.0	mg/kg	100		103	80-120			
Zinc	99.2	20.0	mg/kg	100		99.2	80-120			
Duplicate **Source: 13J0945-02**										
Antimony	ND	8.0	mg/kg		ND				20	
Arsenic	ND	8.0	mg/kg		ND				20	
Barium	43.8	4.0	mg/kg		45.2			3.15	20	
Beryllium	ND	4.0	mg/kg		ND				20	
Cadmium	ND	4.0	mg/kg		ND				20	
Chromium	5.54	4.0	mg/kg		5.96			7.30	20	
Cobalt	ND	20.0	mg/kg		ND				20	
Copper	49.8	2.0	mg/kg		49.8			0.00	20	
Lead	6.46	5.0	mg/kg		7.14			10.0	20	
Molybdenum	ND	10.0	mg/kg		ND				20	
Nickel	3.28	4.0	mg/kg		3.60			9.30	20	J
Selenium	ND	4.0	mg/kg		ND				20	
Silver	2.36	8.0	mg/kg		2.40			1.68	20	J
Thallium	ND	8.0	mg/kg		ND				20	
Vanadium	ND	40.0	mg/kg		ND				20	
Zinc	102	20.0	mg/kg		104			2.53	20	
Matrix Spike **Source: 13J0945-02**										
Antimony	98.2	8.0	mg/kg	100	ND	98.2	75-125			
Arsenic	95.4	8.0	mg/kg	100	ND	95.4	75-125			
Barium	137	4.0	mg/kg	100	45.2	91.8	75-125			
Beryllium	105	4.0	mg/kg	100	ND	105	75-125			
Cadmium	95.0	4.0	mg/kg	100	ND	95.0	75-125			
Chromium	104	4.0	mg/kg	100	5.96	97.6	75-125			
Cobalt	95.6	20.0	mg/kg	100	ND	95.6	75-125			
Copper	135	2.0	mg/kg	100	49.8	85.6	75-125			
Lead	102	5.0	mg/kg	100	7.14	94.7	75-125			
Molybdenum	95.2	10.0	mg/kg	100	ND	95.2	75-125			
Nickel	96.2	4.0	mg/kg	100	3.60	92.6	75-125			
Selenium	102	4.0	mg/kg	100	ND	102	75-125			
Silver	95.0	8.0	mg/kg	100	2.40	92.6	75-125			
Thallium	93.6	8.0	mg/kg	100	ND	93.6	75-125			
Vanadium	108	40.0	mg/kg	100	ND	108	75-125			

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Lab No: 13J0945
Reported: 11/14/13
Phone: 244-0202 x309
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Quality Control Data

Analyte	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Metals - TTLC										
Batch B3J1193 - EPA 3050A										
Zinc	202	20.0	mg/kg	100	104	97.8	75-125			
Batch B3J1258 - EPA 7471A										
Blank										
Mercury	ND	0.33	mg/kg							
LCS										
Mercury	5.46	0.33	mg/kg	5.00		109	80-120			
Duplicate **Source: 13J0526-01**										
Mercury	ND	0.33	mg/kg		ND				20	
Matrix Spike **Source: 13J0526-01**										
Mercury	4.76	0.33	mg/kg	5.00	ND	95	75-125			
Volatile Organic Compounds - Solid										
Batch B3J1308 - EPA 5030B Soil GCMS										
Blank										
Acetone	ND	10.0	ug/kg							
Acrylonitrile	ND	2.0	ug/kg							
Benzene	ND	2.0	ug/kg							
Bromobenzene	ND	2.0	ug/kg							
Bromochloromethane	ND	2.0	ug/kg							
Bromodichloromethane	ND	2.0	ug/kg							
Bromoform	ND	2.0	ug/kg							
Bromomethane	ND	2.0	ug/kg							
2-Butanone (MEK)	ND	5.0	ug/kg							
n-Butylbenzene	ND	2.0	ug/kg							
sec-Butylbenzene	ND	2.0	ug/kg							
tert-Butylbenzene	ND	2.0	ug/kg							
Carbon disulfide	ND	2.0	ug/kg							
Carbon tetrachloride	ND	2.0	ug/kg							
Chlorobenzene	ND	2.0	ug/kg							
Chloroethane	ND	2.0	ug/kg							
2-Chloroethylvinyl ether	ND	2.0	ug/kg							
Chloroform	ND	2.0	ug/kg							
Chloromethane	ND	2.0	ug/kg							
2-Chlorotoluene	ND	2.0	ug/kg							
4-Chlorotoluene	ND	2.0	ug/kg							
Dibromochloromethane	ND	2.0	ug/kg							
1,2-Dibromo-3-chloropropane (DBCP)	ND	2.0	ug/kg							
1,2-Dibromoethane (EDB)	ND	2.0	ug/kg							
Dibromomethane	ND	2.0	ug/kg							
1,2-Dichlorobenzene (o-DCB)	ND	2.0	ug/kg							
1,3-Dichlorobenzene (m-DCB)	ND	2.0	ug/kg							
1,4-Dichlorobenzene (p-DCB)	ND	2.0	ug/kg							
Dichlorodifluoromethane (CFC 12)	ND	2.0	ug/kg							
1,1-Dichloroethane (1,1-DCA)	ND	2.0	ug/kg							

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Quality Control Data

Analyte	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organic Compounds - Solid										
Batch B3J1308 - EPA 5030B Soil GCMS										
1,2-Dichloroethane (1,2-DCA)	ND	2.0	ug/kg							
1,1-Dichloroethene (1,1-DCE)	ND	2.0	ug/kg							
cis-1,2-Dichloroethene (c-1,2-DCE)	ND	2.0	ug/kg							
trans-1,2-Dichloroethene (t-1,2-DCE)	ND	2.0	ug/kg							
Dichloromethane (Methylene Chloride)	ND	10.0	ug/kg							
1,2-Dichloropropane	ND	2.0	ug/kg							
1,3-Dichloropropane	ND	2.0	ug/kg							
2,2-Dichloropropane	ND	2.0	ug/kg							
1,1-Dichloropropene	ND	2.0	ug/kg							
cis-1,3-Dichloropropene	ND	2.0	ug/kg							
trans-1,3-Dichloropropene	ND	2.0	ug/kg							
1,4-Dioxane	ND	100	ug/kg							
Ethylbenzene	ND	2.0	ug/kg							
Ethyl tert-Butyl Ether (ETBE)	ND	2.0	ug/kg							
Hexachlorobutadiene	ND	2.0	ug/kg							
2-Hexanone	ND	10.0	ug/kg							
Isopropylbenzene	ND	2.0	ug/kg							
DI-Isopropyl Ether (DIPE)	ND	2.0	ug/kg							
p-Isopropyltoluene	ND	2.0	ug/kg							
4-Methyl-2-pentanone (MIBK)	ND	10.0	ug/kg							
Methyl tert-Butyl Ether (MTBE)	ND	2.0	ug/kg							
Naphthalene	ND	2.0	ug/kg							
n-Propylbenzene	ND	2.0	ug/kg							
Styrene	ND	2.0	ug/kg							
tert-Amyl Methyl Ether (TAME)	ND	2.0	ug/kg							
1,1,1,2-Tetrachloroethane	ND	2.0	ug/kg							
1,1,2,2-Tetrachloroethane	ND	2.0	ug/kg							
Tetrachloroethene (PCE)	ND	2.0	ug/kg							
Tetrahydrofuran	ND	20.0	ug/kg							
tert-Butyl Alcohol (TBA)	ND	20.0	ug/kg							
Toluene	ND	2.0	ug/kg							
1,2,3-Trichlorobenzene	ND	2.0	ug/kg							
1,2,4-Trichlorobenzene	ND	2.0	ug/kg							
1,1,1-Trichloroethane (1,1,1-TCA)	ND	2.0	ug/kg							
1,1,2-Trichloroethane (1,1,2-TCA)	ND	2.0	ug/kg							
Trichloroethene (TCE)	ND	2.0	ug/kg							
Trichlorotrifluoroethane (Freon 113)	ND	2.0	ug/kg							
Trichlorofluoromethane (Freon 11)	ND	2.0	ug/kg							
1,2,3-Trichloropropane	ND	2.0	ug/kg							
1,2,4-Trimethylbenzene	ND	2.0	ug/kg							
1,3,5-Trimethylbenzene	ND	2.0	ug/kg							
Vinyl acetate	ND	2.0	ug/kg							
Vinyl chloride	ND	2.0	ug/kg							
m,p-Xylene	ND	4.0	ug/kg							
o-Xylene	ND	1.0	ug/kg							
Xylenes (total)	ND	10.0	ug/kg							
Surrogate: 1,2-Dichloroethane-d4	*20.1*		ug/kg	*20.0*		*101*	*53.6-162*			

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Quality Control Data

Analyte	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organic Compounds - Solid										
Batch B3J1308 - EPA 5030B Soil GCMS										
Surrogate: Toluene-d8	*19.6*		ug/kg	*20.0*		*97.8*	*51.2-146*			
Surrogate: 4-Bromofluorobenzene	*19.1*		ug/kg	*20.0*		*95.5*	*50.2-117*			
LCS										
Benzene	20.0	2.0	ug/kg	20.0		100	77.7-121			
Chlorobenzene	20.7	2.0	ug/kg	20.0		103	81.1-118			
1,1-Dichloroethene (1,1-DCE)	22.2	2.0	ug/kg	20.0		111	61.3-127			
Toluene	20.5	2.0	ug/kg	20.0		103	76.3-124			
Trichloroethene (TCE)	21.1	2.0	ug/kg	20.0		106	78.9-120			
Surrogate: 1,2-Dichloroethane-d4	*17.5*		ug/kg	*20.0*		*87.3*	*53.6-162*			
Surrogate: Toluene-d8	*19.0*		ug/kg	*20.0*		*95.2*	*51.2-146*			
Surrogate: 4-Bromofluorobenzene	*18.6*		ug/kg	*20.0*		*92.9*	*50.2-117*			
LCS Dup										
Benzene	20.3	2.0	ug/kg	20.0		101	77.7-121	1.19	20	
Chlorobenzene	20.6	2.0	ug/kg	20.0		103	81.1-118	0.485	20	
1,1-Dichloroethene (1,1-DCE)	21.9	2.0	ug/kg	20.0		109	61.3-127	1.36	20	
Toluene	20.2	2.0	ug/kg	20.0		101	76.3-124	1.57	20	
Trichloroethene (TCE)	21.2	2.0	ug/kg	20.0		106	78.9-120	0.378	20	
Surrogate: 1,2-Dichloroethane-d4	*18.7*		ug/kg	*20.0*		*93.5*	*53.6-162*			
Surrogate: Toluene-d8	*19.6*		ug/kg	*20.0*		*97.8*	*51.2-146*			
Surrogate: 4-Bromofluorobenzene	*18.8*		ug/kg	*20.0*		*94.0*	*50.2-117*			
Matrix Spike Source: 13J0805-03										
Benzene	20.5	2.0	ug/kg	20.0	ND	102	77.7-121			
Chlorobenzene	20.6	2.0	ug/kg	20.0	ND	103	81.1-118			
1,1-Dichloroethene (1,1-DCE)	23.1	2.0	ug/kg	20.0	ND	116	61.3-127			
Toluene	22.1	2.0	ug/kg	20.0	5.10	85.0	76.3-124			
Trichloroethene (TCE)	20.3	2.0	ug/kg	20.0	ND	102	78.9-120			
Surrogate: 1,2-Dichloroethane-d4	*19.3*		ug/kg	*20.0*		*96.4*	*53.6-162*			
Surrogate: Toluene-d8	*20.0*		ug/kg	*20.0*		*100*	*51.2-146*			
Surrogate: 4-Bromofluorobenzene	*18.9*		ug/kg	*20.0*		*94.6*	*50.2-117*			
Matrix Spike Dup Source: 13J0805-03										
Benzene	20.3	2.0	ug/kg	20.0	ND	101	77.7-121	1.08	20	
Chlorobenzene	20.5	2.0	ug/kg	20.0	ND	102	81.1-118	0.584	20	
1,1-Dichloroethene (1,1-DCE)	22.8	2.0	ug/kg	20.0	ND	114	61.3-127	1.22	20	
Toluene	22.0	2.0	ug/kg	20.0	5.10	84.7	76.3-124	0.272	20	
Trichloroethene (TCE)	20.1	2.0	ug/kg	20.0	ND	101	78.9-120	0.989	20	
Surrogate: 1,2-Dichloroethane-d4	*19.5*		ug/kg	*20.0*		*97.6*	*53.6-162*			
Surrogate: Toluene-d8	*20.3*		ug/kg	*20.0*		*102*	*51.2-146*			
Surrogate: 4-Bromofluorobenzene	*19.2*		ug/kg	*20.0*		*96.0*	*50.2-117*			
Semi Volatile Organic Compounds										
Batch B3J1319 - EPA 3550B										
Blank										

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Quality Control Data

Analyte	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Semi Volatile Organic Compounds										
Batch B3J1319 - EPA 3550B										
Acenaphthene	ND	0.330	mg/kg							
Acenaphthylene	ND	0.330	mg/kg							
Aniline	ND	0.330	mg/kg							
Anthracene	ND	0.330	mg/kg							
Benzidine	ND	0.330	mg/kg							
Benzo (a) anthracene	ND	0.330	mg/kg							
Benzo (a) pyrene	ND	0.330	mg/kg							
Benzo (b) fluoranthene	ND	0.330	mg/kg							
Benzo (g,h,i) perylene	ND	0.330	mg/kg							
Benzo (k) fluoranthene	ND	0.330	mg/kg							
Benzyl alcohol	ND	0.330	mg/kg							
Bis(2-chloroethoxy)methane	ND	0.330	mg/kg							
Bis(2-chloroethyl)ether	ND	0.330	mg/kg							
Bis(2-chloroisopropyl)ether	ND	0.330	mg/kg							
Bis(2-ethylhexyl)adipate	ND	0.330	mg/kg							
Bis(2-ethylhexyl)phthalate (DEHP)	ND	0.330	mg/kg							
4-Bromophenyl phenyl ether	ND	0.330	mg/kg							
Butyl benzyl phthalate	ND	0.330	mg/kg							
4-Chloro-3-methylphenol	ND	0.330	mg/kg							
4-Chloroaniline	ND	0.330	mg/kg							
2-Chloronaphthalene	ND	0.330	mg/kg							
2-Chlorophenol	ND	0.330	mg/kg							
4-Chlorophenyl phenyl ether	ND	0.330	mg/kg							
Chrysene	ND	0.330	mg/kg							
Dibenz (a,h) anthracene	ND	0.330	mg/kg							
Dibenzofuran	ND	0.330	mg/kg							
1,2-Dichlorobenzene (o-DCB)	ND	0.330	mg/kg							
1,3-Dichlorobenzene (m-DCB)	ND	0.330	mg/kg							
1,4-Dichlorobenzene (p-DCB)	ND	0.330	mg/kg							
3,3´-Dichlorobenzidine	ND	0.330	mg/kg							
2,4-Dichlorophenol	ND	0.330	mg/kg							
Diethyl phthalate	ND	0.330	mg/kg							
2,4-Dimethylphenol	ND	0.330	mg/kg							
Dimethyl phthalate	ND	0.330	mg/kg							
Di-n-butyl phthalate	ND	0.330	mg/kg							
Di-n-octyl phthalate	ND	0.330	mg/kg							
4,6-Dinitro-2-methylphenol	ND	0.330	mg/kg							
2,4-Dinitrophenol	ND	0.330	mg/kg							
2,4-Dinitrotoluene	ND	0.330	mg/kg							
2,6-Dinitrotoluene	ND	0.330	mg/kg							
Fluoranthene	ND	0.330	mg/kg							
Fluorene	ND	0.330	mg/kg							
Hexachlorobenzene	ND	0.330	mg/kg							
Hexachlorobutadiene	ND	0.330	mg/kg							
Hexachlorocyclopentadiene	ND	0.330	mg/kg							
Hexachloroethane	ND	0.330	mg/kg							
Indeno (1,2,3-cd) pyrene	ND	0.330	mg/kg							
Isophorone	ND	0.330	mg/kg							

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Report To: PACE ENGINEERING
1730 SOUTH STREET
REDDING, CA 96001
Attention: TOM WARNOCK
Project: GENERAL TESTING BURNEY SSB

Lab No: 13J0945
Reported: 11/14/13
Phone: 244-0202 x309
P.O. #

Quality Control Data

Analyte	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Semi Volatile Organic Compounds										
Batch B3J1319 - EPA 3550B										
2-Methylnaphthalene	ND	0.330	mg/kg							
2-Methylphenol	ND	0.330	mg/kg							
3 & 4-Methylphenol	ND	0.330	mg/kg							
Naphthalene	ND	0.330	mg/kg							
2-Nitroaniline	ND	0.330	mg/kg							
3-Nitroaniline	ND	0.330	mg/kg							
4-Nitroaniline	ND	0.330	mg/kg							
Nitrobenzene	ND	0.330	mg/kg							
2-Nitrophenol	ND	0.330	mg/kg							
4-Nitrophenol	ND	0.330	mg/kg							
N-Nitrosodiethylamine	ND	0.330	mg/kg							
N-Nitrosodimethylamine	ND	0.330	mg/kg							
N-Nitrosomethylethylamine	ND	0.330	mg/kg							
N-Nitrosodi-n-butylamine	ND	0.330	mg/kg							
N-Nitrosodi-n-propylamine	ND	0.330	mg/kg							
N-Nitrosodiphenylamine	ND	0.330	mg/kg							
N-Nitrosomorpholine	ND	0.330	mg/kg							
N-Nitrosopiperidine	ND	0.330	mg/kg							
N-Nitrosopyrrolidine	ND	0.330	mg/kg							
Pentachlorophenol (PCP)	ND	0.330	mg/kg							
Phenanthrene	ND	0.330	mg/kg							
Phenol	ND	0.330	mg/kg							
Pyrene	ND	0.330	mg/kg							
Pyridine	ND	0.330	mg/kg							
2,3,4,6-Tetrachlorophenol	ND	0.330	mg/kg							
1,2,4-Trichlorobenzene	ND	0.330	mg/kg							
2,4,5-Trichlorophenol	ND	0.330	mg/kg							
2,4,6-Trichlorophenol	ND	0.330	mg/kg							
Surrogate: 2-Fluorophenol	*0.350*		mg/kg	*0.667*		*52.5*	*18-97.9*			
Surrogate: Phenol-d5	*0.356*		mg/kg	*0.667*		*53.4*	*30.8-106*			
Surrogate: 2,4,6-Tribromophenol	*0.345*		mg/kg	*0.667*		*51.8*	*48.6-152*			
Surrogate: Nitrobenzene-d5	*0.167*		mg/kg	*0.333*		*50.2*	*17.7-119*			
Surrogate: 2-Fluorobiphenyl	*0.166*		mg/kg	*0.333*		*49.7*	*26.2-110*			
Surrogate: Terphenyl-dl4	*0.350*		mg/kg	*0.333*		*105*	*31.7-134*			
LCS										
Acenaphthene	0.219	0.330	mg/kg	0.333		65.7	24.9-129			J
4-Chloro-3-methylphenol	0.188	0.330	mg/kg	0.333		56.4	23.4-137			J
2-Chlorophenol	0.195	0.330	mg/kg	0.333		58.4	26.7-122			J
1,4-Dichlorobenzene (p-DCB)	0.194	0.330	mg/kg	0.333		58.2	22.1-110			J
2,4-Dinitrotoluene	0.242	0.330	mg/kg	0.333		72.6	49.7-109			J
4-Nitrophenol	0.138	0.330	mg/kg	0.333		41.3	33.5-119			J
N-Nitrosodi-n-propylamine	0.192	0.330	mg/kg	0.333		57.5	17.6-132			J
Pentachlorophenol (PCP)	0.206	0.330	mg/kg	0.333		61.9	32-132			J
Phenol	0.175	0.330	mg/kg	0.333		52.4	29.4-124			J
Pyrene	0.297	0.330	mg/kg	0.333		89.0	39.1-136			J
1,2,4-Trichlorobenzene	0.197	0.330	mg/kg	0.333		59.1	22.3-116			J

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Report To: PACE ENGINEERING
1730 SOUTH STREET
REDDING, CA 96001
Attention: TOM WARNOCK
Project: GENERAL TESTING BURNEY SSB

Lab No: 13J0945
Reported: 11/14/13
Phone: 244-0202 x309
P.O. #

Quality Control Data

Analyte	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Semi Volatile Organic Compounds										
Batch B3J1319 - EPA 3550B										
Surrogate: 2-Fluorophenol	*0.360*		mg/kg	*0.667*		*54.0*	*18-97.9*			
Surrogate: Phenol-d5	*0.401*		mg/kg	*0.667*		*60.2*	*30.8-106*			
Surrogate: 2,4,6-Tribromophenol	*0.517*		mg/kg	*0.667*		*77.5*	*48.6-152*			
Surrogate: Nitrobenzene-d5	*0.197*		mg/kg	*0.333*		*59.2*	*17.7-119*			
Surrogate: 2-Fluorobiphenyl	*0.208*		mg/kg	*0.333*		*62.5*	*26.2-110*			
Surrogate: Terphenyl-dl4	*0.326*		mg/kg	*0.333*		*97.7*	*31.7-134*			
Matrix Spike **Source: 13J0945-02**										
Acenaphthene	1.39	9.90	mg/kg	2.00	ND	69.5	24.9-129			R-08, J
4-Chloro-3-methylphenol	1.73	9.90	mg/kg	2.00	ND	86.5	23.4-137			R-08, J
2-Chlorophenol	1.38	9.90	mg/kg	2.00	ND	69.0	26.7-122			R-08, J
1,4-Dichlorobenzene (p-DCB)	1.35	9.90	mg/kg	2.00	ND	67.5	22.1-110			R-08, J
2,4-Dinitrotoluene	1.44	9.90	mg/kg	2.00	ND	72.0	49.7-109			R-08, J
4-Nitrophenol	1.36	9.90	mg/kg	2.00	ND	68.0	33.5-119			R-08, J
N-Nitrosodi-n-propylamine	1.57	9.90	mg/kg	2.00	ND	78.5	17.6-132			R-08, J
Pentachlorophenol (PCP)	1.95	9.90	mg/kg	2.00	ND	97.5	32-132			R-08, J
Phenol	0.940	9.90	mg/kg	2.00	ND	47.0	29.4-124			R-08, Z-01, J
Pyrene	1.99	9.90	mg/kg	2.00	ND	99.5	39.1-136			R-08, J
1,2,4-Trichlorobenzene	1.37	9.90	mg/kg	2.00	ND	68.5	22.3-116			R-08, J
Surrogate: 2-Fluorophenol	*1.36*		mg/kg	*2.00*		*68.0*	*18-97.9*			*R-08*
Surrogate: Phenol-d5	*1.49*		mg/kg	*2.00*		*74.5*	*30.8-106*			*R-08*
Surrogate: 2,4,6-Tribromophenol	*2.37*		mg/kg	*2.00*		*118*	*48.6-152*			*R-08*
Surrogate: Nitrobenzene-d5	*0.730*		mg/kg	*1.00*		*73.0*	*17.7-119*			*R-08*
Surrogate: 2-Fluorobiphenyl	*0.660*		mg/kg	*1.00*		*66.0*	*26.2-110*			*R-08*
Surrogate: Terphenyl-dl4	*1.09*		mg/kg	*1.00*		*109*	*31.7-134*			*R-08*
Matrix Spike Dup **Source: 13J0945-02**										
Acenaphthene	1.49	9.90	mg/kg	2.00	ND	74.5	24.9-129	6.94	30	R-08, J
4-Chloro-3-methylphenol	1.97	9.90	mg/kg	2.00	ND	98.5	23.4-137	13.0	30	R-08, J
2-Chlorophenol	1.48	9.90	mg/kg	2.00	ND	74.0	26.7-122	6.99	30	R-08, J
1,4-Dichlorobenzene (p-DCB)	1.40	9.90	mg/kg	2.00	ND	70.0	22.1-110	3.64	30	R-08, J
2,4-Dinitrotoluene	1.57	9.90	mg/kg	2.00	ND	78.5	49.7-109	8.64	30	R-08, J
4-Nitrophenol	1.40	9.90	mg/kg	2.00	ND	70.0	33.5-119	2.90	30	R-08, J
N-Nitrosodi-n-propylamine	1.59	9.90	mg/kg	2.00	ND	79.5	17.6-132	1.27	30	R-08, J
Pentachlorophenol (PCP)	2.03	9.90	mg/kg	2.00	ND	102	32-132	4.02	30	R-08, J
Phenol	0.940	9.90	mg/kg	2.00	ND	47.0	29.4-124	200	30	R-08, Z-01, J
Pyrene	2.05	9.90	mg/kg	2.00	ND	102	39.1-136	2.97	30	R-08, J
1,2,4-Trichlorobenzene	1.44	9.90	mg/kg	2.00	ND	72.0	22.3-116	4.98	30	R-08, J
Surrogate: 2-Fluorophenol	*1.43*		mg/kg	*2.00*		*71.5*	*18-97.9*			*R-08*
Surrogate: Phenol-d5	*1.49*		mg/kg	*2.00*		*74.5*	*30.8-106*			*R-08*
Surrogate: 2,4,6-Tribromophenol	*2.41*		mg/kg	*2.00*		*120*	*48.6-152*			*R-08*
Surrogate: Nitrobenzene-d5	*0.740*		mg/kg	*1.00*		*74.0*	*17.7-119*			*R-08*
Surrogate: 2-Fluorobiphenyl	*0.690*		mg/kg	*1.00*		*69.0*	*26.2-110*			*R-08*
Surrogate: Terphenyl-dl4	*1.04*		mg/kg	*1.00*		*104*	*31.7-134*			*R-08*

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Report To: PACE ENGINEERING
1730 SOUTH STREET
REDDING, CA 96001
Attention: TOM WARNOCK
Project: GENERAL TESTING BURNEY SSB

Lab No: 13J0945
Reported: 11/14/13
Phone: 244-0202 x309
P.O. #

Notes and Definitions

Z-01	Due to a calculation error in the reporting softeware the RPD reported is 200. The correct RPD is 0.
R-08	The sample was diluted due to sample matrix resulting in elevated reporting limits.
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.

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BASIC LABORATORY CHAIN OF CUSTODY RECORD

2218 Railroad Avenue, Redding, CA 96001 (530) 243-7234 FAX (530) 243-7494

LAB #: 13J0945

PAGE 1 OF 1

CLIENT NAME: PACE Engr / Burney Water Dist

PROJECT NAME: Burney SSB

PROJECT #:

MAILING ADDRESS: 1730 South St Redding CA

REPORT DUE DATE:

TURN AROUND TIME: (Standard) Rush

OF SAMPLES: 2

PROJECT MANAGER: Tom Warnock

MATRIX / TYPE: S/W

PHONE: 244-0202

EMAIL: twarnock@pace.....

CUSTODY SEAL INTACT? Yes No N/A

FAX:

RESULTS SENT: (Email) Fax EDD Mail

SYSTEM #:

EDD TYPE:

INVOICE TO: Burney Water District

PO#:

QC: Standard Level II

ANALYSIS REQUESTED

SAMPLE DATE	SAMPLE TIME	WATER	COMP	SOLID	SAMPLE LOCATION / IDENTIFICATION	NUMBER OF BOTTLES	TSS	% Volatile (TVS)	CAM 17 Metals	VOCs	SOCs	Moisture Content	LAB ID	CHLORINE RESIDUAL OR COMMENTS
10/21/13	1200	X			Sludge Storage Basin	1	X	X					-01	12.9
10/21/13	1300			X	Dewatered Sludge	4	X		X	X	X	X	-02	14.5

PRESERVED WITH: HNO_3 H_2SO_4 NaOH ZnAce/NaOH HCL NaThio OTHER_____

SAMPLED BY (PRINT): THOMAS W. WARNOCK	SAMPLE DATE/TIME: 10/21/13/1200	RELINQUISHED BY:	DATE/TIME: 10/24/13/1040
RECEIVED BY:	DATE/TIME:	RELINQUISHED BY:	DATE/TIME:
RECEIVED BY (LAB):	DATE/TIME: 10/24/13@10:36	PROCESSED AND VERIFIED BY:	DATE/TIME: 10/24/13@10:36
LOGGED IN BY:	DATE/TIME: 10/24/13@10:36	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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BURNEY WATER DISTRICT
20222 HUDSON STREET
BURNEY, CA 96013-4260

MPN TESTING

Sampled By: DON SIBERT
Client Contact: WILLIE RODRIGUEZ
Phone: 921-3475
Fax: 335-2189

Lab No: 3031064
Reported: 04/08/13
System Number: 4510003
Regulator: ODW
P.O. #

Analysis Report

Total & Fecal Coliform MPN 10

Method: SM 9221B/E

Analysis	Result	Units	Set Up	Read Out	Chlorine (mg/l)	Received Temp (C)*
HATHAWAY (3031064-01) Special	**Sampled: 03/29/13 10:05**		**Received: 03/29/13 13:01**			
Total Coliforms	<1.1	MPN/100 ml	03/29/13 13:15	03/31/13 13:00		9.5
Fecal Coliforms	<1.1	MPN/100 ml				9.5

Notes and Definitions

A-01 <1.1

* Received Temp: Samples received in the laboratory (unless received within 2 hours of sampling) with temperatures exceeding 10 degrees C do not meet the transportation temperature requirements as required by CA-DHS ELAP and EPA approved methods.

< Less than reporting limit

≤ Less than or equal to reporting limit

> Greater than reporting limit

≥ Greater than or equal to reporting limit

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BURNEY WATER DISTRICT
20222 HUDSON STREET
BURNEY, CA 96013-4260

BACTERIA TESTING

Sampled By: MIKE SKELLY
Client Contact: WILLIE RODRIGUEZ
Phone: 921-3475
Fax: 335-2189

Lab No: 3030895
Reported: 03/26/13
System Number: 4510003
Regulator: ODW
P.O. #

Coliform Analysis Report

Standard Total Coliform & E.coli

Analysis	Result	Chlorine (mg/l)	Sample Receipt Temp (C)*	Set Up	Read Out	Method
BARTEL STREET (3030895-01) Routine	**Sampled: 03/25/13 09:40**		**Received: 03/25/13 12:53**			
Total Coliforms	Absent		7.6	03/25/13 15:20	03/26/13 09:20	Colilert 24
E. Coli	Absent		7.6			
SERPENTINE LANE (3030895-02) Routine	**Sampled: 03/25/13 09:50**		**Received: 03/25/13 12:53**			
Total Coliforms	Absent		9.4	03/25/13 15:20	03/26/13 09:20	Colilert 24
E. Coli	Absent		9.4			
HUDSON STREET (3030895-03) Routine	**Sampled: 03/25/13 09:56**		**Received: 03/25/13 12:53**			
Total Coliforms	Absent		8.3	03/25/13 15:20	03/26/13 09:20	Colilert 24
E. Coli	Absent		8.3			
JUNIPER STREET (3030895-04) Routine	**Sampled: 03/25/13 09:28**		**Received: 03/25/13 12:53**			
Total Coliforms	Absent		8.0	03/25/13 15:20	03/26/13 09:20	Colilert 24
E. Coli	Absent		8.0			
HATHAWAY (3030895-05) Routine	**Sampled: 03/25/13 09:17**		**Received: 03/25/13 12:53**			
Total Coliforms	Present		8.1	03/25/13 15:20	03/26/13 09:20	Colilert 24
E. Coli	Absent		8.1			

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FAXED
MAR 26 2013
BY BH + ODW

Call: Date/Time 3/26/13 11:30
Basic Representative BH
Client Contact Willie

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BURNEY WATER DISTRICT
20222 HUDSON STREET
BURNEY, CA 96013-4260

BACTERIA TESTING

Sampled By: MIKE SKELLY
Client Contact: WILLIE RODRIGUEZ
Phone: 921-3475
Fax: 335-2189

Lab No: 3030681
Reported: 03/19/13
System Number: 4510003
Regulator: ODW
P.O. #

Coliform Analysis Report

Standard Total Coliform & E.coli

Analysis	Result	Chlorine (mg/l)	Sample Receipt Temp (C)*	Set Up	Read Out	Method
HATHAWAY (3030681-01) Routine	**Sampled: 03/18/13 08:45**		**Received: 03/18/13 12:51**			
Total Coliforms	Absent		14.3	03/18/13 15:10	03/19/13 09:10	Colilert 24
E. Coli	Absent		14.3			

Notes and Definitions

Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially-harmful, bacteria may be present.

The presence of **Fecal coliforms** and/or ***E. coli*** 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.

*** Sample Receipt Temp:** Samples received in the laboratory (unless received within 2 hours of sampling) with temperatures exceeding 10 degrees C do not meet the transportation temperature requirements as required by CA-DHS ELAP and EPA approved methods.

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MAR 19 2013
BY: BA

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BURNEY WATER DISTRICT
20222 HUDSON STREET
BURNEY, CA 96013-4260

MONTHLY TESTING

Sampled By: DON SIBERT
Client Contact: DON SIBERT
Phone: 335-3149
Fax: 335-2189

Lab No: 2110293
Reported: 11/08/12
System Number:
Regulator:
P.O. #

Coliform Analysis Report

Standard Total Coliform & E.coli

Analysis	Result	Chlorine (mg/l)	Sample Receipt Temp (C)*	Set Up	Read Out	Method
HATHAWAY (2110293-03) Routine	**Sampled: 11/07/12 08:41**		**Received: 11/07/12 11:39**			
Total Coliforms	Absent		16.1	11/07/12 16:00	11/08/12 10:00	Colilert 24
E. Coli	Absent		16.1			

Notes and Definitions

Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially-harmful, bacteria may be present.

The presence of **Fecal coliforms** and/or ***E. coli*** 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.

*** Sample Receipt Temp:** Samples received in the laboratory (unless received within 2 hours of sampling) with temperatures exceeding 10 degrees C do not meet the transportation temperature requirements as required by CA-DHS ELAP and EPA approved methods.

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Report To:	BURNEY WATER DISTRICT	**Lab No:**	13I0290
	20222 HUDSON STREET	**Reported:**	09/16/13
	BURNEY, CA 96013-4260	**Phone:**	335-3582
Attention:	WILLIE RODRIGUEZ	**P.O. #**	1327
Project:	BACTERIA TESTING		
Description:	HATHAWAY	**Lab ID:** 13I0290-01	**Sampled:** 09/09/13 09:05
Matrix:	Water		**Received:** 09/09/13 10:37

Microbiology

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
Total Coliforms	MPN/100 ml	<1			1	SM 9223B	09/10/13	09/09/13	B3I0776

Notes and Definitions

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.

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BURNEY WATER DISTRICT
20222 HUDSON STREET
BURNEY, CA 96013-4260

MONTHLY TESTING

Sampled By: DON SIBERT
Client Contact: DON SIBERT
Phone: 335-3149
Fax: 335-2189

Lab No: 2030175
Reported: 03/07/12
System Number:
Regulator:
P.O. #

Coliform Analysis Report

Standard Total Coliform & E.coli

Analysis	Result	Chlorine (mg/l)	Sample Receipt Temp (C)*	Set Up	Read Out	Method
HATHAWAY (2030175-04) Routine	**Sampled: 03/06/12 09:40**		**Received: 03/06/12 11:47**			
Total Coliforms	Absent		15.2	03/06/12 15:30	03/07/12 09:30	Colilert 24
E. Coli	Absent		15.2			

Notes and Definitions

Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially-harmful, bacteria may be present.

The presence of **Fecal coliforms** and/or ***E. coli*** 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.

*** Sample Receipt Temp:** Samples received in the laboratory (unless received within 2 hours of sampling) with temperatures exceeding 10 degrees C do not meet the transportation temperature requirements as required by CA-DHS ELAP and EPA approved methods.

Approved By
Basic Laboratory, Inc.
California ELAP Cert #1677 and #2718

FAXED
MAR 07 2012
BY:

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

BURNEY WATER DISTRICT
20222 HUDSON STREET
BURNEY, CA 96013-4260

MONTHLY TESTING

Sampled By: DON SIBERT
Client Contact: DON SIBERT
Phone: 335-3149
Fax: 335-2189

Lab No: 1110293
Reported: 11/08/11
System Number:
Regulator:
P.O. #

Coliform Analysis Report

Standard Total Coliform & E.coli

Analysis	Result	Chlorine (mg/l)	Sample Receipt Temp (C)*	Set Up	Read Out	Method
HATHAWAY (1110293-04) Routine	**Sampled: 11/07/11 09:10**		**Received: 11/07/11 11:05**			
Total Coliforms	Absent		13.5	11/07/11 16:15	11/08/11 10:15	Colilert 24
E. Coli	Absent		13.5			

Notes and Definitions

Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially-harmful, bacteria may be present.

The presence of **Fecal coliforms** and/or ***E. coli*** 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.

*** Sample Receipt Temp:** Samples received in the laboratory (unless received within 2 hours of sampling) with temperatures exceeding 10 degrees C do not meet the transportation temperature requirements as required by CA-DHS ELAP and EPA approved methods.

Approved By
Basic Laboratory, Inc.
California ELAP Cert #1677 and #27

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NOV 16 2011
BY

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BURNEY WATER DISTRICT
20222 HUDSON STREET
BURNEY, CA 96013-4260

MONTHLY TESTING

Sampled By: DON SIBERT
Client Contact: DON SIBERT
Phone: 335-3149
Fax: 335-2189

Lab No: 1090273
Reported: 09/09/11
System Number:
Regulator:
P.O. #

Coliform Analysis Report

Standard Total Coliform & E.coli

Analysis	Result	Chlorine mg/l	Set Up	Read Out	Method
HATHAWAY (1090273-04) Routine	**Sampled: 09/08/11 09:25**		**Received: 09/08/11 10:59**		
Total Coliforms	Absent		09/08/11 14:45	09/09/11 08:45	Colilert 24
E. Coli	Absent				

Notes and Definitions

Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially-harmful, bacteria may be present.

The presence of **Fecal coliforms** and/or ***E. coli*** 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.

Approved By
Basic Laboratory, Inc.
California ELAP Cert #1677 and #2718

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SEP 09 2011
BY BH

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3860 Morrow Lane, Suite F, Chico, California 95928, voice 530.894.8966, fax 530.894.5143

Report To: BURNEY WATER DISTRICT
20222 HUDSON STREET
BURNEY, CA 96013-4260
Attention: WILLIE RODRIGUEZ
Project: BACTERIA TESTING
Description: HATHAWAY
Matrix: Wastewater

Lab ID: 13F0766-01

Lab No: 13F0766
Reported: 06/21/13
Phone: 921-3475
P.O. # 3728
Sampled: 06/19/13 11:15
Received: 06/19/13 13:31

Microbiology

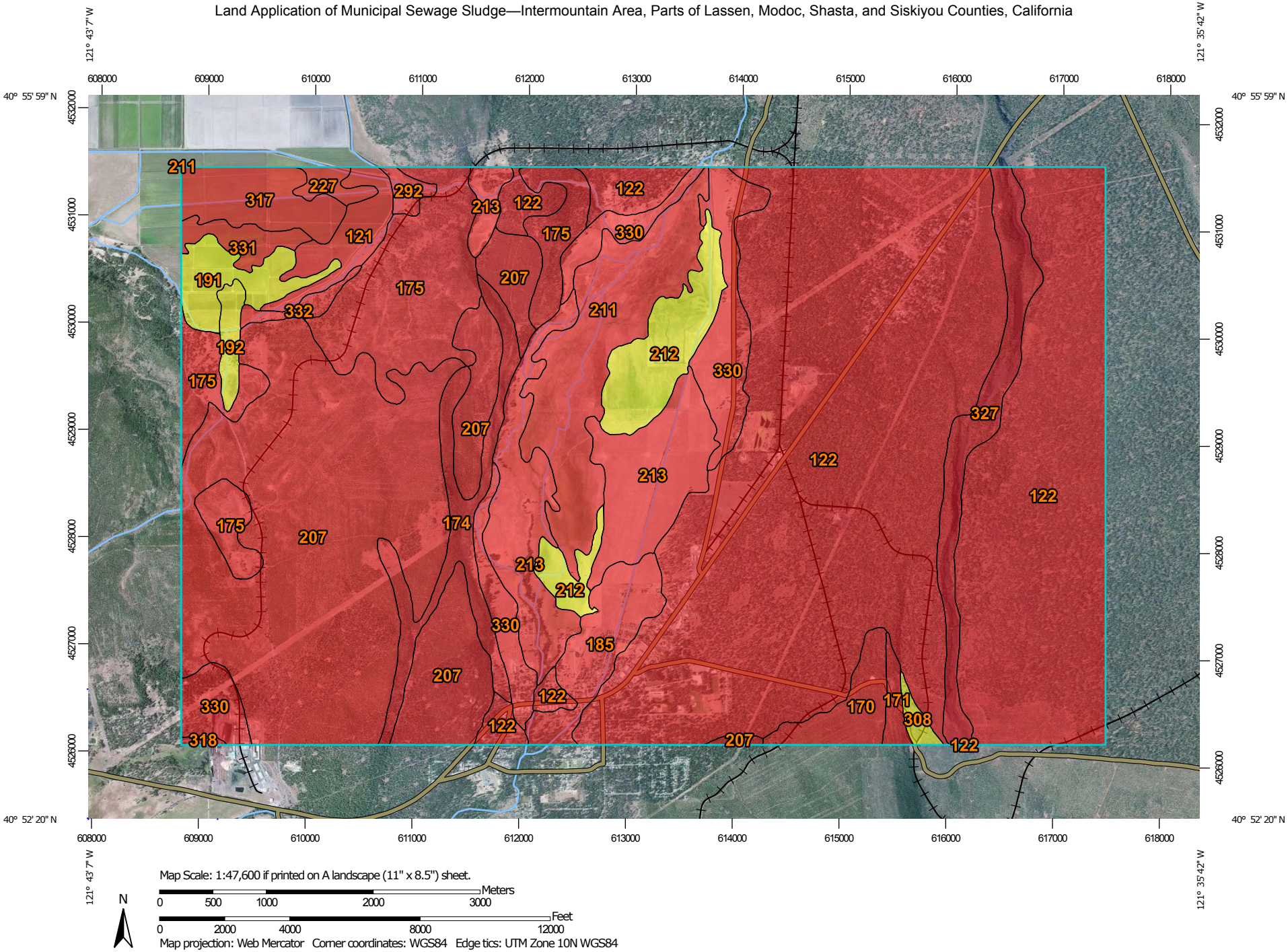
Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
Total Coliforms	MPN/100 ml	<1			1	SM 9223B	06/20/13	06/19/13	B3F0899

Notes and Definitions

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

APPENDIX L


121° 43' 7" W
121° 35' 42" W
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40° 52' 20" N
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122
Map Scale: 1:47,600 if printed on A landscape (11" x 8.5") sheet.
N
Meters
0 500 1000 2000 3000
Feet
0 2000 4000 8000 12000
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

Very limited

Somewhat limited

Not limited

Not rated or not available

Soil Rating Lines

Very limited

Somewhat limited

Not limited

Not rated or not available

Soil Rating Points

Very limited

Somewhat limited

Not limited

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Intermountain Area, Parts of Lassen, Modoc, Shasta, and Siskiyou Counties, California
Survey Area Data: Version 10, Sep 12, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 12, 2010—Aug 25, 2010

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Land Application of Municipal Sewage Sludge

Land Application of Municipal Sewage Sludge— Summary by Map Unit — Intermountain Area, Parts of Lassen, Modoc, Shasta, and Siskiyou Counties, California (CA604)						
Map unit symbol	**Map unit name**	**Rating**	**Component name (percent)**	**Rating reasons (numeric values)**	**Acres in AOI**	**Percent of AOI**
121	Burman-Lasvar complex, 0 to 2 percent slopes	Very limited	Burman (50%)	Slow water movement (1.00)	134.8	1.2%
				Depth to saturated zone (1.00)		
				Depth to cemented pan (0.54)		
				Droughty (0.27)		
			Lasvar (35%)	Slow water movement (1.00)		
				Depth to saturated zone (1.00)		
				Depth to cemented pan (0.35)		
				Droughty (0.16)		
122	Burney-Arkright complex, 2 to 9 percent slopes	Very limited	Burney (40%)	Slow water movement (1.00)	4,854.2	41.9%
				Too acid (0.14)		
			Arkright (40%)	Slow water movement (1.00)		
				Droughty (1.00)		
				Depth to bedrock (0.90)		
				Too acid (0.14)		
170	Gasper-Scarface complex, 15 to 30 percent slopes	Very limited	Gasper (45%)	Slope (1.00)	129.3	1.1%
				Slow water movement (0.31)		
				Too acid (0.14)		
			Scarface (40%)	Slope (1.00)		
				Slow water movement (0.31)		

Land Application of Municipal Sewage Sludge— Summary by Map Unit — Intermountain Area, Parts of Lassen, Modoc, Shasta, and Siskiyou Counties, California (CA604)						
Map unit symbol	**Map unit name**	**Rating**	**Component name (percent)**	**Rating reasons (numeric values)**	**Acres in AOI**	**Percent of AOI**
171	Gasper-Scarface complex, 30 to 50 percent slopes	Very limited	Gasper (60%)	Slope (1.00)	36.6	0.3%
				Slow water movement (0.31)		
				Too acid (0.14)		
			Scarface (30%)	Slope (1.00)		
				Slow water movement (0.31)		
174	Gasper-Scarface complex, moist, 30 to 50 percent slopes	Very limited	Gasper (60%)	Slope (1.00)	264.7	2.3%
				Large stones on the surface (0.99)		
				Slow water movement (0.31)		
				Too acid (0.14)		
			Scarface (20%)	Slope (1.00)		
				Slow water movement (0.31)		
175	Gooval cobbly loam, 2 to 9 percent slopes	Very limited	Gooval (85%)	Slow water movement (1.00)	780.8	6.7%
				Depth to saturated zone (1.00)		
				Droughty (1.00)		
				Depth to bedrock (0.95)		
				Too acid (0.14)		
185	Henhill silt loam, gravelly substratum, 0 to 2 percent slopes	Very limited	Henhill (85%)	Flooding (1.00)	215.0	1.9%
				Depth to saturated zone (0.84)		
				Slow water movement (0.31)		
191	Jadpor gravelly sandy loam, 0 to 5 percent slopes	Somewhat limited	Jadpor (90%)	Droughty (0.80)	143.6	1.2%
				Slow water movement (0.31)		
				Too acid (0.14)		
192	Jadpor very gravelly sandy	Somewhat limited	Jadpor (85%)	Droughty (0.99)	52.9	0.5%

Land Application of Municipal Sewage Sludge— Summary by Map Unit — Intermountain Area, Parts of Lassen, Modoc, Shasta, and Siskiyou Counties, California (CA604)						
Map unit symbol	**Map unit name**	**Rating**	**Component name (percent)**	**Rating reasons (numeric values)**	**Acres in AOI**	**Percent of AOI**
	loam, 0 to 5 percent slopes			Slow water movement (0.31)		
				Too acid (0.14)		
				Large stones on the surface (0.08)		
207	Jimmerson loam-Jimmerson stony sandy loam complex, 2 to 15 percent slopes	Very limited	Jimmerson (60%)	Slow water movement (1.00)	2,257.7	19.5%
				Slope (0.04)		
			Jimmerson (30%)	Large stones on the surface (1.00)		
				Slow water movement (1.00)		
				Slope (0.04)		
211	Keddie muck, 0 to 1 percent slopes	Very limited	Keddie (85%)	Limiting adsorption (1.00)	541.4	4.7%
				Filtering capacity (1.00)		
				Depth to saturated zone (1.00)		
				Flooding (1.00)		
212	Keddie loam, 0 to 2 percent slopes	Somewhat limited	Keddie (85%)	Flooding (0.40)	305.0	2.6%
				Depth to saturated zone (0.24)		
213	Keddie silt loam, 0 to 2 percent slopes	Very limited	Keddie (85%)	Flooding (1.00)	682.0	5.9%
				Depth to saturated zone (0.84)		
				Slow water movement (0.31)		
227	Lasvar-Pitvar complex, 0 to 2 percent slopes	Very limited	Lasvar (55%)	Slow water movement (1.00)	39.4	0.3%
				Depth to saturated zone (1.00)		
				Depth to cemented pan (0.35)		

Land Application of Municipal Sewage Sludge— Summary by Map Unit — Intermountain Area, Parts of Lassen, Modoc, Shasta, and Siskiyou Counties, California (CA604)						
Map unit symbol	**Map unit name**	**Rating**	**Component name (percent)**	**Rating reasons (numeric values)**	**Acres in AOI**	**Percent of AOI**
				Droughty (0.16)		
			Pitvar (35%)	Slow water movement (1.00)		
				Depth to saturated zone (1.00)		
292	Ricketts-Orhood complex, 2 to 15 percent slopes	Very limited	Ricketts (45%)	Slow water movement (1.00)	30.9	0.3%
				Droughty (1.00)		
				Cobble content (1.00)		
				Depth to bedrock (0.80)		
				Slope (0.04)		
			Orhood (35%)	Slow water movement (1.00)		
				Large stones on the surface (1.00)		
				Droughty (1.00)		
				Depth to bedrock (1.00)		
				Cobble content (0.98)		
308	Scarface-Gasper complex, 2 to 15 percent slopes	Somewhat limited	Scarface (50%)	Slow water movement (0.31)	25.6	0.2%
				Slope (0.04)		
			Gasper (35%)	Slow water movement (0.31)		
				Too acid (0.14)		
				Slope (0.04)		
317	Swanberger clay, 0 to 1 percent slopes	Very limited	Swanberger (90%)	Depth to saturated zone (1.00)	186.6	1.6%
				Slow water movement (1.00)		
318	Swanberger muck, 0 to 1 percent slopes	Very limited	Swanberger (85%)	Depth to saturated zone (1.00)	7.4	0.1%

Land Application of Municipal Sewage Sludge— Summary by Map Unit — Intermountain Area, Parts of Lassen, Modoc, Shasta, and Siskiyou Counties, California (CA604)						
Map unit symbol	**Map unit name**	**Rating**	**Component name (percent)**	**Rating reasons (numeric values)**	**Acres in AOI**	**Percent of AOI**
				Slow water movement (1.00)		
327	Wengler very gravelly coarse sandy loam, 30 to 50 percent slopes	Very limited	Wengler (80%)	Limiting adsorption (1.00)	289.8	2.5%
				Filtering capacity (1.00)		
				Slope (1.00)		
				Too acid (0.03)		
330	Winnibulli loam, 0 to 2 percent slopes	Very limited	Winnibulli (80%)	Flooding (1.00)	488.5	4.2%
				Slow water movement (1.00)		
				Depth to saturated zone (0.84)		
331	Winnibulli loam, gravelly substratum, 0 to 5 percent slopes	Very limited	Winnibulli (85%)	Flooding (1.00)	70.1	0.6%
				Slow water movement (1.00)		
				Depth to saturated zone (0.43)		
332	Winnibulli-Burman complex, 0 to 5 percent slopes	Very limited	Winnibulli (60%)	Flooding (1.00)	36.1	0.3%
				Slow water movement (1.00)		
				Depth to saturated zone (0.84)		
			Burman (25%)	Slow water movement (1.00)		
				Depth to saturated zone (1.00)		
				Depth to cemented pan (0.20)		
				Droughty (0.00)		
Totals for Area of Interest					**11,572.4**	**100.0%**

Land Application of Municipal Sewage Sludge— Summary by Rating Value		
Rating	**Acres in AOI**	**Percent of AOI**
Very limited	11,045.3	95.4%
Somewhat limited	527.1	4.6%
Totals for Area of Interest	**11,572.4**	**100.0%**

Description

Application of sewage sludge not only disposes of waste material but also can improve crop production by increasing the supply of nutrients in the soils where the material is applied. Sewage sludge is the residual product of the treatment of municipal sewage. The solid component consists mainly of cell mass, primarily bacteria cells that developed during secondary treatment and have incorporated soluble organics into their own bodies. The sludge has small amounts of sand, silt, and other solid debris. The content of nitrogen varies. Some sludge has constituents that are toxic to plants or hazardous to the food chain, such as heavy metals and exotic organic compounds, and should be analyzed chemically prior to use.

The content of water in the sludge ranges from about 98 percent to less than 40 percent. The sludge is considered liquid if it is more than about 90 percent water, slurry if it is about 50 to 90 percent water, and solid if it is less than about 50 percent water.

The ratings are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, the rate at which the sludge is applied, and the method by which the sludge is applied. The properties that affect absorption, plant growth, and microbial activity include saturated hydraulic conductivity (Ksat), depth to a water table, ponding, the sodium adsorption ratio, depth to bedrock or a cemented pan, available water capacity, reaction, salinity, and bulk density. The wind erodibility group, soil erosion factor K, and slope are considered in estimating the likelihood that wind erosion or water erosion will transport the waste material from the application site. Stones, cobbles, a water table, ponding, and flooding can hinder the application of sludge. Permanently frozen soils are unsuitable for waste treatment.

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect agricultural waste management. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated

rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

APPENDIX M

Offer-No.:	**IET-1704020-HCMA-Rev01**
Date:	**May 26, 2017**
Submitted to:	**PACE Engineering**
Project:	**Burney, CA - Aerobic Digester**
	Budgetary Proposal

INVENT Environmental Technologies Inc.
By: Michael Ordman

216 Little Falls Road, Unit 8
Cedar Grove, NJ 07009

Tel: 973 571 2223
Fax: 973 571 2474
Http://www.invent-et.com

Contents

1 Design Basis

1.1 Application

Aeration in an aerobic digester.

1.2 Wastewater Properties

- Origin of wastewater:		municipal	
- Medium:		activated sludge	
- MLSS:	≤	20,000	ppm
- Sludge Volume Index (SVI)	≥	80	ml/g
- Temperature:		68	°F
- Total Dissolved Solids (TDS):	≤	2,000	ppm
- pH-value:		7	

1.3 Plant Data

- Number of basins:	1	
- Basin shape:	circular	
- :		
- Diameter:	35.0	ft
- Water depth:	11.1	ft
- Basin volume:	0.080	Mgal
- Freeboard:	3.0	ft
- Plant altitude:	3,140	ft

1.4 Oxygen Requirements (per basin)

- AOR:	26.0	lbO2/h
- SOTR:	85.9	lbO2/h

2 Technical Description of the HYPERCLASSIC® Mixer/Aerator

2.1 General Description

The **HYPERCLASSIC**® Mixer/Aerator (HCMA) is a unique mixing and aeration system which provides excellent mixing and homogenization as well as high oxygen transfer efficiency. The HCMA is a rugged and versatile device that can be used in water and wastewater treatment as well as numerous industrial applications.

Figure 1 shows how the HCMA works. This diagram shows the dry mounted drive in a typical application (rectangular or round tank). The characteristic features of the **HYPERCLASSIC**® system are the hyperboloid form of the mixer body, the option of aeration through an INVENT provided sparge ring (from a separate compressed air supply – by others) and the position of the drive. In this illustration, the Hyperboloid Mixer is powered a dry mounted drive with a vertical shaft.

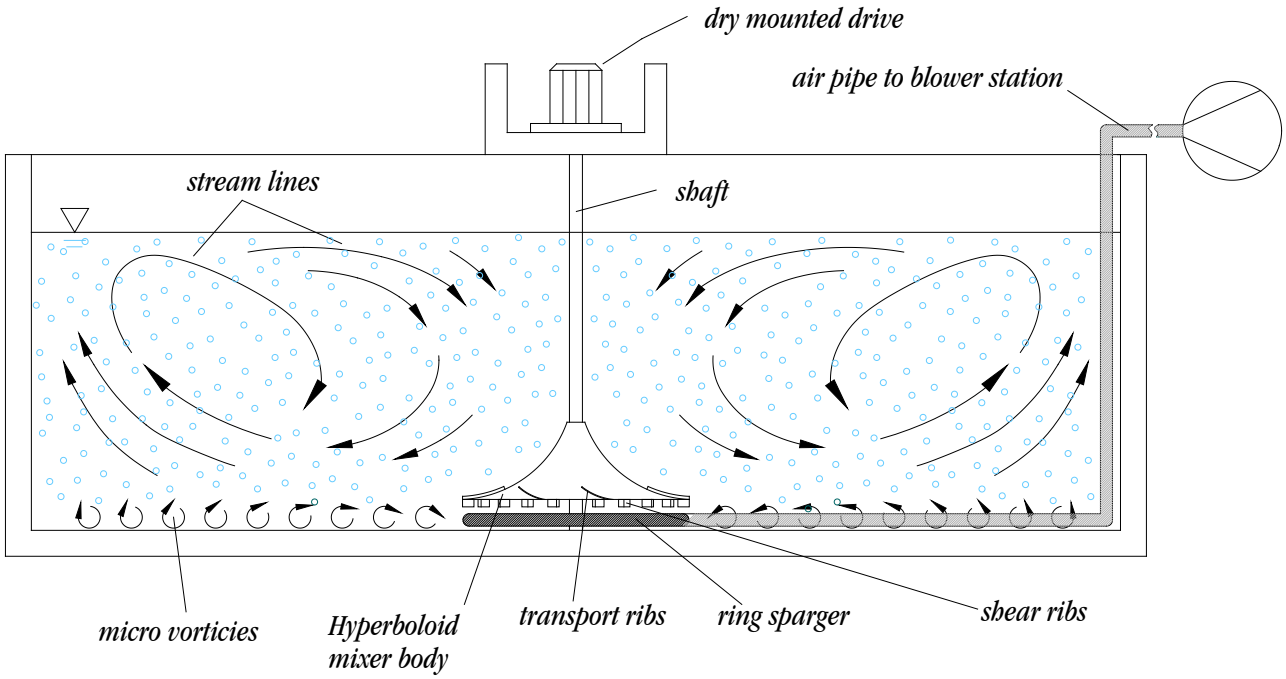

Figure 1: HyperClassic - Mixer / Aerator System Operation with dry mounted drive

2.2 Design

The **HYPERCLASSIC**® Mixer/Aerator consists of:

- Non clogging Hyperboloid body including
  - integrated transport fins
  - stainless steel shear ribs
- Vertical shaft with a motor and mounting base
- Air sparge ring with connection to air supply (by contractor)
- Bottom stabilizer

The Mixer/Aerator is supplied complete including all necessary parts for assembly on either a steel or a concrete bridge. The individual parts are clearly marked for quick installation. Figure 2 shows the design in detail.

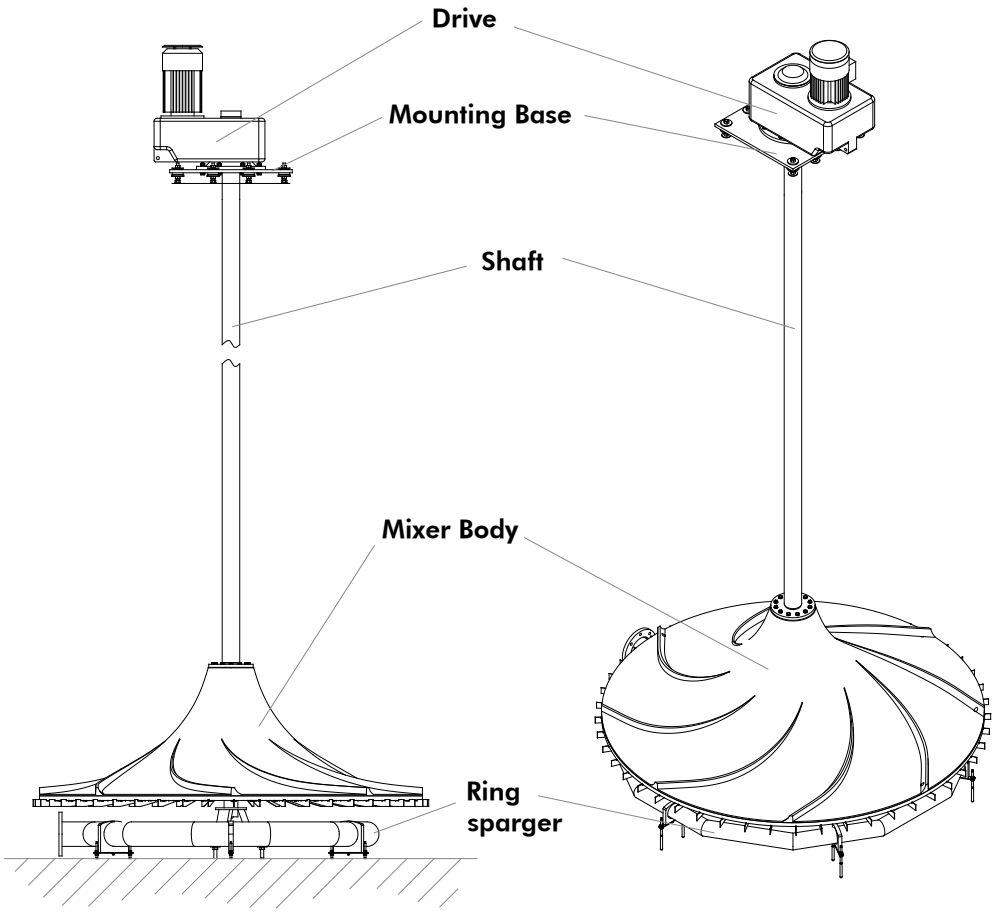

Figure 1: Hyperboloid Mixer/Aerator with top mounted drive

2.3 Advantages

The **HYPERCLASSIC**® Mixer/Aerators system has numerous advantages over conventional aerators.

Mechanical Advantages	➢ Non-clogging Hyperboloid body with integrated transport ribs for optimized fluid acceleration. ➢ Low maintenance due to dry mounted drive. ➢ Consistent aeration efficiency for all waste / process waters (no deterioration in performance as typical with fine bubble diffused aeration systems). The mixer /aerator is highly resistant to chemical and biological fouling.

Process Advantages	➢ The Hyperboloid mixer body shape mimics the streamlines of the flow. This prevents flow separation and assures the highest operating efficiency. ➢ Coarse bubble diffused aeration is introduced at the base of the mixer from a series of engineered orifice in the sparge ring. The energy imparted by the rotating mixer shears the coarse bubbles and forces them outward as fine bubbles. Surface active agents have minimal effect on oxygen transfer (α-values have never been observed below 0.8) resulting in reduced air requirements, smaller diameter piping and accessories as well as smaller blowers and motors. ➢ The large diameter mixer body and low operating speed guarantees high energy efficiency and low shear. The sludge floc is not damaged or sheared. ➢ Complete and uniform mixing of the entire tank contents results in increased retention times and excellent sludge characteristics. ➢ The air supply system can be controlled to optimize treatment and maximize energy efficiency. The Mixer/Aerator can also be operated without air as a mixer only – as required in some applications. ➢ Winter heat loss is minimized due to the compressed air supply and low surface turbulence.

3 Detailed Description and Material Specifications

3.1 Gear drive

Drives for the **HYPERCLASSIC**® Mixer/Aerators are parallel shaft helical geared motors from renowned manufacturers. The drives have a high quality corrosion resistant coating, a robust weather protection hood, humidity and acid protection of the winding (tropical protection) and PTC resistors for thermal protection of the motor.

The gear is rated for a long bearing service life and for adverse operating conditions. The drive shaft is mounted in a hollow shaft and is secured by means of a hex screw. The torque is transmitted by a feather key connection. The hollow shaft is covered and sealed with a special hollow shaft cap. The design is shown in Figure 3.

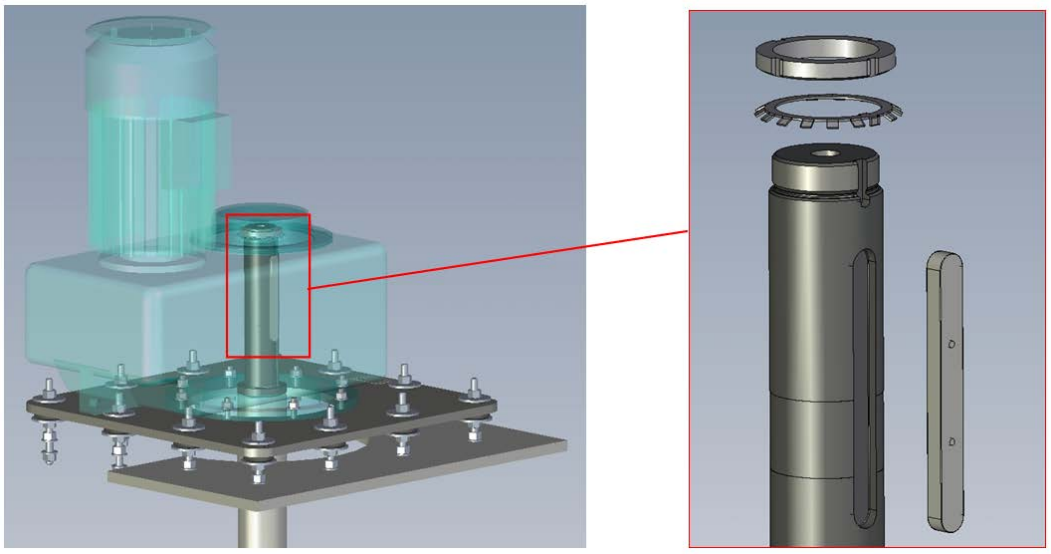

Figure 2: Connection of the Shaft and the Gear box

The gear box housing is made of cast iron covered with a high quality acrylic coating with a minimum thickness of 6 mills. The housing is connected to the mounting base with a flange connection and is secured with stainless steel fasteners.

The motor is a robust three phase squirrel cage motor with helical gear from a renowned US manufacturer (SEW Eurodrive).

The gear box is built as a parallel helical gear shaft with a calculated bearing life of approximately 100,000 h.

3.2 Mounting base

The mounting base of a **HYPERCLASSIC®** Mixer/Aerator consists of a gear base plate mounted in rubber buffers permanently connected to the bridge by bolted connection (see Figure 4). The gear plate is designed as a distortion proof steel structure with an impact proof powder coated surface. The plate can be leveled using the threaded bolts provided. The rubber buffers absorb start up jolts and prevent transfer of vibrations to the bridge. These buffers also provide galvanic separation of the Mixer/Aerator from adjacent materials.

Depending on the type of bridge that the Mixer/Aerator is being secured (steel or concrete), there will be different fastening hardware. For concrete bridges chemical anchors are used. On steel bridges, through bolts are used. Refer to Figure 4 for details.

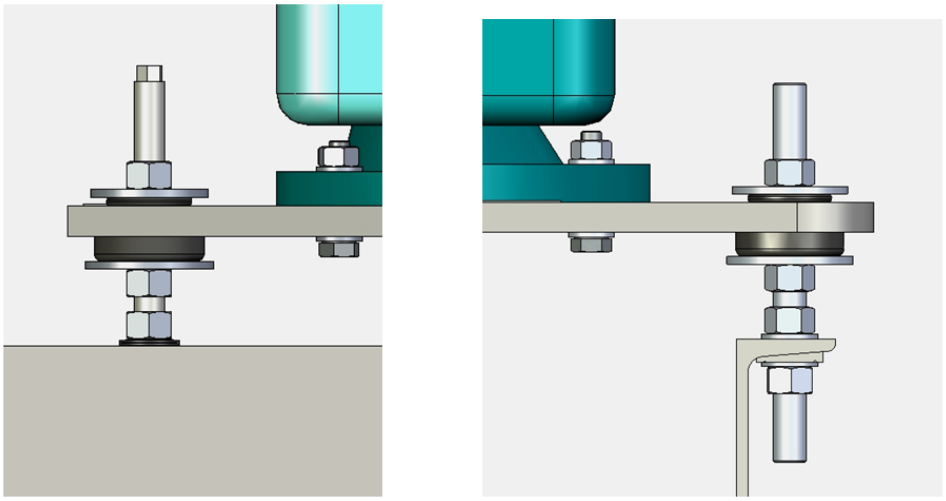

Figure 3: Connection of the Mixer to the Bridge (concrete bridge- left / steel bridge- right)

3.3 Shaft

The drive shaft of the **HYPERCLASSIC®** Mixer/Aerator is made from high quality stainless steel. At the upper connection there is a steel tappet for securing to the gear hollow shaft. At the bottom end there is a flange to connect the shaft to the mixer body.

3.4 Hyperboloid Mixer Body

The shape of the Hyperboloid Mixer body is based on fluid dynamics studies. The transport fins (which accelerate the flow) are integrated in the upper mixer body, the stainless steel shear ribs (which ensure the dispersing of the air into fine bubbles) are fixed to the bottom (underside) of the mixer body. The mixer body is made of high quality fiberglass reinforced plastic. It is coated with a special gel coat and the surface is polished.

4 Aeration System Layout

As the preferred solution for the aeration requirements described in Section 1, we recommend 1 Hyperboloid Mixer/Aerator with the following technical details:

- Number of basins:	1
- Number of Mixer/Aerators per basin:	1
- Total number of Mixer/Aerators:	1
- Model:	HCMA/2500-36-30.0hp

4.1 Process conditions:

- Process temperature:	68	°F
- Dissolved oxygen level under process conditions:	2.0	mg/l
- Site ambient pressure:	13.0	PSI
- AOR/SOTR-ratio[1]:	0.30	

4.2 System design:

- Air flow per Mixer/Aerator:	419	scfm
- Total air flow per basin:	419	scfm
- Total air flow for all basins:	419	scfm
- Total blower(s) intake air flow[2]:	419	scfm
- Pressure required at top of drop pipe (incl. hydr. pressure)[3]:	5.1	PSI
- Standard Oxygen Transfer Efficiency (SOTE):	19.6	%
- Standard Oxygen Transfer Rate ($SOTR_{20,1000}$)[4]:	85.9 (per unit)	lbO2/h
- Mixer diameter	98.4	in

Aeration mode:

- Speed:	36.5	rpm
- Installed motor power:	30.0	hp

[1] Under process conditions.

[2] At 20 °C, 14.7 PSI site pressure.

[3] NOTE: Pressure drop of the piping between blowers and aeration basin as well as losses in the blowers inlet filters are not included..

[4] Standard temperature +20 °C, pressure 14.7 PSI, TDS=1000 ppm. For more information on SOTR please refer to Appendix – Calculation of oxygen demands.

- Power input:	23.4	hp
- Power consumption:	26.6	hp
- Power density:	2.19	hp/1000 cuft
- Power reserve:	≥ 15	%

Mixing mode[5]:

- Speed:	22.0	rpm
- Installed motor power:	30.0	hp
- Power input:	6.0	hp
- Power consumption:	6.9	hp
- Power density:	0.57	hp/1000 cuft
- Power reserve:	≥ 75	%
- Nominal current at 460 V:	34.5	A
- Starting current:	303.6	A
- Total weight:	2,205	lb

4.3 Mixer Forces[6]

- Rated torque:	50,900	lb.in
- Start-up torque:	162,880	lb.in
- Static axial force:	2,205	lbf
- Dynamic axial force:	2,592	lbf

[5] Speed control via frequency inverter (not included in this offer)

[6] Specifications for the design of bridgework

5 Scope of Supply

5.1 HYPERCLASSIC® Mixer/Aerator Configuration

	Number	Mixer/Aerator Part	Material
Standard Mixer/Aerator Configuration	1	Drive	Gear-box housing made from cast iron with: • Acrylic-coating ≥ 6 mills, RAL 5018 • Bearings radial reinforced 3-phase squirrel cage motor with: • Plastic fan wheel (self-ventilated) • Canopy • Protection against humidity and acid • Motor protection IP 55 • Thermal protection PTC-F
	1	Mounting Base	Carbon steel with powder coating and rubber buffers
	1	Shaft with flanged connection	ASTM 316
	1	Hyperboloid Mixer Body with flanged connection	High quality FRP
	1	Bottom Guiding	Bushing made from ASTM 316, with self-lubricating bearing composite
	1	Sparge Ring	HDPE
	1 set	Assembly Hardware	ASTM 316 Ti

6 Budgetary Price

6.1 HYPERCLASSIC® Mixer/Aerator

Total price for the 1 **HYPERCLASSIC**® Mixer/Aerator as described in Section 2, ex works and without VAT

1 **HYPERCLASSIC**®- Mixer/Aerator included

6.2 Transport and Transport Insurance

1 **HYPERCLASSIC**® Mixer/Aerator as previously described, after clarification of all details, to be delivered to delivery address (DDP), unloading by client, without VAT:

1 **HYPERCLASSIC**® Mixer/Aerator included

6.3 Spare Parts Package

Spare Parts, after clarification of all details, to be delivered to delivery address (DDP), unloading by client, without VAT:

1 Set **HYPERCLASSIC**® Mixer rubber buffers
1 Set of special tools, shaft holder included

6.4 Site visits by INVENT personnel

2 Visits of one **INVENT** engineer, incl. travel costs,
- Installation supervision, one visits of 2 days
- Instructional services, one visit of 1 day

Total price **To be sent separately**

7 Excluded items

- Any walkway or support constructions
- Any frequency drives
- Any execution of the dry solids concentration test
- All labor to install the equipment
- The Unloading of the goods, buyer is responsible for unloading the goods. The buyer is responsible for keeping goods safe before assembly.
- Lifting gears for the assembly have to be supplied by the client.
- Electricity and energy must also be supplied by the client free of charge.
- The basins must be empty, cleaned and dry for the assembly.
- The assembly will only be supervised by **INVENT**, not installed.
- The drilling of the wholes for the chemical anchors.
- Any possible required adjustment of the handrails.
- Electrical connecting of the motors
- Scaffolding to enable the access of side of the concrete platform and bridge, if required.

8 Further Options

8.1 HYPERCLASSIC® Mixer/Aerator Drive Options

	Description	Price per Unit
Available Options	Protection type IP 65 (according to DIN 42950): Complete protection against entry of dust, contact with mediums of any kind and water jets from all directions.	Not Included
	Heavy Duty Coating: 3-layer PUR coating. Total thickness of the coating ≥ 10 Mills 1 layer severe duty primer 2 layer top coat, RAL 5018.	Included
	Anti-Condensation Heating: Protection against condensed water inside the motor. The motor is equipped with a space heater.	Not Included
	Synthetic Oil: The common intervals of the lubricant exchange can be increased from 10,000 to 20,000 operating hours.	Included

We reserve the right to make technical changes to improve our products.

We appreciate the opportunity to provide the design and details of the **INVENT** mixing / aeration solution for your project. We will contact you in the next few days to discuss any questions that you may have on this offer.

INVENT Environmental Technologies Inc.

Michael Ordman

9 Commercial conditions

9.1 Guarantee

- The guarantee period is 12 months after start up of the system. The guarantee is only valid if all **INVENT** Environmental Technologies Inc guidelines for the operation and start up of the systems have been followed. If the equipment is not put into service, the guarantee period begins at the latest 4 weeks after the completion of the plant construction. If there is no assembly the time of guarantee starts 6 months after delivery and/or notification of readiness for transport.
- Our guarantee is based on the data and documents we have received prior to purchase of the equipment. We assume that the client has informed us about all possible flow obstacles, such as inflows and outflows. Flow disturbances or damages resulting from flow obstacles or other flow generators, inflows, and outflows are not part of our guarantee.

9.2 Delivery Time

Submittal drawings will be provided 4-6 weeks after acceptance of purchase order.

The equipment will be ready to ship approximately 18 –20 weeks after approval of submittal documents and the receipt of down payment

9.3 Delivery Terms

All prices are ex works unless otherwise indicated.

9.4 Terms of Payment for goods (EXW)

25 %	upon approval of the submittals by the engineer
70 %	upon delivery or announcement readiness for shipping
5 %	upon substantial completion or latest 8 weeks after delivery

9.5 Period allowed for payment

All prices are payable net within 30 days after the receipt of the invoice

9.6 Binding period of quote

The offer is for budgetary purposes.

10 Terms and Conditions

INVENT ENVIRONMENTAL TECHNOLOGIES, INC.

TERMS AND CONDITIONS OF SALE

Offer and Acceptance. ANY ACCEPTANCE OF THIS OFFER IS LIMITED TO ACCEPTANCE OF THE EXPRESS TERMS AND CONDITIONS CONTAINED HEREIN AND IN ANY QUOTATION AND/OR SALES ORDER ACKNOWLEDGEMENT WHICH IS ISSUED BY INVENT. ANY PREVIOUS OFFERS MADE BY BUYER, WHETHER WRITTEN OR VERBAL, NOT ALREADY EXPRESSLY ACCEPTED BY INVENT IN WRITING ARE HEREBY OBJECTED TO AND REJECTED. IN NO EVENT SHALL THIS OFFER BE DEEMED AN ACCEPTANCE OF ANY PRIOR OFFER BY BUYER. THE TERMS AND CONDITIONS BELOW SHALL SUPERSEDE ANY PROVISIONS, TERMS AND CONDITIONS CONTAINED ON ANY PURCHASE ORDER, CONFIRMATION, OR OTHER WRITING THE BUYER MAY GIVE OR RECEIVE, AND THE RIGHTS OF THE PARTIES SHALL BE GOVERNED EXCLUSIVELY BY THE PROVISIONS, TERMS AND CONDITIONS HEREOF. NO CONTRARY, ADDITIONAL OR DIFFERENT PROVISIONS, TERMS OR CONDITIONS SHALL BE BINDING ON INVENT UNLESS ACCEPTED BY INVENT IN A WRITING WHICH MAKES SPECIFIC REFERENCE TO THIS OFFER AND ACKNOWLEDGES SUCH MODIFICATIONS OR REVISIONS. ONCE THIS OFFER IS ACCEPTED BY BUYER, THIS ORDER MAY BE CANCELED ONLY WITH INVENT'S WRITTEN CONSENT AND UPON TERMS THAT WILL INDEMNIFY INVENT AGAINST ANY AND ALL LOSS. INVENT'S COMMENCEMENT TO PROCURE THE GOODS OR SHIPMENT OF THE GOODS WHICH ARE THE SUBJECT OF THIS OFFER SHALL BE DEEMED AN EFFECTIVE MODE OF ACCEPTANCE OF THIS SALES ORDER BY BUYER, UNLESS BUYER, WITHIN A COMMERCIALLY REASONABLE TIME AFTER BUYER BECOMES AWARE, OR SHOULD HAVE BECOME AWARE, OF INVENT'S COMMENCEMENT TO PROCURE THE GOODS HEREIN OR OF SHIPMENT OF SUCH GOODS, NOTIFIES INVENT IN WRITING THAT BUYER OBJECTS TO AND REJECTS THIS OFFER. THIS OFFER IS SUBJECT TO INVENT'S CREDIT APPROVAL OF BUYER.

Quotations and Prices; Other Charges. Written quotations automatically expire 90 calendar days from the date issued and are subject to termination by notice within that period. Unless otherwise expressly provided in this sales order, the prices quoted or referred to herein do not include any charges for packaging, freight, transportation, custom duties, tariffs, import or other taxes, insurance, or any other charges relating to the transportation and shipment to or use by Buyer of the products sold under this sales order. Such charges and/or taxes shall be the sole responsibility of and shall be borne exclusively by Buyer. Wherever applicable, any such charges and/or taxes will be added to the invoice as a separate charge to be paid by Buyer. If Invent is required to pay any such charges and/or taxes, Buyer agrees to reimburse Invent for any amounts so paid upon demand.

Payment Terms. Invent shall bill Buyer for all purchases made under this sales order by invoice sent to Buyer at Buyer's address shown on the sales order. All invoices submitted by Invent to Buyer shall be payable net within thirty (30) days after the date of said invoices. All payments due to Invent hereunder shall be paid in United States dollars to Invent, or to such entity or person as is designated by Invent, in accordance with the remittance instructions contained in the invoice. If payment is not received within the prescribed period, interest shall accrue on any unpaid balance from its due date until payment is made at the rate of one and one half percent (1.5%) per month or the highest interest rate allowable by law, whichever is less. If in Invent's opinion the financial condition of Buyer at any time does not justify continuance of production or shipment on the terms of payment specified herein, Invent may require full or partial payment in advance. Buyer understands and agrees that its obligation to make payments to Invent shall be absolute and unconditional under any and all circumstances, whether or not Invent violates any of its obligations described herein or otherwise, and such payments shall not be subject to any defense, set-off, or counterclaim for any reason whatsoever.

Shipment and Delivery. This offer is made with the understanding that it is subject to Invent's ability to obtain the materials necessary to supply the goods hereunder. Unless otherwise indicated on the sales order, all goods shall be delivered F.O.B. Invent's Oakland, New Jersey location. Invent will endeavor to meet all scheduled dates indicated on the sales order, or otherwise requested in writing by Buyer and accepted in writing by Invent; provided, however, that all shipments are subject to Invent's availability schedule. If shipment of goods is delayed at the request of Buyer, then Invent shall be entitled to place the goods in storage for the account of Buyer, and all expenses incurred by Invent in connection with the storage, handling, preservation, or insurance of the goods shall be paid by Buyer upon presentation of Invent's invoice. Method and route of shipment are at Invent's discretion, unless Buyer supplies explicit written instructions and Seller agrees in writing to such instructions. Unless otherwise indicated in the sales order, all shipments are insured at Buyer's expense and made at Buyer's risk. Identification of the goods to the contract shall occur as each shipment is placed in the hands of the carrier. Nondelivery by Invent as to any product shall not be deemed a breach of this agreement. Any non-delivery shall not relieve Buyer from its obligation to accept or be responsible for any subsequent or prior shipment. All shipments shall be packaged in accordance with the standard packaging specified in the sales order. If no particular packaging is specified in the sales order, all goods shall be shipped in accordance with Invent's standard packaging. Invent shall have no responsibility to obtain insurance on any shipment of Product. Invent shall have the additional right, in the event of the happening of any of the above contingencies, at its option, to cancel this contract or any part hereof without any resulting liability. Shipments made within thirty (30) days after specified date of delivery shall constitute a good delivery. Normal tolerances in specifications shall be acceptable. Invent shall not be obligated to take back any packaging materials and Buyer shall be solely responsible, at Buyer's sole cost and expense, for the disposal of packaging materials.

Title and Risk of Loss; Security Interest. Title to and risk of loss and damage for any shipment of goods shall pass to Buyer immediately upon delivery of such shipment to Buyer or its designated agent or upon deposit with a common carrier in accordance with Buyer's instructions, whichever occurs first. Invent shall retain a security interest in the goods shipped to Buyer until the entire balance of the price of such goods and all other monies then due are paid in full. Buyer hereby authorizes Invent to file U.C.C. financing statements, without Buyer's signature, to perfect its security interest in all goods shipped which have not been paid for in full. In the event Buyer defaults on any payment or makes an assignment for the benefit of creditors, or if a proceeding in insolvency or bankruptcy is initiated by or against Buyer, whether voluntary or involuntary, Invent shall have the right to withhold shipments, in whole or in part, and to recall goods in transit, retake same, and remove and/or repossess goods which may be stored with Invent for Buyer's account, without the necessity of taking any other proceedings and to take such other action as may be necessary to protect its security interest, including any other remedies Invent may have at law, in equity, or otherwise. The foregoing rights and remedies shall be in addition to, and not in lieu of, any other rights and remedies which Invent may have hereunder or otherwise, whether at law, in equity, or otherwise.

Product Warranty. Invent warrants that the products supplied hereunder shall conform at time of delivery to the written specifications accepted by Invent, if any, subject to Invent's standard tolerances for variations.

Disclaimer. INVENT'S SOLE LIABILITY AND BUYER'S EXCLUSIVE REMEDY FOR A BREACH OF THE WARRANTY SHALL BE, AT INVENT'S SOLE OPTION, CREDIT OR REPLACEMENT OR REPAIR OF THE NONCONFORMING PRODUCT. FURTHERMORE, SUCH WARRANTY SHALL NOT APPLY TO, AND SHALL BE NULL AND VOID WITH RESPECT TO, ANY GOODS (i) WHICH ARE ALTERED, MODIFIED, DAMAGED, REPAIRED, ABUSED, MISUSED, OR IMPROPERLY ASSEMBLED, COMMISSIONED, OR INTEGRATED (WHETHER INTENTIONALLY OR ACCIDENTALLY) BY ANY PERSON OTHER THAN INVENT OR ITS AGENTS, (ii) WHICH, NOTWITHSTANDING THEIR NONCONFORMITY, ARE USED OR OTHERWISE ACCEPTED BY BUYER, OR (iii) WITH RESPECT TO WHICH BUYER HAS WAIVED ITS CLAIM FOR REJECTION UNDER THE PROVISIONS OF THE SALES ORDER. THE FOREGOING WARRANTY SET FORTH ABOVE IS IN LIEU OF ALL OTHER WARRANTIES, AND INVENT

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Limitation of Liability. INVENT SHALL NOT UNDER ANY CIRCUMSTANCES BE LIABLE FOR SPECIAL, INDIRECT, PUNITIVE, OR CONSEQUENTIAL DAMAGES OF ANY NATURE WHATSOEVER, INCLUDING, WITHOUT LIMITATION, ANY LOST REVENUES, PROFITS, OR BUSINESS OF BUYER OR ITS CUSTOMERS, AGENTS, AND DISTRIBUTORS, RESULTING FROM, ARISING OUT OF OR IN CONNECTION WITH, ANY SALE, MANUFACTURE, DISTRIBUTION OR ANY USE OF ANY GOODS OR FOR ANY FAILURE OF SUPPLY OF ANY GOODS FOR ANY REASON, WHETHER OR NOT INVENT HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. THE FOREGOING LIMITATION OF LIABILITY SHALL NOT BE CONSTRUED TO APPLY ONLY TO DAMAGES OCCURRING AS A RESULT OF A BREACH OF PRODUCT WARRANTY, BUT SHALL APPLY TO ANY DAMAGES OCCURRING AS A CONSEQUENCE OF THIS SALES ORDER. BUYER'S SOLE REMEDY FOR BREACH OF PRODUCT WARRANTY IS SET FORTH IN THE PRODUCT WARRANTY SECTION ABOVE.

Acceptance; Rejection. Except as provided in this paragraph, Buyer shall accept all goods shipped in accordance with the terms and conditions of this sales order. Buyer may reject any shipment of any goods to the extent such shipment does not conform in any material respect with the written specifications accepted by Invent, if any. Buyer shall not have the right to reject any goods due to negligible defects. In order to reject a shipment, Buyer must give written notice to Invent within ten (10) days after receipt of the shipment, together with a reasonably detailed written statement of its reasons for rejection. If no such notice is received, then Buyer shall be determined to have accepted the shipment of the goods. In no case shall Buyer return goods without first obtaining Invent's permission in writing. Invent shall, within a reasonable period of time, notify Buyer whether it accepts Buyer's assertions of nonconformity. If Invent disagrees with any alleged nonconformity by Buyer, then an independent party mutually agreed upon by the parties shall analyze the goods in question as may be necessary to substantiate whether the goods rejected by Buyer conformed in all material respects to the specifications accepted by Invent therefor, if any. Both parties agree to cooperate with the independent party's reasonable requests for assistance in connection with its analysis hereunder. Both parties shall be bound by the independent party's results of analysis. The costs incurred by the parties shall be borne by the losing party. If Invent or the independent party confirms the nonconformity, Invent shall, at its sole option, replace (if it has not already done so) the nonconforming goods with conforming products as promptly as reasonably possible or credit to Buyer the purchase price therefor.

Indemnification. Buyer shall indemnify, defend, and hold Invent harmless from and against any and all loss, cost, liability, and expense (including, without limitation, reasonable attorneys' fees and costs) incurred and/or paid by Invent resulting from or arising out of or in connection with (a) any representation or warranty made to any third party by Buyer, its affiliates, agents, distributors, or employees which is not expressly authorized by Invent in writing and (b) any claims asserted or actions filed against Invent by a third party, including claims for personal injury or property damage, except if liability for such claims or actions arises from the willful misconduct of Invent.

Force Majeure. Except where set forth expressly herein, neither party shall be liable for any delay or for any consequence of any delay in the delivery or purchase, as the case may be, of any goods if such delay shall be due to (a) any cause beyond its reasonable control, including, but not limited to, acts of God or the public enemy, acts of terrorism, valid law, acts or requests of any national or provincial government, or of any national or provincial officer or agent purporting to act under duly constituted authority, wars, floods, fires, storms, strikes, lockouts, delivery of nonconforming or defective material, supplies, or equipment, interruptions of transportation, freight embargoes or failures, exhaustion or unavailability on the open market (or delays in delivery) of material, supplies, equipment, or services necessary for the performance of any provision hereof, or (b) the happening of any unforeseen acts, misfortune, or casualty by which performance hereunder is delayed or prevented; provided, however, that the party so affected will use all commercially reasonable efforts to remedy the situation, except that nothing contained herein shall require such party to make settlement of any labor dispute on terms unacceptable to it and

no such party shall be liable to the other for any losses, damages, or costs by reason of its inability to remedy the situation. If any such delay occurs, then (unless the cause thereof shall frustrate or render impossible or illegal the performance of this contract or shall otherwise discharge the same), the parties' periods for performing their respective obligations shall be extended by such period (not limited to the length of the delay) as the other party may reasonably require to complete the performance of its obligation.

Insurance. Buyer agrees to carry and maintain at all times after this sale products liability insurance in good and sufficient amounts to cover products liability claims with respect to all products which are subject to this sales order. Buyer will, upon request, name Invent as an additional insured under such insurance and furnish Invent with proper evidence of such coverage.

Subcontracting and Assignability. This agreement, and the performance of any obligations hereunder, may not be assigned by a party hereto without the prior written consent of the other party, but shall be binding upon and inure to the benefit of and be enforceable by the parties hereto and any permitted successors, assignees, and legal representatives; provided, however, that Invent shall be entitled to assign its obligations under this agreement, without the prior written consent of Buyer, to any corporation which controls, is controlled by, or is under common control with Invent or to any corporation which succeeds as a going concern to the business presently conducted by Invent.

Severability. If any part of this agreement shall be held unenforceable, the remainder of the agreement shall nevertheless remain in full force and effect.

Relationship of the Parties. All parties are independent contractors under this agreement. Nothing contained in this agreement is intended nor is to be construed so as to constitute the parties as partners or joint venturers with respect to this agreement. Neither party hereto shall have any express or implied right or authority to assume or create any obligations on behalf of or in the name of the other party to any other contract, agreement or undertaking with any third party.

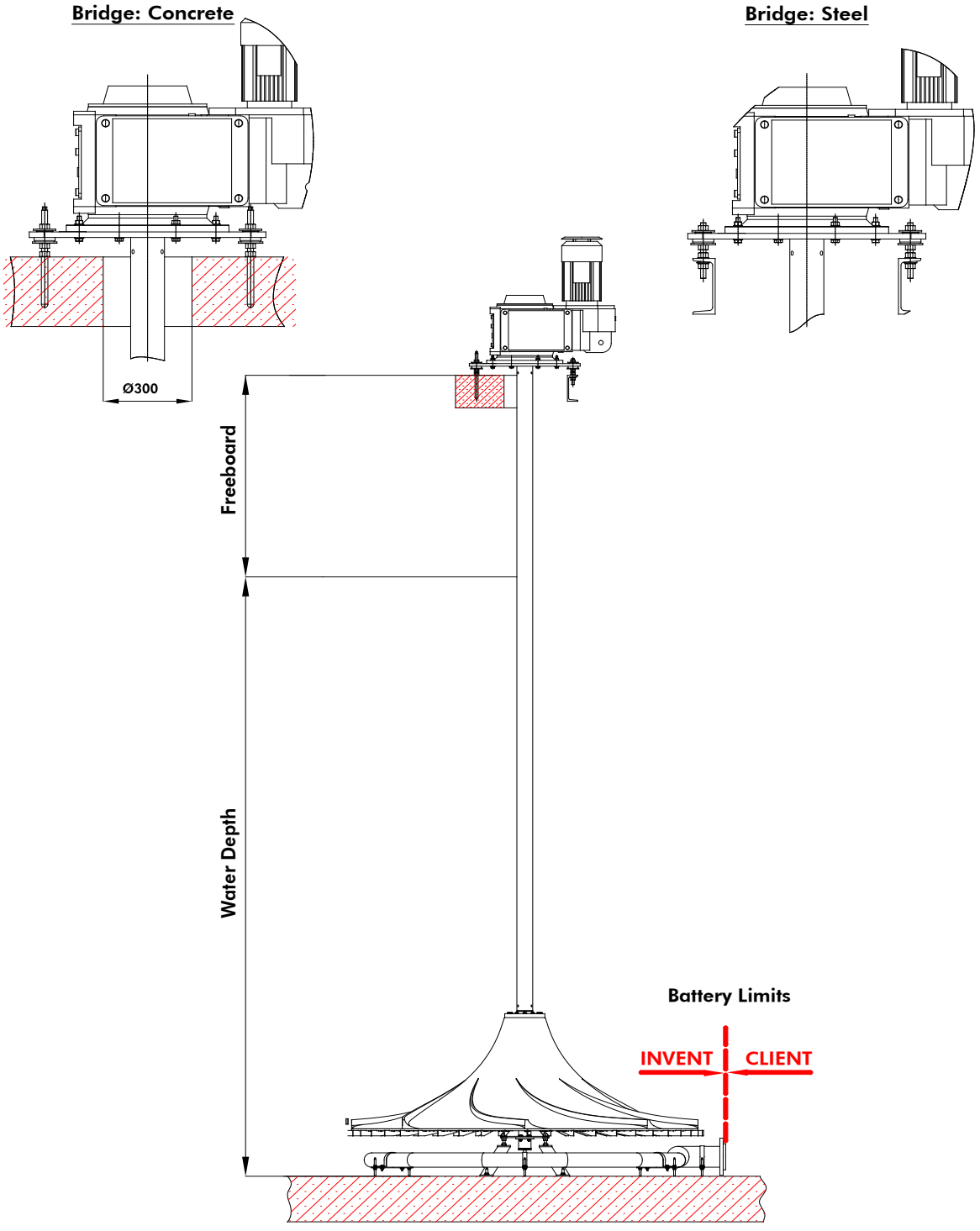
Governing Law; Forum; Enforcement. This sales order and any disputes between the parties arising in connection with this sales order or the agreement resulting from Buyer's acceptance hereof shall be governed by and interpreted in accordance with the laws of the State of New Jersey as if the agreement was performed wholly within the State of New Jersey and without regard to its conflict of law principles. All disputes arising out of this agreement shall be resolved by a court of competent jurisdiction in the State of New Jersey and both parties hereby consent to the jurisdiction of the courts of the State of New Jersey and the Federal District Court for the District of New Jersey; provided that Invent shall have the right to pursue any such action in any court with jurisdiction over Buyer. Invent and Buyer hereby waive and exclude the application of the U.N. Convention on Contracts for the International Sale of Goods in the interpretation and enforcement of this agreement. In the event Invent takes or maintains any action to enforce its rights hereunder and prevails thereafter, Buyer shall reimburse Invent for its reasonable costs and expenses incurred, including, without limitation, reasonable attorneys' fees and costs.

Compliance with Laws. Buyer shall comply with all laws, rules, regulations, and other requirements of local, state, and federal governments in connection with its performance hereunder. Buyer shall obtain and supply, at Buyer's sole cost and expense, any required import licenses and any other required permits, licenses, approvals, and similar items.

Entire Agreement; Modification; Waiver. This sales order contains the entire agreement of the parties regarding the subject matter hereof and supersedes all prior purchase orders, bills of lading, invoices, proposals, letters of intent, agreements, understandings, and negotiations regarding the same. No modification of this order shall be effective without Invent's written consent. Except as otherwise provided herein, in no event shall this agreement be

deemed amendable or amended by any purchase order, bill of lading or invoice issued and/or accepted by either party hereto. Any waiver of strict compliance with the provisions of this order shall not be deemed a waiver of Invent's rights, privileges, claims, or remedies nor of Invent's right to insist on strict compliance thereafter.

Appendix A – Mixer/Aerator Layout Drawing



Appendix B – Calculation of oxygen demands

Calculation of Standard Oxygen Transfer Rate SOTR

SOTR for the aeration system is calculated using the following equation:

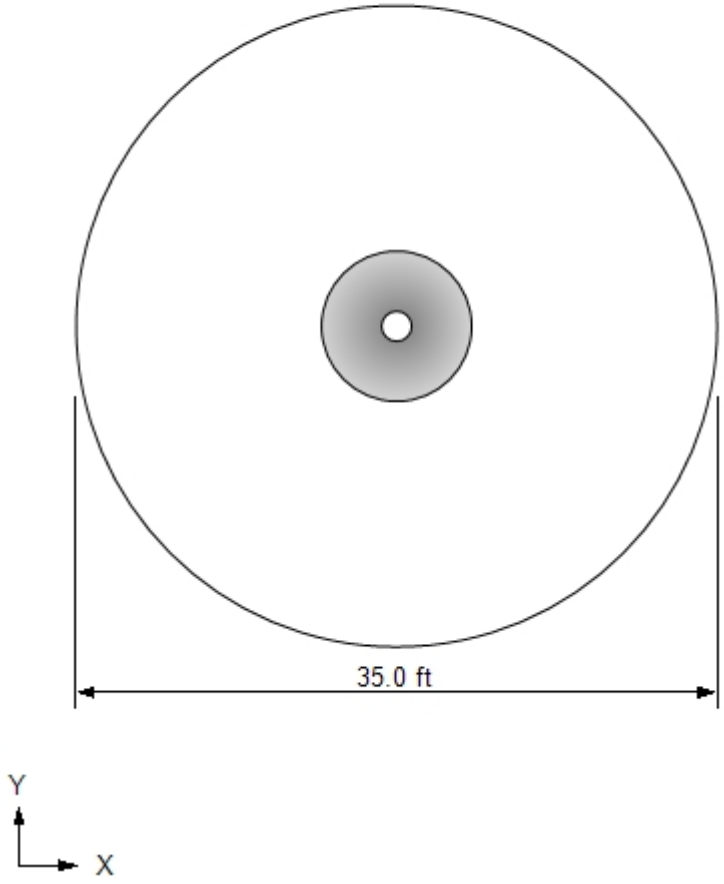
$$SOTR_{20} = \frac{1}{\alpha} \cdot \frac{C^*_{\infty,20}}{\beta \cdot C^*_{\infty} - C_L} \cdot \theta^{20-T} \cdot AOR \cdot \frac{1}{24}$$

The values are given in the following table:

Parameter	Definition	Values used	
SOTR	Standard Oxygen Transfer Rate in clean water (+20°C, 14.7 PSI)		
α	alpha coefficient	0.45	
β	beta coefficient	0.98	
$C^*_{\infty, 20}$	Steady state dissolved oxygen saturation concentration in clean water under standard conditions (+20°C, 14.7 PSI) at aeration depth	10.2	mg/l
$C^*_{\infty,}$	steady state dissolved oxygen saturation concentration in clean water under field conditions (process temp., field atmospheric pressure) at aeration depth	9.0	mg/l
C_L	actual oxygen concentration in the aeration basin (process conditions)	2.0	mg/l
θ	temperature correction coefficient	1.024	
T	process temperature in aeration basin	68	°F
AOR	Actual Oxygen Requirement	624	lbO2/d

Note:
Saturation concentrations are calculated for dry air (oxygen content 20.96 %), hydraulic pressure at medial water depth and field atmospheric pressure at 3,140 ft above sea level is considered.

Appendix C – Basin Layout Drawing



Layout of Actual Oxygen Requirement AOR for aerobic digestors

User input required

Calculated value

Calculated value - please check carefully

User Input:

$Q_{in} := 24000 \frac{gal}{day}$ Wastewater inflow

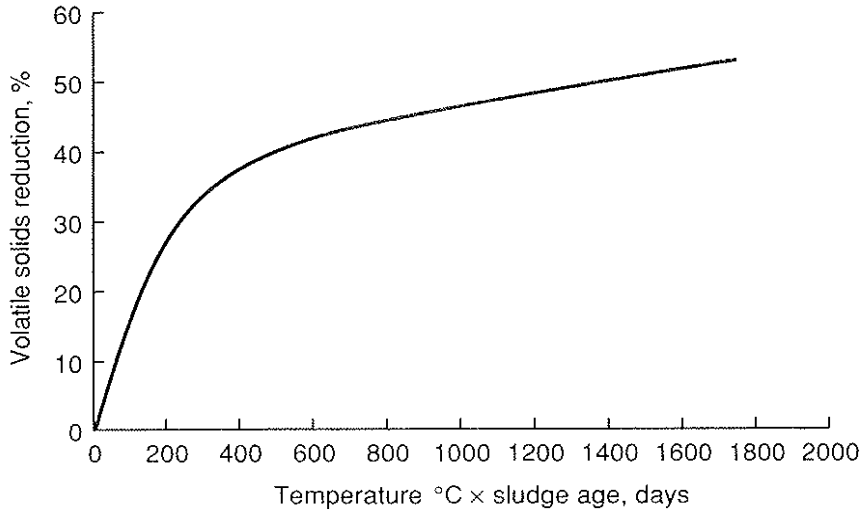
$TSS := 4000 \frac{mg}{liter}$ Total Suspended solids

$f_{VSS} := 0.85$ Fraction of Volatile Suspended Solids

$VSS := TSS \cdot f_{VSS}$ $VSS = 3400 \cdot \frac{mg}{liter}$

tesla := 6.7 Temperature in the digester in °C

CRT := 60 Solids Retention Time



$CRT \cdot tesla = 402$

$VSS_R := 40\%$

Volatile Solids Reduction per day:

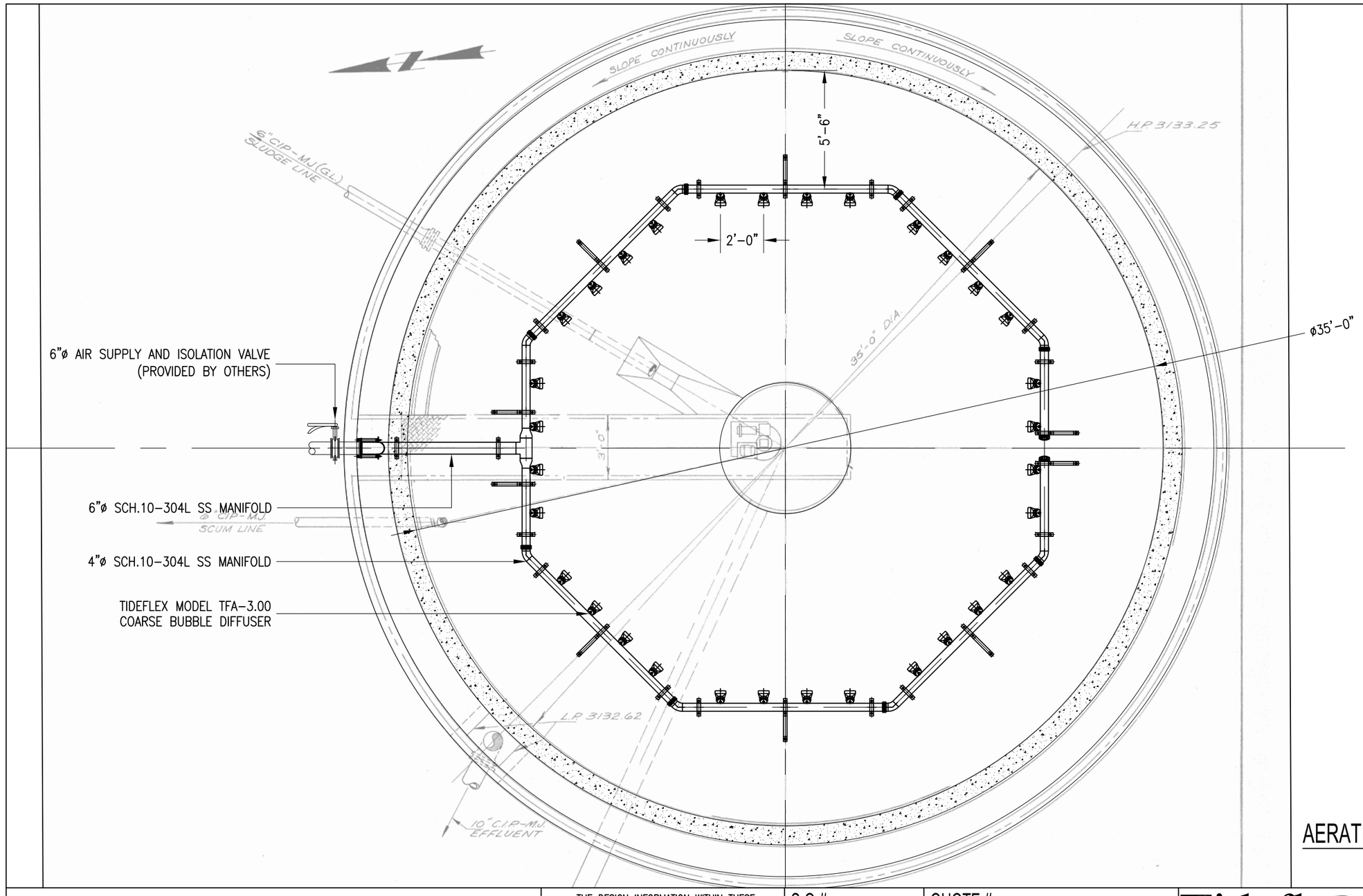
$Q_{VSSR} := Q_{in} \cdot VSS \cdot VSS_R$ $\quad Q_{VSSR} = 272 \cdot \frac{lb}{day}$

Oxygen requirement for Cell tissue reduction:

$AOR_{VSS} := 2.3 \cdot Q_{VSSR}$ $\quad AOR_{VSS} = 26 \cdot \frac{lb}{hr}$

Oxygen requirement for BOD oxidation: (only when primary sludge is digested)

$AOR_{VSS} := 1.6 \cdot Q_{VSSR}$ $\quad AOR_{VSS} = 18 \cdot \frac{lb}{hr}$



AERATION SYSTEM - PLAN VIEW

REV	BY	DATE	ECO#	CHK'D	DESCRIPTION
					RELEASE

S.O.#:

QUOTE #:

DWG. NOTES:

Tideflex® Technologies
A Division of Red Valve Company, Inc.,
TIDEFLEX TECHNOLOGIES
AIR DIFFUSER SYSTEM
600 North Bell Ave.
Carnegie, PA 15106 USA
Phone: 412-279-0044
Fax: 412-279-5410
Website: WWW.TIDEFLEX.COM
Email: INFO@TIDEFLEX.COM

BURNEY COUNTY, CA - WWTF
AEROBIC DIGESTER CONVERSION
COARSE BUBBLE MIXING & O2 SYSTEM

CONSULTANT:

APPLICATION:

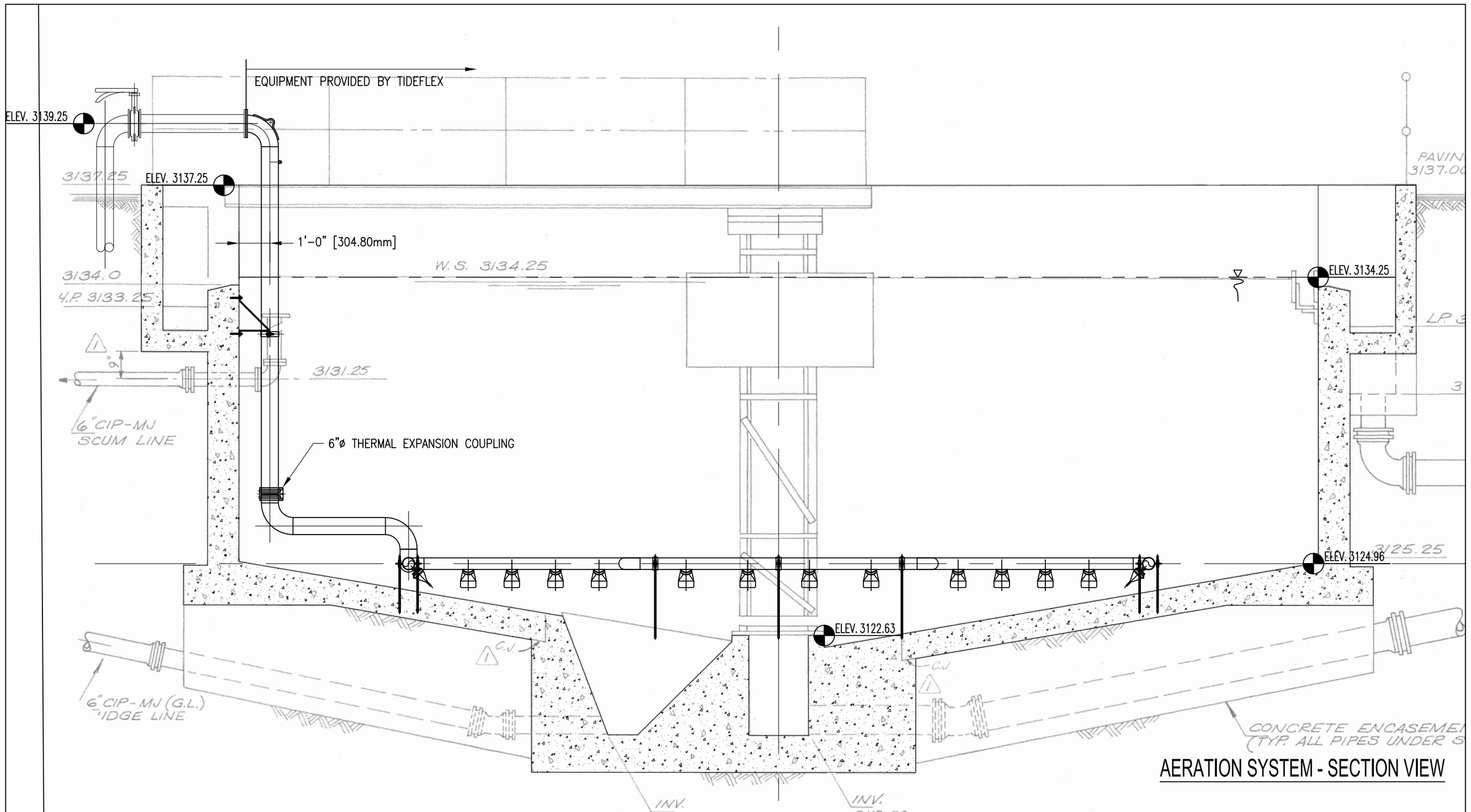
SHEET

CAD SCALE: PLOT SCALE:

DWG. BY: DATE:

DWG. NO. AS17-00000- 01

I:\Engineering\TAD (Air Diffusers)\Projects\USA\Burney County WD, CA\DWG\AS17-00000_RevA.dwg, 5/31/2017 12:16:03 PM



AERATION SYSTEM - SECTION VIEW

REV	BY	DATE	ECO#	CHK'D	DESCRIPTION
REV	BY	DATE			RELEASE

S.O.#:

QUOTE #:

DWG. NOTES:

Tideflex® Technologies
A Division of Red Valve Company, Inc.,
TIDEFLEX TECHNOLOGIES
AIR DIFFUSER SYSTEM
600 North Bell Ave.
Carnegie, PA 15106 USA
Phone: 412-279-0044
Fax: 412-279-5410
Website: WWW.TIDEFLEX.COM
Email: INFO@TIDEFLEX.COM

BURNEY COUNTY, CA - WWTF
AEROBIC DIGESTER CONVERSION
COARSE BUBBLE MIXING & O2 SYSTEM

CONSULTANT:

APPLICATION:

SHEET

CAD SCALE: PLOT SCALE:

DWG. BY: DATE:

DWG. NO. AS17-00000- 03

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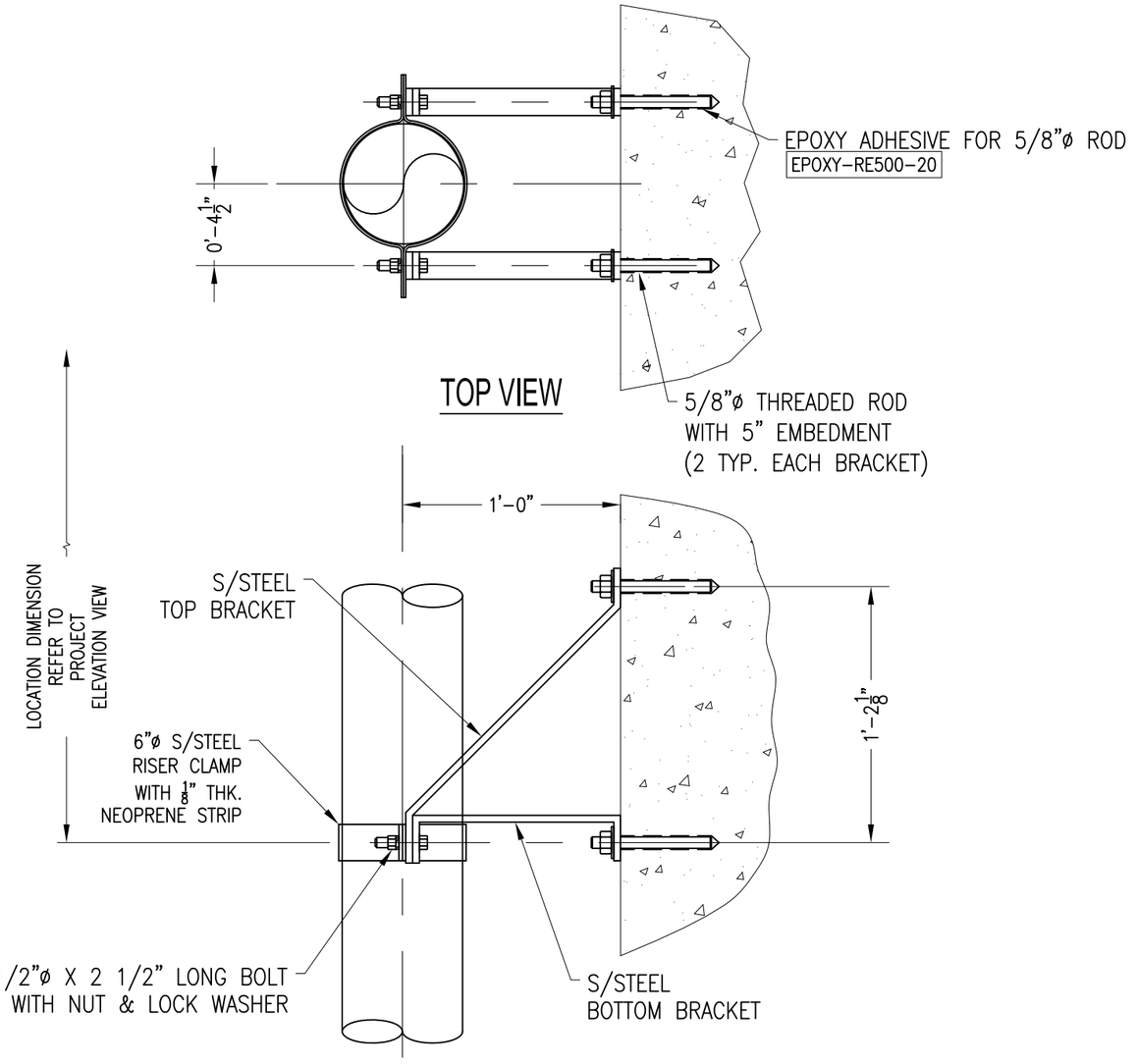


6"Ø DROP PIPE
DROP PIPE SUPPORT BRACKET
2PAD-4X-DPB-06X12E

REV	BY	DATE	ECO#	CHK'D	DESCRIPTION
A	OOO	00/00/0000			ISSUED FOR APPROVAL

S.O.#:

QUOTE #:

DWG. NOTES:

Tideflex® Technologies
A Division of Red Valve Company, Inc.,
TIDEFLEX TECHNOLOGIES
DIFFUSED AERATION SYSTEM
600 North Bell Ave.
Carnegie, PA 15106 USA
Phone: 412-279-0044
Fax: 412-279-5410
Website: WWW.TIDEFLEX.COM
Email: INFO@TIDEFLEX.COM

DROP PIPE WALL BRACKET INSTALLATION DETAILS

CONSULTANT:

APPLICATION: DIFFUSED AERATION SYSTEM

CAD SCALE: PLOT SCALE:

DWG. BY: DATE:

DWG. NO. A-103.01.010

SHEET 1 OF 1

SUPPORT DESIGNATIONS

SHOWN ON PLAN AND ELEVATION SHEETS

(XX) DENOTES ROD LENGTH "C" REQUIRED

R (XX) DENOTES LOCATION FOR RESTRAINING PLATE

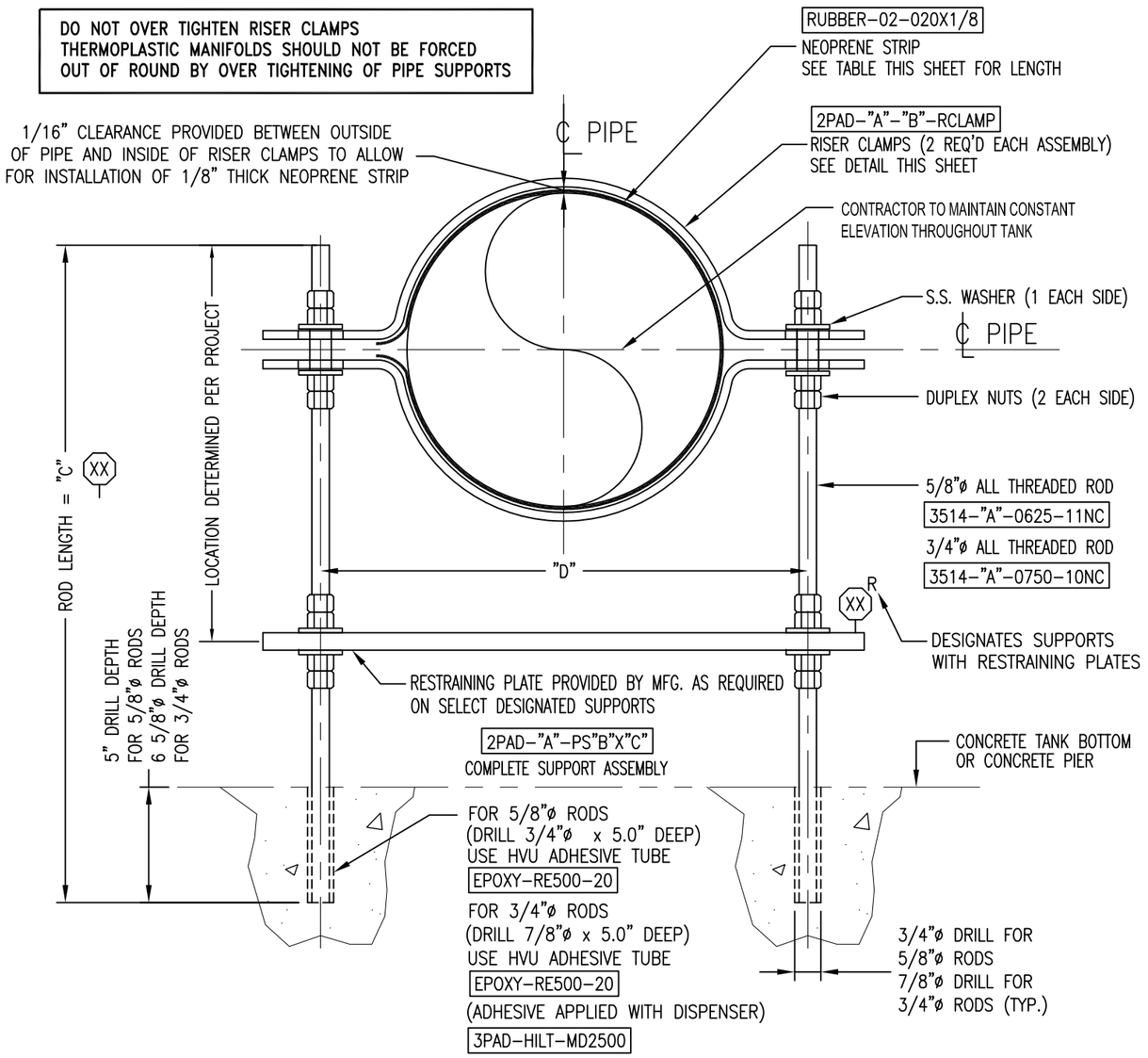
(00) DENOTES PIER HEIGHT "H" REQUIRED

S (XX) DENOTES LOCATION FOR STABALIZER BAR

NOMINAL PIPE SIZE	PIPE SIZE O.D.	ROD DIA.	NEOPRENE STRIP LENGTH	PART NUMBER
2"	2.375"	0.625"	7.00"	RUBBER-02-020X1/8
2.5"	2.875"	0.625"	8.25"	RUBBER-02-020X1/8
3"	3.50"	0.625"	10.50"	RUBBER-02-020X1/8
4"	4.50"	0.625"	13.75"	RUBBER-02-020X1/8
6"	6.625"	0.625"	20.50"	RUBBER-02-020X1/8
8"	8.625"	0.75"	26.75"	RUBBER-02-020X1/8
10"	10.750"	0.75"	33.25"	RUBBER-02-020X1/8
12"	12.750"	0.75"	39.75"	RUBBER-02-020X1/8
14"	14.00"	0.75"	43.75"	RUBBER-02-020X1/8

REFERENCE LETTER	DESCRIPTION	PART NUMBER VALUE	DEFINITION
A	MATERIAL		
		40	304 STAINLESS STEEL
		41	316 STAINLESS STEEL
B	PIPE DIAMETER		
		020	2"ø
		025	2.5"ø
		030	3"ø
		040	4"ø
		060	6"ø
		080	8"ø
		100	10"ø
		120	12"ø
		140	14"ø
C	THREADED ROD LENGTH		
D	THREADED ROD SPACING		
		020	6.00"
		025	6.00"
		030	6.00"
		040	7.00"
		060	9.00"
		080	12.00"
		100	14.00"
		120	16.00"
		140	18.00"

DO NOT OVER TIGHTEN RISER CLAMPS THERMOPLASTIC MANIFOLDS SHOULD NOT BE FORCED OUT OF ROUND BY OVER TIGHTENING OF PIPE SUPPORTS



* FOR SS DROP-IN ANCHORS (IN LIEU OF EPOXY ADHESIVE) REFER TO IOM MANUAL APPENDIX FOR RECOMMENDED CONCRETE DRILL DIAMETER AND DEPTH.

REV	BY	DATE	ECO#	CHK'D	DESCRIPTION
A					ISSUE FOR APPROVAL

S.O.#:

QUOTE #:

DWG. NOTES:

Tideflex® Technologies
A Division of Red Valve Company, Inc.,
TIDEFLEX TECHNOLOGIES
DIFFUSED AERATION SYSTEM
600 North Bell Ave.
Carnegie, PA 15106 USA
Phone: 412-279-0044
Fax: 412-279-5410
Website: WWW.TIDEFLEX.COM
Email: INFO@TIDEFLEX.COM

HORIZONTAL PIPE SUPPORT ASSEMBLY INSTALLATION PROCEDURES 5/8"Ø & 3/4"Ø THREADED RODS

CONSULTANT:

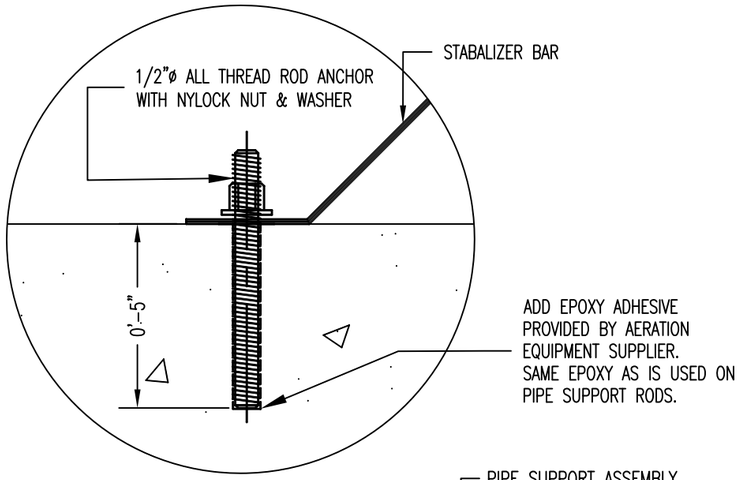
APPLICATION: DIFFUSED AERATION SYSTEM

CAD SCALE: FULL PLOT SCALE: FULL

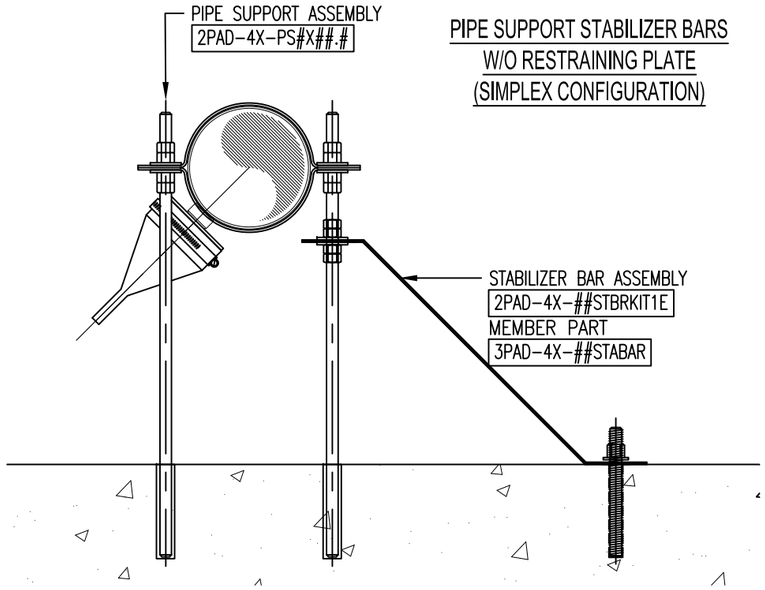
DWG. BY: DATE:

DWG. NO. A-104.00.010

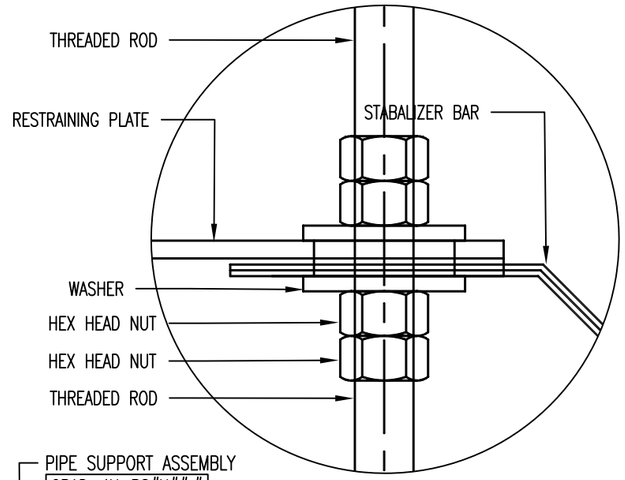
SHEET 1 OF 1



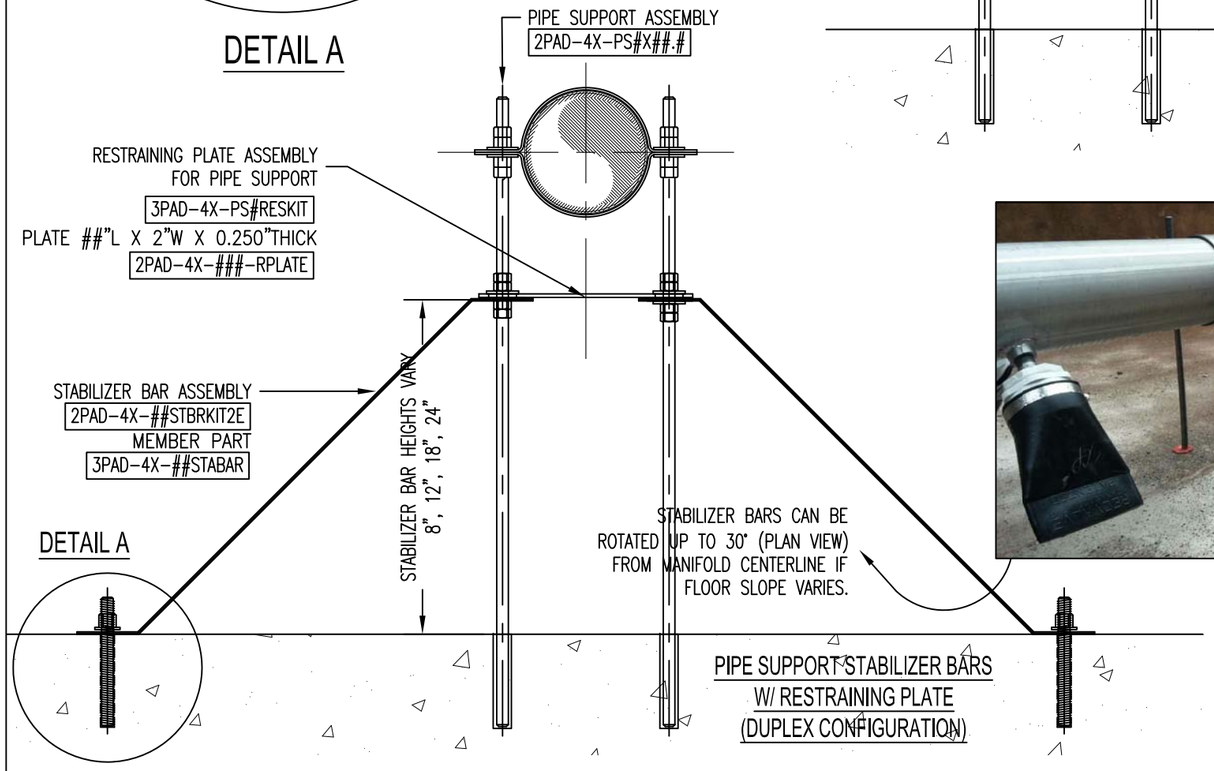
DETAIL A



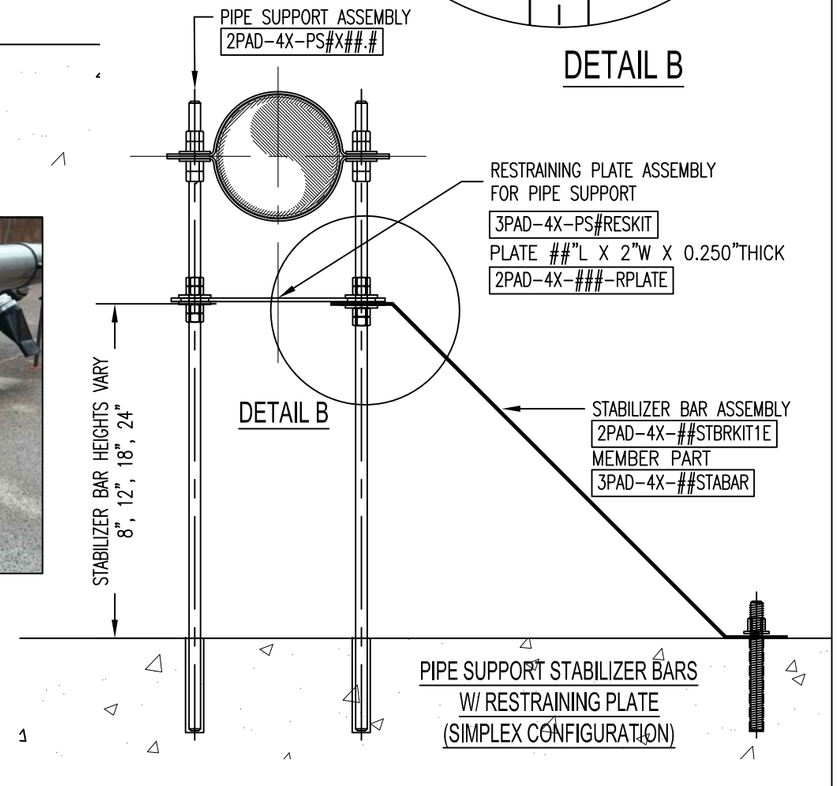
PIPE SUPPORT STABILIZER BARS
W/O RESTRAINING PLATE
(SIMPLEX CONFIGURATION)



DETAIL B



PIPE SUPPORT STABILIZER BARS
W/ RESTRAINING PLATE
(DUPLEX CONFIGURATION)



PIPE SUPPORT STABILIZER BARS
W/ RESTRAINING PLATE
(SIMPLEX CONFIGURATION)

REV	BY	DATE	ECO#	CHK'D	DESCRIPTION
A					

S.O.#:

QUOTE #:

DWG. NOTES:

STABILZER BAR DIMENSIONS
2" WIDE X $\frac{1}{8}$" THICK 304L SS FLATBAR

Tideflex® Technologies
A Division of Red Valve Company, Inc.,
TIDEFLEX TECHNOLOGIES
DIFFUSED AERATION SYSTEM
600 North Bell Ave.
Carnegie, PA 15106-0548, USA
Phone: 412-279-0044
Fax: 412-279-5410
WEBSITE: WWW.TIDEFLEX.COM
EMAIL: INFO@TIDEFLEX.COM

PIPE SUPPORT INSTALLATION DETAILS
RESTRAINING PLATE AND STABILIZER BAR ASSEMBLY
STAINLESS STEEL MANIFOLDS

CONSULTANT:

APPLICATION: DIFFUSED AERATION SYSTEM

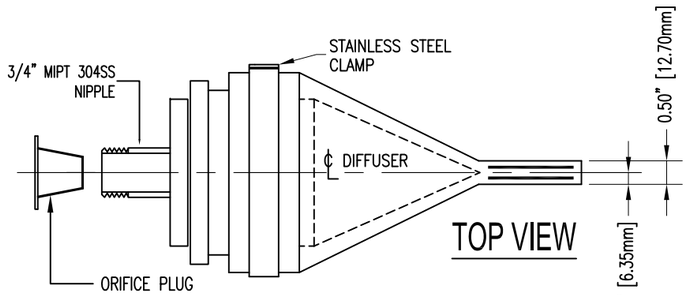
CAD SCALE: PLOT SCALE:

DWG. BY: DATE:

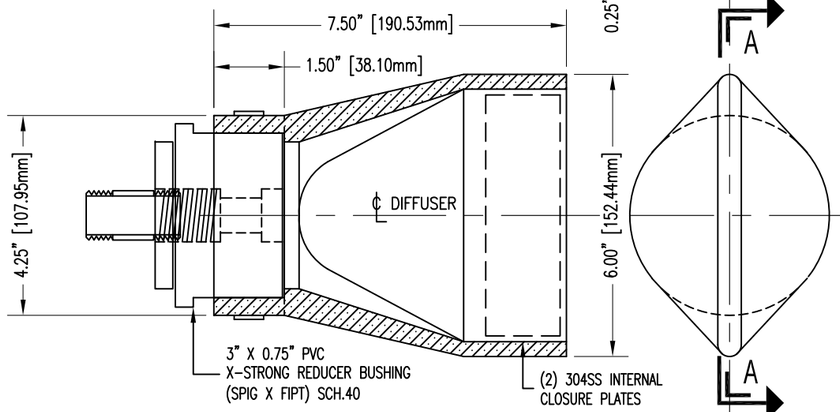
DWG. NO. A-104.02.013

SHEET 1 OF 1

COARSE BUBBLE AIR DIFFUSER



TOP VIEW

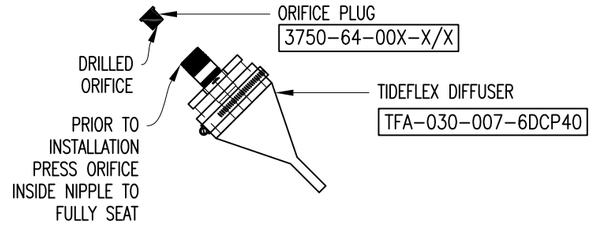


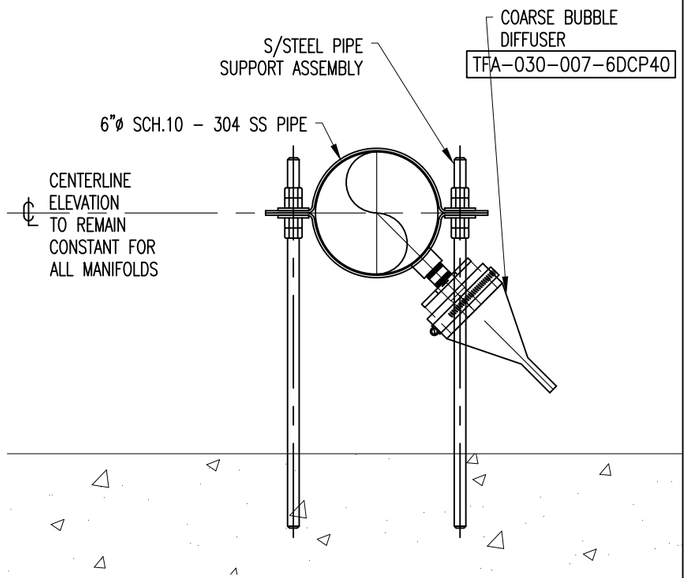
SECTION A-A

END VIEW

TFA-030-007-6DCP40	PART NUMBER	
30	CFM	MAXIMUM OPERATING AIRFLOW
12.5	IN. H20	DIFFUSER HEADLOSS AT MAX AIRFLOW
14.0	IN. H20	ORIFICE HEADLOSS AT MAX AIRFLOW
26.5	IN. H20	TOTAL HEADLOSS AT MAX FLOW
STRAIGHT		DIFFUSER BILL TYPE
MOLDED		DIFFUSER CONSTRUCTION
304SS		INTERNAL CLOSURE PLATES
EPDM		ELASTOMER MATERIAL
HOSE CLAMP		CLAMP TYPE
304SS		CLAMP MATERIAL
304SS		DIFFUSER NPT CONNECTION MATERIAL
0.75	IN	DIFFUSER NPT CONNECTION DIAMETER
304SS		ORIFICE MATERIAL
NIPPLE		ORIFICE TYPE
0.750	IN	ORIFICE DIAMETER

ORIFICE PLUG FIELD INSTALLATION





S.O.#: QUOTE #:

REV	BY	DATE	DESCRIPTION

Tideflex® Technologies
TIDEFLEX TECHNOLOGIES
TIDEFLEX AERATION SYSTEM
600 N BELL AVE
CARNEGIE, PA 15106 USA
PHONE: 412-279-0044 WEBSITE: WWW.TIDEFLEX.COM
FAX: 412-279-5410 EMAIL: INFO@TIDEFLEX.COM

COARSE BUBBLE DIFFUSER
MODEL TFA-3.00 WITH CLOSURE PLATES

CONSULTANT:
APPLICATION:
SCALE: PLOT: DWG. NO. A-105.04.024 SHEET 1 OF 1
DWG. BY: DATE:

REV	BY	DATE	ECO#	CHK'D	DESCRIPTION
A					ISSUE FOR APPROVAL

S.O.#: QUOTE #:

DWG. NOTES:

Tideflex® Technologies
A Division of Red Valve Company, Inc.,
TIDEFLEX TECHNOLOGIES
DIFFUSED AERATION SYSTEM
600 North Bell Ave.
Carnegie, PA 15106-0548, USA
Phone: 412-279-0044 WEBSITE: WWW.TIDEFLEX.COM
Fax: 412-279-5410 EMAIL: INFO@TIDEFLEX.COM

COARSE BUBBLE DIFFUSER
DIFFUSER ASSEMBLIES AND SUPPORTS
SECTION VIEWS

CONSULTANT:
APPLICATION: DIFFUSED AERATION SYSTEM
CAD SCALE: PLOT SCALE: DWG. NO. A-104.02.010 SHEET 1 OF 1
DWG. BY: DATE:

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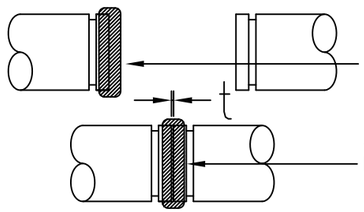
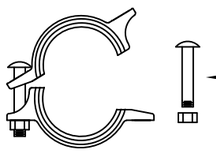
PIPE SIZE O.D.	SS RIGID VICTAULIC COUPLING PART NUMBER	ALLOWABLE PIPE SEP. "t"	BOLT TORQUE FT-LBS
2.375"	3750-41-VCP-RIG020	0.05"	18-27
2.875"	3750-41-VCP-RIG025	0.05"	18-27
3.50"	3750-41-VCP-RIG030	0.05"	45-50
4.50"	3750-41-VCP-RIG040	0.19"	45-50
5.00"	3750-41-VCP-RIG050	0.25"	75-100
6.625"	3750-41-VCP-RIG060	0.25"	125-200
8.625"	3750-41-VCP-RIG080	0.25"	200-300
10.75"	3750-41-VCP-RIG100	0.25"	200-300

VICTAULIC 489 SERIES

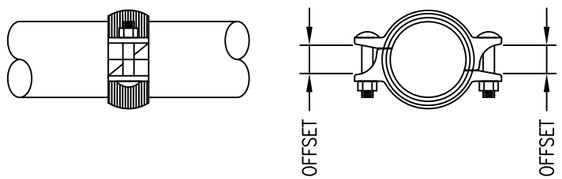


APPLY SILICONE TO INSIDE OF GASKET AND SLIDE ONTO GROOVED PIPE END.

JOIN GROOVED PIPE ENDS; REFER TO TABLE FOR ALLOWABLE CLEARANCE.



OPEN COUPLING ONE SIDE, SEAT TWO HALVES ON GASKET EXTERIOR AND TIGHTEN BOLTS. SEE TABLE FOR REQUIRED TORQUES.



OFFSETS SHOULD BE EQUAL ON BOTH SIDES OF COUPLING.

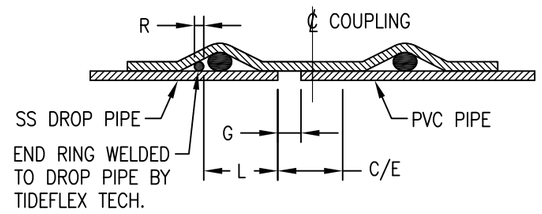
SS RIGID COUPLING FOR GROOVED END PIPE

CLOSURE TOOL REQUIRED FOR INSTALLATION OF COUPLING
TOOLS PROVIDED BY TIDEFLEX WILL BE INVOICED UNLESS RETURNED
TOOLS CAN BE PURCHASED FROM VICTAULIC DEPEND-O-LOK
800-841-6624 ATLANTA, GEORGIA, USA

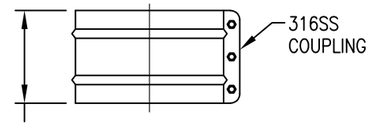
PIPE SIZE O.D.	SS FXE VICTAULIC COUPLING PART NUMBER
2.375"	3750-41-VCOUPL020
2.875"	3750-41-VCOUPL025
3.50"	3750-41-VCOUPL030
4.50"	3750-41-VCOUPL040
6.625"	3750-41-VCOUPL060
8.625"	3750-41-VCOUPL080
10.75"	3750-41-VCOUPL100
12.00"	3750-41-VCOUPL120
14.00"	3750-41-VCOUPL140

TABLE GLOSSARY
L - DISTANCE FROM END OF PIPE TO NEAR EDGE OF END RING.
R - DIAMETER OF END RING.
G - GAP, AT INSTALLATION, BETWEEN PIPE ENDS.
C/E - TOTAL OF CONTRACTION AND EXPANSION

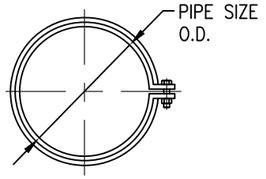
PIPE SIZE O.D.	DIM "L"	DIM "R"	DIM "G"	DIM "C/E"	DIM "W"
2.375"-4.50"	1.125"	0.125"	0.375"	0.75"	5.00"
6.625"	1.75"	0.188"	0.375"	1.25"	7.50"
8.625"-14.00"	2.00"	0.25"	0.625"	1.75"	10.00"



INSTALLATION DETAIL



TOP VIEW



FRONT VIEW

DROP PIPE EXPANSION CLAMP
VICTAULIC - DEPEND-O-LOK BRAND

REV	BY	DATE	ECO#	CHK'D	DESCRIPTION
A					ISSUED FOR APPROVAL

S.O.#: QUOTE #:

DWG. NOTES:

Tideflex® Technologies
A Division of Red Valve Company, Inc.,
TIDEFLEX TECHNOLOGIES
DIFFUSED AERATION SYSTEM
600 North Bell Ave.
Carnegie, PA 15106 USA
Phone: 412-279-0044
Fax: 412-279-5410
Website: WWW.TIDEFLEX.COM
Email: INFO@TIDEFLEX.COM

EXPANSION JOINT INSTALLATION DETAILS
STAINLESS STEEL RIGID COUPLING
STAINLESS STEEL EXPANSION COUPLING

CONSULTANT:
APPLICATION: DIFFUSED AERATION SYSTEM
CAD SCALE: FULL PLOT SCALE: FULL
DWG. BY: DATE:
DWG. NO. A-107.01.010
SHEET 1 OF 1

To: **PACE Engineering**
Attn: Laurie McCollum
1730 South St.
Redding, CA 96001

Date: June 20, 2017
Terms Net 90 Days
F.O.B. Factory, Prepaid & Add

Sales Eng.: Mark Humberstone
Proposal: 17009

MISCO is pleased to submit the following budgetary proposal for your review for course bubble aeration on aerobic digester including Kaeser positive displacement blowers and Tideflex variable orifice nozzle diffusers on the Burney Water District WWTP Upgrade project

QUANTITY	DESCRIPTION	UNIT PRICE	EXTENSION
2	Kaeser Omega Model DB166C Blower Tri-lobe positive displacement blower Fully integrated with VFD, sound enclosure, controls 25 hp, 3 ph, 460V, 60hz motor Design point: 440 scfm, N+1 configuration, 100 degF max temp, 3000 ft elevation Startup, freight included ATTACHMENTS: Blower Design Paramater Sheet, GA Drawing, Blower Curves	$24,500.00	$49,000.00
LOT	Tideflex Course Bubble Aeration System Sch. 10-304L SS manifold and supports Octagon manifold configuration to locate diffusers as low as possible with the conical bottom-shaped basin 1% assumed solids concentration 45 cfm/1000cuft selected to provide adequate mixing at 16 mg/L/hr O2 supply rate Installation inspection and freight included ATTACHMENTS: Design/layout drawings, Design calcs, Reference project, supporting documentation, template specification	$75,000.00	$75,000.00

After the Purchase Order is received, submittal drawings will be provided. Approval of drawings required for release to production. Owner or consulting engineer assumes all responsibility in confirming the DOSA will be able to discharge the peak flow rate with the available driving head (pressure). The Purchaser is to confirm the hydraulic analysis was performed prior to installation. In the event that the delivery of an order is delayed by the customer, Tideflex will hold the product but, will invoice in the month that the order was originally scheduled to ship. In Addition, Tideflex will charge a storage fee. Submittal Drawings: Approx. 1 week after Acceptance of Purchase Order. Approval Drawings Required. Submittal drawings and Installation Manuals for the review process will be provided in digital format. If hard copies are required an additional fee will be applied.

All Sales and contracts made by us are expressly subject to the conditions as shown hereon and on the back hereof. Stenographic and clerical errors subject to correction. Claims for shortages, defective goods, errors or allowances must be made within 30 days from date of invoice. This quotation shall be of no effect unless written acceptance is received by us within 30 days from the date hereof. We reserve the right to withdraw this quotation prior to our receipt of such acceptance.

Submittted By:

Mark Humberstone, MISCOwater

5976 W. LAS POSITAS BLVD., #226
PLEASANTON, CA 94588
PH:(925) 225-1900 / FAX: (925) 225-9200
www.miscowater.com

Customer: Burney County **Prepared By:** Nate Miller

INPUT DATA:

Operating mode: Gauge pressure
Kind of package: Com-paK-Integrat with OFC
Inlet temperature: 100 °F
Inlet pressure: 13.1 psia
Inlet flow: 543 icfm

Flow medium : Humid Air
Specific heat constant κ : 1.40
Specific weight at standard conditions : 0.0760 lb/ ft³
Pressure difference : 6.0 psig
Discharge pressure : 19.1 psia
Air humidity: 50 [%]

Technical data:

Package: **DB 166C**
Blower: OMEGA 42P
Motor power: 25.0 hp
Operating voltage: 460V/60Hz

Blower speed (60Hz): 4800 rpm
Connection ANSI: 4"
% of maximum speed: 100
Blower: OMEGA 42P

Performance data:	**min. frequency**	**Design point**	**max. frequency**	
Frequency:	18.0	59.4	60.0	Hz
Speed:	1440	4750	4800	rpm
Inlet air flow Q1*:	124	543	551	icfm
Inlet air flow Q1 (standard):	101	440	447	scfm
Standard conditions 14.7psia, 68°F and 0 % RH				
Discharge temperature*:	207	181	181	°F
Blower shaft power*:	5.5	19.1	19.2	bhp
Motor shaft power :			21.3	bhp
			with sound enclosure	
Sound pressure level**:	**at fmax**		72	dB(A)
Sound pressure level**:			72	dB(A)
Sound power level**:			88	dB(A)
Dimension [inches] (W x L x H)			60x 46 x 51	
Estimated Weight			ca. 1473 lbs	

IGBT Frequency controlled **460V ± 5 % 60 Hz**

The stated control range can vary depending on manufacturer and type of the frequency converter.
Standard motor with impulse peak resistance in accordance with IEC 60034-1 for operation with a IGBT frequency converter.

*** Performance data to DIN ISO 1217, PART 1, ANNEX C**
**** Measured to DIN EN ISO 2151, figures ± 3 dB(A), with sound isolated pipework.**

Motor shaft power includes belt losses in addition to dirty filter losses of 0.6 psig (40 mbar)

Customer: Burney County

Prepared By: Nate Miller

Kind of package: Com-paK-Integrat with OFC

Operating mode:Gauge pressure

Inlet temperature: 100 °F

Inlet pressure: 13.1 psia

Input inlet flow: 543 icfm

Valve set pressure: **9.0** **psig**

Package: **DB 166C**

Blower: OMEGA 42P

Motor power: 25.0 hp

Operating voltage: 460V/60Hz

Blower speed(60Hz): 4800 rpm

Connection ANSI:4"

% of maximum speed:100

NOTE: ACCESSORIES SHOWN ARE INTENDED FOR AIR USE ONLY.

Accessories:		**yes**	**no**
Unloaded start up valve:	AFE15	☐	☒
Check plate:	4"	☐	☒

Instrument/ sensor:

oil level sensor	☐	☒
speed monitor	☐	☒
Auxiliary heating:	☐	☒
Omega P-GRD:	☐	☒

	yes	**no**
Sound enclosure:	☒	☐
Suction from ambient:	☒	☐
Suction from pipe:	☐	☒

Optional for package with sound enclosure

Sound enclosure for outdor installation:	☐	☒

Frequency converter (FC):

Kaeser FC type OFC: Omega Control (sensor kit included)	☒	☐

Standard equipment with s. encl.: 1x 2" Blowoff valve,

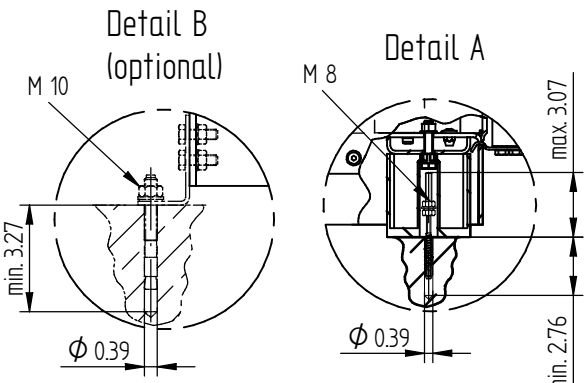
Comments for project:

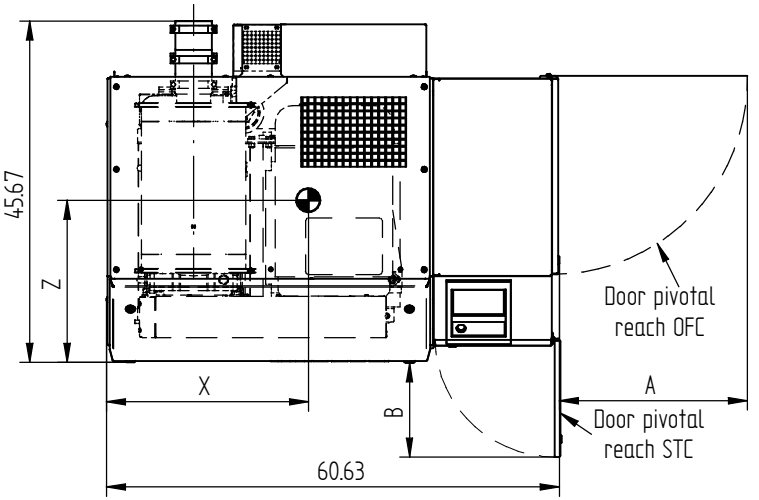
Dimensions in the table in Inch.

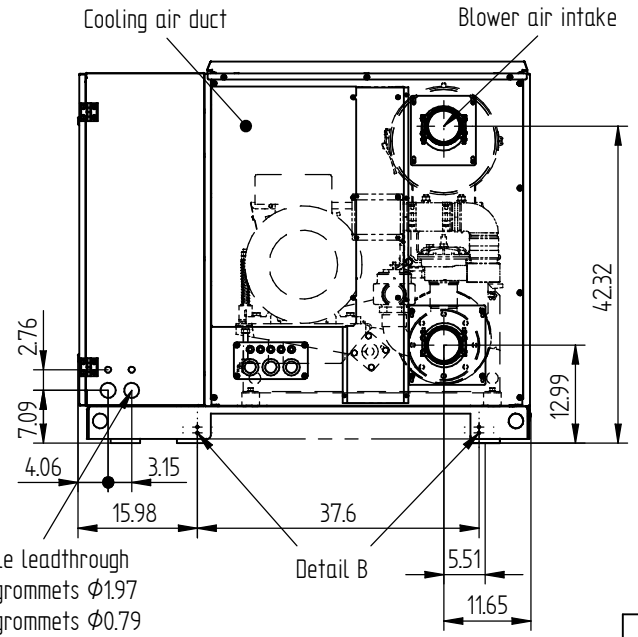
Model	Motor	OFC / STC X*	Y*	Z*	Weight**
DB 166 C pr (pipe)	7.5 hp	24.80/23.82	23.62/21.06	22.24/19.88	~1257/1213 lbs
	10 hp	24.80/24.02	23.62/21.06	22.05/19.88	~1279/1235 lbs
	15 hp	24.80/24.02	23.43/21.26	22.05/19.68	~1301/1257 lbs
	20 hp	25.00/24.21	23.43/21.26	21.85/19.68	~1323/1279 lbs
	25 hp	25.79/24.41	23.43/21.26	22.05/19.88	~1444/1356 lbs
	30 hp	25.79/24.41	23.43/21.26	22.05/19.88	~1466/1378 lbs
	40 hp	26.57/25.39	23.82/21.85	21.85/19.88	~1653/1565 lbs
	50 hp	26.77/25.59	23.82/21.85	21.85/19.88	~1698/1609 lbs
	60 hp	- /25.79	- /21.85	- /19.88	~ - /1676 lbs
DB 236 C pr (pipe)	10 hp	25.20/24.41	23.03/20.67	21.85/19.68	~1334/1290 lbs
	15 hp	25.20/24.61	23.03/20.87	21.65/19.68	~1367/1323 lbs
	20 hp	25.39/24.61	23.03/20.87	21.65/19.49	~1378/1334 lbs
	25 hp	25.98/24.80	23.03/20.87	21.85/19.68	~1510/1422 lbs
	30 hp	25.98/24.80	23.03/20.87	21.85/19.68	~1521/1433 lbs
	40 hp	26.77/25.79	23.43/21.46	21.65/19.68	~1709/1620 lbs
	50 hp	26.97/25.79	23.43/21.46	21.65/19.68	~1764/1676 lbs
	60 hp	- /28.74	- /23.62	- /21.46	~ - /1543 lbs

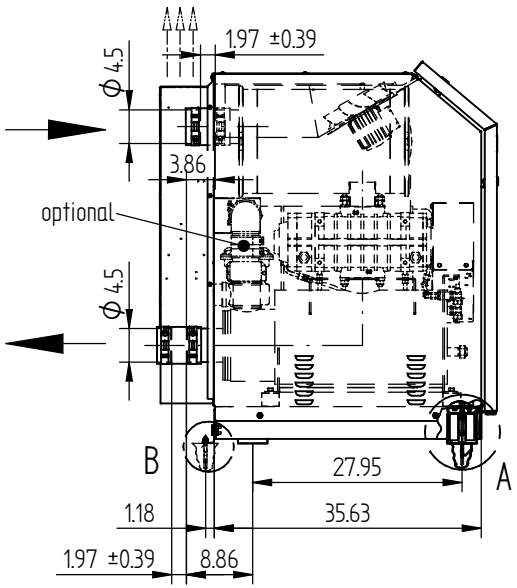
* Center of gravity coordinates are approximate !

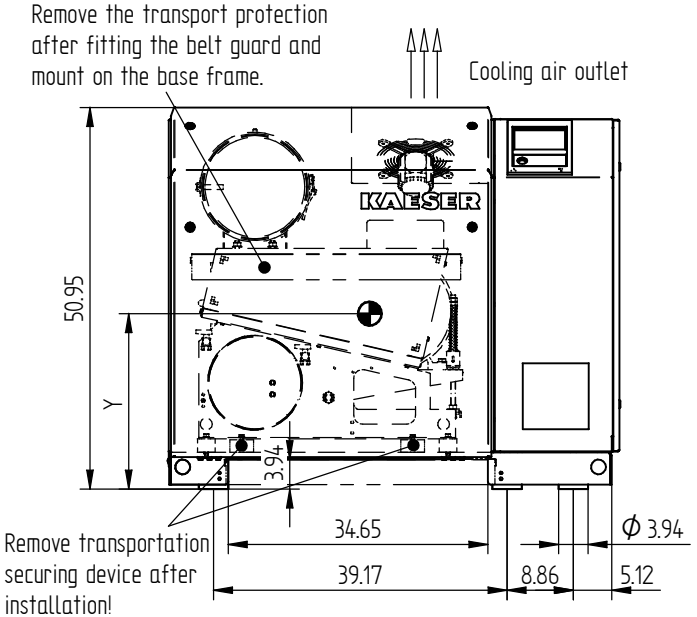
** Guide value, actual weight can vary according to manufacturer.











pivotal reach	OFC	STC
A	25.20	0
B	0	12.60

DB 166/236 C OFC/STC pr (pipe)

Stand:	Datum:	Name:	CAD-Datei:
01.11.10	04.06.09	Dedkov	MB002478-9-USE.dft

KAESER KOMPRESSOREN — Werk Gera —

APPENDIX N

MUNIQUIP, LLC

Your Source For Water & Wastewater Equipment

DATE: January 13, 2017 QUOTE #ME17-1263

TO: Burney Waste Water Treatment Plant

ATTN: Laurie McCollum, P.E.

RE: Budgetary Proposal for Sludge Dewatering Dual Channel Rotary Fan Press Skid System from PRIME Solutions

Dear Laurie,

We are pleased to offer the following item for your consideration:

ITEM 1

One (1) PRIME Solution RFP2.0-48" Dual Channel Rotary Fan Press, 5.0 hp Direct Gear Drive System: This system includes all equipment on attached scope of supply as manufactured by **PRIME SOLUTIONS INC.**

Item 1 as described above for the price of……**$353,995.00**

NOTES:

Sales tax & freight are not included in above pricing.
Freight is F.O.B. factory.
Quotation is valid for 60 days.
This proposal is subject to the attached MuniQuip Terms & Conditions and/or the Terms and Conditions of the individual companies MuniQuip has quoted.

Best Regards,

MuniQuip, LLC
Andy Holmes
Sales Engineer
(916) 787-5641

SLUDGE DEWATERING 48" DUAL CHANNEL 2.0 ROTARY FAN PRESS SKID SYSTEM BUDGETARY PROPOSAL FOR:

PACE ENGINEERING

(Burney Water District WWTP)

PRIME SOLUTION, INC.
610 S. PLATT STREET
OTSEGO, MI 49078 USA
(269) 694-6666
www.psirotary.com

Prime Solution Regional Sales Manager: Mrs. Kelley Dendel / PH: (269) 355-3793 / Kelley@psirotary.com

BUDGETARY PROPOSAL #P-170111KD1
Date: January 11, 2017

To: PACE Engineering, Inc. for
Burney Water District WWTP
1730 South Street
Redding, CA 96001

Contact: Laurie McCollum P.E.
Title: Associate Engineer
Phone: 530-244-0202
E-Mail: lmccollum@paceengineering.us

PSI Sales Rep: MuniQuip
Contact: Andy Holmes
PH: 916-787-5641
E-Mail: aholmes@muniquipllc.com

PROJECT DETAILS	
Project Name:	Burney Water District WWTP
Application:	Municipal
Plant MGD:	-
Sludge Type:	Primary
Sludge Process:	New Plant
Sludge Conditioning Aid(s):	-
Volatile Solids:	-
Sludge Age:	-
Hours of Operation/Day:	-
Dewatering Flow Rate:	50 – 75 GPM
Feed Solids:	1 – 2% TS
Solids Loading:	500.4 – 750.6 d.s. lbs/hr

**Note: A sample has not been analyzed nor pilot test completed; once a sample has been analyzed and a pilot test completed, more refined numbers and process limitations can be provided.*

We hereby submit specifications and estimates for: One (1) 48" Dual Channel 2.0 Rotary Fan Press Skid System as listed below in this Scope of Supply. All equipment listed below is factory tested, pre-plumbed/wired and ready for field installation. Sludge type, feed solids, volatile solids, pretreatment, polymer selection, desired cake solids and process variations will affect performance of the equipment. Installation, system integration, utility and piping connections not included and/or listed below in this Scope of Supply shall be provided by others.

ROTARY FAN PRESS EQUIPMENT SCOPE OF SUPPLY

- One (1) RFP2.0-48D – 48" Dual Channel Rotary Fan Press, 5.0 hp Direct Gear Drive System, Epoxy Coated Carbon Steel Housings and Base, Pneumatic Sludge Discharge Gate Control, Pneumatic Flow Control, All 304 Stainless Steel/Hard Chromed Tapered Slotted Filter Screens with Stainless Steel Support Wheels.
- One (1) RFP Skid Platform, Epoxy Coated Carbon Steel Welded Construction. Anchor Bolts To Be Provided By Others.
- One (1) Wash Manifold Assembly.
- One (1) Upgrade to 304 Stainless Steel on all metal parts.
- Two (2) Dewatering Channel Mixing Elements, 0.25 hp Gearbox/Channel
- Two (2) Stainless Steel Cake Discharge Chutes.
- One (1) In-Line Full Port Pneumatic Mixer with 4-Port Injection Ring.
- One (1) PVC Sludge Retention Manifold with Clear Site Tube Cleanout and Sludge Sampler.
- One (1) PVC Filtrate Collection Piping Assembly.
- One (1) Pneumatic Sludge By-Pass Control Valve.
- One (1) Sludge Feed Magnetic Flow Meter.
- One (1) Sludge Feed Pump (Rotary Lobe) with VFD Gear Drive Direct Coupled On Common Base.

- One (1) Emulsion Polymer Feed/Blend System, with Integrated Controls.
- One (1) Auto Process Control Package (semi-unattended operation) For System As Listed In This Proposal.
- One (1) Central Operator Panel with Touch Screen Controls, Ten Inch (10") Display, Lamps and Main Disconnect Power. System To Include Operation of Associated Dewatering Equipment As Listed In This Scope of Supply, 480 Volt/3 Phase/60 Hertz (Unless Specified Otherwise), NEMA 4X Rated Enclosure.
- Two (2) Copies of Operational/Maintenance Manuals.
- One (1) Standard Limited Workmanship Warranty.
- One (1) On-Site Start-Up/Commissioning/Training For A Total of Twenty-Four (24) Man-Hours.

We Propose to furnish material as stated, FOB Burney Water District WWTP, CA 96013, freight allowed to job site (offloading by others), complete and in accordance with the above specifications for the sum of:

U.S. Dollars: $353,995.00

OPTIONAL ASSETS NOT INCLUDED IN THE ABOVE PRICING

- One (1) Air Compressor with Reciever……...**$2,455.00**

All fees and bonding are the full responsibility of the Purchaser/Customer and not included as part of this proposal. Any non-payment amounts, fines, fees, expenses caused thereof shall be the full payment responsibility of the Purchaser/Customer to any and all parties and/or authorities as the case may be.

Delivery: 10 – 12 weeks from receipt of firm purchase order, receipt of down payment and approval of submittal(s) (1 time shipment only).

Submittals: 20 working days from receipt of purchase order with complete project information supplied by Purchaser/Customer.

Clarifications, Exceptions & Recommendations:

Any system integration, ancillary equipment, services, access platforms, stairs and/or handrails, etc. not listed in this Scope of Supply shall not be part of this proposal and shall be provided by others if required.

All equipment offloading, site storage, installation and interconnecting wiring and piping between all equipment listed and other ancillary equipment or sources shall be by others as selected or retained by the Purchaser/Customer.

Any and all required chemistry (pretreatments/polymers, etc.), testing fees, etc. not listed as included in the Prime Solution, Inc. Equipment Scope of Supply shall be provided and/or paid for by others. The Purchaser/Customer understands and agrees that the type of sludge, pretreatment process, pretreatment chemistry, polymer selection, feed solids, volatile solids, sludge age, any/all changes (temperature, pH, etc.) to the sludge/slurry characteristic(s) not clearly defined in any written documentation will affect the sludge's/slurry's ability to be dewatered and performance/capacity of the equipment. The Purchaser/Customer shall be responsible to provide all suitable pretreatment chemistry for obtaining a suitable and stable flocculated sludge/slurry for mechanical dewatering to achieve any performance requirements. Prime Solution, Inc. can only estimate production performance based upon information supplied by the engineer and/or Purchaser/Customer, lab sample(s) or on-site pilot testing and does not take any responsibility for final equipment performance unless overall process is approved by Prime Solution, Inc. in writing. Any changes and/or omissions in any way to the type of sludge/slurry listed in any specifications that affects dewaterability of the sludge/slurry shall release Prime Solution, Inc. of any/all performance responsibility.

BUDGETARY PROPOSAL #P-170111KD1
Date: January 11, 2017

Prime Solution, Inc. is furnishing the dewatering equipment only and is only subject to the Limited Workmanship Warranty and/or Scope of Supply. All equipment, material and components manufactured by others used in the design of the dewatering system shall have the same warranty afforded to Prime Solution, Inc. and is subject to and stipulated by the respective manufacturer's warranty provided that the required maintenance has been performed by the Purchaser/Customer. Prime Solution, Inc. does not provide any guarantee or warranty of the process, chemistry or other parts and products purchased/supplied by others whatsoever, whether expressed, implied or statutory, including but not limited to, any warranty of merchantability or fitness for a particular purpose or any warranty that the contents of those parts and products will be suitable and error free. Any damages to the Prime Solution, Inc. equipment caused by parts, products or services provided by others will not be covered by the Limited Workmanship Warranty.

In no respect shall Prime Solution, Inc. incur any liability for any damages, direct, indirect, special, or consequential arising out of, resulting from, or any way connected to the use of those parts or products provided by others, whether or not based upon warranty, contract, tort, or otherwise; whether or not injury was sustained by persons or property or otherwise; and whether or not loss was sustained from, or arose out of, the results of parts and products or any services provided by others.

If there are any delays in shipment by the Purchaser/Customer, the Purchaser/Customer agrees to pay storage charges equal to 0.5% of the total project order per month the order is held by Prime Solution, Inc. for shipment.

Should any additional service trips, equipment, supplies and/or labor be required by Prime Solution, Inc. to assist the Purchaser/Customer beyond what is listed in this Scope of Supply, these charges shall be in addition to the price listed in this Scope of Supply. On-site service for process or chemistry after installation and start-up will be subject to additional charges and is not included in the Limited Workmanship Warranty.

Terms: (10%) due upon approved submittals, (80%) due net 30 days from shipment date, balance (10%) due net 30 days after approved start-up not to exceed 60 days from shipment.

Terms listed in this proposal only apply with approved credit application.

This budgetary proposal is valid for sixty (60) days and is meant for Preliminary Budget Costing Purposes Only and is not to be shared in whole or in part with third parties without the express written consent of Prime Solution, Inc. Pricing is valid for delivery of equipment on site for 1 year.

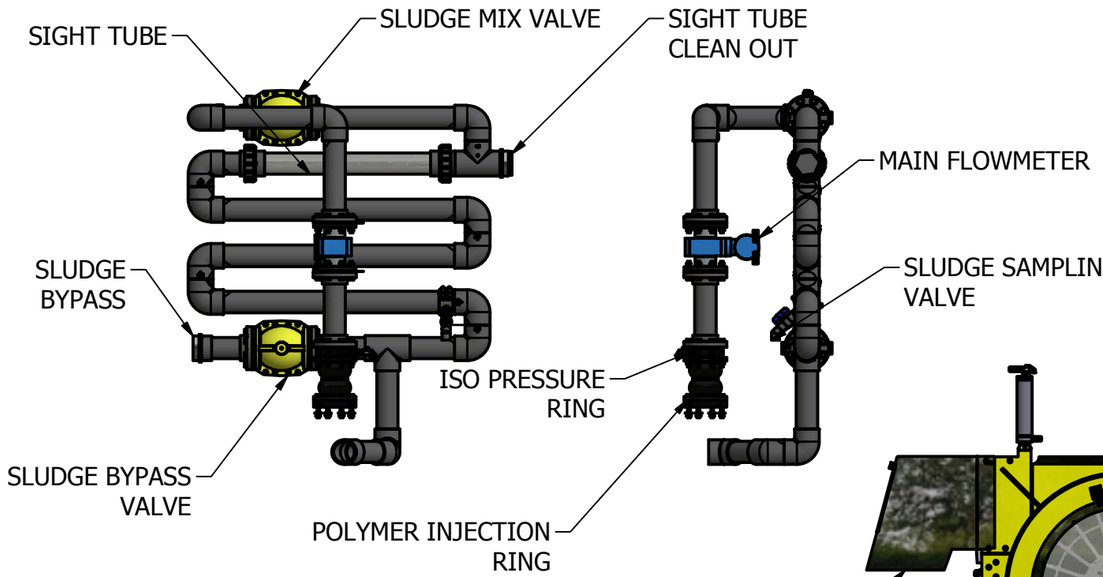
Thank you for your interest in Prime Solution and our Rotary Fan Press, we look forward to talking with you in the near future.

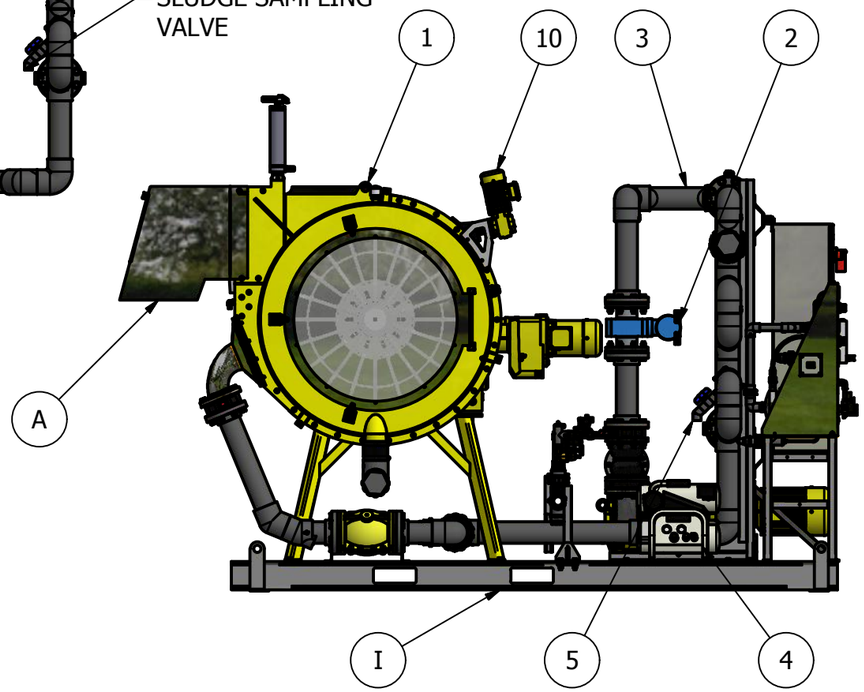
Regards,

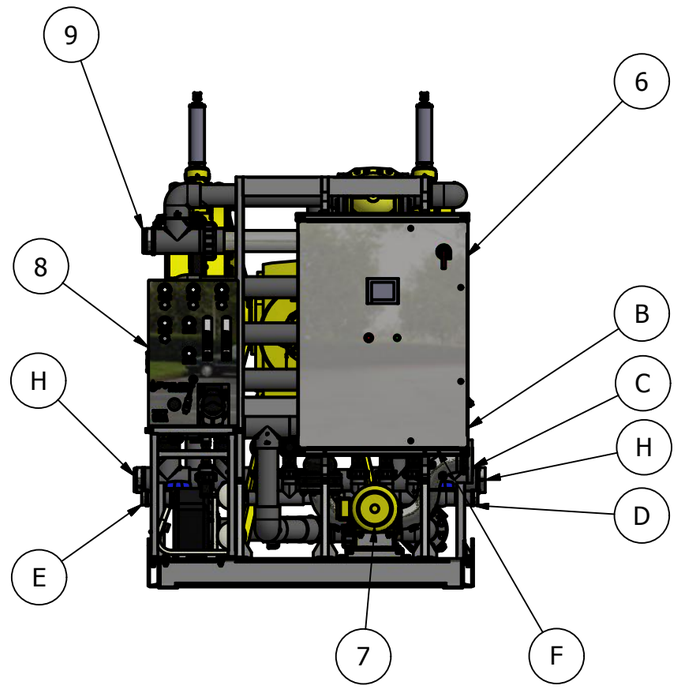
Mrs. Kelley Dendel
Regional Sales Manager
Prime Solution, Inc.
PH: (269) 355-3793
Kelley@psirotary.com

MAIN COMPONENTS	
ITEM	DESCRIPTION
1	ROTARY FAN PRESS
2	MAIN FLOW METER
3	SLUDGE RETENTION ASSY
4	AIR COMPRESSOR
5	SLUDGE SAMPLING VALVE
6	CONTROL PANEL NEMA 4X
7	SLUDGE PUMP ASSY
8	POLYMER FEED/BLEND SYSTEM
9	SIGHT TUBE CLEAN OUT
10	2.0 ASSEMBLY

CONECTIONS	
ITEM	DESCRIPTION
A	CAKE DISCHARGE CHUTE
B	SLUDGE BYPASS 4" FNPT
C	SLUDGE INLET 4" #150 FLANGE
D	REUSE WATER 2" FNPT
E	FRESH WATER 2" FNPT
F	FILTRATE DISCHARGE 4" FNPT
G	POLYMER FEED TUBE
H	FILTRATE DISCHARGE 4" FNPT
I	RFP SKID







SUPPLY VOLTAGE: 480v 3 PHASE 60 HZ 27.60 FULL LOAD AMPS (12.33KW)

SUPPLY WATER: PRIME BLEND POLYMER SYSTEM
AVG. 4 - 8 GPM AT 45 PSI (RECOMMEND POTABLE WATER)

INTERMITTENT: INNER & OUTER WASH 80 GPH @ 45 PSI PER CHANNEL
(NON POTABLE WATER ACCEPTABLE)

CONNECTIONS: SLUDGE FEED 4" 150# FLANGE SLUDGE BYPASS 4" FNPT
FILTRATE DISCHARGE 4" FNPT SUPPLY WATER 2" FNPT

DRAWN	L. HARTMAN	1/19/2016
CHECKED		

PRIME SOLUTION
Dewatering Performance - Simplified
610 S. PLATT ST., OTSEGO, MI 49078
T:(269) 694-6666 F:(269) 694-1298

TITLE

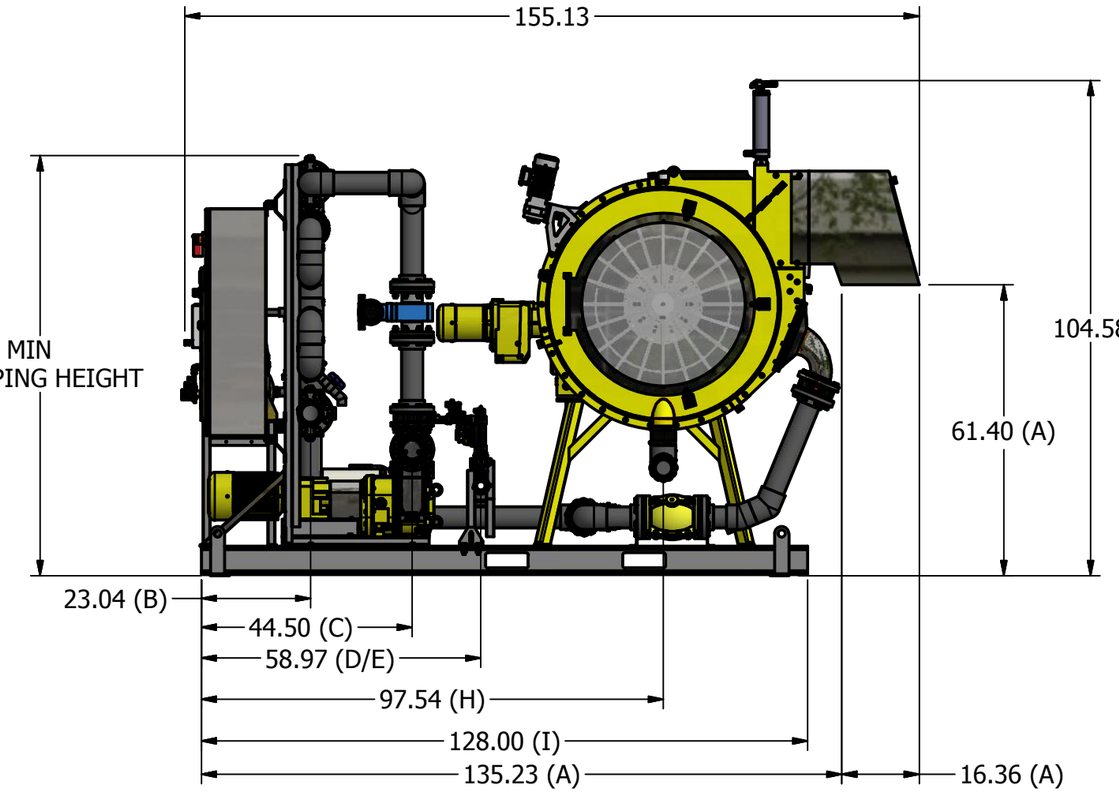
48" ROTARY FAN PRESS SKID SYSTEM W/ 2" SEALS AND 2.0 ASSY

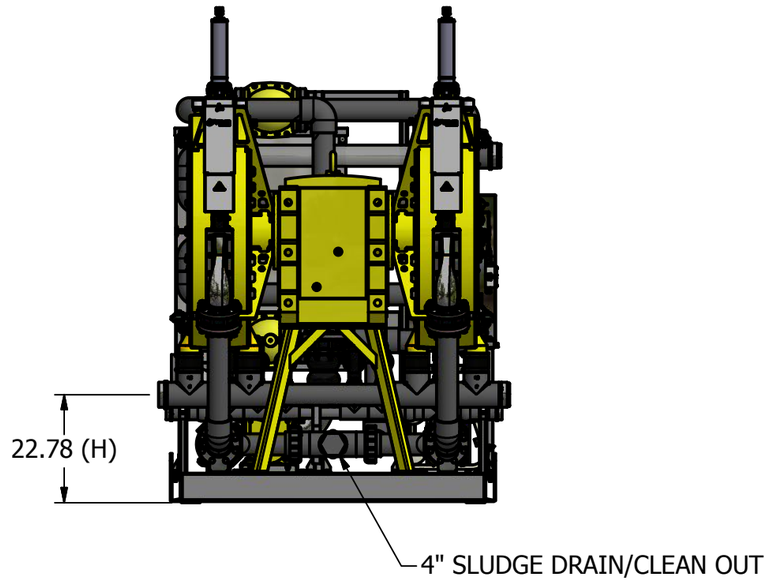
SIZE		DWG NO	REV
B		RFP2.0-48D-SKE	

SCALE NTS SHEET 1 OF 3

MAIN COMPONENTS	
ITEM	DESCRIPTION
1	ROTARY FAN PRESS
2	MAIN FLOW METER
3	SLUDGE RETENTION ASSY
4	AIR COMPRESSOR
5	SLUDGE SAMPLING VALVE
6	CONTROL PANEL NEMA 4X
7	SLUDGE PUMP ASSY
8	POLYMER FEED/BLEND SYSTEM
9	SIGHT TUBE CLEAN OUT
10	2.0 ASSEMBLY

CONECTIONS	
ITEM	DESCRIPTION
A	CAKE DISCHARGE CHUTE
B	SLUDGE BYPASS 4" FNPT
C	SLUDGE INLET 4" #150 FLANGE
D	REUSE WATER 2" FNPT
E	FRESH WATER 2" FNPT
F	RFP MAIN POWER SUPPLY
G	POLYMER FEED TUBE
H	FILTRATE DISCHARGE 4" FNPT
I	RFP SKID





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SUPPLY WATER: PRIME BLEND POLYMER SYSTEM
AVG. 4 - 8 GPM AT 45 PSI (RECOMMEND POTABLE WATER)

INTERMITTENT: INNER & OUTER WASH 80 GPH @ 45 PSI PER CHANNEL
(NON POTABLE WATER ACCEPTABLE)

CONNECTIONS: SLUDGE FEED 4" 150# FLANGE SLUDGE BYPASS 4" FNPT
FILTRATE DISCHARGE 4" FNPT SUPPLY WATER 2" FNPT

DRAWN L. HARTMAN	1/19/2016
CHECKED	

PRIME SOLUTION
610 S. PLATT ST., OTSEGO, MI 49078
T:(269) 694-6666 F:(269) 694-1298

TITLE

48" ROTARY FAN PRESS SKID SYSTEM W/2" SEALS AND 2.0 ASSY

SIZE	DWG NO	REV
B	RFP2.0-48D-SKE	

SCALE NTS SHEET 2 OF 3

MAIN COMPONENTS	
ITEM	DESCRIPTION
1	ROTARY FAN PRESS
2	MAIN FLOW METER
3	SLUDGE RETENTION ASSY
4	AIR COMPRESSOR
5	SLUDGE SAMPLING VALVE
6	CONTROL PANEL NEMA 4X
7	SLUDGE PUMP ASSY
8	POLYMER FEED/BLEND SYSTEM
9	SIGHT TUBE CLEAN OUT
10	2.0 ASSEMBLY

CONECTIONS	
ITEM	DESCRIPTION
A	CAKE DISCHARGE CHUTE
B	SLUDGE BYPASS 4" FNPT
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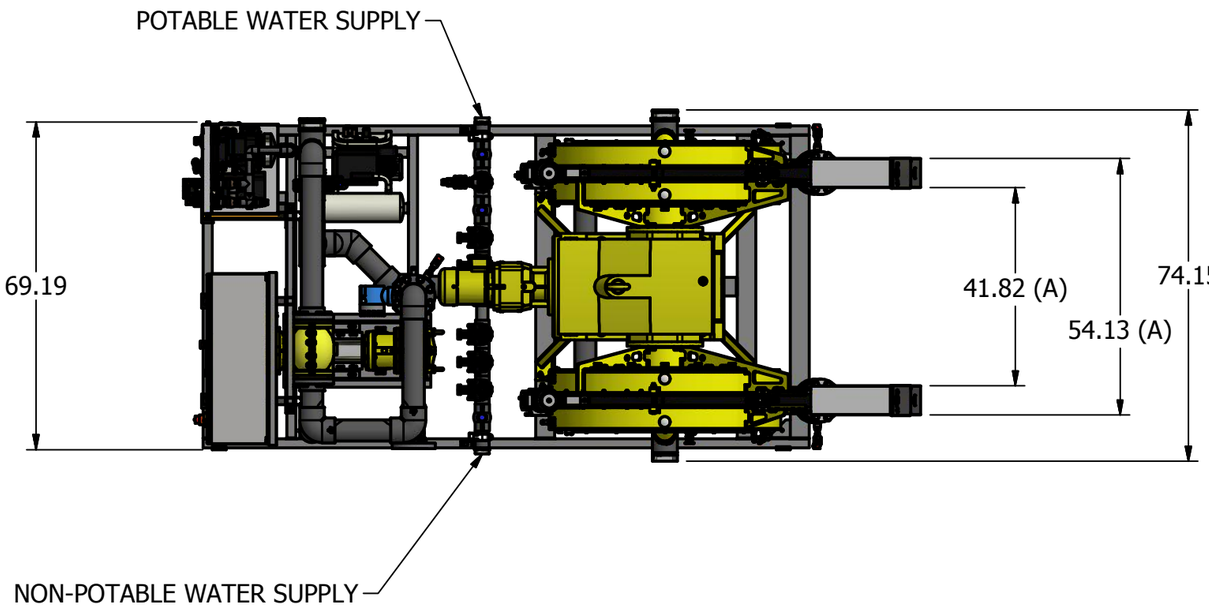

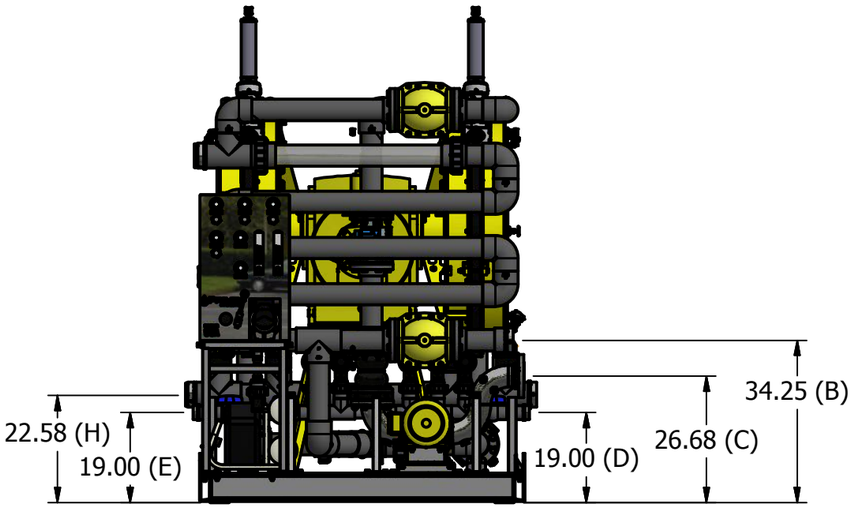

CONTROL PANEL AND
UTILITY STAND REMOVED FOR CLARIFICATION

SUPPLY VOLTAGE: 480v 3 PHASE 60 HZ 27.60 FULL LOAD AMPS (12.33KW)

SUPPLY WATER: PRIME BLEND POLYMER SYSTEM
AVG. 4 - 8 GPM AT 45 PSI (RECOMMEND POTABLE WATER)

INTERMITTENT: INNER & OUTER WASH 80 GPH @ 45 PSI PER CHANNEL
(NON POTABLE WATER ACCEPTABLE)

CONNECTIONS: SLUDGE FEED 4" 150# FLANGE SLUDGE BYPASS 4" FNPT
FILTRATE DISCHARGE 4" FNPT SUPPLY WATER 2" FNPT

DRAWN	L. HARTMAN	1/19/2016
CHECKED		

PRIME SOLUTION
Dewatering Performance - Simplified
610 S. PLATT ST., OTSEGO, MI 49078
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TITLE

48" ROTARY FAN PRESS SKID SYSTEM W/ 2" SEALS AND 2.0 ASSEMBLY

SIZE	DWG NO	REV
B	RFP2.0-48D-SKE	

SCALE NTS SHEET 3 OF 3

TERMS AND CONDITIONS

1. Acceptance of this Order is final only upon written approval by MuniQuip, L.L.C. ("MQ").

2. The total sale price, as set forth on the first page hereof, including all tax, is payable by Purchaser as follows: One-Hundred percent (100%) within 30 days of notice of availability for shipment by the manufacturer. Any amount not paid when due shall bear interest at the rate of 18% *per annum*. Purchaser agrees to pay reasonable attorney's fees and all collection costs incurred by MQ if payment is not timely received. All payments by Purchaser shall be made without offset of deduction.

3. All prices are FOB source shipping point. MQ is not responsible for any loss during transit. Breakage or shortage claims arising from shipments shall be made by the Purchaser directly against the carrier. Purchaser will accept shipment within five (5) days of notice of availability from MQ.

4. Purchaser understands and acknowledges that the Equipment is not manufactured by MQ, and that MQ offers no representations or warranties of any kind or nature with respect to the Equipment. **SPECIFICALLY, MQ DOES NOT OFFER ANY EXPRESS OR IMPLIED WARRANTY OF DESCRIPTION, TITLE, OR CONDITION OF LIEN OR SECURITY INTERESTS, MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE.** The only warranties with respect to the Equipment shall be those offered by the manufacturer, if any. The sole obligation of MQ shall be to assist Purchaser in connection with the presentation of any warranty claim to the Manufacturer. If applicable, MQ will assign all manufacturers' warranties to Purchaser or end user. Purchaser shall be responsible for all costs and labor for installation and start-up assistance of the Equipment.

5. MQ shall not be responsible for any loss, claim or damages resulting from any force majeure, including but not limited to strikes, accidents, unavailability of labor or materials, acts of God, weather conditions, inability of carrier to deliver, legislative, administrative, or executive law, order or requisition of any governmental entity, or any event not under the direct control of MQ. Any delay in delivery from the Manufacturer caused by a force majeure or action or inaction of the Manufacturer or carrier shall not be the responsibility of MQ.

6. In no event shall MQ be responsible for any liquidated, consequential or special damages arising from breach of this Agreement, any delay of delivery or any other cause.

7. Purchaser shall pay any sales, excise, or other government charge payable by MQ to federal, state or local authorities. Any such taxes now or hereafter imposed upon sales or shipments will be added to the purchase price. Purchaser agrees to reimburse MQ for any such tax or to provide MQ acceptable tax exemption certificates.

8. Purchaser may not cancel this Order without the prior written consent of MQ, and in any event Purchaser shall be responsible for all costs, charges and fees caused by such cancellation, including labor expended, material procured, and reasonable overhead expenses applicable thereto.

9. Any failure of MQ to insist upon the performance of any term or condition of this Agreement or any prior quotations, agreements, orders, and acceptances or orders related thereto shall not be deemed to be a waiver of such term, condition, or any other right in the future.

10. The provisions hereof shall apply to all addendums or changes hereto although not specifically set forth therein, all of these terms and conditions being considered to be additional terms and conditions to any such addendum or change.

11. Purchaser agrees to inspect the Equipment immediately upon delivery. Any claim for shortages must be made to MQ within ten (10) days after shipment or shall be deemed waived. Any other claim by Purchaser, other than warranty claims against the manufacturer, shall be made within thirty (30) days after receipt of shipment, and if not made, shall be waived.

12. Purchaser agrees to provide and maintain adequate insurance against loss of or damage to the Equipment until the purchase price to MQ has been fully paid. Any loss or damage to the Equipment after transfer of possession shall not relieve the Purchaser from obligations under this Agreement.

13. This Agreement represents the final and complete understanding of the parties with respect to all terms and conditions of the sale of Equipment as contemplated hereby, and there are no other representations, promises or agreements, whether written or oral, made in connection herewith. Purchaser specifically understands and acknowledges that no agent, employee or representative of MQ has the authority to or has made any other representation, promise or agreement except as specifically set forth in this Agreement. No amendment to this Agreement shall be effective unless it is in writing and executed by both parties.

14. This Agreement shall be construed under the laws of the State of California, and any action arising hereunder shall be commenced in that state.

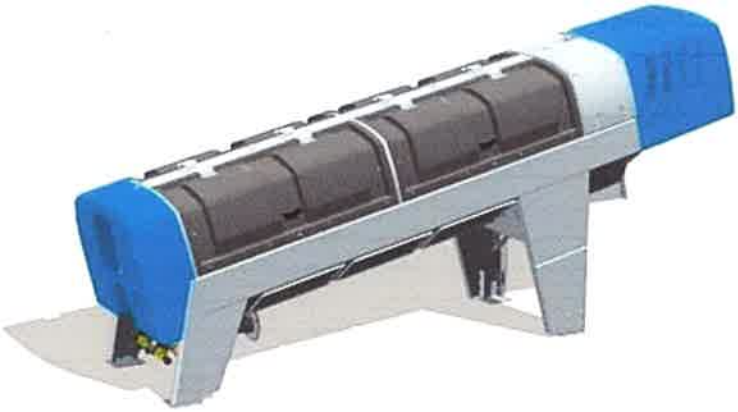
Burney Sized Unit

Budgetary Proposal

Project Name:
Burney, CA

Equipment Type:
Q-Press 620.2 Screw Press

Proposal Date:
6/7/2017



Huber Contacts:
John Lewis
Regional Sales Director - West
704-995-5451
John@hhusa.net

Ed Fritz, P.E.
Application Engineer: Sludge Treatment
704-990-2041
Ed.Fritz@hhusa.net

Represented by:
Ryan Spanton
Goble Sampson Associates
801-558-6805
rspanton@goblesampson.com

HUBER TECHNOLOGY
WASTE WATER Solutions

Huber Technology, Inc.

9735 NorthCross Center Court
Suite A
Huntersville, NC 28078

Phone: (704) 949-1010
Fax: (704) 949-1020

25 lbs/dry ton sludge polymer

Screw Press Design Summary

Burney, CA

June 7, 2017

Sludge Characteristics:

Upstream Process:	Activated Sludge with Secondary Clarifier
Digestion Process:	Information not provided
Sludge Type:	WAS
Sludge VSS:	Information not provided

Project Design Parameters:

Sludge Feed Rate:	14,000 lb/wk (see notes)	
Sludge Concentration:	1%	
Operational Schedule:	48 hr/wk	(8 hr/day, 6 days/wk)
Calculated Total Hydraulic Loading Rate:	58 gpm	(13.2 m^3/hr)
Calculated Total Solids Loading Rate:	291.7 lb/hr	(132.3 kg/hr)

Equipment Recommendation:

Recommended unit model:	Q-Press 620.2		
Recommended unit quantity:	1		
Typical Expected Unit Performance:			
Hydraulic Loading Rate (per unit):	59.3 gpm	(13.5 m^3/hr)	at 1% solids
Solids Loading Rate (per unit):	297 lb/hr	(135 kg/hr)	at 1% solids
Alternate Hydraulic Loading Rate (per unit):	36.5 gpm	(8.3 m^3/hr)	at 2% solids
Alternate Solids Loading Rate (per unit):	365 lb/hr	(165 kg/hr)	at 2% solids
Equipment Performance:			
Estimated Cake Solids:	16-21%		
Capture Rate:	≥95%		

NOTE: All performance is estimated based on typical screw press performance. In order to guarantee performance Huber must run a pilot test.

Equipment Weights:		
Screw Press Empty Weight:	5960 lbs	(2700 kg)
Screw Press Full Weight:	7280 lbs	(3300 kg)
Equipment Requirements:		
Instantaneous Air Requirement:	0.39 SCFM at 87 psi	(11 L/min at 6 bar)
Average Washwater Requirement[1]:	110.4 gph at 72.5 psi	(418 L/hr at 5 bar)

[1]Wash water cycle runs at 44.4 gpm for 114 seconds. Typical applications experience 1-4 wash cycles per hour.

Polymer:	
Estimated Polymer Consumption:	24-34 lb active polymer/dry ton of sludge
Estimated Polymer Makeup Water[2]:	255 gal/hr potable water at 70-100 psi

[2]Assuming 48% active polymer in neat polymer solution and a 0.5% dilute polymer solution to the screw press.

Flocculation Detention Time:	45 sec at 63 gpm

Notes and Assumptions:

1. Equipment specification and drawings are available upon request.
2. If there are site-specific hydraulic constraints that must be applied, please consult the manufacturer's representative to ensure compatibility with the proposed system.
3. Huber Technology warrants all components of the system against faulty workmanship and materials for a period of 12 months from date of start-up or 18 months after shipment, whichever occurs first.
4. Budget estimate is based on Huber Technology's standard Terms & Conditions and is quoted in US dollars unless otherwise stated.
5. Equipment recommendations are based on information provided to Huber Technology. Subsequent information which differs from what has been provided may alter the equipment recommendation.
6. Pricing is based on Huber's standard control panel arrangement.
7. Weekly sludge loading is based on assumed sludge production for a 1 MGD activated sludge process.

Equipment Summary

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Screw Press:

One (1) Q-Press 620.2 Screw Press in 304L stainless steel construction; with full submersion passivated surface treatment for superior corrosion protection. Each including:

- Fully enclosed basket
- Shafted screw with integrated maintenance free bearing
- 12° inclined auger tube
- 3 hp, Class 1/Division 2 drive motor, 460 VAC, 60 Hz, 3 ph

Ancillary Equipment:

- One (1) Polymer Unit
- One (1) Polymer injection ring and mixing device
- One (1) Polymer Flow Meter
- One (1) Compressor
- One (1) Sludge Feed Pump
- One (1) Sludge Flow Meter

Controls:

- One (1) Control Panel - Huber Standard Control Panel Design, including:
  - Stainless Steel NEMA 4X Enclosure
  - CompactLogix PLC
  - PanelView+ 600 HMI
  - Pre-programmed and Factory Tested

Freight and Startup:

- Standard Huber Recommended Start-up Services (6 days, 2 trips)
- Freight to jobsite.

Total Price: **$400,000** **(per unit)**

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Burney, CA: Approximate 20-year O&M Costs
Estimate for one (1) operating Q-Press 620.2 unit

Power Consumption						
Item	**Power (HP)**	**Power (kW)**	**Hours/Day**	**Days/Week**	**20-Year Cost[1]**	
Main Drive Motor	3	2.24	8	6	$10,312	per unit
Spray Wash Motor	0.1	0.07	0.7	6	$29	per unit

Labor Hours-Estimated Yearly costs						
Item	**Man Hours**	**Maintenance Frequency (Years)**	**(Equivalent Frequency)**	**Annualized Cost[2]**	**20-Year Cost**	
Routine Checks	0.50	0.0192	(1/Week)	$ 1,950	$39,000	per unit
Wiper Replacement[4]	16.00	4.9	--	$ 245	$4,898	per unit

Spare Parts Estimate						
Item	**Item Cost[4]**	**Quantity Replaced**	**Replacement Interval (years)**	**Annualized Cost**	**20-Year Cost[5]**	
1. Wiper on screw flight	$102	8	4.9	$ 167	$3,344	per unit
2. Oil seal	$362	2	4.9	$ 148	$2,955	per unit
3. Bushing	$666	1	4.9	$ 136	$2,718	per unit
4. Basket Seal	$236	1	4.9	$ 48	$963	per unit
5. Fastener Set	$125	1	4.9	$ 26	$510	per unit
6. Bearing	$261	1	4.9	$ 53	$1,065	per unit
7. Nilos Ring	$46	2	4.9	$ 19	$376	per unit
					TOTAL	
					20-Year Cost	
					$66,142	per unit

[1]Assumed a power rate of 15.39¢/kWh at average operational electrical loading.
[2]Based on an assumed labor rate of $75/hr.
[3]Wiper replacement is based on expected wiper life in typical applications. Sludge characteristics may vary the wiper life.
[4]Item costs are based on the price of providing items as part of Huber service providing the maintenance.
[5]There are no yearly wear items. The replacement interval is based on wiper replacement. The annualized cost is an based on replacing all parts while the unit(s) are out of service for wiper replacement.