County of Fresno

DEPARTMENT OF PUBLIC WORKS AND PLANNING
BERNARD JIMENEZ, INTERIM DIRECTOR

Planning Commission Staff Report
Consent Agenda Item No. 1
April 28, 2016

SUBJECT: **Classified Conditional Use Permit No. 3415 – First One-Year Time Extension**

Grant a first one-year time extension to exercise Classified Conditional Use Permit No. 3415 which authorizes the construction of a tertiary-level (Title 22 Standard) wastewater treatment facility to serve the Friant Ranch and greater Friant community, operated by County Waterworks District No. 18 on two parcels totaling 144 acres in the AE-20 (Exclusive Agricultural, 20-acre minimum parcel size) Zone District.

LOCATION: **The subject properties are located on the west side of Friant Road, between its intersection with Bluff View Avenue to the south and Lost Lake Road (entrance to Lost Lake Park) to the north, approximately one mile south of the unincorporated community of Friant (16356 N. Friant Road) (SUP. DIST. 5) (APNs 300-160-46 and 51).**

OWNER: **SWD Investments, Inc.**
APPLICANT: **Friant Ranch, LP**
REPRESENTATIVE: **Wagner and Wagner**

STAFF CONTACT: **Derek Chambers, Planner**
(559) 600-4205

Chris Motta, Principal Planner
(559) 600-4227

RECOMMENDATION:

- Approve a first one-year Time Extension for Classified Conditional Use Permit No. 3415; and
- Direct the Secretary to prepare a Resolution documenting the Commission's action.

EXHIBITS:

1. Location Map

2. Existing Zoning Map

3. Existing Land Use Map

4. Board of Supervisors Agenda Item dated May 20, 2014

5. Applicant's correspondence requesting a first one-year Time Extension

ENVIRONMENTAL DETERMINATION:

On February 1, 2011 the Fresno County Board of Supervisors certified the Final Environmental Impact Report (EIR) for the Friant Community Plan Update and Friant Ranch Specific Plan (SCH No. 2007101016). The subject wastewater treatment plant project was identified and assessed in the EIR prepared for the Friant Community Plan Update and Friant Ranch Specific Plan.

According to Section 15162(a) of the California Environmental Quality Act (CEQA) Guidelines, when an EIR has been certified for a project, no subsequent EIR shall be prepared for that project unless the lead agency determines, on the basis of substantial evidence in light of the whole record, one or more of the following: 1) substantial changes are proposed in the project which require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; 2) substantial changes have occurred with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; and 3) new information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the EIR was certified as complete, shows either of the following: (A) the project will have one or more significant effects not discussed in the EIR; or (B) mitigation measures or alternatives previously found not to be feasible would in fact be feasible and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative.

This Time Extension request does not propose changes to the approved project, nor is there evidence of the circumstances noted in Conditions 1, 2 or 3 above. Therefore, a subsequent/supplemental environmental document is not required.

PUBLIC NOTICE:

Notices were sent to 26 property owners within 1,320 feet of the subject parcel, exceeding the minimum notification requirements prescribed by the California Government Code and County Zoning Ordinance.

PROCEDURAL CONSIDERATIONS:

The Fresno County Zoning Ordinance requires that a Conditional Use Permit shall become void when substantial development has not occurred within two (2) years after approval of the Permit. The Zoning Ordinance authorizes the Planning Commission to grant a maximum of four

(4) one (1)-year Time Extensions when it can be demonstrated that circumstances beyond the control of the Applicant have caused delays which do not permit compliance with the original time limitation. The request for extension must be filed prior to the expiration of the Conditional Use Permit.

The decision of the Planning Commission regarding a Classified Conditional Use Permit Time Extension Application is final, unless appealed to the Board of Supervisors within 15 days of the Commission's action.

BACKGROUND INFORMATION:

Classified Conditional Use Permit No. 3415 was approved by the Planning Commission on April 10, 2014. An appeal of the Planning Commission's approval was filed with the Board of Supervisors by the League of Women Voters of Fresno and the Sierra Club Tehipite Chapter on April 18, 2014. In that case, the Appellants asserted that the County failed to follow through on a commitment to conduct further environmental review as part of the approval of the wastewater treatment plant, and that the County also failed to review a Report of Waste Discharge prepared for the wastewater treatment plant in 2012, as part of the Regional Water Quality Control Board's discharge permitting requirements. Subsequently, on May 20, 2014, the Board of Supervisors overturned the Appellants' appeal of the Planning Commission's approval and approved Classified Conditional Use Permit No. 3415.

The Applicant filed the subject time extension request on March 8, 2016, within the time limit noted above. If this first time extension request is granted, the Applicant will have until May 20, 2017 to achieve substantial development of the wastewater treatment plant.

ANALYSIS/DISCUSSION:

Classified Conditional Use Permit (CUP) No. 3415 was approved by the Board of Supervisors on May 20, 2014, based on a determination that the required Findings could be made. Attached is a copy of the Board of Supervisors Agenda Item (Exhibit 4) documenting the Conditions imposed on the project.

According to the Applicant's letter requesting a one-year time extension, additional time is needed to complete the Plan Check process required for the issuance of building permits for the construction of the wastewater treatment plant.

Approval of a time extension request for a Classified Conditional Use Permit is appropriate if circumstances have caused delays which do not permit compliance within the two-year time limit established by the Zoning Ordinance. It should be noted that the Planning Commission's jurisdiction in evaluating this request is limited to determining whether or not the Applicant should be granted an additional year to exercise the Classified Conditional Use Permit as approved.

The subject time extension request was routed to the same agencies that reviewed this project on July 1, 2013. None of those agencies identified any change in circumstances, or the need for additional Conditions, or expressed any concerns with the proposed extension of time.

PUBLIC COMMENT:

None.

CONCLUSION:

Staff believes the first one-year Time Extension for Classified Conditional Use Permit No. 3415 should be approved, based on factors cited in the analysis above. Approval of this Time Extension will extend the expiration date to May 20, 2017.

PLANNING COMMISSION MOTIONS:

Recommended Motion (Approval Action)

- Move to approve the first one-year Time Extension for Classified Conditional Use Permit No. 3415; and

- Direct the Secretary to prepare a Resolution documenting the Commission's action.

Alternative Motion (Denial Action)

- Move to deny the first one-year Time Extension request for Classified Conditional Use Permit No. 3415 (state reasons for denial); and

- Direct the Secretary to prepare a Resolution documenting the Commission's action.

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CUP 3415

LOCATION MAP

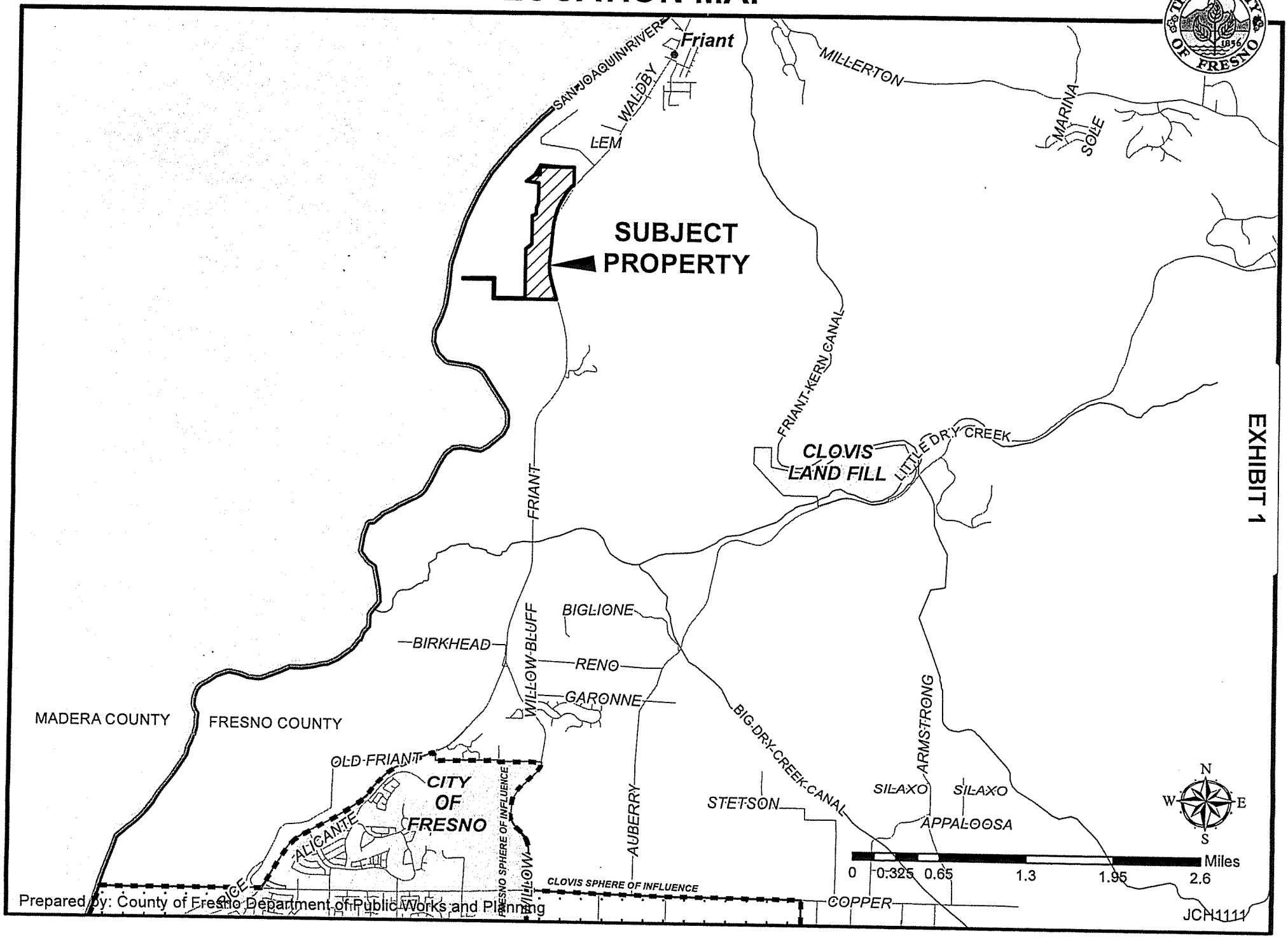


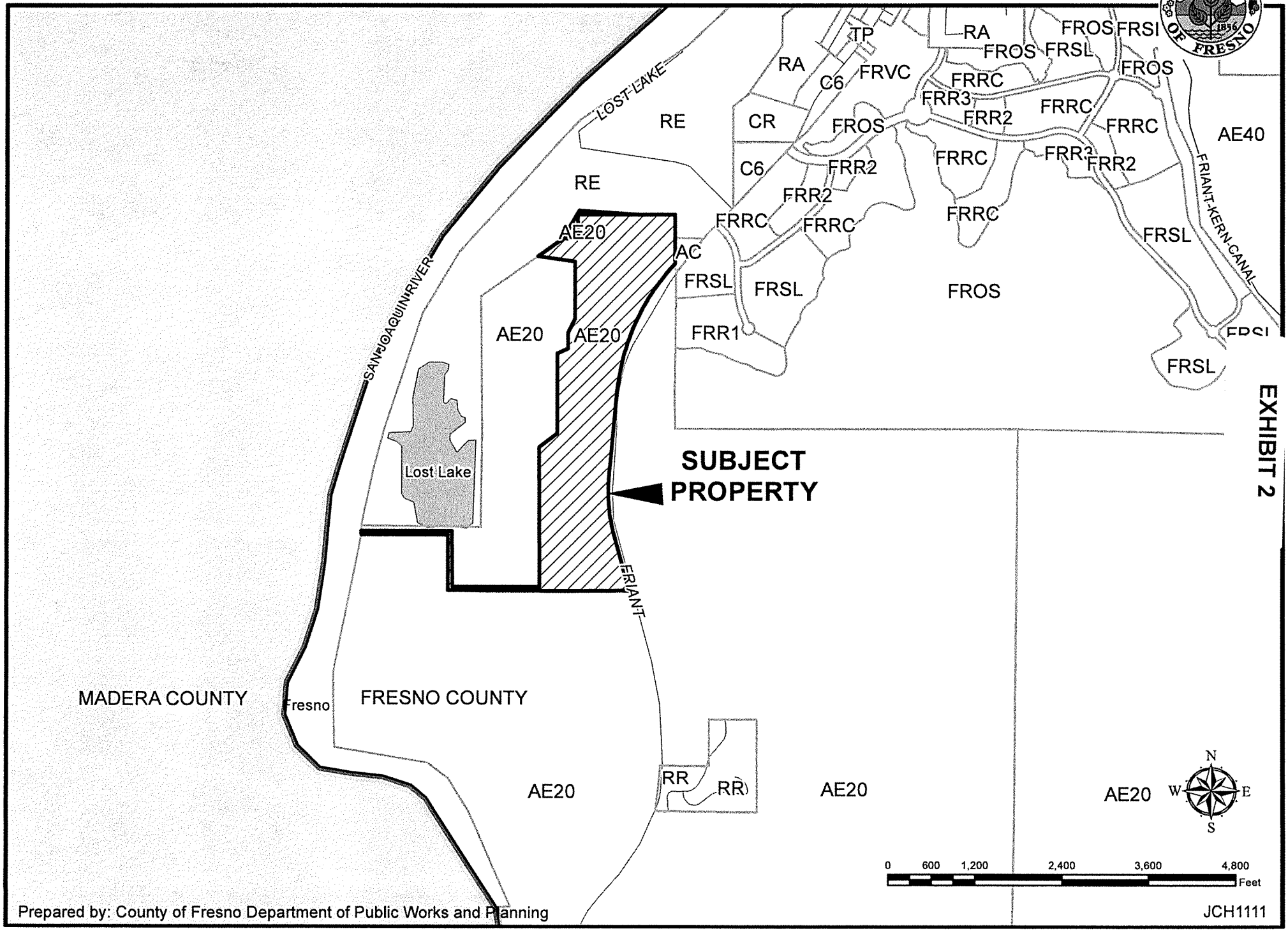
EXHIBIT 1

Prepared by: County of Fresno Department of Public Works and Planning

JCH1111

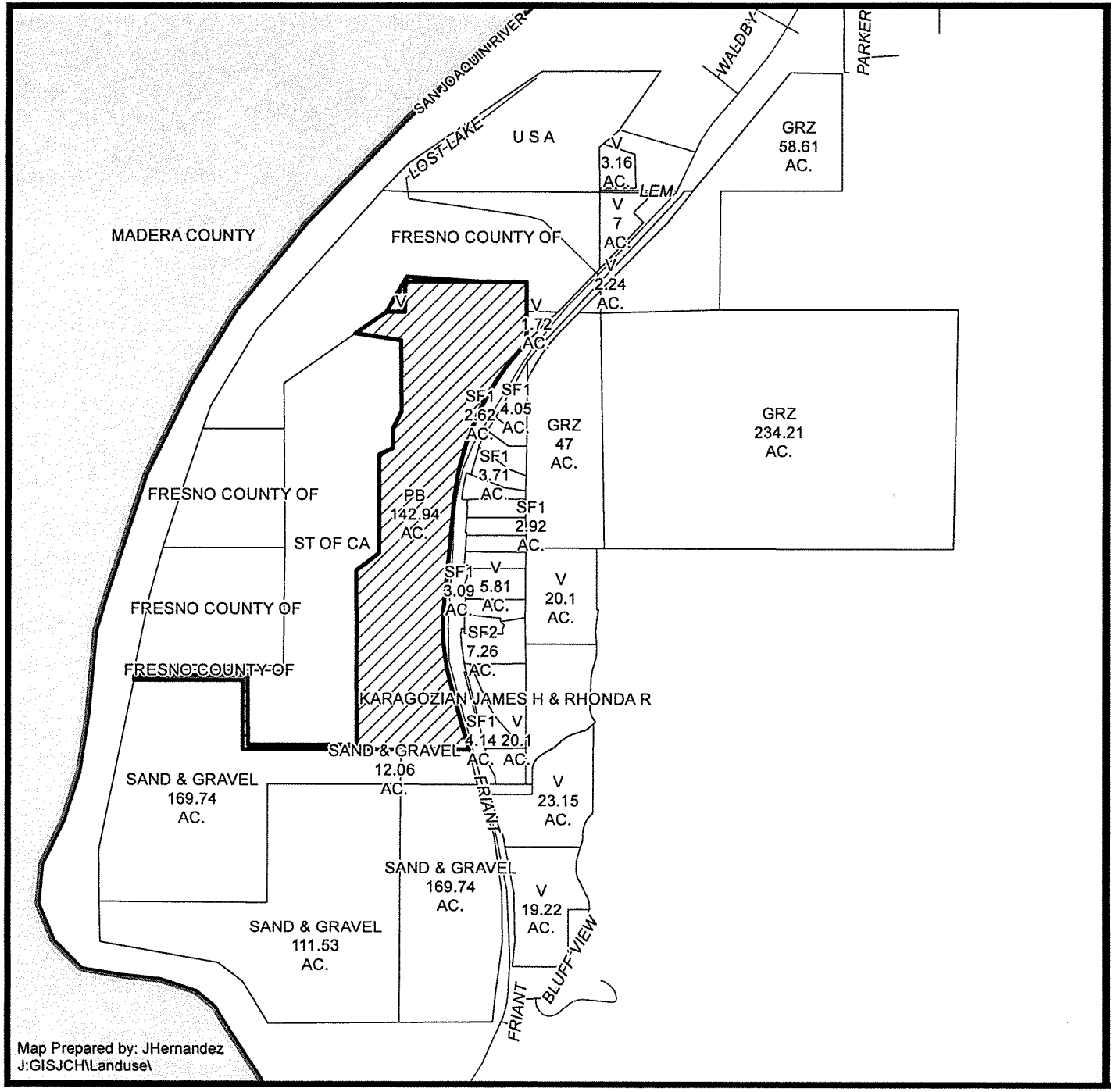
CUP 3415
STR 18 - 11/21

EXISTING ZONING MAP



CUP 3415 EXT 1

EXISTING LAND USE MAP



Map Prepared by: JHernandez
J:GISJCH\Landuse\

LEGEND

GRZ - GRAZING
PONDING BASIN
SF#- SINGLE FAMILY RESIDENCE
V - VACANT

LEGEND:

Subject Property

N
W E
S

0 410 820 1,640 2,460 3,280 Feet

Department of Public Works and Planning
Development Sevices Division

EXHIBIT 3

EXHIBIT 4

18

Inter Office Memo

DATE: May 20, 2014

TO: Board of Supervisors

FROM: Alan Weaver, Director
Department of Public Works and Planning

SUBJECT: Classified Conditional Use Permit Application No. 3415 (Friant Ranch, LP; Applicant – League of Women Voters of Fresno and Sierra Club Tehipite Chapter; Appellants)

RECOMMENDED ACTION

Consider and take action on appeal filed by the League of Women Voters of Fresno and the Sierra Club Tehipite Chapter of the Planning Commission's approval of Classified Conditional Use Permit No. 3415 to allow the construction of a tertiary-level (Title 22 Standard) wastewater treatment facility to serve the Friant Ranch and greater Friant community, operated by County Waterworks District No. 18 on two parcels totaling 144 acres in the AE-20 (Exclusive Agriculture, 20-acre minimum parcel size) Zone District. The subject properties are located on the west side of Friant Road, between its intersection with Bluff View Avenue to the south and Lost Lake Road (entrance to Lost Lake Park) to the north, approximately one mile south of the unincorporated community of Friant (16356 N. Friant Road) (SUP. DIST.: 5) (APNs: 300-160-46 and 51).

BACKGROUND / DISCUSSION

This item comes to your Board on appeal of the Planning Commission's approval of the subject application.

On April 10, 2014, the Planning Commission considered the subject application. After receiving staff's presentation and considering public testimony from the Applicant's representatives and other individuals present at the hearing, the Commission voted 7 to 1 with one Commissioner absent to adopt Resolution No. 12431 approving Classified Conditional Use Permit (CUP) Application No. 3415 subject to the Conditions listed in Exhibit "B" of the Agenda Item.

An appeal was filed on April 18, 2014, to your Board for consideration by the League of Women Voters of Fresno and the Sierra Club Tehipite Chapter asserting that the County failed to follow through on a commitment to conduct further environmental review as part of the approval of the wastewater treatment plant, and that the County also failed to review a Report of Waste Discharge prepared for the wastewater treatment plant in 2012, as part of the Regional Water Quality Control Board's discharge permitting requirements.

By way of background, the County acknowledged at the time of approval of the Friant Ranch Project in 2011, that a subsequent discretionary land use permit would be necessary

for the wastewater treatment facility. It should be noted that staff reviewed the Environmental Impact Report (EIR) certified by your Board in 2011, for adequacy related to the current CUP proposal. The wastewater treatment plant was routed for review consistent with the provisions of the California Environmental Quality Act (CEQA) that allows jurisdictions to rely on existing CEQA documents and solicit comments from reviewing agencies requesting comment as to whether additional CEQA work should be warranted based on specific circumstances identified in CEQA regulations. In this case, the County reviewed the previously certified EIR, reviewed the circumstances identified in the CEQA regulations and solicited input from reviewing agencies with regard to the need for additional CEQA review. None of those agencies, including the California Regional Water Quality Control Board, indicated a need for additional CEQA analysis.

Specifically regarding the issue related to the California Regional Water Quality Control Board, from information provided in the staff report and testimony provided at the April 10, 2014, Planning Commission Hearing, the Planning Commission was aware that the Regional Water Quality Control Board had not expressed any concerns with the project and also that the applicant had received a discharge permit through that agency.

If your Board determines to uphold the Planning Commission's approval of the project, a denial motion denying the appeal and upholding the Commission's approval would be appropriate. Should your Board consider denial of the appeal, staff would request inclusion of an additional Condition requiring:

- The Applicant shall enter into an agreement indemnifying the County for legal costs associated with its approval of Classified Conditional Use Permit No. 3415.

If your Board were inclined to grant the appeal, a motion to uphold the appeal thus denying the project would be appropriate with clarification and reasoning as to which Findings cannot be made.

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Agenda Item 18

DATE: May 20, 2014

TO: Board of Supervisors

FROM: Planning Commission

SUBJECT: Resolution No. 12431 – Classified Conditional Use Permit Application No. 3415

Applicant:	Friant Ranch, LP
Owner:	SWD Investments, Inc.
Representative:	Provost and Pritchard Consulting Group, Inc.

REQUEST: Allow the construction of a tertiary-level (Title 22 Standard) wastewater treatment facility to serve the Friant Ranch and greater Friant community, operated by County Waterworks District No. 18 on two parcels totaling 144 acres in the AE-20 (Exclusive Agriculture, 20-acre minimum parcel size) Zone District.

LOCATION: The subject properties are located on the west side of Friant Road, between its intersection with Bluff View Avenue to the south and Lost Lake Road (entrance to Lost Lake Park) to the north, approximately one mile south of the unincorporated community of Friant (16356 N. Friant Road) (SUP. DIST.: 5) (APNs: 300-160-46 and 51).

PLANNING COMMISSION ACTION:

At its hearing of April 10, 2014, the Commission considered the Staff Report and testimony (summarized in Exhibit "A").

A motion was made by Commissioner Borba and seconded by Commissioner Zadourian to adopt the recommended Findings of Fact in the Staff Report and approve Classified Conditional Use Permit Application No. 3415, subject to the Conditions listed in Exhibit "B".

ADMINISTRATIVE OFFICE REVIEW _____ Page 3 of 204

Official Action of Board of Supervisors

Deputy

CONDUCTED HEARING; RECEIVED PUBLIC TESTIMONY; CLOSED HEARING; DENIED APPEAL FILED BY LEAGUE OF WOMEN VOTERS OF FRESNO AND THE SIERRA CLUB TEHIPITE CHAPTER AND UPHELD PLANNING COMMISSION'S APPROVAL OF CLASSIFIED CONDITIONAL USE PERMIT NO. 3415 SUBJECT TO RECOMMENDED CONDITIONS LISTED IN THE STAFF REPORT, AND WITH AN ADDITIONAL CONDITION THAT THE APPLICANT SHALL ENTER INTO AN AGREEMENT INDEMNIFYING THE COUNTY FOR LEGAL COSTS ASSOCIATED WITH ITS APPROVAL OF CLASSIFIED CONDITIONAL USE PERMIT NO. 3415

UNANIMOUS ____ BORGEAS Aye CASE MCNAIRY No LARSON Aye PEREA Aye POOCHIGIAN Aye

3

This motion passed on the following vote:

VOTING:	Yes:	Commissioners Borba, Zadourian, Batth, Mendes, Rocca, Woolf, and Yates
	No:	Commissioner Lawson
	Absent:	Commissioner Ferguson
	Recused:	None

ALAN WEAVER, DIRECTOR
Department of Public Works and Planning
Secretary-Fresno County Planning Commission

By: _____
William M. Kettler, Division Manager
Development Services Division

Attachments

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EXHIBIT "A"

Classified Conditional Use Permit Application No. 3415

Staff: The Fresno County Planning Commission considered the Staff Report dated April 10, 2014, and heard a summary presentation by staff.

Applicant: The Applicant's representative concurred with the Staff Report and the recommended Conditions. He described the project and offered the following information:

- The wastewater treatment facility will serve the Friant Ranch development and the community of Friant.
- The Friant Ranch development will serve as an active adult community.
- The San Joaquin River Parkway and Conservation Trust has provided a letter of no opposition for the Friant Ranch development.
- An Environmental Impact Report prepared for the Friant Ranch development was certified by the Fresno County Board of Supervisors in 2011.
- The Friant Ranch development will generate up to 660 jobs.
- The wastewater treatment facility will produce Title 22 quality water.
- The Regional Water Quality Control Board has approved the Report of Waste Discharge prepared for the wastewater treatment facility.
- The wastewater treatment facility will initially serve the Millerton Lake Mobile Home Park.

Others: Two other project representatives spoke in favor of the application citing:

- All four Findings necessary for the granting of a Conditional Use Permit have been met.
- Title 22 quality water is acceptable for agricultural and landscaping irrigation, and is also acceptable for swimming.
- Treated water from the wastewater treatment facility will be used for the agricultural cultivation of alfalfa on the project site and irrigation of landscaping in the Friant Ranch Specific Plan area.
- The wastewater treatment facility will be within an enclosed building.
- The Environmental Impact Report adopted by the Fresno County Board of Supervisors in 2011, for the Friant Ranch development has been challenged by three groups in State Superior Court and the Court of Appeals, and has remained legally valid.

- Hydrological analysis, including chemical and radiological testing, has proven that water in the storage ponds which will be utilized in conjunction with the wastewater treatment facility are not connected to the San Joaquin River.

- The storage ponds which will be utilized in conjunction with the wastewater treatment facility are at a lower elevation than the San Joaquin River.

- The wastewater treatment facility has a fully redundant treatment plan to serve as a back-up in case of equipment failure.

- Opponents of the wastewater treatment facility have made the same arguments against the Environmental Impact Report prepared for the Friant Ranch development and the issues identified by the opponents' arguments have been exhaustively discussed and debated.

- County staff determined that no additional environmental analysis beyond the Environmental Impact Report prepared for the Friant Ranch development is required for the wastewater treatment facility.

- The Environmental Impact Report prepared in 2000 which has been referenced by the opposition was prepared for a wastewater treatment facility proposal that would have been located one and a half miles north of the subject proposal in an area subject to different geology.

Seven individuals spoke in opposition to the Classified Conditional Use Permit application citing:

- The wastewater treatment facility will be visible from Lost Lake Park.

- The location proposed for the wastewater treatment facility was identified as an alternative location in the adopted Environmental Impact Report prepared for the Friant Ranch development.

- The wastewater treatment facility is inconsistent with General Plan Policies LU-H.8, PF-D.7, PF-D.A, LU-A.3, and OS-A.28.

- The 2012, Report of Waste Discharge prepared for the wastewater treatment facility needs to be reviewed by the decision making body before a decision is made regarding the Conditional Use Permit.

- The wastewater treatment facility will result in 20 million gallons of water per year seeping into the ground.

- An Environmental Impact Report prepared in 2000, states that surface water and ground water in the area drain toward the San Joaquin River.

- No environmental assessment was conducted for the Conditional Use Permit.

- The wastewater treatment facility should be located in the Friant Ranch development.

- County staff agreed to conduct additional environmental analysis for the wastewater treatment facility, and none has been done.

- The storage ponds which will be utilized in conjunction with the wastewater treatment facility can fill to a level that contacts gravel, thus resulting in water seeping to the San Joaquin River.

- Impacts to salmon in the San Joaquin River should be analyzed.

- There has been no analysis conducted in regard to groundwater impacts or wildlife impacts.

Correspondence: One letter was presented to the Planning Commission from the San Joaquin River Parkway and Conservation Trust, Inc. which expressed no opposition to the Classified Conditional Use Permit application. No letters were presented in opposition to the Classified Conditional Use Permit application.

CLASSIFIED CONDITIONAL USE PERMIT (CUP) APPLICATION NO. 3415
(CONDITIONS OF APPROVAL AND PROJECT NOTES)

	Conditions of Approval
1.	Development of the property shall be in accordance with applicable mitigation measures as listed in the Mitigation and Monitoring Program approved as part of the certified and adopted Friant Ranch Community Plan Update and Friant Ranch Specific Plan Environmental Impact Report (State Clearinghouse No. 2007101016), and the Site Plans, Floor Plans, Elevations, and Operational Statement as approved by the Commission. Applicable mitigation measures are those directly addressing the wastewater treatment facility.
2.	Wastewater discharge to the San Joaquin River shall be prohibited.
3.	Prior to occupancy, a Site Plan Review shall be submitted to and approved by the Department of Public Works and Planning in accordance with Section 874 of the Fresno County Zoning Ordinance. Conditions of the Site Plan Review may include, but are not limited to: design of parking and circulation areas, access, on-site grading and drainage, fire protection, landscaping, signage, lighting and right-of-way dedication.
4.	As part of the Site Plan Review Application the following shall be addressed: a. The type of paving and dimensioned layout of spaces, backup clearance and internal circulation pattern shall be detailed on final plans. b. The number of parking spaces and ADA accessible spaces will be reviewed with final site plan review. c. The driveway shall be graded and concrete or asphalt concrete paved for the first 100 feet off of the edge of the ultimate right-of-way. If just the driveway is intended to be paved then adequate vehicle barriers shall be provided along the edges of the driveway to ensure that vehicles leaving the site travel the entire 100 feet of surfacing before entering Friant Road.
5.	A copy of the facility's Tentative Waste Discharge Requirements (WDR's) as drafted by the California Regional Water Quality Control Board (CRWQCB) shall be submitted with the Site Plan Review. Evidence of approval of the WDR's by the CRWQCB shall be submitted prior to commencement of operations.
6.	A landscaping and irrigation plan shall be submitted with the Site Plan Review to provide a level of visual screening of the proposed facility. Drought-tolerant landscaping shall be utilized and shall be designed to blend-in with existing landscaping and site berming.
7.	A painting scheme and materials design sheet shall be submitted for review and approval by the Director of Public Works and Planning or his designee at the time of filing a Site Plan Review.
8.	As part of the Site Plan Review the applicant shall submit to the San Joaquin Valley Unified Air Pollution Control District (Air District) a Health Risk Assessment (HRA) acceptable to the Air District. The Air District, through review of the HRA may indicate additional conditions that the developer shall implement to reduce potential health impacts associated with the wastewater treatment plant.

9.	Per the Consolidated Mosquito Abatement District the developer shall: a. Insure that any and all water, recycled or fresh, applied to the alfalfa, grasslands, and landscaping shall infiltrate within 48 hours of the application (shorter than minimum mosquito development time). b. Maintain pond water depth in excess of four feet to preclude invasive emergent vegetation such as cattails. c. Pond edges shall be maintained free of excess vegetation to prevent harborage for mosquito breeding and so that mosquito fish and other predators are not inhibited. d. Free and unencumbered access to the pond perimeter for vehicle and foot traffic must be provided for inspection and mosquito control activities.
10.	All lighting shall be hooded and directed as to not shine towards adjacent properties and public streets.

Conditions of Approval reference recommended Condition for the project.

Notes	
The following Notes reference mandatory requirements of Fresno County or other Agencies and are provided as information to the project Applicant.	
1.	This permit shall become void unless there has been substantial development within two years of the effective date of this approval.
2.	The project may be subject to the San Joaquin Valley Unified Air Pollution Control District Regulation VIII - (Fugitive PM10, Prohibitions), Rule 4102 (Nuisance), Rule 4601 (Architectural Coatings), Rule 4641 (Cutback, Slow Cure, and Emulsified Asphalt Paving and Maintenance Operations) and District Rule 4002 (National Emission Standards for Hazardous Air Pollutants) in the event an existing building will be renovated, partially demolished or removed.
3.	An Engineered Grading and Drainage Plan is required to show how the additional storm water run-off generated by the proposed development will be handled without adversely impacting the adjoining parcels.
4.	A Grading Permit or Voucher is required for any grading proposed with this application.
5.	Any additional storm water run-off generated by the project cannot be drained across property lines or into County right-of-way, and must be retained on site, per the County Standards.
6.	Prior to occupancy, the Applicant shall complete and submit a Hazardous Materials Business Plan to the Fresno County Department of Public Health, Environmental Health Division, for review and approval. Contact the Certified Unified Program Agency at (559) 600-3271 for more information.
7.	All hazardous waste shall be handled in accordance with requirements set forth in the California Health and Safety Code, Division 20, Chapter 6.5. This chapter discusses proper labeling, storage and handling of hazardous wastes.
8.	Any water wells that exist or that have been abandoned within the project area and not intended for use shall be properly destroyed. The

Notes	
	Applicant shall apply for and obtain a permit(s) to destroy water well(s) from the Fresno County Department of Public Health, Environmental Health Division prior to commencement of work. The destruction and construction of water wells can only be completed by a licensed C-57 contractor.
9.	The Applicant shall obtain and comply with the Regional Water Quality Control Board standards and conditions.
10.	The proposal shall comply with the California Code of Regulations Title 24 Fire Code. The Applicant shall submit three Site Plans, stamped "reviewed" or "approved" from the Fresno County Department of Works and Planning, to the Fresno County Fire Protection District (Fire District) for their review and approval. The Applicant shall submit evidence that their Plan was approved by the Fire District, and all fire protection improvements shall be installed prior to occupancy.
11.	Plans shall be submitted to the Road Maintenance and Operations Division of the Fresno County Department of Public Works and Planning for review and approval for any street improvements at the intersection of the proposed site access driveway and Friant Road.
12.	An Encroachment Permit shall be required from the Road Maintenance and Operations Division of the Fresno County Department of Public Works and Planning for any work performed within the County right-of-way.
13.	Per the Fresno Metropolitan Flood Control District: a. The proposal shall require coverage under the State Industrial General Permit. b. The proposal is subject to the requirements of the Regional Water Quality Control Board Waste Discharge Requirements Order R5-2013-0080 (commonly referred to as "Municipal Permit").

DC:
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EXHIBIT "B"

RESOLUTION NO.: 12431

EXHIBIT "C"

ATTACHMENT
TO
AGENDA ITEM

FISCAL IMPACT STATEMENT

Classified Conditional Use Permit Application No. 3415

Listed below are the fees collected for the land use application involved in this Agenda Item:

Preliminary Environmental Review:	$ 259.00[1]
Classified Conditional Use Permit Application:	$ 4,569.00[2]
Department of Public Health Review:	$ 654.00[3]
Total Fees Collected	**$ 5,482.00**

Fee Description
[1] Includes project routing, coordination with reviewing agencies, review of need to prepare an environmental document or exemption, circulation and incorporation of analysis into Staff Report.
[2] Review and research, engaging with reviewing Departments and multiple agencies, staff's analysis, Staff Report, public hearings before County Planning Commission.
[3] Review of proposal and associated environmental documents by the Department of Public Health, Environmental Health Division, and provision of review comments.

County of Fresno

DEPARTMENT OF PUBLIC WORKS AND PLANNING
ALAN WEAVER, DIRECTOR

Planning Commission Staff Report
Agenda Item No. 5
April 10, 2014

SUBJECT: **Classified Conditional Use Permit Application No. 3415**

Allow the construction of a tertiary-level (Title 22 Standard) wastewater treatment facility to serve the Friant Ranch and greater Friant community, operated by County Waterworks District No. 18 on two parcels totaling 144 acres in the AE-20 (Exclusive Agriculture, 20-acre minimum parcel size) Zone District.

LOCATION: **The subject properties are located on the west side of Friant Road, between its intersection with Bluff View Avenue to the south and Lost Lake Road (entrance to Lost Lake Park) to the north, approximately one mile south of the unincorporated community of Friant (16356 N. Friant Road) (SUP. DIST.: 5) (APNs: 300-160-46 and 51).**

Representative: **Provost and Pritchard Consulting Group, Inc**
Applicant: **Friant Ranch, LP**
Owner: **SWD Investments, Inc**

STAFF CONTACT: **Derek Chambers, Planner**
(559) 600-4205

Bill Carlson, Senior Planner
(559) 600-4569

RECOMMENDATION:

- Approve Classified Conditional Use Permit (CUP) Application No. 3415 with recommended Findings and Conditions; and
- Direct the Secretary to prepare a Resolution documenting the Commission's action.

IMPACTS ON JOB CREATION:

The Commission's action will not have any substantial effect on job creation. Short-term jobs may be realized with construction activities specific to the project.

EXHIBITS:

1. Conditions of Approval and Project Notes
2. Location Map
3. Existing Zoning Map
4. Existing Land Use Map
5. Site Plans
6. Elevations and Details
7. Applicant's Submitted Operational Statement
8. Customized Design Report prepared by PERC Water Corporation

SITE DEVELOPMENT AND OPERATIONAL INFORMATION:

Criteria	Existing	Proposed
General Plan Designation	Sewage Treatment Plant and Agriculture in the County-adopted Friant Community Plan (updated 2011)	No change
Zoning	AE-20 (Exclusive Agriculture, 20-acre minimum parcel size)	No change
Parcel Size	APN 300-160-46: 1.35 acres APN 300-160-51: 142.94 acres	No change
Project Site	Agriculture and reclaimed gravel extraction site	Tertiary-level wastewater treatment facility (membrane bio-reactor with ultraviolet disinfection) to be developed in two phases on a 1.02-acre portion of the subject 142.94-acre parcel (APN 300-160-51). Wastewater received by the facility will be treated to Title 22 Standards and then released to a storage pond with a 475 acre-foot capacity located on the subject 142.94-acre parcel (APN 300-160-51). Treated water from the storage pond will be utilized to irrigate 38 acres of alfalfa cultivated on the subject 142.94-acre parcel (APN 300-160-51), 20 acres of landscaping partially

Criteria	Existing	Proposed
		located on the subject 142.94-acre parcel (APN 300-160-51) and the subject 1.35-acre parcel (APN 300-160-46), and up to 85 acres of landscaping at Friant Ranch. None of the treated water will be discharged to the San Joaquin River. Phase 1 entails the construction of a 25-foot-wide access driveway from Friant Road, parking area with four parking spaces, and a 9,040 square-foot structure which indudes 7,440 square feet for water treatment equipment and 1,600 square feet for an office and laboratory. Phase I will have a wastewater treatment capacity of 0.4 million gallons per day (MGD). Phase 2 entails the construction of a 4,920 square-foot addition to the 9,040 square-foot structure constructed during Phase I which will be utilized for additional water treatment equipment. Phase II will increase the wastewater treatment capacity of the facility by an additional 0.4 MGD (0.8 MGD total wastewater treatment capacity).
Structural Improvements	Single-family residence (to remain); gravel extraction pit; access roads	Wastewater treatment facility totaling 13,960 square feet at full build-out
Nearest Residence	Approximately 500 feet to the east (excluding on-site residences).	No change
Surrounding Development	Lost Lake Recreation Area to the north and west, gravel extraction operation to the south, Friant Road, existing rural single-family subdivision and proposed Friant Ranch Specific Plan development and grazing land to the east	No change
Operational Features	N/A	Wastewater treatment facility to be operated by Waterworks District No. 18 (see "Project Site" above)
Employees	Waterworks District No. 18 currently has five employees	Waterworks District No. 18 will contract with PERC Water Corporation for three

Criteria	Existing	Proposed
		employees to operate the proposed facility.
Customers	N/A	N/A
Traffic Trips	N/A	Approximately 20 one-way trips per day (10 round-trips per day) during construction Approximately six one-way employee trips per day (three round-trips per day) Monday through Friday, year-round Approximately two one-way employee trips per day (one round-trip per day) on weekends and holidays, year-round Approximately 16 one-way truck trips per month (eight round-trips per month) year-round for chemical delivery Approximately 16 one-way truck trips per month (eight round-trips per month) year-round for maintenance Up to 24 one-way truck trips per month (12 round-trips per month) year-round for sludge disposal
Lighting	Residential lighting	Exterior lighting around the facility and at the lift station, recycled water storage pond and gates – all lighting proposed to be shielded and directed downwards
Hours of Operation	N/A	24 hours per day, 365 days a year

EXISTING VIOLATION (Y/N) AND NATURE OF VIOLATION: No

ENVIRONMENTAL DETERMINATION:

Public Resources Code Section 21166 and California Environmental Quality Act (CEQA) Guidelines, Section 15162(a) provide that when an Environmental Impact Report (EIR) has been certified for a project, that no subsequent or supplemental EIR shall be prepared unless the lead agency determines, on the basis of substantial evidence in light of the whole record, one or more of the following has occurred: (1) substantial changes are proposed in the project which require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; (2) substantial changes have occurred with respect to the circumstances under which the project is undertaken, which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of

previously identified significant effects; and 3) new information of substantial importance which was not known and could not have been known with the exercise of reasonable diligence at the time the EIR was certified as complete has become available.

On February 1, 2011 the Fresno County Board of Supervisors certified the Final EIR (SCH No. 2007101016) for the Friant Community Plan Update and Friant Ranch Specific Plan. The subject wastewater treatment plant application was identified and assessed in the EIR. The proposed wastewater treatment facility was routed under the provisions of 15162 and no reviewing agency requested or indicated the need for subsequent environmental work related to the wastewater treatment facility. It has been determined that none of the circumstances set forth in the CEQA Guidelines Sections 15162 and 15163 mandating preparation of a subsequent environmental review apply to the subject application.

PUBLIC NOTICE:

Notices were sent to 28 property owners within 1,320 feet of the subject properties, exceeding the minimum notification requirements prescribed by the California Government Code and County Zoning Ordinance.

PROCEDURAL CONSIDERATIONS:

Sewage disposal and treatment plants are permitted in the Exclusive Agriculture Zone District subject to approval of a Classified Conditional Use Permit (CUP) per Zoning Ordinance Section 816.3.L. A CUP Application may be approved only if four Findings specified in Zoning Ordinance Section 873-F are made by the Planning Commission.

The decision of the Planning Commission on a CUP Application is final unless appealed to the Board of Supervisors within 15 days of the Commission's action.

BACKGROUND INFORMATION:

The proposed wastewater treatment facility represents an alternative location considered in the Friant Community Plan Update and its associated Environmental Impact Report (EIR) that was approved by the Fresno County Board of Supervisors in February of 2011. The proposed project site is located on a portion of a 150-acre former gravel extraction site. At least four discretionary land use permits associated with gravel extraction were approved for the site between 1984 and 2003. The Friant Ranch Specific Plan, approved for approximately 942 acres northeast of the wastewater treatment plant site, is an active adult community (ages 55+) proposed for approximately 2,500 residential service connections plus a village commercial center and community recreation center.

Phases 1 and 2 of the proposal would include development of 1.02-acres for a tertiary-level wastewater treatment facility (membrane bio-reactor with ultraviolet disinfection) and office/laboratory building totaling 13,960 square feet at full build-out. Other improvements would indude improved access and parking area, fencing, lighting and landscaping.

The facility would be designed to initially serve the residential and commercial areas approved within the Friant Ranch Specific Plan and the existing Millerton Lake Mobile Home Park, which would approximate 2,600 residential units of varying sizes and densities. Ultimate build-out of the facility could accommodate 0.8 million gallons per day (MGD) of flows which could

potentially serve the entire community of Friant. As is typical for a wastewater treatment facility, the plant will operate 24 hours per day, seven days a week, year-round. The facility will be fully automated with SCADA (Supervisory Control and Data Acquisition) and control systems to provide remote notification to on-call Waterworks District No. 18 staff that has offices in the community of Friant.

Water treatment at the plant will meet Title 22 standards for unrestricted use in a volume at build-out estimated to be 896 acre-feet annually. Recycled water reuse areas will include Beck Ranch and the Friant Ranch Specific Plan area. No recycled water will be discharged into the San Joaquin River.

Background documents associated with the Friant Ranch Community Plan update and the Friant Ranch Specific Plan, including the certified Environmental Impact Report (EIR), Community Plan Update, new Specific Plan and the Board of Supervisors' February 1, 2011 approval action, are loaded on the County's web site at http://www.co.fresno.ca.us/departmentpage.aspx?id=4238.

ANALYSIS/DISCUSSION:

Finding 1: *The site of the proposed use is adequate in size and shape to accommodate said use and all yards, spaces, walls and fences, parking, loading, landscaping, and other features required by this Division, to adjust said use with land and uses in the neighborhood.*

	Current Standard:	**Proposed Operation:**	**Is Standard Met (y/n)**
Setbacks	Front: 35 feet Side: 20 feet Rear: 20 feet	Proposed improvements will be in excess of all required setbacks.	Yes
Parking	One standard parking space for each two employees – applicable to the maximum number of employees on duty at any one time; one parking space for the disabled for every 40 parking spaces required	Two standard parking spaces; two parking spaces for the disabled	Yes – final parking layout and space requirements will be evaluated during the Site Plan Review (SPR) required as a Condition of Approval
Lot Coverage	No requirement	N/A	N/A
Separation Between Buildings	75-foot separation between structures for human habitation and structures for housing livestock	N/A	N/A
Wall Requirements	No requirement	N/A	N/A
Septic Replacement	100 percent	N/A	N/A

	Current Standard:	Proposed Operation:	Is Standard Met (y/n)
Area			
Water Well Separation	Sewer/septic tank: 50 feet; disposal field: 100 feet; seepage pit/cesspool: 150 feet	N/A	N/A

Reviewing Agency/Department Comments Regarding Site Adequacy:

Zoning Section of the Fresno County Department of Public Works and Planning: The proposed improvements satisfy the minimum setback requirements of the AE-20 Zone District. Completion of a Site Plan Review (SPR) is recommended to ensure adequate area for parking and circulation.

Site Plan Review Section of the Fresno County Department of Public Works and Planning: The driveway shall be graded and concrete or asphalt concrete paved for the first 100 feet off of the edge of the ultimate right-of-way. If just the driveway is intended to be paved then adequate vehicle barriers shall be provided along the edges of the driveway to ensure that vehicles leaving the site travel the entire 100 feet of surfacing before entering Friant Road. These requirements have been included as Conditions of Approval.

No other comments specific to the adequacy of the site were expressed by reviewing Agencies or Departments.

Analysis:

The project site was previously utilized with a gravel extraction operation, and has been improved with two single-family residences and three storage buildings. Improvements related to the proposed wastewater treatment and disposal facility include an influent lift station, a head works, and recycled water storage pond. Staff review of the submitted Site Plans (Exhibit 5) demonstrates that the proposed improvements exceed minimum building setback requirements of the AE-20 Zone District. In regard to off-street parking, the Zoning Ordinance requires one standard parking space for each two employees, applicable to the maximum number of employees on duty at any one time, and one parking space for the disabled for every 40 parking spaces required. As Waterworks District No. 18 will contract with PERC Water Corporation for three employees to operate the proposed facility, two parking spaces are required with at least one of the required parking spaces being provided for the disabled. The Applicant proposes to provide two standard parking spaces and two parking spaces for the disabled.

Based on the above information and with adherence to an SPR, which shall be required as a Condition of Approval, staff believes the site is adequate to accommodate the proposed use, vehicle circulation, and ingress/egress.

Recommended Conditions of Approval:

- *See Conditions of Approval and Project Notes, attached as Exhibit 1.*

Conclusion:

Finding 1 can be made.

Finding 2: *The site for the proposed use relates to streets and highways adequate in width and pavement type to carry the quantity and kind of traffic generated by the proposed use.*

		Existing Conditions	Proposed Operation
Private Road	No	N/A	N/A
Public Road Frontage	Yes	Friant Road: Good condition	No change
Direct Access to Public Road	Yes	Friant Road	One proposed site access point from Friant Road
Road ADT		Friant Road: 8,000	Minimal traffic increase
Road Classification		Friant Road: Expressway	No change
Road Width		Friant Road: Variable	No change
Road Surface		Friant Road: Paved (pavement width: 68 feet)	No change
Traffic Trips		N/A	Approximately 20 one-way trips per day (10 round-trips per day) during construction Approximately six one-way employee trips per day (three round-trips per day) Monday through Friday, year-round Approximately two one-way employee trips per day (one round-trip per day) on weekends and holidays, year-round Approximately 16 one-way truck trips per month (eight round-trips per month) year-round for chemical delivery Approximately 16 one-way truck trips per month (eight round-trips per month) year-round for maintenance Up to 24 one-way truck trips per month (12 round-trips per month) year-round for sludge disposal
Traffic Impact Study	No	N/A	None required as the proposed

		Existing Conditions	Proposed Operation
(TIS) Prepared			use will generate insignificant traffic trips
Road Improvements Required		N/A	None required

Reviewing Agency/Department Comments:

Design Division of the Fresno County Department of Public Works and Planning: No concerns with the proposal.

Development Engineering Section of the Fresno County Department of Public Works and Planning: Friant Road is a County-maintained road with a variable right-of-way. Due to Friant Road being classified as an expressway, Friant Road has an ultimate right-of-way of 126 feet at the project site, with 63 feet east and 63 feet west of the center line.

Road Maintenance and Operations Division of the Fresno County Department of Public Works and Planning: Plans shall be submitted to the Road Maintenance and Operations Division for review and approval for any street improvements at the intersection of the proposed site access driveway and Friant Road. An Encroachment Permit shall be required from the Road Maintenance and Operations Division for any work performed within the County right-of-way. These requirements have been included as Project Notes.

No other comments specific to the adequacy of streets and highways were expressed by reviewing Agencies or Departments.

Analysis:

The project site will gain access from Friant Road via a proposed 25-foot wide partially-paved access driveway from Friant Road.

This application entails the construction of a new wastewater treatment facility on the site of a former gravel extraction operation. Once construction is complete, operations and maintenance traffic will be minimal. Information provided in the operational statement indicates the plant will average approximately six one-way employee trips per day (three round-trips per day) Monday through Friday, year-round; approximately two one-way employee trips per day (one round-trip per day) on weekends and holidays, year-round; approximately 16 one-way truck trips per month (eight round-trips per month) year-round for chemical delivery; approximately 16 one-way truck trips per month (eight round-trips per month) year-round for maintenance; and up to 24 one-way truck trips per month (12 round-trips per month) year-round for sludge disposal.

Based on the above information, and with adherence to the Project Notes described above, staff believes that the portion of Friant Road at the project site will remain adequate to accommodate the proposed use.

Recommended Conditions of Approval:

None.

Conclusion:

Finding 2 can be made.

Finding 3: *The proposed use will have no adverse effect on abutting property and surrounding neighborhood or the permitted use thereof.*

Surrounding Parcels				
	Size:	**Use:**	**Zoning:**	**Nearest Residence:**
North:	112 acres	Lost Lake Recreation Area	AE-20	None
South:	170 acres 12 acres	Existing gravel extraction operation	AE-20	None
East:	1.7 to 47 acres	Single-Family Residences, Grazing Land, Friant Ranch Specific Plan area	AE-20, AC, Friant Ranch Specific Plan Zoning Districts	500 feet
West:	106 acres	Lost Lake Recreation Area	AE-20	None

Reviewing Agency/Department Comments:

Fresno County Department of Agriculture (Agricultural Commissioner's Office): No concerns with the proposal.

San Joaquin Valley Unified Air Pollution Control District (Air District): The Air District previously commented on the Environmental Impact Report (EIR). As the EIR did not include a Health Risk Assessment (HRA), the Air District recommends that potential health risks be further reviewed when approving all future projects within the scope of the EIR and recommends that a Health Risk Assessment be completed. This requirement has been included as a Condition of Approval. Further, this project may also be subject to the following Air District Rules: Regulation VIII (Fugitive PM10, Prohibitions), Rule 4102 (Nuisance), Rule 4601 (Architectural Coatings), Rule 4641 (Cutback, Slow Cure, and Emulsified Asphalt Paving and Maintenance Operations) and District Rule 4002 (National Emission Standards for Hazardous Air Pollutants) in the event an existing building will be renovated, partially demolished or removed.

Consolidated Mosquito Abatement District (CMAD): CMAD requests the following requirements: 1) any and all water, recycled or fresh, applied to the alfalfa, grasslands, and landscaping shall infiltrate within 48 hours of the application (shorter than minimum mosquito development time); 2) pond water depth shall be maintained in excess of four feet to preclude invasive emergent vegetation such as cattails; 3) vegetation associated with impounded water promotes mosquito breeding, and the production of mosquitoes constitutes a public nuisance (pond edges shall be maintained free of excess vegetation to prevent harborage for mosquito breeding and so that mosquito fish and other predators are not inhibited); and 4) free and unencumbered access to the pond perimeter for vehicle and foot traffic shall be provided for inspection and mosquito control activities. These requirements have been included as Conditions of Approval.

Development Engineering Section of the Fresno County Department of Public Works and Planning: According to the Federal Emergency Management Agency (FEMA) FIRM Panel 1030H, the subject property is not subject to flooding from the 100-year storm. An Engineered Grading and Drainage Plan shall be required to show how the additional storm water run-off generated by the proposed development will be handled without adversely impacting the adjoining parcels. A Grading Permit or Voucher shall be required for any grading proposed with this application. Any additional run-off generated by the proposed development shall be retained on site per the County Standards. These requirements have been included as Project Notes.

Fresno County Department of Public Health, Environmental Health Division: Prior to occupancy, the applicant shall complete and submit a Hazardous Materials Business Plan to the Fresno County Department of Public Health, Environmental Health Division for review and approval. All hazardous waste shall be handled in accordance with requirements set forth in the California Health and Safety Code, Chapter 6.5. Any water wells that exist or that have been abandoned within the project area and not intended for future use shall be properly destroyed. The applicant shall apply for and obtain a permit(s) to destroy water well(s) from the Fresno County Department of Public Health, Environmental Health Division prior to commencement of work. These requirements have been included as Project Notes.

California Regional Water Quality Control Board (CRWQCB): No concerns with the proposal, as the project is within the scope of EIR No. 5481. Tentative Waste Discharge Requirements (WDRs) are being drafted for the proposed discharge by CRWQCB staff. The tentative WDRs will indude operation and monitoring requirements for the wastewater treatment facility.

Fresno County Fire Protection District (Fire District): Any development associated with this proposal shall comply with the California Code of Regulations Title 24 Fire Code. Subsequent to County approval, copies of the approved Site Plan shall be submitted to the Fire District for review and approval. This requirement has been included as a Project Note.

California Department of Public Health (CDPH), Drinking Water Field Operations Branch: No concerns with the proposal, as the project is within the scope of EIR No. 5481.

Fresno Metropolitan Flood Control District (FMFCD): The proposal shall require coverage under the State Industrial General Permit. The proposal is subject to the requirements of the Regional Water Quality Control Board Waste Discharge Requirements Order R5-2013-0080 (commonly referred to as "Municipal Permit"). These requirements have been included as Project Notes.

Analysis:

The proposed tertiary-level wastewater treatment facility (membrane bio-reactor with ultraviolet disinfection) is to be developed in two phases on a 1.02-acre portion of the subject 142.94-acre parcel (APN 300-160-51). Wastewater received by the facility will be treated to Title 22 Standards and then released to a storage pond with a 475 acre-foot capacity located on the subject 142.94-acre parcel (APN 300-160-51). Treated water from the storage pond will be utilized to irrigate 38 acres of alfalfa cultivated on the subject 142.94-acre parcel (APN 300-160-51), 20 acres of landscaping partially located on the subject 142.94-acre parcel (APN 300-160-51) and the subject 1.35-acre parcel (APN 300-160-46), and up to 85 acres of landscaping at Friant Ranch. None of the treated water will be discharged to the San Joaquin River.

Phase 1 of the development entails the construction of a 25-foot-wide access driveway from Friant Road, a parking area with four parking spaces, and a 9,040 square-foot structure which includes 7,440 square feet for water treatment equipment and 1,600 square feet for an office and laboratory. Phase I will have a wastewater treatment capacity of 0.4 million gallons per day (MGD).

Phase 2 entails the construction of a 4,920 square-foot addition to the 9,040 square-foot structure constructed during Phase I which will be utilized for additional water treatment equipment. Phase II will increase the wastewater treatment capacity of the facility by an additional 0.4 MGD (0.8 MGD total wastewater treatment capacity).

The Customized Design Report prepared by PERC Water Corporation provides detailed background information on the proposed wastewater treatment facility (Exhibit 8).

Individual project components as they relate to Finding No. 3 are discussed below:

Effluent and Retention

The facility as proposed is designed so as to operate without a raw effluent intake regulation basin. Instead, the main sewer colection line can store up to 17,500 gallons of wastewater and the influent lift station has a 4,200 gallon storage capacity below the influent line. Further, the volume available in treatment tanks will be provided for twice the daily amount of flow (800,000 gallons). In combination, an excess of 820,000 gallons for storage will be available which will provide for over 24 hours of regulation space; thus, even with a treatment facility failure, the treatment process will not be interrupted.

A diesel back-up generator will address issues associated with power outages. In the event of a tank leak, wastewater would be delivered through the facility drain system to the influent lift station. In the unlikely event of a catastrophic failure in which every concrete tank failed, the facility would retain 90% of the treatment capacity due to the construction of the tank walls which are below ground surface for the majority of the planned liquid depth. If liquid not stored in a submerged tank were to flow out of the facility, gravity would cause the water to move to the storm water retention basin on the east side of the facility.

The property slopes toward the proposed effluent storage pond, which is the lowest point on the property and is approximately 2,000 feet east of the San Joaquin River. Earthen berms 12-15 feet above the high water line of the pond are located north and west of the property. A hydrogeological report for the area found no hydraulic connection between the pond and river and the facility will be graded to drain toward a storm drainage retention basin which cannot drain off the property.

It is initially anticipated that chemicals will be stored in 55 gallon drums. Eventually, 300 gallon totes may also be utilized once the facility is developed to full capacity. The County's Environmental Health Division of the Department of Public Health has stated that prior to occupancy, the applicant shall complete an online Hazardous Materials Business Plan submittal and that all hazardous waste shall be handled in accordance with requirements set forth in the California Health and Safety Code, Chapter 6.5. These mandatory requirements have been included as Project Notes.

Monitoring

Three groundwater monitoring wells will be provided per the Waste Discharge Requirements issued by the California Regional Water Quality Control Board.

Monitoring of four on-site domestic wells will occur per requirements imposed by the Fresno County Department of Public Health, Environmental Health Division, and the California Department of Public Health.

Vectors, Odors, and Lighting

There is no anticipation of a pest issue at the facility and the remainder of the property not specifically associated with the treatment facility will primarily be agricultural land, farmed in accordance with applicable laws and contemporary management practices. The wastewater treatment process will be an enclosed process to insure the avoidance of vector attraction. Facility lighting is not expected to require insect control and will be hooded and directed away from surrounding properties. An Operations and Maintenance Manual which includes procedures for maintenance of the pond slopes will be prepared as part of the construction documents for this facility. The pond slopes will be graded at least annually for weed control, and the pond bottoms will be disked semi-annually.

The reclaimed water storage pond will be monitored by the Consolidated Mosquito Abatement District (District). To address potential vector concerns, the District has requested: 1) any and all water, recycled or fresh, applied to the alfalfa, grasslands, and landscaping shall infiltrate within 48 hours of the application; 2) pond water depth must be maintained in excess of four feet to preclude invasive emergent vegetation such as cattails; 3) vegetation associated with impounded water promotes mosquito breeding and the production of mosquitoes constitutes a public nuisance. Pond edges must be maintained free of excess vegetation to prevent harborage for mosquito breeding and so that mosquito fish and other predators are not inhibited; 4) free and unencumbered access to the pond perimeter for vehicle and foot traffic must be provided for inspection and mosquito control activities. These requirements have been included as Conditions of Approval.

Odors will be controlled in the sludge tanks through a centrifuge, which will remove sludge from the holding tank and dewater it to a concentration of 20 to 22 percent solids. At the head works inside the treatment building, a screen will remove materials such as floatables which will be collected by a screening washer and compactor that will remove most water and place the screened material into a bin for collection. This is an enclosed system within the treatment building and air collected in the screen space is treated for odor in a bio-filter system.

Noise

As the treatment system and most of its associated mechanical equipment will be located within a building, and a sound enclosure will buffer noise from the diesel back-up generator, mechanical noise will be buffered from the surrounding undeveloped natural areas.

Aesthetics

The plant will be enclosed in a building designed in a ranch style (see Exhibit 6) on a one-acre site. The building will be of a size and scale similar to other barns and houses in the area, and will conform to the AE-20 (Exclusive Agriculture) Zone District building height restrictions which

are 35 feet. As designed, the building will visually block the two silo-style 30,000 gallon storage tanks proposed to be 24 feet high and each 15.5 feet in diameter located to the west. This will also assist in screening views from Friant Road. Views of the site from the north (Lost Lake Park entrance road) and west (San Joaquin River Conservancy lands) are blocked by existing earthen berms that extend around the property.

As will be discussed in Finding No. 4, Friant Road is a designated scenic roadway in the Fresno County General Plan. As proposed, buildings will comply with the Scenic Highway Designation for this portion of Friant Road that requires a 200-foot setback for development from the right-of-way (Fresno County General Plan; Open Space and Conservation Element; Goal OS-L.3 – Scenic Road Management).

Mitigation Monitoring and Prior CEQA Action

As indicated under the Environmental Determination section above, the Final EIR (SCH No. 2007101016) for the Friant Community Plan Update and Friant Ranch Specific Plan was certified by the Fresno County Board of Supervisors on February 1, 2011. Through that certification process, a Mitigation Monitoring Program was adopted which contains in excess of 120 specific mitigation measures.

Several of these mitigation measures are directly applicable to the proposed wastewater treatment facility. These include:

> ***Mitigation Measure #3.14.3a:*** *All new development in the Friant Community Plan area, inclusive of the Friant Ranch Specific Plan, shall comply with Fresno County General Plan policy PF-D.2, which requires that any new community sewer and wastewater treatment facilities serving residential subdivisions be owned and maintained by a County Service Area or other public entity approved by the County, such as Waterworks District No. 18.*
>
> ***Mitigation Measure #3.14.3b:*** *Adequately-sized on-site collection facilities, including lift stations, shall be installed for each subdivision in the Specific Plan area concurrent with road construction for individual subdivisions. A "backbone" conveyance system sufficient to serve each subdivision shall be installed prior to issuance of building permits for that subdivision.*
>
> ***Mitigation Measure #3.14.3c:*** *Wastewater collection, treatment and disposal of the Friant Ranch Specific Plan Area shall adhere to Section VI of the Friant Ranch Infrastructure Master Plan. The applicant and/or WWD 18 must demonstrate adherence to Section VI of the Friant Ranch Infrastructure Master Plan prior to issuance of an occupancy permit for development within the Friant Ranch Specific Plan Area.*
>
> ***Mitigation Measure #3.14.3d:*** *Commitments from the wastewater treatment provider to receive anticipated flows from the Friant Ranch Specific Plan Area and Millerton Lake Village Mobile Home Park at the WWTP shall be secured by Fresno County prior to County approval of improvement plans for wastewater collection and transmission infrastructure.*
>
> ***Mitigation Measure #3.14.3e:*** *Prior to issuance of building permits for each increment of new development within the Project Area, the County shall confirm that all necessary*

permits (e.g., NPDES) are in place for the WWTP to discharge additional treated effluent in the amounts associated with new development. This shall include a determination that development timing shall not impede other development for which entitlements have been issued.

***Mitigation Measure #3.14.3f**: Prior to approval of improvement plants and wastewater collection and infrastructure, the applicant must demonstrate to the County that on- and off-site sewer pipelines shall have watertight joints and be in accordance with design standards adopted by Fresno County in order to minimize the potential for accidental discharge.*

***Mitigation Measure #3.14.3g**: The design plans for the WWTP shall incorporate appropriate and cost-effective odor and noise reduction measures as described in the Infrastructure Master Plan, to the satisfaction of the Fresno County Public Works and Planning Department prior to issuance of the conditional use permit for the WWTP.*

The design and treatment level of the proposed wastewater treatment facility has taken these measures into consideration.

An electronic copy of the adopted Mitigation and Monitoring program was distributed to the Planning Commission with staff report distribution. Copies were also made available on the County website through links provided in the Commission Agenda.

Recommended Conditions of Approval:

- *See Conditions of Approval and Project Notes, attached as Exhibit 1.*

Conclusion:

Finding 3 can be made.

Finding 4: The proposed development is consistent with the General Plan.

Relevant Policies:	**Consistency/Considerations:**
General Plan Policy LU-A.3 (Agriculture and Land Use): allows agriculturally-related uses by discretionary permit provided that they meet the following criteria: a. The use provides a needed service to the surrounding agricultural areas which cannot be provided more efficiently within urban areas. b. The use should not be sited on productive agricultural lands if less productive land is available in the vicinity.	In reference to criteria "a" and "b", the subject site is not currently in agricultural production and no concerns with the proposal were expressed by the Fresno County Agricultural Commissioner. Portions of the site are designated as Vacant or Disturbed Land, Farmland of Local Importance, and Nonagricultural and Natural Vegetation on the County's Important Farmland Map 2010 and is not subject to an Agricultural Land Conservation (Williamson Act) Contract. Based on historical use of the site for a gravel extraction site, staff believes that the proposal is consistent with these criteria. In reference to criteria "c" and General Plan Policy PF-C.17, the County Water/Geology/

Relevant Policies:	Consistency/Considerations:
c. The use shall not have a detrimental impact on water resources or management of properties within a ¼-mile radius. d. A probable workforce should be located nearby or be readily available. General Plan Policy PF-C.17: County shall undertake a water supply evaluation, including determinations of water supply adequacy, impact on other water users in the County, and water sustainability.	Natural Resources Unit and Regional Water Quality Control Board did not express any concerns with the proposal related to impacts on water resources. The project does not require additional water usage and is consistent with criteria "c" and Policy PF-C.17. In reference to criteria "d", the proposal will not increase employees. A workforce for the continued operation of the facility is located in the nearby community of Friant and the City of Fresno to the south.
General Plan Policy PF-D.3: The County shall require that any new community wastewater treatment facility meet the policy standard of Policy OS-A.28. General Plan Policy OS-A.28: The County shall only approve new wastewater treatment facilities that will not result in degradation of surface water or groundwater. The County shall generally require treatment to tertiary or higher levels.	The proposed wastewater treatment plant will be a new facility that will treat wastewater to tertiary levels for dispersion on crop land (alfalfa) within the wastewater treatment plant site and for distribution within the Friant Ranch Specific Plan area. The EIR prepared for the Friant Community Plan update and the Friant Ranch Specific Plan determined that establishment of the wastewater treatment facility on the subject property would not result in the degradation of surface water or groundwater.
General Plan Policy PF-D.5: The County shall promote efficient water use and reduced wastewater system demand by: a. Requiring water-conserving design and equipment in new construction; b. Encouraging retrofitting with water-conserving devices; and c. Designing wastewater systems to minimize inflow and infiltration, to the extent economically feasible.	Potable water for the Friant Ranch community will be provided by surface water allotments and services through Waterworks District No. 18. As indicated in the certified EIR, updated Community Plan and adopted Specific Plan, new development will be designed with water conservation measures. Conjunctive reuse of tertiary water is a key component of those plan documents as well as for irrigation and common landscaping areas within the Specific Plan boundary.
General Plan Policy PF-D.7: The County shall require preparation of sewer master plans for wastewater treatment facilities for areas experiencing urban growth.	As part of the Friant Ranch Specific Plan review process, a Friant Ranch Infrastructure Master Plan was prepared. Further, a customized design report was prepared for the wastewater treatment facility as part of the land use submittal package. Mitigation measures associated with the Community and Specific Plan EIR address adherence to Section IV of the Friant Ranch

Relevant Policies:	Consistency/Considerations:
	Infrastructure Master Plan regarding wastewater collection, treatment and disposal.
General Plan Policy OS-A.29: In areas with increased potential for groundwater degradation (*e.g.*, areas with prime percolation capabilities, coarse soils, and/or shallow groundwater), the County shall only approve land uses with low risk of degrading groundwater.	The alternative wastewater treatment facility location was selected based on an environmentally-superior location. Groundwater studies have indicated no hydrogeological connection between the proposed treatment plant site and the San Joaquin River. The Plant will take advantage of existing topography of the former gravel extraction site for containment, and water will be treated to Title 22 levels with no discharges to the San Joaquin River.
General Plan Policy OS-L.3: The County shall manage the use of land adjacent to scenic drives and scenic highways based on the listed principles, including intensive land development proposals that shall be designed to blend into the natural landscape and minimize visual scarring of vegetation and terrain. The design of said development proposals shall also provide for maintenance of a natural open space area two hundred (200) feet in depth parallel to the right-of way with modification permitted based on topographic or vegetative characteristics that preclude such a setback or provide screening.	The wastewater treatment facility proposes all new structural improvements to be set back a minimum of 200 feet from the Friant Road right-of-way. Further, the site will utilize existing berming and landscaping, as well as new landscaping and architectural treatments, to meet or exceed the requirements of this policy.
Friant Community Plan Public Facility and Service Element (PFSE) Policy 1.1: Explore financing and methods for construction of public sewage systems, and plan for such systems in areas slated for new development, as well as in existing developments experiencing repeated septic systems failures.	The proposed wastewater treatment facility will be initially established for the Friant Ranch Specific Plan Area and the Millerton Lake Mobile Home Park. Development within the Specific Plan Area will provide initial financing for the wastewater treatment facility. The facility will be designed to ultimately serve the larger Friant community with ability for infrastructure buy-in/connection for those properties not yet served by community sewer services.
Friant Community Plan PFSE Policy 1.2: Provide new sewer service to promote commercial expansion and economic recreation development where feasible.	Through serving development within the County-adopted Friant Ranch Specific Plan, commercial and recreational development will be established which will in turn meet this policy.
Friant Community Plan PFSE Policy 1.3: Allow connections to new sewer service as	The proposed wastewater treatment facility will be designed to be an expandable facility with the

Relevant Policies:	Consistency/Considerations:
a collector system and service becomes available.	ability to ultimately serve the unincorporated community of Friant.
Friant Community Plan PFSE Policy 1.4: Locate the wastewater treatment facility away from incompatible land uses and screen the facility with landscaping.	The location of the proposed treatment facility provides separation from more intensive commercial development within the Specific Plan area, utilizing a former gravel extraction site with topography suited to containment and screening. The facility will utilize existing berming and landscaping, and provide additional landscaping and architectural treatments to further improve aesthetics and meet the requirements of this policy.
Friant Community Plan PFSE Policy 1.5: Minimize odors by requiring that the wastewater treatment facility incorporate effective odor-reduction and containment technologies.	The facility will utilize an enclosed process with odor control and sludge processing measures to meet this policy.
Friant Community Plan PFSE Policy 1.6: Encourage utilization of wastewater treatment facilities that provide for the reuse of wastewater for uses such as landscape watering, etc.	The facility is designed to provide Title 22 tertiary-level water for reuse on the subject property and landscaped and open space areas within the Friant Ranch Specific Plan.

Reviewing Agency Comments:

Policy Planning Unit of the Development Services Division: The proposal is subject to County General Plan Policies PF-D.3, PF-D.5, PF-D.7 from the Public Facilities Element of the General Plan, and Policies OS-A.28 and OS-A.29 from the Open Space and Conservation Element of the General Plan. Those policies and their considerations are outlined in the above table. The property is not subject to a Williamson Act Land Conservation Contract.

Analysis:

The General Plan allows the subject proposal in the area designated Agriculture provided that it substantially adheres to Policy LU-A.3, criteria a. b. c. d, and Policy PF-C.17. The project site historically has been used as a gravel extraction facility and will be designed to be an enclosed facility with built-in containment to serve both the Friant Ranch Specific Plan area and the Friant community. The disposal of wastewater has site requirements and operational characteristics appropriate for a non-urban area. The table above summarizes specific Policy criteria which are met by this proposal.

The subject property is on the west side of Friant Road. This section of Friant Road, from the City of Fresno to Lost Lake Road, is designated a scenic highway in the County's General Plan. Policy OS-L.3 of the County's General Plan Policy Document states that intensive land development proposals adjacent to scenic highways shall be designed to blend into the natural landscape and minimize visual scarring of vegetation and terrain. In addition, the design of

these development proposals shall provide for maintenance of a natural open space area two hundred feet in depth parallel to the right-of-way.

Prior aesthetic impacts related to the gravel extraction operation were identified in a 1987 EIR prepared for the surfacing mining project. Pursuant to that EIR and conditions of approval of the related Conditional Use Permit, a visual buffer between Friant Road and excavation activities was provided through the installation of berms between 10 and 15 feet in height, adjacent to portions of Friant Road within a 50-foot landscaped setback. Portions of existing orchards adjacent to Friant Road were also retained and additional trees planted along sections of Friant Road, consistent with the requirements of the previous land use applications. The current wastewater treatment plant project proposes that structural improvements be set back a minimum of 200 feet from Friant Road, and that architectural treatments and position of the building, in conjunction with the use of existing berming, landscaping and new landscaping treatments, will address this policy. Staff review of the site plan, elevations and existing conditions has concluded that as proposed, the current project will meet the policy requirements.

The selected site and design for the wastewater treatment facility, as well as the type of treatment processes proposed, meet both County General Plan and County-adopted Friant Community Plan policies for wastewater treatment facilities. Given these considerations, staff believes this proposal is consistent with the aforementioned General Plan Policies. Finding 4 can be made.

Recommended Conditions of Approval:

None.

Conclusion:

Finding 4 can be made.

CONCLUSION:

Staff believes the required findings for granting Classified Conditional Use Permit Application No. 3415 can be made based on the factors cited in the analysis and the recommended Conditions of Approval and Project Notes regarding mandatory requirements. Staff therefore recommends that the project be approved subject to the recommended Conditions.

PLANNING COMMISSION MOTIONS:

Recommended Motion (approval action)

- Move to determine the required Findings can be made and move to approve Classified Conditional Use Permit Application No. 3415, subject to the Conditions and Notes listed below; and

- Direct the Secretary to prepare a Resolution documenting the Commission's action.

Alternative Motion (denial action)

- Determine that the required Findings cannot be made (state which Finding[s] and reason[s]) and move to deny Classified Conditional Use Permit Application No. 3415; and

- Direct the Secretary to prepare a Resolution documenting the Commission's action.

Recommended Conditions of Approval and Project Notes:

See attached Exhibit 1.

CM:dc:ksn
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Exhibit - 1
CLASSIFIED CONDITIONAL USE PERMIT (CUP) APPLICATION NO. 3415
(CONDITIONS OF APPROVAL AND PROJECT NOTES)

	Conditions of Approval
1.	Development of the property shall be in accordance with applicable mitigation measures as listed in the Mitigation and Monitoring Program approved as part of the certified and adopted Friant Ranch Community Plan Update and Friant Ranch Specific Plan Environmental Impact Report (State Clearinghouse No. 2007101016), and the Site Plans, Floor Plans, Elevations, and Operational Statement as approved by the Commission. Applicable mitigation measures are those directly addressing the wastewater treatment facility.
2.	Wastewater discharge to the San Joaquin River shall be prohibited.
3.	Prior to occupancy, a Site Plan Review shall be submitted to and approved by the Department of Public Works and Planning in accordance with Section 874 of the Fresno County Zoning Ordinance. Conditions of the Site Plan Review may include, but are not limited to: design of parking and circulation areas, access, on-site grading and drainage, fire protection, landscaping, signage, lighting and right-of-way dedication.
4.	As part of the Site Plan Review Application the following shall be addressed: a. The type of paving and dimensioned layout of spaces, backup clearance and internal circulation pattern shall be detailed on final plans. b. The number of parking spaces and ADA accessible spaces will be reviewed with final site plan review. c. The driveway shall be graded and concrete or asphalt concrete paved for the first 100 feet off of the edge of the ultimate right-of-way. If just the driveway is intended to be paved then adequate vehicle barriers shall be provided along the edges of the driveway to ensure that vehicles leaving the site travel the entire 100 feet of surfacing before entering Friant Road.
5.	A copy of the facility's Tentative Waste Discharge Requirements (WDR's) as drafted by the California Regional Water Quality Control Board (CRWQCB) shall be submitted with the Site Plan Review. Evidence of approval of the WDR's by the CRWQCB shall be submitted prior to commencement of operations.
6.	A landscaping and irrigation plan shall be submitted with the Site Plan Review to provide a level of visual screening of the proposed facility. Drought-tolerant landscaping shall be utilized and shall be designed to blend-in with existing landscaping and site berming.
7.	A painting scheme and materials design sheet shall be submitted for review and approval by the Director of Public Works and Planning or his designee at the time of filing a Site Plan Review.
8.	As part of the Site Plan Review the applicant shall submit to the San Joaquin Valley Unified Air Pollution Control District (Air District) a Health Risk Assessment (HRA) acceptable to the Air District. The Air District, through review of the HRA may indicate additional

	conditions that the developer shall implement to reduce potential health impacts associated with the wastewater treatment plant.
9.	Per the Consolidated Mosquito Abatement District the developer shall: a. Insure that any and all water, recycled or fresh, applied to the alfalfa, grasslands, and landscaping shall infiltrate within 48 hours of the application (shorter than minimum mosquito development time). b. Maintain pond water depth in excess of four feet to preclude invasive emergent vegetation such as cattails. c. Pond edges shall be maintained free of excess vegetation to prevent harborage for mosquito breeding and so that mosquito fish and other predators are not inhibited. d. Free and unencumbered access to the pond perimeter for vehicle and foot traffic must be provided for inspection and mosquito control activities.
10.	All lighting shall be hooded and directed as to not shine towards adjacent properties and public streets.

Conditions of Approval reference recommended Condition for the project.

Notes	
The following Notes reference mandatory requirements of Fresno County or other Agencies and are provided as information to the project Applicant.	
1.	This permit shall become void unless there has been substantial development within two years of the effective date of this approval.
2.	The project may be subject to the San Joaquin Valley Unified Air Pollution Control District Regulation VIII - (Fugitive PM10, Prohibitions), Rule 4102 (Nuisance), Rule 4601 (Architectural Coatings), Rule 4641 (Cutback, Slow Cure, and Emulsified Asphalt Paving and Maintenance Operations) and District Rule 4002 (National Emission Standards for Hazardous Air Pollutants) in the event an existing building will be renovated, partially demolished or removed.
3.	An Engineered Grading and Drainage Plan is required to show how the additional storm water run-off generated by the proposed development will be handled without adversely impacting the adjoining parcels.
4.	A Grading Permit or Voucher is required for any grading proposed with this application.
5.	Any additional storm water run-off generated by the project cannot be drained across property lines or into County right-of-way, and must be retained on site, per the County Standards.
6.	Prior to occupancy, the Applicant shall complete and submit a Hazardous Materials Business Plan to the Fresno County Department of Public Health, Environmental Health Division, for review and approval. Contact the Certified Unified Program Agency at (559) 600-3271 for more information.
7.	All hazardous waste shall be handled in accordance with requirements set forth in the California Health and Safety Code, Division 20,

Notes	
	Chapter 6.5. This chapter discusses proper labeling, storage and handling of hazardous wastes.
8.	Any water wells that exist or that have been abandoned within the project area and not intended for use shall be properly destroyed. The Applicant shall apply for and obtain a permit(s) to destroy water well(s) from the Fresno County Department of Public Health, Environmental Health Division prior to commencement of work. The destruction and construction of water wells can only be completed by a licensed C-57 contractor.
9.	The Applicant shall obtain and comply with the Regional Water Quality Control Board standards and conditions.
10.	The proposal shall comply with the California Code of Regulations Title 24 Fire Code. The Applicant shall submit three Site Plans, stamped "reviewed" or "approved" from the Fresno County Department of Works and Planning, to the Fresno County Fire Protection District (Fire District) for their review and approval. The Applicant shall submit evidence that their Plan was approved by the Fire District, and all fire protection improvements shall be installed prior to occupancy.
11.	Plans shall be submitted to the Road Maintenance and Operations Division of the Fresno County Department of Public Works and Planning for review and approval for any street improvements at the intersection of the proposed site access driveway and Friant Road.
12.	An Encroachment Permit shall be required from the Road Maintenance and Operations Division of the Fresno County Department of Public Works and Planning for any work performed within the County right-of-way.
13.	Per the Fresno Metropolitan Flood Control District: a. The proposal shall require coverage under the State Industrial General Permit. b. The proposal is subject to the requirements of the Regional Water Quality Control Board Waste Discharge Requirements Order R5-2013-0080 (commonly referred to as "Municipal Permit").

CM:cwm:dc
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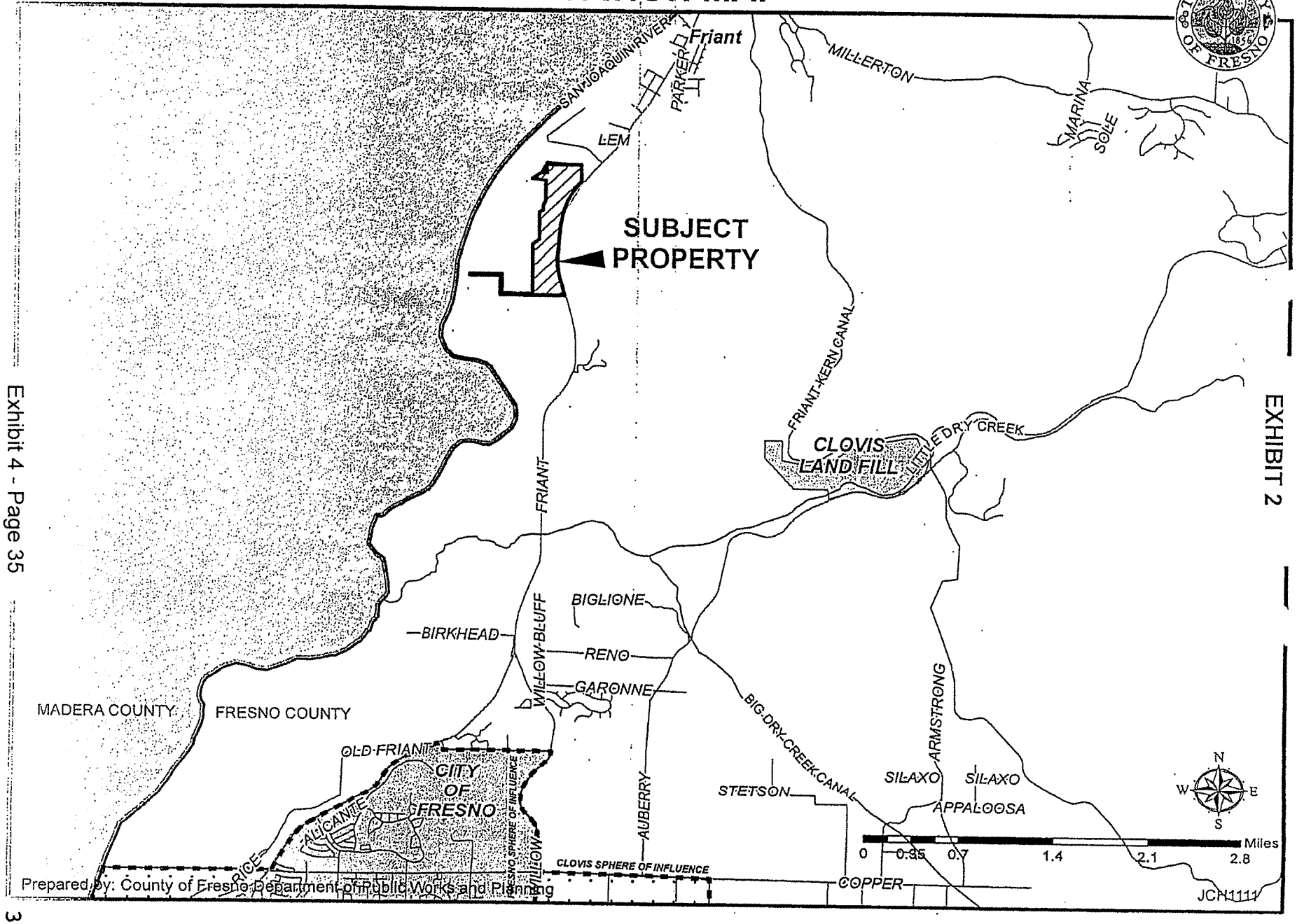
CUP 3415

LOCATION MAP



Prepared by: County of Fresno Department of Public Works and Planning

EXHIBIT 2

EXISTING ZONING MAP

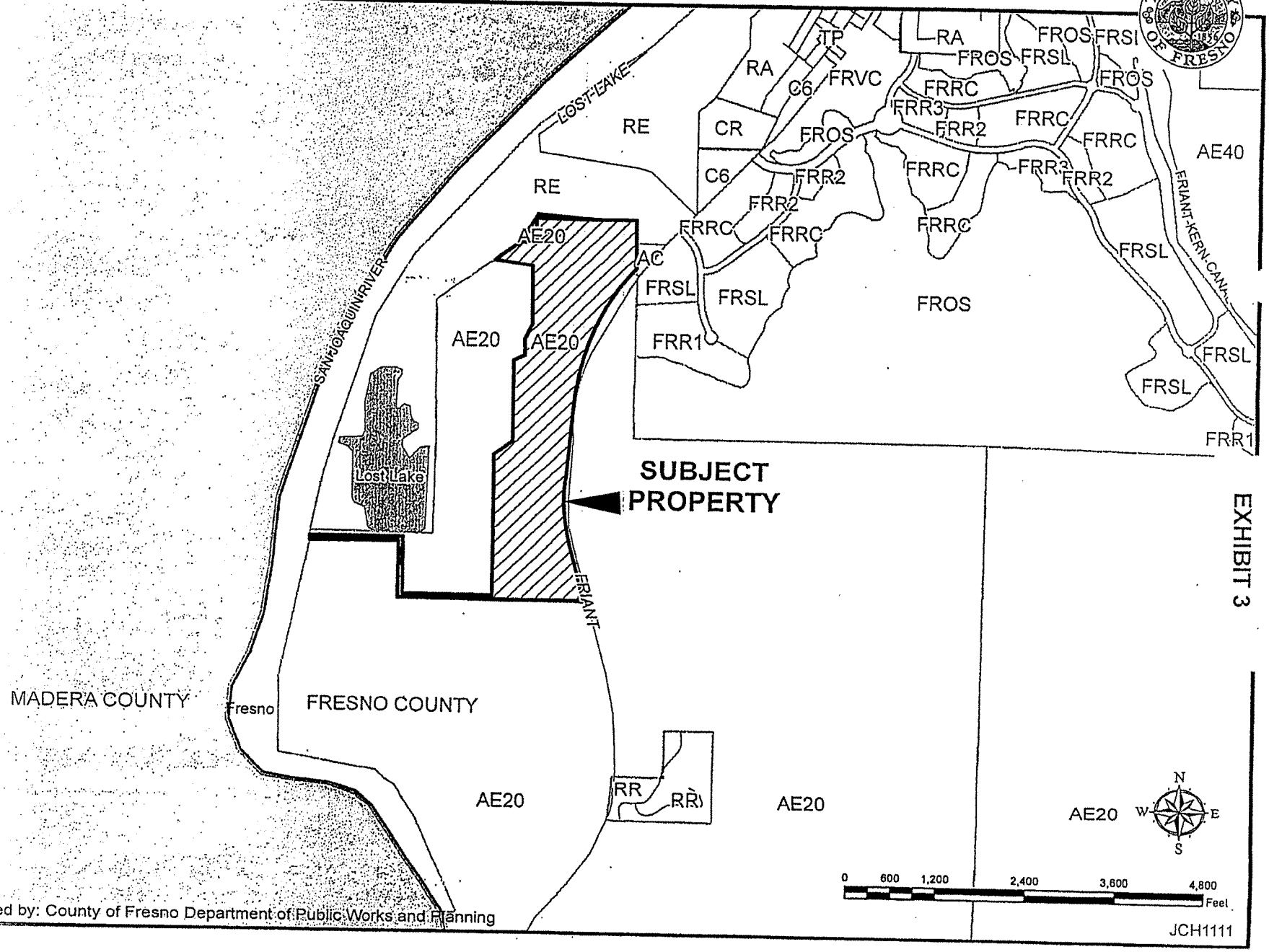
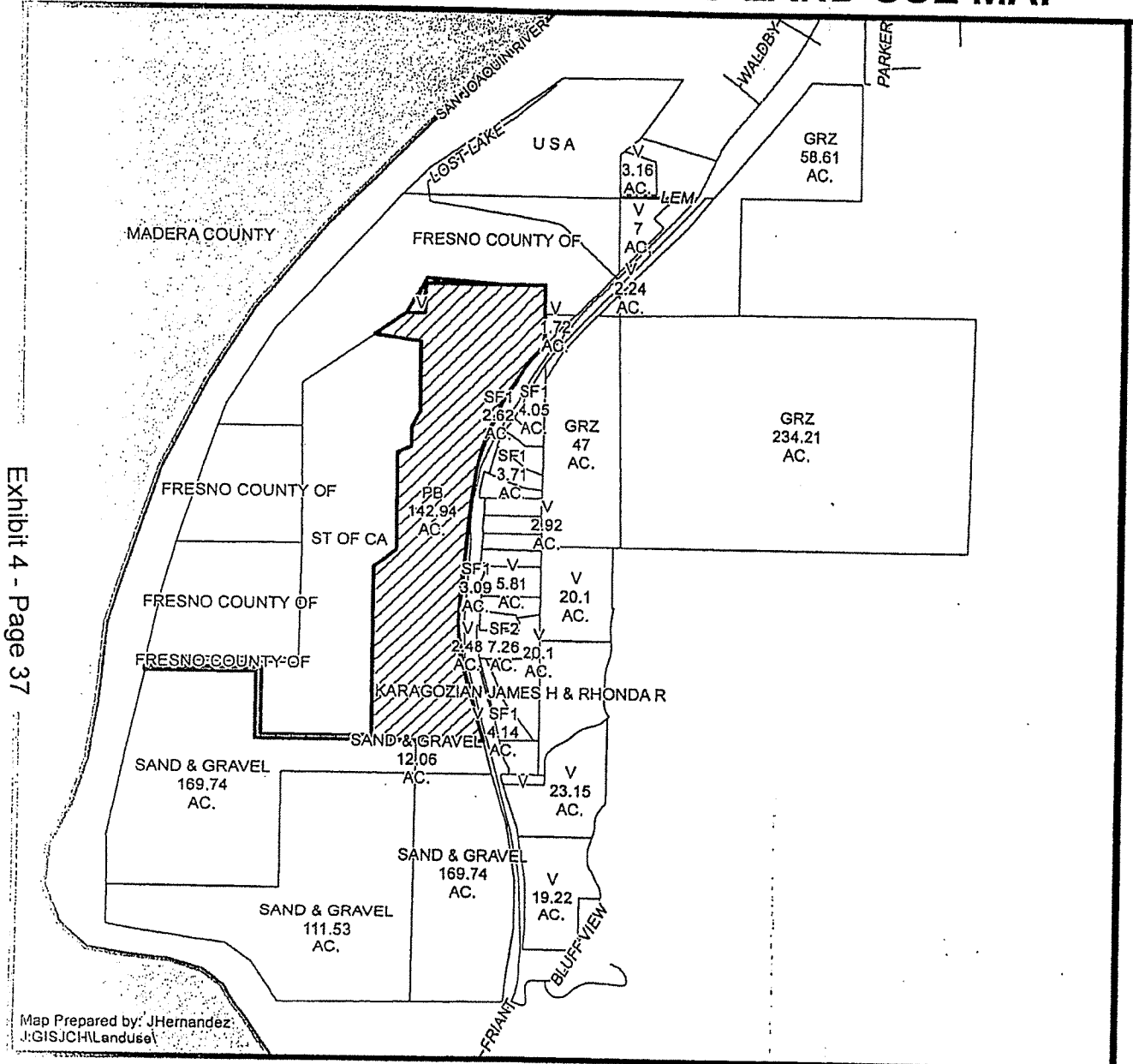


EXHIBIT 3

CUP 3415

EXISTING LAND USE MAP



LEGEND
GRZ - GRAZING
PONDING BASIN
SF# - SINGLE FAMILY RESIDENCE
V - VACANT

LEGEND:

Subject Property

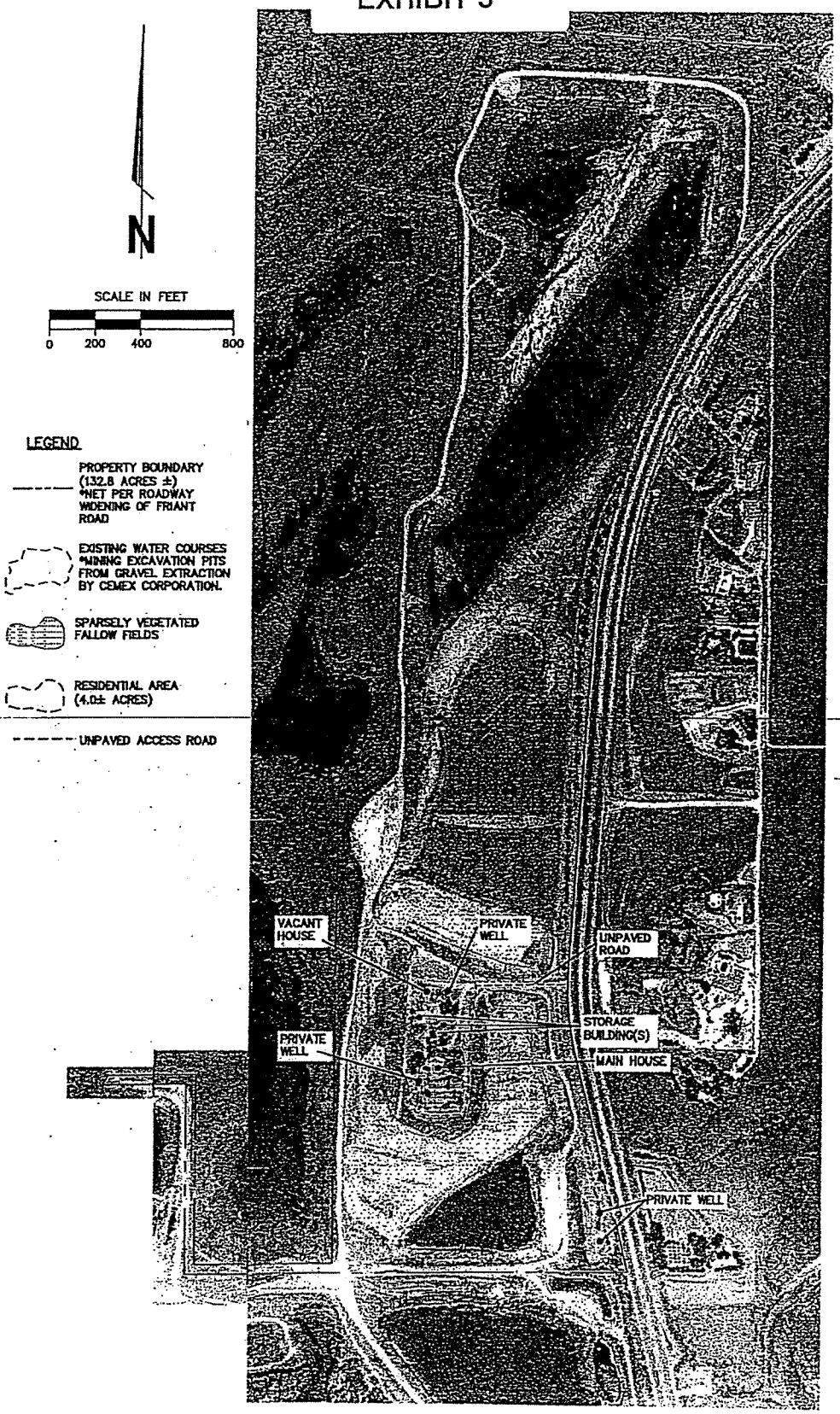
N
W E
S

0 412.5 825 1,650 2,475 3,300 Feet

Department of Public Works and Planning
Development Sevices Division

EXHIBIT 4

EXHIBIT 5

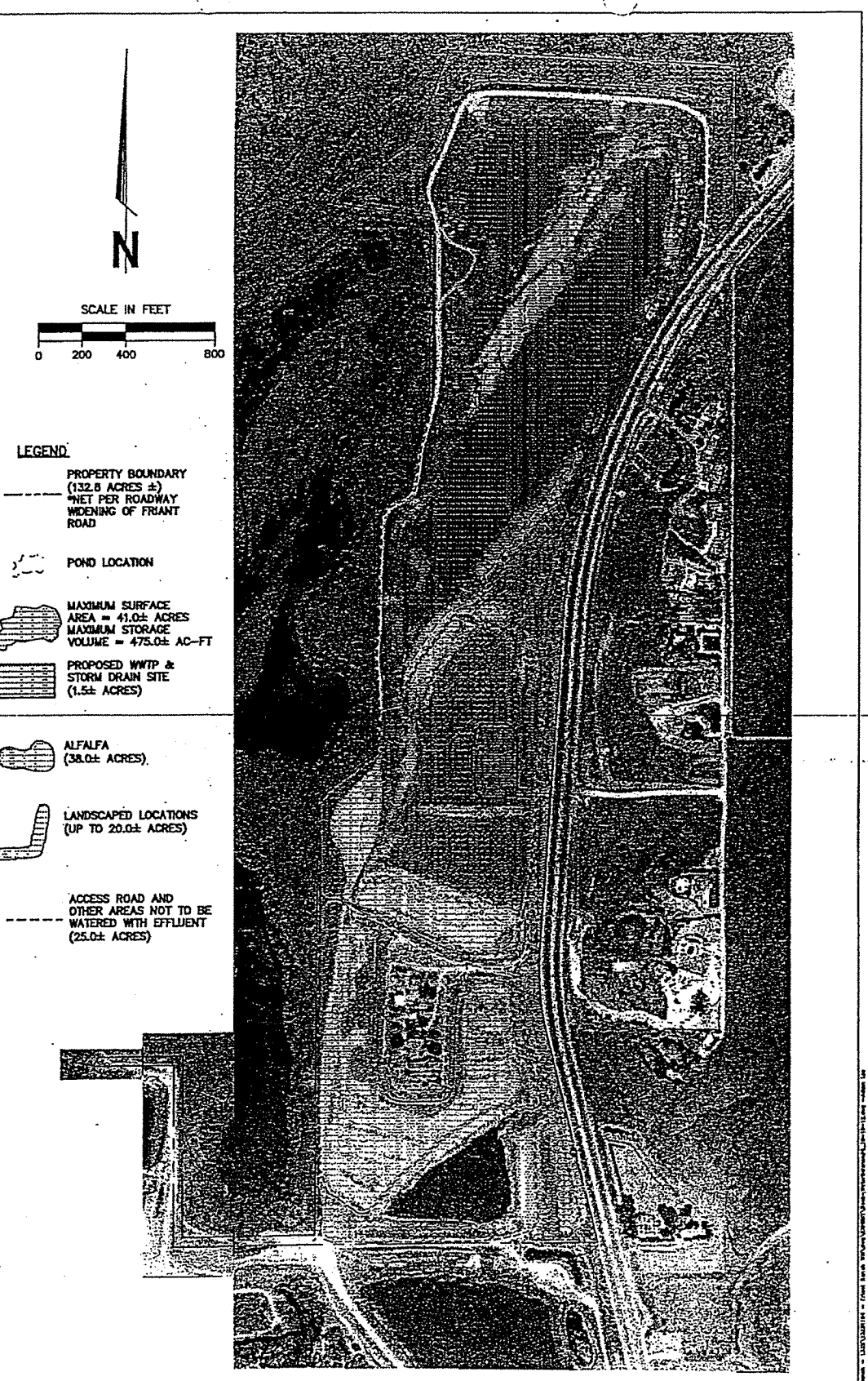


NOTES:
1) AERIAL PHOTO DATED 4-25-2011 FROM GOOGLE MAPS.

PROVOST & PRITCHARD

Beck Property
COUNTY OF FRESNO
FIGURE FOR CUP APPLICATION

SITE PLAN
EXISTING IMPROVEMENTS & FEATURES
County of Fresno

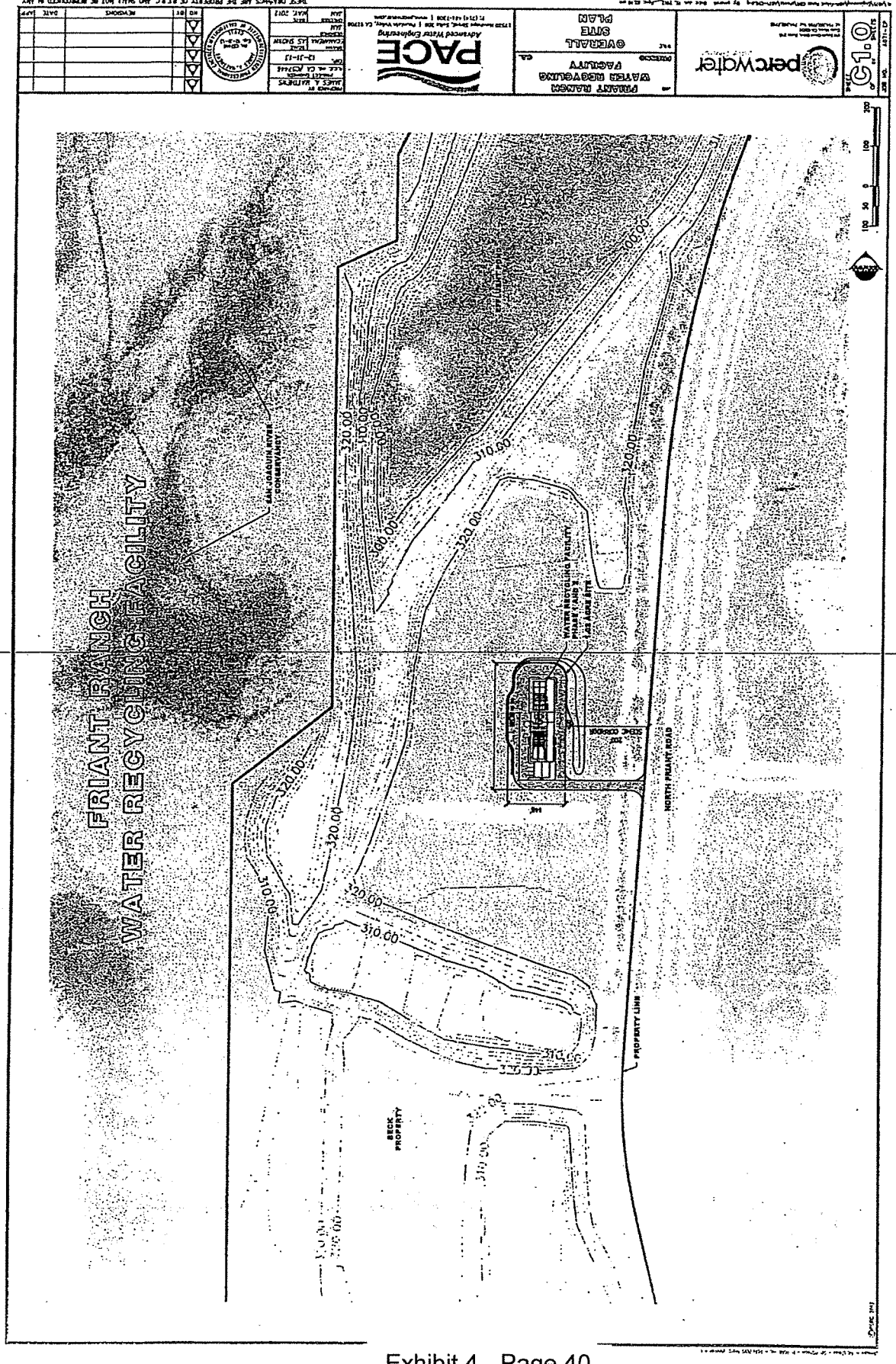


NOTES:
1) AERIAL PHOTO DATED 4-25-2011.

PROVOST& PRITCHARD

Beck Property
COUNTY OF FRESNO
FIGURE FOR CUP APPLICATION

PROPOSED WWTP, STORAGE POND AND IRRIGATION AREAS (ALFALFA / LANDSCAPING)
County of Fresno


FRIANT RANCH
WATER RECYCLING FACILITY
320.00
310.00
300.00
NORTH FRIANT ROAD
PROPERTY LINE
BECK PROPERTY
SAN JOAQUIN RIVER CONSERVANCY

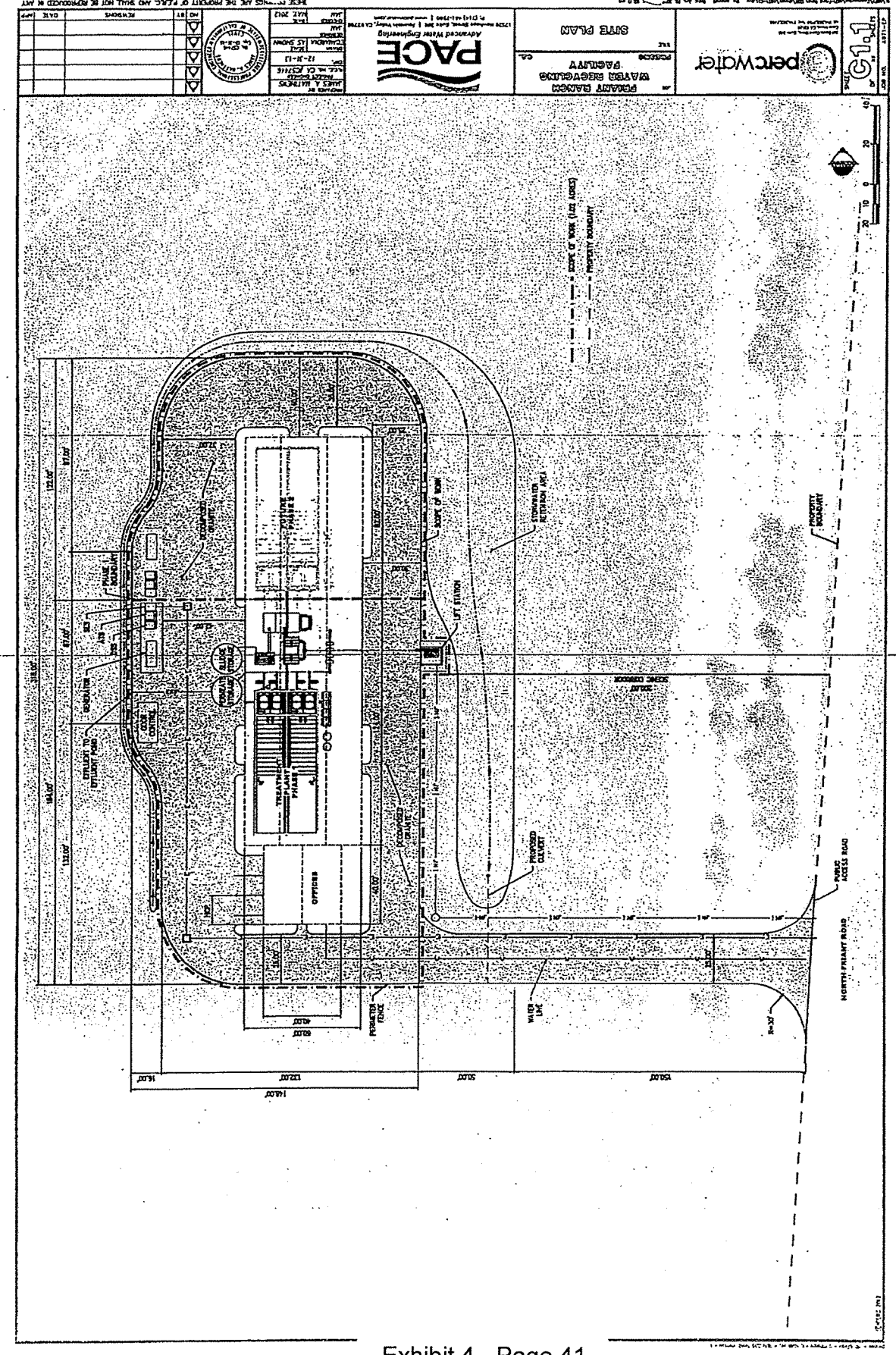
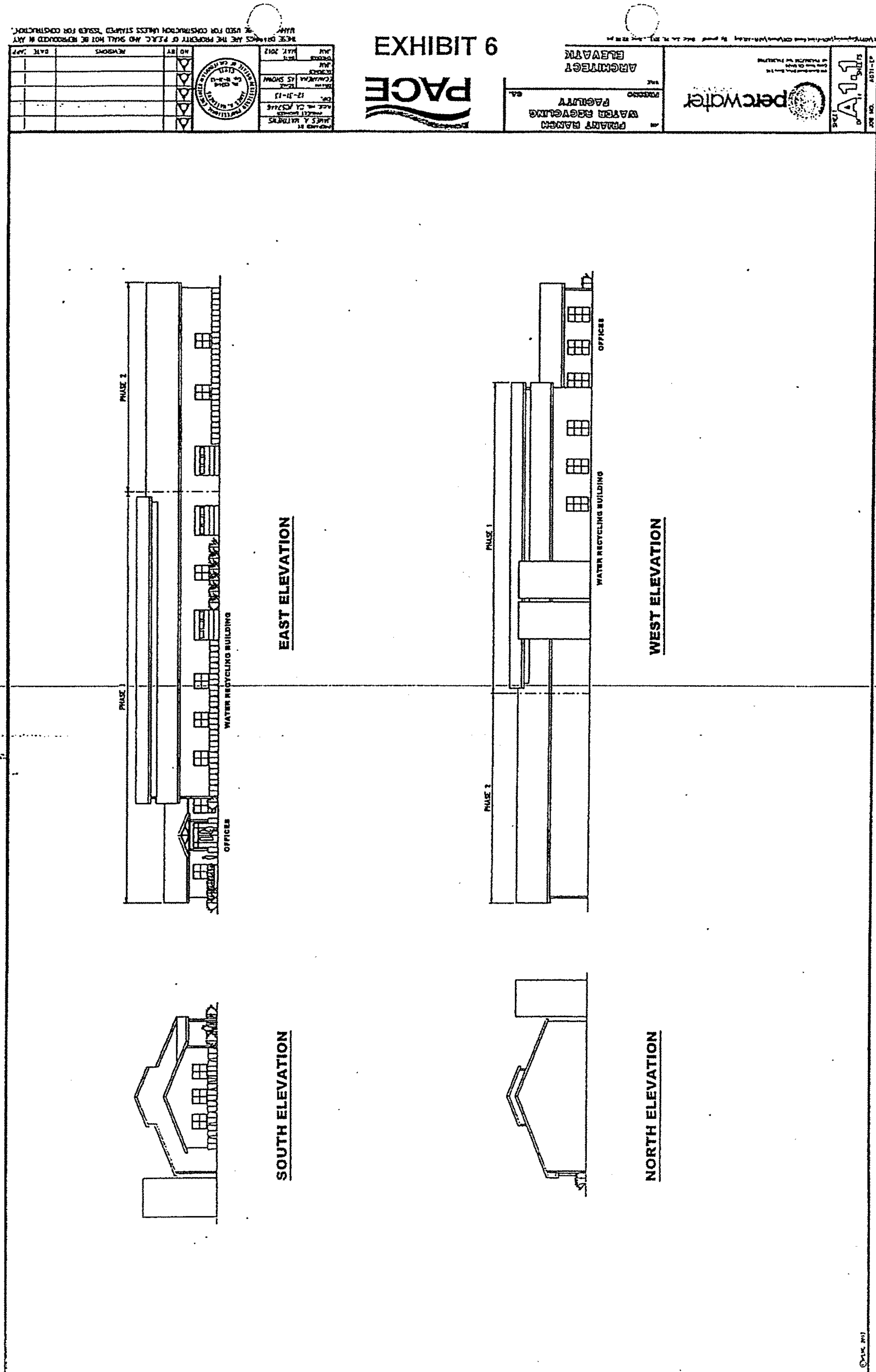
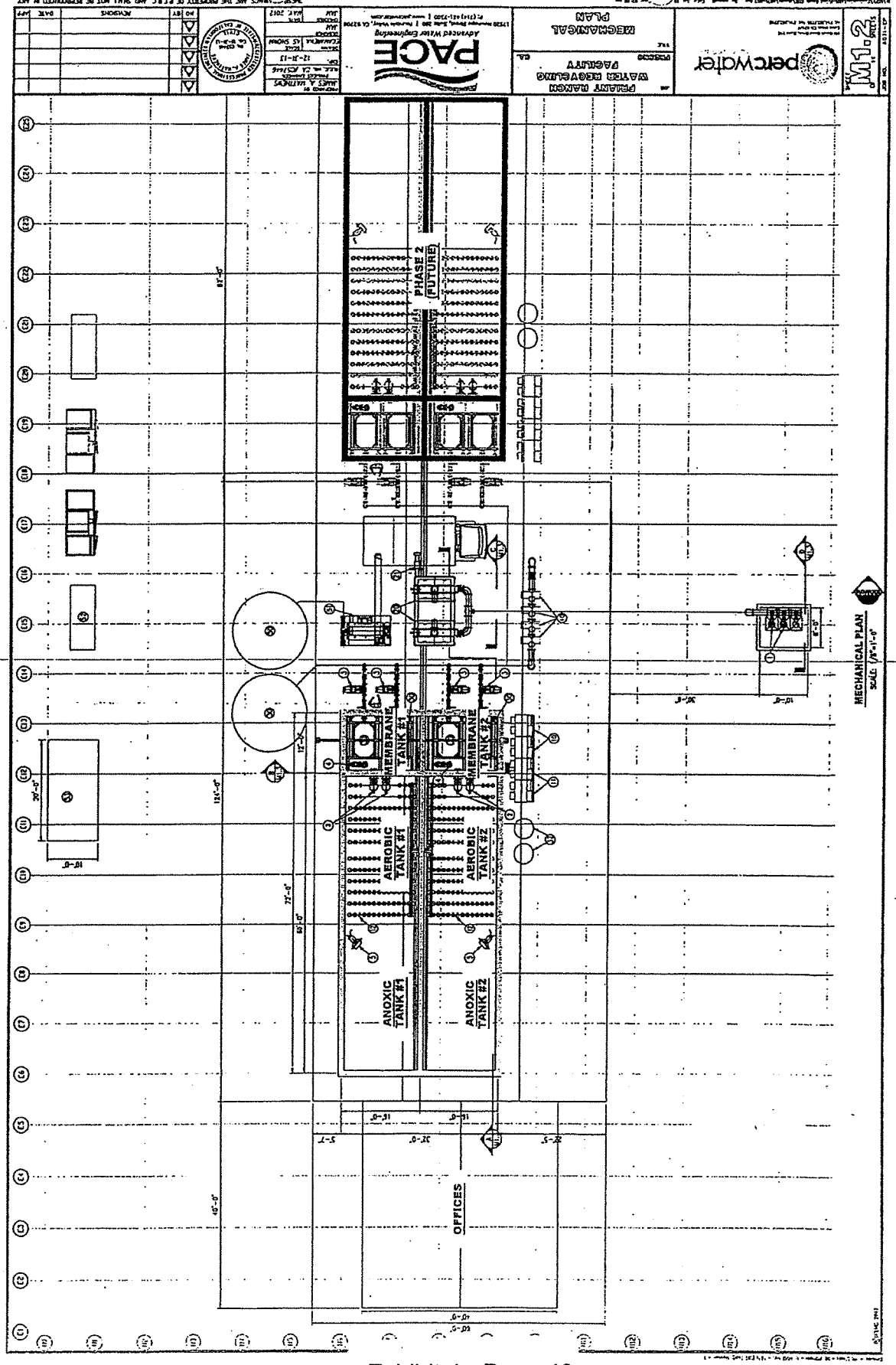

SITE PLAN
PACE
petrowater
PLEASANT GARDEN
WATER RECYCLING
FACILITY
SCALE OF WORK
PROPERTY BOUNDARY
PROPOSED CULVERT
PUBLIC ACCESS ROAD
NORTH PLEASANT ROAD
OFFICES
TREATMENT PLANT PHASE
PROPOSED FENCE
WATER LINE
OUTLET TO OUTLET POND
LIFT STATION
SCALE: 1"=20'

EXHIBIT 6


PACE
percwater
A1.1
EAST ELEVATION
WEST ELEVATION
SOUTH ELEVATION
NORTH ELEVATION
WATER RECYCLING BUILDING
OFFICES
PHASE 1
PHASE 2


PHASE 2 (FUTURE)
MEMBRANE TANK #1
MEMBRANE TANK #2
AEROBIC TANK #1
AEROBIC TANK #2
ANOXIC TANK #1
ANOXIC TANK #2
OFFICES
MECHANICAL PLAN
SCALE: 1/8"=1'-0"
PEBBLY MEADOW WATER RECYCLING FACILITY
MECHANICAL PLAN
petrowater
PACE
Advanced Water Engineering

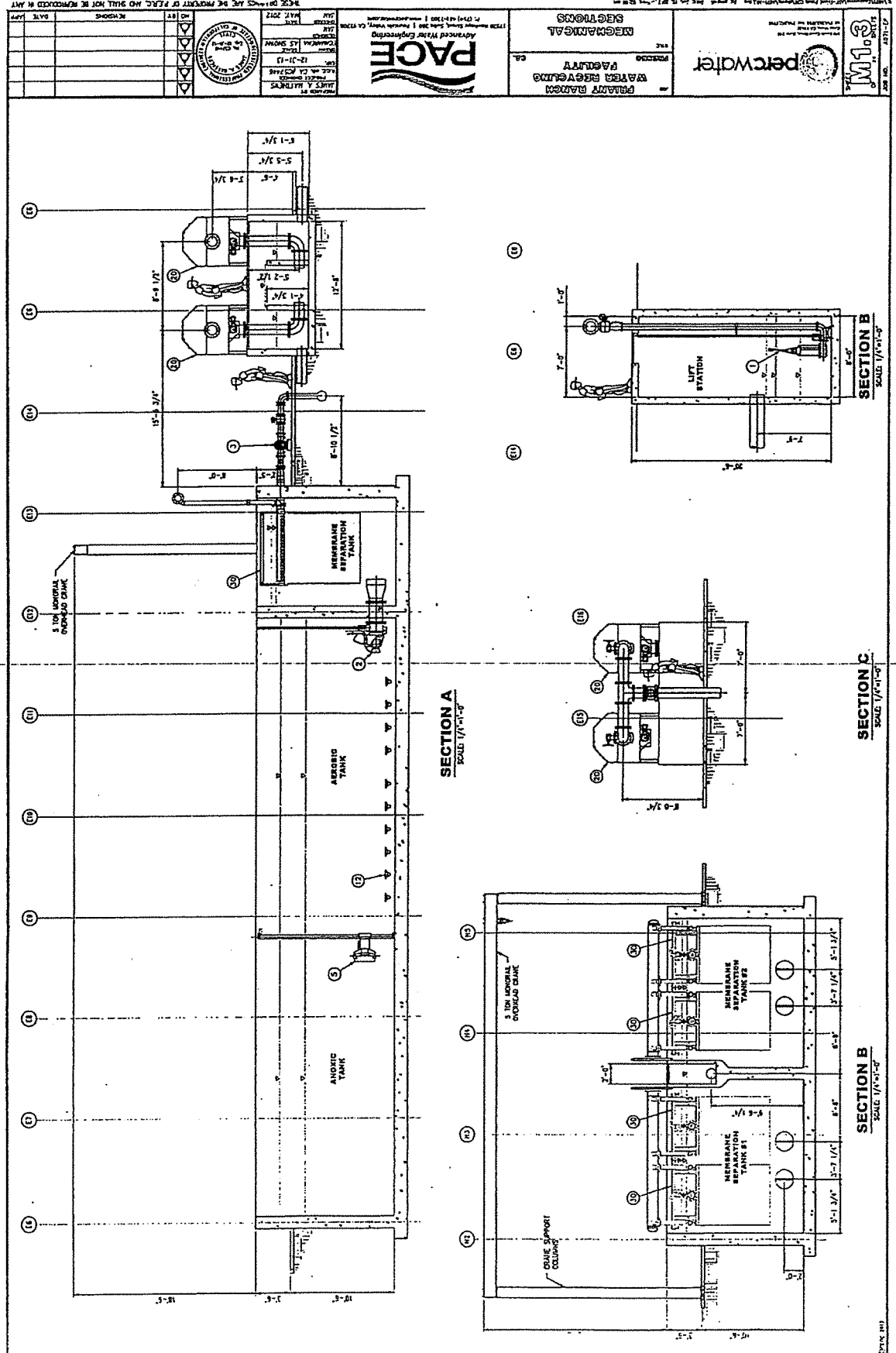

PLANNY RANCH
WATER RECYCLING
FACILITY
MECHANICAL
SECTIONS
petcwater
PACE
Advanced Water Engineering
M1.3
SECTION A
SCALE: 1/4"=1'-0"
SECTION B
SCALE: 1/4"=1'-0"
SECTION C
SCALE: 1/4"=1'-0"
SECTION B
SCALE: 1/4"=1'-0"
MEMBRANE SEPARATION TANK
AEROBIC TANK
ANOXIC TANK
LIFT STATION
5 TON MONORAIL OVERHEAD CRANE
DRIVE SUPPORT COLUMNS
MEMBRANE SEPARATION TANK #2
MEMBRANE SEPARATION TANK #1

EXHIBIT 7

Fresno County Water Works District No. 18
Waste Water Treatment Facilities (WWTF)
Operational Statement

(October 18, 2012)

Nature of the Operation:

Applicants Friant Ranch, LP and Fresno County Water Works District No. 18 (WWD 18) seek approval of a Classified Conditional Use Permit from the County of Fresno for the construction and operation of a tertiary level waste water treatment facility on a portion of a 144.29 acre parcel, south of the Community of Friant within the Friant Community Plan Boundary. The new WWTF would be constructed to initially treat wastewater from the Friant Ranch Project Specific Plan Area and the existing Millerton Lake Mobile Home Park whose existing CSA 44 facility is outdated. At build-out the total capacity of the WWTF will be sized to treat up to a maximum of 0.80 million gallons per day to accommodate these two developments and the remaining Community of Friant. The Applicants are pursuing a Regional Water Quality Control Board permit for a maximum yearly total of 896 AF of recycled water, which corresponds to the WWTF capacity of 0.80 MGD. The recycled water system will be design to dispose of the 896 AF yearly total (combined total between reuse areas at Beck Ranch and within Friant Ranch Specific Plan area). In accordance with the Board of Supervisors' condition within the Friant Ranch Specific Plan, no recycled water will be discharged to the San Joaquin River. Other permits and approvals for the facility (RWQCB Report of Waste Discharge, SJVAPCD ISR 9510, etc.) would be obtained at a later date but prior to the beginning of construction per the EIR requirements. The proposed WWTF is consistent with the Board of Supervisor's certification of the Friant Ranch Community Plan Update and Friant Ranch Specific Plan EIR on February 1, 2011.

Proposed for construction is a Membrane Bio-Reactor (MBR) facility with an ultraviolet light disinfection system. The resulting recycled water will meet Title 22 standards for unrestricted use, with all recycled water produced being used for irrigation of alfalfa and landscaping at Beck Ranch and landscaping at Friant Ranch.

The property is currently zoned AE-20 (Exclusive Agriculture) with a Friant Community Plan land use designation of Agriculture. There are no plans to change the land use designation or change the existing zoning.

Operational Limits:

The WWTP will operate 24 hours a day, 7 days a week, and 365 days a year. The facility will be staffed eight hours per day (single shift) Monday through Friday and approximately four hours per day on weekends and holidays. The facility will also require periodic scheduled maintenance. Additionally, personnel will be on-call at all times to address emergency maintenance needs in off-work hours. Fully automated SCADA and Control systems will provide remote notification to on-call staff as needed.

Number of Customers or Visitors:
There will be no customers on site. WWD No. 18 will maintain their current office location at 17836 N. Friant Road, Suite D in Friant. There will infrequently be small groups of up to six visitors.

Number of Employees:
The current number of employees for the District is five, including three operations personnel, the general manager and a secretary, who handle the existing potable water system. The proposed wastewater facility will be operated under contract with PERC Water, Inc, which would add three employees (two full-time wastewater operators and one maintenance technician). None of the WWTF personnel will live at the WWTF site. The Operations Manager will possess a Grade IV Wastewater Certification and the second operator will possess a Grade II-III Wastewater Certification by the State of California, while the Maintenance Technician will be experienced in mechanical and instrumentation repair and maintenance.

Service and Delivery Vehicles:
The proposed facility will generate infrequent vehicle trips for delivery of chemicals and removal of sludge disposal in addition to daily trips for facility personnel. In addition, delivery or service vehicles may enter the site for scheduled repairs or emergency service on an infrequent basis. Site maintenance for weed control, drainage facilities and the recycled water storage pond will also result in vehicle trips several times a year that may include a trailer with a tractor and/or other equipment. These trips are summarized below:

Type of Delivery	Frequency
Process Chemicals	8 trips/month
Sludge Disposal	8-12 trips/month
Miscellaneous Maintenance	8 trips/month
Operations Staff	8 trips/day

Agricultural vehicle use (by existing land use rights) will have an incidental increase due to the use of recycled water for irrigation at certain times of the year.

Temporary construction traffic will vary in frequency from approximately 5 trips/day to 20 trips/day. Most of the time construction traffic will average 10 trips/day, with high frequency only on occasion for tasks like pouring/finishing concrete.

Access to the Site:
The site fronts Friant Road, a designated expressway. Access will be through a 25-foot wide access road from Friant Road connected to the graded road surface around the perimeter of the building and to the parking area in back of the proposed facility. The access will align with the existing intersection break in the Friant Road median which serves approximately six residential units to the east of Friant Road, so no new median breaks are proposed.

Number of Parking Spaces For Employees, Customers, and Service/ Delivery Vehicles:
The proposed facility's parking area will have a total of four designated parking spaces next to the office/lab building; with two handicap accessible spaces (one will be van-accessible).

Are Any Goods To Be Sold On Site:
There will not be any goods sold on site.

What Equipment Is Used:
The proposed Friant Ranch WWTF plans to use the following equipment to process influent flow into recycled water:

- Influent Pumping (Lift Station) and Flow Monitoring
- Headworks for Fine Screening and Grit removal
- Membrane Bio Reactor (MBR) System
  - Anoxic Tank
  - Aeration Tank
  - Membrane Tank
- Membrane Filtration System (tanks and pumps)
- Ultraviolet Disinfection System
- Chemical Storage and Feed System
- Sludge Storage and Dewatering
- Odor Control – Centralized Biofilter System

A detailed discussion of the proposed process and equipment is provided in the "Friant Ranch Water Recycling Facility Customized Design Report," June 22, 2012, by PERC Water Corporation, which is submitted along with this application.

In addition, maintenance equipment and a tractor will be used on site periodically for scheduled and emergency maintenance.

What supplies or materials are used and how are they stored on site:
The control building and office will store various products that are in common use in offices, kitchens and bathrooms including small quantities of cleaning products, copier toner, electronics equipment and so forth.

The WWTP has available storage for tools, valves and replacement mechanical appurtenances for the WWTP. Chemicals for cleaning will be kept on site, and are summarized below:

Type of Material	Quantity
Sodium Hydroxide	2 ea, 55 lb container
Potassium Hydroxide	2 ea, 55 lb container

Does the use cause an unsightly appearance:
The overall 144-acre site is a former gravel mine which is highly degraded and which will again be put to agricultural use growing alfalfa. The WWTP will be enclosed in a building designed with a ranch style on a one acre site, that fits into the agricultural context of the surroundings (see elevation views submitted along with this application). The building will be of a size and scale similar to other barns and houses in the area, and will conform with the zoning district's building height restrictions. Site zoning is AE-20 (Exclusive Agricultural District), per Zoning Ordinance Section 816.5.D "*no building may exceed thirty-five feet (35) feet in height.*" The building will visually block the two silo-style 30,000 gallon storage tanks (proposed as 15'-6" DIA x 24' H) to the west from the view of the public driving along Friant Road. Views of the site from the north (Lost Lake Park entrance road) and west (San Joaquin River Conservancy lands) are blocked by the high earthen berms that are existing around the property.

Additionally, buildings will comply with the Scenic Highway Designation for this portion of Friant Road that requires a 200-ft setback for development from the right-of-way (Fresno County General Plan; Open Space and Conservation Element; Goal OS-L.3 – Scenic Road Management).

Noise and odor controls make the facility neighbor-friendly and a positive addition to the surrounding community.

List any solid or liquid wastes to be produced:
The office and lab operations will produce typical office-related solid waste including kitchen garbage, copier paper, cardboard, and other miscellaneous waste. Anticipated quantity is one 90-gallon bin per week. Solid waste disposal will include a scheduled pick-up service to the local landfill (current service provided by Ponderosa Solid Waste).

The WWTP will produce dewatered sludge from a centrifuge system installed at the end of the treatment process. The sludge will be stored in covered disposal bins and hauled off to a solid waste landfill or composting facility. For a dumpster with a payload of 7.5 tons the transport frequency would be approximately 4-6 trips/month for Phase 1 (0.40 mgd) and 8-12 trips/month at ultimate build-out (0.80 mgd).

Recycled water is not a "waste product", but would be continually produced by the WWTP and released to the storage pond at the north end of the property. All recycled water will be used to irrigate the designated reclamation areas during the entire growing season (February through October) while over-winter water would be held and used for irrigation in the next irrigation season for both the alfalfa and landscaping areas. No recycled water will be discharged to the San Joaquin River, in compliance with the Friant Ranch Specific Plan.

Reclamation areas will include 38 acres of alfalfa and 20 acres of landscaping at the site, plus up to 85 acres of landscaping at Friant Ranch as described in the Friant

Ranch Specific Plan. These Friant Ranch Specific Plan areas include roadway medians and parkways, public parks and open spaces and the land around the Community Center.

Estimated volume of water to be used (gallons per day):
Actual water use at the WWTF will be for wash down at the lift station and within the treatment building on a regular basis. Use is estimated to be less than 150 gallons per day at a maximum flow rate of 10 – 15 gpm. Given the limited amount of potable water use required, it is anticipated that potable water demand will be served by an existing private well on site.

Describe any proposed advertising including size, appearance, and placement:
The proposed treatment plant will be identified by a 3-foot x 4-foot monument sign on the subject property near the entrance drive at Friant Road.

Will existing buildings be used or will new buildings be constructed:
There is an existing residential structure on the 144-acre site, approximately 1,200 feet or more south of the south line of the proposed WWTP building. This building will remain unaltered.

One new structure is proposed. The building area for Phase 1 is 9,040 SF total, comprised of 7,440 SF for the treatment process and 1,600 SF for offices and laboratory. In Phase 2, the building will expand northward by adding an additional 4,920 SF, so that at 0.80 MGD build-out, the building will total 13,960 SF. Details of this building are provided elsewhere in this application.

Explain which buildings or what portion of buildings will be used in the operation:
The residential structure to the south is occupied and will continue in its current use for the foreseeable future.

The WWTP building will be used entirely for the day to day operations of the facility. Specific functions include housing the wastewater treatment process, the on-site water laboratory, the staff office, and kitchen/break room. No sleeping accommodations will be provided.

Will any outdoor lighting or an outdoor sound amplification system be used:
The proposed operation will result in lighting around the facility building, lift station pumps, several locations at the recycled water storage pond, and access gate location.

All of the proposed lighting will be shielded, directed downward and away from adjoining properties and rights-of-way, reducing the spillage of light onto adjacent properties to less than one-foot-candle standard, as measured at the adjacent property line.

Night lighting will be limited to that necessary for security, safety and identification. Some lighting for emergency maintenance will be switched and used only as required.

No outdoor sound amplification system will be used.

Landscaping or fencing proposed:
The current property does not have any irrigated landscaping. Some non-irrigated eucalyptus and almond trees serve as a buffer along portions of Friant Road. The property is only fenced with barbed-wire fencing along Friant Road and the northern boundary with Lost Lake Park. The west boundary with the San Joaquin Conservancy property and the Cemex property to the south are not fenced.

The proposed WWTF will be surrounded by a 6-ft high chain link security fence including up to two access lockable gates on rollers. The fencing will be located along the perimeter of the facilities site area that includes only the WWTF building and parking/perimeter area (approx. 1.02 acres), not the reclamation/farming area.

The landscaping buffer adjacent to Friant Road will be irrigated as recycled water becomes available. Additional shrubs and trees will be added at that time to enhance the existing visual screening. Immediately adjacent to the building there will be small landscaped accent planters along with trees spaced out along the perimeter fence to be irrigated with recycled water, which will further enhance the appearance of the facility.

Any other information that will provide a clear understanding of the project or operation:
The proposed project is a new tertiary level Waste Water Treatment Plant and recycled water storage pond for the beneficial use of Friant Ranch and the Community of Friant. All recycled water from the new WWTP will be land applied for beneficial reuse. In compliance with the Friant Ranch Specific Plan, there will be no discharge of effluent to the San Joaquin River.

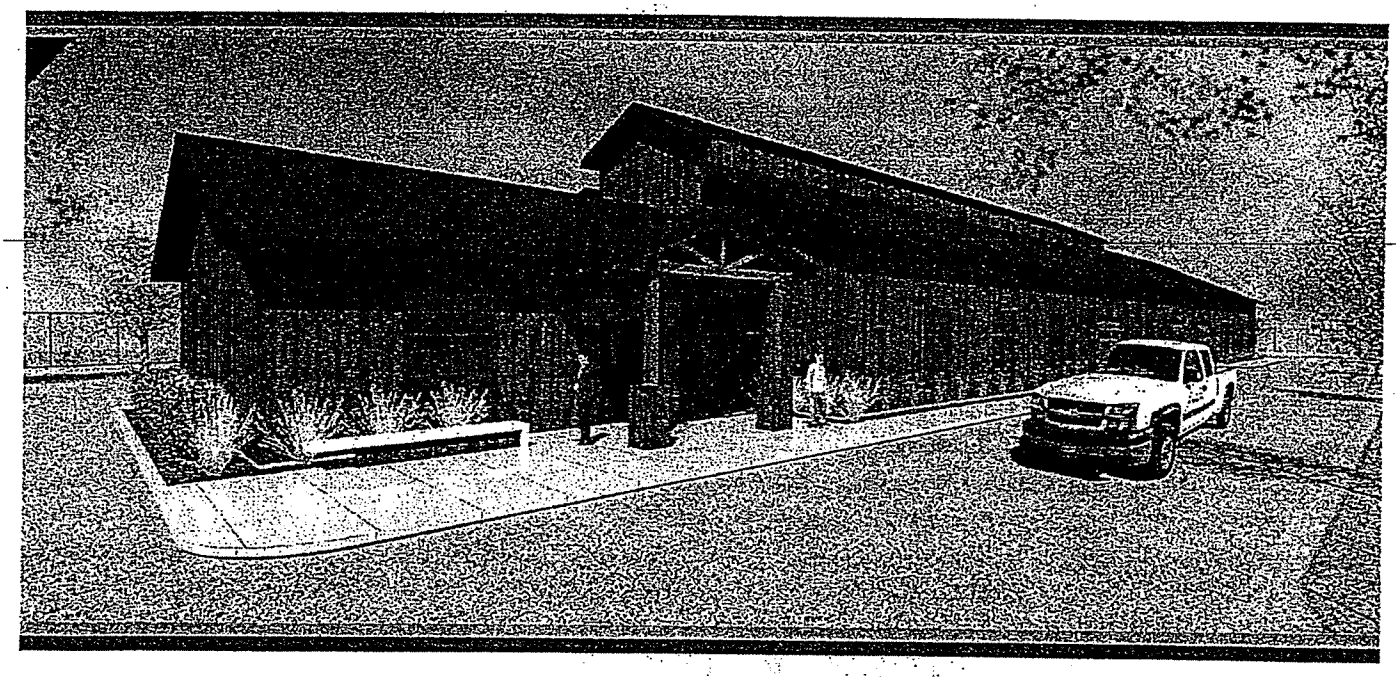
Upon completion of this facility, the 100 connections to the outdated CSA 44A – Millerton Lake Village Mobile Park WWTF will be re-directed to the new WWTP, providing an immediate improvement to the treatment and recycling of that source of wastewater.

Estimated start-up flow available from the existing Millerton Lake Village Mobile Park, per County Special Districts staff, is 25,000 gpd, which proves to be a significant advantage. Start-up minimum at the new plant is approximately 20,000 gpd. The mobile home park flows mean that start-up of the new plant will be greatly eased and it will be in full operation from the very start.

EXHIBIT 8

Friant Ranch
Water Recycling Facility

Customized Design Report



perc water

June 22, 2012

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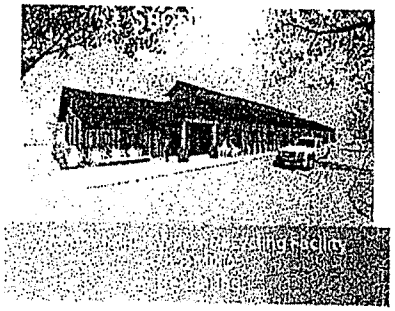
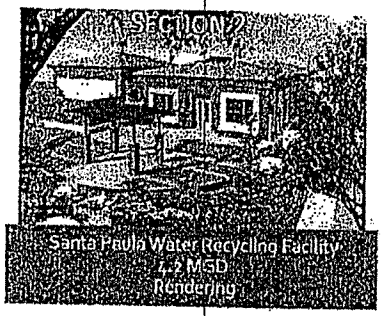
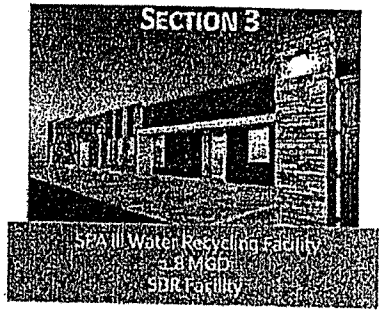


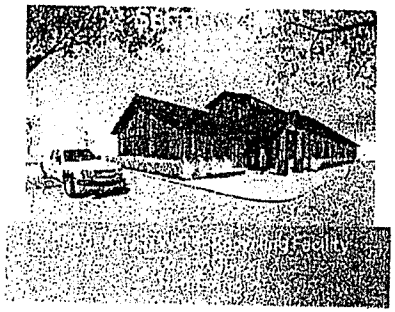
Santa Paula Water Recycling Facility
4.2 MGD



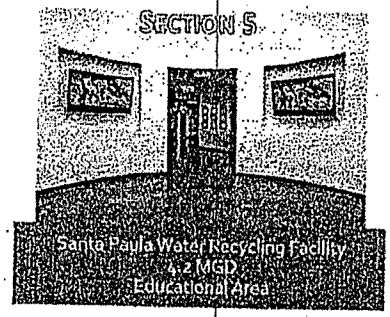
Santa Paula Water Recycling Facility
4.2 MGD
Rendering



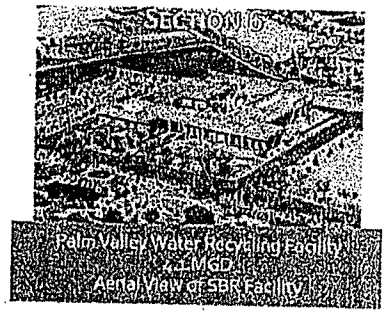
SPA III Water Recycling Facility
4.2 MGD
SBR Facility



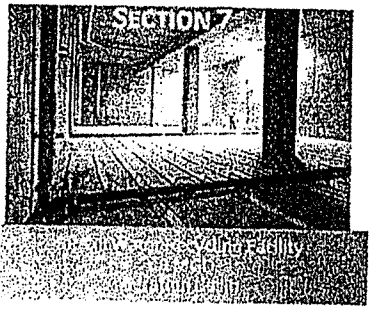
SBR Facility



Santa Paula Water Recycling Facility
4.2 MGD
Educational Area

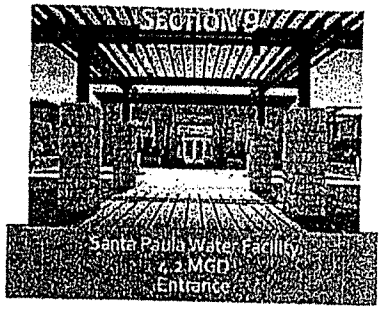


Palm Valley Water Recycling Facility
4.2 MGD
Aerial View of SBR Facility



Tri Facility

Santa Paula Water Recycling Facility
4.2 MGD
Membrane Bio Reactor Tanks



Santa Paula Water Facility
4.2 MGD
Entrance

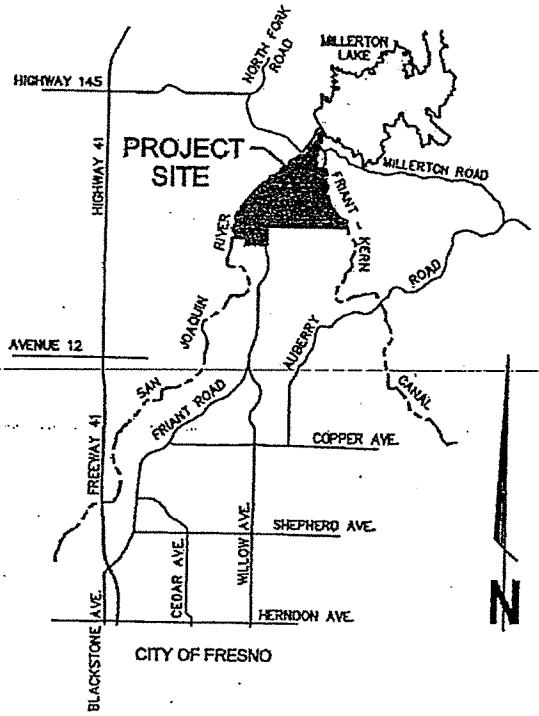
percwater

Friant Ranch Water Recycling Facility
0.8 MGD
Rendering

1.1 INTRODUCTION AND BACKGROUND

Friant Ranch is an unincorporated area within Fresno County, CA. It is located approximately five miles north of the cities of Fresno and Clovis and is currently characterized as rural residential, highway commercial and agricultural. The nearby Millerton Lake is a regional recreational draw that was created by the 1942 installation of the Friant Dam on the San Joaquin River. Waterworks District 18 provides water services to area.

Figure 1.1: Vicinity Map (Not to Scale)



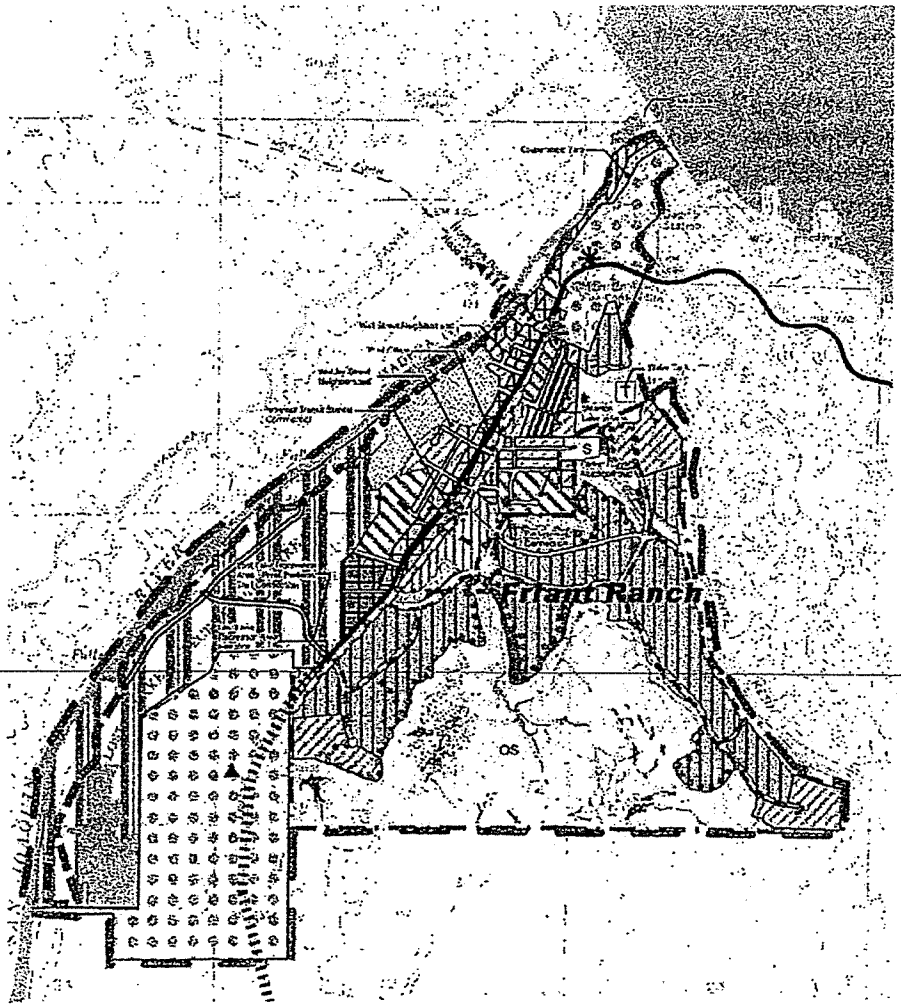
The Friant Ranch Specific Plan was approved by the Fresno County Board of Supervisors in 2011. Under the Plan, approximately 500 acres will be developed to create new residential housing, commercial areas and the related community services. The anticipated build-out will add 2,500 residential service connections and some commercial connections to the Waterworks District 18 service area.

A new 0.8 million gallons per day (MGD) capacity water recycling facility (WRF) will be needed to accommodate the wastewater generated by the community expansion and the residents of the Millerton Lake Village Mobile Home Park whose existing facility is outdated. It may be several years before the community completes the anticipated build-out. Therefore, the facility will be constructed in two equal phases of 0.4 MGD.

Odor control and aesthetics have been carefully considered. All of the process components of the proposed facility will be enclosed. The design of the building is intended to match the character of the community while providing protection for the treatment elements. Noise is minimized by the enclosure and careful selection of equipment.

The design proposed offers flexibility of operation and ease of expansion within a small footprint. Utilizing Membrane Bio-Reactor technology eliminates the need for separate clarification and filtration and produces a very compact facility with ultra-high water quality. Disinfection will be performed by ultraviolet light; a reliable and safe method that does not result in disinfection byproducts. These considerations and more described in the following sections illustrate how the facility will provide state of the art water recycling to the growing community.

Figure 1.2: Community Map (Not to Scale)



Legend

Agriculture
Residential
Commercial
Public Facilities
Open Space
Circulation
Trails
Friant Community Plan Boundary
Area Added Through 2010 Update

Effluent from the WRF will be treated to Title 22 standards for unrestricted reuse, a treatment level referred to by the State Water Resources Control Board as "recycled water." Recycled water produced during the winter (non-irrigation) months of November through July will be stored in the existing pond on the north portion of the Beck Property. This water will be used for irrigation during the spring, summer and fall seasons with the objective of bringing the pond to a minimum pool on or about October 1 of each year.

1.1.1 Draft Conceptual Design Report

Friant Ranch retained the services of CH2MHill to provide a series of seven technical memorandums that together formed the draft Conceptual Design Report. Written in October 2011 the draft report described a 0.25 MGD facility that would also use MBR technology and UV disinfection. However, CH2MHill did not provide guaranteed costs or outline the cost of operations for the completed facility.

1.2 CUSTOMIZED DESIGN REPORT (CDR™)

The PERC Water CDR ™ provides a comprehensive plan tailored specifically to Friant Ranch, outlining and providing certainty regarding each significant development of the project. In this respect it is an advancement of the earlier work and the contents will serve as the project description and scope of work in a Definitive Agreement.

The document relies to an extent on the draft CH2MHill report as well as the information provided by Friant Ranch and the engineering firm Provost & Pritchard. This document was completed without the benefit of a geotechnical report for the area of the proposed water recycling facility.

1.3 WATERWORKS DISTRICT 18

The current provider of water services to the Friant community is Waterworks District 18 (WWD 18). WWD 18 owns, maintains, and operates a water treatment plant and water supply system in the community and proposes to activate its latent powers to provide wastewater collection, treatment and disposal to the Friant Ranch development area.

The proposed Water Recycling Facility would be owned, operated and maintained by WWD 18. The District will fund annual operations, maintenance and costs associated with the water and wastewater service within the project area through regular customer service fees. The capital cost of the proposed facility would be borne by the developers of Friant Ranch absent any financial contribution to the facilities by the WWD 18.

1.4 AVAILABLE DELIVERY METHODS

There are various delivery methods to consider when implementing major water and wastewater capital projects and it is important to understand the advantages and risks associated with each one. There are four delivery methods that are most common to water and wastewater capital projects: Design/Bid/Build (DBB), Design/Build (DB), Design/Build/Operate (DBO), and Design/Build/Operate/Finance (DBOF). Methods suitable for this application are described below.

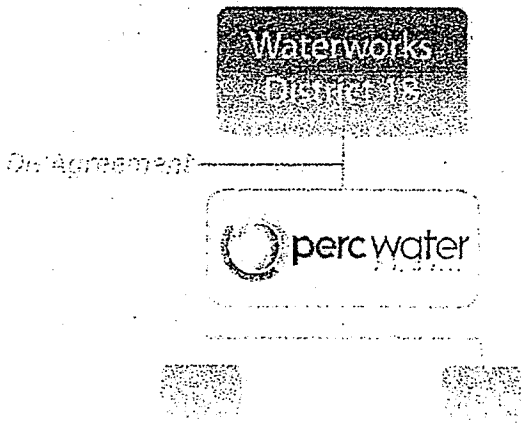
1.4.1 Design/Build

In contrast with the traditional Design-Bid-Build project approach, which typically involves a large number of principal parties and three separate contracts, the Design/Build project approach can reduce life-cycle cost and limit risk by contracting with a single, unified design and construction team. The integrated approach of Design/Build is proven to result in cost-saving construction techniques and a more economical design.

DB Risk Allocation Chart

		Risk Responsibility
Design/Build	Design/Build Cost	
	Schedule/Completion	
	Construction Warranties	
Asset Mgt.	Water Quality Performance	WWD 18
	Capital Replacement	WWD 18
	Power	WWD 18
	Biosolids	WWD 18
	Life Cycle Costs	WWD 18
	Operation & Maintenance	WWD 18

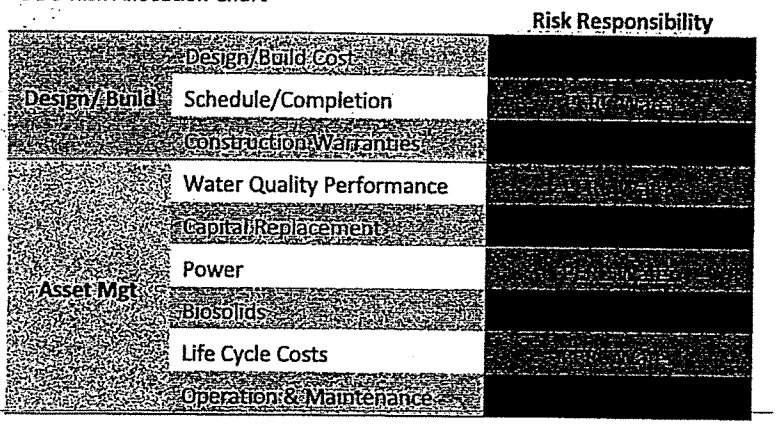
The following chart depicts the Design/Build approach:



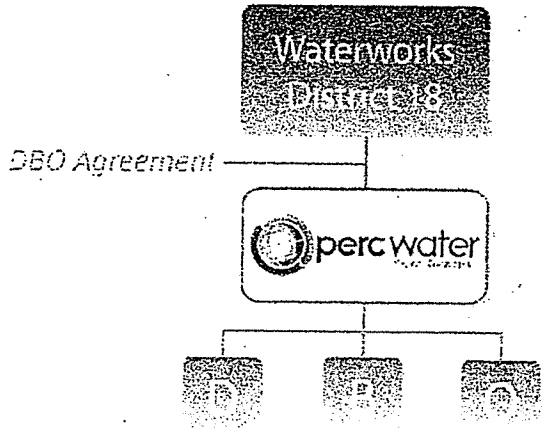
1.4.2 Design/Build/Operate

The Design/Build/Operate project approach enables the client to work with the same integrated Design/Build entity to operate and maintain the Facility after commissioning and startup. This approach transfers the risk of performance of the Facility over the long term to the entity responsible for designing and building the Facility, which significantly reduces the risk for Friant Ranch and WWD 18. PERC Water has operated every facility we have designed and built, and many of which have been transitioned to the municipality.

DBO Risk Allocation Chart



The following chart depicts the Design/Build/Operate approach:



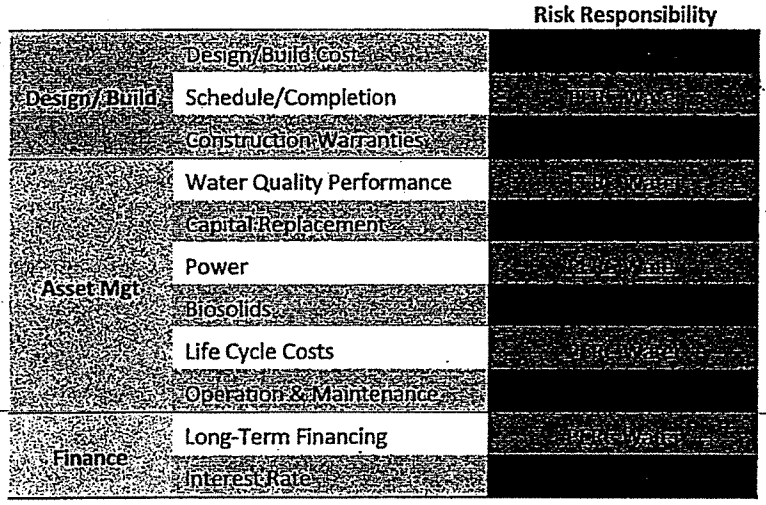
1.4.3 Design/Build/Operate/Finance

This approach contemplates a structure whereby PERC Water and our financial partner would form a special purpose entity which would enter into a DBOF Agreement with Friant Ranch/WWD 18 for a period of no more than 35 years (in accordance with CA Government Code 5956). The structure would require

the special purpose entity to provide the upfront capital for the design and construction of the Facility with no requirement of capital payments by Friant Ranch/WWD 18. The DBOF Agreement would contain a Service Fee that includes capital repayments, capital reserves, fixed O&M costs and variable O&M costs.

The DBOF approach provides flexibility to Waterworks District 18 to commence design and construction of the Facility immediately. This is the approach recently adopted by the City of Santa Paula, located in Ventura County, California. It is an approach that can be attractive to public agencies in a time when there is so much uncertainty in the financial markets.

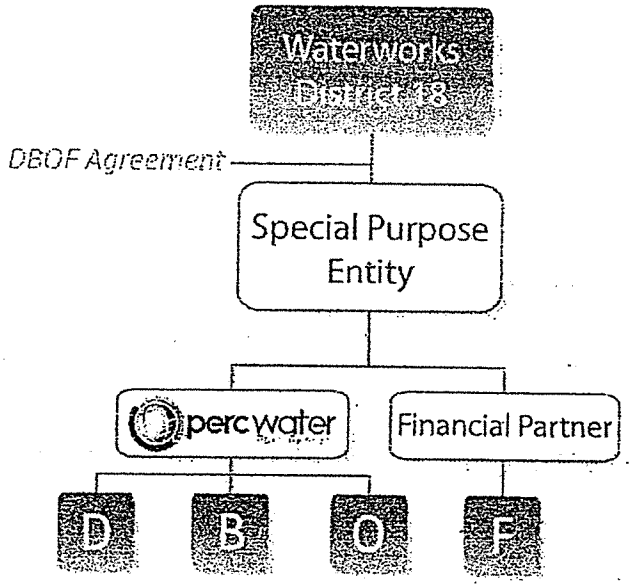
DBOF Risk Allocation Chart



The DBOF Agreement would provide for the following:

- Meet RWQCB's effluent requirements based on Acceptable Influent
- Debt and Equity financing for up to 35 years
  - Includes all risk on interest rates
  - Includes all risk on market financing terms
  - Complete reversion to the WWD 18 at the end of the DBOF Agreement at no cost
- Monthly Services Fees include:
  - Capital Repayments based upon agreed upon schedule
  - Future Capital Replacements (e.g. Process Equipment Replacements)
  - Fixed and Variable O&M Costs
- Exist Standards upon transfer to WWD 18

The following chart depicts the alternative approach using Project Financing:



For a comprehensive review of these delivery methods, see *Delivery Methods Summary* in the Appendix.

1.5 DESIGN AND ENGINEERING

PERC Water's engineering team is responsible for design strategy, feasibility analysis, and research and development for all PERC Water facilities. Additionally, PERC Water's engineering team takes responsibility for equipment procurement and selection, while focusing on risk management for long term reliability.

PERC Water retains the consulting services of Pacific Advanced Civil Engineering, Inc. (PACE), a Water Resources Engineering Consultant, to provide engineering and construction documents for all of PERC Water's facilities. PACE is an engineering design/consulting company specializing in the design of water and wastewater treatment systems, water distribution, water recharge, infrastructure, flood control, drainage, wetlands mitigation, water features, and land use planning. As a result of this unique strategic alliance, we have the added advantage of drawing upon a track record of over 25 years of successful project completion.

1.6 BUILD

PERC Water's team is responsible for project management and construction operations of the PERC Water facility, based on approved construction documents. This team will oversee all construction activities for

the project including project management, construction to engineering specifications, critical path scheduling, QAQC, and management of pertinent subcontractors.

During the construction phase of the project, PACE (Engineer of Record) will provide engineering services and administration to ensure construction is in accordance with construction documents and to provide QA/QC during the construction phase.

In addition, PERC Water's Asset Management Team will incorporate its staff during the construction phase to ensure the facility is being built in the best interest of the facility operations. Having the knowledge and expertise of trained operators with over 50 years in the business is something that PERC Water takes great pride and value in.

1.7 COMMISSIONING AND START UP

Upon completion of the general construction activities, PERC Water will begin control system verification and checkout. Once this is complete, PERC Water will begin the Commissioning phase. Our Technical Services Team will work with OEM/vendors to complete field startup of all process and facility equipment, verify installation and operability of systems, verify control points and set calibration. The Commissioning effort is complete following a successful 24-hour Clean Water Test and the Engineer of Record certifying Substantial Completion, at which time the facility is ready to accept wastewater and commence the Startup Test.

After successful completion of the 24-hour Clean Water Test, PERC Water's Asset Management Team will assume the operations of the project. Once all mechanical and control systems are verified, the facility is ready to commence treating wastewater. After reliable and continuous compliant effluent has been produced, the facility is ready for effluent discharge and the start-up phase is complete.

1.8 ASSET MANAGEMENT

PERC Water's Asset Management Team is responsible for the operation and maintenance of the Facility upon its completion. We recognize wastewater treatment facilities are highly-specialized and complex production facilities and are considered an asset to its Client. Accordingly, our Asset Management Team specializes in a full-service offering, managing every aspect of this asset. Our Total Asset Management Service is beyond the scope of traditional O&M service and results in long-term operational reliability, outstanding process performance, extended life cycle and budget-conscious cost of operation. This service begins with all day-to-day tasks for the entire system in accordance with all regulatory requirements, and includes forward planning and budgeting for capital replacements and other future needs. Ultimately decreasing the overall cost for Waterworks District 18, the Asset Management Team focuses on increased water quality, reduction of power consumption, equipment efficiency, and also provides a "24-7" on-call staff for facility operations and maintenance. PERC Water's Asset Management Team provides customer service specifically tailored to each client, while managing every aspect of Waterworks District 18's wastewater needs.

1.9 STRATEGIC PARTNERS

PACE has provided engineering and construction documents for PERC Water since the first project. As a result of this unique strategic alliance, we have the added advantage of drawing upon a track record of over 25 years of successful project completions. Throughout this time, PERC Water and PACE have been in constant communication, relaying successes and challenges in the field, leading to the development of more dependable and cost effective solutions for clients. This alliance also allows the team to deliver innovative turnkey solutions that create valuable cost savings while maximizing quality and value to our projects.

This list is a representative sample of projects for which this strategic partnership has previously partnered on:

- Santa Paula WRF – Santa Paula, CA – 4.2 MGD WRF
- Mountain House WRF - Mountain House, CA - 3.0 MGD WRF
- Barona WRF - Lakeside, CA - .75 MGD WRF
- Palm Valley WRF - Goodyear, AZ - 4.1 MGD WRF
- City of El Mirage WRF - El Mirage, AZ - 3.6 MGD WRF
- Sundance WRF - Buckeye, AZ – 3.6 MGD WRF
- SPA-2 WRF – Surprise, AZ – 1.2 MGD WRF
- SPA-3 WRF – Surprise, AZ – 1.8 MGD WRF
- SPA-4 WRF – Surprise, AZ – 1.2 MGD WRF
- SPA-5 WRF – Surprise, AZ – 1.2 MGD WRF
- Tartesso WRF – Buckeye, AZ – 1.2 MGD WRF
- Red Rock WRF – Pinal County, AZ – .3 MGD WRF
- Whetstone WRF – Benson, AZ – .25 MGD WRF
- Rancho Viejo WRF – Santa Fe, NM – .075 MGD WRF
- Sky City Casino WRF – Pueblo of Acoma, NM – .075 MGD WRF
- Four Corners WRF – Espinola, NM – .08 MGD WRF\

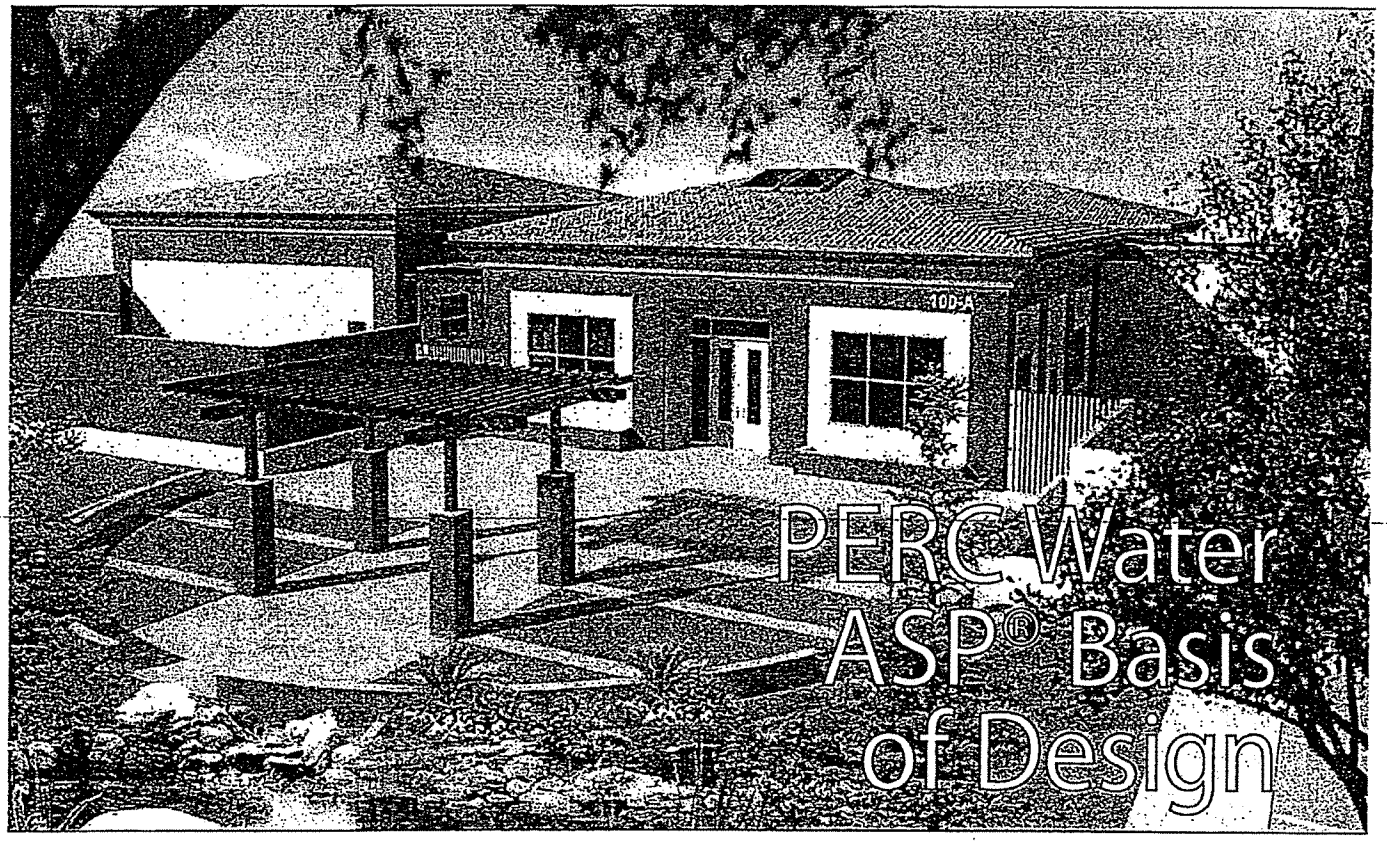
1.9.1 About PERC Water Corporation

PERC Water is the only, completely integrated DBO firm to have designed, built and operated over 20 water recycling facilities. In all of PERC Waters' contracts we have assured quality, project cost and timeline from the early conceptual phase of each design/build project. PERC Water has provided design on over 55 facilities over the past 15 years with treatment processes that have included conventional activated sludge processes, Bardenpho, MLE, Conventional SBR, Hybrid SBR and Hybrid MBR.

1.9.2 About PACE

PACE is a 50-person engineering consulting firm in Fountain Valley, California with a strong reputation for its expertise in water resources that follows the principles of doing what is best for the client and what is right for nature. PACE's service areas include engineering of water/wastewater infrastructure and

stormwater management/flood protection. In the past 10 years, PACE has been the principal engineer for over 25 wastewater treatment facilities throughout California, Arizona, Idaho and New Mexico for municipalities and developers in both traditional design-bid-build and design-build settings, and has served as the Engineer of Record for all PERC Water facilities.



Santa Paula Water Recycling Facility
4.2 MGD
Rendering

2.1 EXECUTIVE SUMMARY

Through extensive research and experience, PERC Water has formulated its own trademarked design to provide efficient, environmentally sensitive solutions for wastewater treatment. The PERC Water ASP (Activated Sludge Process) design is based up highly evolved Membrane Bioreactor technology which incorporates small footprint tanks and aesthetically pleasing buildings.

Our integrated design combines processes efficiently, and results in a compact design where all treatment tanks are fully-enclosed in a building. Housing treatment processes inside protects equipment from exposure, increases security, controls odors, eliminates vectors, and improves the aesthetic appearance of the entire facility. A reduced footprint also means less materials and lower overall cost, despite the added complexity of construction. Finally, land around the facility can be utilized for alternative uses.

The PERC Water Friant Ranch Water Recycling Facility covers an area of 1.02 acres for Phase 1 (400,000 GPD) and Phase 2 (800,000 GPD). The CH2MHill design covers an area of about 2.5 acres for Phase 1 (250,000 MGD), Phase 2 (500,000 GPD), and Phase 3 (750,000 GPD). The CH2MHill design offers 6 percent less treatment capacity using more than twice the space due to the fundamental difference in design philosophy. CH2MHill uses a campus approach, which separates each unit treatment process into its own area and then connects them together with long runs of piping. The PERC Water design integrates processes so they work together harmoniously, which takes more design effort, but results in less materials, shorter runs of piping and electrical conduit, and a more compact facility.

The flow equalization basins are a good example of the differences in design approach. CH2MHill dedicates three equalization basins for the sole purpose of holding peaks in the flow at 750,000 GPM buildout capacity. The ability to store peaks allows the treatment portion of the process to be smaller, but the space the EQ tanks take up is considerable. Three 46' foot diameter EQ basins cover an area of more than 8,000 SF, which is a large piece of real estate for a process that is used a fraction of the year. EQ basins are also notoriously difficult for operations staff to clean and maintain during extended periods of non-use.

The PERC Water design provides peak flow storage within the biological treatment basins themselves, which eliminates the need for separate EQ tanks. By allowing the levels in the anoxic and aerobic treatment tanks to fluctuate, the operator has the ability to adjust the peak storage capacity in the plant based on influent conditions. In addition, the PERC Water design puts more power "under the hood" in the treatment process. The treatment capacity of the membranes is higher so that more flow is treated rather than stored during peak flows. This reduces the overall equalization volume needed. An extra benefit to larger membranes is an extended life span of the equipment due to lower average flux.

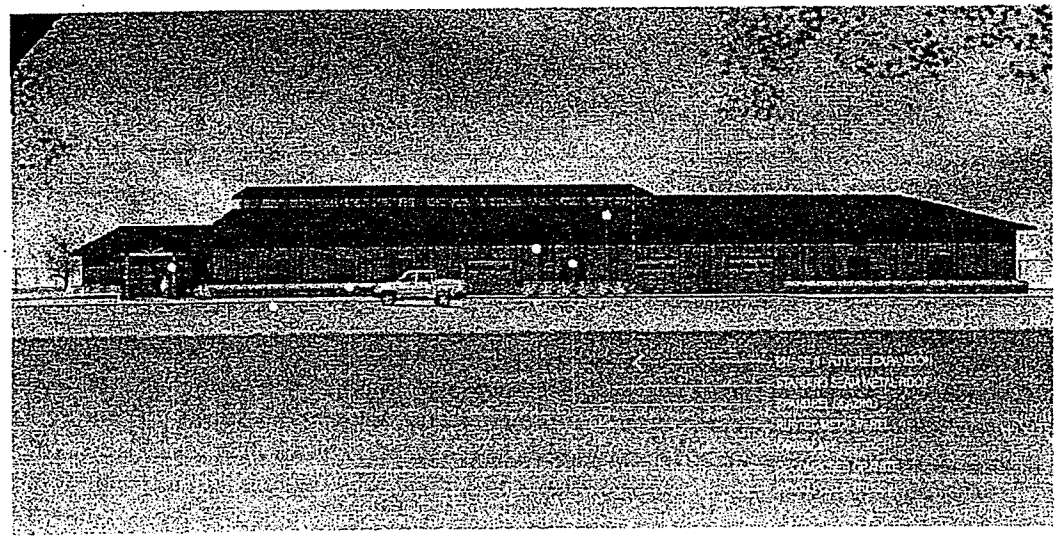
The PERC Water design described in the sections to follow features a smaller footprint, less visual impact, fewer odors and more flexibility in operations. That these improvements are accompanied by a lower cost makes the design especially unique.

2.2 FACILITY DESIGN OVERVIEW

The Friant Ranch Water Recycling Facility is designed to offer flexibility of operation and ease of expansion, all on a small footprint. The facility is designed in two phases, with Phase 1 treating 400,000 gallons per day and Phase 2 doubling the capacity to 800,000 GPD. Utilizing Membrane Bio-Reactor technology without clarifiers or filters, allows for a small footprint while providing high quality effluent and simplicity of operation. The small footprint allows all treatment processes to be enclosed within a ranch style building that fits into the agricultural context of the surroundings. With no open treatment tanks or associated odors, the only cue that the site is a wastewater treatment facility is the entry sign.

The unique architectural elements will be a distinguishing characteristic of the Friant Ranch Water Reclamation Facility. The design is inspired by ranch style architecture to reflect the surrounding contextual elements. Two exterior silo-style storage tanks adjacent to the building will add to the agricultural feel. The overall design of the building, with metal siding and standing seam metal roof, updates the ranch style appearance and improves sustainability and energy efficiency – while adding a unique contemporary feel through the use of materials and colors. The overall building is accented with rustic exterior metal panels, providing a distinctive appearance. This single story building features a horizontal, rambling layout, with pitched gable roof at varying heights. The main entrance is defined by a gable canopy, with exposed wood trusses to give the facility a sense of identity. The tall windows on the east side of the facility are designed to emphasize the openness of the space through natural lighting and to allow for passive cooling, cross air ventilation throughout the building. Landscaped accent planters irrigated with recycled water will further enhance the appearance of the facility.

Figure 2.1: Front Rendering of Proposed Water Recycling Facility



Exterior elements of the treatment process are the underground lift station, emergency electrical generators, odor control, and storage tanks. The two exterior storage tanks hold sludge and treated

permeate, but are designed to look like silos. They are two 30,000 gallon fiberglass tanks approximately 15 feet in diameter and 30 feet tall, which are lower than the roofline and not visible from Friant Road. The Friant Ranch Water Recycling Facility has been designed to be constructed in two phases:

	Construction Phase 1	Construction Phase 2
Treatment Capacity	400,000 Gallons Per Day	800,000 Gallons Per Day
Building Size	9,040 SF	13,960 SF

Building area for Phase 1 is 9,040 SF total, comprised of 7,440 SF for the treatment processes and 1,600 SF for offices and laboratory. In Phase 2, the building expands northward by an additional 4,920 SF, so that at 800,000 GPD build-out, the total building square footage is 13,960.

The water recycling facility is contained within a site area of just over 1.02 acres (44,595 SF). The facilities included within this area are the lift station, building, tankage, and electrical equipment for both phases, and an access road. Access is provided around the perimeter of the building with a graded road surface of decomposed granite. The access road varies in width from 25 to 42 feet and provides adequate clearance for trucks to haul away sludge cake and screenings. Four designated parking spaces are provided next to the office/lab building, with two accessible spaces.

2.3 RELIABILITY, REDUNDANCY AND FLEXIBILITY FOR FUTURE EXPANSION

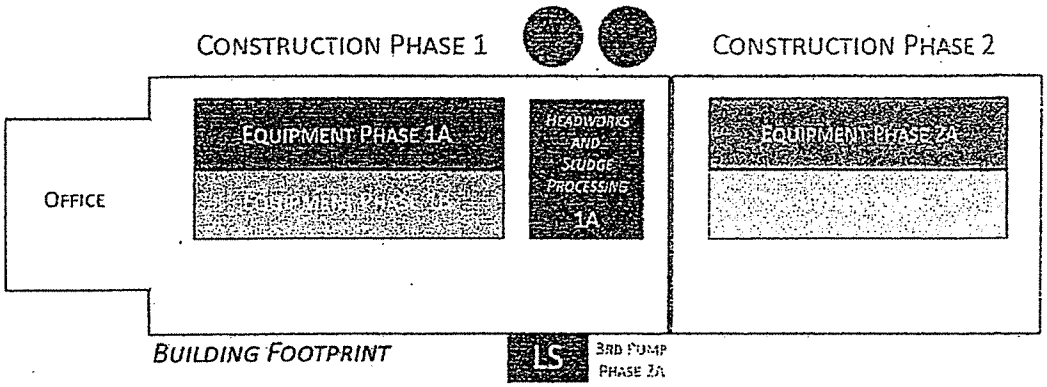
Redundancy is integrated into the overall process design through the use of multiple treatment trains. Construction Phase 1 and 2 each have two trains which can be operated independently, providing flexibility to operate at varying flows. This approach is illustrated in the table below and in Figure 1-2.

First Option – All Equipment Installed during Construction Phases

Construction Phase 1	Construction Phase 2
Trains 1 and 2 operating	Trains 1,2,3 & 4 operating
400,000 GPD	800,000 GPD

Optionally, equipment can be populated only as needed, keeping initial capital expenditures minimized and operational costs optimized. In This second option, following Construction Phase 1, Train 1 is operated alone for flows up to 200,000 GPD. As flows approach 200,000 GPD, Train 2 is brought online for up to 400,000 GPD treatment capacity. Similar steps in treatment capacity can be made in Construction Phase 2 with Trains 3 and 4 to treat incremental flows of 600,000 and 800,000 GPD, or both trains can be brought on together for the ultimate treatment capacity of 0.8 MGD.

Figure 2.2: Construction and Equipment Phasing Plan



Second Option – Some Equipment Installed during Construction Phases, Some Deferred

Construction Phase 1		Construction Phase 2	
Train 1 operating	Trains 1 and 2 operating	Trains 1, 2 & 3 operating	Trains 1, 2, 3 & 4 operating
200,000 GPD	400,000 GPD	600,000 GPD	800,000 GPD

Alternative Phase 2 Operation omits the 600,000 increment, and doubles the flow from 400,000 GPD to 800,000 GPD.

Construction Phase 1		Construction Phase 2
Train 1 operating	Trains 1 and 2 operating	Trains 1, 2, 3 & 4 operating
200,000 GPD	400,000 GPD	800,000 GPD

Construction Phase 1 builds two treatment tank trains housed in 9,040 SF of building space, and one emergency generator. These components will require expansion in Construction Phase 2. Several Phase 1 structures are installed with ultimate build-out capacity, and will not require expansion in Phase 2. "Built-out" processes include the headworks screens, permeate and sludge storage tanks, dewatering equipment, odor control, disinfection, and the concrete lift station structure. The lift station structure will be populated with an additional third pump in Phase 2, but the structure itself will not need to be modified.

Structure/Process	Construction Phase 1 Quantity	Construction Phase 2 Quantity
Building	9,040 SF	13,960 SF
Treatment Tank Trains	2	4
Backup Power Generation	1 Genset 500 kW	2 Gensets 500 kW + 300 kW
Lift Station Wet Well Structure	1	No Change
Permeate Storage Tank	1	No Change
UV Disinfection Modules	4	No Change
Centrifuge	1	No Change
Sludge Storage Tank	1	No Change
Odor Control	1	No Change

Construction Phase 2 consists of duplicating the existing bioreactor tankage and expanding the building. In addition, an influent pump will be added to the existing lift station, and another generator will be installed for standby emergency power. The Phase 2 expansion is designed to minimally disrupt the existing plant operation. Construction of the additional tanks and building expansion occurs without stoppage of existing treatment processes. When Phase 2 construction is complete and operable, the two phases are tied together at flanged stub-outs on influent, permeate, sludge, and CIP piping. These tie-ins can be accomplished within a short period of plant stoppage.

The four-train design provides the opportunity to phase the purchase and installation of equipment with the increase in flow capacity. For example, during initial stages of development when flows are less than 200,000 GPD, treatment requires only the use on Train 1. The purchase of equipment for Train 2 can be deferred until flows increase. When 400,000 GPD capacity is needed, the equipment for Train 2 can be purchased, deferring capital outlay for the following equipment: one mixer, two membrane modules, two membrane feed pumps, two RAS pumps, two permeate pumps, and one blower. Similar equipment phasing can be done in Phase 2.

	Equipment Phasing			
Equipment	200,000 GPD Train 1	400,000 GPD Trains 1 and 2	600,000 GPD Trains 1,2 & 3	800,000 GPD Trains 1,2,3 & 4
Lift Station Pumps	2	No Change	3	No Change
Anoxic Tank Mixers	1	2	3	4
Membrane Modules	2	4	6	8
Pumps for Membrane Feed /RAS/Permeate	2	4	6	8
Blowers	3	4	7	8

As even the best components have the ability to fail and the need to be taken down for maintenance, and some equipment is specifically designed with redundancy so that one unit can be taken out of service while maintaining full capacity of the treatment process. The following equipment is designed with redundancy:

Redundant Equipment
Influent Pumps
Headworks Screens
Blowers
Aerobic/Anoxic Bio-trains
Membrane Feed Pumps
Membrane Modules
Permeate Pumps
UV Disinfection Modules

2.4 INFLUENT DESIGN FLOWS AND CONCENTRATIONS

Influent is assumed to be standard residential strength with a minimum BOD/TKN ratio of 5:1, typical in municipal wastewater. For example, with a TKN of 50 mg/L, a BOD of 250 mg/L is assumed. If TKN rises to 60 mg/L, minimum BOD assumed is 350 mg/L.

Phase 1 Influent Design Parameters

Average Dry Weather Flow	0.4 MGD
Maximum Month Day Flow	0.5 MGD
Maximum Day Flow	1.1 MGD
Peak Hour Hydraulic Flow	1.8 MGD
Average BOD^5 (mg/L)	250 mg/L
Maximum BOD^5 (lbs/day)	834 lbs/d
Average TSS (mg/L)	240 mg/L
Maximum TSS (lbs/day)	800 lbs/d
Average Monthly Ammonia (mg/L)	30 mg/L
Maximum Ammonia (mg/L)	45 mg/L
Maximum Ammonia (lbs/day)	150 lbs/d
Maximum TKN (mg/L)	60 mg/L
Maximum TKN (lbs/day)	200 lbs/d
Minimum BOD:TKN ratio	5:1

Phase 2 Influent Design Parameters

Average Dry Weather Flow	0.8 MGD
Peak Hour Hydraulic Flow	3.0 MGD
Minimum BOD:TKN ratio	5:1

Modeling of the proposed treatment process produces effluent that meets the following criteria as well as CA Title 22 Recycled Water Quality Standards.

Effluent Water Quality

BOD5 (mg/l)	<2 mg/L
TSS	< 2 mg/L
TN	<10 mg/L
Total Coliform (CFU/100ml)	<2.2/<23
Turbidity	< 0.2 NTU
pH	6.0-9.0

2.5 TREATMENT PROCESS AND EQUIPMENT SELECTION

The following equipment is required to populate both trains of Phase 1 for 400,000 GPD treatment capacity.

Phase 1 Equipment List

EQUIPMENT	MANUFACTURER	MODEL #	QUANTITY	DESCRIPTION
PUMPS / MIXERS				
Raw Influent Pumps	Vaughan	SE6U	2	1,260 GPM @ 30' - 20HP / 480V / 3P / 60HZ VFD - 6" Swept Outlet
Membrane Feed / RAS Pumps	Flygt	PP4640-63-837	4	2,200 GPM @ 1.5' / 1,000 GPM @ 3.6' - 4HP / 480V / 3P / 60HZ VFD - 16" Outlet
Membrane Permeate Pumps	Vogelsang	V136-140	4	335 GPM @ 25' - 7.5HP / 480V / 3P / 60HZ VFD - 6" Straight In/Out
WAS Pumps	Flygt	NP3085SH-255	2	220 GPM @ 35' - 4HP/480V/3P/60HZ - 3" Swept Outlet
Anoxic Mixers	Flygt	4630	2	4,300 GPM - 2.5HP/480V/3P/60HZ
Membrane CIP Pumps	Koch	TBD	2	Supplied by Koch

BLOWERS / AERATION EQUIPMENT

Main Aeration Blower	Kaeser	EB421C	2	300 - 1,200 SCFM @ 6.5 PSI - 60HP / 480V / 3P / 60HZ VFD
Membrane Aeration Blower	Kaeser	EB421C	2	300 - 1,200 SCFM @ 6.5 PSI - 60HP / 480V / 3P / 60HZ VFD
Aerobic Basin Aeration Diffusers	Sanitaire	Fine Bubble	308	9" DIA Membrane Diffuser 1-5 SCFM EA

SCREENING / HEADWORKS

Influent Screen	IPEC	IFM4872	2	1mm Perforated Plate Drum Screen - 3.3 MGD
Screenings Washer Compactor	IPEC	PLT-8100	2	Automated Screenings Washer / Compactor

MEMBRANE SEPARATION EQUIPMENT

Membrane Modules	Koch	PSH-1800	4	19,375 SF / MOD - 335 GPM @ 25 GFD
Permeate Storage Tank	Austin Fiberglass	30,000 gal	1	15'6" DIA x 24' H with Aeration System
Cleaning System	Koch	TBD	1	Supplied by Koch

UV DISINFECTION

UV Disinfection Banks	Trojan	UVFIT 18AL40	4	NWRI Certified for Peak Day Flow 1.1 MGD

SLUDGE STORAGE / DEWATERING

Sludge Storage Tank	Austin Fiberglass	30,000 GAL	1	15'6" DIA x 24' H with Aeration System
Centrifuge Dewatering System	CENTRISYS	CS10-4	1	Skid System 20-25 GPM - 475 #/HR

EMERGENCY POWER GENERATION

Emergency Power Standby Generator	Cummins	DQHAB	1	500 kW

ODOR CONTROL

Biofilter	–	200 SF	1	10' x 20' x 4' PERFORATED CONCRETE BOX WITH ORGANIC MEDIA
Blower	–	3 HP	1	600 CFM @ 2" CORROSION RESISTANT
Moisture Control System	–	–	1	Timed sprinklers with two spray heads minimum supplied with recycled water

2.6 INFLUENT LIFT STATION

Per Provost & Pritchard, the anticipated gravity sewer trunkline to the influent lift station is 18-inch diameter with an inlet invert located about 13-ft depth below ground surface. The bottom of the wet well is at a depth of about 20.5 feet below grade, approximately 7 feet below the influent inlet. The difference in height provides the volume for operational storage for both Phase 1 and 2 without expansion. The lift station wet well structure is an 8'x10' precast concrete box and the influent level within the wet well fluctuates up to 5 feet to provide approximately 3,000 gallons of operational storage. The station is equipped with seats for three equal-sized 1,260 GPM pumping units; however only two pumps are installed in Phase 1. Two pumps provide full redundancy in Phase 1, with firm peak flow capacity of 1.8 MGD with one pump running and the other on standby. With the third pump installed in Phase 2, 3.0 MGD peak hour capacity is achieved with redundancy on one pump. The pumps are sized for a total design head of 30 feet to account for the 20.5 depth of the pumps, the addition 8 feet of lift to the headworks, and friction losses in the pipe.

2.7 HEADWORKS

The proper selection of headworks equipment is critical for the operation of MBR systems. The proposed headworks screens have openings of only 1mm to protect the downstream membranes from accumulations of material that can damage the membrane's surface. Raw wastewater is pumped from the lift station into the building where the piping is split between the two screens. The parallel configuration provides redundancy and the ability to service screening equipment without bypassing un-screened sewage to the downstream process. Each screen has 3.3 MGD capacity to meet the peak hour flows of both phases, with no expansion needed in Phase 2. The selected headworks screening equipment is the IPEC IFM, which is an internally-fed drum screen that is fully enclosed to reduce odors and make connection to an odor control system simple. Solids that collect on the screen are conveyed, dewatered, washed, and compacted by a screw press. The IPEC PLT employs a shaftless conveyor screw with compaction head designed to press free liquids from solids. Screenings are conveyed up the shaft and fall into a bin or waste hauling truck.

2.8 ODOR CONTROL

Odor control is provided at both the influent lift station and the headworks. Ducts are connected to the lift station and screen covers and foul air is collected and directed to the central odor control biofilter system. Air from the Lift Station and Headworks will be changed 12 to 16 times per hour.

Odor Control System		
Process	**Air Volume**	**16 Changes per hour**
Lift Station	1,600 CF	425 CFM
Headworks	375 CF	100 CFM
Odor Control System Required Capacity		**525 CFM**

The biofilter system is sized at 10' x 20' x 4' deep with a surface area of 200 SF to provide 600 CFM capacity assuming a typical loading rate of 3 CFM/SF. The biofilter requires a 3 HP fan with a capacity of 600 CFM @ 2" and a sprinkler system to keep the organic media moist.

2.9 MEMBRANE BIOREACTOR

From the influent headworks, screened sewage flows into a splitter box which evenly divides flow between Phase 1 and Phase 2 build-out condition. In Phase 1, the splitter is closed on the east side so flow is directed to Trains 1 & 2 only. Each bio-train consists of an anoxic tank, an aeration tank, and a membrane tank. The tanks utilize common wall construction to optimize concrete usage, and are partially buried. Tank walls are 14' high, and approximately 10.5' of tank is buried and about 42" of the tank wall extends above ground, eliminating the need for safety railings around the tanks. About 1 to 2 feet of freeboard will be allowed in the tanks.

Tank	Tank Dimensions	Tank Volume (per bio-train)	Freeboard
Anoxic Tank	29.5' x 15' x 12'	39,700 gallons	2 feet
Aeration Tank	29.5' x 15' x 12'	39,700 gallons	2 feet
Membrane Tank	11' x 15' x 13'	16,050 gallons	1 foot

From the splitter box, wastewater mixes with RAS in a channel before it flows into the anoxic tank. In the anoxic tank, wastewater and RAS are mixed continuously with a 2.5 HP submersible mixer. The mixing of raw sewage with RAS in anoxic conditions promotes high-rate denitrification. A baffle allows the anoxic mixture to flow into the aeration tank. Each aeration tank is equipped with two grids of fine bubble diffusers and air is delivered using Kaeser rotary lobe blowers. There are four blowers in total, with one dedicated to Aerobic Tanks 1 and 2, one for each Membrane Tank, and one spare. The blowers are able to be turned down from 1,200 CFM to 300 CFM, or 4:1, which makes them very versatile in maintaining an optimum DO within the aeration tanks. Dissolved oxygen levels are monitored in each aerobic tank and reported to the main process control PLC which increases or decreases the speed of the blowers, optimizing DO and minimizing electrical costs.

The membrane feed pump installed at the end the aerobic tank has two purposes; it lifts biologically treated mixed liquor into the membrane tank and also lifts RAS over an outlet weir at the end of the membrane tank where it combines with influent in the recycle channel and flows back to the anoxic tank.

The feed pump is operated on VFDs based on the level in the aerobic reactor to provide 5Q during average flow. The membrane feed/RAS pump is a low head/high flow 4HP internal recycle propeller pump with capability to operate with varying changes in head conditions. These pumps allow batch processing during periods of low flow.

Membrane plant typically run continuously; however, during low flows, wastewater is processed in batches. During batch processing, wastewater is not constantly pumped through the membranes. Instead it accumulates in the anoxic and aerobic tank while the RAS pumps maintain 5Q recycle. Once the tanks are full, the permeate pumps automatically switch on, and pull treated water through the membranes which lowers the level in the anoxic/aerobic tanks. When the permeate pumps turn off, wastewater is allowed to accumulate again and the cycle is repeated.

Membranes provide liquid-solid separation and filtration simultaneously, eliminating the need for separate clarifiers and filter units. The membranes serve as a physical barrier to suspended solids and micro-organisms. Koch PSH-1800 Membranes are the proposed membrane separation equipment. They are listed by CDPH as acceptable equipment for use in Membrane Bio-Rectors (MBRs) to meet Title 22 – 2.2 unrestricted reuse requirements. Each train has two membrane modules with 19,375 SF per module, providing a total installed membrane area of 77,500 for Phase 1. Modules will simply be doubled for Phase 2.

The membrane portion of the MBR system has two basic operating modes: Production and Cleaning. During production mode, rotary lobe membrane permeate pumps pull the treated water through the membranes. As water is pulled through the membranes, biomass accumulates on the surface of the fiber bundles causing an increase in pressure across the membrane surface. Removal of the solids from the bundles is accomplished in two ways: (1) an intermittent air scour is applied to scrub the membrane surface and (2) a permeate backflush is completed where the flow is reversed through the membranes, dislodging solids accumulated on the outside of the fiber bundle.

Each membrane module is equipped with a dedicated 335 gpm rotary-lobe permeate pump to extract and separate water from the mixed liquor. Extracted effluent is pumped to the UV disinfection system for final processing prior to discharge or to a permeate storage tank. The permeate storage tank has 30,000 gallon capacity to provide storage of backflush and CIP water for the membranes during Cleaning Modes.

During backflush cleaning mode, permeate pumps are reversed and the membranes are backflushed with a solution of sodium hypochlorite. Backflushing prolongs the normal operation of the membranes and reduces the frequency of CIP cleaning.

The membranes are also scoured with air to help maintain permeability. At optimum flux rates, the full aeration flow rate is applied intermittently to module trains through the use of air cycling valves on each train to save energy. Typically, the scour aeration will be applied 33 to 50% of the time under normal flow conditions. At higher flux rates, aeration will be applied continuously to all membrane modules. One VFD-operated Kaeser rotary lobe blower is dedicated to each membrane train for this purpose.

Over time, materials adsorb onto the surface of the membrane which cannot be removed by physical cleaning. For adsorbed substances, such as biofilms or other deposits on the membrane surface, a chemical cleaning is required. Depending upon the nature of the foulant, common chemicals such as sodium hypochlorite or citric acid are used to chemically clean the membranes. These chemical cleans can be completed at regularly scheduled intervals during a backflush (Maintenance Clean), or after system upsets when a more intensive cleaning (Recovery Clean) is required. Recovery Cleans are typically performed once per year to restore membrane permeability.

Maintenance cleans (Preventative chemical cleaning operations) are performed periodically to maintain membrane permeability. Typical maintenance cleaning frequency is approximately every 4 weeks. During a maintenance clean operation, the permeate system is shut off and aeration is shut down. The dedicated Clean-In-Place (CIP) pump is activated to maintain a constant flow rate. For a period of about 30-60 minutes, chemicals are continuously dosed chemical into the CIP line to clean the membranes. Following chemical dosing, the CIP pump continues to run for another 15 minutes to flush residual chemicals out of the system. In normal operation a pH adjusted sodium hypochlorite cycle is performed. If required, the initial hypochlorite cycle will be followed by a citric acid cycle to remove mineral foulants.

2.10 UV DISINFECTION

The disinfection system is comprised of four Trojan UVFIT ultraviolet light modules in a series configuration to meet NWRI certified design capacity of 1.1 MGD in Phase 1. In Phase 2, it is anticipated that the existing system will also be meet requirements without the addition of additional lamps, although additional compliance testing will likely be required. The space has been planned to accommodate additional Phase 2 modules, if required.

2.11 SLUDGE STORAGE AND DEWATERING

At Phase 1 flow of 400,000 GPD, sludge production is anticipated to be 8,000 to 10,000 gallons per day. Sludge production will double for Phase 2 buildout. The facility is designed with a 30,000 gallon sludge storage tank to provide 3 days' storage capacity for Phase 1 and 1.5 days storage for Phase 2 buildout. Each treatment train is provided with a 220 GPM WAS pump to convey the sludge from the membrane tank to the sludge storage tank or to the dewatering equipment.

Sludge Generation

Phase 1	Phase 2
8,000 to 10,000 GPD @ 0.8 to 1.0% solids	16,000 to 20,000 GPD @ 0.8 to 1.0% solids
3 days storage capacity in 30,000 gallon tank	1.5 days storage capacity in 30,000 gallon tank

Dewatering is provided with a package centrifuge system by Centrisys. The 20 HP packaged skid system fully-equipped with a sludge feed pump, polymer blending unit, dewatered cake conveyor and sludge flow meter. The CS10-4 unit provides solids and hydraulic capacity of 475 LB/HR and 5 to 35 GPM, respectively, and cake dryness of 20 to 22 percent. At a 20 GPM loading rate, the centrifuge will run for approximately 6.5 hours per day.

2.12 PERMITTING DESCRIPTION AND PROCESS

We have extensive experience working with local, regional, state and federal agencies in the permitting process for our facilities and will utilize this experience to negotiate the best possible compliance requirements for the project. We have years of experience in obtaining permits necessary to complete successful projects. One of the most import steps in the permitting process to know what you will need before you start the project which allows our team to quickly identify and develop a schedule to help keep the project moving. In several of our past projects clients have been up against State mandated compliance dates and our team has been able to effectively obtain and complete permit requirements without delays.

Our project team has preliminarily identified the following potential permit requirements for the Project which are included in the tables below. All permit fees will be the responsibility of Friant Ranch

Fresno County and Local Permits – Table 1

Reviewing Agency	Department	Permit	Responsible Party
Fresno County	Planning Department	Conditional Use Permit Site Plan Review	Friant Ranch
Fresno County	Building and Safety	Building Permit	PERC Water
Fresno County	Building and Safety	Mechanical Permit	PERC Water
Fresno County	Building and Safety	Electrical Permit	PERC Water
Fresno County	Building and Safety	Plumbing Permit	PERC Water
Fresno County	Building and Safety	Grading Permit	PERC Water
Fresno County	County Clerk's Office	Business License	PERC Water
Fresno County	Public Works and Planning	Offsite Utilities, Roadway, Street Use, and Landscape	PERC Water
Fresno County	Environmental Health	Hazardous Materials Review/ Field Inspection	PERC Water
Fresno County Fire	Protection District	Sprinkler System Permit/Plan Check and Field Inspection	PERC Water
Fresno County Fire	Protection District	Underground Water System Permit/ Plan Check and Field	Friant Ranch

Reviewing Agency	Department	Permit	Responsible Party
		Inspection – If Necessary	
Fresno County Fire	Protection District	Fire Alarm System Permit / Review and Field Inspection	PERC Water
Fresno County Fire	Protection District	Fire Pump Permit – If Necessary	Friant Ranch
Fresno County	Environmental Health	Hazardous Materials Review and Field Inspection	PERC Water
San Joaquin Valley	Air Pollution Control District	Authority to Construct and Permit to Operate (Generator)	PERC Water

State of California – Table 2

Reviewing Agency	Department	Permit	Responsible Party
California Energy Commission	For Submittal with Electrical & Mechanical Plans for County Approval	Title 24 Energy Compliance Report	PERC Water
Regional Water Quality Control Board	Central Valley -Fresno	Waste Discharge Requirements and Title 22 Report	Friant Ranch, PERC Water provides information/reviews
State Water Quality Control Board		Permit not required, all precipitation is contained onsite	NA

We do not anticipate the need for any federal permits for the completion of the project.

2.13 UTILITIES

Per Provost & Pritchard, the gravity sewer trunkline will enter the site from North Friant Road. It is anticipated to be 18-inch diameter and connect to the influent pump station at an approximate elevation of 310.5 feet, or about 13-feet below ground surface. Sanitary sewer for the restrooms at the facility will be piped internally to the treatment process with no dedicated exterior piping required.

Potable water required in the office area (break room, bathroom, shower, laboratory, etc.) is provided through a standard municipal supply connection. Potable water demand of 10 to 15 GPM is expected.

Fire flow is supplied by recycled water stored in the effluent storage basin located north of the treatment facility. Dedicated fire pumps draw recycled water from the ponds to pressurize the system. Coordination with the local fire department is required to determine the extent of fire protection required for the treatment facility.

The wastewater treatment processes use recycled water produced at the Friant Ranch Water Recycling Facility . 30,000 gallons of recycled water is stored in the permeate storage tank to supply the facility with water for equipment washdown and the membrane clean in place system. Water with high mineral content cannot be used for CIP due to potential fouling issues; therefore water quality testing of the water supply will be performed to determine whether water softening is required on the CIP system.

Natural gas is not available at the site and is not required to complete the facility or to operate it effectively. Electrical service is provided by the electrical utility at 480 Volts with a standard 750 kVa three phase transformer installed in Phase 1. No expansion of the electrical service is necessary in Phase 2. The following table lists total CONNECTED load plus 25%, as required by the utility for sizing the service; actual power consumption will be much less. Section 8.1.3 provides information on the anticipated use.

	Phase 1	Phase 2
Phase 1 Connected Load + 25% Largest Load	540 KVa	560 Kva

2.14 STANDBY POWER GENERATING SYSTEM – PHASED APPROACH

Emergency standby power is provided by two diesel-powered gensets, one installed in each Construction Phase. A total of 800 kW of standby power is required for the 800,000 GPM buildout condition. Rather than purchase an 800 kW genset that will not be fully utilized for several years, the facility is designed with two smaller generators: a 500 kW genset in Phase 1 and 300 kW genset in Phase 2, utilizing two transfer switches of 800 amps and 400 amps.

	Phase 1	Phase 2
Genset	500 kW	300 kW + 500 kW
Transfer Switch	800 amps	400 amps + 800 amps

Upon utility power failure, the generator starts automatically and the transfer switch disengages from the main power and engages the generator. It takes approximately 15 seconds from the time the utility failure is detected until the generator is able to provide power to the facility. Electrical loads will be sequenced back on through the use of time delays to prevent block loading the power supply. Standby power is supplied only to selected loads, with redundant and non-critical loads dropped. The gensets will be equipped with fuel tanks to supply standby power for a 12-hour period.

Once power is restored, the ATS will automatically transfer back to prime power. Electrical loads will be sequenced back on through the use of time delays to prevent block loading the prime power supply.

2.15 CONTROLS AND SCADA SYSTEM

The WWTP control system consists of a Main Programmable Logic Controller (PLC), the MBR PLC, a network of control panels, and a Supervisory Control and Data Acquisition (SCADA) system. The Main PLC, located in the control room, provides the operating parameters for each process components and controls the operations of equipment based on instrumentation readings. The MBR PLC performs the same function as the Main PLC but just for the MBR process. It also communicates with the Main PLC to provide instrumentation readings that may be needed for other processes. The individual process control panels contain factory installed PLCs or remote I/O processors programmed to run the equipment they control. The equipment control panels are field-mounted near the equipment they control and communicate to the Main PLC and the SCADA system.

The facility will utilize WonderWare SCADA software to monitor and control the operation of the facility. The SCADA system is installed on a computer desktop located in the control room and can be used to control and operate equipment remotely. The SCADA system provides alarming and auto-dialing to alert operators of alarm conditions and can be used to change pre-programmed set points in the PLC.

2.16 PRELIMINARY TREATMENT PROCESS MODEL AND CALCULATIONS

Based on the process description provided above, dynamic computer simulation modeling was performed using Bio-Win to verify the required air flows, recirculation rates and tank volumes proposed. The results of the preliminary process simulations are contained in the appendix of this report. Based on the results of the modeling (see appendix), the project effluent objectives will be met.

2.17 SPILL CONTAINMENT

The facility is equipped with floor drains that collect and contain washdown water and spillage that occurs inside the building. The floor drains convey flow by gravity to the lift station, returning spillage to the head of the treatment process. In this way interior spillage is contained and re-treated in the wastewater train.

In an emergency spillage situation where the floor drain system is overwhelmed, spillage that overflows the building is captured in the exterior stormwater detention facilities. Stormwater detention basins are sized for rainfall runoff, but also serve the purpose of emergency spill containment. Typically, onsite stormwater retention basins at wastewater treatment facilities are sized to hold a 25-year rainfall event.

At Friant Ranch, the average 25-year precipitation is 2.65 inches over a 24-hour period per NOAA Atlas 14 for Fresno. Engineering stormwater detention is outside the current scope of work; however, for planning purposes, the suggested stormwater retention capacity is the product of the rainfall and the impervious site area:

2.65 inches/12 inches/foot x 44,595 SF x 7.48 gal/SF = approx. 74,000 gallons

If designed such, these basins will provide 74,000 gallons of spill capacity during dry weather. A spill of this size from the biological treatment tanks in unlikely considering they are located 10.5 feet below grade. The volume of the entire above-ground 30,000 gallon sludge storage tank is less than half the volume of the planned detention basins.

SPA III Water Recycling Facility
1.8 MGD
SBR Facility

3.1 PERC WATER ASP® MEMBRANE BIO REACTOR

3.1.1 Overview

The Facility will be designed in accordance with the PERC Water ASP® Membrane Bio Reactor ("MBR") Basis of Design as included with this Customized Design Report. Construction Documents will be prepared based on the approved CDR, and will be consistent with and a logical evolution of the approved CDR. The Facility will be constructed in accordance with the Construction Documents.

3.1.2 General Outline Specifications

3.1.2.1 Division 1 – General Requirements/Conditions

All miscellaneous general condition items necessary for the construction of the Facility are included as listed herein:

- Testing Laboratory Services
- Mobilization
- Temporary Utilities
- Security
- Protection of Existing Facilities
- Site Access and Storage
- Temporary Environmental Controls
- Dust Control
- Erosion and Sediment Controls
- Products, Materials, Equipment & Substitutions
- Project Closeout
- Cleaning
- Field Engineering
- Operating and Maintenance Data

3.1.2.2 Division 2 – Site Construction / Site Work

- Cast-In-Place Concrete Manholes
- Precast Manholes
- Underground Precast Concrete Utility Structures
- Frames, Grates, Rings, and Covers
- Site Preparation
- Dewatering
- Earthwork
- Removing Existing Pavements & Structures
- Abandonment of Sewers
- Roadway Excavation
- Trenching
- AC Pavement and Base – California
- Pipeline Connections to Existing Facilities
- High Density Polyethylene (HDPE) Solid Wall Pipe
- Polyvinyl Chloride Pipe
- Gravity Sanitary Sewers
- Ductile Iron Pipe
- Sanitary Sewer System Testing
- Pipeline Testing
- Pavement Joint Sealants
- Concrete Curbs, Gutters, and Sidewalks
- Unit Pavers
- Reinforcing Polyester Geomembrane
- Turf Reinforcement Mat

3.1.2.3 Division 3 – Concrete Tanks

- Concrete Formwork
- Concrete Accessories
- Grout
- Concrete for Utility Construction

- Reinforcement Steel
- Joints in Concrete
- Cast-in-Place Concrete
- Precast Planks
- Epoxy Injection System
- Water Leakage Tests for Concrete Structures

3.1.2.4 Divisions 4 through 10 – Buildings

Included in the Facility are approximately 13,200 square feet of buildings, including approximately 3,240 for operations buildings, approximately 4,800 for shop and dewatering buildings and approximately 5,160 for headworks buildings. Aesthetics for the buildings will be consistent with the logical evolution of the architectural renderings contained in this CDR.

4. Masonry
   - Reinforced Concrete Masonry Block

5. Metals
   - Structural Steel
   - Light Gauge Framing
   - Misc. Metals, Fasteners & Special Finishes
   - Aluminum Grating
   - Safety Hatches

6. Woods and Plastics
   - Rough Carpentry
   - Finish Carpentry

7. Thermal and Moisture
   - Building Insulation
   - Roof Accessories
   - Clay Roofing Tile
   - Metal Wall and Soffit Panels
   - Modified Bitumen Membrane Roofing
   - Metal Roofing
   - Flashing and Sheet Metal
   - Caulking and Sealants

8. Doors and Windows
   - Steel Doors and Frames
   - Wood Doors
   - Coiling Steel Doors Insulated
   - Sectional Overhead Doors
   - Aluminum Entrances and Storefronts
   - Aluminum Windows
   - Horizontal Slide Vehicular Gate – A&D Auto Gate
   - Translucent Panel Skylight System
   - Finish Hardware
   - Glazing

9. Finishes
   - Furring and Lathing
   - Portland Cement Plaster
   - Gypsum Wallboard
   - Ceramic Tile
   - Acoustical Panel Ceilings
   - Special Coatings
   - Painting

10. Specialties
    - Louvers
    - Fire Protection Specialties
    - Toilet Compartments
    - Metal Lockers
    - Toilet Accessories
    - Office Furniture

3.1.2.5 Division 11 – Process Equipment

- Equipment General Provisions
- Pumps, General
- Submersible Pumps
- Positive Displacement Solids Feed Pumps
- Vertical Turbine Pumps
- Booster Pumps
- Jet Manifold Aeration System
- Fine Bubble Membrane Aeration System
- Anoxic Mixers
- Positive Displacement Blowers
- Fine Screens
- Grit Removal System
- Thickeners
- Odor Control Systems
- MBR Filters
- Ultraviolet Disinfection
- Polymer Feed System
- Screw Press

3.1.2.6 Division 12 – Furnishings

- Wood Plastic Laminate Casework
- Inset Steel Laboratory Casework
- Blinds

3.1.2.7 Division 13 – Special Construction

- Hydroneumatic Tank
- Chemical Storage Tanks
- Stream Equipment

3.1.2.8 Division 14 – Conveying Systems

- Hoists and Cranes
- Conveyor Systems

3.1.2.9 Division 15 – Mechanical

- Piping, General
- Piping Identification and Signage Systems
- Pipe Supports
- Steel Pipe
- Stainless Steel Pipe
- Ductile Iron Pipe
- Plastic Pipe and Tubing
- Fiberglass Reinforced Plastic (FRP) Duct
- Electric Operators
- Gauges
- Valves, General
- Valve and Gate Actuators
- Butterfly Valves
- Check Valves
- Plug Valves
- Gate Valves
- Ball Valves
- Sluice Gates
- Miscellaneous Valves
- Plumbing, Piping Systems, and Utilities
- Ventilating, Heating and Air Conditioning

3.1.2.10 Division 16 – Electrical

- Electrical Test
- General Electrical Requirements
- Basic Electrical Materials and Methods
- Conduits
- Conduit Schedule
- Duct Banks and Pull Boxes
- Wire Fuses and Terminal Blocks
- Wiring Devices
- Automatic Transfer Switch
- Safety and Disconnect Switches
- Grounding
- Induction Motors
- Power Generator
- Service and Distribution
- Motor Control Centers (MCC)
- Variable Frequency Drive Equipment

- Nameplates
- Support Devices
- Electrical Load Calculations
- Soft Starter
- Lighting& Fixtures
- Electrical Controls

3.1.2.11 Division 17 – Controls and Instrumentation

- Process Instrumentation & Control Systems
- Control Strategy
- Computer Hardware and Software Systems
- Processor
- Human Machine Interface
- Flow Meters
- Field Instruments
- Level Instruments
- Radio Communication System
- PERC Water will furnish and install a computer control system including SCADA software to monitor the Facility's operations.
- Furnish and install all internal data cabling to facilitate the computer control system.

3.1.2.12 Division 18 – Facility Startup and Testing per the Asset Management section of this CDR

- Clean water hydraulic testing
- Seeding biological process
- Initial wastewater flow
- Establish biological process
- Facility performance test
- Effluent discharge to reuse system

3.1.2.13 Division 20 – Design, Engineering and Permitting Services

- PERC Water will furnish all civil, architectural, structural, mechanical, and electrical design services necessary for the construction by PERC Water of a fully functional and operable Facility meeting all existing local and state codes applicable to the design, construction and operation of the Facility in conformance with these Outline Specifications.

1. Facility Design Report
2. Construction Shop Drawings
   a. Civil
   b. Structural
   c. Mechanical
   d. Electrical
   e. Architectural
   f. Instrumentation
3. Permitting per the CPM Schedule Permit List
4. Construction Observation and Administration
5. SCADA Programming and Development
6. Electronic O&M Manual
7. Record Drawings

3.2 GENERAL CLARIFICATIONS AND ASSUMPTIONS

3.2.1 Definitive Agreement Clarifications

1. The approved CDR will be integrated into a Definitive Agreement.
2. The CDR is the property of PERC Water and will not be utilized by any other entity for the design and/or construction of the Facility or any other Water Recycling Facility.
3. The CDR assumes no Project Labor Agreement, or similar agreements, with Trade Unions.
4. Developer/District to be responsible for environmental contamination and Hazardous Materials on the Property.
5. Developer/District to be responsible for concealed or latent physical conditions or subsurface conditions on the Property.
6. Developer/District to be responsible for all costs associated with any Change In Law, including but not limited to changes in Title 22 and/or sales tax changes.
7. Once construction documents are permitted, the implementation of any County or City requested changes to the permitted Construction Documents will be pursuant to a change order (including applicable compensation and adjustment to schedule) executed by the Developer/District and PERC Water.
8. PERC Water has not relied on any Geotechnical Report. Any additional work due to final evaluation of complete soils report, and / or Differing Site Conditions will result in a change order (including applicable compensation and adjustment to schedule) to be submitted to the Developer.
9. No modifications to Design outside standard evolution of design consistent with the CDR.
10. Assumes one review and one re-submittal per each design phase at 30%, and 90%. Friant Ranch's review and approval of Construction Documents is assumed as 15 business days, upon which no response shall be deemed as approval.
11. Final design submittals considered to be complete.
12. County and Developer's review of drawings shall be completed within a specified timeframe consistent with the baseline schedule contained in the CDR.
13. Developer to indemnify PERC Water for all consequences of Unacceptable Influent delivered to the Facility.
14. Commencement Date of Operations shall be established retroactively once laboratory results confirm its achievement.
15. Soils report was not prepared for our proposed tank layout, therefore CDR is based on our best estimate of the site conditions and requirements. Priced may need to be revised if conditions and requirements vary from those anticipated. Easy dig assumed with use of native materials used for structural backfill.
16. No extra work will be performed by PERC Water unless a Change Order has been executed.

17. Friant Ranch retains ownership of all effluent and bio-solids from the Facility and shall be legally responsible for their disposal. Friant Ranch may delegate to PERC Water the responsibility to coordinate the disposal process.

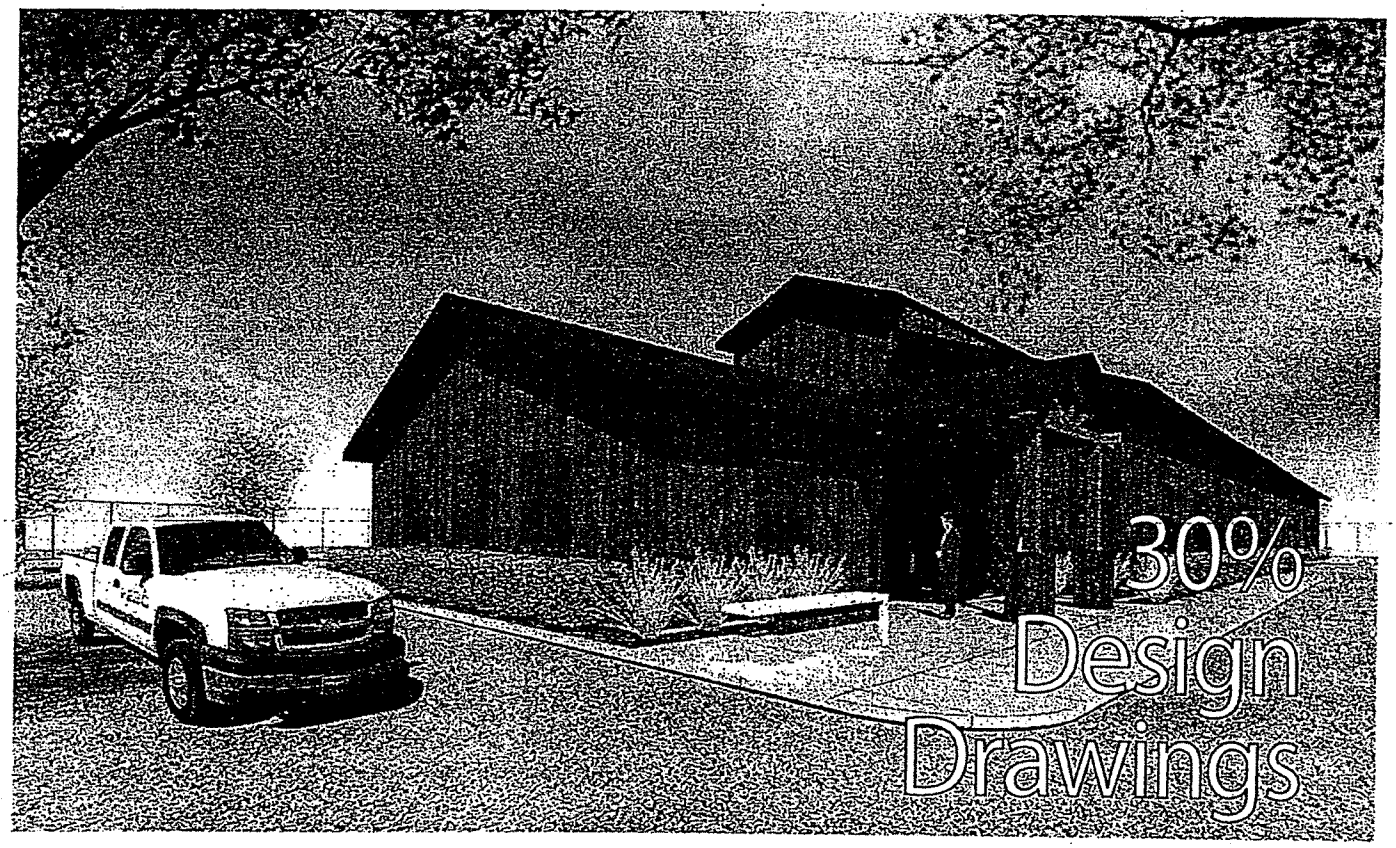
3.2.2 Scope of Work Clarifications

1. Scope of Work extents are delineated plan Sheet C1.1. The CDR document elaborates on the items contained within the boundary.
2. Developer to provide sufficient wastewater to the new Facility during start up as required by the Facility Start Up Plan in Section 5.2.1.
3. Developer to provide suitable property for the Facility.
4. Developer to provide Geotechnical Reports for the Property for use by PERC Water in connection with the design and construction of the Facility.
5. Developer to obtain and pay for property insurance for the Property and for the Facility.
6. Developer to pay all fees charged in connection with the permits and licenses necessary for the operation of the Facility and the discharge of the effluent from the Facility.
7. Developer responsible for all ad-valorem, property and posessory taxes associated with the Property and Facilities.
8. Developer to be responsible for any and all permits pertaining to the 401, 404, CIOMR, LOMR, Fish and Game stream bed alteration and incidental take permits and all permits not directly pertaining to the design, construction and operation of the Facility.
9. Developer to be responsible for Monitoring and Mitigation required by the EIR or Negative Declaration outside identified scope of work area.
10. Developer shall provide initial layout of Bench Marks & Offsets suitable for construction (Developer to provide record survey for the Facility site). PERC Water will perform construction staking.
11. Fire water and storage system to be provided by developer.
12. All excavation and backfill is intended to have no import or export of soil required.
13. PERC Water has assumed that existing onsite soils are suitable for backfill.
14. Should excavated material exceed the backfill required, the surplus will be left stockpiled on site.
15. Additional material if required will be supplied by Developer at Developer's cost.
16. Effluent piping to extend 30' from building.
17. 800 LF Permanent fence will be 6' high (chain link) with including up to 2 access lockable gates on rollers.
18. Assumes an area on the property can be used during excavation to stockpile material.
19. No hard digs are considered in this CDR. Hard digs are defined in Section 7.
20. No Asbestos removal is considered in this CDR.

21. Naturally Occurring Asbestos (NOA): PERC Water shall not be required to indemnify Owner or Indemnified parties for any claims caused by NOA unless they arise from Contractors failure to comply with the OSHA Plan, the AQMD approved asbestos Dust Mitigation Plan or any other legal requirements applicable to the NOA.
22. It is assumed that all utilities electric, phone, fiber optics, and cable will be provided to building.
23. All ground water monitoring wells shall be installed and maintained by Developer.
24. Site storm water to be contained on the site based on communications with Probost & Pritchard. No storm water and NPDES permitting necessary.
25. Based on the CH2MHill Draft Conceptual Design Report ground water is not anticipated to be encountered during construction.
26. Minimal spare parts for major process of equipment included.

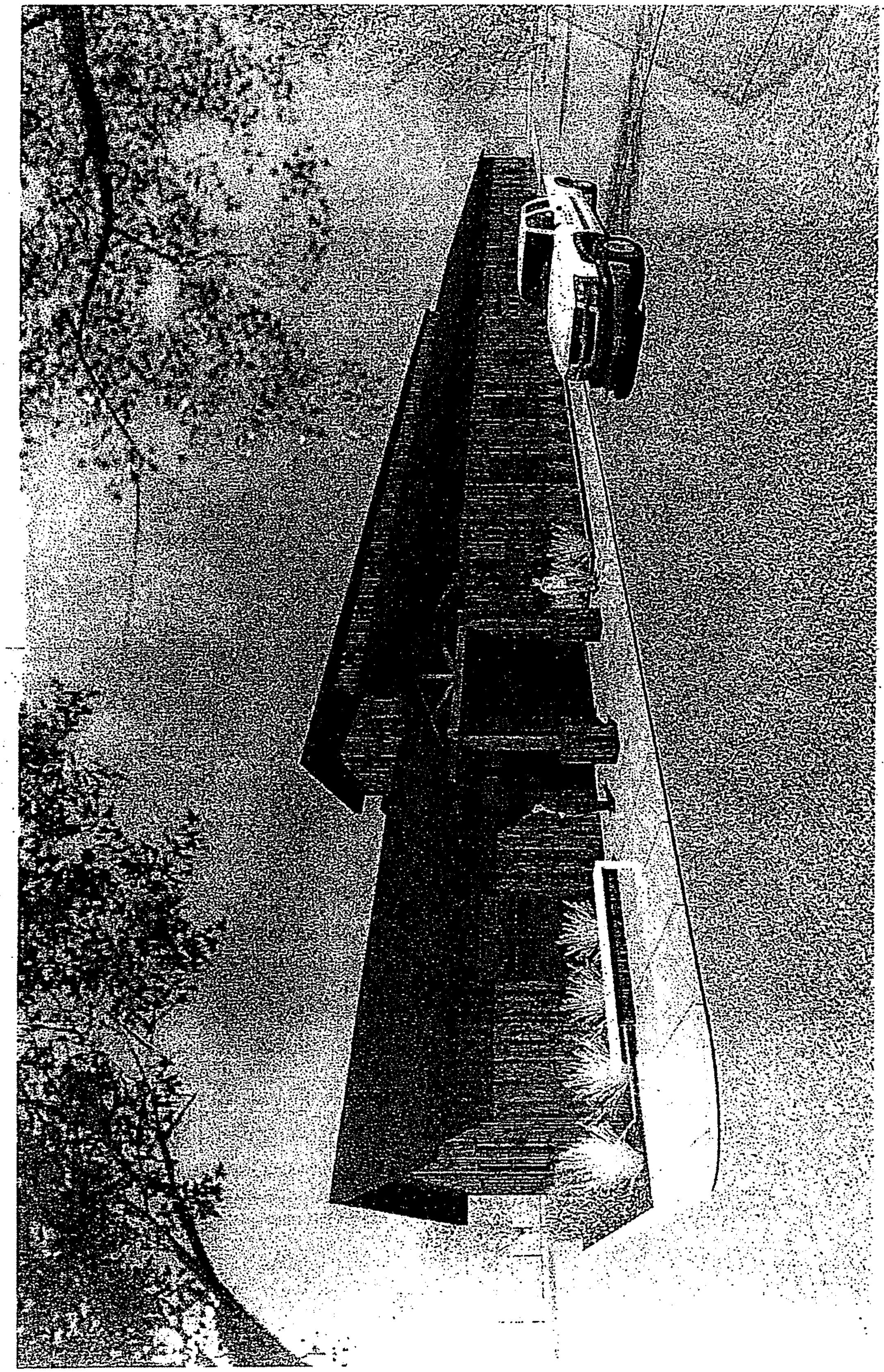
3.2.3 Cost and Schedule Clarifications

1. All costs are based on the Rider Levett Bucknall Cost Index of 17,295 (June 2012).
2. All costs and schedules assume no preliminary design following the CDR – PERC Water to prepare Construction Documents from approved CDR™.
3. All costs are based on the milestones contained in the Project Schedule included in this CDR™.
4. Project cost do not include prevailing wages
5. Sales Taxes based on current 7.975 %. Adjustment will be made if the sales tax rate changes.
6. Capital Replacement Costs are excluded from the Fixed and Variable O&M Costs.
7. Variable O&M Fees are based on the greater of a) total influent flows for a specific month or b) total influent loading for a specific month.
8. Exclusions to the Facility Cost include:
    - 8.1. Permanent dewatering wells and materials.
    - 8.2. Facility security system
    - 8.3. Dust Control and SWPPP
    - 8.4. Temp Power and Water
    - 8.5. Third Party and Special Inspectors
    - 8.6. Installation and monitoring of ground water wells.
    - 8.7. Changes in structural conditions as a result of groundwater and subsurface conditions.
    - 8.8. Any Hard Digs during tank or site excavating outside of identified items in soils report.
    - 8.9. Import or export of dirt material in excess of 200 feet from tank structure.
    - 8.10. Conduit for dry and wet utilities including connection to the Facility.

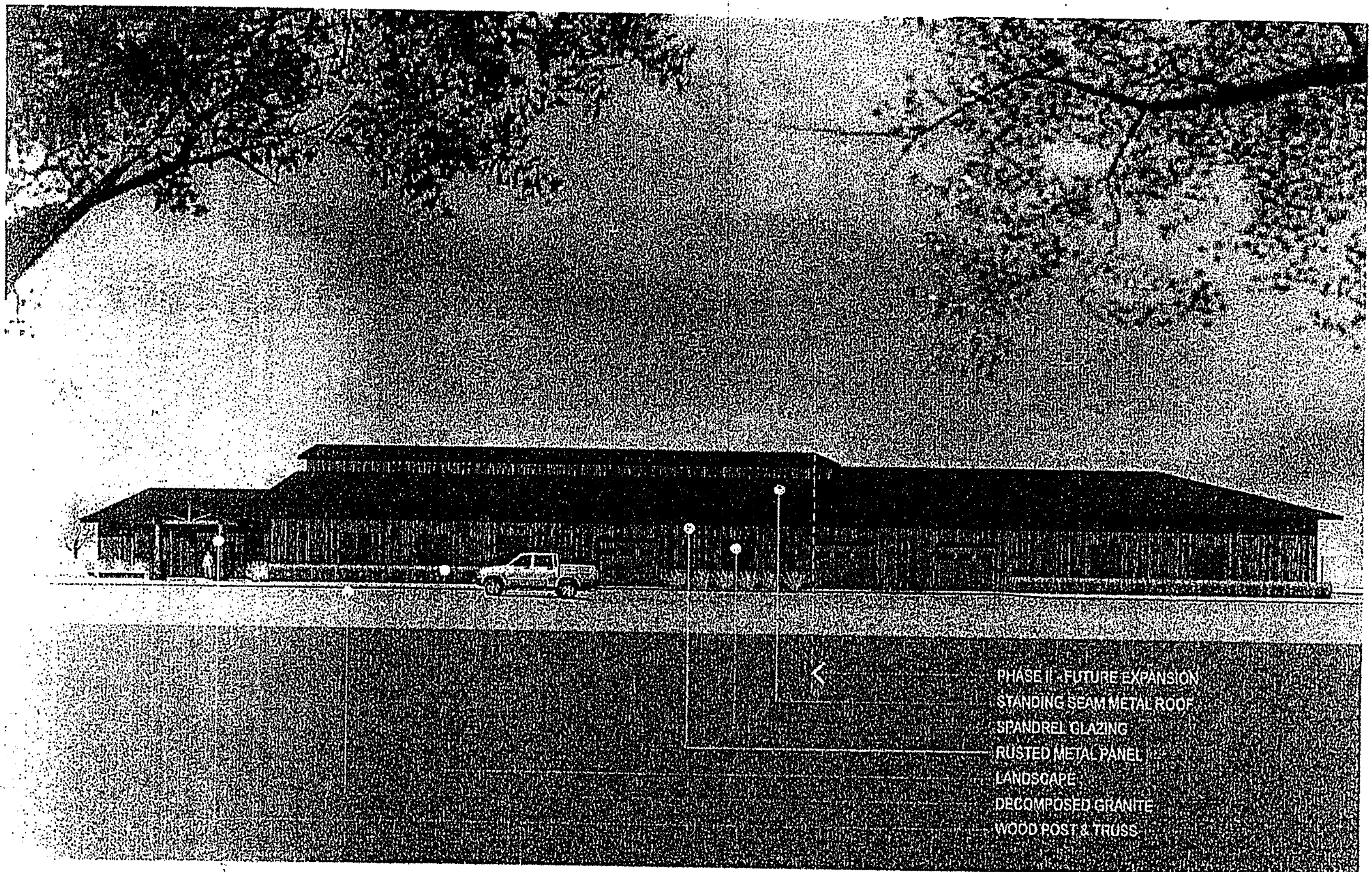


Friant Ranch Water Recycling Facility
0.8 MGD
Rendering

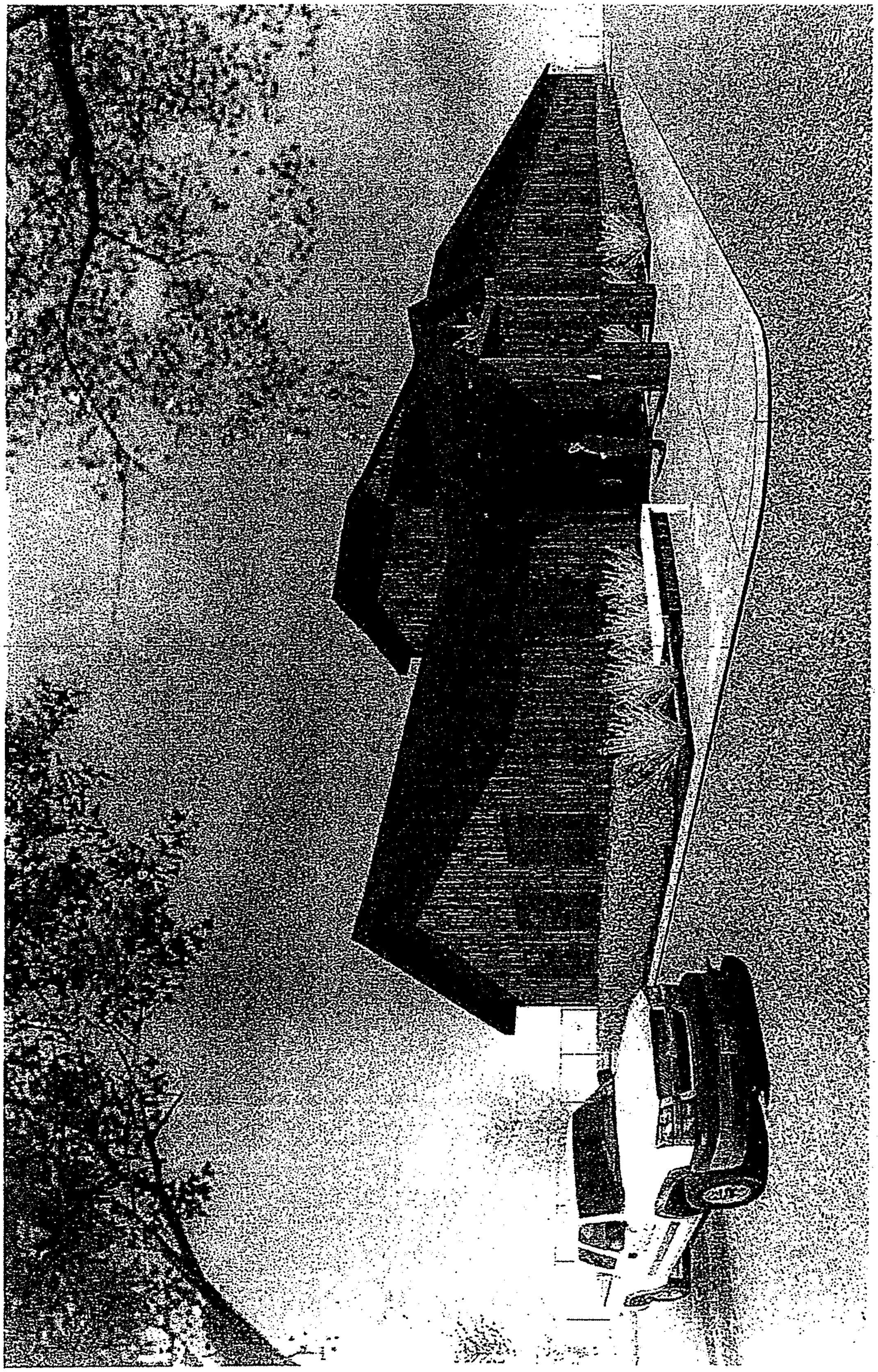
PERC Water ASP® MBR- Entry



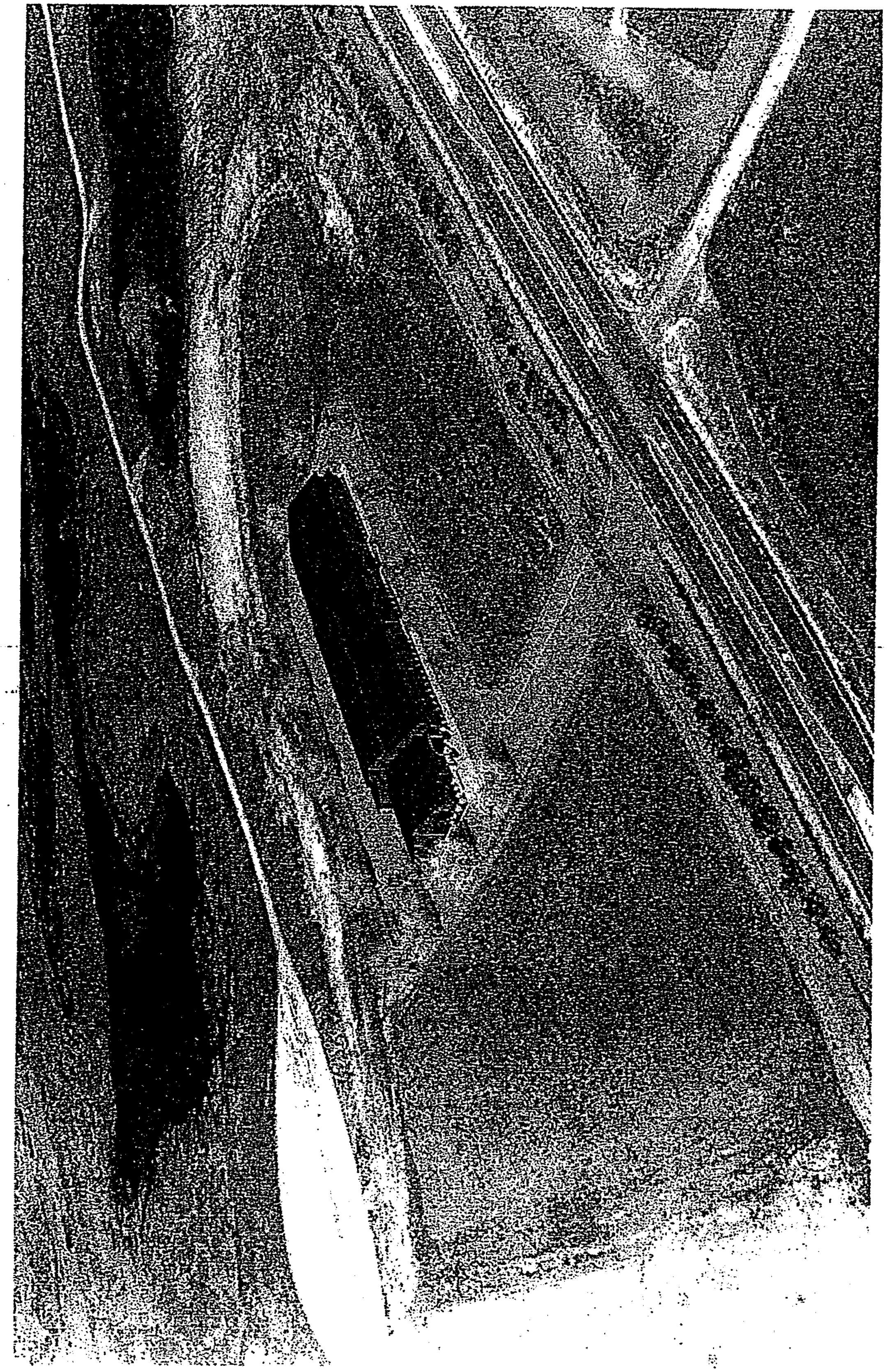
PERC Water ASP® MBR- Front View at Build-Out

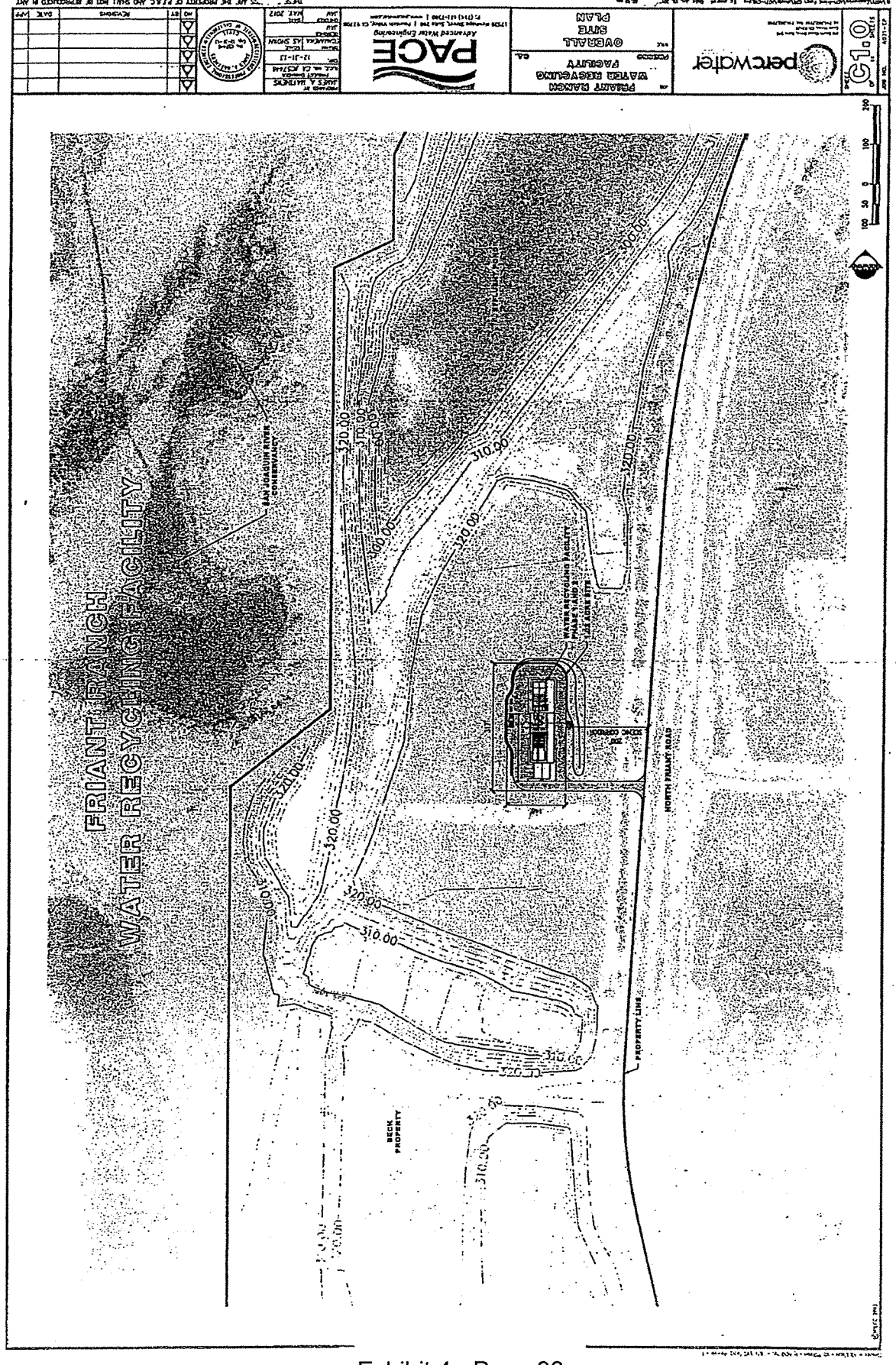


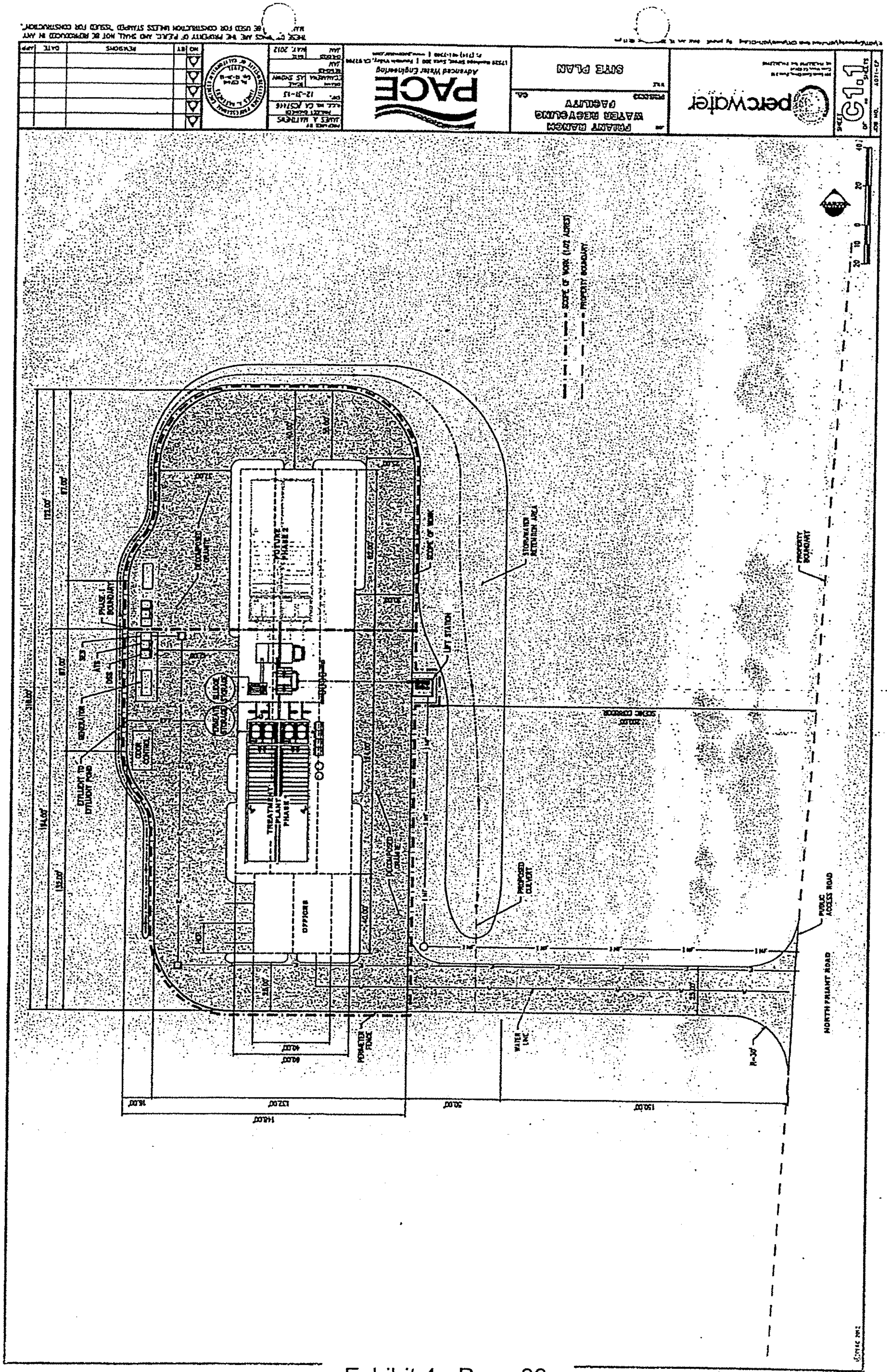
PERC Water ASP® MBR- Side View at Build-Out

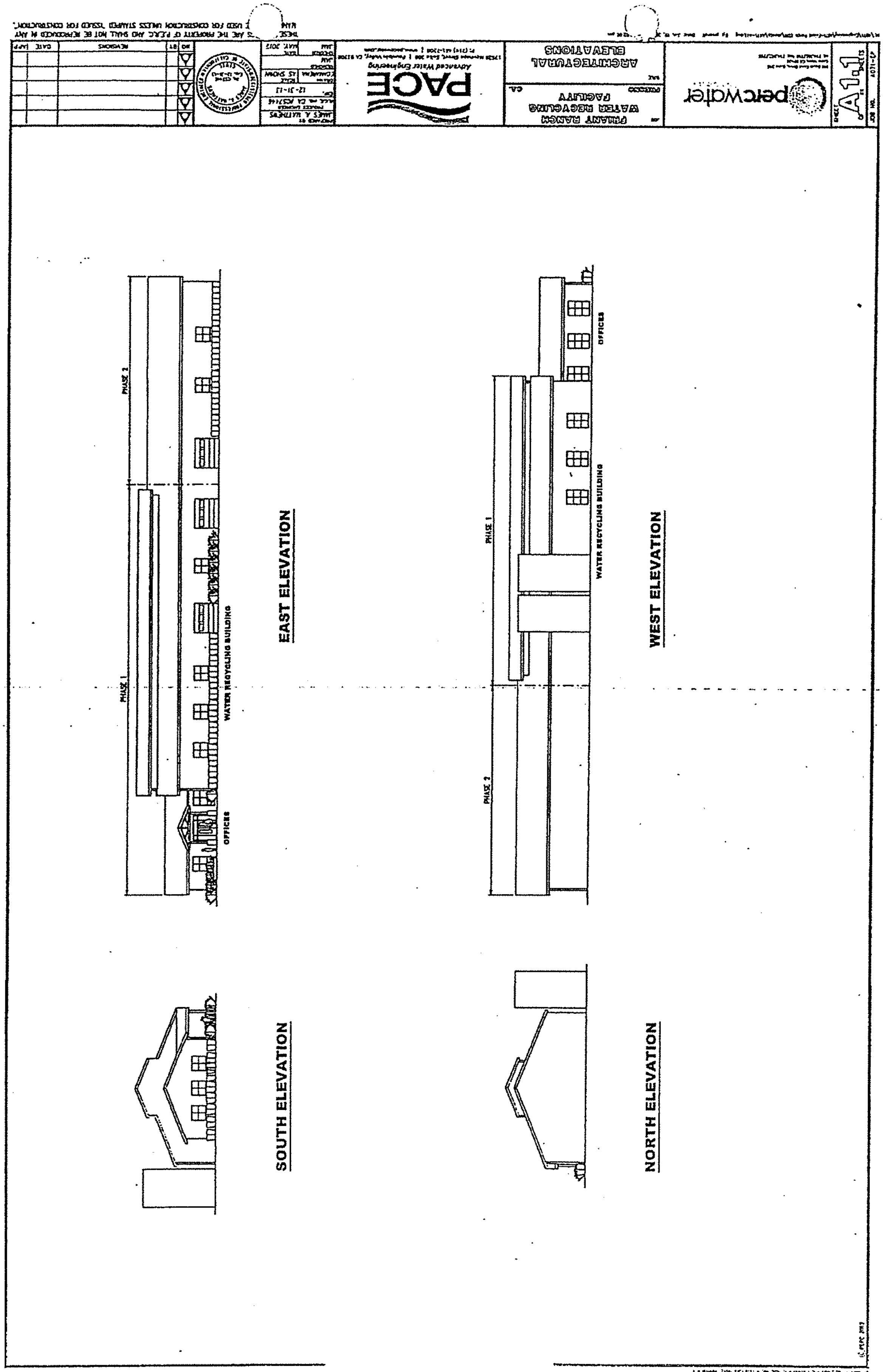


PERC Water ASP® MBR- Aerial View




FRIANT RANCH
WATER RECYCLING FACILITY
PROJECT SITE
NORTH FRIANT ROAD
BECK PROPERTY
320.00
310.00
300.00
petrowater
PACE
C1.0


SITE PLAN
FRIANT RANCH WATER RECYCLING FACILITY
PACE
Advanced Water Engineering
percwater
C1.1
TREATMENT PLANT PHASE 1
FUTURE PHASE 2
OFFICES
LIFT STATION
SCOPE OF WORK
PROPERTY BOUNDARY
STORMWATER RETENTION AREA
PROPOSED CULVERT
PUBLIC ACCESS ROAD
NORTH FRIANT ROAD
WATER LINE
PERIMETER FENCE
SCENIC CORRIDOR
GENERATOR
EFFLUENT TO EFFLUENT POND


EAST ELEVATION
WEST ELEVATION
SOUTH ELEVATION
NORTH ELEVATION
WATER RECYCLING BUILDING
OFFICES
PHASE 1
PHASE 2
PACE
Advanced Water Engineering
percwater
FRIANT RANCH
WATER RECYCLING
FACILITY
ARCHITECTURAL
ELEVATIONS
A1.1

EQUIPMENT LIST

ITEM #	EQUIPMENT	PERC ID	MANUFACTURER	MODEL #	QUANTITY	DESCRIPTION
	PUMPS / MIXERS					
1	RAW INFLUENT PUMPS	11-210	VAUGHAN	SE8U	2	1,200 GPM @ 30' - 30HP/480V/3PH/60HZ VFD - 8" SWEPT OUTLET
2	MEMBRANE FEED / RAS PUMPS	11-272	FLYGT	PP4640-63-837	4	3,200 GPM @ 1.8' / 1,500 GPM @ 3.8' - 4HP/480V/3PH/60HZ VFD - 16" OUTLET
3	MEMBRANE PERMEATE PUMPS	11-292	VOGELSANG	V136-140	4	335 GPM @ 25' - 7.5HP/480V/3PH/60HZ VFD - 6" STRAIT IN/OUT
4	WAS PUMPS	11-271	FLYGT	NP3085.SH-255	2	220 GPM @ 30' - 4HP/480V/3PH/60HZ - 3" SWEPT OUTLET
5	ANOXIC MIXERS	11-211	FLYGT	4630	2	4,300 GPM - 2.5HP/480V/3PH/60HZ
6	MEMBRANE CIP PUMPS	11-293	KOCH	TBD	2	SUPPLIED BY KOCH
	BLOWERS / AERATION EQUIPMENT					
10	MAIN AERATION BLOWER	11-410	KAESER	EB421C	2	300 - 1,200 SCFM @ 8.5 PSI - 60HP/480V/3PH/60HZ VFD
11	MEMBRANE AERATION BLOWER	11-400	KAESER	EB421C	2	300 - 1,200 SCFM @ 6.5 PSI - 60HP/480V/3PH/60HZ VFD
12	AEROBIC BASIN AERATION DIFFUSERS	11-306	SANITAIRE	FINE BUBBLE	306	9" DIA MEMBRANE DIFFUSER 1-8 SCFM EA
	SCREENING / HEADWORKS					
20	INFLUENT SCREEN	11-134	IPEC	IF1447T	2	1mm PERFORATED PLATE DRUM SCREEN - 2.3 MGD
21	SCREENINGS WASHER COMPACTOR	11-136	IPEC	PLT-6100	2	AUTOMATED SCREENINGS WASHER / COMPACTOR
	MEMBRANE SEPERATION EQUIPMENT					
30	MEMBRANE MODULES	11-436	KOCH	PSH-1800	4	15,375 SF / MOD - 333 GPM @ 25 GFD
31	PERMEATE STORAGE TANK	11-840	AUSTIN FIBERGLASS	30,000 gal	1	12'8" DIA x 34" H WITH AERATION SYSTEM
32	CIP CLEANING SYSTEM	*	KOCH	TBD	1	SUPPLIED BY KOCH
	UV DISINFECTION					
40	UV DISINFECTION BANKS	11-710	TROJAN	UVFIT 18AL40	4	NWRI CERTIFIED FOR PEAK DAY FLOW 1.1 MGD
	SLUDGE STORAGE / DEWATERING					
50	SLUDGE STORAGE TANK	11-845	AUSTIN FIBERGLASS	30,000 GAL	1	12'8" DIA x 34" H WITH AERATION SYSTEM
51	PACKAGE CENTRIFUGE DEWATERING SYSTEM	11-530	CENTRISYS	CS10-4	1	SKID SYSTEM 20-25 GPM - 475 AMR
	EMERGENCY STANDBY POWER					
52	EMERGENCY STANDBY DIESEL GENSET	11-910	CUMMINS	DQHAB	1	300 KW
	ODOR CONTROL					
53	BIOFILTER	11-810	-	290 SF	1	10' X 29' X 4' PERFORATED CONCRETE BOX WITH ORGANIC MEDIA
54	BLOWER	11-400	-	3 HP	1	800 CFM @ 3" CORROSION RESISTANT
55	MOISTURE CONTROL SYSTEM	11-800	-	-	1	TIMED SPRINKLERS WITH 2 SPRAY HEADS SUPPLIED WITH RECYCLED WATER

*INCLUDED WITH OTHER EQUIPMENT

©PERC 2013

FRIANT RANCH WATER RECYCLING FACILITY

EQUIPMENT LIST

PACE Advanced Water Engineering

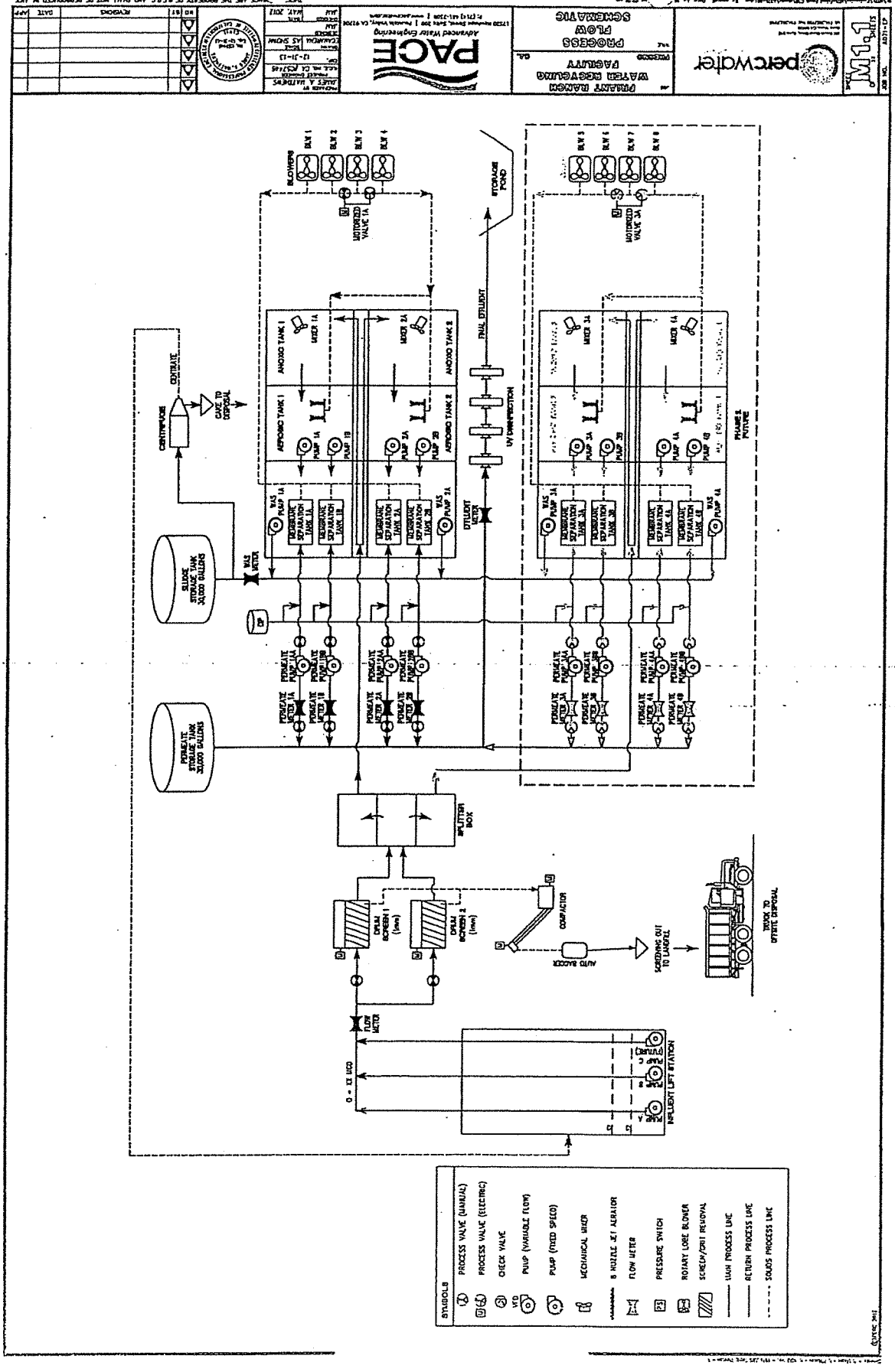
PREPARED BY JAMES A. MATHEWS

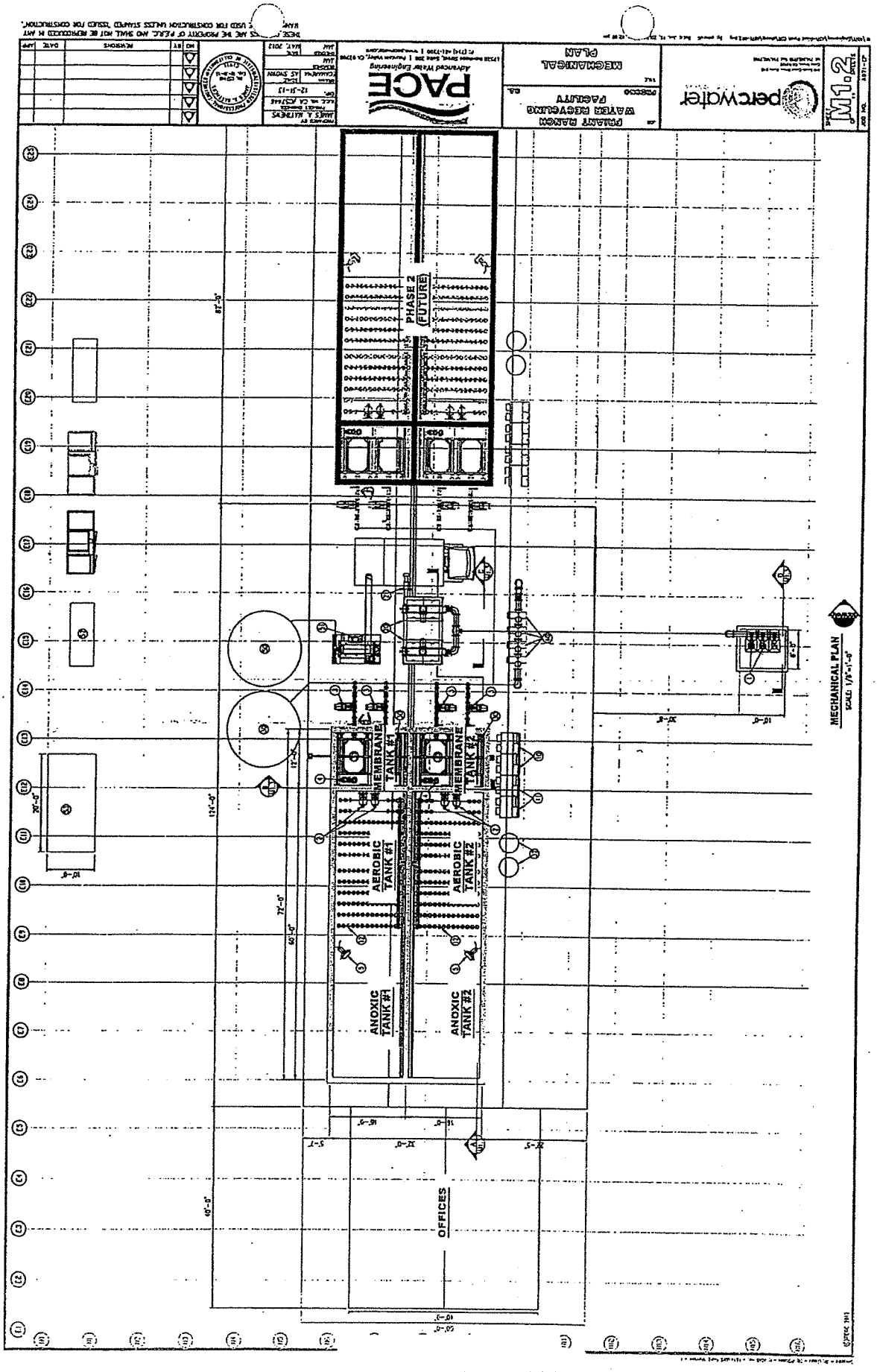
DATE MAY, 2012

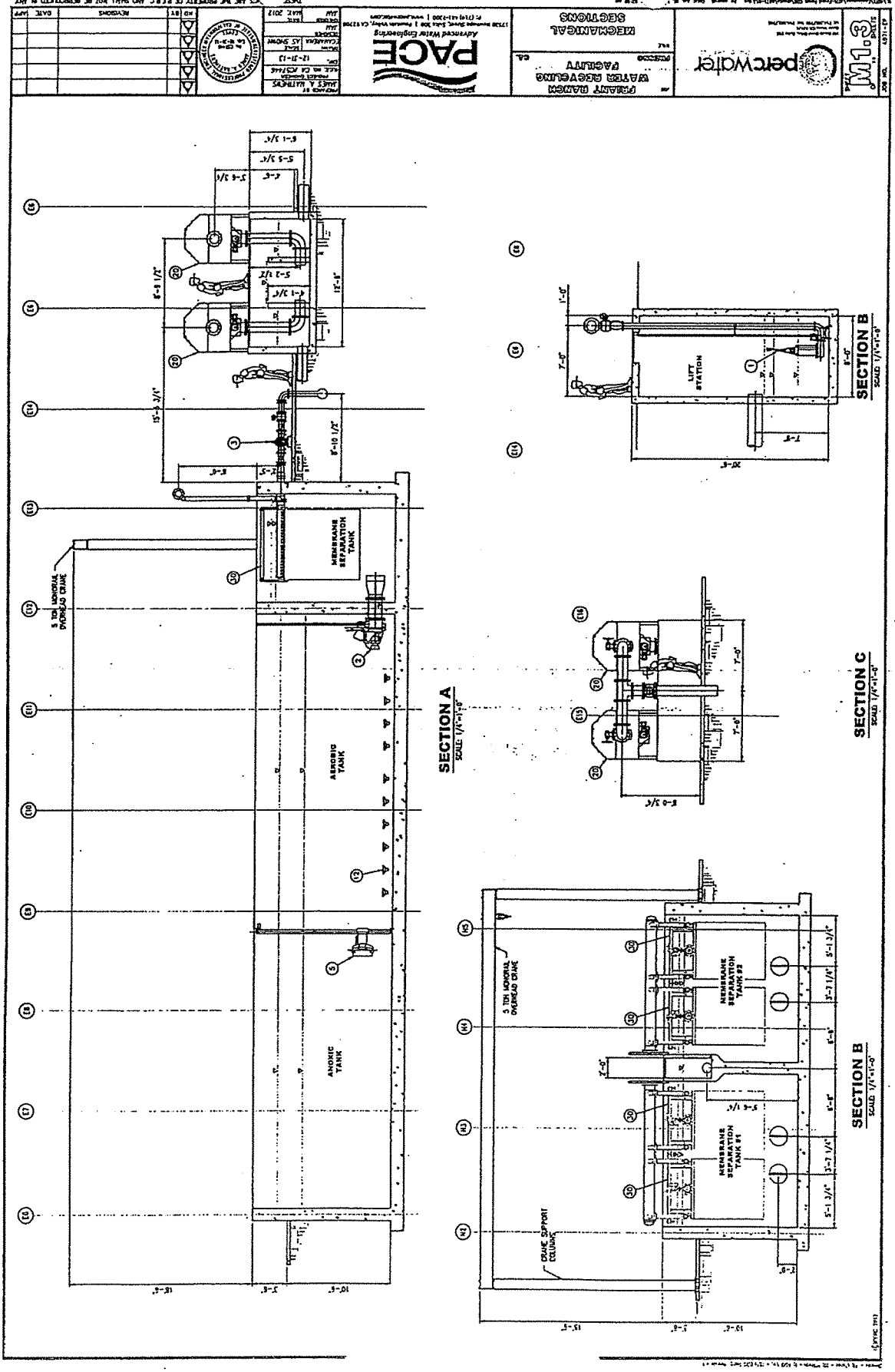
perc water

SHEET M1.0

JOB NO. A071-CP


PLANT MAKEUP WATER RECYCLING FACILITY
PROCESS FLOW SCHEMATIC
petrowater
PACE
Advanced Water Engineering
SYMBOLS
PROCESS VALVE (MANUAL)
PROCESS VALVE (ELECTRIC)
CHECK VALVE
PUMP (VARIABLE FLOW)
PUMP (FIXED SPEED)
MECHANICAL MIXER
8 NOZZLE JET AERATOR
FLOW METER
PRESSURE SWITCH
ROTARY LOBE BLOWER
SCREW/GRIT REMOVAL
MAIN PROCESS LINE
RETURN PROCESS LINE
SOLIDS PROCESS LINE
BLOWERS
STORAGE POND
FINAL EFFLUENT
UV DISINFECTION
CENTRIFUGE
CENTRATE
CAKE TO DISPOSAL
SLUDGE STORAGE TANK 30,000 GALLONS
PERMEATE STORAGE TANK 30,000 GALLONS
SPLITTER BOX
DRUM SCREEN 1 (1mm)
DRUM SCREEN 2 (1mm)
COMPACTOR
AUTO BAGGER
SCREENINGS OUT TO LANDFILL
TRUCK OR TRAILER TO HAUL
INFLUENT LIFT STATION
PHASE II FUTURE


PHASE 2 (FUTURE)
MEMBRANE TANK #1
MEMBRANE TANK #2
AEROBIC TANK #1
AEROBIC TANK #2
ANOXIC TANK #1
ANOXIC TANK #2
OFFICES
MECHANICAL PLAN
SCALE: 1/8"=1'-0"
MECHANICAL PLAN
PLANT RANCH WATER RECYCLING FACILITY
PACE
perc water
M1.2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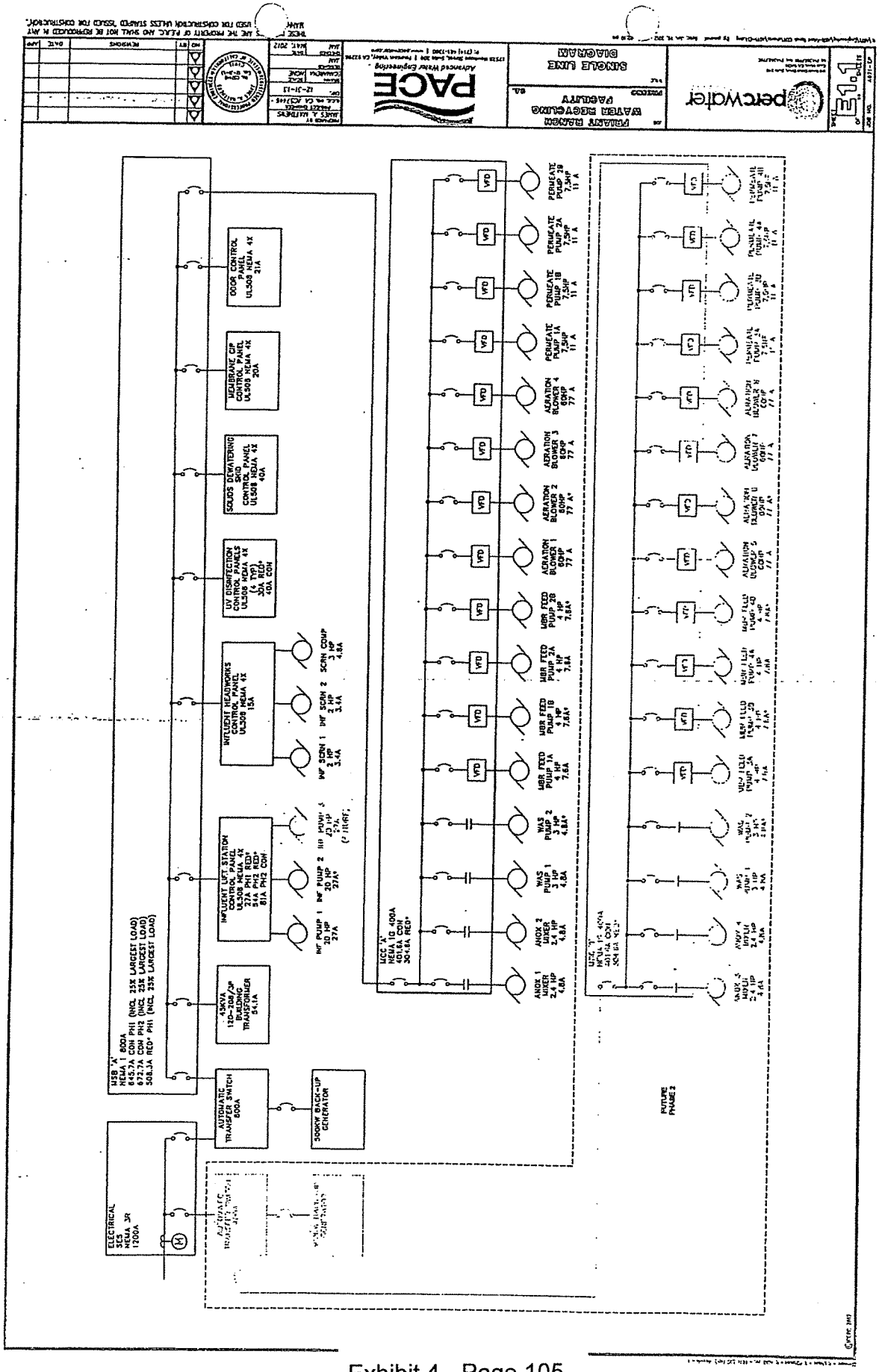
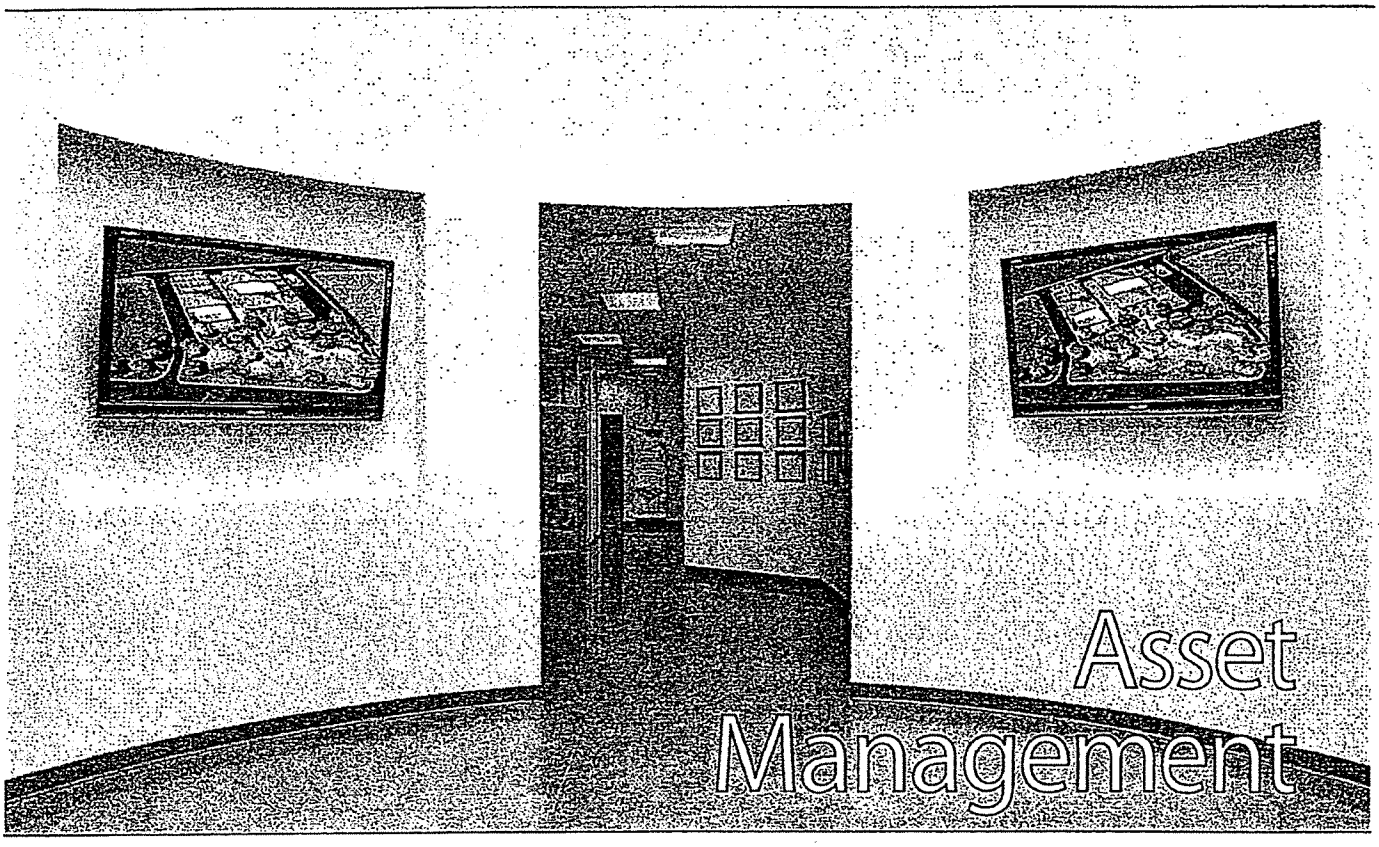
SECTION B
SCALE: 1/4"=1'-0"
SECTION C
SCALE: 1/4"=1'-0"
SECTION B
SCALE: 1/4"=1'-0"
MEMBRANE SEPARATION TANK
AEROBIC TANK
ANOXIC TANK
LIFT STATION
5 TON MONORAIL OVERHEAD CRANE
CRANE SUPPORT COLUMNS


petrowater
PACE
SINGLE LINE
DIAGRAM
ELECTRICAL
SCS
480VAC 3Ø
1200A
AUTOMATIC
TRANSFER SWITCH
800A
500KW BACK-UP
GENERATOR
MSB 'A'
NEMA 1 800A
645.7A CON PH1 (INCL 25% LARGEST LOAD)
672.7A CON PH2 (INCL 25% LARGEST LOAD)
508.3A RED* PH1 (INCL 25% LARGEST LOAD)
15KVA
120-208VAC/3P
BUILDING
TRANSFORMER
54.1A
INFLUENT LIFT STATION
CONTROL PANEL
UL508 NEMA 4X
27A PH1 RED*
81A PH2 CON
INFLUENT HEADWORKS
CONTROL PANEL
UL508 NEMA 4X
15A
UV DISINFECTION
CONTROL PANELS
UL508 NEMA 4X
3A RED*
40A CON
SOLIDS DEWATERING
SKID
CONTROL PANEL
UL508 NEMA 4X
40A
MEMBRANE CIP
CONTROL PANEL
UL508 NEMA 4X
20A
ODOR CONTROL
PANEL
UL508 NEMA 4X
21A
MCC 'A'
NEMA 1Ø 400A
454.6A CON
304.6A RED*
MCC 'B'
NEMA 1Ø 400A
454.6A CON
304.6A RED*
FUTURE
PHASE 2



Santa Paula Water Recycling Facility
4.2 MGD
Educational Area

5.1 ASSET MANAGEMENT OVERVIEW

PERC Water's Asset Management team will provide Friant Ranch with a Total Asset Management Approach for the Facility. Asset Management is a planning process that ensures the community gets the most value from each asset, while establishing the financial resources to maintain and/or replace asset components as necessary. Asset Management also includes developing a plan to manage costs while increasing the efficiency and reliability of the asset. Asset Management results in long term operational reliability, outstanding process performance, extended life cycle and budget-conscious cost of operation.

Asset Management entails much more than the typical operations and maintenance services typically provided in the industry. This results in many benefits for Friant Ranch and the community, for example:

- Increased water quality
- A life-cycle focus for the management of the asset
- Management of power consumption
- Management of chemical consumption
- Equipment efficiency and a "24-7" on-call staff for operations and maintenance

PERC Water's Asset Management team plays a major role in the design and construction of the Facility and are intimately involved with the decision making of equipment selection, Facility layout, warranties, etc. Operators are provided the autonomy to influence the design and construction, all the while satisfying our internal engineering division, Engineer of Record and internal construction division. PERC Water's Director of Operating Services is a signatory to all of PERC Water's Construction Documents. This Total Asset Management Approach results in higher quality engineering and construction prior to completion of such activities.

5.2 FACILITY START UP AND TRANSITION PLAN

PERC Water's Asset Management team will prepare a formal Start Up and Transition Plan specific to the Facility. The Start Up and Transition Plan will be completed six months prior to Commencement Date of Operations and will provide a detailed road map for commissioning, start up and transitioning of wastewater treatment to the new Facility. The Start Up and Transition Plan begins with a narrative describing each step of the start up process, beginning with PERC Water's QA/QC process during mechanical equipment installation during the construction phase of the project. As the Facility nears the end of the Construction Phase, the Commissioning Phase begins. During this period, each process equipment manufacturer conducts a field inspection to verify proper installation of their respective process systems. During this period, PERC Water's Control System Integrators implement the initial PLC Control and SCADA System and complete the control loop checks to verify each system id communicating as required.

After all systems are verified functional and PERC Water's in-house Technical Services team is satisfied the Facility is fully commissioned, a Clean Water Test is conducted. The Clean Water Test simulates the automated operation of the wastewater treatment process while the Facility is filled with clean water. During this effort the Integrated Control System is verified to function as designed prior to the introduction of wastewater. When the Clean Water Test is successfully completed, the Facility is will have achieved Substantial Completion and is therefore ready to commence introduction of wastewater to commence the Start Up Test. At this point of the start up schedule, the new Facility will receive "seed sludge" to facilitate the development of the biological growth. Seed Sludge is obtained from an operating facility in close proximity to Friant Ranch and is used to expedite the growth of the biological mass required for treatment. A delicate balance of raw wastewater and seed sludge is maintained during the first week of operation to provide the healthy growth of biomass.

5.2.1 Start-Up Requirement

Approximately 10% of the facility flow is required for startup. By isolating the flows into one tank, the minimum flow for start-up is approximately 20,000 gpd. Once completed, the first flows to the facility will be generated by the Millerton Village Mobile Park. With approximately 95 units the flows expected from the area will probably slightly less than the requirement. New homes or commercial areas will need to come online before the facility can be operated.

An estimate of the flows from each mobile home (130 gpd) and for each new connection (150 gpd) indicates that the new facility may require between 20 and 60 new connections before coming online. In the interim time frame, facilities commonly engage in the practice of Vault and Haul. Incoming sewer flows are collected in the lift station and removed periodically by truck to a neighboring community facilty. The Fraint Ranch Water Recycling facility will be able to vault and haul though due to the expense this generally entails, it's advisable to limit the vault and haul phase.

5.2.1 Facility Expansions

The construction and equipment expansions (if they are utilized) must be begun in earnest when flows reach 80% of existing capacity. Local permitting should be initiated at that time in order for the expansion is considered underway.

5.3 STAFFING

Typical staffing for a facility of this size would be a minimum of two (2) full time wastewater operators. The operators will be based in the Facility and dedicated the operations and maintenance of the Facility.

5.3.1 Operations Manager

The Operations Manager assigned to the Facility will possess a Grade IV Wastewater Certification issued by the State of California and will be responsible for oversight and management of the day to day operation.

5.3.2 Operator

The second operator will possess a Grade II-III Wastewater Certification.

5.3.3 Maintenance Technician

The third team member will be a Maintenance Technician experienced in mechanical and instrumentation repair and maintenance.

The Facility will be staffed eight hours per day, Monday through Friday and approximately four hours per day on weekends and holidays. Facility team members are considered on-call at all times to respond to any additional needs that may arise. The Facility shall include a fully automated SCADA and Control System utilizing the latest version of Wonderware Remote Response for remote notification of on-call staff as needed, and remote access to the Facility's SCADA, O&M Manuals, CMMS, Reporting, Energy Efficiency, Record Drawings, Permits will be available through Central PERC™ via mobile devices. PERC Water's onsite staff will be supported by the Director of Operating Services as well as our in-house Technical Services Division which includes Maintenance Specialists, Control System Integrators, Process Engineers, Design Engineers, Instrumentation Engineers and the Project "Engineer of Record."

5.4 PERFORMANCE WARRANTY

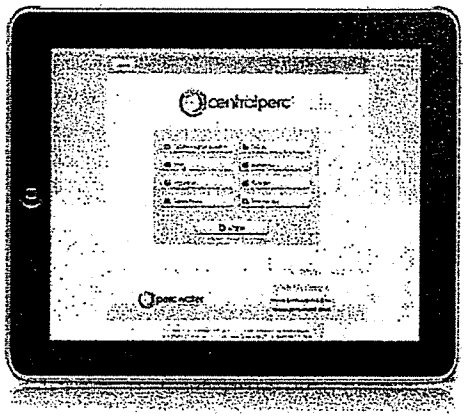
PERC Water's Performance Warranty is included with our Asset Management service offering. The Performance Warranty provides true risk transfer of regulatory compliance. The PERC Water Facility is designed to produce Compliant Effluent (as defined in this CDR) based on parameters detailed on the Basis of Design. Acceptable Influent governs the Performance Warranty. PERC Water provides this Warranty for as long as we are contracted to provide Asset Management Services for the Facility. The Facility design includes a secondary biological process and nutrient removal producing CA Title 22-2.2 tertiary effluent classified for unrestricted reuse. The Facility design does not include treatment processes for removal of any dissolved solids such as, but not limited to chloride, boron, sulfate, etc. Additionally, the Facility is not intended to remove any constituents referred to on the California Toxic Rule (CTR) constituents list. The Facility design provides treatment for constituents listed on the tables provided in the Basis of Design only.

5.5 BIOSOLIDS DISPOSAL

The waste activated sludge (WAS) produced by the secondary biological treatment process will be dewatered and disposed as described in the Basis of Design. PERC Water's approach to biosolids disposal provides an efficient operation for biosolids handling. Polymer manufacturers are required to jar test their products to determine the most efficient results. A centrifuge has been selected based on overall cost efficiency. The centrifuge shall produce approximately 20-22 % cake solids for disposal. Biosolids for the Friant Ranch Facility will be disposed at a landfill accepting unclassified biosolids.

5.6 centralperc

Our team also offers the implementation of Central PERC™, a technology application where all the current and historical data necessary to operate and manage water and wastewater infrastructure is centrally hosted and integrated within one platform.



We created Central PERC to provide information access to our treatment facility staff and now we are extending it to our clients. Increased information availability makes any authorized user a better strategic decision maker. A secure data rich environment gives users the ability to drill down into different aspects of operation to investigate a problem or an idea.

Based on their login, each users experience is suited to them. Individual configuration allows each user to elect alerts that are important to their activities and establish dashboard priorities. Highlight what's most important to you be it energy, equipment, human resources or water quality. Managers and reviewers are treated to all the information they need in a read only format. Operators have the same dashboards but are also able to enter SCADA or CMMS systems directly from the app and make changes.

Central PERC provides a dashboard to illustrate the whole picture of a facility's health in a friendly and intuitive setting. A user can:

- check to see if water quality is within the parameters,
- examine energy use patterns to look for savings,
- see how many work orders are outstanding, and
- verify if special projects are getting the intended results

Meters and instruments are already measuring the parameters you care most about; Central PERC displays these elements and makes plant specific references including O&M Manuals, permits, past reports and safety records available. With up the minute information and historic trends Central PERC creates an information advantage that did not exist previously.

The degree to which each aspect of Central PERC will be integrated will depend on the existing facility systems and the proposed upgrades which are part of the proposal and were discussed elsewhere (ex. SCADA upgrade and eRPortal integration at the Facility). Under the contract, an analysis of the available operational cost savings and Central PERC's demonstrated ability to reduce O&M costs at the facilities will be used to decide how to proceed.

As part of our efforts to provide up to date information and wireless control for those engaged by either of the facilities PERC Water will supply up to three iPads, the preferred Central PERC device, for use by facility personnel. Additional devices may be authorized by request.

5.7 REPORTING AND COMMUNICATION

PERC Water will produce a Total Asset Management Report to be distributed monthly and presented during the monthly project review meeting with representatives from Friant Ranch to update them on the details of the Facility. The monthly report will include an executive summary describing all activities that have occurred during the month of operation. Additionally, the monthly report will include official regulatory reporting forms, CMMS monthly reports (confirming 100% completion of scheduled PM/CM tasks), laboratory reporting worksheets, monthly site safety training schedules and details, equipment spare parts inventory, power consumption reports and actions underway to increase efficiency, a quarterly engineering inspection report by the Engineer of Record, process chemical consumption report and upcoming key projects and community outreach program information.

5.8 O&M QA/QC

PERC Water continuously monitors all aspects of operation and maintenance by utilizing a rigorous quality assurance/quality control program. This is accomplished by the implementation of the following plans, programs and procedures:

- A computerized preventative maintenance program
- An operation and maintenance training program
- Process sampling plans and procedures
- In-house process control analysis
- Independent outside laboratory analysis of compliance samples
- A facility operation and maintenance reference manual
- A daily operating log book
- Standard operating procedures
- Daily operating data files
- Daily SCADA screen printouts
- Computerized data management system
- Computerized report generation
- Written safety program and procedures
- Operational oversight by PERC Water Management

5.9 COMPUTERIZED MAINTENANCE MANAGEMENT SYSTEM

PERC Water utilizes a Computerized Maintenance Management System (CMMS) designed to interface with the SCADA software package. This industry specific software application provides an ongoing account of all predictive, preventive, and corrective maintenance activities throughout the Facility as well as communicating with SCADA system. Additionally, this readily available software program records reporting data into the appropriate regulatory reporting forms as it communicates with outside laboratories and databases.

5.10 OPERATIONS AND MAINTENANCE MANUAL

PERC Water prepares a standardized, advanced, digital O&M Manual created specifically for each PERC Water Facility. The digital approach allows for unlimited flexibility in use, as well as access. The O&M Manual includes all operating details starting with design and process theory, and includes Process Equipment Manuals produced by OEM partners, control and SCADA system design and operational details, original and as-built engineering drawings, safety procedures specific to each facility, a section dedicated to trouble shooting and process adjustment, contact information for every equipment vendor, as well as internet links to appropriate vendor websites (i.e. USA Bluebook). This digital application can be updated and expanded with ease to accommodate Facility upgrades and expansions and also serves as a training handbook for operators and technicians. The O&M Manual and all supporting documents are available via Central PERC.

5.10.1 Site Maintenance

PERC Water's Management Philosophy is to provide an enjoyable work environment that all employees are proud to be part of. Our team takes extreme pride in their day to day efforts, which increases overall productivity. Our facilities are maintained at the highest standards by onsite staff. The result is a clean, neat, odor-free, neighbor-friendly facility that is enjoyed by site the team and the community.

5.11 EMERGENCY RESPONSE PROCEDURES

PERC Water will establish and maintain a comprehensive Emergency Response Plan for interaction and coordination with all applicable municipal fire, police, public works and emergency management personnel for expedient implementation during emergencies.

5.12 SAFETY PROCEDURES

The personal safety of each employee is the primary concern for our company. PERC Water's Operations Safety Officer has extensive experience in the developing and implementing safety programs for municipalities and has accomplished in excess of 1000 hours of water and wastewater safety training. The

Operations Safety Officer visits operating PERC Water facilities periodically to ensure adherence to all safety requirements and provides support to all site superintendents. Each Facility Superintendent serves as the onsite safety officer for their respective Facility, conducting monthly safety training sessions for all Facility employees. The training sessions cover the following examples:

- Your Responsibility to Your Safety
- Confined Space Entry and all required equipment
- Right to Know
- Hazardous Communication
- Emergency Response
- First Aid and Blood borne Pathogens
- Lockout/Tagout
- Electrical Safety
- Fire Prevention
- PPE- Eye, Head, Hand, Hearing, and Foot Protection
- Slips, Trips, and Falls
- Machine Guarding
- Proper Lifting Techniques
- Respiratory Protection
- Materials Handling including the use of lifts and hoists
- Tool Safety
- Welding, Cutting, and Brazing
- Ladder Safety
- Laboratory Safe Practices and PPE

PERC Water will closely maintain Facility security to ensure the safety of onsite staff and unannounced visitors and intruders. PERC Water's non-site employees, contractors, guests, invitees, and Friant Ranch staff are required to sign in and receive appropriate safety apparel before entering any process area and/or restricted area of the facility.

Palm Valley Water Recycling Facility
4.1 MGD
Aerial View of SBR Facility

6.1 PROJECT MANAGEMENT APPROACH

The PERC Water project management approach focuses on building complete connectivity between the design and construction phases of the project. The PERC Water project manager will be the project's primary source contact for the project and will coordinate all planning and design work with all project team members and consultants. All incoming or outgoing correspondence will be through the PERC Water project manager. She/he will maintain records of all telephone conversations with the client, other offices and consultants as well as maintain the minutes from project meetings.

In addition to the implementation of a project manager, several project management systems have been designed including: planning, scheduling, estimating, real-time/electronic management, quality control and safety management. When these systems are followed, project continuity and communication are increased to a level in which each member benefits from the other's input.

6.2 PLANNING

6.2.1 Project Management Plan

The ultimate tool for planning is the project management plan. Before the project begins, the PERC Water team presents a project management plan. The plan is a complete guide to how the project is going to be built before the first employee steps on site. It encompasses every detail of the project and is scrutinized to the point of perfection. When the process is complete, no stone has been left unturned and the team has a clear plan for success.

6.2.2 Procurement Checklist

At the inception of the project, PERC Water identifies all potential long lead items. A proactive approach allows us to plan for items that may be arriving out of sequence of a traditional schedule. The procurement checklist can point out potential schedule problems early, while alternate products can be purchased to maintain the City's timeline. The procumbent checklist allows us to plan the submittal process ahead of time. We can effectively communicate to our subcontractors when key submittals are necessary. It allows us to give the design team an early warning that we may need their help with a quick submittal turn around.

6.2.3 Project Team Meetings

Each week during construction, the project team meets to review the significant aspects of the project, including schedule, quality, deliveries, safety, and construction related issues. PERC Water has developed an outline of meeting minutes which allows team members to accurately track progress and

responsibilities. Our proactive approach to these weekly meetings encourages effective communication and follow-through.

6.2.4 Real Time, Electronic Management

To manage the project, we will use the Primavera Expedition system to manage RFI's, submittals, meeting minutes and daily journals. These are operated out of one system where a change in one module will flow through and update the other modules.

6.3 ESTIMATING

PERC Water has compiled an extensive database of construction information from previous projects; a great resource to draw from to measure proposed work. This database gives us the abilty to incorporate into new projects the best cost-saving features from past projects.

6.4 QUALITY CONTROL

Quality is our culture. Our employees, strategic partners and subcontractors understand our commitment to quality prior to making their own commitment to the PERC Water team. Specific systems include setting quality standards early in the process before work begins. At the pre-award and pre-mobilization meetings, quality standards are strictly defined for all subcontracted work.

6.4.1 Monthly Construction Activity Reports

During the construction phase of any project, PERC Water prepares a Monthly Activity Report that is submitted to the Owner and all Project Team Members. The purpose of the Monthly Activity Report is to maintain the expectations of the Owner and all Project Members about the status of the Project. The key components of the Monthly Activity Report are:

- Meeting minutes and Progress Photographs
- CPM Schedules and Project Action Lists
- RFI Logs
- Equipment Received Lists
- Safety Statistics

6.4.2 Mock Ups and Work Portioning

Mock ups are another useful way to communicate quality to our subcontractors. Often our superintendent will as subcontractor to fully complete a small portion of the work. Our superintendent will inspect the work and make comments until it is perfect. At that point he/she will release the

subcontractor on the rest of the work. If the subcontractor has a quality question, they can refer back to the mock up as a standard for comparison.

6.4.3 Submittal Reviews

The submittal process is also used for quality control. We thoroughly evaluate all submittals to make sure they match the specified product. Then, we make sure the submitted and approved item is that same in all material aspects to what is delivered and installed.

Equipment Selection is prioritized based on the following categories:

- Equipment Operations Efficiency
- Equipment Performance and Reliability
- Equipment Quality and Life Cycle
- Equipment Warranty
- Equipment Delivery Schedule
- Equipment Capital and Life Cycle Cost

6.5 SCHEDULE NARRATIVE

6.5.1 Monthly Update Review

6.5.1.1 Schedule Overview

The schedule narrative reports the progress made during each monthly period. The table below gives an example of the summary status as it would appear through the data date.

Schedule Overview	Thru Period		
P6 Schedule File Name Data Date	Rev 1 1-June-12	Rev 2 1-Jul-12	Delta 31
NTP for Construction	5-Sep-13	5-Sep-13	0
Target Construction Completion	18-Jun-14	18-Jun-14	0
Target Substantial Completion	15-Sep-14	15-Sep-14	0
Target Commencement Date of Operations	16-Oct-14	16-Oct-14	0
Current Construction Completion	18-Jun-14	18-Jun-14	0
Current Substantial Completion	15-Sep-14	23-Mar-10	0
Current Commencement Date of Operations	16-Oct-14	14-May-10	0
Total Project Float from target (WD)	0	0	0
Total Schedule Activities	106	106	0
Completed or In Progress Activities	0	0	0
Weather Days Allowance			
Requested Weather Days (WD)			
Total Approved Extensions			
Total Pending Delays (WD)			

The above snapshot shows the contract completion milestones and progress. Please refer to the progress summary and critical path analysis for more details

6.6 PROGRESS SUMMARY

This section provides a breakdown of all activities on the schedule. The total number of activities completed and in progress is outlined in this section. A list of activities which made progress are listed as below:

6.6.1 Examples of the Period Progress

6.6.1.1 Permitting

Description of work completed under a certain heading may be noted here.

6.6.1.2 Site Work

Examples will highlight what work has been completed and what if any is outstanding.

6.6.1.3 Project Closeout (example)

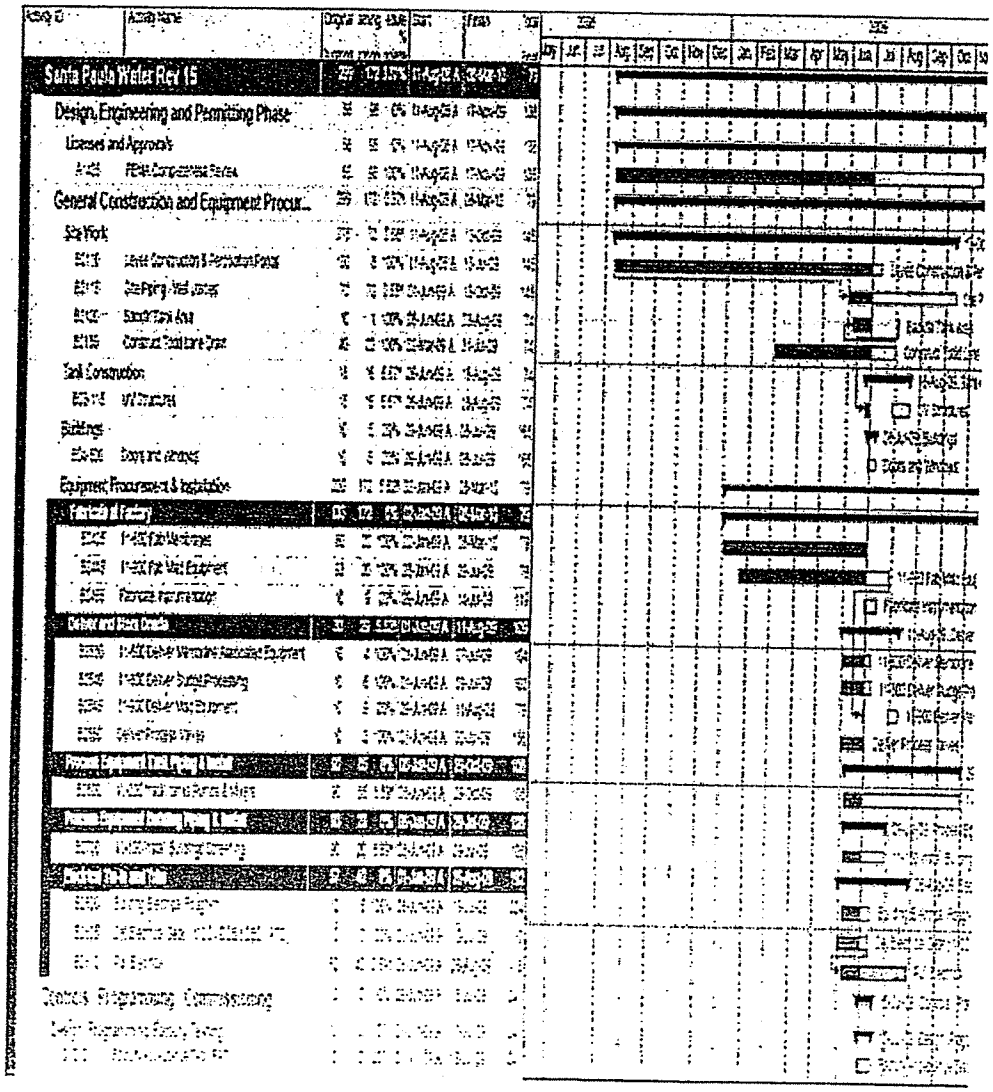
Activity **A1530 Install Roll-up Doors** started and is 80% complete. The **A1520 Install Windows & Louvers** activity was completed this month.

Activities **A1540 MEP Rough** and **A1560 Finishes Drywall Painting** both made significant progress during the period.

Although, work continues on activities **A1550 Thermal Insulation** and, **A1570 MEP Finishes** original estimates have been revised and work is expected to continue into July.

6.6.2 Activities with Progress (example)

An example of activities with progress in the highlighted period is shown below:



6.7 CRITICAL PATH

Critical path management techniques available in the Primavera software have been employed to successfully manage several PERC Water projects. As a result, our projects have consistently been complete on time or ahead of schedule. Additionally, our project teams experience less frustration, better planning and a higher level of communication between all team members.

The critical path schedule is continuously monitored and updated to identify critical activities that have the potential to delay completion. The Look-Ahead schedule will show the critical path of activities driving the project milestones. This section gives an each team member context to be aware of their related responsibilities.

6.8 SCHEDULE REVISIONS

The following section will include a summary of the revisions that were made during the period's schedule. Examples include:

1. Changes in activity ID's during the period
2. Changes in activity description
    a. Example: Activity **A2020 Certificate of Occupancy** is now shown as a Finish Milestone rather than a Task Dependant activity
3. Changes in Activity Durations
4. Changes in Activity Relationships
    a. Example: A new Finish - Start relationship was added to the schedule, the activity **A1940 24 HR Clean Water Test** must be completed in order to progress to **A1950 SUBSTANTIAL COMPLETION**
5. Any new activities added to the schedule in the period
6. Any Activities deleted from the schedule during the period

6.9 FRIANT RANCH CDR SCHEDULE

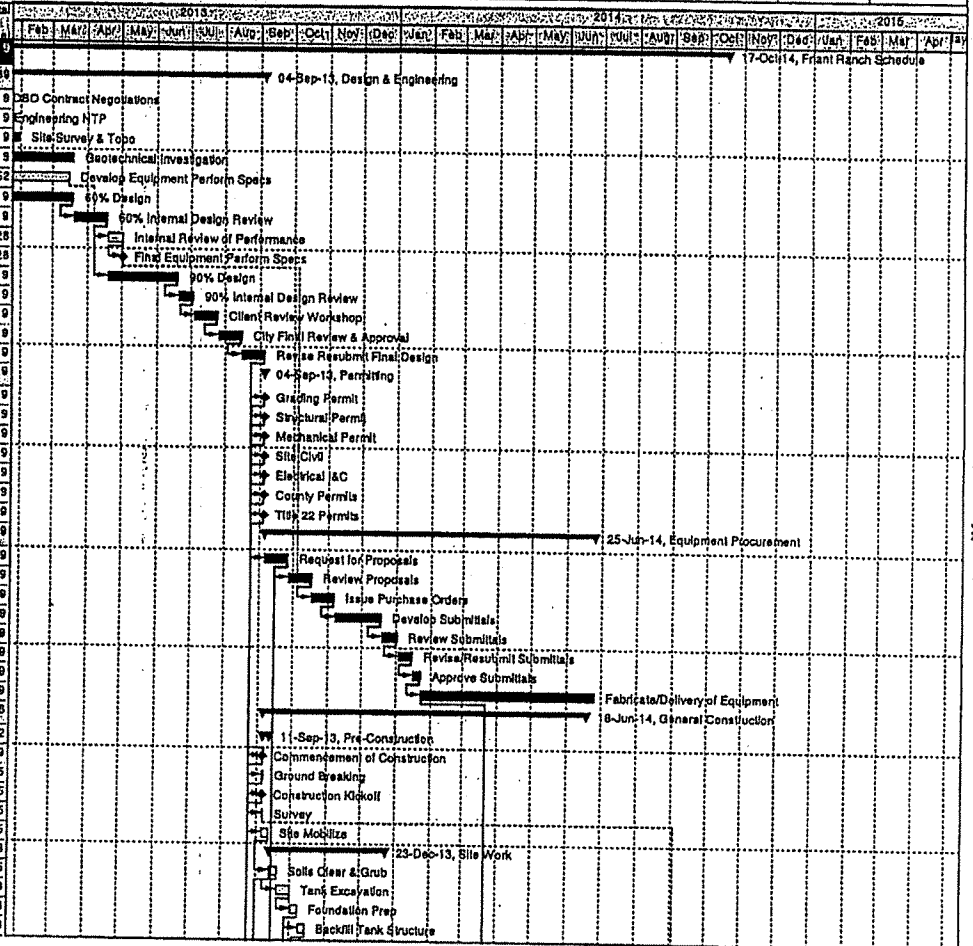
The Friant Ranch schedule appears on the following pages.

percwater

Friant Ranch CDR Schedule

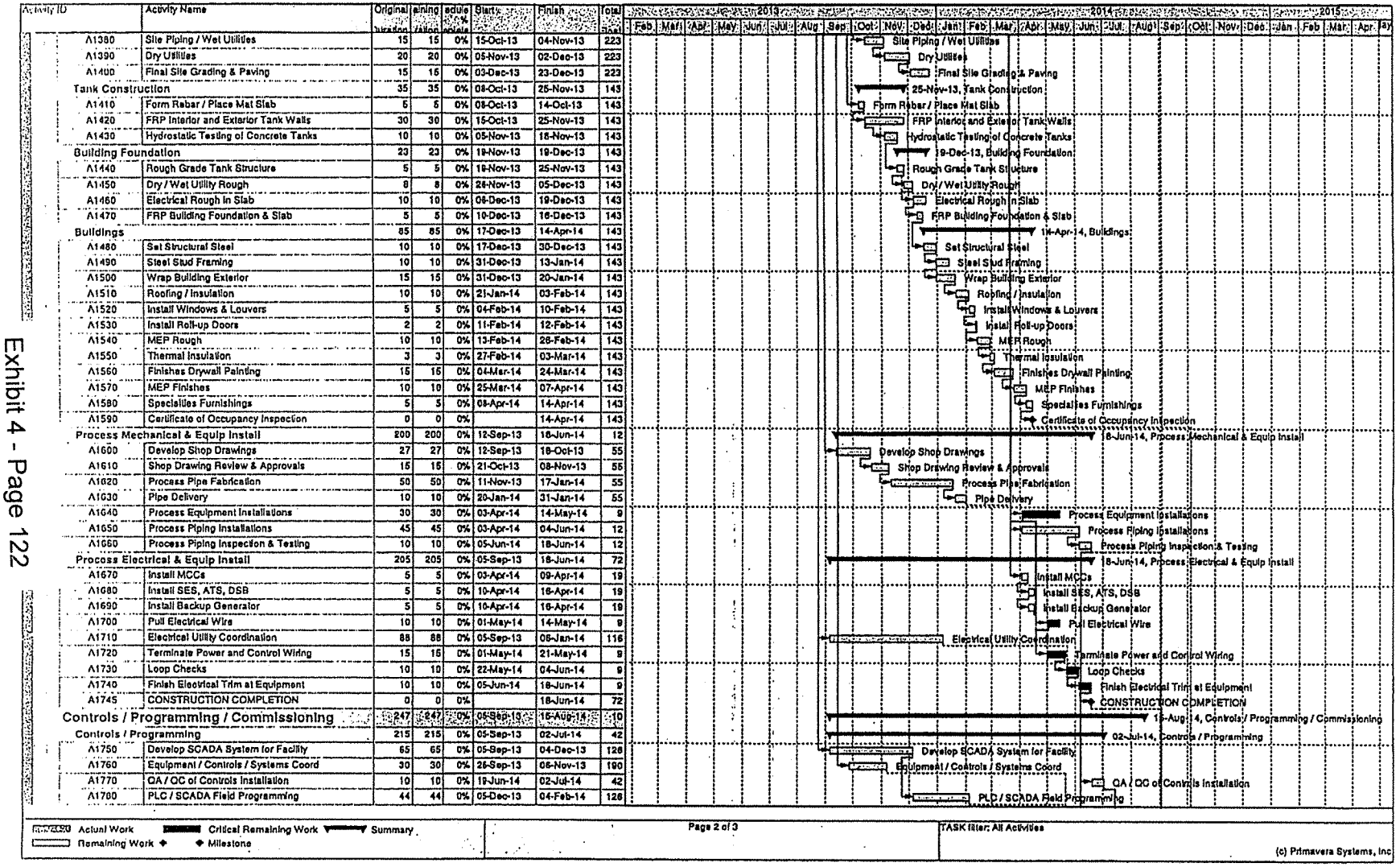
Date	Revision	Checked	Approved
31-May-12	Rev 1		

Activity ID	Activity Name	Original Duration	Remaining Duration	% Schedule	Start	Finish	Total Float
F	Friant Ranch Schedule	409	409	0%	01-Jan-13	17-Oct-14	9
	Design & Engineering	177	177	0%	01-Jan-13	04-Sep-13	99
A1000	DBO Contract Negotiations	10	10	0%	01-Jan-13	14-Jan-13	9
A1010	Engineering NTP	0	0	0%	15-Jan-13		9
A1020	Site Survey & Topo	10	10	0%	17-Jan-13	30-Jan-13	9
A1030	Geotechnical Investigation	44	44	0%	17-Jan-13	19-Mar-13	9
A1040	Develop Equipment Perform Specs	44	44	0%	15-Jan-13	15-Mar-13	152
A1050	60% Design	44	44	0%	17-Jan-13	19-Mar-13	9
A1060	60% Internal Design Review	22	22	0%	20-Mar-13	18-Apr-13	9
A1070	Internal Review of Performance	10	10	0%	19-Apr-13	02-May-13	128
A1080	Final Equipment Perform Specs	0	0	0%		02-May-13	128
A1090	90% Design	44	44	0%	19-Apr-13	19-Jun-13	9
A1100	90% Internal Design Review	10	10	0%	20-Jun-13	03-Jul-13	9
A1110	Client Review Workshop	15	15	0%	04-Jul-13	24-Jul-13	9
A1120	City Final Review & Approval	15	15	0%	25-Jul-13	14-Aug-13	9
A1130	Revise Resubmit Final Design	15	15	0%	15-Aug-13	04-Sep-13	9
	Permitting	0	0	0%	04-Sep-13	04-Sep-13	9
A1140	Grading Permit	0	0	0%		04-Sep-13	9
A1150	Structural Permit	0	0	0%		04-Sep-13	9
A1160	Mechanical Permit	0	0	0%		04-Sep-13	9
A1170	Site Civil	0	0	0%		04-Sep-13	9
A1180	Electrical I&C	0	0	0%		04-Sep-13	9
A1190	County Permits	0	0	0%		04-Sep-13	9
A1200	Title 22 Permits	0	0	0%		04-Sep-13	9
	Equipment Procurement	210	210	0%	05-Sep-13	25-Jun-14	9
A1210	Request for Proposals	15	15	0%	05-Sep-13	25-Sep-13	9
A1220	Review Proposals	15	15	0%	26-Sep-13	16-Oct-13	9
A1230	Issue Purchase Orders	15	15	0%	17-Oct-13	06-Nov-13	9
A1240	Develop Submittals	30	30	0%	07-Nov-13	18-Dec-13	9
A1250	Review Submittals	10	10	0%	19-Dec-13	01-Jan-14	9
A1260	Revise/Resubmit Submittals	10	10	0%	02-Jan-14	15-Jan-14	9
A1270	Approve Submittals	5	5	0%	16-Jan-14	22-Jan-14	9
A1280	Fabricate/Delivery of Equipment	110	110	0%	23-Jan-14	25-Jun-14	9
	General Construction	205	205	0%	05-Sep-13	18-Jun-14	99
	Pre-Construction	5	5	0%	05-Sep-13	11-Sep-13	272
A1290	Commencement of Construction	0	0	0%	05-Sep-13		9
A1300	Ground Breaking	2	2	0%	05-Sep-13	06-Sep-13	55
A1310	Construction Kickoff	0	0	0%	05-Sep-13		55
A1320	Survey	2	2	0%	05-Sep-13	06-Sep-13	275
A1330	Site Mobilize	5	5	0%	05-Sep-13	11-Sep-13	55
	Site Work	73	73	0%	12-Sep-13	23-Dec-13	223
A1340	Soils Clear & Grub	5	5	0%	12-Sep-13	18-Sep-13	55
A1350	Tank Excavation	8	8	0%	19-Sep-13	30-Sep-13	143
A1360	Foundation Prep	5	5	0%	01-Oct-13	07-Oct-13	143
A1370	Backfill Tank Structure	5	5	0%	08-Oct-13	14-Oct-13	223



Actual Work | Remaining Work | Critical Remaining Work | Milestone | Summary

TASK filter: All Activities



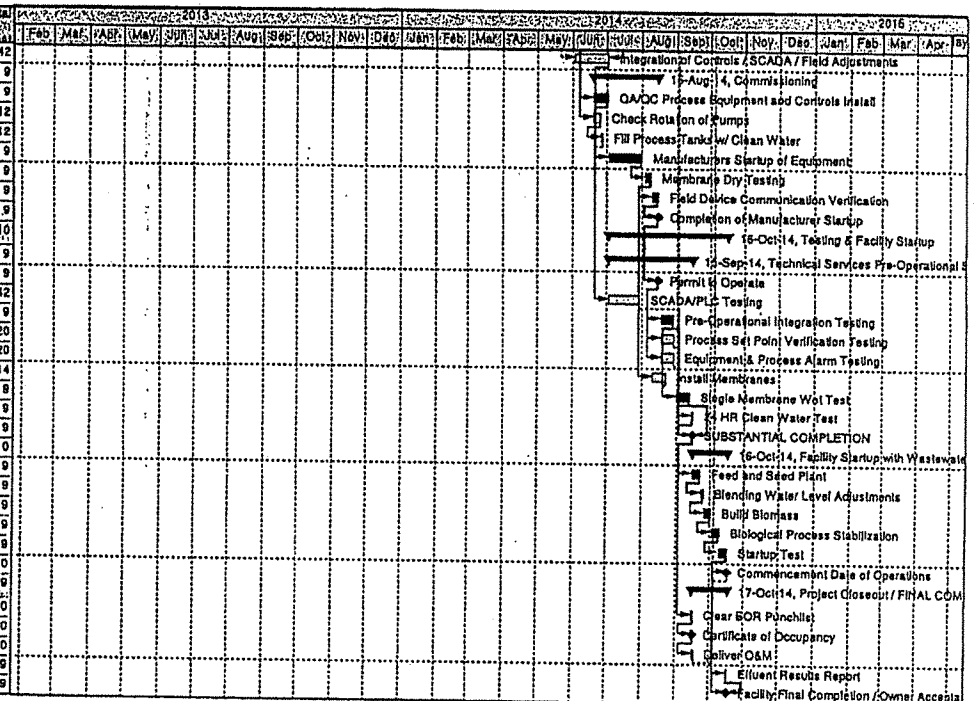
Activity ID	Activity Name	Original Duration	Remaining Duration	% Complete	Start	Finish	Total Float
A1380	Site Piping / Wet Utilities	15	15	0%	15-Oct-13	04-Nov-13	223
A1390	Dry Utilities	20	20	0%	05-Nov-13	02-Dec-13	223
A1400	Final Site Grading & Paving	15	15	0%	03-Dec-13	23-Dec-13	223
Tank Construction		35	35	0%	08-Oct-13	25-Nov-13	143
A1410	Form Rebar / Place Mat Slab	5	5	0%	08-Oct-13	14-Oct-13	143
A1420	FRP Interior and Exterior Tank Walls	30	30	0%	15-Oct-13	25-Nov-13	143
A1430	Hydrostatic Testing of Concrete Tanks	10	10	0%	05-Nov-13	18-Nov-13	143
Building Foundation		23	23	0%	19-Nov-13	19-Dec-13	143
A1440	Rough Grade Tank Structure	5	5	0%	19-Nov-13	25-Nov-13	143
A1450	Dry / Wet Utility Rough	8	8	0%	26-Nov-13	05-Dec-13	143
A1460	Electrical Rough in Slab	10	10	0%	06-Dec-13	19-Dec-13	143
A1470	FRP Building Foundation & Slab	5	5	0%	10-Dec-13	16-Dec-13	143
Buildings		85	85	0%	17-Dec-13	14-Apr-14	143
A1480	Set Structural Steel	10	10	0%	17-Dec-13	30-Dec-13	143
A1490	Steel Stud Framing	10	10	0%	31-Dec-13	13-Jan-14	143
A1500	Wrap Building Exterior	15	15	0%	31-Dec-13	20-Jan-14	143
A1510	Roofing / Insulation	10	10	0%	21-Jan-14	03-Feb-14	143
A1520	Install Windows & Louvers	5	5	0%	04-Feb-14	10-Feb-14	143
A1530	Install Roll-up Doors	2	2	0%	11-Feb-14	12-Feb-14	143
A1540	MEP Rough	10	10	0%	13-Feb-14	26-Feb-14	143
A1550	Thermal Insulation	3	3	0%	27-Feb-14	03-Mar-14	143
A1560	Finishes Drywall Painting	15	15	0%	04-Mar-14	24-Mar-14	143
A1570	MEP Finishes	10	10	0%	25-Mar-14	07-Apr-14	143
A1580	Specialties Furnishings	5	5	0%	08-Apr-14	14-Apr-14	143
A1590	Certificate of Occupancy Inspection	0	0	0%		14-Apr-14	143
Process Mechanical & Equip Install		200	200	0%	12-Sep-13	18-Jun-14	12
A1600	Develop Shop Drawings	27	27	0%	12-Sep-13	18-Oct-13	55
A1610	Shop Drawing Review & Approvals	15	15	0%	21-Oct-13	08-Nov-13	55
A1620	Process Pipe Fabrication	50	50	0%	11-Nov-13	17-Jan-14	55
A1630	Pipe Delivery	10	10	0%	20-Jan-14	31-Jan-14	55
A1640	Process Equipment Installations	30	30	0%	03-Apr-14	14-May-14	9
A1650	Process Piping Installations	45	45	0%	03-Apr-14	04-Jun-14	12
A1660	Process Piping Inspection & Testing	10	10	0%	05-Jun-14	18-Jun-14	12
Process Electrical & Equip Install		205	205	0%	05-Sep-13	18-Jun-14	72
A1670	Install MCCs	5	5	0%	03-Apr-14	09-Apr-14	19
A1680	Install SES, ATS, DSB	5	5	0%	10-Apr-14	16-Apr-14	19
A1690	Install Backup Generator	5	5	0%	16-Apr-14	16-Apr-14	19
A1700	Pull Electrical Wire	10	10	0%	01-May-14	14-May-14	9
A1710	Electrical Utility Coordination	88	88	0%	05-Sep-13	06-Jan-14	116
A1720	Terminate Power and Control Wiring	15	15	0%	01-May-14	21-May-14	9
A1730	Loop Checks	10	10	0%	22-May-14	04-Jun-14	9
A1740	Finish Electrical Trim at Equipment	10	10	0%	05-Jun-14	18-Jun-14	9
A1745	CONSTRUCTION COMPLETION	0	0	0%		18-Jun-14	72
Controls / Programming / Commissioning		247	247	0%	05-Sep-13	15-Aug-14	10
Controls / Programming		215	215	0%	05-Sep-13	02-Jul-14	42
A1750	Develop SCADA System for Facility	65	65	0%	05-Sep-13	04-Dec-13	126
A1760	Equipment / Controls / Systems Coord	30	30	0%	26-Sep-13	06-Nov-13	190
A1770	QA / QC of Controls Installation	10	10	0%	19-Jun-14	02-Jul-14	42
A1780	PLC / SCADA Field Programming	44	44	0%	05-Dec-13	04-Feb-14	126

Actual Work | Remaining Work | Critical Remaining Work | Milestone | Summary

Page 2 of 3

TASK filter: All Activities

Activity ID	Activity Name	Original Duration	Remaining Duration	% Complete	Start	Finish	Total Float
A1790	Integration of Controls / SCADA / Field Adjustm...	22	22	0%	03-Jun-14	02-Jul-14	42
Commissioning		42	42	0%	19-Jun-14	15-Aug-14	9
A1800	QA/QC Process Equipment and Controls Install	10	10	0%	19-Jun-14	02-Jul-14	9
A1810	Check Rotation of Pumps	5	5	0%	19-Jun-14	25-Jun-14	12
A1820	Fill Process Tanks w/ Clean Water	2	2	0%	26-Jun-14	27-Jun-14	12
A1830	Manufacturers Startup of Equipment	22	22	0%	03-Jul-14	01-Aug-14	9
A1840	Membrane Dry Testing	5	5	0%	04-Aug-14	08-Aug-14	9
A1850	Field Device Communication Verification	5	5	0%	11-Aug-14	15-Aug-14	9
A1860	Completion of Manufacturer Startup	0	0	0%		15-Aug-14	9
Testing & Facility Startup		76	76	0%	03-Jul-14	16-Oct-14	10
Technical Services Pre-Operational Ser.		53	53	0%	03-Jul-14	15-Sep-14	9
A1870	Permit to Operate	0	0	0%		15-Aug-14	9
A1880	SCADA/PLC Testing	20	20	0%	03-Jul-14	30-Jul-14	42
A1890	Pre-Operational Integration Testing	10	10	0%	18-Aug-14	29-Aug-14	9
A1900	Process Set Point Verification Testing	10	10	0%	18-Aug-14	29-Aug-14	20
A1910	Equipment & Process Alarm Testing	10	10	0%	18-Aug-14	29-Aug-14	20
A1920	Install Membranes	10	10	0%	11-Aug-14	22-Aug-14	14
A1930	Single Membrane Wet Test	10	10	0%	01-Sep-14	12-Sep-14	9
A1940	24 HR Clean Water Test	1	1	0%	15-Sep-14	15-Sep-14	9
A1950	SUBSTANTIAL COMPLETION	0	0	0%		15-Sep-14	9
Facility Startup with Wastewater		23	23	0%	16-Sep-14	16-Oct-14	10
A1960	Feed and Seed Plant	5	5	0%	16-Sep-14	22-Sep-14	9
A1970	Blending Water Level Adjustments	3	3	0%	23-Sep-14	25-Sep-14	9
A1980	Build Biomass	5	5	0%	26-Sep-14	02-Oct-14	9
A1990	Biological Process Stabilization	5	5	0%	03-Oct-14	09-Oct-14	9
A2000	Startup Test	5	5	0%	10-Oct-14	16-Oct-14	9
A2005	Commencement Date of Operations	0	0	0%		16-Oct-14	10
Project Closeout / FINAL COMPLETION		24	24	0%	16-Sep-14	17-Oct-14	9
A2010	Clear EOR Punchlist	1	1	0%	16-Sep-14	16-Sep-14	30
A2020	Certificate of Occupancy	0	0	0%		16-Sep-14	30
A2030	Deliver O&M	1	1	0%	17-Sep-14	17-Sep-14	30
A2040	Effluent Results Report	1	1	0%	17-Oct-14	17-Oct-14	9
A2050	Facility Final Completion / Owner Acceptance	0	0	0%		17-Oct-14	9



Actual Work | Remaining Work | Critical Remaining Work | Summary | Milestone

Page 3 of 3

TASK filter: All Activities

SPA III Water Recycling Facility
1.8 MGD
Aeration Basin

7.1 KEY DEFINITIONS *(in alphabetical order)*

Acceptable Influent means influent received by the Facility meeting the applicable parameters set forth in the Performance Specifications contained in this CDR. Acceptable Influent excludes all Hazardous Waste and all chloride, sulfate, boron, aluminum, iron, selenium, mercury, cyanide and other unknown constituents not intended to be removed by the Facility as designed and constructed in accordance with the Construction Documents (collectively, "Unacceptable Influent").

Applicable Law means any law, regulation, ordinance or rule applicable to the design, construction or operation of, or any discharge from, the Facility.

Applicable Permits and Orders means any permit or governmental or judicial, finding or judgment with respect to the design, construction or operation of, or any discharge from, the Facility.

Average Dry Weather Flow (ADWF) means sewer flow volume expected in a 24-hour period during periods of little or no rain. This flow rate is typically used to define the facility capacity with respect to effluent reuse planning. For the purpose of this CDR, the AADF is defined as 0.8 MGD at build out and 0.40 MGD in Phase I.

BOD5 (5-day Biological Oxygen Demand) means a measure of the level of contamination of the influent and effluent wastewater. It is measured by determining the oxygen demand of a given sample over a 5-day period under controlled conditions. BOD5 is typically used to size certain components of the biological treatment processes. The biological treatment process requires a minimum amount of BOD to provide enough food to support the micro-organisms. This minimum load is typically 20% of the average day design loading of a single process train.

BOD: TKN Ratio is the comparison of the concentration of BOD5 and TKN in the influent wastewater when both values are measured as mg/L. Typically, residential communities have a ratio that is greater than 5 due to the characteristic habits of the residents. Significant contributions of clean water due to inflow or infiltration can lower this ratio. When the ratio is below 5, it limits the ability of a water recycling facility to denitrify wastewater on its own.

Change in Law means any changes in Applicable Law or in Applicable Permits and Orders that may occur after the date of this CDR.

Commencement of Construction means the date when all applicable permits required for construction of the Facility have been issued, Fresno County has approved the applicable Construction Documents and Friant Ranch has issued a Notice to Proceed with the construction portion of the Work.

Commencement Date of Operations (CDO) means the date that the Facility commences to treat Acceptable Influent in a manner that produces Compliant Effluent.

Compliant Effluent means effluent generated by the Facility that: (i) complies with Applicable Law; and (ii) with respect to all Acceptable Influent: (A) meets the parameters for Compliant Effluent set forth in the Performance Specifications contained in this CDR; and (B) complies with Applicable Permits and Orders.

Construction Documents means a set of drawings and plans necessary for the construction of the Facility (including all aesthetic features reflected in this CDR) that are consistent with, and a logical evolution of, this CDR as approved by Friant Ranch and integrated into the Definitive Agreement. The Construction Documents are intended to be the documents for which the Fresno County will issue a building permit for the Work. The term "Construction Documents" includes drawings and plans contained in or proposed pursuant to any change orders or work change directives issued in accordance with the Definitive Agreement.

Contract Time means the duration of the performance of the Work either as a part of the total work thereof or the total time from Notice-to-Proceed to the Final Completion Date.

Definitive Agreement means the agreement entered into between Friant Ranch and PERC Water. The Definitive Agreement may be a Design and Build Agreement, or Design, Build and Operate Agreement.

Differing Site Conditions means concealed or latent physical conditions or subsurface conditions at the Property that differ from the assumed site conditions.

Engineer of Record is the engineer retained by PERC Water, either directly, or in PERC Water's capacity as the Company's contractor, to prepare the Construction Documents and to provide engineering services for the Facility. The Engineer of Record is Pacific Advanced Civil Engineering, Inc. ("PACE").

Facility means all the buildings, structures, equipment, piping and related or required appurtenances that are to be designed and constructed by PERC Water in accordance with the Construction Documents.

Final Completion Date means the date when: (i) a certificate of occupancy has been issued; (ii) the punch list has been completed; (iii) record drawings have been submitted; (iv) all final lien waivers have been submitted; and (v) demonstration that the Facility operates in compliance with Applicable Law and produces Compliant Effluent. Once Final Completion has been achieved, it will be deemed that Substantial Completion has also been achieved.

Float means the number of days by which an activity on the Project Schedule may be delayed from its earliest start date without the necessity to extend the Substantial Completion Date, or Final Completion Date.

Hard Dig any rock removal or excavation that would require a hammer attachment and any excavation that can't be done using a standard excavator.

Hazardous Materials means any substance, material, or waste which is or becomes regulated by any Applicable Laws including, but not limited to, any material or substance which is: (i) defined as a "hazardous waste," "extremely hazardous waste," or "restricted hazardous waste" under Section 25115, 25117 or 25122.7, or listed pursuant to Section 25140 of the California Health and Safety Code, Division 20, Chapter 6.5 (Hazardous Waste Control Law); (ii) defined as a "hazardous substance" under Section

25316 of the California Health and Safety Code, Division 20, Chapter 6.8 (Carpenter-Presley-Tanner Hazardous Substance Account Act); (iii) defined as a "hazardous material," "hazardous substance," or "hazardous waste" under Section 25501 of the California Health and Safety Code, Division 20, Chapter 6.95 (Hazardous Materials Release Response Plans and Inventory); (iv) defined as a "hazardous substance" under Section 25281 of the California Health and Safety Code, Division 20, Chapter 6.7 (Underground Storage of Hazardous Substances); (v) petroleum; (vi) friable asbestos; (vii) polychlorinated byphenyls; (viii) listed under Article IX or defined as "hazardous" or "extremely hazardous" pursuant to Article 11 of Title 22 of the California Administrative Code, Division 4, Chapter 20; (ix) designated as "hazardous substances" pursuant to Section 311 of the Clean Water Act (33 U.S.C. 13-17); (x) defined as a "hazardous waste" pursuant to Section 1004 of the Resource Conservation and Recovery Act (42 U.S.C. 6901 et seq.) ; or (xi) defined as "hazardous substances" pursuant to Section 101 of the Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. 9601 et seq.).

Maximum Month Day Flow means maximum sewer flow, averaged over a one-month period which has the highest daily flows. The Maximum Month Flow has been used to determine the size of the sludge processing systems for the treatment facility. For the purpose of this CDR, the flow is anticipated to be 0.5 MGD in Phase I.

Maximum Day Flow means the maximum flow anticipated during a 24 hour period. For the purpose of this CDR, the Maximum Day Flow is defined as 1.1 MGD in Phase 1.

Notice to Proceed (NTP) means the authorization by Friant Ranch for PERC Water to proceed with the Work or some portion of the Work.

O&M Component of the Service Fees means the amount set forth in the CDR.

O&M Scope of Work means the scope of work for operating and maintaining the Facility as set forth in this CDR.

O&M Services means all operation and maintenance services described in the O&M Scope of Work to be provided by PERC Water or the Company as set forth in this CDR.

Peak Hour Hydraulic Flow mean maximum sewer flow expected in any 2-hour period within a year. For this project, the Peak Flow rate has been used to size the headworks of the treatment facility and to determine the amount of surge attenuation required for the fine screening, secondary and tertiary treatment processes. For the purpose of this CDR, the Peak Hour Flow is defined as 3.0 MGD at build out and 1.8 MGD in Phase I.

PERC Water means PERC Water Corporation, a California corporation, a company experienced in designing, building and operating wastewater treatment facilities. PERC Water is licensed as a general contractor by the State of California under License Number 763702 and registered as a contract operator by the California Water Resources Control Board. It is anticipated that PERC Water will either be a party to the Definitive Agreement.

Performance Warranty means the warranty to be given by PERC Water, as applicable, that the Facility will produce Compliant Effluent.

Price Index means Rider Levett Bucknall Quarterly Construction Cost Report, Second Quarter Report 2012 which was 17,295 as of April 15, 2012.

Project Schedule means the CPM schedule that is prepared by PERC Water for the Work pursuant to this CDR.

Property means the site on which the Facility will be constructed.

Regional Board means the California Regional Water Quality Control Board, Central Valley Region, which operates out of the Fresno Office.

Scheduled Construction Commencement Date means the date in the Project Schedule for commencement of the Work.

Scope of Work means all Work within the delineated line on Sheets 01 contained in this CDR and titled "Scope of Work".

Start Up Test means the usual and customary testing of any equipment, system or component to be performed following Substantial Completion for the purposes of demonstrating that the Facility: (i) performs properly in accordance with the Construction Documents; and (ii) produces Compliant Effluent. The term "Start Up Test" will not include the twenty-four (24) hour clean water test referred to in the below definition of "Substantial Completion."

Substantial Completion Date means the date when the Facility has successfully accomplished completion of the twenty-four (24)-hour clean water test and delivery of a letter from the Engineer of Record certifying Substantial Completion.

TSS (Total Suspended Solids) means a measure of the particulate (non-dissolved) mass in the wastewater. It is typically used to determine the clarity of the water and is a component in the determination of the amount of waste sludge the facility will generate.

TKN (Total Kjeldahl Nitrogen) means a measure of the nitrogen content of raw wastewater which is the product of adding the Organic + Ammonia + Ammonium. It does not include Nitrate or Nitrite which are typically not present in raw wastewater due to septic conditions. The Friant Ranch Conceptual Design Report by CH2MHill only provided ammonia values and did not provide TKN valves for influent loading conditions. Therefore, our project team has assumed that sufficient TKN is available to denitrify without chemical facilities.

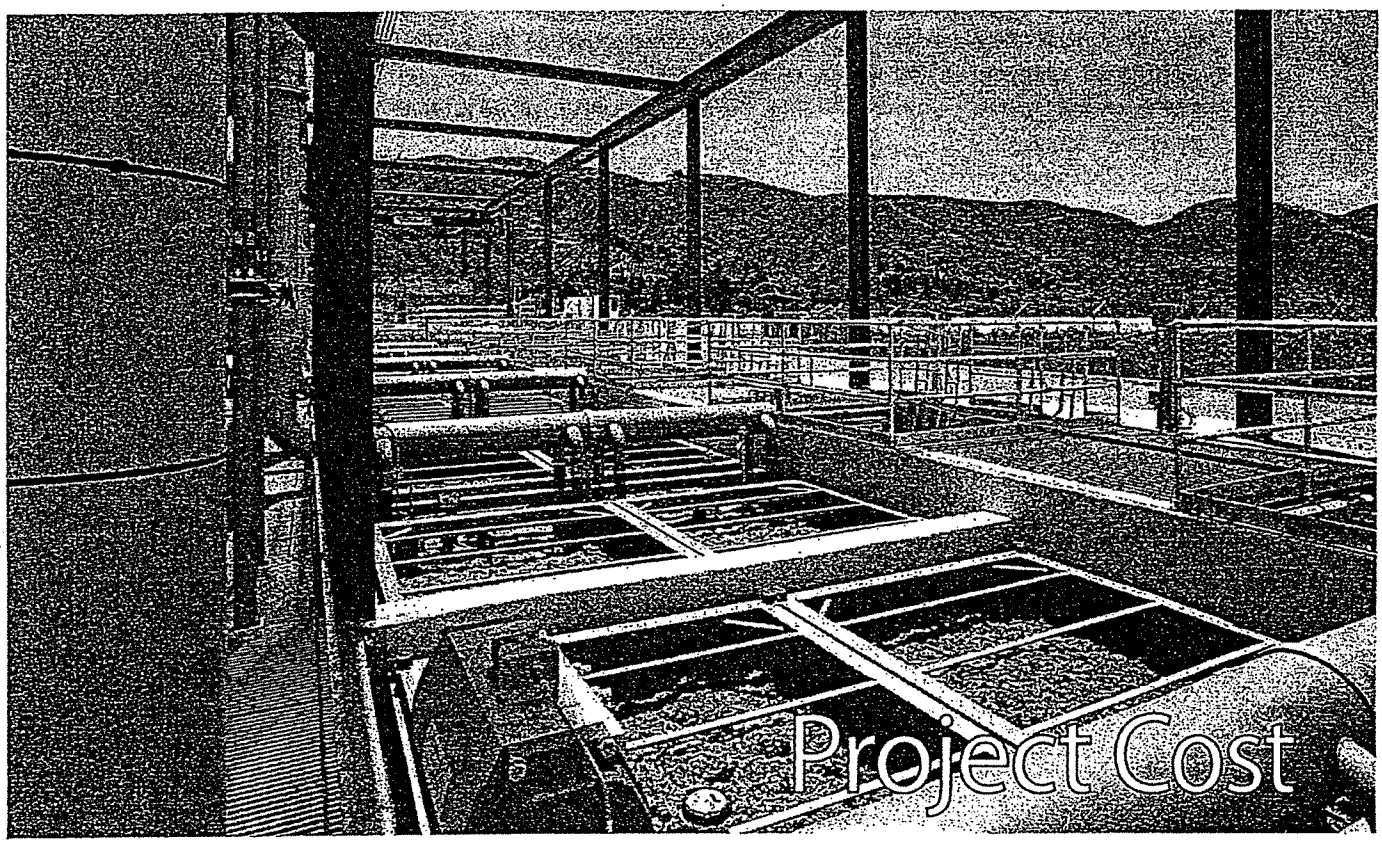
TN (Total Nitrogen) means a measure of the nitrogen content of final effluent which includes all chemical forms of Nitrogen.

Water Recycling Facility (WRF) is the term used to describe the facility accepting sewer flows and treating them through various biological and mechanical processes to produce clean (non-potable) water that can

be reused under California Title 22. Wastewater Treatment facility or Wastewater Treatment plant are similar, though slightly less descriptive terms that do not imply reuse.

Waterworks District 18 (WWD 18 or District)) refers to the public entity that will own, maintain, and operate the Water Recycling Facility proposed for the community of Friant Ranch.

Work means the design, architectural, engineering, permitting, construction, start-up testing and start up, and any and all other services required for the construction of the Facility in accordance with the Construction Documents, wholly and severally, including the Start Up Test, including labor, tools, materials and equipment. All Work will be performed by PERC Water or PERC Water's subcontractors and/or consultants.



Santa Paula Water Recycling Facility
4.2 MGD
Membrane Bio-Reactor Tanks

Section 8 – Project Cost

Text/Tables have been removed. Estimated Cost not applicable for Conditional Use Permit (CUP) determination.

Santa Paula Water Recycling Facility
4.2 MGD
Entrance

File C:\Program Files\EnviroSim\BioWin 3\Data\BIOWIN MODELING\Fraint Ranch Config 2.BWC

BioWin user and configuration data

Project details
Project name:
Plant name:

Project ref.: 9200E

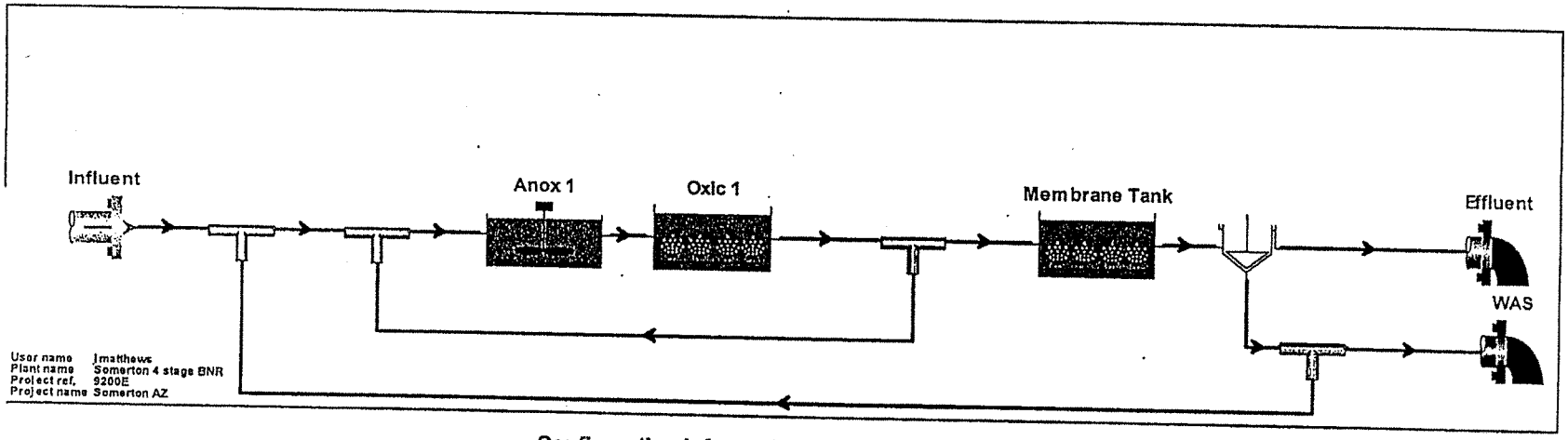
User name: jmatthews

Created: 7/25/2008

Saved: 5/18/2012

Steady state solution
SRT #0: -----
Temperature: 20.0

Flowsheet



Configuration information for all Bioreactor units

Physical data

Element name	Volume [Mil. Gal]	Area [ft2]	Depth [ft]	# of diffusers
Anox 1	0.0794	885.0000	12.0	Un-aerated
Oxic 1	0.0794	885.0000	12.0	50
Membrane Tank	0.0321	330.0000	13.0	19

Operating data Average (flow/time weighted as required)

Element name	Average DO Setpoint [mg/L]
Anox 1	0
Oxic 1	2.0
Membrane Tank	2.0

Aeration equipment parameters

Element name	k1 in C = k1(PC)^0.25 + k2	k2 in C = k1(PC)^0.25 + k2	Y in Kla = C Usg ^ Y - Usg in [m3/(m2 d)]	Area of one diffuser	% of tank area covered by diffusers [%]
Anox 1	2.5656	0.0432	0.8200	0.0410	10.0000
Oxic 1	2.5656	0.0432	0.8200	0.2369	14.4000
Membrane Tank	2.5656	0.0432	0.8200	0.2369	14.4000

Element name	Alpha (surf) OR Alpha F (diff) [-]	Beta [-]	Surface pressure [kPa]	Fractional effective saturation depth (Fed) [-]
Oxic 1	0.5000	0.9500	101.3250	0.3250
Membrane Tank	0.5000	0.9500	101.3250	0.3250

Element name	Supply gas CO2 content [vol. %]	Supply gas O2 [vol. %]	Off-gas CO2 [vol. %]	Off-gas O2 [vol. %]	Off-gas H2 [vol. %]	Off-gas NH3 [vol. %]	Off-gas CH4 [vol. %]	Surface turbulence factor [-]
Oxic 1	0.0350	20.9500	2.0000	18.8000	0	0	0	2.0000
Membrane Tank	0.0350	20.9500	2.0000	18.8000	0	0	0	2.0000

Configuration Information for all BOD Influent units

Operating data Average (flow/time weighted as required)

Element name	Influent
Flow	0.4
Total Carbonaceous BOD mgBOD/L	350.00
Volatile suspended solids mgVSS/L	270.00
Total suspended solids mgTSS/L	340.00
Total Kjeldahl Nitrogen mgN/L	60.00
Total P mgP/L	8.00
Nitrate N mgN/L	0
pH	7.30
Alkalinity mmol/L	20.00
Calcium mg/L	80.00
Magnesium mg/L	15.00
Dissolved oxygen mg/L	0

Element name	Influent
Fbs - Readily biodegradable (including Acetate) [gCOD/g of total COD]	0.1600
Fac - Acetate [gCOD/g of readily biodegradable COD]	0.1500
Fxsp - Non-colloidal slowly biodegradable [gCOD/g of slowly degradable COD]	0.7263
Fus - Unbiodegradable soluble [gCOD/g of total COD]	0.0500
Fup - Unbiodegradable particulate [gCOD/g of total COD]	0.1300
Fna - Ammonia [gNH3-N/gTKN]	0.6600
Fnox - Particulate organic nitrogen [gN/g Organic N]	0.5000
Fnus - Soluble unbiodegradable TKN [gN/gTKN]	0.0200
FupN - N:COD ratio for unbiodegradable part. COD [gN/gCOD]	0.0350
Fpo4 - Phosphate [gPO4-P/gTP]	0.5000
FupP - P:COD ratio for influent unbiodegradable part. COD [gP/gCOD]	0.0110
FZbh - Non-poly-P heterotrophs [gCOD/g of total COD]	0.0001
FZbm - Anoxic methanol utilizers [gCOD/g of total COD]	0.0001
FZaob - Ammonia oxidizers [gCOD/g of total COD]	0.0001
FZnob - Nitrite oxidizers [gCOD/g of total COD]	0.0001
FZamob - Anaerobic ammonia oxidizers [gCOD/g of total COD]	0.0001
FZbp - PAOs [gCOD/g of total COD]	0.0001
FZbpa - Propionic acetogens [gCOD/g of total COD]	0.0001
FZbam - Acetoclastic methanogens [gCOD/g of total COD]	0.0001
FZbhm - H2-utilizing methanogens [gCOD/g of total COD]	0.0001

Configuration Information for all Effluent units

Configuration Information for all Sidestream Mixer units

Physical data

Element name	Volume[Mil. Gal]	Area[ft2]	Depth[ft]
	0	N/A	N/A
	0	N/A	N/A

Configuration Information for all Point clarifier units

Physical data

Element name	No Volume
Point clarifier3	0

Operating data Average (flow/time weighted as required)

Element name	Split method	Average Split specification
Point clarifier3	Flow paced	600.00 %

Element name	Percent removal
Point clarifier3	100.00

Configuration Information for all Sludge units

Configuration Information for all Splitter units

Physical data

Element name	Volume[Mil. Gal]	Area[ft2]	Depth[ft]
Splitter14	0	N/A	N/A
Splitter21	0	N/A	N/A

Operating data Average (flow/time weighted as required)

Element name	Split method	Average Split specification
Splitter14	Flowrate [Main]	0.008
Splitter21	Flow paced	0.00 %

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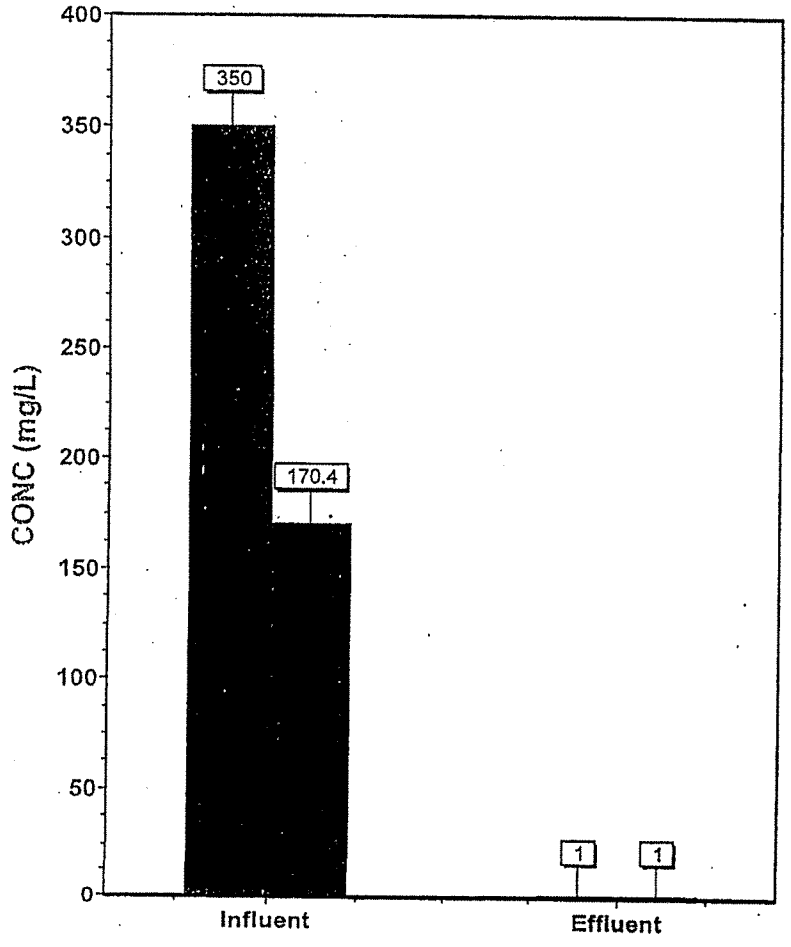
C:\Program Files\EnviroSim\BioWin 3\Data\BIOWIN MODELING\Fraint Ranch Config 2



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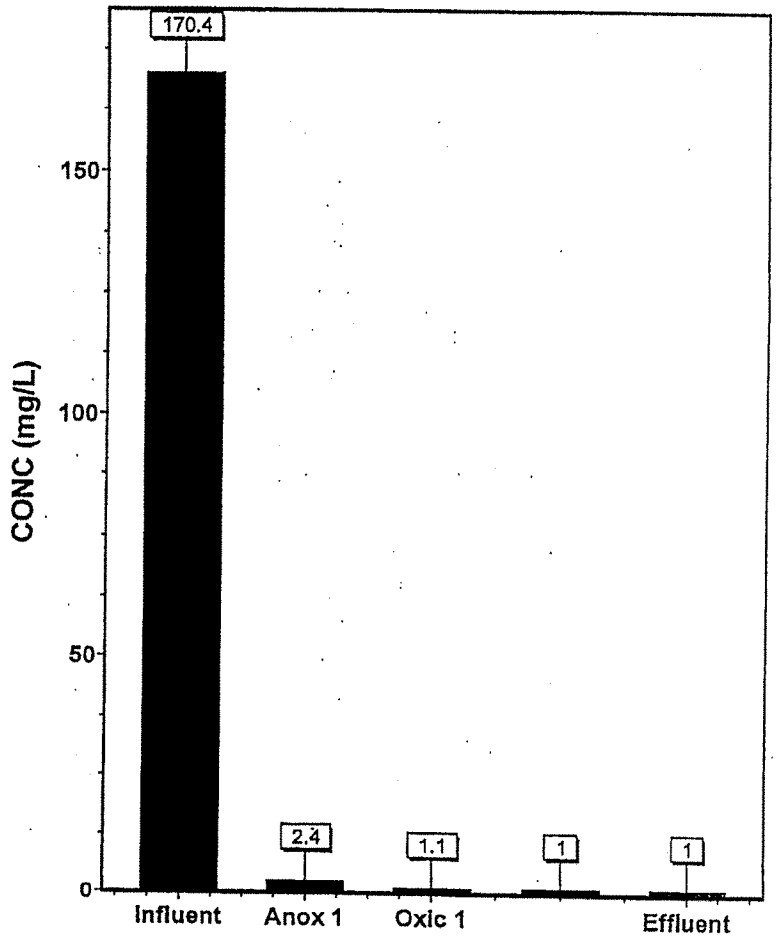

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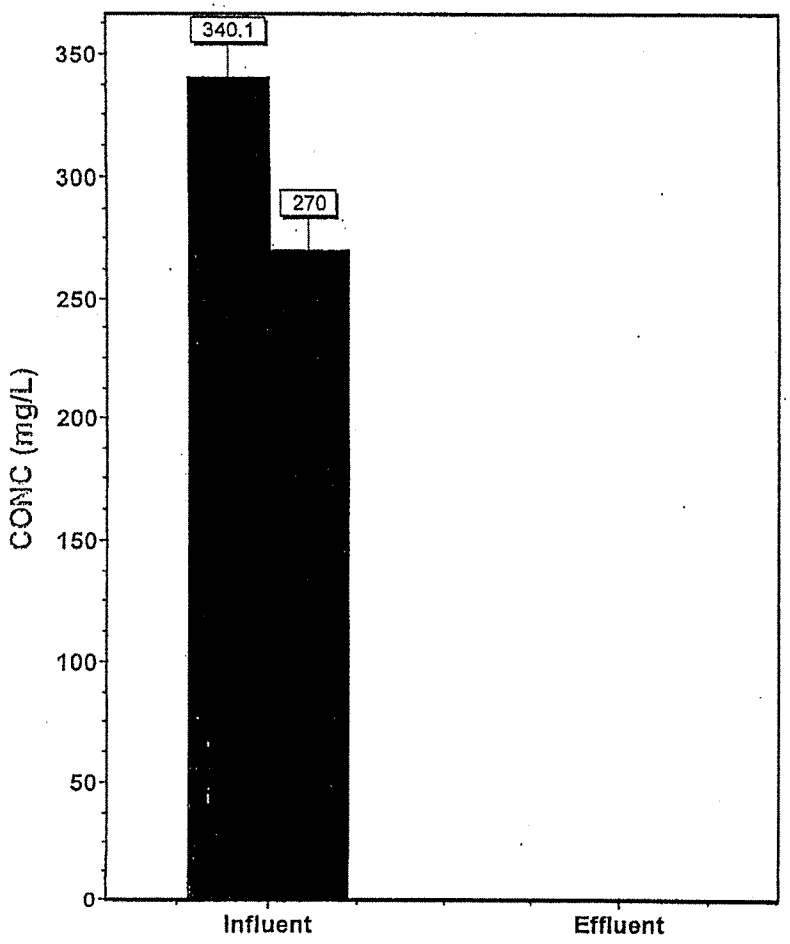

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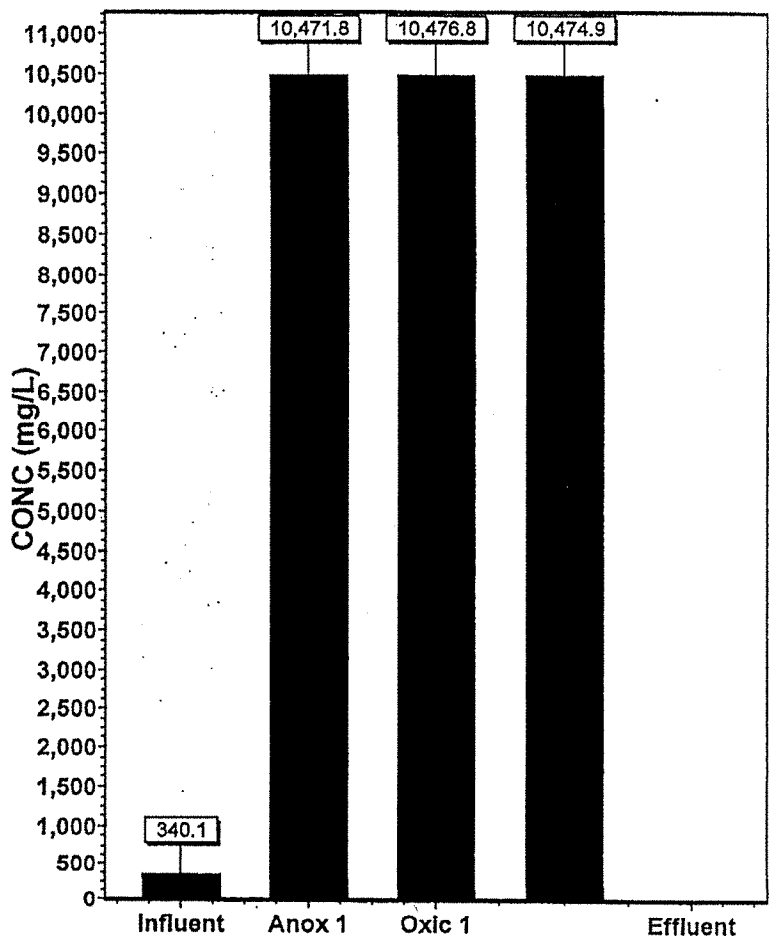

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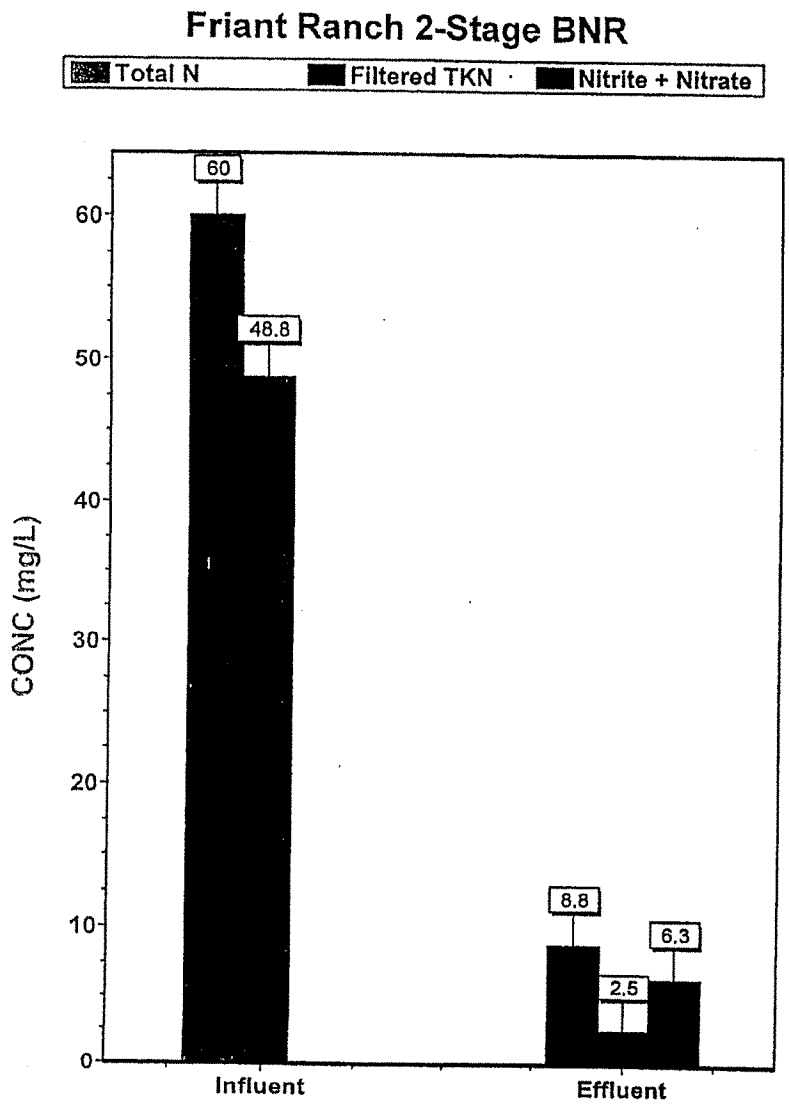

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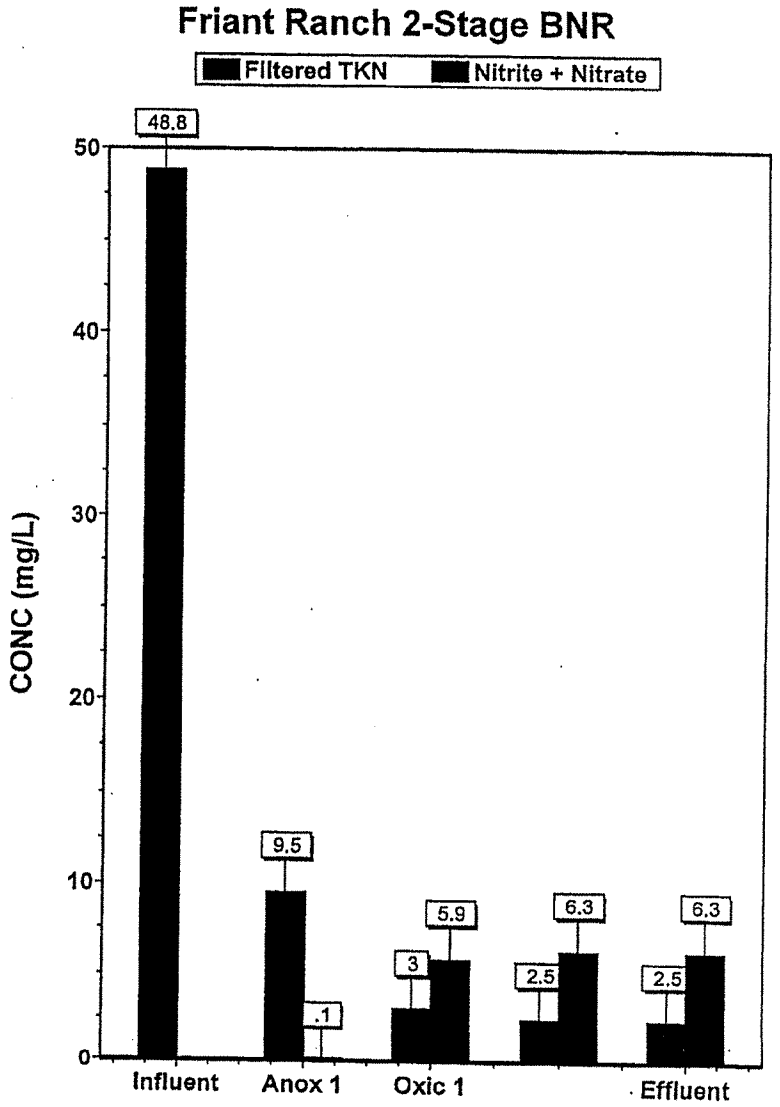

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Elements	Total oxygen uptake rate [mgO/L/hr]	Carbonaceous OUR [mgO/L/hr]	Nitrogenous OUR [mgO/L/hr]	OTR [lb/hr]	Off gas flow rate (dry) [ft3/min]	Air supply rate [ft3/min (20C, 1 atm)]
Anox 1	0.00	0.00	0.00	0	1.16	0
Oxic 1	79.97	42.58	37.39	54.86	706.64	702.72
Membrane Tank	47.88	39.05	8.83	12.82	132.39	132.29

AOB

Name	Default	Value	
Max. spec. growth rate [1/d]	0.90000	0.90000	1.0720
Substrate (NH4) half sat. [mgN/L]	0.70000	0.70000	1.0000
Aerobic decay rate [1/d]	0.17000	0.17000	1.0290
Anoxic/anaerobic decay rate [1/d]	0.08000	0.08000	1.0290
KiHNO2 [mmol/L]	0.00500	0.00500	1.0000

NOB

Name	Default	Value	
Max. spec. growth rate [1/d]	0.70000	0.70000	1.0600
Substrate (NO2) half sat. [mgN/L]	0.10000	0.10000	1.0000
Aerobic decay rate [1/d]	0.17000	0.17000	1.0290
Anoxic/anaerobic decay rate [1/d]	0.08000	0.08000	1.0290
KINH3 [mmol/L]	0.07500	0.07500	1.0000

ANAMMOX

Name	Default	Value	
Max. spec. growth rate [1/d]	0.10000	0.10000	1.1000
Substrate (NH4) half sat. [mgN/L]	2.00000	2.00000	1.0000
Substrate (NO2) half sat. [mgN/L]	1.00000	1.00000	1.0000
Aerobic decay rate [1/d]	0.01900	0.01900	1.0290
Anoxic/anaerobic decay rate [1/d]	0.00950	0.00950	1.0290
KI Nitrite [mgN/L]	1000.00000	1000.00000	1.0000
Nitrite sensitivity constant [L / (d mgN)]	0.01600	0.01600	1.0000

OHOs

Name	Default	Value	
Max. spec. growth rate [1/d]	3.20000	3.20000	1.0290
Substrate half sat. [mgCOD/L]	5.00000	5.00000	1.0000
Anoxic growth factor [-]	0.50000	0.50000	1.0000
Aerobic decay [1/d]	0.62000	0.62000	1.0290
Anoxic/anaerobic decay [1/d]	0.30000	0.30000	1.0290
Hydrolysis rate (AS) [1/d]	2.10000	2.10000	1.0290
Hydrolysis half sat. (AS) [-]	0.06000	0.06000	1.0000
Anoxic hydrolysis factor [-]	0.28000	0.28000	1.0000
Anaerobic hydrolysis factor [-]	0.50000	0.50000	1.0000
Adsorption rate of colloids [L/(mgCOD d)]	0.80000	0.80000	1.0290
Ammonification rate [L/(mgN d)]	0.04000	0.04000	1.0290
Assimilative nitrate/nitrite reduction rate [1/d]	0.50000	0.50000	1.0000
Fermentation rate [1/d]	3.20000	3.20000	1.0290
Fermentation half sat. [mgCOD/L]	5.00000	5.00000	1.0000
Anaerobic growth factor (AS) [-]	0.12500	0.12500	1.0000
Hydrolysis rate (AD) [1/d]	0.10000	0.10000	1.0500
Hydrolysis half sat. (AD) [mgCOD/L]	0.15000	0.15000	1.0000

Methylotrophs

Name	Default	Value	
Max. spec. growth rate of methanol utilizers [1/d]	1.30000	1.30000	1.0720
Methanol half sat. [mgCOD/L]	0.50000	0.50000	1.0000
Aerobic decay rate of methanol utilizers [1/d]	0.04000	0.04000	1.0290
Anoxic/anaerobic decay rate of methanol utilizers [1/d]	0.03000	0.03000	1.0290

PAOs

Name	Default	Value	
Max. spec. growth rate [1/d]	0.95000	0.95000	1.0000
Max. spec. growth rate, P-limited [1/d]	0.42000	0.42000	1.0000
Substrate half sat. [mgCOD(PHB)/mgCOD(Zbp)]	0.10000	0.10000	1.0000
Substrate half sat., P-limited [mgCOD(PHB)/mgCOD(Zbp)]	0.05000	0.05000	1.0000
Magnesium half sat. [mgMg/L]	0.10000	0.10000	1.0000
Cation half sat. [mmol/L]	0.10000	0.10000	1.0000
Calcium half sat. [mgCa/L]	0.10000	0.10000	1.0000
Aerobic decay rate [1/d]	0.10000	0.10000	1.0000
Anaerobic decay rate [1/d]	0.04000	0.04000	1.0000
Sequestration rate [1/d]	6.00000	6.00000	1.0000
Anoxic growth factor NO3 [-]	0.33000	0.33000	1.0000
Anoxic growth factor NO2 [-]	0.33000	0.33000	1.0000

Acetogens

Name	Default	Value	
Max. spec. growth rate [1/d]	0.25000	0.25000	1.0290
Substrate half sat. [mgCOD/L]	10.00000	10.00000	1.0000
Acetate inhibition [mgCOD/L]	10000.00000	10000.00000	1.0000
Decay rate [1/d]	0.05000	0.05000	1.0290
Aerobic decay rate [1/d]	0.52000	0.52000	1.0290

Methanogens

Name	Default	Value	
Acetoclastic Mu Max [1/d]	0.30000	0.30000	1.0290
H2-utilizing Mu Max [1/d]	1.40000	1.40000	1.0290
Acetoclastic Ks [mgCOD/L]	100.00000	100.00000	1.0000
Acetoclastic methanol Ks [mgCOD/L]	0.50000	0.50000	1.0000
H2-utilizing CO2 half sat. [mmol/L]	0.10000	0.10000	1.0000
H2-utilizing Ks [mgCOD/L]	0.10000	0.10000	1.0000
H2-utilizing methanol Ks [mgCOD/L]	0.50000	0.50000	1.0000
Acetoclastic propionic inhibition [mgCOD/L]	10000.00000	10000.00000	1.0000
Acetoclastic decay rate [1/d]	0.13000	0.13000	1.0290
Acetoclastic aerobic decay rate [1/d]	0.60000	0.60000	1.0290
H2-utilizing decay rate [1/d]	0.13000	0.13000	1.0290
H2-utilizing aerobic decay rate [1/d]	0.60000	0.60000	1.0290

pH

Name	Default	Value
Heterotrophs low pH limit [-]	4.00000	4.00000
Heterotrophs high pH limit [-]	10.00000	10.00000
Methanol utilizers low pH limit [-]	4.00000	4.00000
Methanol utilizers high pH limit [-]	10.00000	10.00000
Autotrophs low pH limit [-]	5.50000	5.50000
Autotrophs high pH limit [-]	9.50000	9.50000
PolyP heterotrophs low pH limit [-]	4.00000	4.00000
Poly P heterotrophs high pH limit [-]	10.00000	10.00000
Heterotrophs low pH limit (anaerobic) [-]	5.50000	5.50000
Heterotrophs high pH limit (anaerobic) [-]	8.50000	8.50000
Propionic acetogens low pH limit [-]	4.00000	4.00000
Propionic acetogens high pH limit [-]	10.00000	10.00000
Acetoclastic methanogens low pH limit [-]	5.00000	5.00000
Acetoclastic methanogens high pH limit [-]	9.00000	9.00000
H2-utilizing methanogens low pH limit [-]	5.00000	5.00000
H2-utilizing methanogens high pH limit [-]	9.00000	9.00000

Switches

Name	Default	Value
Heterotrophic DO half sat. [mgO2/L]	0.05000	0.05000
Aerobic denit. DO half sat. [mgO2/L]	0.05000	0.05000
Ammonia oxidizer DO half sat. [mgO2/L]	0.25000	0.25000
Nitrite oxidizer DO half sat. [mgO2/L]	0.50000	0.50000
Anaerobic ammonia oxidizer DO half sat. [mgO2/L]	0.01000	0.01000
Anoxic NO3 half sat. [mgN/L]	0.10000	0.10000
Anoxic NO2 half sat. (mgN/L)	0.05000	0.05000
NH3 nutrient half sat. [mgN/L]	1.0000E-4	1.0000E-4
PolyP half sat. [mgP/L]	0.01000	0.01000
VFA sequestration half sat. [mgCOD/L]	5.00000	5.00000
P uptake half sat. [mgP/L]	0.15000	0.15000
P nutrient half sat. [mgP/L]	0.00100	0.00100
Autotroph CO2 half sat. [mmol/L]	0.10000	0.10000
Heterotrophic Hydrogen half sat. [mgCOD/L]	1.00000	1.00000
Propionic acetogens Hydrogen half sat. [mgCOD/L]	5.00000	5.00000
Synthesis anion/cation half sat. [meq/L]	0.01000	0.01000

AOB

Name	Default	Value
Yield [mgCOD/mgN]	0.15000	0.15000
N in biomass [mgN/mgCOD]	0.07000	0.07000
N in inert [mgN/mgCOD]	0.07000	0.07000
P in biomass [mgP/mgCOD]	0.02200	0.02200
P in inert [mgP/mgCOD]	0.02200	0.02200
Fraction to endogenous residue [-]	0.08000	0.08000
COD:VSS ratio [mgCOD/mgVSS]	1.42000	1.42000

NOB

Name	Default	Value
Yield [mgCOD/mgN]	0.09000	0.09000
N in biomass [mgN/mgCOD]	0.07000	0.07000
N in inert [mgN/mgCOD]	0.07000	0.07000
P in biomass [mgP/mgCOD]	0.02200	0.02200
P in inert [mgP/mgCOD]	0.02200	0.02200
Fraction to endogenous residue [-]	0.08000	0.08000
COD:VSS ratio [mgCOD/mgVSS]	1.42000	1.42000

ANAMMOX

Name	Default	Value
Yield [mgCOD/mgN]	0.11400	0.11400
Nitrate production [mgN/mgBiomassCOD]	2.28000	2.28000
N in biomass [mgN/mgCOD]	0.07000	0.07000
N in inert [mgN/mgCOD]	0.07000	0.07000
P in biomass [mgP/mgCOD]	0.02200	0.02200
P in inert [mgP/mgCOD]	0.02200	0.02200
Fraction to endogenous residue [-]	0.08000	0.08000
COD:VSS ratio [mgCOD/mgVSS]	1.42000	1.42000

OHOs

Name	Default	Value
Yield (aerobic) [-]	0.66600	0.66600
Yield (fermentation, low H2) [-]	0.10000	0.10000
Yield (fermentation, high H2) [-]	0.10000	0.10000
H2 yield (fermentation low H2) [-]	0.35000	0.35000
H2 yield (fermentation high H2) [-]	0	0
Propionate yield (fermentation, low H2) [-]	0	0
Propionate yield (fermentation, high H2) [-]	0.70000	0.70000
CO2 yield (fermentation, low H2) [-]	0.70000	0.70000
CO2 yield (fermentation, high H2) [-]	0	0
N in biomass [mgN/mgCOD]	0.07000	0.07000
N in inert [mgN/mgCOD]	0.07000	0.07000
P in biomass [mgP/mgCOD]	0.02200	0.02200
P in inert [mgP/mgCOD]	0.02200	0.02200
Endogenous Residue [-]	0.08000	0.08000
COD:VSS ratio [mgCOD/mgVSS]	1.42000	1.42000
Yield (anoxic) [-]	0.54000	0.54000
Yield propionic (aerobic) [-]	0.50000	0.50000
Yield propionic (anoxic) [-]	0.41000	0.41000
Yield acetic (aerobic) [-]	0.40000	0.40000
Yield acetic (anoxic) [-]	0.32000	0.32000
Yield methanol (aerobic) [-]	0.50000	0.50000
Adsorp. max. [-]	1.00000	1.00000

Methylotrophs

Name	Default	Value
Yield (anoxic) [-]	0.40000	0.40000
N in biomass [mgN/mgCOD]	0.07000	0.07000
N in inert [mgN/mgCOD]	0.07000	0.07000
P in biomass [mgP/mgCOD]	0.02200	0.02200
P in inert [mgP/mgCOD]	0.02200	0.02200
Endogenous Residue [-]	0.08000	0.08000
COD:VSS ratio [mgCOD/mgVSS]	1.42000	1.42000

PAOs

Name	Default	Value
Yield (aerobic) [-]	0.63900	0.63900
Yield (anoxic) [-]	0.52000	0.52000
Aerobic P/PHA uptake [mgP/mgCOD]	0.95000	0.95000
Anoxic P/PHA uptake [mgP/mgCOD]	0.35000	0.35000
Yield of PHA on sequestration [-]	0.88900	0.88900
N in biomass [mgN/mgCOD]	0.07000	0.07000
N in part. inert [mgN/mgCOD]	0.07000	0.07000
N in sol. inert [mgN/mgCOD]	0.07000	0.07000
P in biomass [mgP/mgCOD]	0.02200	0.02200
P in part. inert [mgP/mgCOD]	0.02200	0.02200
Fraction to endogenous part. [-]	0.25000	0.25000
Inert fraction of endogenous sol. [-]	0.20000	0.20000
P/Ac release ratio [mgP/mgCOD]	0.49000	0.49000
COD:VSS ratio [mgCOD/mgVSS]	1.42000	1.42000
Yield of low PP [-]	0.94000	0.94000

Acetogens

Name	Default	Value
Yield [-]	0.10000	0.10000
H2 yield [-]	0.40000	0.40000
CO2 yield [-]	1.00000	1.00000
N in biomass [mgN/mgCOD]	0.07000	0.07000
N in endogenous residue [mgN/mgCOD]	0.07000	0.07000
P in biomass [mgP/mgCOD]	0.02200	0.02200
P in endogenous residue [mgP/mgCOD]	0.02200	0.02200
Fraction to endogenous residue [-]	0.08000	0.08000
COD:VSS ratio [mgCOD/mgVSS]	1.42000	1.42000

Methanogens

Name	Default	Value
Acetoclastic yield [-]	0.10000	0.10000
Methanol acetoclastic yield [-]	0.10000	0.10000
H2-utilizing yield [-]	0.10000	0.10000
Methanol H2-utilizing yield [-]	0.10000	0.10000
N in acetoclastic biomass [mgN/mgCOD]	0.07000	0.07000
N in H2-utilizing biomass [mgN/mgCOD]	0.07000	0.07000
N in acetoclastic endog. residue [mgN/mgCOD]	0.07000	0.07000
N in H2-utilizing endog. residue [mgN/mgCOD]	0.07000	0.07000
P in acetoclastic biomass [mgP/mgCOD]	0.02200	0.02200
P in H2-utilizing biomass [mgP/mgCOD]	0.02200	0.02200
P in acetoclastic endog. residue [mgP/mgCOD]	0.02200	0.02200
P in H2-utilizing endog. residue [mgP/mgCOD]	0.02200	0.02200
Acetoclastic fraction to endog. residue [-]	0.08000	0.08000
H2-utilizing fraction to endog. residue [-]	0.08000	0.08000
Acetoclastic COD:VSS ratio [mgCOD/mgVSS]	1.42000	1.42000
H2-utilizing COD:VSS ratio [mgCOD/mgVSS]	1.42000	1.42000

General

Name	Default	Value
Particulate substrate COD:VSS ratio [mgCOD/mgVSS]	1.60000	1.60000
Particulate inert COD:VSS ratio [mgCOD/mgVSS]	1.60000	1.60000
Ash content of biomass (synthesis ISS) [%]	8.00000	8.00000
Molecular weight of other anions [mg/mmol]	35.50000	35.50000
Molecular weight of other cations [mg/mmol]	39.10000	39.10000
Mg to P mole ratio in polyphosphate [mmolMg/mmolP]	0.30000	0.30000
Cation to P mole ratio in polyphosphate [meq/mmolP]	0.30000	0.30000
Ca to P mole ratio in polyphosphate [mmolCa/mmolP]	0.05000	0.05000
Cation to P mole ratio in organic phosphate [meq/mmolP]	0.01000	0.01000
Bubble rise velocity (anaerobic digester) [cm/s]	23.90000	23.90000
Bubble Sauter mean diameter (anaerobic digester) [cm]	0.35000	0.35000
Anaerobic digester gas hold-up factor []	1.00000	1.00000
Tank head loss per metre of length (from flow) [m/m]	0.00250	0.00250
Minimum air flow (per unit volume) without mixing [m3/(m3 d)]	1.00000	1.00000

Mass transfer

Name	Default	Value	
Kl for H2 [m/d]	17.00000	17.00000	1.0240
Kl for CO2 [m/d]	10.00000	10.00000	1.0240
Kl for NH3 [m/d]	1.00000	1.00000	1.0240
Kl for CH4 [m/d]	8.00000	8.00000	1.0240
Kl for N2 [m/d]	15.00000	15.00000	1.0240
Kl for O2 [m/d]	13.00000	13.00000	1.0240

Physico-chemical rates

Name	Default	Value	
Struvite precipitation rate [1/d]	3.0000E+10	3.0000E+10	1.0240
Struvite redissolution rate [1/d]	3.0000E+11	3.0000E+11	1.0240
Struvite half sat. [mgTSS/L]	1.00000	1.00000	1.0000
HDP precipitation rate [L/(molP d)]	1.0000E+8	1.0000E+8	1.0000
HDP redissolution rate [L/(mol P d)]	1.0000E+8	1.0000E+8	1.0000
HAP precipitation rate [molHDP/(L d)]	5.0000E-4	5.0000E-4	1.0000

Physico-chemical constants

Name	Default	Value
Struvite solubility constant [mol/L]	6.9180E-14	6.9180E-14
HDP solubility product [mol/L]	2.7500E-22	2.7500E-22
HDP half sat. [mgTSS/L]	1.00000	1.00000
Equilibrium soluble PO4 with Al dosing at pH 7 [mgP/L]	0.01000	0.01000
Al to P ratio [molAl/molP]	0.80000	0.80000
Al(OH)3 solubility product [mol/L]	1.2590E+9	1.2590E+9
AlHPO4+ dissociation constant [mol/L]	7.9430E-13	7.9430E-13
Equilibrium soluble PO4 with Fe dosing at pH 7 [mgP/L]	0.01000	0.01000
Fe to P ratio [molFe/molP]	1.60000	1.60000
Fe(OH)3 solubility product [mol/L]	0.05000	0.05000
FeH2PO4++ dissociation constant [mol/L]	5.0120E-22	5.0120E-22

Aeration

Name	Default	Value
Alpha (surf) OR Alpha F (diff) [-]	0.50000	0.50000
Beta [-]	0.95000	0.95000
Surface pressure [kPa]	101.32500	101.32500
Fractional effective saturation depth (Fed) [-]	0.32500	0.32500
Supply gas CO2 content [vol. %]	0.03500	0.03500
Supply gas O2 [vol. %]	20.95000	20.95000
Off-gas CO2 [vol. %]	2.00000	2.00000
Off-gas O2 [vol. %]	18.80000	18.80000
Off-gas H2 [vol. %]	0	0
Off-gas NH3 [vol. %]	0	0
Off-gas CH4 [vol. %]	0	0
Surface turbulence factor [-]	2.00000	2.00000
Set point controller gain []	1.00000	1.00000

Modified Vesilind

Name	Default	Value
Maximum Vesilind settling velocity (Vo) [ft/min]	0.3873	0.3873
Vesilind hindered zone settling parameter (K) [L/g]	0.3700	0.3700
Clarification switching function [mg/L]	100.0000	100.0000
Specified TSS conc.for height calc. [mg/L]	2500.0000	2500.0000
Maximum compactability constant [mg/L]	16000.0000	16000.0000

Double exponential

Name	Default	Value
Maximum Vesilind settling velocity (Vo) [ft/min]	0.9341	0.9341
Maximum (practical) settling velocity (Vo') [ft/min]	0.6152	0.6152
Hindered zone settling parameter (Kh) [L/g]	0.4000	0.4000
Flocculent zone settling parameter (Kf) [L/g]	2.5000	2.5000
Maximum non-settleable TSS [mg/L]	20.0000	20.0000
Non-settleable fraction [-]	0.0010	0.0010
Specified TSS conc. for height calc. [mg/L]	2500.0000	2500.0000

Biofilm general

Name	Default	Value
Attachment rate [g / (m2 d)]	80.00000	80.00000
Attachment TSS half sat. [mg/L]	100.00000	100.00000
Detachment rate [g/(m3 d)]	8.0000E+4	8.0000E+4
Solids movement factor []	10.00000	10.00000
Diffusion neta []	0.80000	0.80000
Thin film limit [mm]	0.50000	0.50000
Thick film limit [mm]	3.00000	3.00000
Assumed Film thickness for tank volume correction [mm]	0.75000	0.75000
Film surface area to media area ratio - Max.[ ]	1.00000	1.00000
Minimum biofilm conc. for streamer formation [gTSS/m2]	4.00000	4.00000

Maximum biofilm concentrations [mg/L]

Name	Default	Value	
Non-polyP heterotrophs	5.0000E+4	5.0000E+4	1.0000
Anoxic methanol utilizers	5.0000E+4	5.0000E+4	1.0000
Ammonia oxidizing biomass	1.0000E+5	1.0000E+5	1.0000
Nitrite oxidizing biomass	1.0000E+5	1.0000E+5	1.0000
Anaerobic ammonia oxidizers	5.0000E+4	5.0000E+4	1.0000
PolyP heterotrophs	5.0000E+4	5.0000E+4	1.0000
Propionic acetogens	5.0000E+4	5.0000E+4	1.0000
Acetoclastic methanogens	5.0000E+4	5.0000E+4	1.0000
Hydrogenotrophic methanogens	5.0000E+4	5.0000E+4	1.0000
Endogenous products	3.0000E+4	3.0000E+4	1.0000
Slowly bio. COD (part.)	5000.00000	5000.00000	1.0000
Slowly bio. COD (colloid.)	0	0	1.0000
Part. inert. COD	5000.00000	5000.00000	1.0000
Part. bio. org. N	0	0	1.0000
Part. bio. org. P	0	0	1.0000
Part. inert N	0	0	1.0000
Part. inert P	0	0	1.0000
Stored PHA	5000.00000	5000.00000	1.0000
Releasable stored polyP	1.1500E+6	1.1500E+6	1.0000
Fixed stored polyP	1.1500E+6	1.1500E+6	1.0000
PolyP bound cations	1.1500E+6	1.1500E+6	1.0000
Readily bio. COD (complex)	0	0	1.0000
Acetate	0	0	1.0000
Propionate	0	0	1.0000
Methanol	0	0	1.0000
Dissolved H2	0	0	1.0000
Dissolved methane	0	0	1.0000
Ammonia N	0	0	1.0000
Sol. bio. org. N	0	0	1.0000
Nitrite N	0	0	1.0000
Nitrate N	0	0	1.0000
Dissolved nitrogen gas	0	0	1.0000
PO4-P (Sol. & Me Complexed)	1.0000E+10	1.0000E+10	1.0000
Sol. inert COD	0	0	1.0000
Sol. inert TKN	0	0	1.0000
Inorganic S.S.	1.3000E+6	1.3000E+6	1.0000
Struvite	8.5000E+5	8.5000E+5	1.0000
Hydroxy-dicalcium-phosphate	1.1500E+6	1.1500E+6	1.0000
Hydroxy-apatite	1.6000E+6	1.6000E+6	1.0000
Magnesium	0	0	1.0000
Calcium	0	0	1.0000
Metal	1.0000E+10	1.0000E+10	1.0000
Other Cations (strong bases)	0	0	1.0000

Effective diffusivities [m2/s]

Name	Default	Value	
Non-polyP heterotrophs	5.0000E-14	5.0000E-14	1.0290
Anoxic methanol utilizers	5.0000E-14	5.0000E-14	1.0290
Ammonia oxidizing biomass	5.0000E-14	5.0000E-14	1.0290
Nitrite oxidizing biomass	5.0000E-14	5.0000E-14	1.0290
Anaerobic ammonia oxidizers	5.0000E-14	5.0000E-14	1.0290
PolyP heterotrophs	5.0000E-14	5.0000E-14	1.0290
Propionic acetogens	5.0000E-14	5.0000E-14	1.0290
Acetoclastic methanogens	5.0000E-14	5.0000E-14	1.0290
Hydrogenotrophic methanogens	5.0000E-14	5.0000E-14	1.0290
Endogenous products	5.0000E-14	5.0000E-14	1.0290
Slowly bio. COD (part.)	5.0000E-14	5.0000E-14	1.0290
Slowly bio. COD (colloid.)	6.9000E-11	6.9000E-11	1.0290
Part. inert. COD	5.0000E-14	5.0000E-14	1.0290
Part. bio. org. N	5.0000E-14	5.0000E-14	1.0290
Part. bio. org. P	5.0000E-14	5.0000E-14	1.0290
Part. inert N	5.0000E-14	5.0000E-14	1.0290
Part. inert P	5.0000E-14	5.0000E-14	1.0290
Stored PHA	5.0000E-14	5.0000E-14	1.0290
Releasable stored polyP	5.0000E-14	5.0000E-14	1.0290
Fixed stored polyP	5.0000E-14	5.0000E-14	1.0290
PolyP bound cations	5.0000E-14	5.0000E-14	1.0290
Readily bio. COD (complex)	6.9000E-10	6.9000E-10	1.0290
Acetate	1.2400E-9	1.2400E-9	1.0290
Propionate	8.3000E-10	8.3000E-10	1.0290
Methanol	1.6000E-9	1.6000E-9	1.0290
Dissolved H2	5.8500E-9	5.8500E-9	1.0290
Dissolved methane	1.9625E-9	1.9625E-9	1.0290
Ammonia N	2.0000E-9	2.0000E-9	1.0290
Sol. bio. org. N	1.3700E-9	1.3700E-9	1.0290
Nitrite N	2.9800E-9	2.9800E-9	1.0290
Nitrate N	2.9800E-9	2.9800E-9	1.0290
Dissolved nitrogen gas	1.9000E-9	1.9000E-9	1.0290
PO4-P (Sol. & Me Complexed)	2.0000E-9	2.0000E-9	1.0290
Sol. inert COD	6.9000E-10	6.9000E-10	1.0290
Sol. inert TKN	6.8500E-10	6.8500E-10	1.0290
Inorganic S.S.	5.0000E-14	5.0000E-14	1.0290
Struvite	5.0000E-14	5.0000E-14	1.0290
Hydroxy-dicalcium-phosphate	5.0000E-14	5.0000E-14	1.0290
Hydroxy-apatite	5.0000E-14	5.0000E-14	1.0290
Magnesium	7.2000E-10	7.2000E-10	1.0290
Calcium	7.2000E-10	7.2000E-10	1.0290
Metal	4.8000E-10	4.8000E-10	1.0290
Other Cations (strong bases)	1.4400E-9	1.4400E-9	1.0290
Other Anions (strong acids)	1.4400E-9	1.4400E-9	1.0290
Total CO2	1.9600E-9	1.9600E-9	1.0290
User defined 1	6.9000E-10	6.9000E-10	1.0290
User defined 2	6.9000E-10	6.9000E-10	1.0290
User defined 3	5.0000E-14	5.0000E-14	1.0290
User defined 4	5.0000E-14	5.0000E-14	1.0290
Dissolved oxygen	2.5000E-9	2.5000E-9	1.0290

EPS Strength coefficients []

Name	Default	Value	
Non-polyP heterotrophs	1.00000	1.00000	1.0000
Anoxic methanol utilizers	1.00000	1.00000	1.0000
Ammonia oxidizing biomass	1.00000	1.00000	1.0000
Nitrite oxidizing biomass	1.00000	1.00000	1.0000
Anaerobic ammonia oxidizers	1.00000	1.00000	1.0000
PolyP heterotrophs	1.00000	1.00000	1.0000
Propionic acetogens	1.00000	1.00000	1.0000
Acetoclastic methanogens	1.00000	1.00000	1.0000
Hydrogenotrophic methanogens	1.00000	1.00000	1.0000
Endogenous products	1.00000	1.00000	1.0000
Slowly bio. COD (part.)	1.00000	1.00000	1.0000
Slowly bio. COD (colloid.)	0	0	1.0000
Part. inert. COD	1.00000	1.00000	1.0000
Part. bio. org. N	1.00000	1.00000	1.0000
Part. bio. org. P	1.00000	1.00000	1.0000
Part. inert N	1.00000	1.00000	1.0000
Part. inert P	1.00000	1.00000	1.0000
Stored PHA	1.00000	1.00000	1.0000
Releasable stored polyP	1.00000	1.00000	1.0000
Fixed stored polyP	1.00000	1.00000	1.0000
PolyP bound cations	1.00000	1.00000	1.0000
Readily bio. COD (complex)	0	0	1.0000
Acetate	0	0	1.0000
Propionate	0	0	1.0000
Methanol	0	0	1.0000
Dissolved H2	0	0	1.0000
Dissolved methane	0	0	1.0000
Ammonia N	0	0	1.0000
Sol. bio. org. N	0	0	1.0000
Nitrite N	0	0	1.0000
Nitrate N	0	0	1.0000
Dissolved nitrogen gas	0	0	1.0000
PO4-P (Sol. & Me Complexed)	1.00000	1.00000	1.0000
Sol. inert COD	0	0	1.0000
Sol. inert TKN	0	0	1.0000
Inorganic S.S.	0.33000	0.33000	1.0000
Struvite	1.00000	1.00000	1.0000
Hydroxy-dicalcium-phosphate	1.00000	1.00000	1.0000
Hydroxy-apatite	1.00000	1.00000	1.0000
Magnesium	0	0	1.0000
Calcium	0	0	1.0000
Metal	1.00000	1.00000	1.0000
Other Cations (strong bases)	0	0	1.0000
Other Anions (strong acids)	0	0	1.0000
Total CO2	0	0	1.0000
User defined 1	0	0	1.0000
User defined 2	0	0	1.0000
User defined 3	1.00000	1.00000	1.0000
User defined 4	1.00000	1.00000	1.0000
Dissolved oxygen	0	0	1.0000

Nathan C. Owen
Vice President Design Build

Construction Industry Experience – 15 years
Joined PERC Water in 2006

Nate has a wide range of experience in the construction industry and has had the opportunity to be involved in all phases of construction from project conception through project closeout. He has a unique ability to bring a project from conception through close out on time and under budget while maintaining safety and quality at the highest level. Nate has an eye for detail and track record for leading successful teams through the design build process. His integrity, passion, and work ethic for the industry have been key ingredient in delivering successful projects at PERC Water.

PERC Water Corporation, Costa Mesa, CA
Santa Paula Water Recycling Facility 4.2 MGD

The Santa Paula Water Recycling Facility is a 4.2 MGD MBR Facility that houses some of the industries most state of the art equipment and has already been the recipient of several nominations and awards including Global Water Awards' 2009 "Water Deal of the Year" Award of Distinction for the utilization of public-private partnerships to design, build, operate and finance the Santa Paula Water Recycling Facility. For most Design Build firms constructing a facility within the 100 year floodplain and with the highest seismic zone can prevent an abundance of challenges; however with our unique design these concerns have become common place for our team. There were several critical phases during the construction process which included installing a new 42" trunk line to feed the new facility while maintaining flow to the old facility until the new plant could treat all of the Cities waste water flow. Construction of the facility started just 2 months after being awarded the contract. The project completed 6 months ahead of the Cities schedule to complete that was mandated by the county.

Sundance Water Recycling Facility Phase II 3.6 MGD

PERC Water expanded the existing 1.2 MGD facility to 3.6 MGD. The Sundance Facility was a fast track project that had a critical path of tying into and expanding an existing facility that was treating near capacity for the town of Buckeye Arizona. Attention to detail and communication of construction activities were vital to keeping the existing plant up and running while expanding and modifying the facility. Due to the intricacy of modifications that had to be made to the running facility PERC Water decided to self perform and manage the process mechanical piping and equipment installation that allowed us ultimate flexibility and control of the schedule.

SPA 3 Water Recycling Facility 1.8 MGD

Special Planning Area Three in the City of Surprise Arizona is a 1.8 MGD facility that was constructed in 13 months and similar to all our facilities is readily expandable to 3.6 MGD. Due to our unique design and approach we were once again able to utilize an area of land adjacent to a floodplain. This project included an offsite lift station that PERC Water also designed and built to feed the facility using two 12" forced mains.

SPA 2 Water Recycling Facility, 1.2 MGD

PERC Water designed, built and is currently operating this facility. SPA 2 is another regional WRF for Special Planning Area Two located in Surprise, Arizona. Phase I is a 1.2 MGD Facility expandable to 2.4 MGD within the existing land allocation. This was an exciting project that included several miles of 24" gravity sewer line entering our onsite facility lift station at a depth of 45 feet below finish grade of our buildings. The project was a success and PERC Water's Operations Staff continues to operate the facility today.

Red Rock Water Recycling Facility 0.3 MGD

PERC Water designed and built the Red Rock facility for a private utility company that supplied the local builder with water recycling service. The facility sits just a few hundred feet from the newly built homes with

the masonry control building blending beautifully into the community. The water is treated and held in a recently added water feature where it is then pumped back into the community to provide reuse services.

Suffolk Construction, Irvine, California
Superintendent

Projects included Marriot Vacation Villas Newport Beach, California / Stadium Lofts Anaheim, California / Temecula Ridge Apartments Temecula, California. Responsibilities included: scheduling, quality control and assessment, safety planning, coordination of trade work, sub contractor management, management of site logistics and daily activities, and project close out. Mr. Owen worked closely with project owners, architects, engineers and inspectors.

South Valley Developers, Morgan Hill, California
Project Manager/Superintendent

While working at South Valley Developers Mr. Owen developed a Quail Creek a fifty-three semi-custom home subdivision. Responsibilities included managing project job costing and controls, schedule, safety, quality, purchasing, negotiations, and delivery of finish product. Mr. Owen was responsible for managing the relationship between the developer and Cities officials, Inspectors, Engineers, Architects, Sub Contractors, and Home Owners.

Hensel Phelps Construction, Irvine, California
Field Engineer

Projects included $300 million dollar Coalinga Secure Treatment Facility. Responsible for layout and control for Hensel Phelps concrete crews placing an average 1500-2500 cubic yards of concrete a week continuous for 12 months, built the facilities own Waste Water Treatment Facility.

EDUCATION

Bachelors of Science, Technology Management, Building Construction, Utah Valley University, Orem, Utah

AFFILIATIONS

OSHA 30 Hour and other various safety training programs and classes
CRP certified
DBI member

Juergen T. Nick, PE

Vice President Design & Engineering

Wastewater Industry Experience – more than 20 years
Joined PERC Water in 2003

PERC Water Corporation, Costa Mesa, CA
Vice President Design & Engineering

As the Vice President of Design and Engineering, Mr. Nick is responsible for the design and continuous development of the PERC Water ASP® facilities.

Santa Paula Water Recycling Facility, Santa Paula, California
4.5 MGD MBR Facility
Engineering oversight and responsibility for overall electrical design, plant control and system integration. Designing of Facility Power Distribution, Emergency Generator Power Distribution, Entrance Service Section and Motor Control Center (MCC) layout, Conduction Short Circuit Analysis, Load Calculations, Energy Efficiency Studies, Harmonic Analysis and Conductor Sizing. Design and Layout of PLC- Control Panels, drawing of Facility Loop Diagrams and Control Network Design. Generating of Control Description for Facility Programming. Selection and Procurement of Control Instrumentation, Electrical Switch Gear and Process Equipment

Mountain House Water Recycling Facility, Tracy, California
3.0 MGD SBR Facility
Onsite Project Manager with overall Project Responsibility

SPA 2 (1.2 MGD, SBR), SPA 3 (1.8 MGD, SBR), SPA 4, SPA 5, Sundance II (3.6 MGD, SBR) Water Recycling Facilities, Greater Phoenix Area, Arizona
Engineering oversight and responsible for overall electrical design, plant control and system integration.

Palm Valley Water Recycling Facility, Litchfield Park, Arizona
4.1 MGD SBR Facility
El Mirage Water Recycling Facility Phase III, El Mirage, Arizona
3.6 MGD SBR Facility
Barona Water Recycling Facility, Lakeside, California
0.75 MGD SBR Facility
San Pasqual Recycling Facility, San Diego, California
0.04 MGD SBR Facility
Responsible for the electrical design, controls, production and start up of the UV systems at these PERC facilities. UV Control Systems utilizing Allen Bradley MicroLogix 1500 and SLC 5/05 PLC's and HMI's

Ozonia North America Inc., Elmwood Park, NJ
Senior Engineer

Mr. Nick was responsible for development and design of an Ultra Violet Water Treatment Product line as well as for engineering and manufacturing a product line of Ozone Generating Systems. He also designed electrical systems, programmed the controls / SCADA Systems and started up a number of complex Process and Water Treatment Systems in North America, Russia, Japan, South Africa and Brunei. Extensive experience with 5 generations of ABB DC Drives and inverter technologies (VFD), PLC programming with AB - RS Logix 500, RS Logix 5000. MODICON - Concept, Mitsubishi, ABB CS31 as well as SCADA Programming with WONDERWARE and INTELUTION.

Schindler Elevators Ltd, Ebikon - Switzerland
Export Sales Manager

Mr. Nick was in charge of Western European Sales for high end elevator products, heading a team of 16 sales engineers. At the same he also was the project leader for the market introduction of a new elevator program for Schindler's Switzerland Export department. Notable involvements were the elevator contract for the cruise ship "Carnival Destiny" and the high rise buildings "Castor and Pollux" in Frankfurt/Germany.

Asea Brown Boveri – ABB-, Zurich – Switzerland
Field Service Manager

Managed and supervised a team of 8 field engineers as well as conducting on the job training with new engineers. Programmed the controls, commissioned and synchronizing three10 Mega Watt diesel power generators and power distribution grid in India. He also damage assessed an Ozone generating plant at a waste water facility in Saudi Arabia, three days after the end of the first Gulf War. As a young engineer he was responsible for commissioning Ozone and Hydrogen Plants in Western and Eastern Europe as well as in North and South America and the Middle East. Responsibilities also included customer education and plant-operator training.

Education

Electrical Engineer, Dipl. El. Ing FH/HTL – (MS Electrical Engineering)
Majored in Power Generation, Power Distribution and Power Electronics
Zurich University of Applied Sciences in Winterthur- Switzerland / 1986

Graduate Studies in Economics and Marketing, WI-STV – (MBA)
University of St' Gallen - Switzerland / 1991

Registered Professional Engineer (PE) – AZ51151, Credentials on file with NCEES

Other

Commercial Rated Glider Pilot, Instrument Rated Private Pilot – Single Engine

Erin E. Hubbard, MBA, P.E.

Civil Engineering Senior Project Manager &
Director of Central PERC™

Civil Engineering Experience – 12 years
Joined PERC Water in 2011

PERC Water Corporation, Costa Mesa, CA
Director of Central PERC™ January 2011 - Present

Erin is responsible for Central PERC planning and execution. Her expereince working in the planning, design and construction of PERC Water reclamation facilities enables her to gather and prioritize customer requirements, define the product vision, and work effectively with engineering, sales, marketing and treatment facility staff. Her role ensures that operators and other authorized users have up the minute access to information they need to improve water treatment facility performance and reduce risk.

In addition Erin will continue to operate as an environmental engineer and project manager, bringing her many years of expereince in the wastewater and recycled water fields to bear.

VERISAE, INC., Minneapolis, MN
Environmental Business Analyst 2009 - 2010

Erin led the first deployment of Verisae's SAAS sustainability product and executed all consulting engagements related to carbon, water, waste, and energy. She calculated entity wide carbon footprints of major nationwide grocery retailers and developed new reporting protocols. Working with energy managers Erin developed plans to help organizations meet carbon footprint and energy use goals. She also worked with utility providers to reduce energy expenditures, acquire rebates and correct errors.

Pacific Advanced Civil Engineering, Inc., Fountain Valley, CA
Project Manager, Environmental Water Department 2000 - 2007

At PACE, a strategic partner of PERC Water, Erin led concurrent design engagements and recruited new projects. She supervised an interdisciplinary team of design engineers, technical writers, and drafters to achieve the company's highest labor efficiency and surpass the goal by one third. Erin was the go-to resource for permitting and was able to use her skills to develop a new firm specialty providing recycled water planning, facilities design, permitting and reuse.

Mountain House Wastewater Reclamation Facility - Tracy, California
Erin expanded the recycled water storage and irrigation system to take advantage of the existing pump station and add two others and 130 million gallons of storage capacity. Erin also led the permitting activities for the construction including the NPDES discharge. Extensive laboratory monitoring, letters of engineering opinion and plan sets were compiled for the effort to be completed. Ms. Hubbard is also responsible for the successful completion of the treatment facility design report and was integral in the preparation of the specifications for the project.

Quay Valley Ranch - Los Angeles, California
Before the developer encountered financial stress, PACE staff was responsible for bringing water to the new community proposed for Kings County. Until her departure to attend Business School, Ms. Hubbard was responsible for researching potable water sources, identifying community water needs and creating water balances for the onsite storage facilities in the preliminary planning stages. With a proposed service area of twenty square miles, Quay Valley Ranch required novel water supply systems. Recycled water, stormwater,

ground water, and more traditional surface water were designed to provide for the community and meet the self-sustainability standards proposed.

Arboles Viejos - Marana, Arizona
Erin partnered with Duong Do, P.E. to complete the design of twin potable water storage tanks for a new community in Arizona. The accompanying pump station provides secure, efficient and reliable water to residents.

Colusa Heritage Ranch – Colusa County, California
Erin created a reconnaissance study of all water supply systems for the proposed Colusa Heritage Ranch community. Based on neighboring community water use, site data engineering standards and the WaterGEMS program, Erin developed the proposed water system and created a report and figures to illustrate the system for the EIR process.

Pacific Union Homes, Pulte Homes, - Lathrop, California
Beginning with on one small portion of a development project, Ms. Hubbard's success has resulted in completed contracts with four private parties to address permitting needs, plan recycled water infrastructure, design a total of three pump stations and accompanying recycled water storage basins. By proposing shared pump stations, a significant savings to the clients was achieved.

Palm Valley Effluent Management Plan and Wastewater Reclamation Facility – Goodyear, Arizona
Ms. Hubbard was responsible for planning and permitting the distribution of reclaimed water for four primary consumers and multiple secondary customers. Flowmaster was used to establish the appropriate pipe sizes and layout under several anticipated scenarios. Ms. Hubbard's annual water balance model estimated the flows required for irrigated landscapes on a monthly basis. Her efforts also led to the issue of the permits required for the facility construction and operation.

El Mirage Wastewater Reclamation Facility – El Mirage, Arizona
Ms. Hubbard assisted in many components of the design and design documentation for the El Mirage Wastewater Reclamation Facility. Included among her responsibilities were the compilation of the operation and maintenance manual and the receipt of permits required by the facility.

EDUCATION

Carlson School of Management, Minneapolis, Minnesota
University of Minnesota, Master of Business Administration, May 2009
Emphases in Green Business Practices and Innovation

University of Wisconsin, Madison, Wisconsin
Bachelor of Science: Civil Engineering with an environmental engineering emphasis, May 2000
Environmental Studies Certificate

REGISTRATIONS

Professional Engineer/CA
2004/66612
Professional Engineer/AZ
2005/42236
Professional Engineer/FL
2011/ 72912

Licensing available throughout the Unites States

AFFILIATIONS

Net Impact
Project Management Institute (PMI)
Water Reuse Association

Larry L. Johnson
Director of Technical Services

Wastewater Industry Experience – more than 30 years
Joined PERC Water in 2002

PERC Water Corporation, Costa Mesa, CA
Director of Technical Services

Assisted the construction completion, vendor equipment testing, integrated pre-operational testing and initial start-up of PERC ASP facilities ranging in size 40,000 gpd to 4.0 MGD. Responsibilities include facility commissioning, QA/QC, control system functionality, operability verification, clean water testing, plant seeding and initial process start up and performance compliance testing. Work with operations department coordinate and complete heavy maintenance tasks and collection system repairs. Participate in the design and operability review of all facilities designed and built by PERC.

LPSCO/Palm Valley Water Reclamation Facility, Litchfield Park, AZ
Chief Wastewater Operator

Chief Operator for the Palm Valley WRF. Assisted in the startup and performance test compliance of the new 4.1 MGD PERC ASP SBR.

Wastewater Treatment Plant, City of Goodyear, AZ
Plant Operator/Maintenance Technician

Involved in all phases of operation and maintenance of a 3.0 mgd and a 0.8 mgd water reclamation facility. Onsite operations representative for a plant up grade from 0.4 to 0.8 mgd facility and responsible for initial start up and operation of the upgrade.

Palo Verde Nuclear Power Plant, Tonopah, AZ
Project/Outage Manager

Managed a wide range of plant change projects at Palo Verde Nuclear Generating Station ranging in cost from a few thousand to several million dollars. Acted as a single point of accountability from design inception through construction, testing and turn over to the operations department. Scheduled and coordinated field activities during refuel and surveillance test outages. Coordinated in house work staff as well as vendor support activities.

Test Engineer

Directed start-up and preoperational tests in various nuclear and non-nuclear power plant facilities. Responsible for steam production systems in the nuclear field. Responsibilities include steam boilers and support systems as well as industrial pretreatment plant at manufacturing facilities. Verified engineering and construction completion prior to system turnover to operations. Operated plants during initial operations and developed standard operating procedures as well as maintenance procedures. Trained operations and maintenance personnel upon acceptance by the client.

EDUCATION

Wastewater/Water Operations –Rio Solado Community College
Over 300 hours of continuing education in Wastewater related courses

REGISTRATIONS

Grade IV Wastewater Treatment Operator Certification: Arizona, California, and New Mexico

Richard L. Rhoads
Director of Operating Services

Wastewater Industry Experience – more than 30 years
Joined PERC Water in 2001

PERC Water Corporation, Costa Mesa, CA
Director of Operating Services

Manage and supervise PERC Water's operating team including facility superintendents, operators and technicians. Oversee process control and regulatory compliance on a daily basis. Manage facility staff to ensure reliable operation. Managed the startup and performance test compliance of the PERC Water ASP® facilities. Facilities included:

Sundance Water Reclamation Facility (3.5 mgd), Buckeye, Arizona
Tartesso Water Reclamation Facility (1.2 mgd), Buckeye, Arizona
SPA-2 Water Reclamation Facility (1.2 mgd), Surprise, Arizona
SPA-3 Water Reclamation Facility (1.8 mgd), Surprise, Arizona
Red Rock Water Reclamation Facility (0.3 mgd), Red Rock, Arizona
Whetstone Ranch Water Reclamation Facility (0.3 mgd), Benson, Arizona
Grizzly Ranch Water Reclamation Facility (0.08 mgd), Portola, California

Mountain House Water Reclamation Facility (3.0 mgd), Tracy, CA
Managed the PERC Water operations team responsible for commissioning, startup and operation of the new PERC ASP facility.

LPSCO/Palm Valley Water Reclamation Facility (4.1 mgd), Goodyear, AZ
Managed the PERC Water operations team responsible for commissioning, startup and operation of the new PERC ASP facility.

El Mirage Water Reclamation Facility (3.6 mgd), El Mirage, AZ
Managed the PERC Water operations team responsible for commissioning, startup and operation of the new PERC ASP facility

Wastewater Division, Goodyear, AZ
Supervisor
Responsible for the operation and maintenance of a 3.0 mgd and a 0.8 mgd Water Reclamation Facilities and associated wastewater collection systems.

Hamilton Lake Conservancy District, Indiana
Superintendent
Responsible for the operation and maintenance of a 3.0 mgd and a 0.8 mgd Water Reclamation Facilities and associated wastewater collection systems.

Cottonwood Wastewater Reclamation Facility, Arizona
Chief Operator
Supervised operation and maintenance of 0.68 mgd SBR (sequencing batch reactor). Supervised operation and maintenance of collection system including 4 lift stations.

Wabash WRF, Indiana
Chief Operator

Supervised operation and maintenance of 2.75 mgd, 2.0 mgd, and 0.009 mgd plants. Supervised collection system maintenance and laboratory operations.

EDUCATION

Wastewater Operations -Indiana Vocational Technical College

Over 500 hours of continuing education in Wastewater related course

REGISTRATIONS

Grade IV Wastewater Treatment and Collection System Operator Certification: Arizona

Grade III Wastewater Treatment Certification: California

AFFILIATIONS

American Water Works Association (AWWA)
Arizona Water Pollution Control Association (AWPCA)
Water Environment Federation (WEF)

PACE

James A. Matthews, PE

Sr. Vice President – Environmental Water Division

EDUCATION

B.S./Civil Engineering
San Diego State University
1994

YEARS OF EXPERIENCE

18+ Years
Joined PACE in 1994

City of San Diego
Water Production Engineering

REGISTRATIONS

Professional Engineer / AZ
1999 / 34090

Professional Engineer / CA
1997 / C57746

Professional Engineer / ID
2004 / 11229

Professional Engineer / NM
2004 / 16491

Professional Engineer / VA
2005 / 040716

Professional Engineer / FL
2009 / 69722

Professional Engineer / HI
2009 / 13718

Wastewater Treatment Operator
Certification: Arizona

AFFILIATIONS

American Water Works Association (AWWA)

Water Environment Federation (WEF)

PRESENTATIONS & PUBLICATIONS

EPA's *Small Flows Quarterly: "Hybrid Sequencing Batch Reactors"*

Southern California Resort Managers Conference Reverse Osmosis & Water Softening

City of Lathrop Recycled Water Training Seminar

PEARL Program: Electrical Power and Control Systems

Advanced Control Components

Pump Hydraulics and Design

James Matthews is highly regarded in the water and wastewater industry for his tremendous wealth of practical knowledge and his ability to use technologies and research to develop value for clients. Mr. Matthews has created designs of several award-winning water reclamation facilities in California and throughout the southwestern US, saving capital cost, reducing construction schedules, and minimizing operations and maintenance needs on hundreds of pump station, reservoir and water and wastewater treatment projects by implementing creative, advanced design concepts. His expertise stems from an extensive background in technical engineering and process design, construction administration and plant operations. Mr. Matthews has a proven record of developing and ensuring completion of impressive solutions to dozens of clients' most difficult problems. He has also developed the trust of numerous municipalities, developers, and regulators alike through his straightforward, open-minded, and ethical approach to projects. Often considered the most difficult aspect of any project's completion, Mr. Matthews has personally installed custom control systems, including PLC programming, SCADA, radio telemetry, and solid-state controls on numerous water resource projects. Mr. Matthews currently serves as a Principal Engineer at PACE, directing the growth and development of our Environmental Water Division. As division manager, he is responsible for key aspects of the technical design process and quality control of all Environmental Water projects, ensuring purpose driven, cost effective and value-added designs.

RELEVANT EXPERIENCE

Santa Paula Water Recycling Facility – Santa Paula, CA
Beginning design in May of 2008, Mr. Matthews served as the Engineer-of-Record and Principal Engineer for the State of California's first Design-Build-Operate-Finance (DBOF) wastewater reclamation facility project for the City of Santa Paula, CA in Ventura County. The facility consists of a 4.2 MGD Biological Nutrient Removal (BNR), Membrane Bio-Reactor (MBR) with a peak treatment capacity of 17 MGD. Mr. Matthews was responsible for the design of all major aspects of the facility, including the hydraulic and biological treatment system design, an NWRI certified Title 22 UV disinfection system, EPA Class B bio-solids treatment and dewatering and effluent discharge permitting with both local and state agencies. The project was designed and constructed on an extremely tight time schedule with completion and start-up occurring in June of 2010. The facility has won numerous awards from both national and global water organizations including Global Water Intelligence and the Design-Build Institute of America and has been designed currently to be the lowest power consuming MBR in the US. Mr. Matthews continues to provide operational engineering consulting services to PERC Water, the facility's Design-Build-Operator, which has a 30-year contract to Operate and Maintain the facility.

Mountain House Water Reclamation Facility – Tracy, CA
Mr. Matthews served as the Engineer-of-Record and Principal Engineer for the Design / Build of an expansion/replacement of an existing 0.45 MGD treatment facility for the Mountain House Community Services District. The project included the design of a 3.0 MGD Tertiary Water Recycling Facility capable of meeting Title 22 – 2.2 Unrestricted Reuse effluent requirements as well as newly imposed NPDES permit requirements for discharge to the Sacramento Delta at Old River. The new facility utilizes a three-tank hybrid SBR process for biological oxidation and secondary clarification which occupies approximately 2.4 acres of land as opposed to the 23 acres of land used by the existing plant. Tertiary treatment was accomplished through biological nutrient removal in the SBR, Aqua-Disk filtration, and an advanced NWRI certified UV disinfection system. The facility also provides sludge processing and dewatering to meet EPA Class B bio-solids through a 2-stage aerobic digestion system. Mr. Matthews was responsible for all aspects of the facility engineering including civil / site design, mechanical process and equipment selection, instrumentation and controls, and effluent permitting for both Title 22 and NPDES discharges. Completed in 2005, the facility won the 2006 Global Water Award for wastewater reclamation facilities < 5 MGD.

Grizzly Ranch Water Reclamation Facility – Portola, CA
Mr. Matthews served as the principal and the engineer on record for the Grizzly Ranch WRF. The WRF treats and reclaims wastewater flows from a proposed residential and commercial development in Plumas County, CA. The facility is located northeast of the City of Portola off Grizzly Road. Phase I of the WRF was designed to reclaim 40,000 gallons per day (GPD) Maximum Month Daily flow (MMDF). This is the average day flow during a time with 100% occupancy within the development. The wastewater flow projection was based on information provided by Destination Development Corporation. The facility was designed to accommodate peaking factors of 2X MMDF and 3X MMDF for peak day and peak hour flow, respectively. The wastewater produced is anticipated to be domestic in nature with influent [BOD] and [TSS] averaging 300 mg/L and total nitrogen averaging 40 mg/L. The anticipated use of the reclaimed water is a proposed 171 acre golf course. Winter flows will be directed to Grizzly Creek under a pending National Pollutant Discharge Elimination System Permit (NPDES).

Barona Water Reclamation Facility – Lakeside, CA
Mr. Matthews was responsible for the design, production of construction documents and services during construction for this .75 MGD advanced water reclamation facility designed and built by PERC/PACE for the new Barona casino complex. The system is designed for high BOD (700 mg/l), TSS (500 mg/l) and Ammonia (60 mg/l) loadings to produce water with less than 5 mg/l BOD, 5 mg/l TSS and less than 3 mg/l total nitrogen. The facility has been on-line since February of 2000 and has consistently delivered high quality effluent while treating influent concentration three times the design loading. In addition to the treatment facility, Mr. Matthews was also involved in the planning and design of the sewer collection system upgrades, which included new collection lines and a computer controlled sewage lift station. Mr. Matthews participated in the implementation of Barona's advanced SCADA control system and on-line electronic O&M manual.

Palm Valley Water Reclamation Facility – Litchfield Park, AZ
Mr. Matthews was responsible for the design and construction services for this 4.1 MGD (expandable to 8.2 MGD) water reclamation facility for the Litchfield Park Service Co (LIPSCo) which serves the north portion of the City of Goodyear and the City of Litchfield Park in the west valley area of Phoenix, AZ. The design/build approach used on the project allowed the utility to implement ADEQ Class A+ treatment in less than 18 months from start design to construction completion at 30% less cost than constructing an expansion to the City of Goodyear's existing treatment plant. The facility features advanced biological nutrient removal, Aqua-disk filtration, UV disinfection and an Auto Thermophilic Aerobic Digestion (ATAD) process for EPA Class A bio-solids. Mr. Matthews was responsible for all engineering aspects of the project including design, construction services, start-up assistance and permitting of the facility which now treats in excess of 4.0 MGD for direct groundwater recharge.

Somerton Wastewater Treatment Plant –Somerton, AZ
Mr. Matthews is currently serving as the Principal Engineer and Sr. Process Designer in the City of Somerton (Located 9 miles south of Yuma, AZ) for the expansion of an existing 0.8 MGD SBR treatment facility. Under Mr. Matthews direction, the project was re-evaluated from a simple copy of the existing 4-tank SBR, providing a total of 1.6 MGD, to converting the SBR tanks into a 4-stage Barden Pho process, providing 1.8 MGD of capacity. The alternative provides the City with 10 to 15% more capacity at a cost savings of nearly 30% over the original SBR expansion. The facility design includes conversion and upgrades to the existing SBR aeration and mixing systems, two new 60-foot, high performance clarifiers, a new RAS/WAS pumping station, a new constant SRT control system and a new two-story solids dewatering building. Grant funding for the project, including American Recovery and Redevelopment Act (ARRA) funds, Arizona Department of Environmental Quality (ADEQ) – Effluent Enhancement funds, Water Infrastructure Finance Authority (WIFA) and Arizona Public Service (APS) energy efficiency funds were all obtained under the direction of Mr. Matthews, to provide nearly 75% of the total cost of the project. Construction of the facility is scheduled for completion in August of 2011.

San Jose Wastewater Treatment Plant – Bisbee, AZ
Mr. Matthews served as Principal and Sr. Process Engineer to provide a Value Engineering review and eventually the design of a new treatment facility for the City of Bisbee, AZ. The 1.2 MGD treatment facility, originally designed by another consulting engineering firm to replace three existing, out-dated wastewater treatment plants, was publically bid in 2005 at a $13.5M cost that exceeded the $9.5 million grant funding secured for the project. Under the direction of Mr. Matthews, PACE provided Value Engineering alternatives which led to the redesign of the facility from an MLE continuous flow plant to a Sequencing Batch Reactor (SBR) process. Additional VE services netted a total savings of $2.4M, including PACE's redesign fees, while maintaining the original project schedule. More importantly, the design provided a system which is less costly to operate and maintain and can be easily reconfigured to achieve future effluent requirements with little or no major construction The demonstrated "Value" provided by Mr. Matthews's work was instrumental in securing additional grant funding, allowing the project to move forward to a completion date of January, 2006. Mr. Matthews continues to provide the City's operations staff with engineering process support.

PACE

Brian Reid, PE

Sr. Project Engineer / Construction Management

EDUCATION

B.S./Civil Engineering
University of Florida/ 1997
Highest Honors – 3.95 GPA

YEARS OF EXPERIENCE

Joined Pacific in 2000

REGISTRATION

Professional Engineer/CA 2002/

AFFILIATIONS

Tau Beta Pi – Honor Society

A.S.C.E.

ACCOMPLISHMENTS

Class A General Contractor

Private Pilot

Brian Reid has over ten years of Civil Engineering & Construction experience. His areas of expertise include water resources design and field engineering, particularly in the design-build environment. Mr. Reid is proficient in design, ACAD drafting, and coordinating project plans with contractors and consultants. Other responsibilities include:

- Observation of field work and construction materials to determine general compliance with plans, specifications, and design concepts.
- Construction administration including coordination with 3rd party agencies and consultants, supplemental drawings and directives, contractor's requests for information and material / equipment submittals.
- Construction management including review of contractor's payment applications, requests for change orders, budgets, and schedules.
- As-built and construction layout using GPS survey technology.
- Facilitating the permitting and plan review processes.

RELATED EXPERIENCE

Santa Paula Water Recycling Plant – Santa Paula, CA
Mr. Reid is currently serving as the Construction Engineer for the new Santa Paula WWTP. The existing treatment plant has reached the end of its service life and is non-compliant with current regulatory requirements. The City is planning to replace the existing facility with a new Water Recycling Facility (WRF) and percolation system. PACE was contracted to provide design for the new WRF, which will be designed as a Membrane Bio Reactor (MBR) with an initial capacity of 3.4 MGD and readily expandable to 4.2 MGD to meet wastewater flow projections for the year 2025. The Santa Paula WWTP will be the largest Koch MBR facility in the United States upon completion and is the first DBOF municipal WWTP in California.

Mountain House Water Reclamation Facility – Mountain House, CA
Mr. Reid was on site as the Construction Engineer for the award winning wastewater treatment plant completed in 2005. PACE provided design services for this 3.0 MGD facility expansion capable of meeting strict Title 22 effluent requirements for unrestricted reuse. The new facility utilizes a two-tank SBR process for biological oxidation of organics and secondary clarification. The Mountain House WRF is among the first facilities in the United States to utilize a UV Disinfection System certified under NWRI to meet California Title 22 requirements.

Mountain House Potable Water Storage and Booster Pumping Station – Tracy, CA
Mr. Reid serves as Sr. Construction Services Engineer for this two twin 3.7 MG pre-stressed concrete tank and a multi-zone, multi-pump water booster pump station. The dual-zone pump station allows water from either storage tank to be boosted into either of two pressure zones. Chemical injection facilities located within the facility automatically maintain chlorine residuals within the tanks as well as water entering the distribution system.

Gibbs Ranch Sewer Lift Station – Rio Vista, CA
PACE under Mr. Reid was retained by Shea Homes to construct the sewer lift station for the new residential and non-residential developments in the Gibbs property, with an estimated sewer generation of 380 gpm (Average Dry Weather Flow - ADWF) and peak hour flow of 1,140 gpm (Peak Wet Weather Flow). The Gibbs Ranch sewer lift station conveys the sewage flows along a new proposed 10-inch forcemain of approximately 7,000 feet in length to regional gravity collection system. The wet well is covered by a concrete deck and H20 rated aluminum hatch for access to pumps and level controls. A valve vault box will be situated inside at the top of the wet well for all discharge piping, valving, flow metering, etc. A driveway will be located such that removal of pumps for service and emergency generator power connection is well accessible.

5,000 gpm Westside Booster Pump Station – Tracy, CA
Mr. Reid was the construction services engineer on a new inter-pressure zone booster pump station in the Mountain House CSD. The small footprint station is in close proximity to residences, and blends well architecturally with the surrounding community. The station has an integrated bridge crane to service equipment.

1.2 MG Storage Steel Tank and Potable/Fire Booster Station – Lathrop, CA
Mr. Reid was the construction services engineer for a new welded steel water storage tank and potable/fire booster station which is designed for low-area land impact and operational flexibility. The station is designed with backup power, overhead crane, flow metering, level monitoring, chlorine residual and feed, etc. The aesthetic site and tank with the City Logo imprinted on it are visible from Interstate 5 south of Louise Road in Lathrop, CA.

Westlake Combination Pumping Station – Stockton, CA
Mr. Reid was project engineer on a new combination City of Stockton pump station which is connected to a new state-of-art lake project. The storm portion of the station uses top-mounted mixed flow turbine pumps capable of discharging 110 cfs with the largest unit out of service. The station has a backup natural gas generator for continuous operation during power outages. The station design also includes irrigation pumps, recirculation pumps, dewatering pumps, lake aeration, and other ancillary equipment.

30-60 cfs Stormwater Pumping Stations – Lathrop & Riverside, CA
Five innovative stormwater conveyance pumping facilities were built under the supervision of Mr. Reid for primary treatment and discharge to downstream receiving waters in the new residential developments. The stations included operation design considerations including low-flow pumping, backup power generation, overhead crane, mechanically-cleaned screens, although constructed under budget. The stations are located in parks and recreational areas.

Cypress Grove Stormwater Pump Station – Oakley, CA
Mr. Reid led the PACE team in construction administration for the stormwater conveyance system for the Cypress Grove development. The system is composed of a network of gravity flow lines that discharge into a stormwater collection lake (water feature). This lake serves the following functions: retention area to handle nuisance flow up to a 100-year storm event, intake area for the stormwater discharge pump station, serves as a Best Management Practice (BMP), irrigation reservoir, and as an aesthetic water feature for the adjacent residential properties.

Dreamcatcher Sewer Lift Station – Brentwood, CA
Under the direction of Mr. Reid, a new sewer lift station was implemented for the City of Brentwood. The sewer lift station conveys sewage from a low-lying area to the City's main plant. The project includes full SCADA and telemetry, backup controls, redundant pumping equipment, and an odor bioscrubber.

DELIVERY METHODS

For Water Infrastructure Development

Research Study Prepared by
PERC Water Corporation

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PERC Water is a water recycling company focused on returning water to nature. We design, build, operate and manage water recycling facilities throughout the United States, are committed to producing water of the highest quality, and guarantee the risks associated with water recycling for every client. PERC Water has designed 55 Water Recycling Facilities with an aggregate capacity of over 75 MGD and an average of 1.4 MGD, of which 20 have been built and operated by PERC Water to an aggregate of 25 MGD and an average of 1.3 MGD. The company guarantees water of the highest quality and assumes the risks associated with water recycling. PERC Water is headquartered in Costa Mesa, CA. See www.percwater.com for more information.

Disclaimer

EXECUTIVE SUMMARY

Municipalities face difficult decisions when implementing major water and wastewater capital projects with significant uncertainties with respect to cost, schedule and performance. There are various delivery methods to consider and it is important that public agencies understand the advantages and risks associated with each one.

This study evaluates four delivery methods: Design - Bid - Build (DBB), Design - Build (DB), Design - Build - Operate (DBO), and Design - Build - Operate - Finance (DBOF). The goal is to provide municipal decision-makers with a deeper understanding of the advantages and challenges of each method.

PERC Water has extensive experience with alternative delivery methods, such as DB, DBO and DBOF. Since 1998, PERC Water has completed 20 DB, DBO, and DBOF projects, including the Santa Paula Water Recycling Facility, the first 100% privately funded water recycling facility in the US.

The City of Santa Paula was required to comply with waste discharge standards mandated by the Regional Water Quality Control Board. The City's existing wastewater treatment plant, originally built in 1939 was in need of replacement. The City spent several years designing alternatives and incurred significant dollars during this time, with a looming deadline ahead of them and $8 million of accrued fines. In 2007, the City entered into a settlement agreement with the RWQCB to achieve full compliance with the permit by December 15, 2010. Following years of design efforts and millions of dollars of engineering consulting fees, the City voted to solve its wastewater problems using a DBOF delivery method.

In May 2008, the City of Santa Paula awarded a DBOF contract to the team of Alinda Capital and PERC Water. Two months later, PERC Water broke ground and commenced construction and in parallel completed the engineering documents for the project. In May 2010, the new water recycling facility was treating 100% of the City's wastewater in full compliance with the DBOF contract, seven months ahead of the deadline mandated by the RWQCB. The award winning plant has been operating in full compliance with the DBOF contract since the commencement of operations.

The City's goals were fully achieved, as follows:

- Provide certainty of financing – *Achieved*
- No capital outlay by City – *Achieved*
- Local job creation – *Achieved, 88% of hours were local labor*
- Provide certainty of schedule – *Achieved, seven months ahead of schedule*
- Provide certainty of costs – *Achieved*
- Provide certainty of compliance with RWQCB – *Achieved, seven months early*
- Provide transfer of risk for energy costs – *Achieved, 38% lower than expected*
- Provide a facility that would meet the City's future objectives – *Achieved*

- No or limited Change Orders – *Achieved, 1.7% change orders including extra work requested by the Owner*

Santa Paula's Vice Mayor Bob Gonzales was Mayor at the time the DBOF contract was signed and he said, "The cost of doing business was significant for us. We had to build a new wastewater treatment facility and we did not have the necessary funds. The DBOF delivery method gave the City a lot more latitude and the risk was transferred to the company who was doing the work."

John Quinn, the City of Santa Paula's former Finance and Public Works Director, said, "In this challenging economic environment, California cities are eagerly seeking cost saving opportunities. The City of Santa Paula is enthusiastic about our new water recycling facility's reduced power costs as it means savings for our citizens over the long term."

Please refer to "The Santa Paula Solution" video and the facility website for more information regarding the Santa Paula Water Recycling Facility.

We hope you find this document useful and welcome questions and comments.

RECOMMENDATION

Select the delivery method that provides the highest level of risk transfer and the highest degree of certainty of life-cycle cost and asset performance for the Owner.

It is our recommendation to the Staff and Councilmembers of municipalities to carefully consider the alternatives available and decide which delivery method provides the highest level of certainty to their municipality, with a life-cycle perspective that delivers the best level of value to their citizens. It is our experience that a delivery method that provides the highest level of risk transfer to the private sector is the delivery method that provides the best "Value for Money" to a municipality. We highly recommend municipalities make their decisions following a thorough understanding of life-cycle costs and effective long-term risk management, avoiding the pitfalls of focusing exclusively on design control and initial capital cost. Therefore, we suggest municipalities consider the following items in its decision making process, and ask, *"Which delivery method..."*:

- provides the highest level of certainty to the municipality and ratepayers?
- provides the highest level of risk transfer to the private sector?
- provides the highest level of cost certainty over the long-term?
- provides the most guarantees of performance?
- provides the lowest overall net present value for the long term?
- provides the most modern form of technology?
- locks in future construction costs today ("treatment plants are on sale")?
- most likely to meet future permit changes?
- provides the highest level of innovation?

Delivery Methods Risk Allocation Table

		Design-Bid-Build (DBB)	Design-Build (DB)	Design-Build-Operate (DBO)	Design-Build-Operate-Finance (DBOF)
Design/Build	Design/Build Cost	Owner			
	Schedule/Completion	Owner			
	Construction Warranties	Owner			
Asset Mgt	Water Quality Performance	Owner	Owner		
	Capital Replacement	Owner	Owner		
	Power	Owner	Owner		
	Biosolids	Owner	Owner		
	Life Cycle Costs	Owner	Owner		
	Operation & Maintenance	Owner	Owner		
Finance	Long-Term Financing	Owner	Owner	Owner	
	Interest Rate	Owner	Owner	Owner	

It is PERC Water's opinion that the DBOF delivery method meets all of the bulleted objectives. There are various industry reports supporting the benefits of DBOF and PPPs, and some of them are available at the following links:

- Deloitte, *Closing the Infrastructure Gap: The Role of Public-Private Partnerships*
- Deloitte, *Partnering for Value, Structuring effective public-private partnerships for infrastructure*
- PricewaterhouseCoopers, *Delivering the PPP Promise*
- KPMG, *Delivery Water Infrastructure using Private Finance*

The PERC Water Approach / Customized Design Report (CDR™)

PERC Water performs projects using DB, DBO and DBOF as core delivery methods. We believe that DBO and DBOF offer the best long-term value and risk management to a municipality. The "traditional DB" approach where an Owner prepares a performance specification and a 30% preliminary design so DB teams can provide a firm capital cost quotation. Although a better risk profile for the Owner than DBB, this DB approach can be very costly and timely.

Alternatively, PERC Water prepares a Customized Design Report ("CDR™") that is also a 30% level design; and a CDR can be submitted within 90 days of contract. PERC Water has prepared almost 60 CDRs in the last 10 years, of which 20 have been developed as DBO or DBOF projects. The CDR is the foundation of a DB, DBO or DBOF project and is intended to clearly align the expectations of an Owner and practitioner. The PERC Water CDR contains the following items:

- Project Approach
- Basis of Design
- Outline Specifications and General Clarifications
- Asset Management Overview
- Customized Drawings
    - Site Plan
    - Equipment Schedule
    - Line Diagrams
    - Mechanical Layouts and Sections
    - Electrical Single Line Diagrams
    - Electrical Load Calculations
    - Architectural Renderings
- Detailed Critical Path Schedule with Schedule Narrative
- Project Cost
    - DB Approach
    - DBO Approach
    - DBOF Approach (Service Fee structure)

We recommend that municipalities authorize PERC Water to prepare a CDR for a new, state-of-the-art water recycling facility that will meet the current and future needs of the City. We do not suggest that Cities abandon their current paths of exploring delivery methods, but recommend pursuing a parallel path. We are confident the outcome of the CDR will meet or exceed the expectations of the City, and will deliver a capital and life-cycle cost significantly lower than the current engineer's estimate.

PRIVATE FINANCING

Private Financing is typically integrated into DBOF or DBOOT (Design, Build, Own, Operate, Transfer) contracts, as private investors generally require an operations contract for the same duration of the finance term. This is the case as private investors will generally seek to manage their infrastructure investments with their own personnel or affiliated partners. Given this integration of private financing with the long-term operating commitment inherent in the DBOF structure, private investors typically approach such projects from a lifecycle perspective, whereby they invest up front in design and construction costs as required to deliver the appropriate level of service over the life of the project.

Private financing for municipal infrastructure is usually in the form of private equity managed by large infrastructure fund managers. Private financing for projects is also referred to as Project Financing, which typically has a long investment horizon of 30 years or longer. Public infrastructure attracts funds such as teacher and other public employee pension funds, university endowments or other types of institutional investment funds. These funds are seeking predictable, safe returns from investments into mission critical infrastructure with a low risk profile, such as water and wastewater related assets.

Accelerated Schedule

By utilizing private financing, a municipality can accelerate the timing of a new project launch and completion. In the current market, private financing sources are readily available to be deployed into new projects, typically without the timing constraints that are required for State Revolving Fund and/or municipal bond financing arrangements. Furthermore, municipalities can only raise debt in given tranche sizes and at a pace that the markets and their internal staff resources will allow. As a result, private sources of capital are valuable in expediting the pace at which projects can be undertaken. Private financing can be considered a mechanism for extending the municipalities "bandwidth" for ongoing infrastructure investment – that is, the rate at which they can implement new projects that would otherwise be constrained either by the capacity of their fundraising/Treasury functions or the ability of the markets to absorb their bond issuance.

Common questions about private financing include the cost of capital. This is perhaps the major objection to PPPs; however, this question overlooks several important points:

- Difference between Cost of Capital and Cost of Debt
  Cost of capital and cost of debt are not one and the same. Cost of capital encompasses the risk-adjusted weighted average cost of debt and equity capital, taking into consideration the risks associated with cost overruns, schedule delays and performance related risks. Cost of debt is considered at a risk free rate.

- Lower Lifecycle Cost offsets higher Weighted Average Cost of Capital
  Owners commonly focus on the cost of financing without taken into account the total lifecycle cost. Due to the transfer of risk to the private entity, and the private entity's ability to manage such risk, the lifecycle cost using private financing may be lower than the lifecycle cost using public debt.

- Value For Money
  Irrespective of the procurement structure used, any public agency should have a methodology to demonstrate that Value for Money ("VFM") has been achieved. VFM testing considers whether the procurement structure being considered offers the lowest overall cost (in present value terms) relative to an estimate of the risk-adjusted costs were the public sector to deliver the project itself (commonly referred to as the Public Sector Comparator or PSC). A key first step in developing a PSC/VFM framework is to define "conventional" public procurement. This is usually performed by analyzing a DBB or DB method of procurement with some form of bond financing to a PPP structure where private funding is utilized and adjusting both sets of figures for the respective level of risk to the Owner.

ADVANTAGES	DISADVANTAGES
Owner Transfers Risk to Private Firm	Education of Value for Money
Transfer Risk of Interest Rate Change	Education of Financing vs. Service Fee
Transfer Risk of Cost Overruns	Potential Higher Cost of Capital vs. Public Debt
Transfer Risk of Delays	
Fast Deployment of Capital	
Accelerated Project Start	
Fast Job Creation	
Preserve Capital for Other Projects	
Diversify Funding Sources	
Lower Project Lifecycle Costs	
Increased "Bandwidth" for stretched Municipal Human Resources	
Project Reverts to Municipality upon End of Concession Period	
Municipality can Retain Control over Rate Setting and Collections	
Must Maintain Water Quality Standards/Regulatory Requirements	

DELIVERY METHOD: Design - Bid - Build (DBB)

Design-Bid-Build is a project delivery method whereby an Owner contracts with separate entities for the design and construction of a given project, thereby splitting the responsibility for design and construction into two distinct phases. DBB is the least efficient delivery method, and places the highest level of risk onto the Owner. DBB is not performance or "qualified selection" based, and ignores accountability for life-cycle costs. Significant uncertainty exists under DBB and knowledge of construction costs usually becomes fully known at the completion of construction, after all change orders are calculated. Engineering consultants tend to be restricted by associations and insurance to provide guaranteed cost, schedule and performance, therefore placing the entire risk for such components onto the Owner. DBB is known for creating "significant uncertainty" for municipalities and can breed contention between engineers, contractors and Owners.

Greater Risk for the Owner

It is a common belief that DBB provides greater control to the Owner, and as much as this may be true with respect to controlling the design, the irony is that the Owner takes on a significantly higher level of risk by controlling such design. For example, due to the separation of design and construction, the Owner represents and warrants to the Contractor that the plans and specifications prepared by the Engineer are complete and accurate; therefore, the Owner assumes liability for changes to the design.

DBB was a reaction to the favoritism, corruption, and waste associated with major infrastructure projects in the 19th century. Ever since contracting reforms formally separated the design and construction phases at the turn of the century, design-bid-build became the traditional procurement method for public agencies. However, some public officials are concerned about the efficiency of the design-bid-build method in terms of project cost, schedule, productivity and lack of certainty. For this reason, there is growing interest among local and state agencies to consider utilizing alternative project delivery methods.

Professional Liability / Errors and Omissions Insurance carried by the Engineer will typically exclude claims made by the Contractor for design errors and omissions, therefore placing such risk onto the Owner. Since the Engineer is retained by the Owner, any design claims will likely need to originate by the Owner resulting in potential significant legal costs and attorney's fees for the Owner. Surety bonds typically exclude performance of operations for the Contractor's contract; therefore, the Contractor's bond will be limited to construction performance in accordance with the plans and specifications provided by the Owner.

Change Orders

Change Orders are very typical to the DBB delivery method, and Contractor's are usually entitled to Change Orders under the following situations:

- Impacts caused by Owner (i.e. scope changes, interference or disruption by Owner or other parties for whom Owner is responsible)
- Changed conditions (i.e. unknown subsurface obstacles, force majeure)
- Design problems (i.e. errors, omissions, ambiguities, etc. in the plans and specifications)

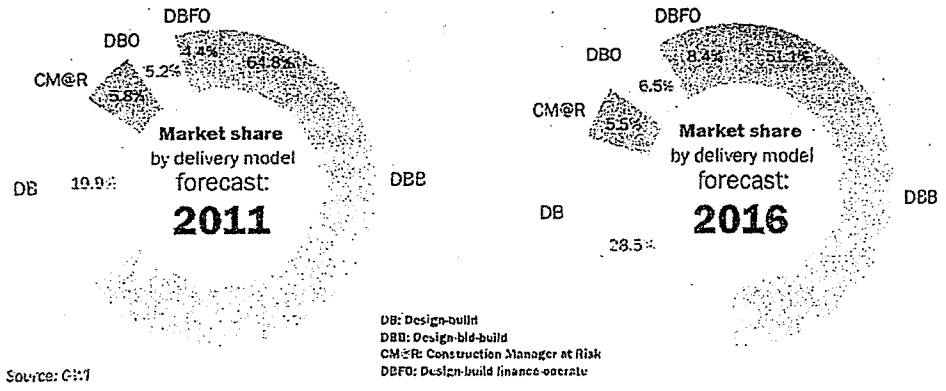
Examples of DBB problems

Brush, CO
Members of the Brush City Council voiced concerns about an engineering mistake that will likely increase the projected cost of the wastewater-treatment plant construction project by more than $600,000. More information is available here.

Southern Nevada Water Authority, NV
Southern Nevada Water Authority board members want more information before they approve another $40 million for the new intake project now under construction at Lake Mead. More information is available here.

City of Boerne, TX
The City of Boerne, TX voted 5-0 to table a construction project due to the low bid being at least $5 million higher than the engineer's estimate. More information is available here.

According to American Water Intelligence, the DBB delivery method is on the decline and expected to decrease over the next five years, further described in the following graph:



DBB ADVANTAGES	DBB DISADVANTAGES
Owner Control of Design	Significant Uncertainty for the Owner
Contractors Bid Same Design	Owner Assumes Higher Risks for the Project
Lowest Bid Wins the Project	Requires Owner to Pay for 100% Design
Complete Design Before Construction	Uncertainty of Capital / O&M Cost
Owner's Staff Manages Projects	Uncertainty of Performance / Water Quality
Well Known and Understood	Uncertainty of Financing
Widely Used by US Municipalities	Uncertainty of Future Capital Replacements
	Owner Required to Fund Project (SRF/Bonds)
	DBB is not Performance Based
	Dependent on Engineer's Estimate for Funding
	Longer Design Schedule Delays Job Creation
	High Probability of Change Orders
	No Bidding Contractor Involvement in Design
	No Qualified Selection Process
	Emphasis on Capital Cost vs. Life Cycle Cost
	Owner at Risk to Contractor for Design Errors
	Sequential Design and Construction Schedule
	Higher Cost to Owner in Managing Project
	Owner Required to Use "Low Bidder"
	Breeds Contention between Parties

Under the DBB delivery method, the Owner will retain and assume the following risks as described in Table 1 on the following page:

- Construction Costs
- Change Orders
- Project Schedule
- Design Changes / Errors and Omissions
- Performance and Water Quality
- Operations Costs
- Capital Replacement Costs
- Equipment Failure
- Energy Costs
- Financing Costs
- Permit / Law Changes
- Legal Disputes between Engineer and Contractor

DBB Risk Allocation Table

		Design-Bid-Build (DBB)
Design/Build	Design/Build Cost	Owner
	Schedule/Completion	Owner
	Construction Warranties	Owner
Asset Mgt	Water Quality Performance	Owner
	Capital Replacement	Owner
	Power	Owner
	Biosolids	Owner
	Life Cycle Costs	Owner
	Operation & Maintenance	Owner
Finance	Long-Term Financing	Owner
	Interest Rate	Owner

DELIVERY METHOD: Design - Build (DB)

Design-Build (DB) is a project delivery method whereby an Owner contracts with a single entity for design and construction of a given project through a single contract with the Owner. Generally, DB is utilized to reduce the risk to Owners, and reduce project schedule with a "fast-track" approach. DB is sometimes referred to as the "master builder" approach, one of the oldest forms of construction procedures. The Master Builder system for designing and building construction projects was the dominant project delivery system in the construction industry during the early part of the 20th century, and has since developed into the Design/Build project delivery approach.

Risk Transfer for Design & Construction

DB provides a higher level of risk transfer compared to DBB due to the combination of the designer and contractor being responsible for both disciplines under a single contract. The Owner can transfer the risk of design, construction, capital cost and project schedule to a single entity. However, the DB Entity will not assume operations responsibility; therefore, the Owner retains the risk of performance, water quality and operations / maintenance costs. The risk assumed by the DB Entity is limited to design and construction, and although a better risk profile for the Owner than DBB, it neglects to provide accountability for life-cycle costs and asset performance. Over the past 15 years, use of DB has greatly accelerated in the US, making this delivery method one of the most significant trends in design and construction today.

The DB process typically includes an engineering consultant and a general contractor forming a joint venture or the general contractor retaining the services of an engineering consultant by contract. There are very few integrated DB Entities in the water sector that have performed multiple DB projects as integrated entities – engineering consultants and general contractors may team on one given project and compete on another. This can cause some conflicts of interests between team members, and in the case of a first-time DB relationship, the Owner can assume a higher level of risk if the engineering consultant and general contractor end up in a dispute. On the other hand, if a DB Entity is an integrated company that has performed projects with the same team members, the risk to the Owner is greatly reduced.

It is a common belief that DB limits the control by the Owner. This is a misunderstanding of DB as the Owner still retains control over the design by requiring DB Entities provide a) performance guarantees and b) quality standards in accordance with a 30% preliminary design, which would be approved by the Owner. The irony of this misunderstanding is that the Owner assumes greater control of the project by transferring the risk of design and construction to the DB Entity. Typically, the DB process includes the Owner preparing a preliminary design to a level sufficient for a DB Entity to provide a guaranteed price, schedule and performance. The preliminary design will be integrated into a DB contract, and the DB Entity will be required to complete the engineering plans and specifications consistent with and a logical

evolution of the preliminary design. The DB Entity will therefore be required to build the asset in accordance with the DB contract, plans and specifications. This approach reduces the engineering fees for the Owner by about 30%, at which time the Owner will obtain a guaranteed fixed price form the DB Entity. The challenge with this approach is the Owner is still required to incur significant engineering costs in preparing a 30% preliminary design, albeit lower cost than the DBB approach where 100% design is required.

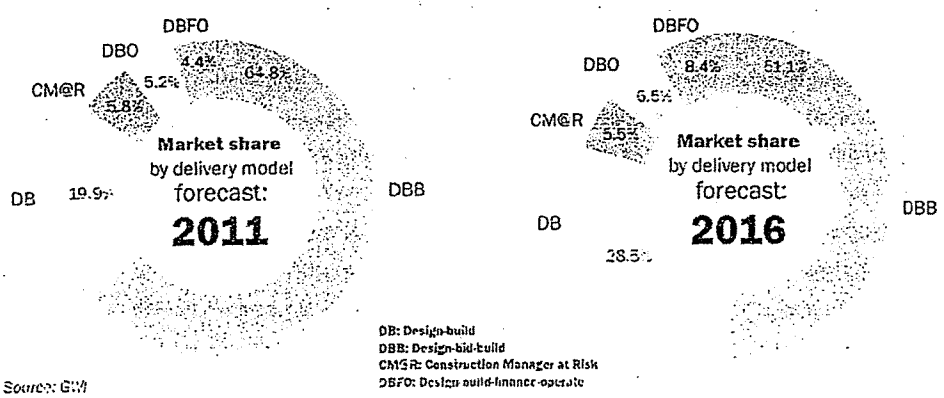
Limited Change Orders

Under a DB structure, Professional Liability / Errors and Omissions Insurance carried by the Engineer and surety bonds issued by the Contractor will now be the responsibility of the DB Entity. The Owner will be relieved of claims made by the Contractor for design errors and omissions, and associated Change Orders. Change Orders are not typical to the DB delivery method and are usually limited to requests by the Owner for additional / extra work. Since the DB Entity is responsible for design and construction, any gaps that exist will be the responsibility of the DB Entity.

Shortcomings

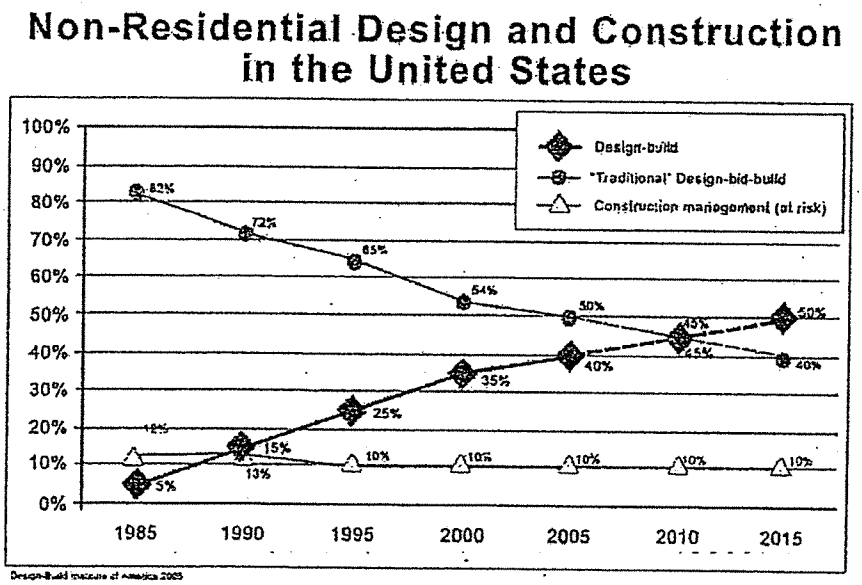
There are shortcomings with DB, although a better value proposition for the Owner than DBB, if the Owner and DB Entity fail to clearly align expectations at the contract stage. Since the DB contract integrates the 30% preliminary design / CDR and requires the DB Entity to complete the design, any changes by the Owner post-contract may result in schedule delays or change orders. In addition, any changes in applicable laws post-contract will result in a change to the DB contract. Although this is still a better risk offer than DBB (the same issue applies to the DBB), it is critical for the DB contract to clearly outline expectations.

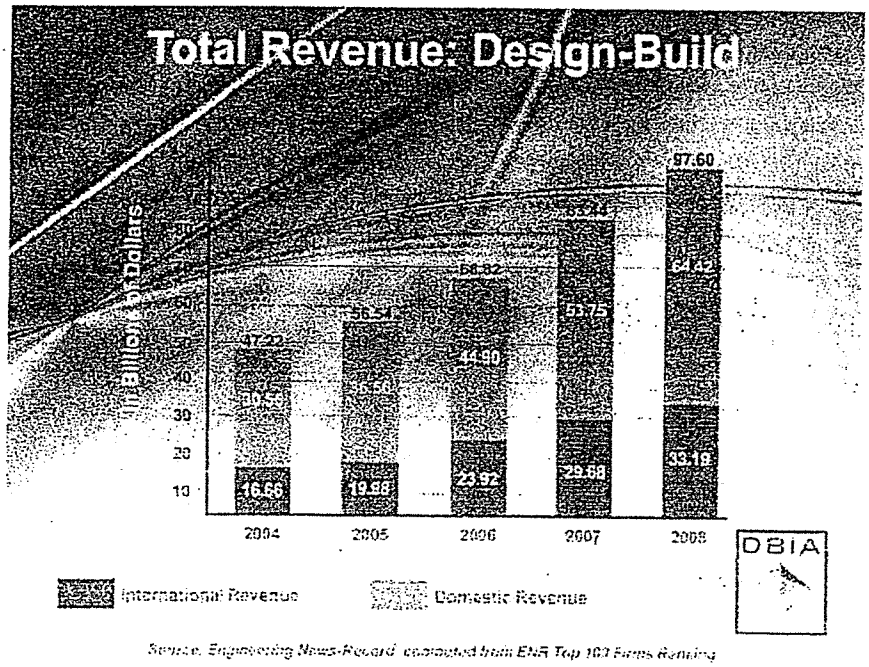
According to American Water Intelligence, the DB delivery method is expected to increase by over the next five years, further described in the graph on the following page:



Source: GWI

According to the Design Build Institute of America ("DBIA"), the DB delivery method is expected to increase from 2010 to 2015 by 5%, further described below:





Source: Engineering News-Record, calculated from ENR Top 100 Firms Ranking

DB ADVANTAGES	DB DISADVANTAGES
Owner Controls Design Specification	Uncertainty of Life Cycle Cost for the Owner
Reduced Risk for Owner vs. DBB	Owner Assumes Operational Risk
Early Knowledge of Capital Cost	Engineer / Contractor Joint Venture Issues
Cost Savings / Innovation	Uncertainty of O&M Cost
Fast Track Schedule	Uncertainty of Performance / Water Quality
Reduced Change Orders	Uncertainty of Financing
Reduced Litigation for Owner	Uncertainty of Future Capital Replacements
Qualified Based Selection	Owner Required to Fund Project (SRF/Bonds)
Not Based on "Low Bid Wins"	Emphasis on Capital Cost vs. Life Cycle Cost
Engineer & Contractor Collaboration	
Favorable DB Procurement Laws	
Certainty of Capital Cost	
Certainty of Schedule	
Better Quality	
Single Responsibility	
Decreased Owner Staff Burden	

Under the DB delivery method, the Owner will retain and assume the following risks as described in Table 2 below:

- Performance and Water Quality
- Operations Costs
- Capital Replacement Costs
- Equipment Failure
- Energy Costs
- Financing Costs
- Permit / Law Changes

DB Risk Allocation Table

		Design-Build (DB)
Design/Build	Design/Build Cost	
	Schedule/Completion	
	Construction Warranties	
Asset Mgt	Water Quality Performance	Owner
	Capital Replacement	Owner
	Power	Owner
	Biosolids	Owner
	Life Cycle Costs	Owner
	Operation & Maintenance	Owner
Finance	Long-Term Financing	Owner
	Interest Rate	Owner

DELIVERY METHOD: Design - Build - Operate (DBO)

Design-Build-Operate (DBO) is a project delivery method whereby an Owner contracts with a single entity for design, construction and operations of a given project. Generally, DBO is utilized to reduce the long-term risk to Owners, and reduce project schedule with a "fast-track" approach. DBO is an extension of DB whereby the DBO Entity will perform Operations following completion of the construction of an asset.

Risk Transfer for Design, Construction & Operations

DBO provides a higher level of risk transfer compared to DBB and DB due to the combination of the designer, contractor and operator being responsible for all such disciplines under a single contract. The Owner can transfer the risk of design, construction, operations, capital cost, operations/maintenance ("O&M") cost and project schedule to a single entity. In addition, the DBO Entity will assume operations responsibility; therefore the Owner transfers the risk of performance, water quality and operations / maintenance costs to the DBO Entity. The DBO Entity approaches a project from a life-cycle perspective and will not compromise operational performance and cost during the design and construction phase of the project.

Although similar to DB in terms of a combined engineering and construction entity, the DBO Entity is typically led by a firm that specializes in operating and maintaining infrastructure. This makes sense as the DBO Entity has a vested interest in the operational performance of the infrastructure, and the DBO Entity will have long-term responsibility for warranties, performance obligations, energy efficiency and overall life-cycle costs. DBO Entities will usually apply strict quality control measures with its engineering and construction team members, and implement quality assurance systems such as having operations staff authorize and approve engineering and construction documents. DBO also forces the construction team members to avoid some of the quality compromising cost-cutting that DBB or DB construction can spawn.

In contrast to DBB and DB, the DBO Entity will be required by contract to operate and maintain the infrastructure in accordance with the performance standards set forth in the DBO contract, which will include guarantees to produce compliant effluent and bio-solids performance. A DBO delivery method will clearly avoid the Owner's risk of finger-pointing between the engineer, contractor and operator, therefore providing significant certainty and greater risk transfer for the Owner.

Owner Retains Control

Similar to the DB delivery method, it is a common belief that DBO limits the control by the Owner. This is a misunderstanding of DBO as the Owner still retains control over the design by requiring DBO Entities

provide a) performance specifications, b) performance guarantees, and c) quality standards in accordance with a 30% preliminary design, which would be approved by the Owner and d) long-term operational guarantees. The irony of this misunderstanding is that the Owner assumes greater control of the project by transferring the risk of design, construction and operations to the DBO Entity.

Another common belief is that a DBO delivery method restricts flexibility for future modifications to infrastructure, such as changes with regulatory permits. This is a misunderstanding of the DBO delivery method, as the infrastructure will be designed with the best estimates of future permit modifications, which is no different from a DBB or DB delivery method. Most professional engineers will design to the standard of care, and utilize best estimates of future regulations and anticipated permits changes, which will be incorporated into a DBB, DB and DBO delivery method. Ironically, under a DBO delivery method, the Owner will continue to work in the future with the entity that was responsible for design at the outset of the DBO contract, whereas under DBB or DB delivery methods, the engineering entity is long been dismissed from the project.

Under a DBO structure, Professional Liability / Errors and Omissions Insurance carried by the Engineer and surety bonds issued by the Contractor will now be the responsibility of the DBO Entity. In addition, certain Professional Liability Policies include coverage for errors and omissions, and professional negligence on the part of the operator, therefore providing greater risk management for the Owner.

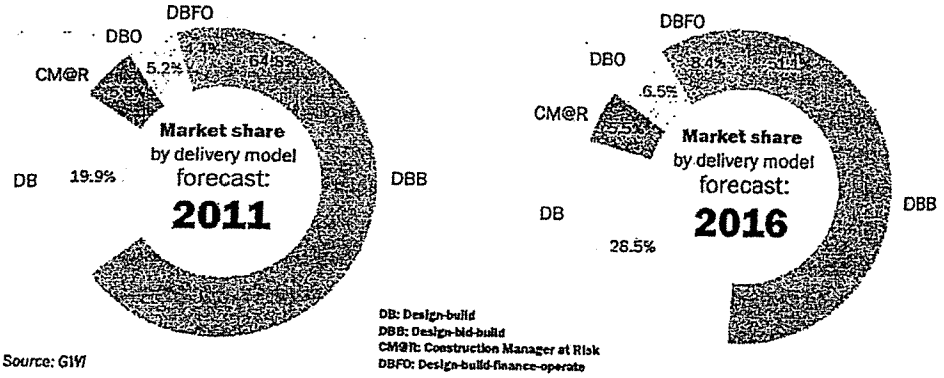
Change Orders Are Rare

The Owner will be relieved of claims made by the Contractor for design errors and omissions, and associated Change Orders. Change Orders are not typical with the DBO delivery method and are usually limited to requests by the Owner for additional / extra work. Since the DBO Entity is responsible for design, construction and operations, any gaps that exist will be the responsibility of the DBO Entity.

Align Expectations

There are shortcomings with DBO, although a better value proposition for the Owner than DBB and DB, if the Owner and DBO Entity fail to clearly align expectations at the contract stage. Since the DBO contract integrates the 30% preliminary design / CDR and requires the DBO Entity to complete the design, any changes by the Owner post-contract may result in schedule delays or change orders. In addition, any changes in applicable laws post-contract will result in a change to the DBO contract. Although this is still a better risk offer than DBB and DB (the same issue applies with DBB and DB), it is critical for the DBO contract to clearly outline expectations.

According to American Water Intelligence, the DBO delivery method is expected to increase marginally by 2016, further described below:



Source: GWI

DB: Design-build
DBB: Design-bid-build
CM@R: Construction Manager at Risk
DBFO: Design-build-finance-operate

US municipal water and wastewater DBOs since 2000

Year of award	Project location	State	Contractor	Capacity (m^3/d)	Contract duration (years)	Contract scope
2010	East Providence	RI	AECOM/United Water	39,364	10	WWTP
2009	Spokane	WA	CH2M Hill	30,280	20	WWTP
2008	Santa Paula	CA	PERC/PACE/Trussell Engineering/Kennedy Jenks/W.M. Lyles	12,869	30	Water recycling facility
2007	Tampa Bay	FL	Veolia Water NA	181,680	13	Surface water TP
2006	Fillmore	CA	American Water/Boyle Eng./W.M. Lyles/Kennedy Jenks	6,813	20	Water recycling facility
2006	Clovis	CA	CH2M Hill	10,598	10	WWTP MBR
2006	Rockland	NY	Veolia Water ST/Jett Industries/CDM/Delaware Engineering	5.678	5	WWTP
2005	Twin Oaks	CA	CH2M Hill	378,500	15	WTP
2004	Tampa Bay	FL	American Water/Acciona	94.625	20	SWRO
2003	Lake Pleasant	AZ	American Water	302,800	15	WTP
2003	Lathrop	CA	Veolia Water	2,839	20	Tertiary treatment plant
2003	Stockton	CA	CH2M Hill	208,175	20	WWTP + Water
2003	Cle Elum	WA	Veolia Water	13,626	20	WWTP
2002	San Juan Capistrano	CA	ECO Resources, Inc./ Boyle Engineering/ARB Inc.	19,455	20	BWRO
2002	Taunton River (1)	MA	Inima/Metcalf & Eddy	18,925	20	BWRO
2002	Pawtucket	RI	Earth Tech	94,625	20	WTP
2002	Richmond	CA	USFilter (Veolia Water)	60,560	20	WWTP
2001	Seattle (Cedar)	WA	CH2M Hill	681,300	25	WTP
2001	Newport	RI	Earth Tech	40,500	20	WWTP
2001	Beverly Hills (1) (2)	CA	Earth Tech	11,355	20	WTP
2001	Camp Creek	GA	American Water/Western Summit Constructors/Parsons	90,840	15	WWTP
2001	Lynn	MA	Aqua Alliance (Veolia)	97,653	20	WWTP
2001	Glens Falls (3)	NY	Earth Tech	26,495	20	WTP
2000	Tampa Bay	FL	Veolia Water NA/CDM/Clark	249,810	15	Surface water TP
2000	Quincy (1)	WA	Earth Tech	19,493	20	WWTP
2000	Springfield	MA	US Water (United Water)	253,595	20	WWTP

(1) DBFO

(2) The city repurchased the plant after five years

(3) Contract terminated in 2006; also included upgrades and 20-year O&M of a 5.5MGD WWTP

Sources: Company releases, NCFPD, USCW

DBO ADVANTAGES	DBO DISADVANTAGES
Owner Controls Design Specification	No Guarantee of Financing
Reduced Risk for Owner vs. DBB	No Guarantee of Future Capital Replacements
Early Knowledge of Capital Cost	Owner Required to Fund Project (SRF/Bonds)
Early Knowledge of O&M Cost	Public Employees Transition to DBO Entity
Emphasis on Life-Cycle Cost	Education to the Community of Private O&M
Cost Savings / Innovation	
Fast Track Schedule	
Reduced Change Orders	
Reduced Litigation for Owner	
Qualified Based Selection	
Not Based on "Low Bid Wins"	
Engineer& Contractor Collaboration	
Operator Approval of Design/Build	
Favorable DBO Procurement Laws	
Certainty of Capital Cost	
Certainty of O&M Cost	
Certainty of Energy Cost	
Certainty of Capital Replacements	
Guarantee of Water Quality	
Guarantee of Bio-Solids	
Better Certainty of Schedule	
Better Quality	
Single Responsibility	
Decreased Owner Staff Burden	
Long Term O&M Relationships	

Under the DBO delivery method, the Owner will retain and assume the following risks as described in Table 3 on the following page:

- Financing Costs
- Permit / Law Changes

DBO Risk Allocation Table

		Design-Build-Operate (DBO)
Design/Build	Design/Build Cost	
	Schedule/Completion	DBO Entity
	Construction Warranties	
Asset Mgt	Water Quality Performance	DBO Entity
	Capital Replacement	
	Power	DBO Entity
	Biosolids	
	Life Cycle Costs	DBO Entity
	Operation & Maintenance	
Finance	Long-Term Financing	Owner
	Interest Rate	Owner

DELIVERY METHOD: Design - Build - Operate - Finance (DBOF) / Public-Private Partnerships (PPP)

Design/Build/Operate/Finance or PPP is a project delivery method whereby a municipal Owner contracts with a single entity for design, construction, operations and finance of a given project. Generally, DBOF is utilized to reduce the long-term operational and limit financial risk to Owners, and reduce project schedule with a "fast-track" approach. DBOF is an extension of DBO whereby the DBOF Entity will fund the initial capital cost of construction and fund future capital replacements during the Operations period (generally 30-35 years). At the end of the DBOF term, the asset reverts to the Owner at no transfer cost and in a fully maintained condition for continued use by the Owner. A major distinction between DBO and DBOF is that the DBOF Entity retains ownership of the asset-until transfer at the end of the DBOF contract. The DBOF delivery the method is *"going beyond the transaction and adopting a life-cycle perspective."*

Best Form of Risk Transfer

DBOF provides the highest level of risk transfer for the Owner as compared to DBB, DB and DBO since the DBOF Entity takes full responsibility for a combination of critical roles (including designer, contractor, operator and financier) under a single contract. As such, the Owner transfers the risk of design, construction, operations, financing, capital cost, operations/maintenance ("O&M") cost and project schedule to a single entity. Since the DBOF Entity will assume operations responsibility, the Owner transfers the risk of performance, water quality and operations / maintenance costs, and future capital replacements to the DBOF Entity.

Given the broad range of responsibilities assumed by the DBOF Entity over the long-term operating period, the DBOF Entity approaches a project from a life-cycle perspective (i.e. with a focus on long-term delivery of Service to the Owner rather than a near-term completion of a project). The DBOF Entity will not compromise operational performance during the design and construction phase of the project, but rather will invest in the project as required to deliver the appropriate level of Service over the life of the project. For example, they are incentivized to implement measures that allows for the greatest energy efficiency as they are responsible for the long-term operation costs. As Lawrence Summers, an economist and former President of Harvard, once said, "In the history of the world, no one has ever washed a rented car."

Although similar to DBO in terms of a combined engineering, construction and operations entity, the DBOF Entity is typically led by a Special Purpose Entity ("SPE") to contract with the Owner for a long term concession. The SPE is privately owned, and fully capitalized with private capital, such as public employee retirement funds, and is fully responsible for the risk of financing and capital cost. The Owner is not

required to contribute any funding towards the capital cost of the infrastructure and is only required to pay the "Service Fee" when the infrastructure is operating in compliance with the DBOF contract.

The US Government Accountability Office ("GAO") prepared the Report to the Ranking Member, Committee on Transportation and Infrastructure, House of Representatives for Wastewater Infrastructure Financing in July 2010. The GAO focused on Stakeholder Views on a National Infrastructure Bank and Public-Private Partnerships. The GAO identified seven municipalities (as listed below) that have entered into privately funded PPPs since 1992, of which one was a new water recycling facility under a 30-year DBOF (City of Santa Paula, with PERC Water and its financial partner comprising the DBOF Entity). The remaining six DBOFs applied to leases, concessions and plant upgrades. The full report can be found on their website.

Table 4: Privately Financed Wastewater PPPs Developed Since 1992 Identified by GAO

Municipality	Company	Year initiated	Type	Initial term (years)	Assets included	Up-front payment (Y/N)
Arvin, CA	U.S. Filter (now Veolia Water)	1999	Lease & DBFO	35	Lease: existing treatment plant DBFO: upgraded treatment plant components	Y
Cranston, RI[a]	Triton Ocean State LLC (now Veolia Water)	1997	Lease	25	Treatment plant, collection system, pumping stations, industrial pretreatment	Y
Fairbanks, AK	Golden Heart Utilities	1997	Lease & Asset Sale[b]	30	Lease: treatment plant Asset sale: collection system	Y
Franklin, OH[c]	Wheelabrator EOS (now Veolia Water)	1995	Lease & Asset Sale[d]	20	Asset sale: treatment plant Lease: one process within the treatment plant	Y
North Brunswick, NJ[e]	U.S. Water (now United Water)	1995	Lease	20	Collection system & pumping stations[f]	Y
Santa Paula, CA	Santa Paula Water, LLC[g]	2008	DBFO	30	New water recycling facility	N
Woonsocket, RI[h]	U.S. Filter (now Veolia Water) with third-party financing through LaSalle Bank and ABN AMRO	1999	DBFO	20	Upgrade of existing treatment plant	Y

Source: GAO

In contrast to DBB, and DB and DBO, the procurement laws and process is a lot more streamlined. The procurement process would be very similar to a DBO with respect to a 30% preliminary design or a CDR in the case of PERC Water, and although there would continue to be a performance specification for selection of a DBOF Entity, the legislation that governs DBOF delivery methods in California permits competitive negotiation. California Government Code §5956 et seq. is the code that governs DBOF delivery methods in California, which encourages the use of private funding to solve municipal infrastructure challenges. Please refer to the following links for information regarding California Government Code §5956:

- Summary
- Amendment
- Legal Memo

Service Fee Agreement

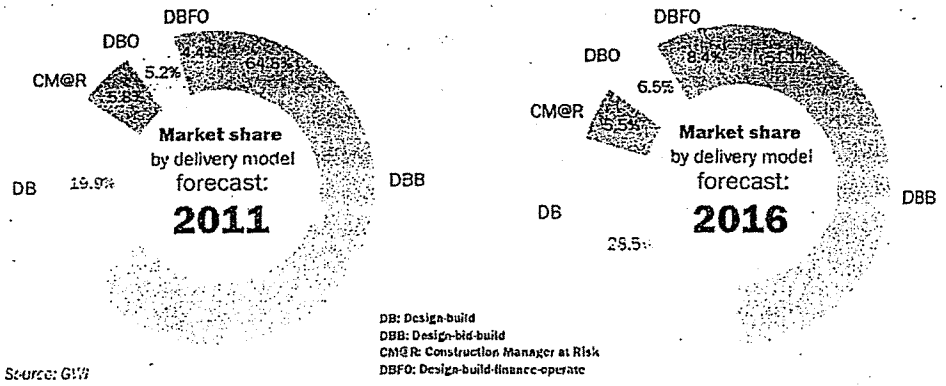
A common misunderstanding with DBOF is that many interpret the delivery method to be providing financing to a DBO delivery method. This is not the case, as the DBOF Entity is raising its own capital to fund the infrastructure and assumes the risk of such financing into the future, with limited recourse to the Owner. Therefore a DBOF delivery method is more akin to a Service Agreement whereby a private entity provides treatment and recycle services for a predetermined Service Fee that includes capital recovery, debt service, O&M costs, capital replacement reserves and energy guarantees.

A common question asked by Owners is the "what is cost of capital?" or "what is the interest rate?" As much as these questions are valid, they are very difficult to answer due to the timing of when the financing occurs by the DBOF Entity and the type of financing the DBOF Entity obtains. An important point is that the interest rate risk lies with the DBOF Entity and not with the Owner.

Another common valid question asked by many Owners is "how do we compare apples-to-apples?" The simple answer is "life-cycle analysis" and "net present value analysis." The advantage of the DBOF delivery method is it requires Owners and practitioners to evaluate life-cycle costs and assign a risk-adjusted cost of capital to varying delivery methods. For example, under a DBB delivery method Owner's are typically focused on the capital cost, while future operating costs are often ignored. In contrast, under DBO and DBOF delivery methods, Owners are forced to analyze both capital and long-term operating costs to make a decision on a capital project. This life-cycle outlook is healthy for the Owner.

Please refer to the DBO delivery method overview regarding design, construction and operations processes.

According to American Water Intelligence, the DBOF delivery method is expected to increase significantly over the next five years, further described below:



Socio-Economic Value

The DBOF delivery method also allows for various socio-economic values that are not available with the other methods. Because the work can be started earlier than with the other methods as a result of the secured capital funding, local job creation is expedited. In addition, the utilization of local vendors will be accelerated. The multiplier effect of an early work start date has a profound effect on the local community and must be given consideration.

DBOF ADVANTAGES	DBOF DISADVANTAGES
Owner Controls Design Specification	Public Employees Transition to DBOF Entity
Reduced Risk for Owner vs. DBB	Education of DBOF delivery method
Early Knowledge of Service Fees	Perceived Higher Cost of Capital
Certainty of Service Fees	Education of Value for Money
Certainty of Sewer Rates	
Emphasis on Life-Cycle Cost	
Cost Savings / Innovation	
Fast Track Schedule & Job Creation	
Reduced Change Orders	
Reduced Litigation for Owner	
Qualified Based Selection	
Not Based on "Low Bid Wins"	
Engineer & Contractor Collaboration	
Operator Approval of Design/Build	
Favorable DBO Procurement Laws	
Certainty of Energy Cost	
Certainty of Capital Replacements	
Guarantee of Water Quality	
Guarantee of Bio-Solids	
Certainty of Schedule	
Better Quality	
Single Responsibility	
Decreased Owner Staff Burden	
Long Term OEM Relationships	
Expedited Job Creation	

Under the DBOF delivery method, the Owner will retain and assume the following risks as described in Table 4 on the following page:

- Permit / Law Changes *(Note, same applies to DBB, DB and DBO)*

DBOF Risk Allocation Table

		Design-Build-Operate-Finance (DBOF)
Design/Build	Design/Build Cost	
	Schedule/Completion	
	Construction Warranties	
Asset Mgt	Water Quality Performance	
	Capital Replacement	
	Power	
	Biosolids	
	Life Cycle Costs	
	Operation & Maintenance	
Finance	Long-Term Financing	
	Interest Rate	

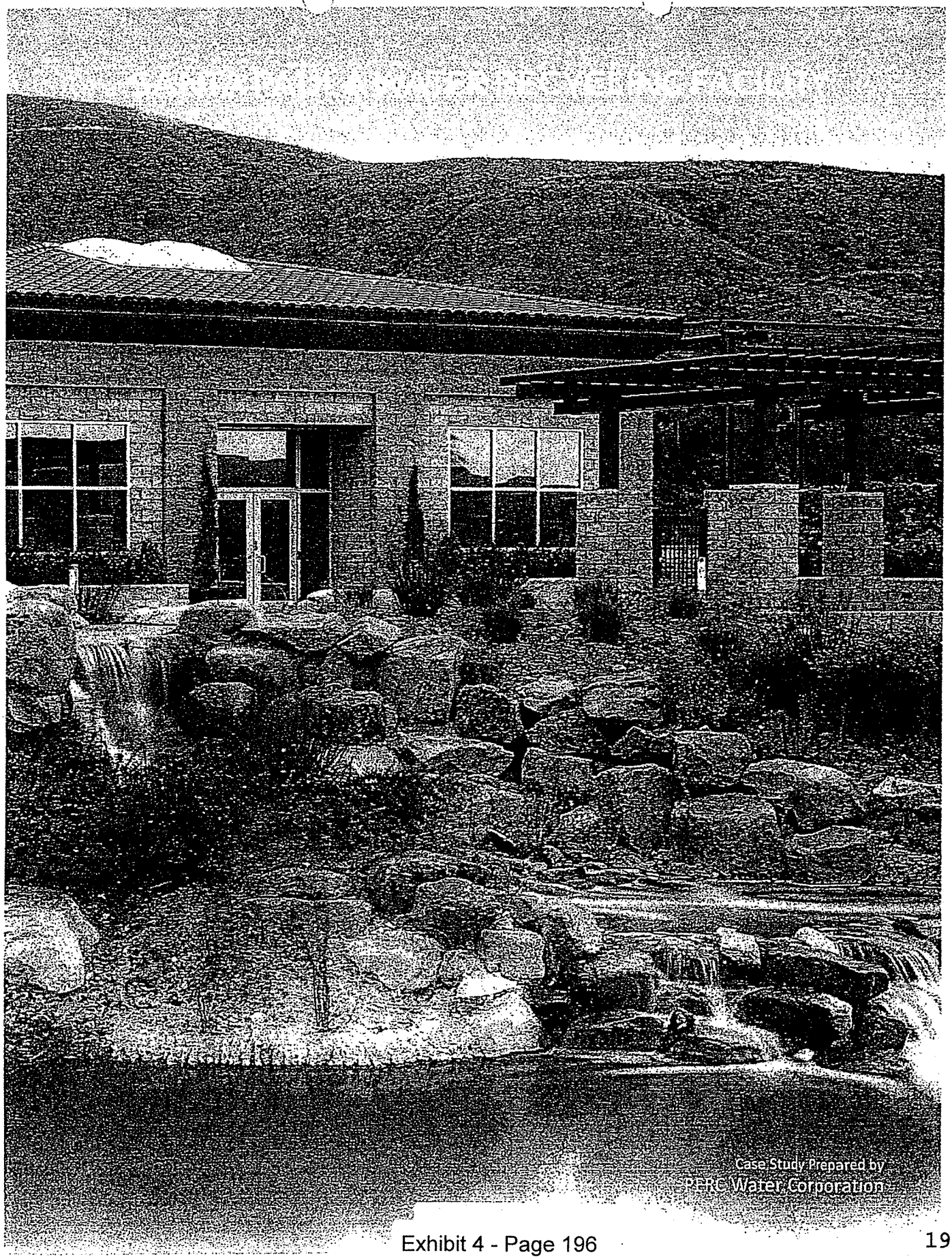
CONTRACT OPERATIONS

Contract Operations is a service of operations and maintenance performed by a private entity under contract with an Owner, whether a public agency of private industrial Owner. Contract Operations is a service offered by many private companies and could be integrated into a DBO / DBOF contract or separately as a stand-alone contract.

Contract Operations firms usually provide services of operations, maintenance, equipment replacements and other services necessary to maintain public infrastructure, and very often limited to an "a la carte" type contract. An extension of Contract Operations is Asset Management, which is a significantly broader offering by the private sector. Asset Management will include additional services, including:

- Operating Staff
- Maintenance Staff
- Engineering Services and Support
- Construction Services and Support
- Energy efficiency and guarantees
- Capital replacement obligations
- Security Management
- Total maintenance responsibility
- Permit facilitations / regulatory relations
- SCADA / CMMS Software Upgrades
- Alternative energy management
- Laboratory Services

ADVANTAGES	DISADVANTAGES
Owner Transfers Risk to Operator	Public Employees Transition to Operator
Guarantee of Water Quality	Education of Contract Operations
Guarantee of Bio-Solids	Operator may not be Designer or Builder
Certainty of O&M Costs	
Certainty of Energy Costs	
Certainty of Capital Replacements	
Long Term OEM Relationships	


Case Study Prepared by
PERC Water Corporation

SANTA PAULA WATER RECYCLING FACILITY

Innovative Solutions to Municipal Wastewater Problems

The City of Santa Paula faced a challenge that is common to many municipalities – its wastewater treatment facility was out of compliance and needed replacement and the City did not have sufficient funds to pay for a new facility. Additionally, the Regional Water Quality Control Board mandated a tight completion and compliance deadline or the City would be required to pay more than $8 million dollars in fines.

Project Delivery Solution: DBOF

Santa Paula is located just north of Los Angeles in Ventura County, California and has a population of approximately 30,000. Their original wastewater facility was built in 1939 and despite several upgrades and modifications it did not comply with the state requirements and had reached the end of its useful service life. The Regional Board agreed that if the City could come into compliance by December 15, 2010, they would waive the $8 million in fines.

The City initially chose the conventional design-bid-build approach funded by public tax-exempt municipal bonds to build the new facility but after years of work and significant financial commitments into engineering studies, the City Council and Staff realized this method would not meet their tight timeline or budget requirements. In July 2007, the City Council approved the design-build-operate-finance (DBOF) method of procurement and began an RFQ/RFP selection process for the new facility.

The goals and objectives of the City were to:

1. obtain certainty of financing over the long term
2. be compliant by the Regional Board deadline and eliminate the fines
3. establish certainty of capital and operating costs
4. improved efficiency and effectiveness of the City's operations and maintenance
5. lowest overall rates to the citizens of Santa Paula

Santa Paula's Vice Mayor Bob Gonzales was Mayor at the time the DBOF contract was signed and he said, "The cost of doing business was significant for us. We had to build a new wastewater treatment facility and we did not have the necessary funds. The DBOF delivery method gave the City a lot more latitude and the risk was transferred to the company who was doing the work."

In May 2008, the City Council awarded the DBOF contract to Santa Paula Water, LLC, a joint venture of PERC Water Corporation and Alinda Capital Partners.

DBOF Project Structure

PERC Water, a water recycling company that designs, builds, operates and manages water recycling facilities, teamed with Alinda Capital Partners, an independent investment firm that specializes in infrastructure investments, to form Santa Paula Water. As permitted under CA Government Code 5956, Santa Paula Water entered into a service agreement with the City to design, build, operate and finance the new facility over a 30-year concession, the longest such agreement for a new wastewater treatment/water recycling facility in the United States.

The facility was 100% privately funded and the City was not required to pay any up front capital costs towards the design and construction. Once the facility was in full operation, the City began paying a monthly service fee that includes facility operations and maintenance, debt service, capitalized interest during construction and 30-years of capital replacements. The City made its first payment toward the facility in July 2010.

The DBOF Service Agreement between Santa Paula Water LLC and the City includes:

- Guaranteed schedule to meet Regional Board's compliance date
- Guaranteed water quality to meet Regional Board's present effluent requirements
  - Title 22 Unrestricted Reuse
  - Class B Biosolids
- Guaranteed debt and equity financing for 30 years
  - Including all risk on interest rates
  - Including all risk on market financing terms
  - Transfer ownership from Santa Paula Water to the City after 30 years at no cost to the City
- Energy/Power Risk and Responsibility
- Exit Standards upon transfer to the City
- Service Fees include:
  - Capital Repayments based on agreed upon schedule
  - Capital Replacements
  - Fixed O&M Cost
  - Variable O&M Cost
  - Expansion from 3.4 MGD to 4.2 MGD (no additional capital cost)

PERC Water entered into an agreement with Santa Paula Water LLC to design, build and operate the new Facility for the 30-year term. Upon completion of the construction, PERC Water began providing Total Asset Management of the Facility for the 30-year term.

The DBO Agreement between Santa Paula Water LLC and PERC Water includes:

- Guaranteed schedule to meet Regional Board's compliance date

- Guaranteed water quality to meet Regional Board's present effluent requirements
  - Title 22 Unrestricted Reuse
  - Class B Biosolids
- Fixed design/build cost
- Total Asset Management for 30 tear term
  - Fixed O&M cost
  - Expansion from 3.4 MGD to 4.2 MGD (no additional capital cost)
  - Capital Replacements responsibility
  - Energy / Power risk and responsibility
  - Exit Standards upon transfer to the City

Facility Design Overview

PERC Water developed a membrane bioreactor (MBR) process design where the majority of the treatment occurs in underground tanks. The tanks require approximately three-quarters of an acre of land and are built mostly below the existing grade. The tanks utilize common wall construction, requiring a total volume of 7,000 cubic yards of concrete and less yard piping and conduits. The operations buildings are constructed above the tank structure, reducing land requirements, and contain the process equipment, a laboratory, restrooms, workshop, break rooms and administrative offices. The covered tanks and noise and odor controls makes the facility neighbor-friendly and a positive addition to the surrounding community.

The facility was designed to be built in two phases, allowing for an efficient expansion when additional capacity is required. The tank structure was constructed for both phase one and two at 4.2 million gallons per day (MGD) average dry weather flow (ADWF) but is equipped with membranes needed to treat 3.4 MGD serving a maximum population of approximately 42,500. When it becomes necessary to expand the capacity, additional membranes will be installed into the facility, increasing the rated capacity to 4.2 MGD serving a population equivalent of approximately 52,500. This helps to keep operation and maintenance costs and future construction costs at a minimum.

Major treatment processes include:

- Influent Lift Station
- Screening and Head Works
- Flow Equalization Tanks
- Pre-Anoxic Zone
- Aerobic Zone
- Post–Anoxic Zone
- Membrane Separation Tank

- UV–Disinfection
- Effluent Storage
- Effluent Pump Station
- Percolation Ponds

The solids processes include aerobic digestion and sludge dewatering. All odorous process areas are fully controls with a dual- odor control system.

The effluent is treated to a tertiary level meeting Title 22 requirements and present requirements of the Regional Board. It is currently disposed in thirteen acres of percolation ponds located to the east of the new facility, however the City is drafting an alternate use plan for the recycled water to reclaim and reuse it as an additional revenue stream for the City.

Facility Construction

PERC Water began the engineering of the project on May 6, 2008 following completion and approval of PERC Water's 30% design, which was submitted to the City as part of PERC Water's proposal, and they commenced construction two months later. The facility's design and PERC Water's integrated design-build-operate team allowed the flexibility to start construction two months into the design. The fast-track approach required that the construction drawings and documents for future components of the construction were prepared concurrently with the construction. Construction of the tank structures commenced in September 2008 and was completed in January 2009. Construction of the project was completed in December 2009.

Change orders, including extra work requested by the City, was less than 1.7% of the construction cost, most of which included additional work requested by the City. More than 85% of the construction hours worked on the facility were from local union workers. The project required 180,000 man-hours and had no loss-time accidents.

After completion of construction, PERC Water commenced electrical, mechanical, equipment installation, controls, programming, testing, commissioning and startup. The facility took full flow from the City in May 2010, seven months in advance of its December 15 compliance deadline.

Vice Mayor Gonzales said, "I've never known of a municipal project to be completed on time. I've been involved in a number of different organizations, community college district, city school districts, where finishing six months after the projected completion date is considered a success. This project was completed not just on time but seven months early and I give credit to PERC Water and their team for getting the job done."

Operational Efficiencies

PERC Water is contracted to operate the facility for 30 years. As a result, they invested their own funds in design enhancements during construction to reduce the energy consumption costs. In the first five months of the facility's operation, the power consumption costs have been approximately 35 percent lower than expected.

The energy savings are split 50/50 with the City. Vice Mayor Gonzales said, "The savings are significant for the City of Santa Paula. The benefactors are the rate payers."

These energy-efficient features included:

UV Disinfection – The facility uses the Degremont Technologies' Aquaray® 3X UV Modules which are equipped with amalgam lamps for UV disinfection. Amalgam lamps are the most energy efficient lamps for generating ultra violet light at the high power density required. Additionally, the control system can vary the lamp output to precisely meet the UV dose requirements for disinfection, minimizing the electrical consumption.

Membrane system – The MBR technology combines biological wastewater treatment and membrane filtration into one unit process, producing a consistently high quality effluent in an extremely compact footprint. PERC Water incorporated Koch Membrane Systems' single header PURON™ membrane filtration modules into the MBR design because they are energy efficient and provide significantly lower lifecycle costs.

Aeration system – As membrane scouring and aeration account for nearly half of a facility's power consumption, PERC Water selected energy-efficient air production and usage systems. Most noticeable are the facility's K-Turbo High Speed Turbine blowers which are used throughout the facility's various process areas. The blower's internal variable frequency drives allows PERC Water to control, monitor and specifically adjust the air flow for aeration over a wide range of operations.

Smart controlling system – A proprietary technology developed by PERC Water, the Supervisory Control and Data Acquisition (SCADA) system has the unique ability to gather, display, track and store live data generated by the facility. In an effort to optimize energy consumption, the SCADA system is designed to consistently update operators on the exact status and measurements of all of the facility's processes such as air flow, water flow and tank capacity and will notify operators of abnormal conditions directly to the operator's cell phone. The SCADA system is accessed through Central PERC™, a web application where all the facility's current and historical operational data is integrated within one platform that can be accessed and controlled wirelessly from an iPad, iPhone, Droid or any other web-capable device.

Lighting design – Using a combination of natural lighting, LED lamps, electronic ballast for fluorescent lamps, light sensors and automatic dimming devices, the facility exceeded the state's Title 24 energy-efficiency requirements and Southern California Edison's stringent standard.

As a result of the energy saving measures employed at the facility, PERC Water was awarded the 2009 Sustainability and Resource Protection Award by the *Environmental Business Journal* and a grant through Southern California Edison's "Savings by Design" program to help fund the energy saving technology.

High Quality Water for Reuse

Beginning May 13, 2010, the facility has been fully operational, treating all of the City's wastewater, and in compliance with the Regional Board's waste discharge permit for what the facility is intended to treat.

Table 1 shows the facility's water quality results for the month of October 2010.

Table 1

	Influent	Effluent Permit Requirements	Effluent Results
BOD	340	10	1.1
TSS	283	10	<1
Total Nitrogen	n/a	10	6.0

The City is developing a reuse plan for the effluent produced by the facility to be used within the community.

Awards

Design-Build Institute of America - Western Pacific - Top Tier Water Award 2011
PERC Water was awarded the top level 2011 DBIA Western Pacific "Best Project – Water" Regional Award for implementing "interdisciplinary teamwork, innovation, and problem solving" for the Santa Paula Water Recycling Facility. The Santa Paula Facility was recognized for its ground breaking approach to developing water recycling infrastructure, both in its utilization of the Design – Build – Operate - Finance (DBOF) delivery method and its innovative design.

Environmental Business Journal 2010 Business Achievement Award - Project Merit
For the second year in a row, the EBJ selected PERC Water as a 2010 Award Recipient, this year in the Project Merit category for "the design, construction, and operation of the Santa Paula Water Recycling Facility." According to the EBJ, this projects accomplishments include: 100% private funding in a

challenging financial environment, completion seven months heads of mandated deadline, no up-front capital costs for the City, power consumption costs are 35% lower than expected, small footprint and virtually no odor or noise as a result of underground process tanks, etc.

Environmental Business Journal 2009 Business Achievement Award - Sustainability & Resource Protection
The EBJ selected PERC Water as a 2009 Sustainability and Resource Protection Award recipient as a result of our efforts to deploy "energy-saving technology" at the Santa Paula, California Water Recycling Facility. They stated our innovative lighting, membrane scouring and aeration, and SCADA system designs will save up to 15% in wastewater treatment power consumption costs while maintaining quality and efficiency.

Global Water Intelligence – Water Deal of the Year 2009
PERC Water was presented the Global Water Awards' 2009 "Water Deal of the Year" Award of Distinction for our utilization of public-private partnerships in our contract to design, build, operate and finance the Santa Paula Water Recycling Facility. Al Gore, former Vice President of the United States and Nobel laureate, presented the award at a banquet in Zurich, Switzerland hosted by Global Water Intelligence (GWI), one of the premier international news magazines for professionals in the water sector. The Water Deal of the Year award recognizes deals that have made the biggest contribution to the advancement of public-private partnerships in the international water sector in 2008. GWI stated the decision made by the city of Santa Paula to use private sector funding demonstrates a "bold new direction in the financing of US water infrastructure" and described the deal as a "ground-breaking transaction which can be emulated across the United States."

Additional Information

For more information regarding the Santa Paula Water Recycling, please visit www.percwater.com and view the video "The Santa Paula Solution."

San Joaquin River
Parkway and
Conservation Trust, Inc.

To Whom It May Concern:

This letter is written with reference to the Friant Ranch Project ("Project") approved by the Fresno County Board of Supervisors on February 1, 2011. The San Joaquin River Parkway and Conservation Trust, Inc. ("Parkway Trust") is a Party to the Friant Ranch Project Settlement Agreement ("Agreement") dated 14th of February, 2014, which settled litigation regarding the Project. By providing guaranteed funding to help restore and maintain vital recreational facilities along the San Joaquin River Parkway, the Agreement helps ensure that adequate regional park facilities will be available to all residents of Fresno County and the surrounding region.

In light of the benefits achieved by this Agreement, which addresses the Parkway Trust's major concerns about the Project, the Parkway Trust has does not oppose the Project or any approvals for the Project consistent with the terms of the Agreement. Anyone who purports to represent the Parkway Trust and claims that the Trust opposes the Friant Ranch Project does not represent the Parkway Trust or its position on the Project.

By: _____
Dave Koehler,
Executive Director

By: _____
George Folsom,
Board President

CUP 3415
RECEIVED
COUNTY OF FRESNO
MAR 19 2014
DEPARTMENT OF PUBLIC WORKS AND PLANNING
DEVELOPMENT SERVICES DIVISION

555714.2

EXHIBIT 5

FRIANT RANCH L.P.

March 7, 2016

Mr. William Kettler
Division Manager
Fresno County Department of Public Works
2220 Tulare Street, 6th Floor
Fresno, CA 93721

RE: Friant Ranch L.P. Conditional Use Permit 3415 Time Extension

Dear Mr. Kettler:

Attached for submission to the County of Fresno is the Conditional Use Permit 3415 (CUP) time extension application for the wastewater recycling facility located at the Beck Ranch property. Significant progress has occurred under the approved CUP including the completion of tertiary water distribution system for agriculture irrigation, geotechnical studies and 60% design of the engineering and construction plans. The extension is required for completion of the plans and the County review process necessary for commencement of construction. The application is being submitted by SWD Investments as Owner of Beck Ranch and Friant Ranch L.P. as applicant.

Enclosed is check #3202 in the amount of $1,401.25 for the extension fee and Sec. 15162 routing fee. Please do not hesitate to contact me for any additional information required to complete approval of this time extension request.

Sincerely,

By: SWD Investments - Friant Ranch, Inc., G.P.

By: Bryan Wagner, Secretary

7110 N. Fresno, Suite 340 Fresno, CA 93720