

1 **GUAM CONSOLIDATED COMMISSION ON UTILITIES**

2 **RESOLUTION NO. 49-FY2016**

3 **RELATIVE TO APPROVAL OF CHANGE ORDER NO. 3 FOR**
4 **THE CENTRAL GUAM RESERVOIRS DESIGN PROJECT**

5
6 **WHEREAS**, under 12 G.C.A. § 14105, the Consolidated Commission on Utilities
7 (“CCU”) has plenary authority over financial, contractual and policy matters relative to the
8 Guam Waterworks Authority (“GWA”); and

9
10 **WHEREAS**, GWA is a Guam Public Corporation established and existing under the
11 laws of Guam; and

12
13 **WHEREAS**, GWA is currently working on critical reservoir projects under the 2011
14 Court Order (“CO”) Paragraph 29 – Storage Tank/Reservoir Repair, Replacement, and
15 Relocation Program; and

16
17 **WHEREAS**, Resolution No. 21-FY2015 (Exhibit A – Resolution 21-FY2015)
18 authorized funding of Two Million Five Hundred Fifty Two Thousand Four Hundred Forty Five
19 Dollars (\$2,552,445.00) plus 10% contingency of Two Hundred Fifty Five Thousand Two
20 Hundred Forty Four Dollars and Fifty Cents (\$255,244.50) bringing the total authorized funding
21 to a maximum of Two Million Eight Hundred Seven Thousand Six Hundred Eight Nine Dollars
22 and Fifty Cents (\$2,807,689.50); and

23
24 **WHEREAS**, following CCU approval in Resolution No. 21-FY2015, GWA contracted
25 with GHD in the amount of Two Million Five Hundred Fifty Two Thousand Four Hundred Forty
26 Five Dollars (\$2,552,445.00) to provide design services for the Central Guam Reservoirs, which
27 includes:
28

- 29 (1) site investigations and system evaluations at Hyundai, Pulantat/Manenggon, Chaot No. 2,
30 Tumon No. 1 (Airport), Tumon No. 2 (Nissan), and Piti reservoir sites; and
31 (2) development of design plans and specifications for various sized concrete reservoirs
32 ranging from 0.5 MG to 2.0 MG nominal capacities, booster station upgrades,

1 instrumentation and control upgrades, control valves upgrades, pipe upgrades, and other
2 general site and system upgrades; and

3
4 **WHEREAS**, GWA issued Change Orders No. 1 and No. 2 to GHD for additional
5 services that were required due to needs for land acquisition for various project sites and
6 additional water distribution system upgrade design needed for the Hyundai Reservoir service
7 zones in which the total value of the Contract was increased to Two Million Eight Hundred
8 Seven Thousand Six Hundred Eight Nine Dollars (\$2,807,689.00); and

9
10 **WHEREAS**, GWA engineering had further determined through the course of the design
11 work with the engineering consultant that additional water distribution system improvements
12 associated with the above noted reservoirs are required to meet the water distribution system
13 rezoning plan that is intended to improve water system functionality and reliability; and

14
15 **WHEREAS**, GWA management finds that the design of the necessary water distribution
16 system improvements would be best handled by the current design consultant given the
17 alternative solutions were provided by them thus GWA could expect the final design to be
18 completed expeditiously and that savings in design services would be realized as opposed to
19 putting out a whole new Request for Proposal for the necessary water distribution system
20 improvements; and

21
22 **WHEREAS**, GWA is requesting for additional design work which includes the
23 following (Exhibit B – Scope of Work and Fees):

- 24
25 (1) design work for disconnection of the 11 A-series deep wells from Chaot No. 1, Chaot
26 No. 2, and Agana Heights Reservoir distribution waterlines to eliminate cross
27 connections,
28 (2) design work for the rehabilitation existing pressure reducing valve for the Chaot
29 distribution line, upgrades to the centralize chlorination and SCADA systems at Chaot
30 No. 1, Chaot No. 2, and Agana Heights Reservoir sites to allow the system to function
31 properly,
32

- 1 (3) design for new pressure reducing valves and associated appurtenances for Tumon No. 1
2 and Tumon No. 2 reservoir systems,
- 3 (4) design for rehabilitating existing pressure reducing valve and associated appurtenances
4 for Tumon No. 2 reservoir system,
- 5 (5) design for SCADA connections for all new and upgraded pressure reducing valves and
6 flow meters,
- 7 (6) design for SCADA connections for Tumon No. 1, Tumon No. 2, Manenggon, and Piti
8 Reservoirs,
- 9 (7) escrow and purchasing fees associated with GWA's acquisition of a portion of Lot 177-
10 1 for the new Pulantat/Manenggon Reservoirs,
- 11 (8) design of a fire pump and electrical improvements for the new Hyundai Reservoir
12 booster pump station to meet fire flow code requirements,
- 13 (9) additional survey, geotechnical, archeological, and appraisal work for Tumon No. 1
14 Reservoir will be required should the Guam International Airport Authority (GIAA)
15 require GWA to move the existing reservoir to a new location,
- 16 (10) additional geotechnical, archeological, appraisal, booster station design, and off site
17 piping work for Piti Reservoir will be required should the U.S. National Park Services
18 (NPS) require GWA to move the existing reservoir to a new location.
19

20
21 **WHEREAS**, GWA engineering and GHD negotiated the price for the services to be
22 provided in the amount of Six Hundred Eighty Thousand Five Hundred Forty Eight Dollars
23 (\$680,548.00); and

24
25 **WHEREAS**, GWA Management is seeking CCU approval of the fee proposal relative to
26 Change Order No. 3 in the amount of Six Hundred Eighty Thousand Five Hundred Forty Eight
27 Dollars and Zero Cents (\$680,548.00) to fund the additional design services; and

28
29 **WHEREAS**, GWA Management further seeks CCU approval of the total authorized
30 funding for the design contract with GHD, Inc. to Three Million Four Hundred Eighty Eight
31 Thousand Two Hundred Thirty Seven Dollars and Fifty Cents (\$3,488,237.50); and
32

1 **WHEREAS**, funding for this project will be from 2013 and/or 2015 Bond Funds under
2 CIP line item PW 09-11 Water System Reservoirs 2005 Improvements; and

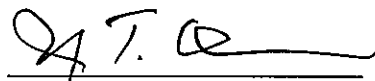
3
4 **NOW BE IT THEREFORE RESOLVED**, the Consolidated Commission on Utilities
5 does hereby approve the following:

- 6
7 1. The recitals set forth above hereby constitute the findings of the CCU.
8 2. The CCU finds that the terms of the fee proposal submitted by GHD is fair
9 and reasonable.
10 3. The CCU finds that the terms of the conditions set by GWA relative to
11 commencement of subsequent work activities are fair and reasonable and
12 serve as a measure of Quality Assurance/Quality Control (QA/QC).
13 4. The CCU hereby authorizes GWA management to execute Change Order No.
14 3 in the amount of Six Hundred Eighty Thousand Five Hundred Forty Eight
15 Dollars (\$680,548.00) (Exhibit B).
16 5. The CCU further approvals increasing the total authorized funding for the
17 design contract with GHD, Inc to Three Million Four Hundred Eighty Eight
18 Thousand Two Hundred Thirty Seven Dollars and Fifty Cents (\$3,488,237.50)
19 6. Funding source will be CIP PW 09-11 Water System Reservoir 2005
20 Improvements.
21

22 **RESOLVED**, that the Chairman certified and the Board Secretary attests to the adoption
23 of this Resolution.
24

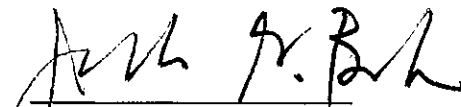
25
26 **DULY AND REGULARLY ADOPTED**, this 26th day of July 2016.

27
28 Certified by:

29 

30 **JOSEPH T. DUENAS**
31 Chairperson

32 Attested by:



J. GEORGE BAMBA
 Secretary

1 I, J. George Bamba, Board Secretary of the Consolidated Commission on Utilities as
2 evidenced by my signature above do hereby certify as follows:

3 The foregoing is a full, true and accurate copy of the resolution duly adopted at a regular
4 meeting by the members of the Guam Consolidated Commission on Utilities, duly and
5 legally held at a place properly noticed and advertised at which meeting a quorum was
6 present and the members who were present voted as follows:

6 AYES: _____ 4 _____
7 NAYS: _____ 0 _____
8 ABSTENTIONS: _____ 0 _____
9 ABSENT: _____ 1 _____



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EXHIBIT A

GUAM CONSOLIDATED COMMISSION ON UTILITIES RESOLUTION NO. 21 – FY2015

RELATIVE TO CONTRACT APPROVAL FOR THE CENTRAL GUAM RESERVOIRS DESIGN SERVICES

1 **WHEREAS**, under 12 G.C.A. § 14105, the Consolidated Commission on Utilities
2
3 **RELATIVE TO CONTRACT APPROVAL FOR THE**
4 **CENTRAL GUAM RESERVOIRS DESIGN SERVICES**
5
6 **WHEREAS**, under 12 G.C.A. § 14105, the Consolidated Commission on Utilities
7 **RELATIVE TO CONTRACT APPROVAL FOR THE**
8 **CENTRAL GUAM RESERVOIRS DESIGN SERVICES**
9
10 **WHEREAS**, the Guam Waterworks Authority (“GWA”) is a Guam Public Corporation
11 established and existing under the laws of Guam; and
12

13 **WHEREAS**, GWA is currently working on critical reservoir projects under the 2011
14 Court Order (“CO”) Paragraph 29 – Storage Tank/Reservoir Repair, Replacement, and
15 Relocation Program; and
16

17 **WHEREAS**, GWA has advertised the Request For Proposals (RFP-09-ENG-2014)
18 soliciting statement of qualifications from experienced and qualified engineering firms for the
19 preparation of design plans and specifications for the Central Guam Reservoirs; and
20

21 **WHEREAS**, the Central Guam Reservoirs design project includes site investigations
22 and system evaluations at the Hyundai, Pulantat/Manenggon, Chaot #2, Tumon #1 (Airport),
23 Tumon #2 (Nissan), and Piti reservoir sites, development of design plans and specifications for
24 various sized concrete reservoirs ranging from 0.5 MG to 2.0 MG nominal capacities, booster
25 station upgrades, instrumentation and control upgrades, control valves upgrades, pipe
26 upgrades, and other general site upgrades; and
27

28 **WHEREAS**, RFP packages were downloaded by forty five (45) interested parties,
29 from which GWA received proposal submittals from nine (9) firms before the RFP submittal
30 deadline; and
31

32 **WHEREAS**, the GWA A-E Selection committee reviewed and evaluated the nine (9)
 proposals (see EXHIBIT A – Evaluation Score) and generated a short list of the top four (4)

1 firms with a recommendation to award a contract to the firm GHD, Inc. ("GHD") and any
2 successor at interest thereto (see EXHIBIT B – Evaluation Summary and GM Determination);
3 and

4
5 **WHEREAS**, GHD and GWA negotiated the price for the services to be provided in the
6 amount of Two Million Five Hundred Fifty Two Thousand Four Hundred Forty Five Dollars
7 (\$2,552,445.00) (see EXHIBIT C – Fee Proposal); and

8
9 **WHEREAS**, GWA management seeks approval of the fee proposal amount of Two
10 Million Five Hundred Fifty Two Thousand Four Hundred Forty Five Dollars (\$2,552,445.00),
11 plus a ten percent (10%) contingency of Two Hundred Fifty Five Thousand Two Hundred
12 Forty Four Dollars and Fifty Cents (\$255,244.50) to bring the total authorized funding amount
13 to a maximum of Two Million Eight Hundred Seven Thousand Six Hundred Eighty Nine
14 Dollars and Fifty Cents (\$2,807,689.50); and

15
16 **WHEREAS**, funding for this project will be from the 2010 and 2013 Bond Funds
17 under the line items CIP PW 09-11 Water System Reservoirs 2005 Improvements, CIP PW 12-
18 04 Agana Heights and Chaot Tank Construction, and CIP PW 12-06 Tank Replacements Piti &
19 Hyundai Tanks; and

20
21 **WHEREAS**, GWA management recommends that a contract be entered into with
22 GHD in the aforementioned amount.

23
24 **NOW BE IT THEREFORE RESOLVED**, the Consolidated Commission on Utilities
25 does hereby approve the following:

- 26
- 27 1. The recitals set forth above hereby constitute the findings of the CCU.
 - 28 2. The CCU finds that the terms of the fee proposal submitted by GHD are fair
29 and reasonable.
 - 30 3. The CCU finds that the terms of the conditions set by GWA relative to
31 commencement of subsequent work activities are fair and reasonable and
32 serve as a measure of Quality Assurance/Quality Control (QA/QC).

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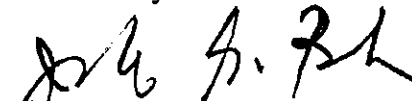
- 4. The CCU hereby authorizes the management of GWA to enter into a contract with GHD, in the amount of Two Million Five Hundred Fifty Two Thousand Four Hundred Forty Five Dollars (\$2,552,445.00).
- 5. The CCU hereby further approves the total funding amount for this project of Two Million Five Hundred Fifty Two Thousand Four Hundred Forty Five Dollars (\$2,552,445.00), plus a ten percent (10%) contingency of Two Hundred Fifty Five Thousand Two Hundred Forty Four Dollars and Fifty Cents (\$255,244.50) to bring the total authorized funding amount to a maximum of Two Million Eight Hundred Seven Thousand Six Hundred Eighty Nine Dollars and Fifty Cents (\$2,807,689.50);

RESOLVED, that the Chairman certified and the Board Secretary attests to the adoption of this Resolution.

DULY AND REGULARLY ADOPTED, this 24th day of March 2015.

Certified by:

Attested by:

JOSEPH T. DUENAS
Chairperson

J. GEORGE BAMBA
Secretary

I, J. George Bamba, Board Secretary of the Consolidated Commission on Utilities as evidenced by my signature above do hereby certify as follows:

The foregoing is a full, true and accurate copy of the resolution duly adopted at a regular meeting by the members of the Guam Consolidated Commission on Utilities, duly and legally held at a place properly noticed and advertised at which meeting a quorum was present and the members who were present voted as follows:

AYES:	<u>5</u>
NAYS:	<u>0</u>
ABSTENTIONS:	<u>0</u>
ABSENT:	<u>0</u>



GUAM WATERWORKS AUTHORITY

DNA Building, Suite 502 • 238 Archbishop Flores Street • Hagatna, Guam 96910

January 6, 2015

To: Barbara C. Cruz, P.E., Acting Chief Engineer

From: Gloria P. Bensen
Chairperson, Consultant Selection Board

Subject: RFP-09-ENG-2014 Design Services for:
PW 12-04 Central Guam Reservoirs – GWA Project No.W14-006-BND

The Selection Committee met on December 30, 2014 to conduct the Architect-Engineer shortlist for the above referenced project. The four (4) firms short listed by the committee for interviews are ranked 1-4 below.

EVALUATION COMMITTEE MEMBERS	
Name	Title
Mauryn McDonald	Engineer Supervisor
Garrett Yeoh	Senior Engineer
Marc Lopez	Associate Engineer
Joey Cheng	PMO, Brown & Caldwell

GROSS SCORE SUMMARY						
Consultant	Evaluation Score				Total	Rank
1. N.C. Macario & Associates, Inc.	71	73	71	65	279	7
2. SSFM International	75	80	80	79	314	4
3. EMPSCO Engineering Consultants	56	56	55	57	224	9
4. GHD Inc.	77	93	88	88	346	1
5. LYON	74	68	75	63	280	6
6. E.M. Chen & Associates, Inc.	60	71	65	62	258	8
7. Duenas, Camacho & Associates	74	83	78	75	310	5
8. HDR	79	91	85	75	330	3
9. AECOM	79	94	95	76	344	2

Scores were evaluated based on straight average of the individual scores as well as an average of the scores after eliminating the high and low scores. The results were the same for both and therefore the recommendation of the evaluation committee is shown in the ranking above.

Please review and approve at your earliest convenience so that we may proceed with the notification letters.

Approved to proceed with the Top 4 AE firms as listed above.

[Signature] 1/7/2015
Barbara Cruz Date



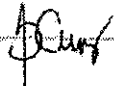
GUAM WATERWORKS AUTHORITY

DNA Building, Suite 502, 238 Archbishop Flores St., Hagatna, Guam 96910 • Tel. (647) 646-7810

MEMORANDUM

January 14, 2015

To: Thomas F. Cruz, P.E.
Interim General Manager

From: Barbara C. Cruz, P.E. 
Acting Chief Engineer

Subject: RFP-09-ENG-2014 Evaluation Summary
PW 12-04 Central Guam Reservoirs- GWA Project No. W14-006-BND

The Selection Committee has completed all necessary actions for selecting the most qualified consultant for the referenced solicitation. All proposals were reviewed and scored according to the conditions established in the solicitation and shortlisted firms were interviewed.

The committee recommends the following top four (4) firms in order of preference for the project:


- 1. GHD Inc.
- 2. AECOM
- 3. HDR
- 4. SSFM

The evaluation summary sheet is attached for your information.

GENERAL MANAGER'S DETERMINATION

Consultant Firm Selected: GHD Inc.

Remarks:


THOMAS F. CRUZ, P.E.
Interim General Manager

1/15/15
Date



GUAM WATERWORKS AUTHORITY

DNA Building, Suite 502 • 238 Archbishop Flores Street • Hagatna, Guam 96910

January 15, 2015

To: Barbara C. Cruz, P.E., Acting Chief Engineer

From: Gloria P. Bensaon 
Chairperson, Consultant Selection Board

Subject: RFP-09-ENG-2014 Design Services for:
PW 09-11 Northern and Southern Guam Reservoirs- GWA Project No. W14-007-BND
PW 12-04 Central Guam Reservoirs- GWA Project No. W14-006-BND

The Selection Committee met on January 13, 2015 to conduct the A-E interviews for the above referenced projects. The following information is intended to document the evaluation process undertaken for the referenced project.

EVALUATION COMMITTEE MEMBERS	
Name	Title
Mauryn McDonald	Engineer Supervisor
Garrett Yeoh	Senior Engineer
Marc Lopez	Associate Engineer
Joey Cheng	PMO, Brown & Caldwell

PW 12-04 Central Guam Reservoirs- GWA Project No. W14-006-BND						
GROSS SCORE SUMMARY						
Consultant	Evaluation Score				Total	Rank
1. SSFM International	78	80	76	82	316	4
2. GHD Inc.	86	94	90	100	370	1
3. HDR	80	91	80	82	333	3
4. AECOM	80	91	84	91	346	2

PW 09-11 Northern and Southern Guam Reservoirs- GWA Project No. W14-007-BND						
GROSS SCORE SUMMARY						
Consultant	Evaluation Score				Total	Rank
1. GHD Inc.	86	94	90	100	370	2
2. HDR	80	91	80	73	324	4
3. AECOM	80	91	84	82	337	3
4. TG Engineers, PC	88	95	95	100	378	1

-End of Summary-



GWA Central Guam Reservoirs Design Scope of Work and Fees

I. GENERAL

GHD will provide design services for the Central Guam Reservoirs including Hyundai, Pulantat/Manenggon #1 & 2, Chaot #2, Tumon #2, Piti, and Tumon #1. The design services will consist of preparation of plans, specifications, and estimates which includes a Basis of Design, design calculations, hydraulic modelling and report, computational fluid dynamic modelling (CFD), construction schedule estimate, topographical survey, property research, property mapping, geotechnical report, cultural resource inventory and evaluation of historic resources, hazardous materials survey, construction documents, design drawings in Auto CAD, permit applications, construction bid support services, and response to requests for interpretation/information during construction.

GHD will evaluate the four wall types of ANSI/AWWA D110 tanks and provide GWA a recommendation. The new reservoirs shall conform to the type selected by GWA.

Reports, plans, specifications and other documents submitted to GWA shall be in a form approved by GWA's Chief Engineer.

II. PROJECT OVERVIEW

The design for the Central Guam Reservoirs project will include seven different reservoirs at six locations. The following is a description of the existing sites and key elements of the proposed scope of work for each:

A. Tumon #1 Reservoir Site

The project site is located off Route 10A near the Antonio B. Won Pat International Airport. The site contains an existing 1.0 MG ground steel reservoir built in the 1960's that is currently online. The proposed 2.0 MG concrete reservoir may be located adjacent to the existing reservoir on property that will need to be acquired by GWA. GHD shall analyse the optimum location for the reservoir and initiate dialogue with the Guam International Airport Authority to acquire land that will have enough room for future reservoirs. GHD will perform land appraisal services. The steel reservoir will be inspected by GWA once the new reservoir is completed.



Guam International Airport Authority (GIAA) requested that the new reservoir be relocated because of proposed road expansion. Possible locations will be investigated, as well as storage volume and elevation requirements. The option of moving the tank into the hillside and farther away from the road will be discussed with GIAA and GWA. The construction of the new tank must be completed by November 2018.

B. Tumon #2 Reservoir Site

The project site is located off Marine Corps Drive behind the Nissan auto dealership. The site contains an existing 1.0 MG ground steel reservoir that is currently offline. According to GWA, the current configuration of the tank and piping causes the tank to fill but not empty leading to stagnation issues. The piping shall be designed to provide separate inlet and outlet pipes and connect the outlet to piping on Pale San Vitores Road which feeds lower Tumon. An existing PRV may need replaced by St. John's School. The existing water surface elevation may also be 17 feet too high.

GHD will analyse the system. The existing tank may be rehabilitated. GHD will perform a life cycle cost analysis and provide recommendations. GWA will determine new construction or repair based on the recommendations. GHD will review storage volume requirements and may initiate dialogue with the property owner of the strip of property immediately behind the existing tank site if it would be beneficial to GWA. The construction of the new 1.0 MG tank must be completed by November 2018.

C. Chaot #2 Reservoir Site

The project site is located off a dirt road near Dero Drive in Ordot. The site contains a central chlorination building. The Chaot #1 reservoir is under construction. Chaot #1 construction is expected to be completed 4th quarter 2014.

The new 0.5 MG reservoir will be designed adjacent to the Chaot #1 reservoir. GHD shall evaluate the existing chlorination system and design any upgrades or adjustments if necessary to provide a system that uses the tanks for chlorination contact time. GHD shall incorporate any changes necessary for the chlorination system to function with both the reservoirs; each separately and with the source wells. The design will include any required baffles and manifolds within the new reservoir. The construction of the new tank must be completed by November 2018.

D. Hyundai Reservoir Site

The project site is located off a dirt road near Sabana Road in Barrigada Heights. The site contains a 1.0 MG ground steel reservoir that is currently online. The steel reservoir will be inspected by GWA once the new reservoir is completed. GWA expects that the existing tank will need significant repairs.



A new 1.0 MG reservoir will be designed adjacent to the existing steel reservoir. There is plenty of property for the new tank. The property is not under GWA ownership and GHD will assist with the transfer including property research. There are residences that have low pressure in the vicinity of the tank. GHD is assuming that a small pump station, piping, and a generator and fuel tank will be part of the design to provide higher pressure to these residences. The construction of the new tank must be completed by November 2016.

E. Pulantat/Manenggon Reservoirs Site

The project site is located off Chalan Teleforo in Yona. The site contains an existing 1.0 MG ground steel reservoir that is currently online but leaking. GHD will assume that the existing tank will be demolished after the new reservoirs are on-line. Two new, 1.0 MG reservoirs will be built at this location. There is enough property to construct the new 1.0 MG reservoirs adjacent to the existing tank. However, the new reservoirs may be relocated near the Manenggon reservoir if the hydraulic analysis shows this to be a better option. Property acquisition may be required if the new tanks are located at the Manenggon site. GHD shall initiate dialogue with adjacent property owner. GHD will include performing land appraisal.

The hydraulic analysis will verify the elevation requirements of the new tanks and the adequacy of the pump stations supplying the reservoir. GHD is assuming that they will provide a topographic survey, archaeological investigation and geotechnical investigation of both sites and for both reservoirs so that, when the hydraulic analysis is complete, the design will not be delayed. GHD is assuming we will provide the reservoir design for the preferred site. The reservoirs will be separated into two separate bid packages. GHD will verify the pump sizes at the Pago Bay Pump Station supplying the existing Pulantat Reservoir and is assuming the pumps will require resizing as part of the design. The construction of one of the new tanks must be completed by November 2016.

F. Piti Reservoir Site

The project site is located off Route 6 in Piti. The site contains an existing 0.5 MG ground steel reservoir that is currently offline and will require demolition. The new reservoir may be relocated. Property has not been parcelled off to GWA for the reservoir site. The existing reservoir sits on Federal property. GHD will provide assistance with property acquisition.

The hydraulic analysis will verify the required elevation of the new 1.0 MG reservoir. The water supply is fed from the north and the reservoir is tied to Agana Heights and Tumon #1. According to GWA, the existing tank had difficulty filling. GHD is assuming



that a pump station will be required on Marine Corps Drive will require a generator and fuel tank, and that GWA will assist in finding an acceptable location. The new reservoir may not be located on the same property as the existing tank. The construction of the new tank must be completed by November 2018.

III. DESIGN PHASE TASKS

A. Project Controls:

These services shall be provided to insure that the project is efficiently managed and sufficient data is collected to provide a thorough design.

The project controls for each site shall consist of:

1. Analysis of the existing site conditions and on-site inspection – GHD shall visit each site to determine existing conditions and system configurations including
 - a. Existing site conditions and facilities
 - b. Existing site operation
 - c. Proposed site improvements
 - d. Preliminary site layout
 - e. Research existing property map
 - f. If property acquisition is required, research properties adjacent to GWA property. Work will include initiating dialogue with land owner and land appraisal.
 - g. Demolition requirements
 - h. Grading requirements
 - i. Drainage requirements
 - j. Piping and valving requirements
 - k. Operational requirements
 - l. Fire and emergency storage requirements
 - m. Electrical power supply
 - n. Construction access
 - o. Construction sequencing
 - p. Future expandability
 - q. Laydown area for proposed and future reservoirs and building infrastructure
2. Survey Services – The GHD team will provide surveying services at each site, consisting of property boundary and topographic field survey and preparation of topographical mapping. These services include preparation of topographical and boundary mapping of the tank site including existing facilities above ground within the project area and adjacent sites which may be impacted. The consultant shall make all necessary research for determination of land ownership.



3. **Geotechnical Investigation** – The GHD team will perform geotechnical investigations at each site to assess the stability of the sub-grade and develop a soils report, including field exploration and laboratory tests, corrosion, and seismic investigations. The geotechnical investigations will assess the general conditions of the project site and provide design recommendations for the proposed tank and ancillary facilities including the following:
 - a. Characterization of earth materials and ground water level
 - b. Development of seismic design criteria for a concrete storage tank per 2009 IBC
 - c. Determination of bearing pressure and settlement
 - d. Lateral earth pressures - static and seismic
 - e. Assessment of liquefaction potential
 - f. Foundation design of the proposed water storage tank and ancillary structures
 - g. Earthwork requirements
4. **Hazardous Materials Survey** – The GHD team will perform hazardous materials survey on existing sites, consisting of lead-based paint testing of four on-site paint samples from the reservoir interior and exterior surfaces by a qualified material testing firm. Paint testing is assumed to be conducted at the Tumon #1, Hyundai, and Pulantat/Manenggon reservoirs. Oiled sand testing under the reservoir floor is assumed to be required for the Piti and Tumon #2 (Nissan) reservoirs.
5. **Archaeological Services** – The GHD team will provide archaeological services at each site to determine any adverse impact of the project on cultural resources and to make recommendations regarding their historical properties. This shall include a technical report, which defines background research, field methodology, results of survey and mitigation recommendations. The archaeological party will conduct cultural resource inventory and evaluation of historic resources that might be affected by this project. This will require preparing and submitting an inventory survey plan, conducting inventory survey, and reporting to the Department of Parks and Recreation/Guam Historic Preservation Office and all other required agencies (which may include Department of Agriculture, Guam Environmental Protection Agency, U.S. Fish and Wildlife Services, and etc.) regarding the project and recommendations as to eligibility and effect from the undertaking. The technical report will include background research, field methodology, results of survey and mitigation recommendations. The Department of Parks and Recreation/Guam Historic Preservation Office will be consulted for each site to verify their requirements prior to undertaking the investigations.
6. **Tank Evaluation** – GHD will evaluate and compare all four wall types of ANSI/AWWA D110 Wire- and Strand-Wound, Circular, Prestressed Concrete Water Tanks. A recommendation report will be provided to GWA for



consideration. GWA will review the recommendation and make a decision on what type of tank shall be used in the design of all six reservoirs.

7. Hydraulic Analysis and Report – GHD shall perform reservoir and system hydraulic analysis for each reservoir site. The analysis shall include evaluation of the required storage, fire, and emergency capacity for the service zones, reservoir elevations, and system control valve locations. GHD shall utilize H2ONET software to perform the analysis. GHD shall review and verify the Water System Hydraulic Analysis Report, May 3, 2013, prepared by Brown and Caldwell. A master report for each reservoir site will be produced that can be appended to the Water System Hydraulic Analysis Report by Brown and Caldwell.

Task A Deliverables: Two (2) hardcopies and electronic PDF files of the following: 1) Hazardous Materials Survey Reports; 2) Archaeological Reports; 3) Tank Evaluation Memo, 4) Hydraulic Analysis Reports.

B. Design:

1. GHD will develop a Basis of Design Report. The report will address the following:
 - a. Piping design criteria including size, alignments, tie-in connections of reservoir inlet/outlet to existing inlet/outlet pipeline. Design shall determine if the site requires inlet/outlet piping reconfiguration, tank inlet mixing manifolds/nozzles, tank baffling, etc.
 - b. Geotechnical report and recommendations
 - c. Structural characteristics (Seismic Zone 4)
 - d. Design requirements for valving, electrical, instrumentation and control for on-site monitoring of electrical panels onsite with provisions for connection to a future SCADA system, which may include high/low water alarms, intrusion alarms, security camera footage, flood alarms, hydraulically operated altitude valve, limit switches, water level gauges, flow meters, and transmitters
 - e. Hydraulic system analysis assumptions
 - f. Flow and emergency storage requirements
 - g. Chlorine contact time requirements
 - h. Tank flow mixing requirements
 - i. Site operational flexibility (each site will require a bypass system should the reservoir be needed to be taken down for inspection, maintenance, etc.)
 - j. Reservoir instrumentation and controls
 - k. Site security and lighting requirements
 - l. Tank coating requirements. Decorative designs for exterior coating.
 - m. Proposed locations for system control valves (PRV, PRSV, etc.)



- n. Cost estimate will be a Class 4 cost estimate in accordance with the AACE International Cost Estimate Classification System. All cost will be in current dollars and escalated to the estimated midpoint of construction.
 - o. Proposed construction schedule with major work items for application in the bid documents.
2. GHD will perform modeling for tank flow mixing to determine chlorine contact time requirements and ensure that the requirements are met in the design.
 3. GHD will prepare construction drawings, specifications, cost estimates, construction schedule, supporting design calculations, and all other documents necessary for project construction.
 - a. The design plans will include all necessary piping, valving, fittings, and appurtenances to connect to the existing water system as indicated in the Basis of Design Report. The plan will also include necessary erosion control measures such as erosion control seeding, silt fencing, protection of stockpiled materials, and other necessary measures to mitigate the impact of erosion and sedimentation.
 - b. Based on the Basis of Design report approved by GWA, GHD will prepare and submit the following:
 - Multidiscipline plans to the 30% (preliminary design), 60%, 90%, and 100% completion levels.
 - Specifications at 60%, 90%, and 100% completion levels, which will include front end documents and technical specifications applicable to the indicated completion levels. GHD shall propose any changes to GWA's front end documents for Legal Counsel to review. GHD will work in conjunction with the other design team for the North and South Guam Reservoir Projects to provide GWA an updated and consistent set of specifications to meet the project objectives and current codes.
 - A Basis of Estimate, Estimate Trend Log, Estimate Trend Report, and Risk Analysis shall be prepared.
 - Construction cost estimate update at 60% completion level. This estimate will be a Class 3 estimate in accordance with the AACE International Cost Estimate Classification System. All costs will be in current dollars and escalated to the estimated midpoint of construction.
 - Final construction cost estimate based on quantity takeoffs and the requirements of the 100% design plans and specifications. This estimate will be a Class 2 estimate in accordance with the AACE International Cost Estimate Classification System. All costs will be in current dollars and escalated to the estimated midpoint of construction.



- GHD shall coordinate with relevant agencies such as Guam Environmental Protection Agency, Department of Public Works, and other relevant agencies at the 30%, 60%, 90%, and 100% submittals. This includes submitting design documents (full size plans and specifications at each phase) and maintaining communication throughout the duration of the project and incorporating any relevant regulation requirements in the design.
- 4. GHD will prepare the construction permit application and route the permit through the required government agencies, with the exception of the Contractor's Licensing Board.

Task B Deliverables: Deliverables to GWA will be provided in accordance with the following:

1. 30% phase
 - a. 5 hard copies of the Basis of Design documents
 - b. Digital copy of the Basis of Design
2. 60% phase
 - a. 5 hard copies of the 60% design documents (plan submittal shall consist of 2 sets of 36"x24" sized drawings and 3 sets of 11"x17" sized drawings)
 - b. Digital copy of the 60% design documents
3. 90% phase
 - a. 5 hard copies of the 90% design documents (plan submittal shall consist of 2 sets of 36"x24" sized drawings and 3 sets of 11"x17" sized drawings)
 - b. Digital copy of the 90% design documents
4. Final phase
 - a. 5 hard copies of the final design documents (plan submittal shall consist of 2 sets of 36"x24" sized drawings and 3 sets of 11"x17" sized drawings)
 - b. Digital copy of the final design documents

C. Construction Bid Support Services:

1. Pre-Bid Conference - GHD shall assist GWA with the meeting, provide meeting minutes for the pre-bid conference. The pre-bid conference shall be arranged to inform prospective bidders of the overview of the project. GHD will be present to respond to technical questions involving the design and specifications and will provide formal responses within five working days of the meeting.
2. Request For Information - GHD will assist GWA with preparing answers to questions regarding the bid packages during the bidding phase.
3. Bid Addenda - GHD will provide addenda to the plans, specifications and contract documents as needed during the bidding phase.
4. Bid Evaluation - Upon receipt of bids GHD will review the bid packages and provide GWA with a recommendation and/or concurrence on the proposed selected contractor. This will include a bid analysis, review of bid proposal prices,



and conformance with contract requirements and the Guam Procurement Code. GHD will prepare a recommendation of award letter.

D. Construction Support Services:

1. **Submittal and Shop Drawing Review** – GHD will review shop drawings, design calculations, samples, test results and other data required to be submitted by the contractor for conformance with the contract documents. Responses will be provided to GWA. This shall include assisting in the review of the Quality Control Plan for complete content. At this time it is estimated that approximately 30 submittals/shop drawings will require review by the Designer of Record (GHD) for each reservoir project. GHD, with GWA input, shall address GEPA's concerns and requirements of any submittals, if any. GHD will chair and record the meeting minutes for any required meetings with governmental agencies regarding submittal approvals.
2. **Requests for Information (RFI)** – GHD will review requests for clarification or interpretation submitted by the contractor and provide responses to GWA. At this time it is estimated that approximately 10 RFIs will require review and response by the Designer of Record (GHD) for each reservoir project.
3. **Requests for Substitution** – GHD shall evaluate substitution requests to determine acceptability of substitute materials and equipment proposed by the contractor and provide recommendations to GWA. The GWA Chief Engineer will give final approval of Requests for Substitution. At this time it is estimated that approximately 5 Requests for Substitution will require review and response by the Designer of Record (GHD) for each reservoir project.

IV. PROJECT PLANNING AND MANAGEMENT

The GHD team shall arrange for a weekly design meeting with team members and GWA to discuss design issues, progress of work, and coordination. GHD shall prepare meeting minutes for all design progress meetings. The meeting minutes shall include action items from week to week. Separate hydraulic analysis team meetings will be held to streamline this time sensitive work.

GHD has also assumed four (4) specification coordination meetings with the design team of the North and South Guam Reservoir Projects.

GHD shall maintain an electronic project record which will include all project correspondence, reports, meeting minutes, deliverables, and other items required to document the project. GHD will communicate and coordinate with all stakeholders during the design, bid and construction phases.

**V. PERFORMANCE SCHEDULES**

A. PROJECT CONTROLS PHASE: Work will commence with the Notice to Proceed for the project controls.

B. DESIGN PHASE: The design deliverables are anticipated to be completed within the calendar days specified below.

Priority Group	Reservoir	Calendar Days
1	Hyundai Pulantat/Manenggon Chaot #2	240
2	Tumon #2 Piti	300
3	Tumon #1	360

CLARIFICATIONS AND ASSUMPTIONS:

1. The fee assumes items will be included in the design that may not be needed based on the hydraulic analysis. If any item is not required, based on the hydraulic analysis report, then the individual fee can be removed from the scope.
2. A pump station is assumed to be part of the design for the Hyundai and Piti reservoirs. Both will include a generator and fuel tank.
3. Each reservoir site will be designed with either a control building or a pump station/control building.
4. Each reservoir site will include site lighting and a security camera system.
5. GHD will obtain permits required for geotechnical investigation.
6. GHD will prepare the construction permit applications and route the permits through the required government agencies with the exception of the Contractor's Licensing Board. The construction permit fees are excluded.
7. The hole cut in the Piti and Tumon #2 (Nissan) tanks to collect oil sand will not need to be welded closed after the sample is collected. Access to these two tanks will be provided by GWA through the side access hatch. Enclosed space certified individuals will be provided by GHD's sub-consultants.
8. GHD is assuming that a topographic survey, archaeological investigation and geotechnical investigation will be provided for both sites for the Pulantat/Manenggon Reservoirs so that, when the hydraulic analysis is complete, the design will not be delayed. GHD will complete a tank design for only the preferred site based on the modelling and property availability.



9. GHD is assuming no design changes will be needed to the existing pump stations or wells serving the existing or new reservoirs except for an upgrade of the pumps at the Pago Bay Pump Station supplying the existing Pulantat/Manenggon Reservoir.
10. GHD will create a separate bid package for each reservoir and site.
11. Fees are not included for GHD to revise or update bid packages that have expired due to a delay in advertising them for bid. GWA agrees to negotiate with GHD for change orders for additional work that may include such services as restamping plans and specifications, verifying design based on a change in the adopted building code or design standards, and preprinting of the bid packages.
12. The scope assumes the processing of up to the specified number of RFIs, submittals, and requests for substitution under Task D, with the understanding that the Construction Manager will be able to provide responses to the majority. If additional work is required it will be brought to GWA's attention and negotiated.
13. GWA agrees to negotiate with GHD for change orders for additional design phase services due to additional work or any other reason not due to the negligent acts of GHD.

VI. FEE SCHEDULE

TASK	DESCRIPTION	COST
A	PROJECT PLANNING/MANAGEMENT	
A1	Project Design Meetings (52)	\$140,392
A1.1	Hydraulic Analysis Team Meetings (4)	\$10,048
A1.2	Specifications Meetings with TGE (4)	\$7,192
A2	Planning and Design Team Management	\$60,684
A3	Design Schedule Development	\$6,216
A4	Subconsultant Management	\$20,020
A5	Project Communication/File Management	\$46,218
A6	Project Administration/Invoicing	\$23,640
	EXPENSES	\$18,400
	SUBTOTAL PLANNING/MANAGEMENT SERVICES	\$335,466
B	HYUNDAI RESERVOIR	
B1.0	Project Controls	
B1.1	Analysis of Existing Site Conditions/On-site Inspection	\$5,104
B1.2	As-built Review and Background Adjustment	\$4,812
B1.3	Topographic Survey and Review of Survey	\$14,244
B1.4	Geotechnical Investigation & Permitting	\$40,896
B1.5	Hazardous Material Investigation	\$3,000
B1.6	Archaeological Investigation	\$15,425
B1.7	Land and Property Research	\$1,788
B1.8	Tank Evaluation	\$3,386
B1.9	Hydraulic Analysis	\$10,418
B1.10	Storage Analysis	\$1,328



	SUBTOTAL	\$100,401
B2.0	Design	
B2.1	Civil	
B2.1.1	Site Plan	\$9,108
B2.1.2	Erosion and Sediment Control Plan	\$1,992
B2.1.3	Piping System	\$5,964
B2.1.4	Tank Flow Mixing and Chlorine Contact Analysis	\$1,660
B2.2	Structural	
B2.2.1	Tank Plans	\$6,188
B2.2.2	Vaults	\$634
B2.2.3	Pump Building	\$5,596
B2.3	Mechanical	
B2.3.1	Pump Station	\$7,392
B2.3.2	Fuel System	\$5,064
B2.4	Electrical	
B2.4.1	Instrumentation and Controls	\$1,162
B2.4.2	Generator	\$2,656
	SUBTOTAL	\$47,416
B3.0	Submittals	
B3.1	30% Phase	
B3.1.1	Construction Drawings	\$11,653
B3.1.2	Construction Schedule	\$5,704
B3.1.3	Basis of Design	\$15,440
B3.1.4	Agency Coordination/Meetings (GEPA)	\$632
B3.1.5	Quality Control Review	\$5,304
B3.1.6	Design Review Meeting	\$1,186
B3.2	60% Phase	
B3.2.1	Construction Drawings	\$20,698
B3.2.2	Specifications	\$6,042
B3.2.3	Construction Estimate	\$8,372
B3.2.4	Agency Coordination/Meetings	\$292
B3.2.5	Quality Control Review	\$5,304
B3.2.6	Design Review Meeting	\$1,186
B3.3	90% Phase	
B3.3.1	Construction Drawings	\$8,476
B3.3.2	Specifications	\$19,208
B3.3.3	Construction Estimate	\$5,896
B3.3.4	Agency Coordination/Meetings	\$292
B3.3.5	Quality Control Review	\$5,304
B3.3.6	Design Review Meeting	\$1,186
B3.4	Final Phase	
B3.4.1	Construction Drawings	\$7,800
B3.4.2	Specifications	\$2,704
B3.4.3	Construction Estimate	\$2,372



B3.4.4	Basis of Design	\$2,032
B3.4.5	Agency Coordination/Meetings	\$292
B3.4.6	Quality Control Review	\$5,304
B3.4.6	Permitting	\$1,308
	SUBTOTAL	\$143,987
B5.0	Construction Bid Support Services	
B5.1	Prebid Conference and Meeting Minutes	\$1,074
B5.2	RFI Responses (assume 10 at 2 hr each)	\$3,520
B5.3	Bid Addenda	\$808
B5.4	Bid analysis and recommendation	\$4,386
	SUBTOTAL	\$9,788
B6.0	Construction Support Services	
B6.1	Submittal and Shop Drawing Review (assume 30 at 2 hr each)	\$8,610
B6.2	RFI Responses (assume 10 at 2 hr each)	\$2,870
B6.3	Substitution Request Review (assumes 5 at 2 hr each)	\$2,265
	SUBTOTAL	\$13,745
	SUBTOTAL HYUNDAI SERVICES	\$315,337
C PULANTAT/MANENGGON RESERVOIR		
C1.0	Project Controls	
C1.1	Analysis of Existing Site Conditions/On-site Inspection	\$4,108
C1.2	As-built Review and Background Adjustment	\$4,812
C1.3	Topographic Survey and Review of Survey	\$23,964
C1.4	Geotechnical Investigation & Permitting	\$138,852
C1.5	Hazardous Material Investigation	\$3,000
C1.6	Archaeological Investigation	\$30,806
C1.7	Land and Property Research	\$11,788
C1.8	Tank Evaluation	\$3,386
C1.9	Hydraulic Analysis	\$11,650
C1.10	Storage Analysis	\$1,328
	SUBTOTAL	\$233,694
C2.0	Design	
C2.1	Civil	
C2.1.1	Site Plan	13,662
C2.1.2	Erosion and Sediment Control Plan	2,988
C2.1.3	Piping System	9,092
C2.1.4	Tank Flow Mixing and Chlorine Contact Analysis	1,660
C2.2	Structural	
C2.2.1	Tank Plans	6,822
C2.2.2	Vaults	634
C2.2.3	Control Building	1,268
C2.3	Mechanical	
C2.4	Electrical	
C2.4.1	Instrumentation and Controls	1,826



	SUBTOTAL	37,952
C3.0	Submittals	
C3.1	30% Phase	
C3.1.1	Construction Drawings	15,789
C3.1.2	Construction Schedule	9,408
C3.1.3	Basis of Design	9,998
C3.1.4	Agency Coordination/Meetings (GEPA)	924
C3.1.5	Quality Control Review	10,608
C3.1.6	Design Review Meeting	2,372
C3.2	60% Phase	
C3.2.1	Construction Drawings	27,822
C3.2.2	Specifications	2,898
C3.2.3	Construction Estimate	12,744
C3.2.4	Agency Coordination/Meetings	584
C3.2.5	Quality Control Review	10,608
C3.2.6	Design Review Meeting	2,372
C3.3	90% Phase	
C3.3.1	Construction Drawings	31,550
C3.3.2	Specifications	2,340
C3.3.3	Construction Estimate	8,768
C3.3.4	Agency Coordination/Meetings	584
C3.3.5	Quality Control Review	10,608
C3.3.6	Design Review Meeting	2,372
C3.4	Final Phase	
C3.4.1	Construction Drawings	11,176
C3.4.2	Specifications	1,740
C3.4.3	Construction Estimate	3,744
C3.4.4	Basis of Design	524
C3.4.5	Agency Coordination/Meetings	584
C3.4.6	Quality Control Review	10,608
C3.4.6	Permitting	2,276
	SUBTOTAL	193,001
C5.0	Construction Bid Support Services	
C5.1	Prebid Conference and Meeting Minutes	1,808
C5.2	RFI Responses (assume 10 at 2 hr each)	7,040
C5.3	Bid Addenda	1,616
C5.4	Bid analysis and recommendation	8,772
	SUBTOTAL	19,236
C6.0	Construction Support Services	
C6.1	Submittal and Shop Drawing Review (assume 30 at 2 hr each)	\$17,220
C6.2	RFI Responses (assume 10 at 2 hr each)	\$5,740
C6.3	Substitution Request Review (assumes 5 at 2 hr each)	\$4,530
	SUBTOTAL	\$27,490
	SUBTOTAL PULANTAT/MANENGGON SERVICES	\$511,373



D	CHAOT #2 RESERVOIR	
D1.0	Project Controls	
D1.1	Analysis of Existing Site Conditions/On-site Inspection	\$4,108
D1.2	As-built Review and Background Adjustment	\$4,812
D1.3	Topographic Survey and Review of Survey	\$6,144
D1.4	Geotechnical Investigation & Permitting	\$40,896
D1.5	Hazardous Material Investigation	
D1.6	Archaeological Investigation	\$15,434
D1.7	Land and Property Research	\$1,788
D1.8	Tank Evaluation	\$3,386
D1.9	Hydraulic Analysis	\$5,010
D1.10	Storage Analysis	\$1,328
	SUBTOTAL	\$82,906
D2.0	Design	
D2.1	Civil	
D2.1.1	Site Plan	\$7,448
D2.1.2	Erosion and Sediment Control Plan	\$1,992
D2.1.3	Piping System	\$4,636
D2.1.4	Tank Flow Mixing and Chlorine Contact Analysis	\$1,660
D2.2	Structural	
D2.2.1	Tank Plans	\$6,822
D2.2.2	Vaults	\$634
D2.3	Mechanical	
D2.3.1	Chlorination System Evaluation	\$3,376
D2.4	Electrical	
D2.4.1	Instrumentation and Controls	\$1,992
	SUBTOTAL	\$28,560
D3.0	Submittals	
D3.1	30% Phase	
D3.1.1	Construction Drawings	\$12,156
D3.1.2	Construction Schedule	\$5,704
D3.1.3	Basis of Design	\$9,424
D3.1.4	Agency Coordination/Meetings (GEPA)	\$632
D3.1.5	Quality Control Review	\$5,304
D3.1.6	Design Review Meeting	\$1,186
D3.2	60% Phase	
D3.2.1	Construction Drawings	\$21,332
D3.2.2	Specifications	\$2,898
D3.2.3	Construction Estimate	\$8,372
D3.2.4	Agency Coordination/Meetings	\$292
D3.2.5	Quality Control Review	\$5,304
D3.2.6	Design Review Meeting	\$1,186
D3.3	90% Phase	



D3.3.1	Construction Drawings	\$9,296
D3.3.2	Specifications	\$17,280
D3.3.3	Construction Estimate	\$5,896
D3.3.4	Agency Coordination/Meetings	\$292
D3.3.5	Quality Control Review	\$5,304
D3.3.6	Design Review Meeting	\$1,186
D3.4	Final Phase	
D3.4.1	Construction Drawings	\$7,800
D3.4.2	Specifications	\$1,740
D3.4.3	Construction Estimate	\$2,372
D3.4.4	Basis of Design	\$524
D3.4.5	Agency Coordination/Meetings	\$292
D3.4.6	Quality Control Review	\$5,304
D3.4.6	Permitting	\$1,308
	SUBTOTAL	\$132,384
D5.0	Construction Bid Support Services	
D5.1	Prebid Conference and Meeting Minutes	\$1,074
D5.2	RFI Responses (assume 10 at 2 hr each)	\$3,520
D5.3	Bid Addenda	\$808
D5.4	Bid analysis and recommendation	\$4,386
	SUBTOTAL	\$9,788
D6.0	Construction Support Services	
D6.1	Submittal and Shop Drawing Review (assume 30 at 2 hr each)	\$8,610
D6.2	RFI Responses (assume 10 at 2 hr each)	\$2,870
D6.3	Substitution Request Review (assumes 5 at 2 hr each)	\$2,265
	SUBTOTAL	\$13,745
	SUBTOTAL CHAOT SERVICES	\$267,383
E	TUMON #2 RESERVOIR	
E1.0	Project Controls	
E1.1	Analysis of Existing Site Conditions/On-site Inspection	\$4,108
E1.2	As-built Review and Background Adjustment	\$4,812
E1.3	Topographic Survey and Review of Survey	\$10,464
E1.4	Geotechnical Investigation & Permitting	\$40,896
E1.5	Hazardous Material Investigation	\$7,000
E1.6	Archaeological Investigation	\$14,956
E1.7	Land and Property Research	\$6,788
E1.8	Tank Evaluation	\$3,386
E1.9	Hydraulic Analysis	\$8,330
E1.10	Storage Analysis	\$1,328
	SUBTOTAL	\$102,068
E2.0	Design	
E2.1	Civil	
E2.1.1	Site Plan	\$9,108



E2.1.2	Erosion and Sediment Control Plan	\$1,992
E2.1.3	Piping System	\$8,620
E2.1.4	Tank Flow Mixing and Chlorine Contact Analysis	\$1,660
E2.1.5	PRV	\$3,984
E2.2	Structural	
E2.2.1	Tank Plans	\$6,188
E2.2.2	Vaults	\$634
E2.2.3	Control Building	\$1,268
E2.3	Mechanical	
E2.4	Electrical	
E2.4.1	Instrumentation and Controls	\$1,162
	SUBTOTAL	\$34,616
E3.0	Submittals	
E3.1	30% Phase	
E3.1.1	Construction Drawings	\$11,653
E3.1.2	Construction Schedule	\$5,704
E3.1.3	Basis of Design	\$8,580
E3.1.4	Agency Coordination/Meetings (GEPA)	\$632
E3.1.5	Quality Control Review	\$5,304
E3.1.6	Design Review Meeting	\$1,186
E3.2	60% Phase	
E3.2.1	Construction Drawings	\$20,698
E3.2.2	Specifications	\$2,898
E3.2.3	Construction Estimate	\$8,372
E3.2.4	Agency Coordination/Meetings	\$292
E3.2.5	Quality Control Review	\$5,304
E3.2.6	Design Review Meeting	\$1,186
E3.3	90% Phase	
E3.3.1	Construction Drawings	\$8,476
E3.3.2	Specifications	\$17,280
E3.3.3	Construction Estimate	\$5,372
E3.3.4	Agency Coordination/Meetings	\$292
E3.3.5	Quality Control Review	\$5,304
E3.3.6	Design Review Meeting	\$1,186
E3.4	Final Phase	
E3.4.1	Construction Drawings	\$7,800
E3.4.2	Specifications	\$1,740
E3.4.3	Construction Estimate	\$2,372
E3.4.4	Basis of Design	\$524
E3.4.5	Agency Coordination/Meetings	\$292
E3.4.6	Quality Control Review	\$5,304
E3.4.6	Permitting	\$1,308
	SUBTOTAL	\$129,059
E5.0	Construction Bid Support Services	



E5.1	Prebid Conference and Meeting Minutes	\$1,074
E5.2	RFI Responses (assume 10 at 2 hr each)	\$3,520
E5.3	Bid Addenda	\$808
E5.4	Bid analysis and recommendation	\$4,386
	SUBTOTAL	\$9,788
E6.0	Construction Support Services	
E6.1	Submittal and Shop Drawing Review (assume 30 at 2 hr each)	\$8,610
E6.2	RFI Responses (assume 10 at 2 hr each)	\$2,870
E6.3	Substitution Request Review (assumes 5 at 2 hr each)	\$2,265
	SUBTOTAL	\$13,745
	SUBTOTAL TUMON #2 SERVICES	\$289,276
F	PITI RESERVOIR	
F1.0	Project Controls	
F1.1	Analysis of Existing Site Conditions/On-site Inspection	\$4,108
F1.2	As-built Review and Background Adjustment	\$4,812
F1.3	Topographic Survey and Review of Survey	\$9,924
F1.4	Geotechnical Investigation & Permitting	\$40,896
F1.5	Hazardous Material Investigation	\$7,000
F1.6	Archaeological Investigation	\$15,403
F1.7	Land and Property Research	\$11,788
F1.8	Tank Evaluation	\$3,386
F1.9	Hydraulic Analysis	\$13,738
F1.10	Storage Analysis	\$1,328
	SUBTOTAL	\$112,383
F2.0	Design	
F2.1	Civil	
F2.1.1	Site Plan	\$9,108
F2.1.2	Erosion and Sediment Control Plan	\$1,992
F2.1.3	Piping System	\$5,964
F2.1.4	Tank Flow Mixing and Chlorine Contact Analysis	\$1,660
F2.2	Structural	
F2.2.1	Tank Plans	\$6,188
F2.2.2	Vaults	\$634
F2.2.3	Pump Building	\$6,120
F2.2.4	Control Building	\$1,268
F2.3	Mechanical	
F2.3.1	Pump Station	\$13,016
F2.3.2	Fuel System	\$5,064
F2.4	Electrical	
F2.4.1	Instrumentation and Controls	\$1,162
F2.4.2	Generator	\$2,656
	SUBTOTAL	\$52,832
F3.0	Submittals	



F3.1	30% Phase	
F3.1.1	Construction Drawings	\$11,653
F3.1.2	Construction Schedule	\$5,704
F3.1.3	Basis of Design	\$14,596
F3.1.4	Agency Coordination/Meetings (GEPA)	\$632
F3.1.5	Quality Control Review	\$5,304
F3.1.6	Design Review Meeting	\$1,186
F3.2	60% Phase	
F3.2.1	Construction Drawings	\$20,698
F3.2.2	Specifications	\$6,042
F3.2.3	Construction Estimate	\$8,372
F3.2.4	Agency Coordination/Meetings	\$292
F3.2.5	Quality Control Review	\$5,304
F3.2.6	Design Review Meeting	\$1,186
F3.3	90% Phase	
F3.3.1	Construction Drawings	\$8,476
F3.3.2	Specifications	\$19,208
F3.3.3	Construction Estimate	\$5,372
F3.3.4	Agency Coordination/Meetings	\$292
F3.3.5	Quality Control Review	\$5,304
F3.3.6	Design Review Meeting	\$1,186
F3.4	Final Phase	
F3.4.1	Construction Drawings	\$7,800
F3.4.2	Specifications	\$2,704
F3.4.3	Construction Estimate	\$2,372
F3.4.4	Basis of Design	\$524
F3.4.5	Agency Coordination/Meetings	\$292
F3.4.6	Quality Control Review	\$5,304
F3.4.6	Permitting	\$1,308
	SUBTOTAL	\$141,111
F5.0	Construction Bid Support Services	
F5.1	Prebid Conference and Meeting Minutes	\$1,074
F5.2	RFI Responses (assume 10 at 2 hr each)	\$3,520
F5.3	Bid Addenda	\$808
F5.4	Bid analysis and recommendation	\$4,386
	SUBTOTAL	\$9,788
F6.0	Construction Support Services	
F6.1	Submittal and Shop Drawing Review (assume 30 at 2 hr each)	\$8,610
F6.2	RFI Responses (assume 10 at 2 hr each)	\$2,870
F6.3	Substitution Request Review (assumes 5 at 2 hr each)	\$2,265
	SUBTOTAL	\$13,745
	SUBTOTAL PITI SERVICES	\$331,859
G	TUMON #1 RESERVOIR	



G1.0	Project Controls	
G1.1	Analysis of Existing Site Conditions/On-site Inspection	\$4,108
G1.2	As-built Review and Background Adjustment	\$4,812
G1.3	Topographic Survey and Review of Survey	\$11,544
G1.4	Geotechnical Investigation & Permitting	\$40,896
G1.5	Hazardous Material Investigation	\$3,000
G1.6	Archaeological Investigation	\$14,950
G1.7	Land and Property Research	\$6,788
G1.8	Tank Evaluation	\$3,386
G1.9	Hydraulic Analysis	\$5,674
G1.10	Storage Analysis	\$1,328
	SUBTOTAL	\$96,486
G2.0	Design	
G2.1	Civil	
G2.1.1	Site Plan	\$9,108
G2.1.2	Erosion and Sediment Control Plan	\$1,992
G2.1.3	Piping System	\$5,964
G2.1.4	Tank Flow Mixing and Chlorine Contact Analysis	\$1,660
G2.2	Structural	
G2.2.1	Tank Plans	\$6,822
G2.2.2	Vaults	\$634
G2.2.3	Control Building	\$1,268
G2.3	Mechanical	
G2.4	Electrical	
G2.4.1	Instrumentation and Controls	\$1,162
	SUBTOTAL	\$28,610
G3.0	Submittals	
G3.1	30% Phase	
G3.1.1	Construction Drawings	\$12,156
G3.1.2	Construction Schedule	\$5,704
G3.1.3	Basis of Design	\$8,580
G3.1.4	Agency Coordination/Meetings (GEPA)	\$632
G3.1.5	Quality Control Review	\$5,304
G3.1.6	Design Review Meeting	\$1,186
G3.2	60% Phase	
G3.2.1	Construction Drawings	\$21,332
G3.2.2	Specifications	\$2,898
G3.2.3	Construction Estimate	\$8,372
G3.2.4	Agency Coordination/Meetings	\$292
G3.2.5	Quality Control Review	\$5,304
G3.2.6	Design Review Meeting	\$1,186
G3.3	90% Phase	
G3.3.1	Construction Drawings	\$9,296
G3.3.2	Specifications	\$17,280



G3.3.3	Construction Estimate	\$5,372
G3.3.4	Agency Coordination/Meetings	\$292
G3.3.5	Quality Control Review	\$5,304
G3.3.6	Design Review Meeting	\$1,186
G3.4	Final Phase	
G3.4.1	Construction Drawings	\$7,800
G3.4.2	Specifications	\$1,740
G3.4.3	Construction Estimate	\$2,372
G3.4.4	Basis of Design	\$524
G3.4.5	Agency Coordination/Meetings	\$292
G3.4.6	Quality Control Review	\$5,304
G3.4.6	Permitting	\$1,308
	SUBTOTAL	\$131,016
G5.0	Construction Bid Support Services	
G5.1	Prebid Conference and Meeting Minutes	\$1,074
G5.2	RFI Responses (assume 10 at 2 hr each)	\$3,520
G5.3	Bid Addenda	\$808
G5.4	Bid analysis and recommendation	\$4,386
	SUBTOTAL	\$9,788
G6.0	Construction Support Services	
G6.1	Submittal and Shop Drawing Review (assume 30 at 2 hr each)	\$8,610
G6.2	RFI Responses (assume 10 at 2 hr each)	\$2,870
G6.3	Substitution Request Review (assumes 5 at 2 hr each)	\$2,265
	SUBTOTAL	\$13,745
	SUBTOTAL TUMON #1 SERVICES	\$279,645
H	TIME AND MATERIAL BUDGET	\$120,000
	SUMMARY	
All	SUBTOTAL	\$2,450,339
All	GRT	\$102,106
All	TOTAL	\$2,552,445



EXHIBIT B

July 7, 2016

Mr. Miguel Bordallo, PE
General Manager
Guam Waterworks Authority
Gloria B. Nelson Public Service Building
688 Route 15
Mangilao, Guam 96913

Attn.: Mr. Tom Cruz, P.E.

**RE: Change Proposal 06 for PW12-04 Design Services for GWA's Central Water Reservoirs, GWA Project W14-006-BND
Additional Design Services for Chaot No. 2 Reservoir, PRV Improvements, SCADA Improvements, and Hyundai Pump Station**

Dear Mr. Bordallo:

GHD is pleased to submit this change proposal to amend our Scope of Work and Fee for the above referenced project. This scope of work defines the additional design services GHD will provide in connection with the Design Services for GWA's Central Water Reservoirs Project. Deliverables of the tasks will be combined with the construction documents for related reservoirs. GHD will require the survey services of a subconsultant to perform some tasks in this scope of work. The original project fee will be amended on a lump sum fee basis per the fees shown in the Fee Schedule below.

SCOPE OF WORK

Related to Chaot No. 2 Reservoir:

Task A – Disconnection of Distribution Waterlines at Wells: According to the Standard Operating Procedure for the Sinajana Water Transmission Line System (SOP), March 16, 2012, a transmission line was completed in 2011 to connect a number of A-series wells directly to the Chaot and Agana Heights Reservoirs. The transmission line was meant to supply raw well water to the reservoirs for disinfection and contact time before entering the distribution system. Currently, the A-series wells on the system are connected to both the distribution and transmission lines until the new Chaot and Agana Heights Reservoirs and their chlorination systems are completed. There are 11 wells included: A-1, A-3, A-5, A-6, A-12, A-23, A-25, A-29, A-30, A-31, and A-32. GHD shall prepare plans, 10 total, to disconnect each of these wells from the distribution system piping. Only one disconnection is required for wells A-29 and A-30. The plans will be added to the Chaot No. 2 Reservoir construction documents. Figures of the as-



built piping are attached for reference. This will eliminate the chance of cross-contamination of raw, untreated well water from entering the potable water supply at these wells. These off-site piping improvements were not part of GHD's original contract.

The design will include plan view drawings with approximate locations of utility crossings to minimize conflicts and unknowns during construction. GHD assumes no topographic survey will be required for this Task. GHD also assumes DCA will provide CAD drawings from the figures in the SOP for use in preparing the drawings. GHD will visit each site to verify the layout of the figures and locate potential conflicts that can be detected from above ground features.

Task B – PRV and Vault and Route 4 Valve Replacement: GHD shall include the design for the replacement of the Pressure Reducing Valve (PRV) near well A-12 in the Chaot No. 2 Reservoir construction documents. The existing PRV is not operating and must be replaced. The valve has no bypass, and there is evidence of a pipe break adjacent to the vault. Plans will be developed to show replacement of the PRV, the addition of a bypass with smaller PRV, and a new vault large enough to house the valves and bypass. Waterlines on each side of the existing vault will be replaced as required to repair expected pipe breaks or leakage. The design of this improvement was not included in GHD's original scope of work.

GWA discovered that a gate valve on Route 4, west of Spring Lane, will not fully close. The valve is located at a zone boundary and should be normally closed. GHD will include plans to replace the valve in the Chaot No. 2 Reservoir construction documents. GWA may choose to move the new valve location in order to include the service to the residence farther west on Route 4 in the upper pressure zone. GWA will direct GHD on the new location based on GWA's model and analysis. The plan will include an air release valve downhill of the gate valve.

GHD assumes a topographic survey will not be required for Task B. The design will include plan and elevation drawings and details. The valve relocation plans will consist of schematic drawings showing the gate and air release valves overlaid onto an aerial image.

Task C – Site Design Adjustments at Chaot No. 2 Reservoir: The construction of Chaot No. 1 Reservoir has not been completed at the time GHD's Notice to Proceed was issued. However, GWA directed GHD to move forward with the design of Chaot No. 2 and base the design on the Chaot No. 1 construction drawings. During the construction of Chaot No. 1 Reservoir the Contractor made errors and made changes late in the project that affected GHD's design of Chaot No. 2 Reservoir. These changes are summarized below:

- 1) The vaults on the west side of the chlorination building were installed too high. These vaults were in the location of the driveway used to access the site. Therefore, the driveway was not able to be constructed per the plans. GWA requested GHD include the driveway in our design on the east side of the chlorination building. The modification resulted in adjustments to our grading and drainage plan which were already completed to the 90% design level. Additional surveying was required to obtain the finished



elevations of the vaults at the new location of the driveway because the vaults were installed after our original topographic survey was completed.

2) The final pavement of the access road around Chaot No. 1 Reservoir did not match the elevations on the Chaot No. 1 construction plans. GHD's design of the access road around Chaot No. 2 Reservoir matched the elevation of the access road for Chaot No. 1. The difference between the planned and as-built condition made it necessary to redesign our grading plan after the 90% design submittal. Adjusting grading is not usually a significant problem, but the Chaot site is challenging due to the cramped conditions and limited space.

GHD found it necessary to move forward with our design of Chaot No. 2 Reservoir due to the court-ordered deadline for the tank's construction. The above design adjustments were due to delays by the Chaot No. 1 construction contractor. The Chaot No. 1 project was supposed to be completed prior to our Notice to Proceed. These changes could not have been accounted for earlier because construction of the site was completed after our 90% design submittal. However, the decision to move forward with the design saved about 6 months for Chaot No. 2.

These design adjustments required additional effort that was not anticipated in GHD's original scope of work. The lump sum fee for Task C is based on actual effort.

Task D – Repairs to Chaot and Agana Heights Chlorination Systems and Buildings: The chlorination systems for the Chaot and Agana Heights Reservoirs were recently installed. GWA found some deficiencies and requested that GHD evaluate the chlorination systems and recommend adjustments. Below are specific items that will be addressed by this task:

- Replace the Advance 200 vacuum gas feeders to meet GWA standards,
- Evaluate the size of the gas flow control valve (Series WP70CV3) and replace it to meet GWA standards,
- Replace the leak sensor,
- Analyze the redundancy and sizes of the chlorination pumps,
- Analyze the redundancy of the chlorination tanks,
- Evaluate the piping for the chlorine analyzer for correct installation and missing equipment.

The evaluation of the system at Chaot is included in GHD's original scope. The addition of analyzing the Agana Heights chlorination system is included in the fee for this task. GHD will prepare a memo with recommended changes to both chlorination systems for GWA's consideration. The design of the GWA approved adjustments will be included in the Chaot No. 2 Reservoir construction documents.

Both chlorination systems have a chlorine analyzer connected to the outlet pipe of the reservoirs. These analyzers control the chlorine injection rate. In order for GWA to comply with the safe drinking water act, GWA must report the chlorine residual of the water just before entering the distribution system. GWA has requested GHD to design the installation of chlorine analyzers connected to the outlet pipes of the reservoirs. Both analyzers will be connected to the SCADA system. There is a possibility that there is not



enough room in the existing buildings for the additional analyzers. If this is the case, then GHD will include a manufactured fiberglass enclosure for the equipment. GHD assumes GWA will provide the CAD files for the Agana Heights Reservoir site.

GHD will also prepare drawings and specifications to replace the doors on the Chaot and Agana Heights Chlorination buildings to match GWA standards. Intrusion alarms will be designed on the doors for both buildings as part of this task. These alarms will be connected to the SCADA system for monitoring at the main office.

The inlet line to the tanks is a transmission line from the wells. Once the chlorination systems at the wells are taken offline, the water in the transmission line will be non-potable. The eyewash system at Chaot is currently connected to the transmission line and must be reconnected to the tank outlet line. This task will prepare piping plans to achieve this change. GWA has requested that GHD design an air/vacuum release valve and check valve on the inlet line to the Chaot tanks; venting for the inlet meter vault, valve vault 1, and the outlet meter vault; and the installation of pressure gauges on both sides of the existing altitude valve for the Chaot No. 1 Reservoir. The plans for all five of these items will be included in the Chaot No. 2 Reservoir construction documents.

GHD will provide additional construction bid support services for this task including responding to Requests for Information (RFIs, assume 2), assisting with the preparation of bid addenda, and assisting with review of proposals. Construction support services will include submittal and shop drawing review (assume 3) and RFI responses (assume 2).

Forty-five additional calendar days will be added to the Chaot No. 2 Reservoir design schedule in order to complete Tasks A through D concurrently.

Task E – Escrow and Other Purchasing Fees Associated With GWA Acquisition of Portion of Lot 177-1 For Manenggon Reservoirs: This Task includes a budget for escrow, additional surveys, and other purchasing fees associated with the acquisition of the property for the Manenggon Reservoirs. The fee for this task is based on the escrow fee breakdown received from Norma Sablan with Security Title on April 29, 2016. GHD discussed the amount with GWA and GHD was directed to double the estimate to cover any escalation or unforeseen fees connected with the acquisition. The fee was estimated and the actual cost may vary. Any unused fee from this task may be applied to additional design related to the tanks.

No additional time is required for Task E.

PRV Improvements:

Task F – PRV #16 (St. John's) Piping and Flow Meters: PRV #16 is meant to create a zone break on the 24-inch waterline on Marine Corps Drive. However, the two 12-inch and one 4-inch (sizes need to be



verified) PRVs are not operational. GHD's original scope of work included the replacement of these PRVs and piping in the vault as needed.

A 14-inch waterline on Finegayan Road (aka Hamburger Road) currently connects downstream of the existing PRV #16. According to the Final Pressure Zone Realignment and Pressure Improvement Plan, dated December 21, 2015, this is a proposed location for a zone break on this line. A proposed PRV installation is shown on Detail 56 on A-55 of Appendix A to achieve the zone break. Another option is to connect the 14-inch upstream of PRV #16 and size the new PRVs for the capacity of both lines. The 14-inch would reconnect downstream of the PRVs using the current connection and be disconnected on the upstream side of the tee. GHD has evaluated this option and found the pressures between the two zones, the one supplying the 24-inch and the one supplying the 14-inch, vary by only 3 psi. This connection provides the benefits of having a looped system and saving cost by combining the PRVs for the two zones.

GWA also requested flow meters to be installed downstream of the PRVs. These will require installation in separate vaults to provide the necessary straight pipe lengths and likely some changes to the existing piping to create space for the meter. The flow meters and SCADA system (see Task J below) will require power from GPA. GWA requested GHD to investigate the cost and arrangement for an unmet power supply. As part of this task, GHD will contact GPA and collect the information so GWA can make the arrangements.

GHD will develop a Basis of Design (BOD), plans, and specifications for the PRVs and flow meters that will be added to the Tumon No. 2 Reservoir construction documents. It is assumed that a topographic survey will be required for this Task in order to accurately locate the different vaults.

Task G – New PRV on Simon Sanchez Street: According to GWA's GIS, there is a 12-inch waterline connected to the lines on Marine Corps Drive that goes down Simon Sanchez Street and connects to the back side of Talo Verde Estates. The Final Pressure Zone Realignment and Pressure Improvement Plan, dated December 21, 2015 shows this as a location for a zone break with a PRV. Detail 50 on A-49 of Appendix A of the Final Pressure Zone Realignment and Pressure Improvement Plan, shows the proposed location of the PRV. Piping to connect all of the lines on Marine Corps Drive is also shown on the detail.

GHD will use as-built drawings and above ground features to investigate the existing piping configuration on Marine Corps Drive to verify the 18, 14, and 12-inch lines exist and their location relative to each other. GWA has also determined a flow meter is needed downstream of the PRV. GHD will develop a Basis of Design (BOD), plans, and specifications for the installation of the PRV, flow meter, and the connection of the waterlines. These will be added to the Tumon No. 1 Reservoir construction documents. It is assumed a topographic survey will be required for this Task in order to accurately locate the different vaults.

Task H – New PRV on Intersection of Marine Corps Drive and Airport Road: According to GWA's GIS, there are 18, 14, and 12-inch waterlines on Marine Corps Drive at the intersection of Route 10A



(Airport Road). The 12-inch is a continuation of the outlet from Tumon #1 Reservoir. The Final Pressure Zone Realignment and Pressure Improvement Plan, dated December 21, 2015 shows this as a location for a zone break with a PRV. Detail 29 on A-30 and the Additional Details on A-31 of Appendix A of the Final Pressure Zone Realignment and Pressure Improvement Plan, dated December 21, 2015 show the proposed location of the PRV as well as connections of waterlines.

GHD will use as-built drawings and above ground features to investigate the existing piping configuration on Marine Corps Drive to verify the 18, 14, and 12-inch lines exist and their location relative to each other. GWA has also determined a flow meter is needed downstream of the PRV. GHD will develop a Basis of Design (BOD), plans, and specifications for the installation of the PRV, flow meter, and the connection of the waterlines. These will be added to the Tumon No. 1 Reservoir construction documents. It is assumed that a topographic survey will be required for this Task in order to accurately locate the different vaults.

Supervisory Control and Data Acquisition (SCADA) Improvements:

General: The SCADA Improvement tasks below include work to design an automated data acquisition system to gather real-time field data at the selected sites in the GWA system. The resulting data acquisition system at each site includes field instrumentation, programmable logic controllers (SCADAPack), local Human Machine Interfaces and communication systems (TropOS routers) to integrate into the existing GWA systems and coordinate with other GWA master planned improvements. The data acquisition system will be designed to automatically read and collect flow rates, alarms, levels, pressures, pump status, and PRV status. The data collected at each site will be transmitted and integrated with GWA's new SCADA system to allow real-time remote monitoring capabilities for the selected monitoring sites.

GHD will review GWA's SCADA Master Plan and SCADA standards to assure the design will follow the Master Plan guidance and standards. The tasks will also include field investigation and coordination with GWA for instrumentation requirements, equipment type, and instrumentation layout. GHD will design power and wiring systems to support the data acquisition system, with a backup power supply.

This scope assumes that the configuration of the TropOS routers and programming and development of the remote SCADA operator stations will be by the Contractor specified by GWA. GHD will provide local SCADAPack PLC and Vision HMI programming in accordance with GWA standards. The HMI programming of the workstations at GWA's main office using existing Wonderware software licenses is included in a separate task.

GHD will provide construction bid support services including responding to Request for Information (RFI, assume 2 for each task), assist with the preparation of bid addenda and assist with review of proposals. Construction support service will include submittal and shop drawing review (assume 2 for each task) and RFI response (assume 2 for each task).



Task I – SCADA for PRVs on Pale San Vitores and Design of Flow Meters: The replacement of the PRVs on the 12 and 16-inch waterlines on Pale San Vitores and the connection of the lines downstream was agreed to be included in GHD's original scope because the line connecting the outlet of the tank to Pale San Vitores was found to already exist. The improvements will have the same result as is shown on Detail 27 on A-28 of Appendix A of the Final Pressure Zone Realignment and Pressure Improvement Plan, dated December 21, 2015. This task will provide common SCADA improvements for the two PRVs. Analog Inputs to be transmitted for each PRV will include upstream and downstream pressure, and flow. Discrete inputs to be transmitted include valve position, vault or hatch open and control panel door open. No analog or digital outputs will be provided but the hardware will provide terminals for future connections.

Additionally, GWA has also determined that a flow meter is needed downstream of each PRV prior to the connection of the lines. GHD will develop a Basis of Design (BOD), plans, and specifications for the installation of the SCADA improvements and flow meters. These will be added to the Tumon No. 2 Reservoir construction documents. The transmission of the flow meter readings will be included in the SCADA improvements and programming. It is assumed that a topographic survey will be required for this Task in order to accurately locate the different flow meter vaults, SCADA handholes, and power poles.

Thirty-five additional calendar days will be added to the Tumon No. 2 Reservoir design schedule in order to complete Tasks F, I, J, and N concurrently.

Task J – SCADA for PRV #16 (St. John's): The SCADA installation at this location is included in the scope of the Water Hydraulic Modeling Data Collection Barrigada Service Area Project. This task will provide coordination of the PRV and flow meter improvements in Task F above with the SCADA improvements included in the scope of the other project. Topography will be provided under Task E for the SCADA handholes and power poles. Analog Inputs to be transmitted will include upstream and downstream pressure, and flow. Discrete inputs to be transmitted include valve position, vault or hatch open and control panel door open. No analog or digital outputs will be provided but the hardware will provide terminals for future connections.

Task K – SCADA for PRV on Simon Sanchez Street: This task will provide SCADA improvements for the PRV and flow meter included in Task G above. Topography will be provided under Task G for the SCADA handholes and power poles. Analog Inputs to be transmitted will include upstream and downstream pressure, and flow. Discrete inputs to be transmitted include valve position, vault or hatch open and control panel door open. No analog or digital outputs will be provided but the hardware will provide terminals for future connections.

Task L – SCADA for New PRV on Intersection of Marine Corps Drive and Airport Road: This task will provide SCADA improvements for the PRV and flow meter included in Task H above. Topography will be provided under Task G for the SCADA handholes and power poles. Analog Inputs to be transmitted will include upstream and downstream pressure, and flow. Discrete inputs to be transmitted



include valve position, vault or hatch open and control panel door open. No analog or digital outputs will be provided but the hardware will provide terminals for future connections.

Task M – SCADA for Hyundai Reservoir PRV and Easement: Change Order Number 1 included the design of a PRV to reduce the pressure for a commercial area to the north of the tank. This task will provide SCADA improvements for that PRV. Topography has been provided for this Task under Change Order No. 2. Analog Inputs to be transmitted will include upstream and downstream pressure. No flow meter will be installed at this PRV site. Discrete inputs to be transmitted include valve position, vault or hatch open and control panel door open. No analog or digital outputs will be provided but the hardware will provide terminals for future connections.

The waterline west of the PRV location runs through private property with no recorded easement. GHD will provide documentation, a boundary survey, and figures for a utility easement. The easement will be recorded.

Task N – SCADA Tumon No. 1, Tumon No. 2, Manenggon and Piti Reservoirs: GHD's original scope included "Design requirements for valving, electrical, instrumentation and control for on-site monitoring of electrical panels onsite with provisions for connection to a future SCADA system." This task will provide SCADA improvements for the remaining four tank sites: Tumon No. 1, Tumon No. 2, Manenggon, and Piti Reservoirs. No topography will be required for this Task. SCADA scope for Task N includes powering, mounting and connecting a new wireless (Tropos router) system to the PLC (SCADAPack) which is part of GHD's original scope. No analog or digital outputs will be provided but the hardware will provide terminals for future connections.

Note that SCADA improvements for Hyundai Reservoir are included in the scope of the Water Hydraulic Modeling Data Collection Barrigada Service Area Project. This task will include coordination between the two projects.

Twenty-one additional calendar days will be added to the Manenggon Reservoir design schedule in order to complete Task N.

Hyundai Pump Station:

Task O – Fire Pump and Electrical Upgrades for Hyundai Pump Station: GHD's original scope for the Hyundai Reservoir stated that "GHD is assuming that a small pump station, piping, and a generator and fuel tank will be part of the design to provide higher pressure" to the residences experiencing low pressure. As the design progressed, a commercial business was discovered that increased the maximum flow during a fire from the assumed 1,000 gallons per minute to 2,000 gallons per minute. GHD began developing a design that included this additional flow requirement using a standard motor and starter system. However, it has since been determined that as this flow is required during a fire emergency, the installation of a dedicated fire pump and controller is required by Code which adds a significant level of complexity to the pump station design. No longer is it a small pump station with only a packaged booster



pump system as was originally assumed. Building Code requirements for a fire pump include a dedicated, listed pump controller, special building and electrical construction requirements, fire protection sprinkler system and a much larger generator than what is normally used for a large motor. While the fire pump generator can be used for the much smaller booster pumps, using a generator to serve a load less than 30% of the full load rating of the generator will lead to exhaust system damage to the generator due to wet-stacking the engine. The booster pumps will require a second, smaller generator.

GHD had already proceeded with the design of the larger pump to supply the 2,000 gallon per minute fire flow. The complexities this decision caused started to present themselves first with the wet-stacking issue of the larger generator that was required. The decision from GWA was to provide two generators, one large to power the fire pump and one smaller for the packaged booster pump system and controls. On April 1, 2016 GHD confirmed with GWA that the larger pump needed to be considered a fire pump and therefore the pump station has to meet the building codes requirements for a fire pump system.

The current plans are completed to the 60% level. GHD will revise the plans and specifications to upgrade the pump station design from a small pump station to meet building code requirements for a fire pump station. No additional topography is required for this Task.

Thirty-five additional calendar days will be added to the Hyundai Reservoir design schedule in order to complete Tasks M and O.

Tumon No. 1 Reservoir:

Task P – Tumon No. 1 Reservoir Site Location Change: With GHD's assistance, GWA has been in discussion with the Guam International Airport Authority (GIAA) to acquire property at the location of the existing airport reservoir. GHD produced figures for GIAA that showed the extents of an apron that they wished to construct in the future. The figures made obvious the obstacles for the construction of such an apron due to the steep slope and elevation difference from the terminal to the location of the existing tank. GIAA therefore agreed verbally to transfer to GWA an area that encompassed the existing tank and provided space for the Tumon No. 1 Reservoir and two future concrete reservoirs. A geotechnical investigation, archaeological survey, topographic survey, and appraisal were completed at the proposed lot for the design of the Tumon No. 1 Reservoir. The design was completed to the 30% level including a preliminary site plan and basis of design.

The figures provided by GHD proposed an alternate location for the Tumon No. 1 Reservoir and one future reservoir. This option connected to a future Tiyan Parkway phase two but was rejected because the right-of-way needed to install new waterlines had not been purchased yet by DPW. At the beginning of April, 2016, DPW decided to accelerate the Tiyan Parkway project. GIAA reconsidered the second option and decided to proceed with the alternate location for the reservoirs.

With this task, GHD will provide a geotechnical investigation, archaeological survey, topographic survey and two (2) appraisals for the new parcel. The new lot is covered in thick jungle. The fees will include



clearing for access and the investigations/surveys. The topography will include the intersection of Route 10A and the entrance to Home Depot and the right-of-way of the future Tiyan Parkway up to the new lot. The 30% design will also be revised to reflect the new location. Two appraisals of the current market value are required for the transfer of property between government agencies. Two (2) additional appraisals of the current market value will be provided under this task for the Tumon No. 2 Reservoir property being acquired from the Chamorro Land Trust. The parceling of the property for the Tumon No. 1 Reservoir is already included in Change Order 1.

Sixty additional calendar days will be added to the Tumon No. 1 Reservoir design schedule in order to complete Tasks G, H, K, L, N and P concurrently.

Piti Reservoir:

Task Q – Piti Reservoir Relocation, Pump Station and Waterline: GWA scheduled a meeting with the National Parks Service (NPS) on June 9, 2016. The NPS noted that the existing waterline supplying the Piti Reservoir runs very close to the Piti Guns. If the waterline were to break or need repairs, one of the guns would be subjected to damage. NPS requested GWA to relocate the waterline away from the guns as a condition of granting GWA right-of-way for the reservoir.

As part of this task, GHD has completed a preliminary investigation of possible routes for a new waterline and parallel underground power from the village to the existing tank location. Two routes were evaluated. Option 1 was to notify NPS that rerouting the waterline would not be feasible and leave the line where it is with no improvements. The power would have to come from Nimitz Hills Estates. Option 2 was a route north of the tank. Option 3 was a route south of the tank. The Option 2 route was deemed too steep for construction. Option 3 was viable although the length is about 3,200 feet which would result in a significant cost. GHD prepared a figure for GWA showing the possible alignment for Option 3.

Additionally, GHD completed a preliminary investigation of possible alternative locations for the reservoir and the piping required to connect with the mainline on Route 1. A site was identified at Nimitz Hills Estates that is at the elevation necessary for the reservoir. This location became Option 4. GWA believes the owner of the property is the NPS, but the ownership still needs to be confirmed. GHD determined that the waterline could be constructed along two alignments to connect to the mainline on Route 1. Two figures were prepared showing these and were called Options 4A and 4B. Option 4A goes east and then parallel to an existing sanitary sewer line on known NPS property. Option 4B goes west on the same property as the tank and then possibly through private property. Ownership of all the properties involved in the options described above is being determined by GWA. Figures of Options 3, 4A and 4B are attached.

GWA's preference and GHD's recommendation is for Option 4A. The proposed tank site is accessible to power, so a transmission line would not have to be installed as compared to the existing tank site. GWA must apply for a right-of-way for the existing sanitary sewer line, and a new parallel waterline could be



combined in the application. GWA currently purchases Navy water to serve Nimitz Hills Estates. This tank location, with a pump station, could put all of these customers on GWA water.

Depending on property ownership, Option 4A is the preferred choice. GHD will walk the route of the proposed waterline to verify that overland construction is possible and then will assist GWA in completing the right-of-way application and getting approval for this new reservoir location. A topographic survey, archaeological investigation per Section 106 procedures, and preparation of the 30% Basis of Design and plans for the Nimitz Hill Estates location will be repeated since GHD completed them for the existing tank location. GHD will proceed with the geotechnical investigation and the 60, 90 and 100% plans, specifications, Basis of Design, and cost estimate per the original scope of work and fee with the addition of the waterline and large pump station designs. The fee for this task includes the preliminary investigation and preparation of the figures mentioned above.

The pump station will include a fire pump capable of providing the fire flow required by code for the Nimitz Towers, packaged booster pump system, backup power, fuel storage, and an electrical/control room. GHD will check the hydraulic model to verify that one pump station at the reservoir site can provide the standard pressure range and fire flow for Nimitz Hill Estates. The additional waterline design will include approximately 3,100 linear feet of 12-inch waterline plan and profile drawings. The design will include additional topography and archaeological investigation according to Section 106 procedures. The topography will locate the existing sanitary sewerline so the waterline can be designed in parallel.

This task includes up to four (4) meetings with NPS and GWA, including the one that took place on June 9. If Option 4A is not selected by GWA based on property ownership or for any other reason, then the fees for this task can be applied toward the design of Option 3 or 4B or other design additions connected to the reservoir sites as GWA deems necessary.

Ninety additional calendar days will be added to the Piti Reservoir design schedule in order to complete Tasks N and Q concurrently.

ASSUMPTIONS AND EXCEPTIONS

- This change proposal only applies to the scope of work. The terms of the original executed agreement still apply.
- Topographic surveys will be required as noted for each task. Where no topography is assumed, the final drawings will require the contractor to match the existing grades.
- The fee for Tasks I (SCADA for PRVs on Pale San Vitores) and Task N (SCADA for Tumon No. 1, Tumon No. 2, Manenggon and Piti Reservoirs) includes a thorough, internal review for one (1) PRV site and one (1) tank site. The review will verify that GHD's design meets the intent of the SCADA Masterplan.
- GWA staff will be responsible for providing site access and for opening electrical and control panels, operating electrical and mechanical equipment, opening vaults and boxes, and providing other access as needed for field investigations. GWA staff will also be responsible for site closure



and restoration to maintain GWA operations of the facilities.

- This Scope assumes that GWA SCADA system will be up and running in time to accept this project's sites. This project does not comprise a review of GWA SCADA, nor a design of SCADA modifications, but instead implementation of new sites within an existing SCADA framework. (For the purpose of this scope, "existing SCADA" applies to the SCADA system which is planned to exist at the time this project is constructed.)
- The scope does not include other SCADA components which might be requested, such as mobile devices, additional workstations, development machines, and/or related software. It is assumed that SCADA licensing will be adequate as it exists, with no evaluation nor specification of tag count increases, additional terminal services capabilities, etc. The programming of HMI at workstations in the GWA main office is not included, but general programming requirements will be part of the specifications.
- The Scope assumes GWA will provide CAD files of approved network diagrams and the information of approved equipment to be used at the SCADA sites.
- Operator terminal units for the SCADA system are not included in this scope.
- The time extensions specified for each task will be worked on concurrently with other tasks associated with the same reservoir site.

Our lump sum fees are summarized in the following Fee Schedule:

FEE SCHEDULE FOR ADDITIONAL DESIGN SERVICES

TASKS	TOTALS
Original Contract Amount	\$2,552,445
Contract Amount with CO #1	\$2,675,912
Contract Amount with CO #2	\$2,807,689
Task A: Disconnection of Distribution Waterlines at Wells	\$19,088
Task B: PRV and Vault and Route 4 Valve Replacement	\$25,294
Task C: Site Design Adjustments at Chaot No. 2 Reservoir	\$4,314
Task D: Repairs to Chaot and Agana Heights Chlorination Systems and Buildings (+45 days for Chaot #2 for Tasks A-D)	\$39,576
Task E: Escrow and Other Purchasing Fees Associated With GWA Acquisition of Portion of Lot 177-1 For Manenggon Reservoirs	\$8,394
Task F: PRV #16 (St. John's) Piping and Flow Meters	\$45,490
Task G: New PRV on Simon Sanchez Street	\$41,374
Task H: New PRV at Intersection of Marine Corps Drive and Airport Road	\$39,914
Task I: SCADA for PRVs on Pale San Vitores and Design of Flow Meters (+35 days for Tumon #2 for Tasks F, I, J and N)	\$38,941
Task J: SCADA for PRV #16 (St. John's)	\$2,648
Task K: SCADA for PRV on Simon Sanchez Street	\$13,649
Task L: SCADA for New PRV at Intersection of Marine Corps Drive and Airport Road	\$13,649
Task M: SCADA for Hyundai Reservoir PRV and Easement	\$17,941



Task N: SCADA for Tumon No. 1, Tumon No. 2, Manenggon and Piti Reservoirs (+21 days for Manenggon for Task N)	\$41,764
Task O: Fire Pump and Electrical Improvements for Hyundai Pump Station (+35 days for Hyundai for Tasks M and O)	\$59,954
Task P: Tumon No. 1 Reservoir Site Location Change (+60 days for Tumon #1 for Tasks G, H, K, L, N and P)	\$107,231
Task Q: Piti Reservoir Relocation, Pump Station and Waterline (+90 days for Piti for Tasks N and Q)	\$134,103
Subtotal Cost	\$653,324
Guam GRT (at 4.167%)	\$27,224
TOTAL CHANGE PROPOSAL COST	\$680,548
AMENDED CONTRACT AMOUNT	\$3,488,237

Work that exceeds the scope of this proposal will be brought to your attention for review, approval and fee adjustment. Work performed will be billed monthly based on the estimated percent complete. We stand ready to provide the professional services necessary to assist GWA in this endeavor.

Sincerely,

Aaron Sutton
Project Manager

Attachments: GHD Estimating Summary dated 06/30/16
Well figures from SOP
Piti Reservoir Options Figures (3)

Cc: file

GHD - PROJECT ESTIMATING SHEET- SUMMARY SHEET

Project Name: GWA Central Reservoirs Design Services - Change Proposal No. 6	Attachment: 1
GHD Project Number: 8411830	of: 17
Prepared by: Aaron Sutton	Checked by: Jeff Groom
	Date: 6/30/2016

Task Letter	Task Description	Amount
A	Design of well disconnections to distribution lines	\$19,088
B	Design of PRV and Route 4 Valve Replacement for Chaot #2 Reservoir	\$25,294
C	Chaot design adjustments due to contractor changes	\$4,314
D	Repairs to Chaot and Agana Heights Chlorination Systems and Buildings	\$39,576
E	Escrow and Other Purchasing Fees for Manenggon Lot	\$8,394
F	PRV #16 (St. John's) Piping and Flow Meters	\$45,490
G	New PRV on Simon Sanchez Street	\$41,374
H	New PRV on Intersection of Marine Corps Drive and Airport Road	\$39,914
I	SCADA for PRVs on Pale San Vitores and Design of Flow Meters	\$38,941
J	SCADA for PRV #16 (St. John's)	\$2,648
K	SCADA for PRV on Simon Sanchez Street	\$13,649
L	SCADA for New PRV on Intersectn of Marine Corps Dr. and Airport Rd.	\$13,649
M	SCADA for Hyundai Reservoir PRV and Easement	\$17,941
N	SCADA for Tumon No. 1, Tumon No. 2, Manenggon and Piti Reservoirs	\$41,764
O	Fire Pump and Electrical Upgrades for Hyundai Pump Station	\$59,954
P	Tumon No. 1 Reservoir Site Location Change	\$107,231
Q	Piti Reservoir Relocation, Pump Station and Waterline	\$134,103
ALL	Subtotal	\$653,324
	Guam GRT (4.167%)	\$27,224
	GRAND TOTAL CHANGE PROPOSAL COST	\$680,548
	Original Contract Amount	\$2,552,445
	Change Order #1	\$123,467
	Change Order #2	\$131,777
	GRAND TOTAL	\$3,488,237

Phase Letter and Task Number	Task Description	Project Principal	Project Manager	Asst. Project Manager	Sr. Civil Engineer	Civil Engineer	Pat Tortora/Raines/Frederick Tack	Sr. Pump Station Designer	Pump Station Designer	Field Engineer	Sr. CAD Designer	CADD Technician	Quality Control	Surveyor	Cost Estimating	Amount
HOURLY LABOR RATES		251	146	106	211	166	166	221	166	121	106	101	221			
A	Design of well disconnections to distribution lines															
A1.0	Project Controls															
A1.1	Analysis of Existing Site Conditions/On-site Inspection		16							8						3,304
A1.2	As-built Review and Background Adjustment		8							4	12					2,924
A1.3	Topographic Survey and Review of Survey															
A1.4	Geotechnical Investigation & Permitting															
A1.5	Hazardous Material Investigation															
A1.6	Archaeological Investigation															
A1.7	Land and Property Research		8													1,168
A1.8	Project Management															
A1.9	Subconsultant Management		4													584
A1.10	Project Communication/File Management		36							12	12					7,980
	SUBTOTAL															
A2.0	Design															
A2.1	Civil															
A2.1.1	Site Plan		1							8						1,114
A2.1.2	Erosion and Sediment Control Plan															
A2.1.3	Piping System		8							16						3,104
A2.1.4	Tank Flow Mixing and Chlorine Contact Analysis															
A2.2	Structural															
A2.2.1	Tank Plans															
A2.2.2	Vaults															
A2.2.3	Pump Building															
A2.3	Mechanical															
A2.3.1	Pump Station															
A2.3.2	Fuel System															
A2.4	Electrical															
A2.4.1	Instrumentation and Controls															
A2.4.2	Generator															
	SUBTOTAL		9							24						4,218
A3.0	Submittals															
A3.1	30% Phase															
A3.1.3	Basis of Design															
A3.1.4	Agency Coordination/Meetings (GEPA)															
A3.1.5	Quality Control Review															
A3.2	60% Phase															
A3.2.1	Construction Drawings															
A3.2.2	Specifications															
A3.2.3	Construction Estimate															
A3.2.4	Agency Coordination/Meetings															
A3.2.5	Quality Control Review															
A3.2.6	Design Review Meeting															
A3.3	90% Phase															
A3.3.1	Construction Drawings															
A3.3.2	Specifications															

Phase Letter and Task Number	Task Description	Project Principal	Project Manager	Asst Project Manager	Sr. Civil Engineer	Civil Engineer	Pat Tortora/Mike Janes/Casey	Sr. Pump Station Designer	Greg Watanabe	Pump Station Designer	Frederick Tack	Field Engineer	Jacelia Legado	Sr. CADD Designer	Mark Pachkoski	CADD Technician	Ted Babauta or Eq.	Quality Control	Steve McHaney/Clay	Sarah/Bryan Ryley	Surveyor	Prudencio Balagas & Assoc.	Cost Estimating	Rider Levett Bucknall	Amount
A3.3.3	Construction Estimate	Jeff Groom																							
A3.3.4	Agency Coordination/Meetings																								
A3.3.5	Quality Control Review																								
A3.3.6	Design Review Meeting																								
A3.4	Final Phase																								
A3.4.1	Construction Drawings		8																						4,680
A3.4.2	Specifications		4																						584
A3.4.3	Construction Estimate																								500
A3.4.4	Basis of Design																								
A3.4.5	Agency Coordination/Meetings																								
A3.4.6	Quality Control Review																								884
A3.4.6	Permitting																								242
	SUBTOTAL		12									2	10	24					4	4					6,890
A4.0	Construction Bid Support Services																								
A4.1	Prebid Conference and Meeting Minutes																								
A4.2	RFI Responses (assume 10 at 2 hr each)																								
A4.3	Bid Agenda																								
A4.4	Bid analysis and recommendation																								
	SUBTOTAL																								
A5.0	Construction Support Services																								
A5.1	Submittal and Shop Drawing Review (assume 30 at 2 hr each)																								
A5.2	RFI Responses (assume 10 at 2 hr each)																								
A5.3	Substitution Request Review (assumes 5 at 2 hr each)																								
	SUBTOTAL																								
	TASK A HOUR SUBTOTAL		57									46	46	36					4	4					500
	TASK A SUBTOTAL		8,322									5,588	3,816						884						500
	ALL SUBTOTAL HOURS		57									46	46	36					4	4					500
ALL	SUBTOTAL																								19,088
ALL	GRT AT 4.167%																								795
ALL	GRAND TOTAL																								19,883

Phase Letter and Task Number	Task Description	Project Principal	Project Manager	Asst. Project Manager	Sr. Structural Engineer	Structural Designer	Sr. Civil Engineer	Civil Engineer	Sr. Pump Station Designer	Pump Station Designer	Field Engineer	Sr. CADD Designer	CADD Technician	Quality Control	Surveyor	Cost Estimating	Amount
HOURLY LABOR RATES																	
B	PRV Design for Chaot #2	281	148	186	118	131	211	166	221	166	121	106	101	221	1	1	
B1.0	Project Controls																
B1.1	Analysis of Existing Site Conditions/On-site Inspection		12														1,752
B1.2	As-built Review and Background Adjustment		2									4					716
B1.3	Topographic Survey and Review of Survey																
B1.4	Geotechnical Investigation & Permitting																
B1.5	Hazardous Material Investigation																
B1.6	Archaeological Investigation																
B1.7	Land and Property Research																
B1.8	Project Management		6														876
B1.9	Subconsultant Management		6														876
B1.10	Project Communication/File Management		26									4					4,220
B1.10	SUBTOTAL																
B2.0	Design																
B2.1	Civil																
B2.1.1	Site Plan		4								4						1,068
B2.1.2	Erosion and Sediment Control Plan																
B2.1.3	Piping System		16								8						3,304
B2.1.4	Hydraulic Modeling																1,328
B2.2	Structural																
B2.2.1	Tank Plans		8														5,632
B2.2.2	Vaults																
B2.2.3	Pump Building																
B2.3.1	Pump Station																
B2.3.2	Fuel System																
B2.4	Electrical																
B2.4.1	Instrumentation and Controls																
B2.4.2	Generator																
B2.4.2	SUBTOTAL		28		24			8			12						11,332
B3.0	Submittals																
B3.1	30% Phase																
B3.1.3	Basis of Design																
B3.1.4	Agency Coordinator/Meetings (GEPA)																
B3.1.5	Quality Control Review																
B3.2	60% Phase																
B3.2.1	Construction Drawings																
B3.2.3	Construction Estimate																
B3.2.4	Agency Coordination/Meetings																
B3.2.5	Quality Control Review																
B3.2.6	Design Review Meeting																
B3.3	90% Phase																
B3.3.1	Construction Drawings																
B3.3.2	Specifications																
B3.3.3	Construction Estimate																
B3.3.4	Agency Coordination/Meetings																
B3.3.5	Quality Control Review																
B3.3.6	Design Review Meeting																
B3.4	Final Phase																

Phase Letter and Task Number	Task Description	Project Principal	Project Manager	Asst. Project Manager	Sr. Structural Engineer	Structural Designer	Sr. Civil Engineer	Civil Engineer	Sr. Pump Station Designer	Pump Station Designer	Field Engineer	Sr. CADD Designer	CADD Technician	Quality Control	Surveyor	Cost Estimating	Amount
B3.4.1	Construction Drawings	Jeff Groom	Aaron Sutton	Pat Tortora	Brett King/Manny Yeo	Andree Tonorio	Don Whitehead	Pat Tortora/Mike James/Casey	Greg Watanabe	Frederick Tack	Jocelia Legado	Mark Pachkoski	Ted Babautz or Eq.	Steve McHarey/Clay	Prudencio Balagtas & Assoc.	Rider Levett Bucknall	7,260
B3.4.2	Specifications		6														1,540
B3.4.3	Construction Estimate																500
B3.4.4	Basis of Design																
B3.4.5	Agency Coordination/Meetings																
B3.4.6	Quality Control Review																442
B3.4.6	Permitting																
B3.4.6	SUBTOTAL		18					8			12	32		2		500	9,742
B4.0	Construction Bid Support Services																
B4.1	Prebid Conference and Meeting Minutes																
B4.2	RFI Responses (assume 10 at 2 hr each)																
B4.3	Bid Addenda																
B4.4	Bid analysis and recommendation																
B4.4	SUBTOTAL																
B5.0	Construction Support Services																
B5.1	Submittal and Shop Drawing Review (assume 30 at 2 hr each)																
B5.2	RFI Responses (assume 10 at 2 hr each)																
B5.3	Substitution Request Review (assumes 5 at 2 hr each)																
B5.3	SUBTOTAL		72		24			16			24	36		2		500	25,294
	TASK B HOUR SUBTOTAL		10,512		4,464			2,656			2,904	3,816		442		500	25,294
	TASK B SUBTOTAL																
ALL	SUBTOTAL HOURS		72		24			16			24	36		2		500	
ALL	SUBTOTAL																25,294
ALL	IGRT AT 4.167%																1,054
ALL	IGRAND TOTAL																26,348

Phase Letter and Task Number	Task Description	Project Principal	Project Manager	Asst Project Manager	Sr. Civil Engineer	Civil Engineer	Pat Tortora/Mike Jones/Casey	Sr. Pump Station Designer	Greg Watanabe	Pump Station Designer	Frederick Tack	Field Engineer	Jocelia Legado	Sr. CAD Designer	Mark Pachoski	CADD Technician	Ted Babauta or Eq.	Quality Control	Steve McHaney/Clay	Serran/Bryan Ryley	Surveyor	Prudencio Balagtas & Assoc.	Cost Estimating	Rider Levett Bucknall	Amount
HOURLY LABOR RATES		261	146	186	211	166	166	221	221	156	156	121	121	106	106	101	101	221	221	221	1	1	1		
C	Chaot design adjustments due to contractor changes																								
C1.0	Project Controls																								
C1.1	Analysis of Existing Site Conditions/On-site Inspection																								
C1.2	As-built Review and Background Adjustment																								
C1.3	Topographic Survey and Review of Survey		4																						947
C1.4	Geotechnical Investigation & Permitting																								
C1.5	Hazardous Material Investigation																								
C1.6	Archaeological Investigation																								
C1.7	Land and Property Research																								
C1.8	Project Management																								
C1.9	Subconsultant Management																								
C1.10	Project Communication/File Management		4																						
	SUBTOTAL																								947
C2.0	Design																								
C2.1	Civil																								
C2.1.1	Site Plan																								
C2.1.2	Erosion and Sediment Control Plan		4																						3,367
C2.1.3	Piping System																								
C2.1.4	Tank Flow Mixing and Chlorine Contact Analysis																								
C2.2	Structural																								
C2.2.1	Tank Plans																								
C2.2.2	Vaults																								
C2.2.3	Pump Building																								
C2.3	Mechanical																								
C2.3.1	Pump Station																								
C2.3.2	Fuel System																								
C2.4	Electrical																								
C2.4.1	Instrumentation and Controls																								
C2.4.2	Generator																								
	SUBTOTAL		4																						3,367
C3.0	Submittals																								
C3.1	30% Phase																								
C3.1.3	Basis of Design																								
C3.1.4	Agency Coordination/Meetings (GEPA)																								
C3.1.5	Quality Control Review																								
C3.2	60% Phase																								
C3.2.1	Construction Drawings																								
C3.2.2	Specifications																								
C3.2.3	Construction Estimate																								
C3.2.4	Agency Coordination/Meetings																								
C3.2.5	Quality Control Review																								
C3.2.6	Design Review Meeting																								
C3.3	90% Phase																								
C3.3.1	Construction Drawings																								
C3.3.2	Specifications																								

Phase Letter and Task Number	Task Description	Project Principal	Project Manager	Asst. Project Manager	Sr. Civil Engineer	Civil Engineer	Pat Tortora/Mike Janes/Casey	Sr. Pump Station Designer	Greg Watanabe	Pump Station Designer	Frederick Tack	Field Engineer	Jocella Legado	Sr. CADD Designer	Mark Pachkoski	CADD Technician	Ted Babauta or Eq.	Quality Control	Steve McHarey/Clay	Serrahn/Bryan Ryley	Surveyor	Prudencio Balagtas & Assoc.	Cost Estimating	Rider Levett Bucknall	Amount
C3.3.3	Construction Estimate																								
C3.3.4	Agency Coordination/Meetings																								
C3.3.5	Quality Control Review																								
C3.3.6	Design Review Meeting																								
C3.4	Final Phase																								
C3.4.1	Construction Drawings																								
C3.4.2	Specifications																								
C3.4.3	Construction Estimate																								
C3.4.4	Basis of Design																								
C3.4.5	Agency Coordination/Meetings																								
C3.4.6	Quality Control Review																								
C3.4.6	Permitting																								
	SUBTOTAL																								
C4.0	Construction Bid Support Services																								
C4.1	Prebid Conference and Meeting Minutes																								
C4.2	RFI Responses (assume 10 at 2 hr each)																								
C4.3	Bid Addenda																								
C4.4	Bid analysis and recommendation																								
	SUBTOTAL																								
C5.0	Construction Support Services																								
C5.1	Submittal and Shop Drawing Review (assume 30 at 2 hr each)																								
C5.2	RFI Responses (assume 10 at 2 hr each)																								
C5.3	Substitution Request Review (assumes 5 at 2 hr each)																								
	SUBTOTAL																								
	TASK C HOUR SUBTOTAL		8									26													
	TASK C SUBTOTAL		1,168									3,146													
	ALL SUBTOTAL HOURS		8									26													
ALL	SUBTOTAL																								4,314
ALL	GRT AT 4.167%																								180
ALL	GRAND TOTAL																								4,494

Phase Letter and Task Number	Task Description	Project Principal	Project Manager	Asst. Project Manager	Pat Tortora	SCADA Specialty	Architectural	Civil Engineer	Electrical Engineer	Sr. Pump Station Designer	Pump Station Designer	Field Engineer	Sr. CADD Designer	CADD Technician	Quality Control	Surveyor	Cost Estimating	Amount	
HOURLY LABOR RATES																			
D Repairs to Chaot and Agana Heights Chlorination Systems and Buildings																			
D1.0	Project Controls		8																
D1.1	Analysis of Existing Site Conditions/On-site Inspection		4																1,168
D1.2	As-built Review and Background Adjustment		4																1,856
D1.3	Topographic Survey and Review of Survey																		
D1.4	Geotechnical Investigation & Permitting																		
D1.5	Hazardous Material Investigation																		
D1.6	Archaeological Investigation																		
D1.7	Land and Property Research																		876
D1.8	Project Management		6																
D1.9	Submittal Management																		
D1.10	Project Communication/File Management		4																584
	SUBTOTAL		22										12						4,484
D2.0	Design																		
D2.1	Civil																		
D2.1.1	Site Plan							16											2,656
D2.1.2	Erosion and Sediment Control Plan																		
D2.1.3	Piping System							8											4,232
D2.1.4	Chlorine System Analysis																		2,656
D2.2	Structural																		
D2.2.1	Tank Plans																		
D2.2.2	Vaults																		968
D2.2.3	Pump Building																		332
D2.3	Mechanical																		
D2.3.1	Pump Station																		
D2.3.2	Fuel System																		
D2.4	Electrical																		
D2.4.1	Instrumentation and Controls																		1,328
D2.4.2	Generation																		1,416
	SUBTOTAL							24		16	16	32							13,590
D3.0	Submittals																		
D3.1	30% Phase																		
D3.1.1	Basis of Design																		
D3.1.4	Agency Coordination/Meetings (GEPA)																		
D3.1.5	Quality Control Review																		
D3.2	60% Phase																		
D3.2.1	Construction Drawings																		
D3.2.2	Specifications																		
D3.2.3	Construction Estimate																		
D3.2.4	Agency Coordination/Meetings																		
D3.2.5	Quality Control Review																		
D3.2.6	Design Review Meeting																		
D3.3	90% Phase																		
D3.3.1	Construction Drawings																		
D3.3.2	Specifications																		
D3.3.3	Construction Estimate																		
D3.3.4	Agency Coordination/Meetings																		
D3.3.5	Quality Control Review																		
D3.3.6	Design Review Meeting																		
D3.4	Final Phase																		
																			8,856
																			2,998
																			884

Phase Letter and Task Number	Task Description	Project Principal	Project Manager	Asst. Project Manager	SCADA Specialty	Architectural	Civil Engineer	Electrical Engineer	Sr. Pump Station Designer	Pump Station Designer	Field Engineer	Sr. CADD Designer	CADD Technician	Quality Control	Surveyor	Cost Estimating	Amount
D3.4.1	Construction Drawings	Jeff Groom	Aaron Sutton	Pat Tortora	Jim Cook	Sue Brady	Pat Tortora/Mike Janes/Casoy	Eric Fern or other	Greg Watanabe	Frederick Tack	Jaceta Liagado	Mark Pachkoski	CADD Technician	Steve McHorney/Clay	Surveyor	Cost Estimating	3,630
D3.4.2	Specifications																996
D3.4.3	Construction Estimate																
D3.4.4	Basis of Design																
D3.4.5	Agency Coordination Meetings																884
D3.4.6	Quality Control Review																
D3.4.6	Permitting																
	SUBTOTAL					20	12			16	18	54		8			17,638
D4.0	Construction Bid Support Services																
D4.1	Prebid Conference and Meeting Minutes																
D4.2	RFI Responses (assume 2 at 2 hr each)																664
D4.3	Bid Addenda																544
D4.4	Bid analysis and recommendation																332
	SUBTOTAL									6		2					1,540
D5.0	Construction Support Services																
D5.1	Submittal and Shop Drawing Review (assume 3 at 2 hr each)					2											996
D5.2	RFI Responses (assume 2 at 2 hr each)																664
D5.3	Substitution Request Review (assume 2 at 2 hr each)																664
	SUBTOTAL					2				12							2,324
	TASK D HOUR SUBTOTAL					24	36	14	52	52	50	68		8			39,576
	TASK D SUBTOTAL					3,984	5,976	2,324	8,632	6,050	7,208			1,788			39,576
ALL	SUBTOTAL HOURS				2	24	36	14	52	50	68			8			
ALL	SUBTOTAL																39,576
ALL	GRT AT 4.67%																1,649
ALL	GRAND TOTAL																41,225

Phase Letter and Task Number	Task Description	Project Principal	Project Manager	Ast. Project Manager	Sr. Structural Engineer	Eric Magee/Manny Yoo	SCADA Specialty	Structural Designer	Sc. Civil Engineer	Don Whitehead	Civil Engineer	Pat Tector/Mika Jansz/Cassidy	Mehmet/Fredrick Tack	Mechanical Engineer	Tony Wong	Electrical Engineer	Eric Penn or other	Sr. Pump Station Designer	Greg Wetanabe	Pump Station Designer	Frederick Tack	Jacelia Legado	Sr. CAD Designer	Mark Pachoski	CAD Technician	Ted Babauts or Eq.	Quality Control	Steve McHenry/Chiy	Sarah/Bryan Rylay	Surveyor	Francisco Balagas & Assoc.	Cost Estimating	Rider Lovell Buchhalt	SCADA Peer Review	Machine	Amount
F4.3	Blu Andonza																																			
F4.4	Site analysis and recommendations																																			504
F5.0	Construction Support Services																																		1,560	
F5.1	Submittal and Shop Drawing Review (assume 5 at 2 hr each)		10																																584	
F5.2	RFI Responses (assume 2 at 2 hr each)		4																																2,044	
F5.3	Substitution Request Review (assume 0 at 2 hr each)		14																															8,000		
	SUBTOTAL		78																																8,000	
	TASK F SUBTOTAL		11,368																																8,000	
	TASK F SUBTOTAL																																			8,000
ALL	ISUBTOTAL HOURS		78																																	8,000
ALL	SUBTOTAL																																			45,600
ALL	IGRT AT 4.067%																																			1,996
ALL	IGRAND TOTAL																																			47,596

Phase Letter and Task Number	Task Description	Project Principal	Project Manager	Asst. Project Manager	Sr. Structural Engineer	SCADA Specialty	Structural Designer	Civil Engineer	Civil Engineer	Pat Torrealmeida JanezCassidy	Mechanical Engineer	Electrical Engineer	Sr. Pump Station Designer	Greg Vitanabe	Pump Station Designer	Field Engineer	Sr. CAD Designer	Mark Fachkahl	CADD Technician	Quality Control	Steve McHenry/Clay	Serrano/Bryan Ryley	Surveyor	Prudencio Balagtas & Assoc.	Cost Estimating	Rider Lovitt Bucknall	SCADA Peer Review	Archline	Amount
G4	Bid Addenda	Jeff Groom	Aaron Burton	Pat Torora	Eric Magee/Manny Yeo	SCADA Specialty	Nate Dakes/Andre Tenorio	Sr. Civil Engineer	Don Whitehead	Civil Engineer	Pat Torrealmeida JanezCassidy	Mechanical Engineer	Eric Penn or other	Sr. Pump Station Designer	Greg Vitanabe	Pump Station Designer	Field Engineer	Sr. CAD Designer	Mark Fachkahl	CADD Technician	Quality Control	Serrano/Bryan Ryley	Surveyor	Prudencio Balagtas & Assoc.	Cost Estimating	Rider Lovitt Bucknall	SCADA Peer Review	Archline	584
G4.1	Bid specials and recommendations		4																										1,460
	SUBTOTAL																												584
G5.0	Construction Support Services		10																										584
G5.1	Submitted and Shop Drawing Review (assume 5 at 2 hr each)		4																										2,044
G5.2	RFI Responses (assume 2 at 2 hr each)																												8,000
G5.3	Substitution Request Review (assume 0 at 2 hr each)		14																										8,000
	SUBTOTAL		68																										17,084
	TASK G HOUR SUBTOTAL		9,576			5,064				8,300								7,314				6							8,000
	TASK G SUBTOTAL																												17,084
	ALL SUB TOTAL HOURS		88			24				50								69				8							9,000
	ALL SUB TOTAL																												41,374
	ALL SUB TOTAL																												1,724
	ALL GRAND TOTAL																												43,098

Phase Letter and Task Number	Task Description	Project Principal	Project Manager	Asst. Project Manager	Sr. Structural Engineer	SCADA Specialty	Structural Designer	Civil Engineer	Structural Designer	Electrical Engineer	Sr. Pump Station Designer	Pump Station Designer	Field Engineer	SCAD Designer	CADD Technician	Quality Control	Surveyor	Cost Estimating	Architect	Amount
		267	144	188	190	217	131	211	164	211	221	188	221	194	101	221	1	1	1	
HOURLY LAUNCH RATES																				
H	New PRV Maine Corps Drive and Airport Road																			
H1.0	Project Controls																			
H1.1	Analysis of Existing Site Conditions/On-site Inspection																			
H1.2	As-built Review and Background Adjustment		4																	802
H1.3	Topographic Survey and Review of Survey		4																	9,220
H1.4	Geotechnical Investigation & Planning																			
H1.5	Hazardous Material Investigation																			
H1.6	Pre-geological Investigation																			
H1.7	Geological Investigation																			
H1.8	Geotechnical Investigation																			
H1.9	Subsidence Investigation																			
H1.10	Project Communication/Field Management																			
H1.11	SubTOTAL																			12,458
H2.0	Design																			
H2.1	Civil																			
H2.1.1	Silo Plan																			
H2.1.2	Erosion and Sediment Control Plan																			
H2.1.3	Piping System																			
H2.1.4	Modeling and Hydraulic Analysis																			
H2.2	Structural																			
H2.2.1	Beam Piers																			
H2.2.2	Yard Piers																			
H2.2.3	Pump Building																			
H2.3	Mechanical																			
H2.3.1	Pump Station																			
H2.3.2	Fuel System																			
H2.4	Electrical																			
H2.4.1	Instrumentation and Controls																			
H2.4.2	Generator																			
H2.4.3	SubTOTAL																			10,056
H3.0	Submittals																			
H3.1	30% Plans																			
H3.1.1	As-Built																			
H3.1.2	Agency Coordination/Meetings (GEPA)																			
H3.1.3	Quality Control Review																			
H3.2	60% Phase																			
H3.2.1	Construction Drawings																			
H3.2.2	Specifications																			
H3.2.3	Construction Estimate																			
H3.2.4	Agency Coordination/Meetings																			
H3.2.5	Quality Control Review																			
H3.2.6	Design Review Meeting																			
H3.3	90% Phase																			
H3.3.1	Construction Drawings																			
H3.3.2	Specifications																			
H3.3.3	Agency Coordination/Meetings																			
H3.3.4	Quality Control Review																			
H3.3.5	Design Review Meeting																			
H3.4	Final Phase																			
H3.4.1	Construction Drawings																			
H3.4.2	Specifications																			
H3.4.3	Construction Estimate																			
H3.4.4	Basis of Design																			
H3.4.5	Agency Coordination/Meetings																			
H3.4.6	Quality Control Review																			
H3.4.7	Design Review Meeting																			
H4.0	Construction Bid Support Services																			
H4.1	Prebid Conference and Meeting Minutes																			
H4.2	RFP Responses (assume 2 at 2 hr each)																			

Phase Letter and Task Number	Task Description	Project Principal	Project Manager	Ast. Project Manager	Sr. Structural Engineer	Eric Magee/Manny Yeo	SCADA Specialty	Structural Designer	Nate Cokes/Andra Tenorio	Sr. Civil Engineer	Don Whitehead	Civil Engineer	Pat Torroni/Mike Janetz/Casay	Reinbar/Fredrick Tack	Mechanical Engineer	Terry Wong	Electrical Engineer	Eric Penn or other	Sr. Pump Station Designer	Greg Wetanabe	Pump Station Designer	Frederick Tack	Field Engineer	Jacelia Logado	Sr. CADD Designer	Mark Pachoski	CADD Technician	Tad Babava or Eq.	Quality Control	Steve McHenry/Clay	Serrah/Brynn Ryland	Surveyor	Prudencio Balagtas & Assoc.	Cost Estimating	Rider Levett Bucknall	SCADA Peer Review	Amount		
H4.3	Bill Address																																						
H4.4	File analysis and recommendation																																					584	
H5.0	Construction Support Services																																					1,460	
H5.1	Submittal and Shop Drawing Review (assume 5 at 2 hr each)		10																																		584		
H5.2	RFI Responses (assume 2 at 2 hr each)		4																																			2,044	
H5.3	Submittal Request Review (assume 0 at 2 hr each)		14																																		8,000		
	SUBTOTAL		14																																		8,000		
	TASK H HOUR SUBTOTAL		58																																		1,000		
	TASK H SUBTOTAL		8,468																																		39,514		
	ALL SUBTOTAL HOURS		58																																		1,000		
	ALL SUBTOTAL																																				39,514		
	ALL GRT AT 4.67%																																				1,663		
	ALL GRAND TOTAL																																				41,177		

Phase Letter and Task Number	Task Description	Project Principal	Project Manager	Asst. Project Manager	Sr. Structural Engineer	SCADA Specialty	Structural Designer	Civil Engineer	Civil Engineer	Patricia/Marka James/Cassidy	Mechanical Engineer	Eric Penn or other	Sr. Pump Station Designer	Greg Vitanabe	Pump Station Designer	Field Engineer	Sr. CAD Designer	CAD Technician	Quality Control	Surveyor	Cost Estimating	Mike Tocher	Amount
HOVET 1 ABOOK RATE4																							
I	SCADA for PRVs on Pale San Vitores and Design of Flow Meters	Jeff Green	Aaron Guin	Pat Torera	Eric Magee/Hanny Yeo	Jim Cook	Nata Daka/Ahndra Toronto	Don Whitehead	Patricia/Marka James/Cassidy	Mehmet/Fredrick Tack	Terry Wong	Eric Penn or other	Sr. Pump Station Designer	Greg Vitanabe	Pump Station Designer	Field Engineer	Sr. CAD Designer	CAD Technician	Quality Control	Surveyor <td>Cost Estimating</td> <td>Mike Tocher</td> <td>Amount</td>	Cost Estimating	Mike Tocher	Amount
I1.0	Project Controls		1																				146
I1.1	Analysis of Existing Site Conditions/On-site Inspection																						146
I1.2	As-built Review and Background Adjustment																						146
I1.3	Topographic Survey and Review of Survey		2																	5,000			5,716
I1.4	Construction Method/Procurement																						
I1.5	Hydrological Investigation																						
I1.6	Hydrological Investigation																						
I1.7	Land and Property Research		8																				1,168
I1.8	Project Management																						1,168
I1.9	Subconsultant Management																						1,198
I1.10	Project Communication/File Management																						11,980
I2.0	SUBTOTAL		19																				
I2.0	Design																						
I2.1	Civil																						
I2.1.1	Site Plan																						
I2.1.2	Erosion and Sediment Control Plan																						
I2.1.3	Paving System																						
I2.1.4	Stormwater Management																						
I2.2	Structural																						
I2.2.1	Task Plans																						
I2.2.2	Vaults																						
I2.2.3	Pump Building																						
I2.3	Mechanical																						
I2.3.1	Pump Station																						
I2.3.2	Fuel System																						
I2.4	Electrical																						
I2.4.1	SCADA																						
I2.4.2	Generator																						
I2.4.3	Generator																						
I3.0	SUBTOTAL																						
I3.1	30% Phase																						
I3.1.1	30% Phase																						
I3.1.2	30% Phase																						
I3.1.3	30% Phase																						
I3.1.4	30% Phase																						
I3.1.5	30% Phase																						
I3.2	60% Phase																						
I3.2.1	60% Phase																						
I3.2.2	60% Phase																						
I3.2.3	60% Phase																						
I3.2.4	60% Phase																						
I3.2.5	60% Phase																						
I3.3	80% Phase																						
I3.3.1	80% Phase																						
I3.3.2	80% Phase																						
I3.3.3	80% Phase																						
I3.3.4	80% Phase																						
I3.4	Final Phase																						
I3.4.1	Final Phase																						
I3.4.2	Final Phase																						
I3.4.3	Final Phase																						
I3.4.4	Final Phase																						
I3.4.5	Final Phase																						
I3.4.6	Final Phase																						
I4.0	SUBTOTAL																						
I4.0	Construction Bid Support Services																						
I4.1	Prebid Conference and Meeting Minutes																						
I4.2	RFI Responses (assumed 2 at 2 hr each)																						

Phase Letter and Task Number	Task Description	Project Principal	Project Manager	Asst. Project Manager	Sr. Structural Engineer	Eric Magee/Manny Yeo	SCADA Specificity	Jim Cook	Structural Designer	Nate Cakes/Andre Tanorio	Sr. Civil Engineer	Don Whitehead	Civil Engineer	Pat Tortora/Mike Jarama/Casey Mahow/Fredrick Tack	Mechanical Engineer	Terry Wong	Electrical Engineer	Eric Penn or other	Sr. Pump Station Designer	Greg Watanabe	Pump Station Designer	Frederick Tack	Field Engineer	Jacelia Lligado	Sr. CAD Designer	Mark Pachnoki	CAD Technician	Tad Babauta or Eq.	Quality Control	Steve McHenry/Clay Serran/Bryan Ryley	Surveyor	Prudencio Balagtas & Assoc.	Cost Estimating	Roger Levitt Buchhalt	SCADA Review	Mike Teicher	Amount			
M.3	Bid Addenda	Jeff Proom	Aaron Sutton	Pat Tortora	Sr. Structural Engineer	Eric Magee/Manny Yeo	SCADA Specificity	Jim Cook	Structural Designer	Nate Cakes/Andre Tanorio	Sr. Civil Engineer	Don Whitehead	Civil Engineer	Pat Tortora/Mike Jarama/Casey Mahow/Fredrick Tack	Mechanical Engineer	Terry Wong	Electrical Engineer	Eric Penn or other	Sr. Pump Station Designer	Greg Watanabe	Pump Station Designer	Frederick Tack	Field Engineer	Jacelia Lligado	Sr. CAD Designer	Mark Pachnoki	CAD Technician	Tad Babauta or Eq.	Quality Control	Steve McHenry/Clay Serran/Bryan Ryley	Surveyor	Prudencio Balagtas & Assoc.	Cost Estimating	Roger Levitt Buchhalt	SCADA Review	Mike Teicher	422			
M.4	Bid analysis and recommendation							2																															1,266	
IS.0	Construction Support Services							6																															844	
IS.1	Submittal and Shop Drawing Review (assume 2 at 2 hr each)							4																															844	
IS.2	RFI Responses (assume 2 at 2 hr each)							4																															1,588	
IS.3	Substitution Request Review (assume 0 at 2 hr each)							6																														20		
	SUBTOTAL							45	28	3,658				3,652												6,148							8,000	1,000	1,000				20	38,541
	TASK 1 HOUR SUBTOTAL							9,495	3,658					3,652												6,148						8,000	1,000	1,000				20	38,541	
	TASK 1 SUBTOTAL							45	28					22												58						8,000	1,000	1,000				20	38,541	
ALL	SUBTOTAL HOURS							45	28					22												58						8,000	1,000	1,000				20	38,541	
ALL	SUBTOTAL																																						38,541	
ALL	GRT AT 4.167%																																						1,523	
ALL	GRAND TOTAL																																						40,064	

Phase Letter and Task Number	Task Description	Project Principal	Project Manager	Asst. Project Manager	Sr. Structural Engineer	SCADA Specialty	Structural Designer	Civil Engineer	Civil Engineer	Pat Torona/Mika James/Cassey	Mechanical Engineer	Electrical Engineer	Sr. Pump Station Designer	Pump Station Designer	Field Engineer	Sr. CAD Designer	CAD Technician	Quality Control	Surveyor	Cost Estimating	Riser Layout Bucknall	SCADA Peer Review	Amount
1A	RM Askenda																						
1A.4	RM Analysis and recommendation																						
	SUBTOTAL																						
J5.0	Construction Support Services																						
J5.1	Submitted and Shop Drawing Review (assume 0 at 2 hr each)																						
J5.2	RF Responses (assume 0 at 2 hr each)																						
J5.3	Substitution Request Review (assume 0 at 2 hr each)																						
	SUBTOTAL																						
	TASK J HOUR SUBTOTAL		1,768			64										63							2,648
	TASK J SUBTOTAL		1,768			64										63							2,648
ALL	SUBTOTAL HOURS		1,768			64										63							2,648
ALL	SUBTOTAL																						2,648
ALL	GRTA1 4.67%																						110
ALL	GORD TOTAL																						2,758

Phase Letter and Task Number	Task Description	Project Principal	Project Manager	Asst. Project Manager	Sr. Structural Engineer	SCADA Specialty	Structural Designer	Civil Engineer	Civil Engineer	Mechanical Engineer	Electrical Engineer	Sr. Pump Station Designer	Pump Station Designer	Field Engineer	Sr. CAD Designer	CADD Technician	Quality Control	Surveyor	Cost Estimating	SCADA Peer Review	Amount
L	SCADA for New PRV Marine Corps Dr and Airport Rd																				
L1.0	Project Controls																				
L1.1	Analysis of Existing Site Conditions/On-site Inspection																				
L1.2	As-buil Review and Background Adjustment																				
L1.3	Topographic Survey and Review of Survey																				
L1.4	Utility Location and Identification																				
L1.5	Hydrologic Method Investigation																				
L1.6	Archaeological Investigation																				
L1.7	Land Use and Property Research																				1,159
L1.8	Project Management																				
L1.9	Subcontractor Management																				
L1.10	Project Communication/Title Management																				
	SUBTOTAL																				1,159
L2.0	Design																				
L2.1	Design																				
L2.1.1	Site Plan																				
L2.1.2	Storm Water Sediment Control Plan																				
L2.1.3	Process Flow																				
L2.1.4	Task Force Meeting and Change Contact Analysis																				
L2.2	Structural																				
L2.2.1	Tank Plans																				
L2.2.2	Vaults																				
L2.2.3	Pump Building																				
L2.3	Mechanical																				
L2.3.1	Pump Station																				
L2.3.2	Fuel System																				
L2.4	Electrical																				
L2.4.1	SCADA																				2,532
L2.4.2	General																				644
L2.4.3	SCADA																				3,376
	SUBTOTAL																				
L3.0	Support																				
L3.1	Support																				
L3.1.3	Basis of Design																				
L3.1.4	Agency Coordination/Meetings (SEPA)																				
L3.1.5	Quality Control Review																				
L3.2	60% Phase																				
L3.2.1	Construction Drawings																				2,116
L3.2.2	Specifications																				
L3.2.3	Construction Estimate																				
L3.2.4	Agency Coordination/Meetings																				
L3.2.5	Quality Control Review																				
L3.3	80% Phase																				
L3.3.1	Design Review Meeting																				
L3.3.2	Construction Drawings																				1,892
L3.3.3	Specifications																				
L3.3.4	Agency Coordination/Meetings																				
L3.3.5	Quality Control Review																				
L3.4	Final Phase																				
L3.4.1	Final Phase																				
L3.4.2	Construction Drawings																				846
L3.4.3	Specifications																				844
L3.4.4	Construction Estimate																				
L3.4.5	Basis of Design																				
L3.4.6	Agency Coordination/Meetings																				211
L3.4.7	Quality Control Review																				
L3.4.8	Final Review Meeting																				
	SUBTOTAL																				21
L4.0	Construction Bid Support Services																				
L4.1	Prebid Conference and Meeting Minutes																				
L4.2	RFI Responses (assume 2 at 2 hr each)																				6,151
	SUBTOTAL																				844

Phase Letter and Task Number	Task Description	Project Principal	Project Manager	Assl. Project Manager	Sr. Structural Engineer	SCADA Specialty	Structural Designer	Sr. Civil Engineer	Civil Engineer	Pat Tomora/Mike Janes/Casoy	Mechanical Engineer	Electrical Engineer	Sr. Pump Station Designer	Greg Wickhambe	Pump Station Designer	Field Engineer	Sr. CAD Designer	CADD Technician	Quality Control	Surveyor	Coat Estimating	SCADA Peer Review	Amount	
L4	Bid Appendix																							
L4.4	Bid seals and recommendation																							
L4.4	SURTOTAL																							1,262
L5.0	Construction Support Services																							
L5.1	Submittal and Shop Drawing Review (assume 2 at 2 hr each)																							
L5.2	RFI Responses (assume 2 at 2 hr each)																							
L5.3	Substitution Request Review (assume 0 at 2 hr each)																							
	SURTOTAL																							844
	TASK L HOUR SUBTOTAL																							1,888
	TASK L SUBTOTAL																							13,619
ALL	SUBTOTAL HOURS																							
ALL	SUBTOTAL																							13,619
ALL	GRI AT 4.167%																							899
ALL	GROUND TOTAL																							14,518

Phase Letter and Task Number	Task Description	Project Principal	Project Manager	Ast. Project Manager	Sr. Structural Engineer	SCADA Specialty	Structural Designer	Civil Engineer	Mechanical Engineer	Electrical Engineer	Sr. Pump Station Designer	Pump Station Designer	Field Engineer	Sr. CAD Designer	CADD Technician	Quality Control	Surveyor	Cost Estimating	Rider Levitt Bucknall	SCADA Peer Review	Amount
MONTHLY LABOR RATES																					
M SCADA for Hyndal Reservoir PRV and Easement																					
	M1.0 Project Controls																				
	M1.1 Analysis of Existing Site Conditions/On-site Inspection																				
	M1.2 As-built Review and Background Adjustment																				
	M1.3 Topographic Survey and Review of Survey																				
	M1.4 Geotechnical Investigation & Remitting																				
	M1.5 Hazardous Material Investigation																				
	M1.6 Remedial Investigation																				
	M1.7 Land Use and Property Research and Easement recorded	6																			3,000
	M1.8 Project Management	2																			1,186
	M1.9 Subconsultant Management	6																			292
	M1.10 Project Communication/Infile Management	2																			3,000
	SUBTOTAL	18																			4,460
	M2.0 Design																				
	M2.1 Civil																				
	M2.1.1 Site Plan																				
	M2.1.2 Erosion and Sediment Control Plan																				
	M2.1.3 Piping System																				
	M2.1.4 Storm Water Management and Channelization Analysis																				
	M2.2 Tank Plans																				
	M2.2.1 Tank Plans																				
	M2.2.2 Vaults																				
	M2.2.3 Pump Building																				
	M2.3 Mechanical																				
	M2.3.1 Pump Station																				
	M2.3.2 Fuel System																				
	M2.4 Electrical																				
	M2.4.1 SCADA																				
	M2.4.2 Generator																				
	M2.4.3 SCADA																				
	M2.4.4 Generator																				
	SUBTOTAL																				
	M3.0 Submittals																				
	M3.1 50% Phase																				
	M3.1.1 Basis of Design																				
	M3.1.2 Agency Coordination/Meetings (GEP)																				
	M3.1.3 Quality Control Review																				
	M3.2 60% Phase																				
	M3.2.1 Construction Drawings																				
	M3.2.2 Specifications																				
	M3.2.3 Construction Estimate																				
	M3.2.4 Agency Coordination/Meetings																				
	M3.2.5 Quality Control Review																				
	M3.2.6 Design Review Meeting																				
	M3.3 90% Phase																				
	M3.3.1 Construction Drawings																				
	M3.3.2 Construction Estimate																				
	M3.3.3 Agency Coordination/Meetings																				
	M3.3.4 Quality Control Review																				
	M3.3.5 Design Review Meeting																				
	M3.4 Final Phase																				
	M3.4.1 Construction Drawings																				
	M3.4.2 Specifications																				
	M3.4.3 Construction Estimate																				
	M3.4.4 Basis of Design																				
	M3.4.5 Agency Coordination/Meetings																				
	M3.4.6 Quality Control Review																				
	SUBTOTAL																				
	M4.0 Construction Bid Support Services																				
	M4.1 Prebid Conference and Meeting Minutes																				
	M4.2 RF Responses (assume 2 at 2 hr each)																				

Phase Letter and Task Number	Task Description	Project Principal	Project Manager	Asst. Project Manager	Sr. Structural Engineer	Eric Magee/Manny Yoo	SCADA Specialty	Structural Designer	Sr. Civil Engineer	Civil Engineer	Pat Torora/Mike Janek/Cassy Raines/Fredrick Task	Mechanical Engineer	Tary Wong	Electrical Engineer	Eric Penn or other	Sr. Pump Station Designer	Greg Wetanabe	Pump Station Designer	Field Engineer	Jocelia Legado	Sr. CAD Designer	Mark Pachoski	CAD Technician	Ted Babara or Eq.	Quality Control	Steve McHenry/Clay Serrano/Bryan Ryby	Surveyor	Fredrick Balagtas & Assoc.	Cost Estimating	Roger Lovett Buchhall	SCADA Peer Review	Archive	Amount
M4	Bid Address																															422	
M4	Bid Analysis and recommendation																															1,268	
M4	SUBTOTAL																															844	
M5.1	Submitted and Shop Drawing Review (assume 2 at 2 hr each)																															844	
M5.2	RFI Responses (assume 2 at 2 hr each)																																1,888
M5.3	Substitution Request Review (assume 0 at 2 hr each)																															1,000	
	SUBTOTAL																															3,000	
	TASK M HOUR SUBTOTAL		10				45														24		24				2	1,000	1,000			17,541	
	TASK M SUBTOTAL		1,460				9,495														2,544		2,544				442	1,000	1,000			17,541	
ALL	SUBTOTAL HOURS		10				45														24		24			2	3,000	1,000				17,541	
ALL	SUBTOTAL																															17,541	
ALL	GRI AT 4.167%																																748
ALL	GRAND TOTAL																																18,839

Phase Letter and Task Number	Task Description	Project Principal	Project Manager	Asst. Project Manager	Sr. Structural Engineer	Eric Magee/Manny Vco	SCADA Specialty	Jim Cook	Structural Designer	Nate Cakes/Andre Tanorio	Sr. Civil Engineer	Don Whitehead	Civil Engineer	Pat Tortora/Mika Janak/Cassey Kinosh/Frederick Tack	Mechanical Engineer	Terry Wong	Electrical Engineer	Eric Penn or other	Sr. Pump Station Designer	Oreg Watanabe	Pump Station Designer	Frederick Tack	Field Engineer	Jocelia Liegado	Sr. CAD Designer	Mark Pachoski	CADD Technician	Ted Babara or Eq.	Quality Control	Steve McHenry/Clay Serrahvbrynn Ryley	Surveyor	Pridencio Balagtas & Assoc.	Cost Estimating	Roger Lovett Buchnahl	SCADA Review	Mike Tocher	Amount			
N4.3	Bill Address																																							
N4.4	Site analysis and recommendation																																							844
SUBTOTAL																																							1,988	
N5.0	Contract Report Review																																							844
N5.1	Submitted and Shaded Review (assume 2 at 2 hr each)																																						844	
N5.2	RFI Responses (assume 2 at 2 hr each)																																						844	
N5.3	Submittal Request Review (assume 0 at 2 hr each)																																					1,588		
SUBTOTAL																																						2,500		
TASK N HOUR SUBTOTAL																																							20	
TASK N SUBTOTAL																																							3,320	
ALL SUBTOTAL HOURS																																							20	
SUBTOTAL																																							41,784	
GRT AT 4.67%																																							1,740	
GRAND TOTAL																																							43,524	

Phase Letter and Task Number	Task Description	Project Principal	Project Manager	Asst. Project Manager	Sr. Structural Engineer	Structural Designer	Sr. Civil Engineer	Civil Engineer	Mechanical Engineer	Electrical Engineer	Sr. Pump Station Designer	Pump Station Designer	Field Engineer	Sr. CAD Designer	CAD Technician	Quality Control	Surveyor	Cost Estimating	Amount
03.4.8	Quality Control Review																		
03.4.9	Summitting																		
	SUBTOTAL																		26,074
04.0	Construction Bid Support Services																		
04.1	Best Conference and Reading Minutes																		
04.2	RFI Responses (assume 10 at 2 hr each)																		
04.3	RFI Agenda																		
04.4	RFI Support and recommendation																		
	SUBTOTAL																		
05.0	Construction Support Services																		
05.1	Soil and Shop Drawing Review (assume 30 at 2 hr each)																		
05.2	RFI Review (assume 10 at 2 hr each)																		
05.3	Submittal Request Review (assume 5 at 2 hr each)																		
	SUBTOTAL																		
	TASK O HOUR SUBTOTAL																		
	TASK O SUBTOTAL																		59,954
ALL	SUBTOTAL HOURS																		1,500
ALL	SUBTOTAL																		59,954
ALL	GRT AT 4.167%																		2,498
ALL	GRAND TOTAL																		62,452

Phase Letter and Task Number	Task Description	Project Manager	Sr. Civil Engineer	Civil Engineer	Field Engineer	Sr. CADD Designer	CADD Technician	Quality Control	Surveyor	Geotechnical Engineering & Testing	Land Appraisal/Real Estate Inc.	Archaeological & Historical SEARCH	Amount
HOURLY LABOR RATES													
P	Tumon No. 1 Reservoir Site Location Change	145	211	156	121	106	101	221					
P1.0	Project Controls												
P1.1	Analysis of Existing Site Conditions/On-site Inspection												
P1.2	As-built Review and Background Adjustment												13,800
P1.3	Topographic Survey and Review of Survey								13,800	48,875			50,307
P1.4	Geotechnical Investigation & Permitting	4											
P1.5	Hazardous Material Investigation												
P1.6	Archaeological Investigation											14,950	14,950
P1.7	Land and Property Research										14,000		14,000
P1.8	Project Management	16											2,336
P1.9	Subconsultant Management	16											2,336
P1.10	Project Communication/File Management	4											584
	SUBTOTAL	40	-	-	-	8	-	-	13,800	48,875	14,000	14,950	98,313
P2.0	Design												
P2.1	Civil												
P2.1.1	Site Plan			16									2,656
P2.1.2	Erosion and Sediment Control Plan												
P2.1.3	Piping System			8									1,328
P2.1.4	Architectural												
P2.2	Structural												
P2.2.1	Tank Plans												
P2.2.2	Vaults												
P2.2.3	Pump Building												
P2.3	Mechanical												
P2.3.1	Pump Station												
P2.3.2	Fuel System												
P2.4	Electrical												
P2.4.1	Instrumentation and Controls												
P2.4.2	Fire Sprinkler System												
	SUBTOTAL	-	-	24	-	-	-	-	-	-	-	-	3,984
P3.0	Submittals												
P3.1	30% Phase												
P3.1.3	Basis of Design			8		16							3,024
P3.1.4	Agency Coordination/Meetings (G/AA)	4											584
P3.1.5	Quality Control Review							6					1,328
P3.2	60% Phase												
P3.2.1	Construction Drawings												
P3.2.2	Specifications												

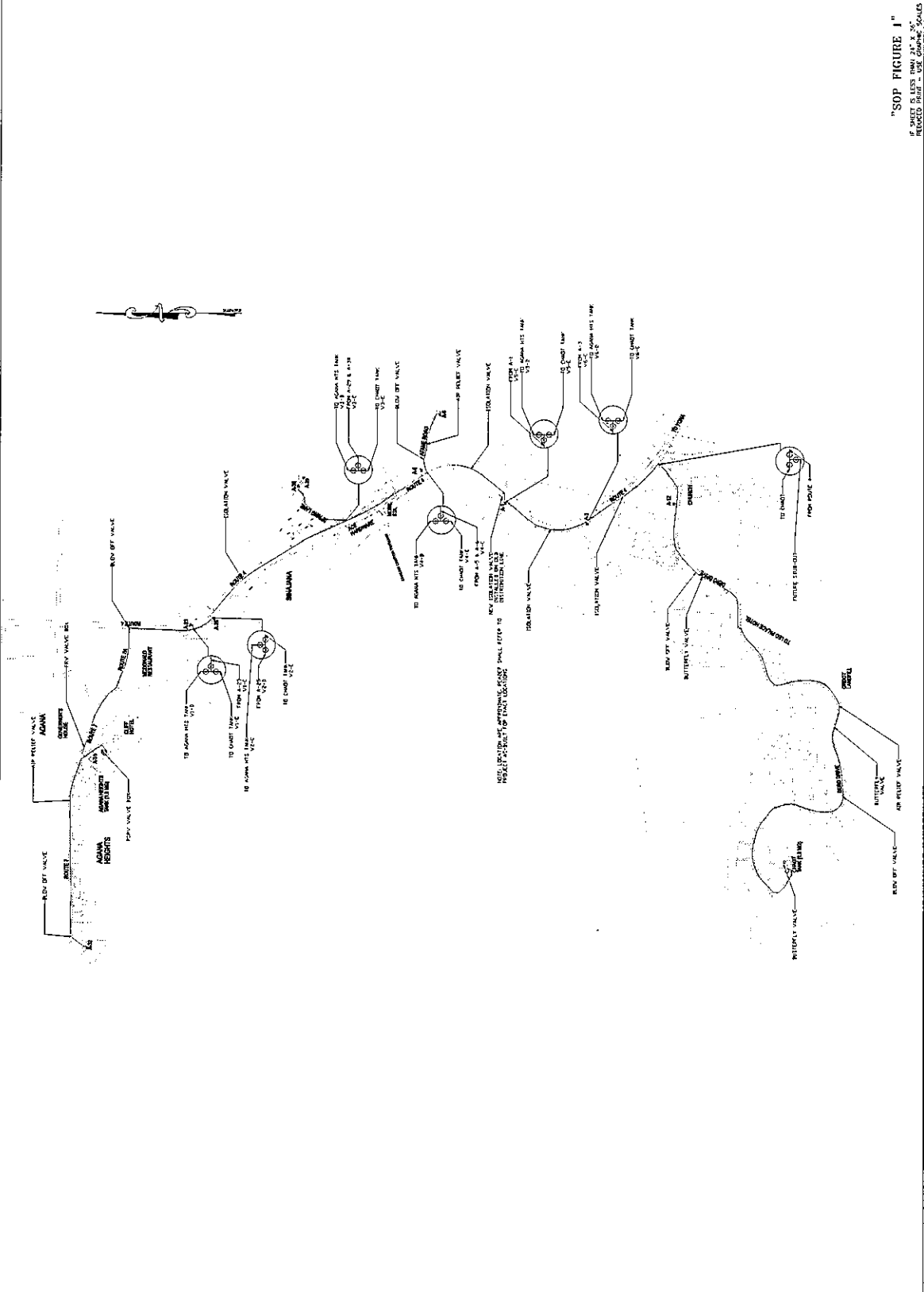
Phase Letter and Task Number	Task Description	Project Manager	Sr. Civil Engineer	Civil Engineer	Field Engineer	Sr. CADD Designer	CADD Technician	Quality Control	Surveyor	Geotechnical Engineering & Pacific Soils Engineering & Testing	Land Appraisal/Real Estate	Archaeological & Historical Investigations SEARCH	Amount
P3.2.3	Construction Estimate	Aaron Sutton											
P3.2.4	Agency Coordination/Meetings												
P3.2.5	Quality Control Review												
P3.2.6	Design Review Meeting												
P3.3	90% Phase												
P3.3.1	Construction Drawings												
P3.3.2	Specifications												
P3.3.3	Construction Estimate												
P3.3.4	Agency Coordination/Meetings												
P3.3.5	Quality Control Review												
P3.3.6	Design Review Meeting												
P3.4	Final Phase												
P3.4.1	Construction Drawings												
P3.4.2	Specifications												
P3.4.3	Construction Estimate												
P3.4.4	Basis of Design												
P3.4.5	Agency Coordination/Meetings												
P3.4.6	Quality Control Review												
P3.4.6	Permitting												
	SUBTOTAL	4	-	8	-	16	-	6	-	-	-	-	4,934
P4.0	Construction Bid Support Services												
P4.1	Prebid Conference and Meeting Minutes												
P4.2	RFI Responses (assume 10 at 2 hr each)												
P4.3	Bid Addenda												
P4.4	Bid analysis and recommendation												
	SUBTOTAL												
P5.0	Construction Support Services												
P5.1	Submittal and Shop Drawing Review (assume 30 at 2 hr each)												
P5.2	RFI Responses (assume 10 at 2 hr each)												
P5.3	Substitution Request Review (assumes 5 at 2 hr each)												
	SUBTOTAL												
	TASK P HPLUR SUBPTAL	44	-	32	-	24	-	6	13,800	48,875	14,000	14,950	107,231
	TASK P SUBPTAL	6,424	-	5,312	-	2,544	-	1,326	13,800	48,875	14,000	14,950	107,231
ALL	SUBTOTAL HOURS	44	-	32	-	24	-	6	13,800	48,875	14,000	14,950	
ALL	SUBTOTAL												107,231
ALL	GRT AT 4.167%												4,468
ALL	GRAND TOTAL												111,699

Phase Letter and Task Number	Task Description	Project Manager	Aest. Project Manager	Sr. Structural Engineer	Structural Designer	Civil Engineer	Civil Engineer	Mechanical Engineer	Electrical Engineer	Sr. Pump Station Designer	Pump Station Designer	Field Engineer	Sr. CAD Designer	CADD Technician	Quality Control	Surveyor	Geotechnical Engineering & Pacific Soils Engineering & Testng	Archaeological & Historical Investigations	SEARCH	Cost Estimating	Amount
HOURLY LABOR RATES																					
Q	Pitt Reservoir Relocation, Pump Station and Waterline																				
Q1.0	Project Controls																				
Q1.1	Analysis of Existing Site Conditions/On-site Inspection	24																			3,904
Q1.2	As-Built Review and Background Adjustment	6																			1,800
Q1.3	Topographic Survey and Review of Survey															20,600					21,236
Q1.4	Geotechnical Investigation & Permitting	12																			2,176
Q1.5	Site Location Investigation and Figures																				13,750
Q1.6	Archaeological Investigation (Section 106)																				1,752
Q1.7	Land and Property Research																				584
Q1.8	Project Management	12																			1,752
Q1.9	Subconsultant Management	12																			584
Q1.10	Project Communication/PR Management	4																			1,752
Q1.10	SUBTOTAL	70														20,600					46,054
Q2.0	Design																				
Q2.1	Design																				
Q2.1.1	Site Plan and Sediment Control Plan					16															2,656
Q2.1.2	Pump Station					24															3,984
Q2.1.3	Pump Station					24															3,984
Q2.1.4	Architectural					12															1,992
Q2.2	Structural																				
Q2.2.1	Tank Plans																				
Q2.2.2	Vaults																				
Q2.2.3	Mechanical					8															1,488
Q2.2.4	Pump Building																				
Q2.3	Mechanical																				
Q2.3.1	Pump Station							12													5,184
Q2.3.2	Fuel System							16													3,376
Q2.4	Electrical							58													9,628
Q2.4.1	Instrumentation and Controls							4													864
Q2.4.2	Fire Sprinkler System							24													5,728
Q2.4.2	SUBTOTAL					8		52		12											34,700
Q3.0	Submittals																				
Q3.1	30% Phase																				
Q3.1.3	Basis of Design					1		6		6											8,874
Q3.1.4	Agency Coordination/Meetings (NFS)																				292
Q3.1.5	Quality Control Review	2																			442
Q3.2	60% Phase																				
Q3.2.1	Construction Drawings							6		4											8,570
Q3.2.2	Specifications							8		8											3,096
Q3.2.3	Construction Estimate							8		8											1,000
Q3.2.4	Agency Coordination/Meetings	2																			292
Q3.2.5	Quality Control Review							52		65											884
Q3.2.6	Design Review Meeting																				
Q3.3	90% Phase																				
Q3.3.1	Construction Drawings							8		8											9,628
Q3.3.2	Specifications							2		1											659
Q3.3.3	Construction Estimate																				292
Q3.3.4	Agency Coordination/Meetings	2																			684
Q3.3.5	Quality Control Review																				
Q3.4	Final Review Meeting																				
Q3.4.1	Construction Drawings							4		4											5,162
Q3.4.2	Specifications							1		1											387
Q3.4.3	Construction Estimate																				1,000
Q3.4.4	Basis of Design							3		2											1,719
Q3.4.5	Agency Coordination/Meetings	2																			292
Q3.4.6	Quality Control Review																				684
Q3.4.6	Permitting	2																			292

Phase Letter and Task Number	Task Description	Project Manager	Asst. Project Manager	Sr. Structural Engineer	Structural Designer	Sr. Civil Engineer	Civil Engineer	Pat Torora/Mike Janec/Casey	Mechanical Engineer	Electrical Engineer	Sr. Pump Station Designer	Pump Station Designer	Field Engineer	Sr. CAD Designer	CADD Technician	Quality Control	Surveyor	Geotechnical Engineering & Testing	Archaeological & Historical Investigations	Cost Estimating	Amount
O4.0	SUBTOTAL	10																		2,000	45,117
O4.1	Construction Bid Support Services																				
O4.2	Prohibit Conflicts and Meeting Minutes																				
O4.3	RFI Responses (assume 5 at 2 hr each)																				
O4.4	Bid Addenda																				
O4.5	Bid analysis and recommendation																				
O5.0	SUBTOTAL																				1,970
O5.1	Construction Support Services																				
O5.2	Submittal and Shop Drawing Review (assume 10 at 2 hr each)																				
O5.3	RFI Responses (assume 4 at 2 hr each)																				
O5.4	Substitution Request Review (assume 2 at 2 hr each)																				
O5.5	SUBTOTAL																				3,910
TASK O	HQUQ SUBTOTAL																				1,488
TASK G	HQUQ SUBTOTAL																				864
TASK O	GRAND SUBTOTAL																				6,262
TASK G	GRAND SUBTOTAL																				134,103
ALL	SUBTOTAL HOURS	82		23					91	116	60	60		114		14	20,600		13,750	2,000	
ALL	SUBTOTAL																				134,103
ALL	GRT AT 4.167%																				5,588
ALL	GRAND TOTAL																				139,691

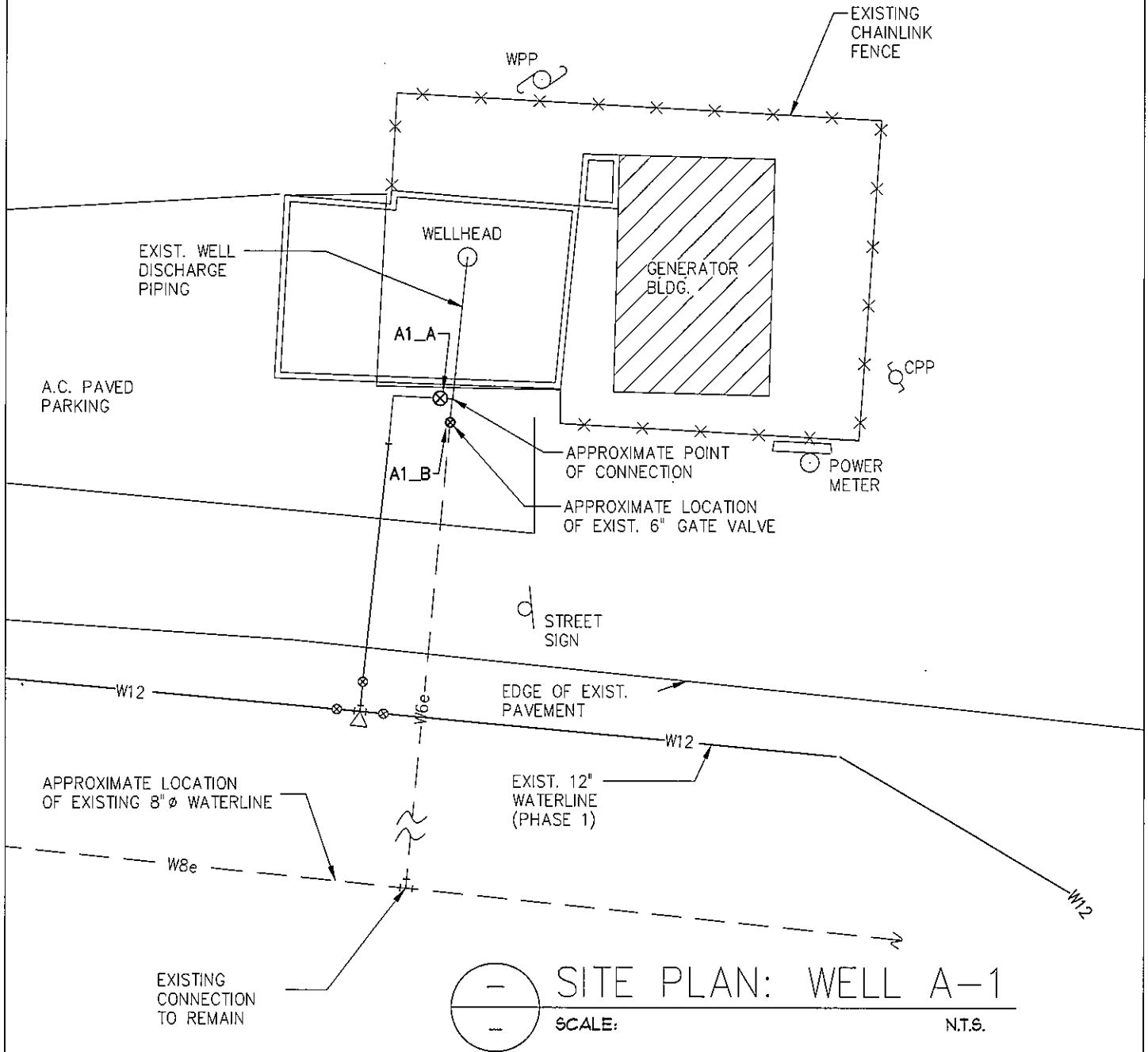
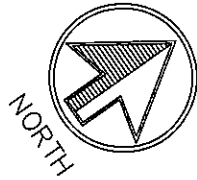
Figures

CONSULTANTS	
PROJECT TITLE	
GUAM WATERWORKS AUTHORITY "SINAJANA & AGANA HEIGHTS TRANSMISSION LINE" CONTRACTOR:	
DATE	DESCRIPTION
PROJECT NO.	
CAD DWG FILE	
DRAWN BY	JAB
CHECKED BY	KAR
SUPV. BY	KMP
SHEET TITLE	



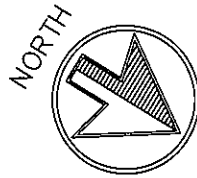
"SOP FIGURE 1"
 IF SHEET IS LESS THAN 24" X 36"
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	TRANSMISSION	DISTRIBUTION
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A1_B	CLOSED	OPEN

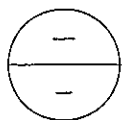
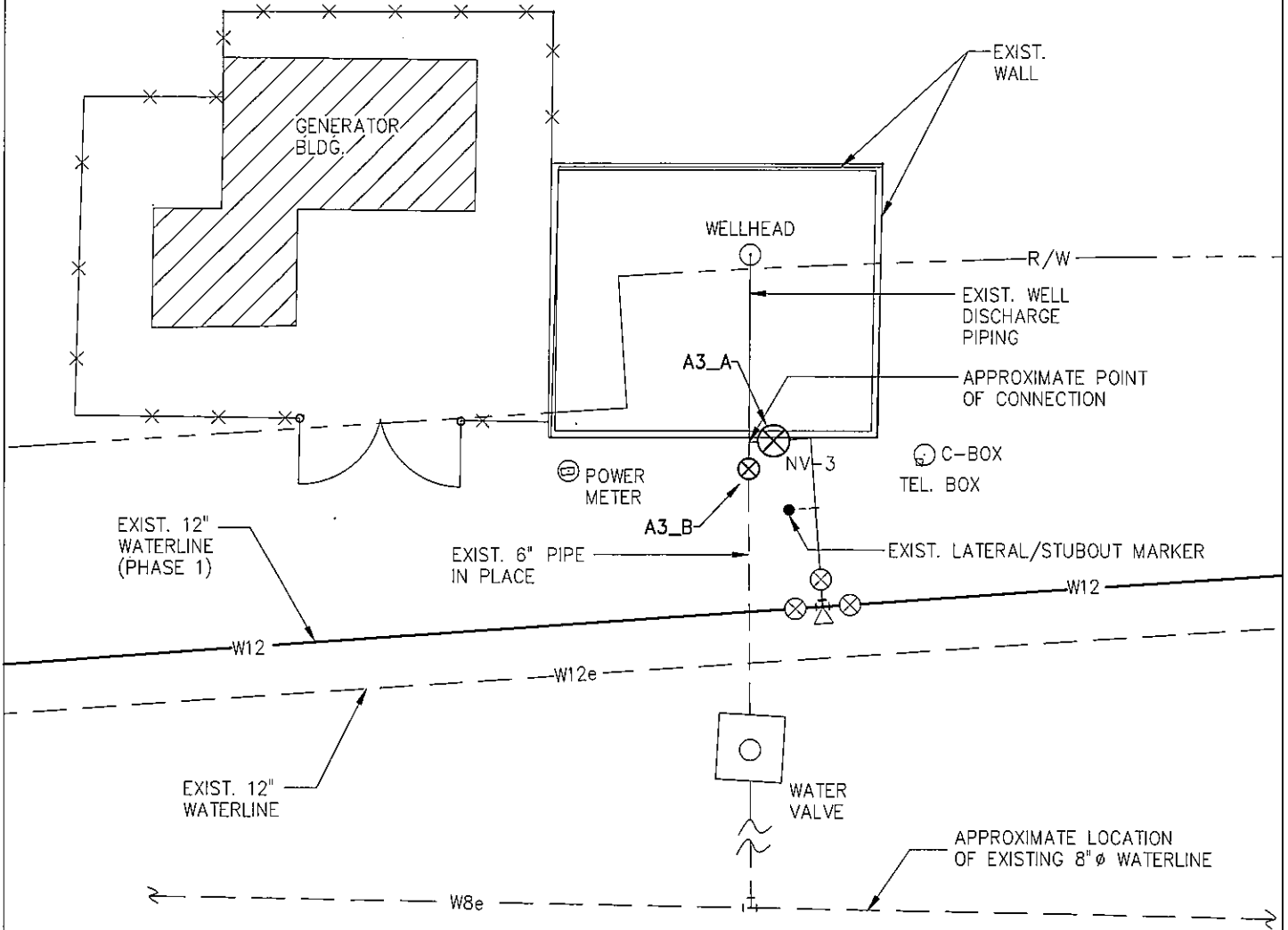


SITE PLAN: WELL A-1
 SCALE: N.T.S.

	SINAJANA & AGANA HEIGHTS WATER TRANSMISSION LINES	Issued By: KMR
	TITLE: WELL A-1 FIGURE 3	Scale: N.T.S.
		Date: DEC. 28, 2011
		Drawing No. _____
		Sheet No. ____ of ____



	TRANSMISSION	DISTRIBUTION
A3_A	OPEN	CLOSED
A3_B	CLOSED	OPEN



SITE PLAN: WELL A-3

SCALE:

N.T.S.

SINAJANA & AGANA HEIGHTS WATER TRANSMISSION LINES

TITLE:

**WELL A-3
FIGURE 4**

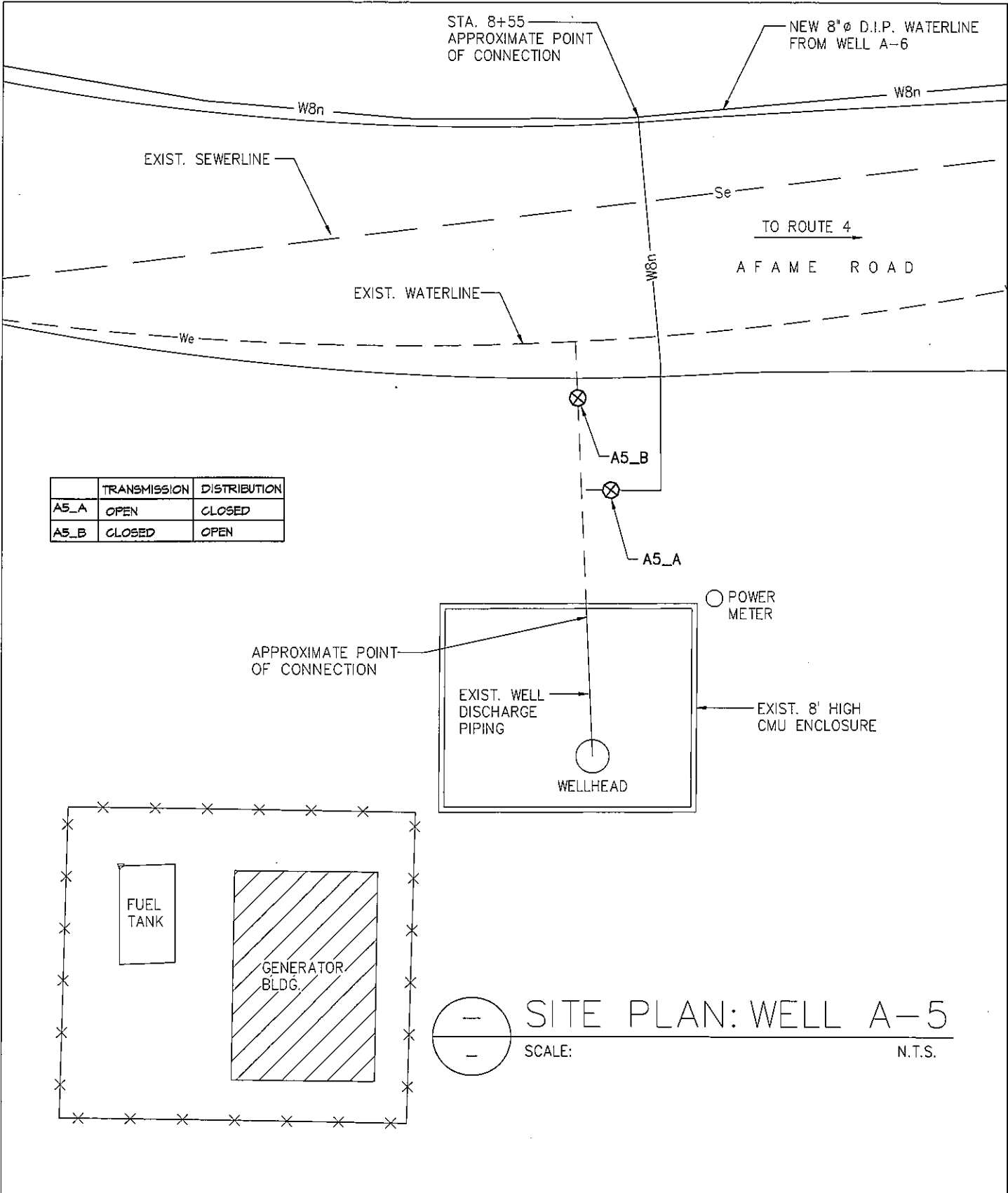
Issued By: **KMR**

Scale: **N.T.S.**

Date: **DEC. 28, 2011**

Drawing No.

Sheet No. ___ of ___



**SINAJANA & AGANA HEIGHTS WATER
TRANSMISSION LINES**

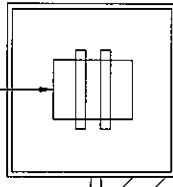
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 Date: **DEC. 28, 2011**
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 Sheet No. ____ of ____

TITLE:
**WELL A-5
 FIGURE 5**

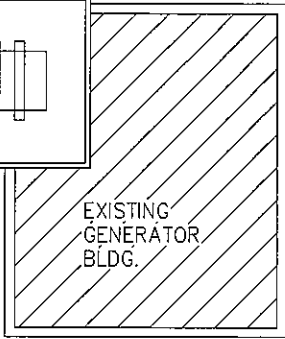


EXISTING CHAINLINK FENCE

EXIST. DIESEL OIL TANK



EXISTING GENERATOR BLDG.



APPROXIMATE POINT OF CONNECTION

WELLHEAD

EXIST. FENCE

EXIST. WELL DISCHARGE PIPING

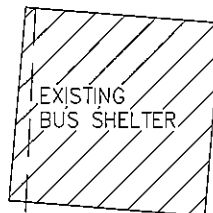


A6_A

GPA BOX



TEL. BOX



NEW 8" ϕ LATERAL WATERLINE

NEW 8" ϕ WATERLINE CONNECTION TO NEW 12" ϕ AT ROUTE 4

	TRANSMISSION	DISTRIBUTION
A6_A	OPEN	CLOSED
A6_B	CLOSED	OPEN

A6_B



STA. 0+00 POINT OF CONNECTION

EXIST. WATERLINE

WATER VALVE BOX

A F A M E R O A D

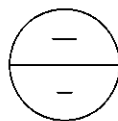
EXIST. SEWERLINE

SMH

Se

Se

EXIST. EDGE OF PAVEMENT



SITE PLAN: WELL A-6

SCALE:

N.T.S.

SINAJANA & AGANA HEIGHTS WATER TRANSMISSION LINES

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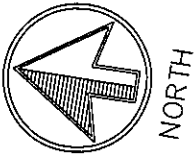
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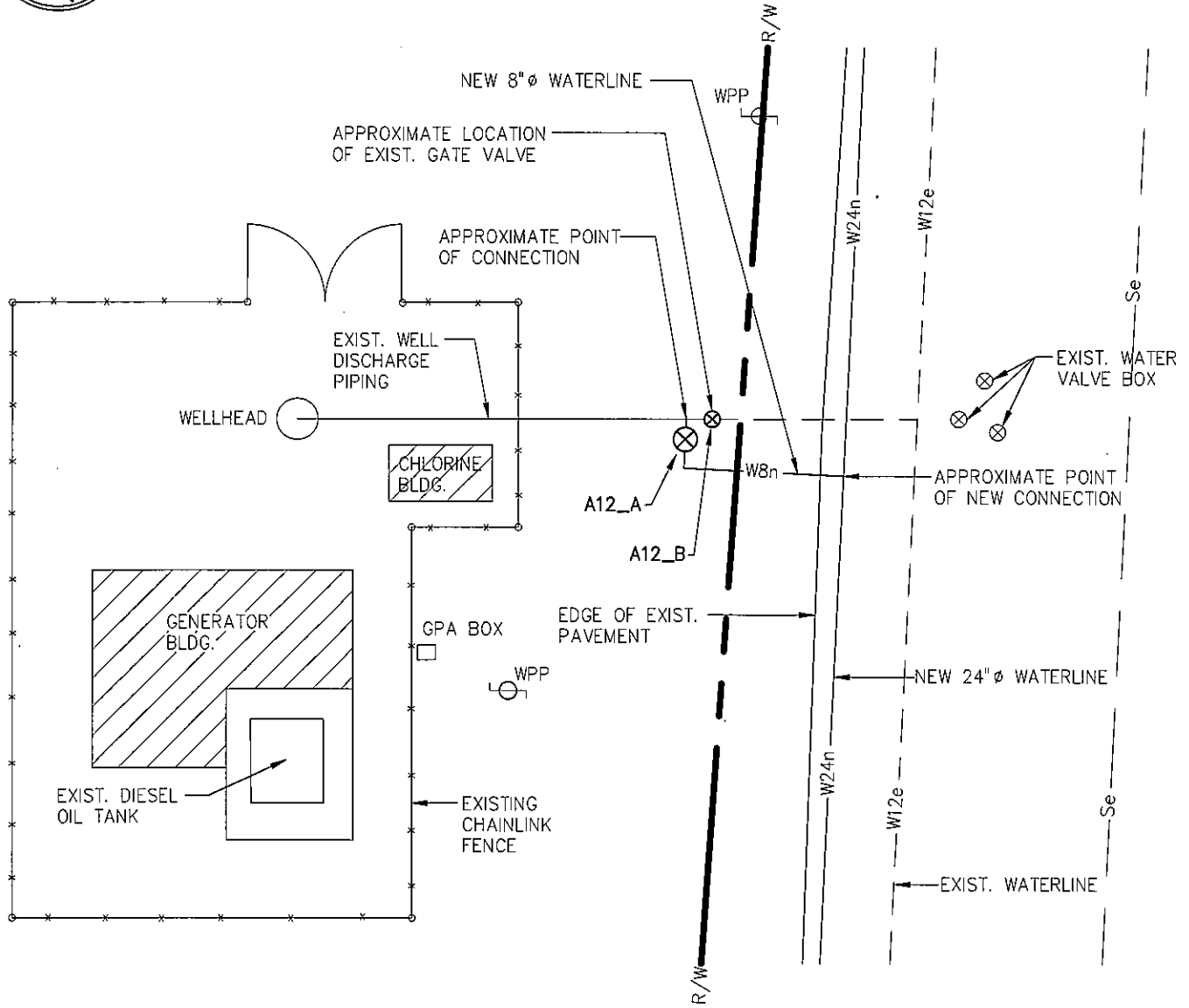
Sheet No. ___ of ___

TITLE:

WELL A-6 FIGURE 6



	TRANSMISSION	DISTRIBUTION
A12_A	OPEN	CLOSED
A12_B	CLOSED	OPEN



SITE PLAN: WELL A-12
 SCALE: _____ N.T.S.

SINAJANA & AGANA HEIGHTS WATER TRANSMISSION LINES

TITLE:

**WELL A-12
FIGURE 7**

Issued By: **KMR**

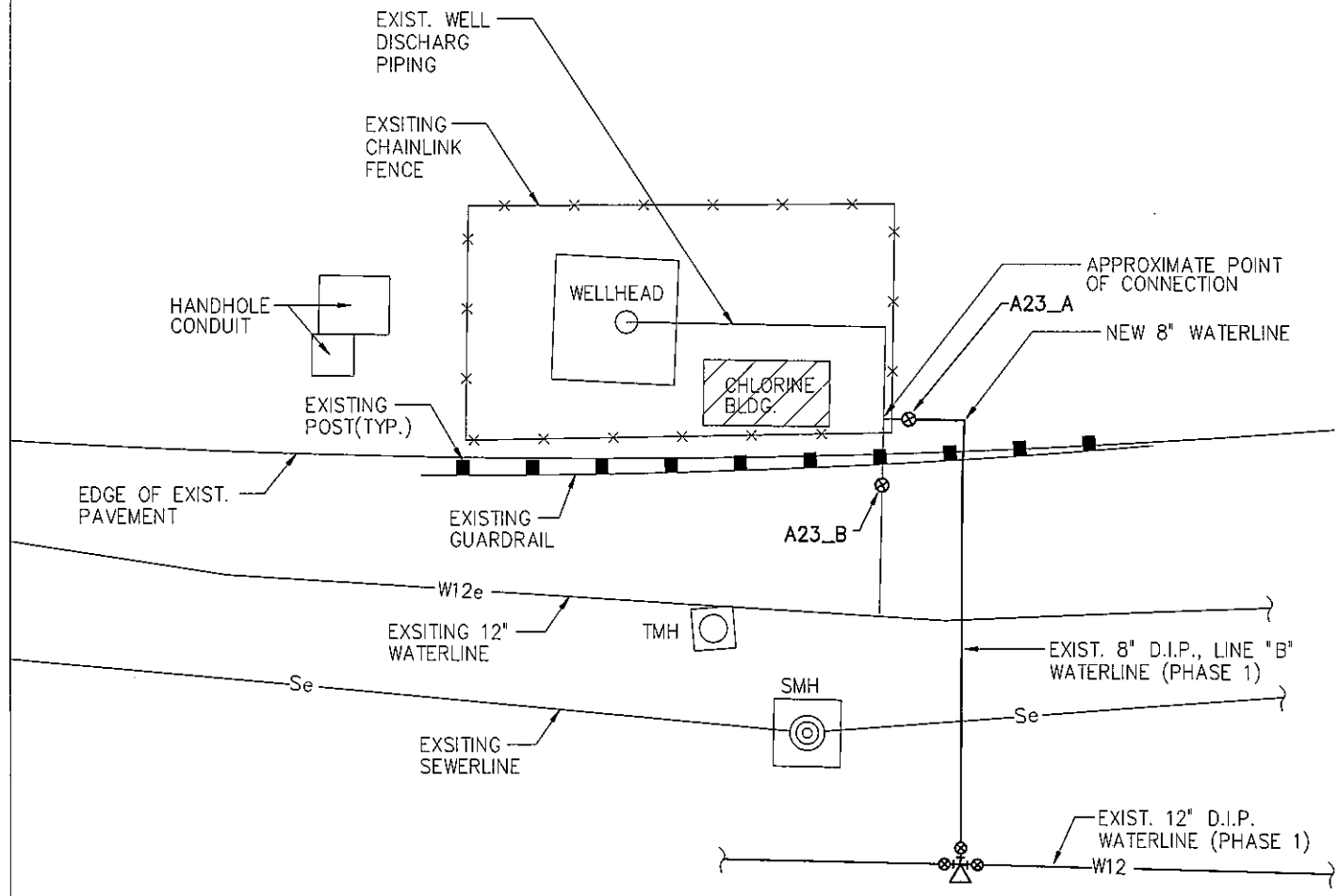
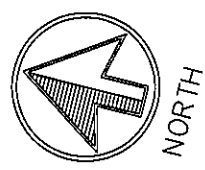
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Date: **DEC. 28, 2011**

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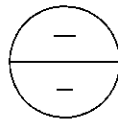
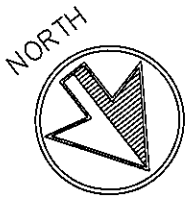
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	TRANSMISSION	DISTRIBUTION
A23_A	OPEN	CLOSED
A23_B	CLOSED	OPEN




SITE PLAN: WELL A-23
 SCALE: N.T.S.

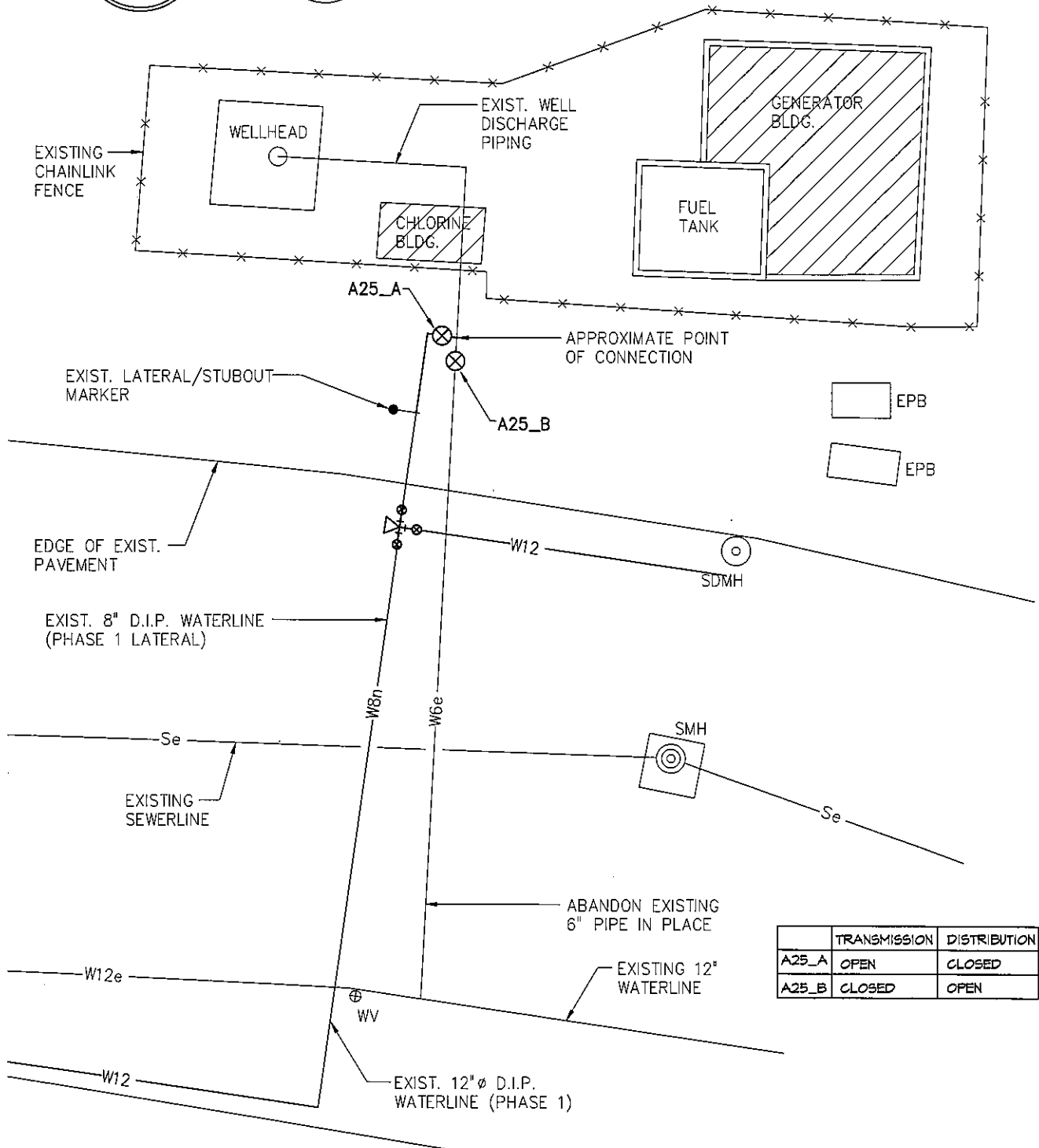
	SINAJANA & AGANA HEIGHTS WATER TRANSMISSION LINES	Issued By: KMR
	TITLE: WELL A-23 FIGURE 8	Scale: N.T.S.
		Date: DEC. 28, 2011
		Drawing No. _____
		Sheet No. _____ of _____



SITE PLAN: WELL A-25

SCALE:

N.T.S.



	TRANSMISSION	DISTRIBUTION
A25_A	OPEN	CLOSED
A25_B	CLOSED	OPEN

SINAJANA & AGANA HEIGHTS WATER TRANSMISSION LINES

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Scale: N.T.S.

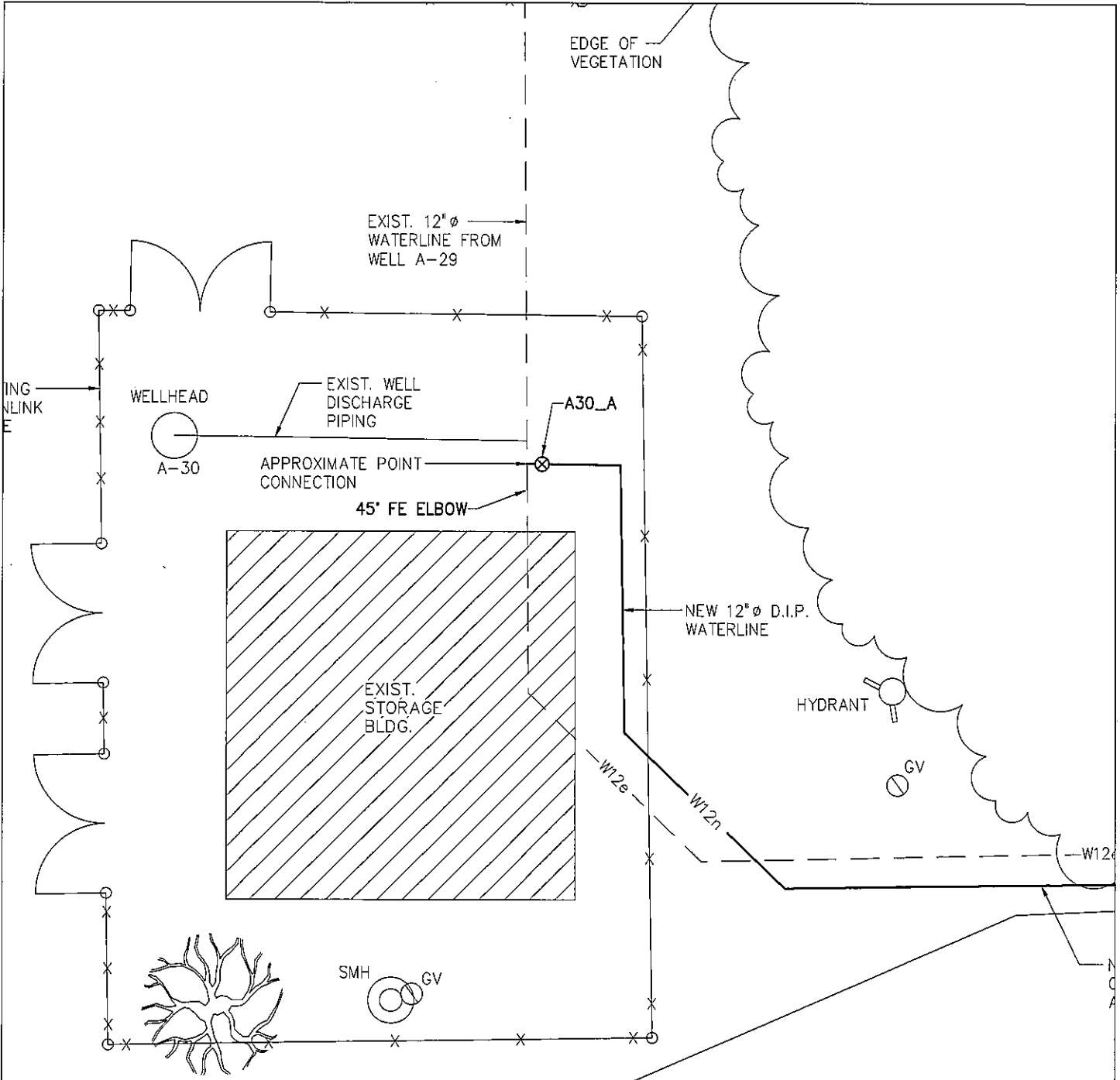
TITLE:

WELL A-25 FIGURE 9

Date: DEC. 28, 2011

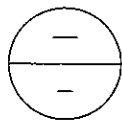
Drawing No.

Sheet No. ___ of ___



	TRANSMISSION	DISTRIBUTION
A30_A	OPEN	CLOSED
ELBOW	*	*

*45 ELBOW MUST BE REMOVED AND BLIND FLANGE INSTALLED



SITE PLAN: WELL A-30

SCALE:

N.T.S.

SINAJANA & AGANA HEIGHTS WATER TRANSMISSION LINES

TITLE:

**WELLS A-29 AND A-30
FIGURE 10**

Issued By: **KMR**

Scale: **N.T.S.**

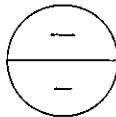
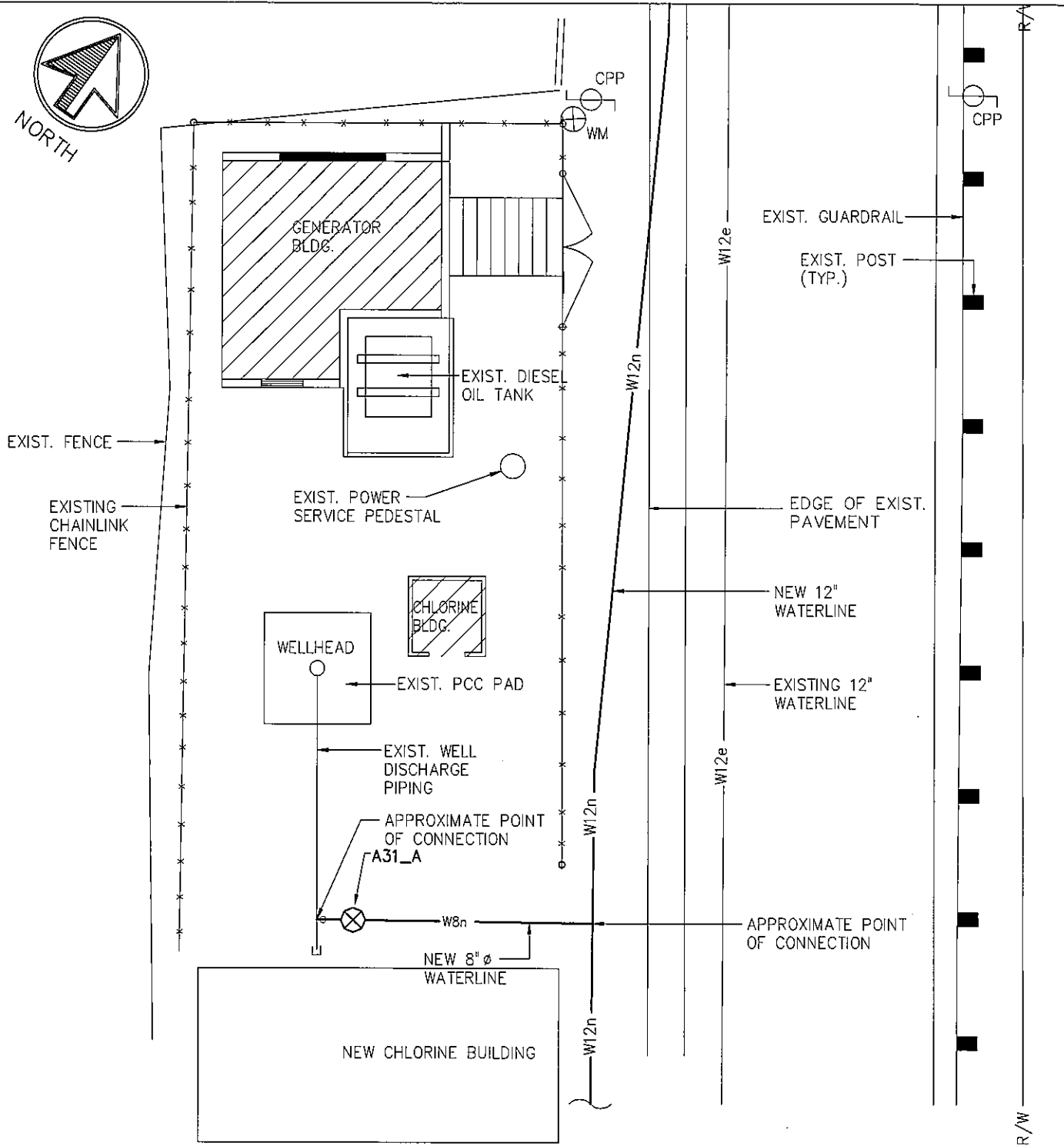
Date: **DEC. 28, 2011**

Drawing No.

Sheet No. ___ of ___



NORTH

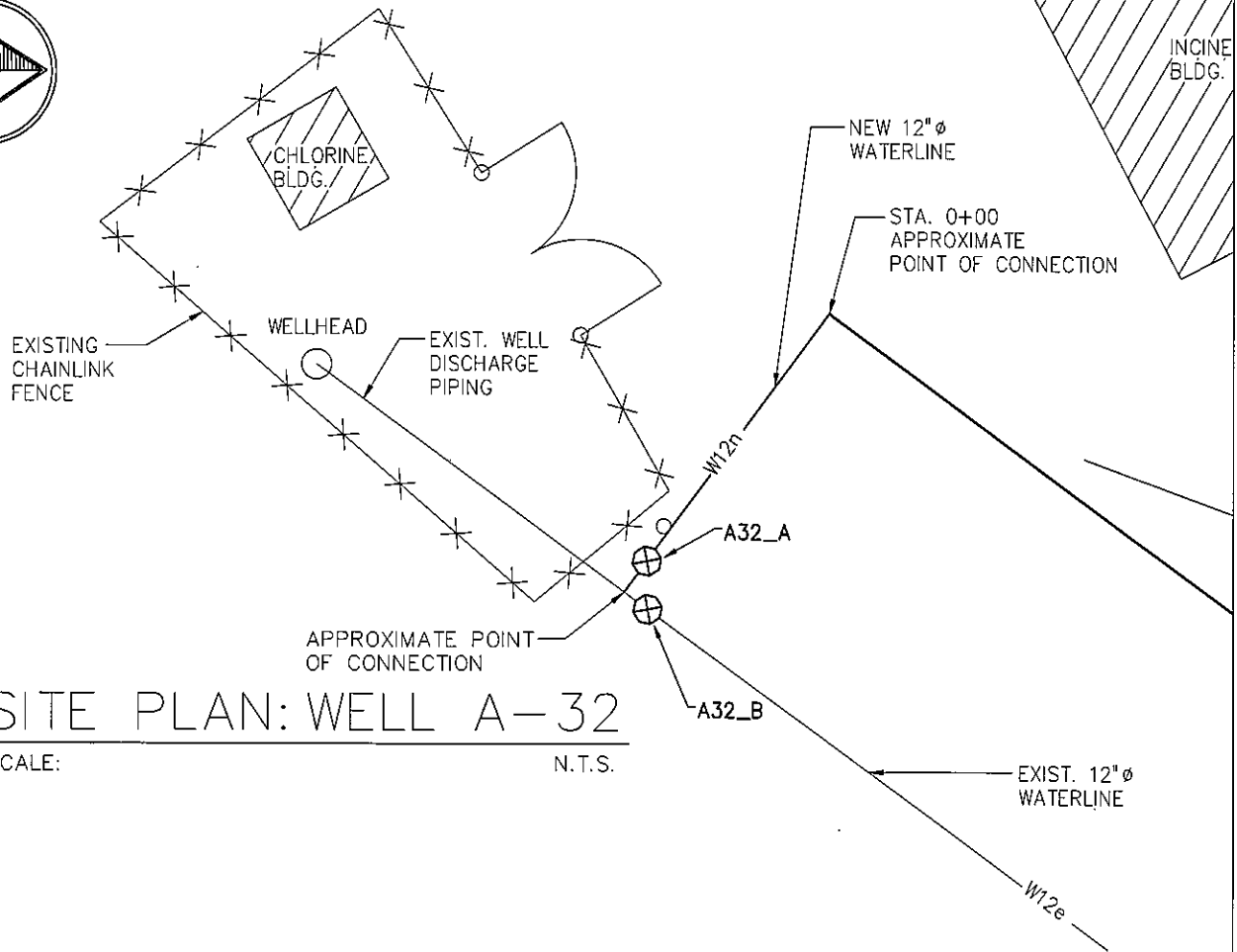
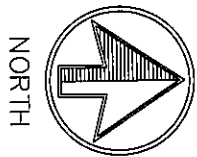


SITE PLAN: WELL A-31

SCALE:

N.T.S.

	SINAJANA & AGANA HEIGHTS WATER TRANSMISSION LINES	Issued By: KMR
		Scale: N.T.S.
	TITLE: WELL A-31	Date: DEC. 28, 2011
	FIGURE 11	Drawing No. _____
		Sheet No. _____ of _____



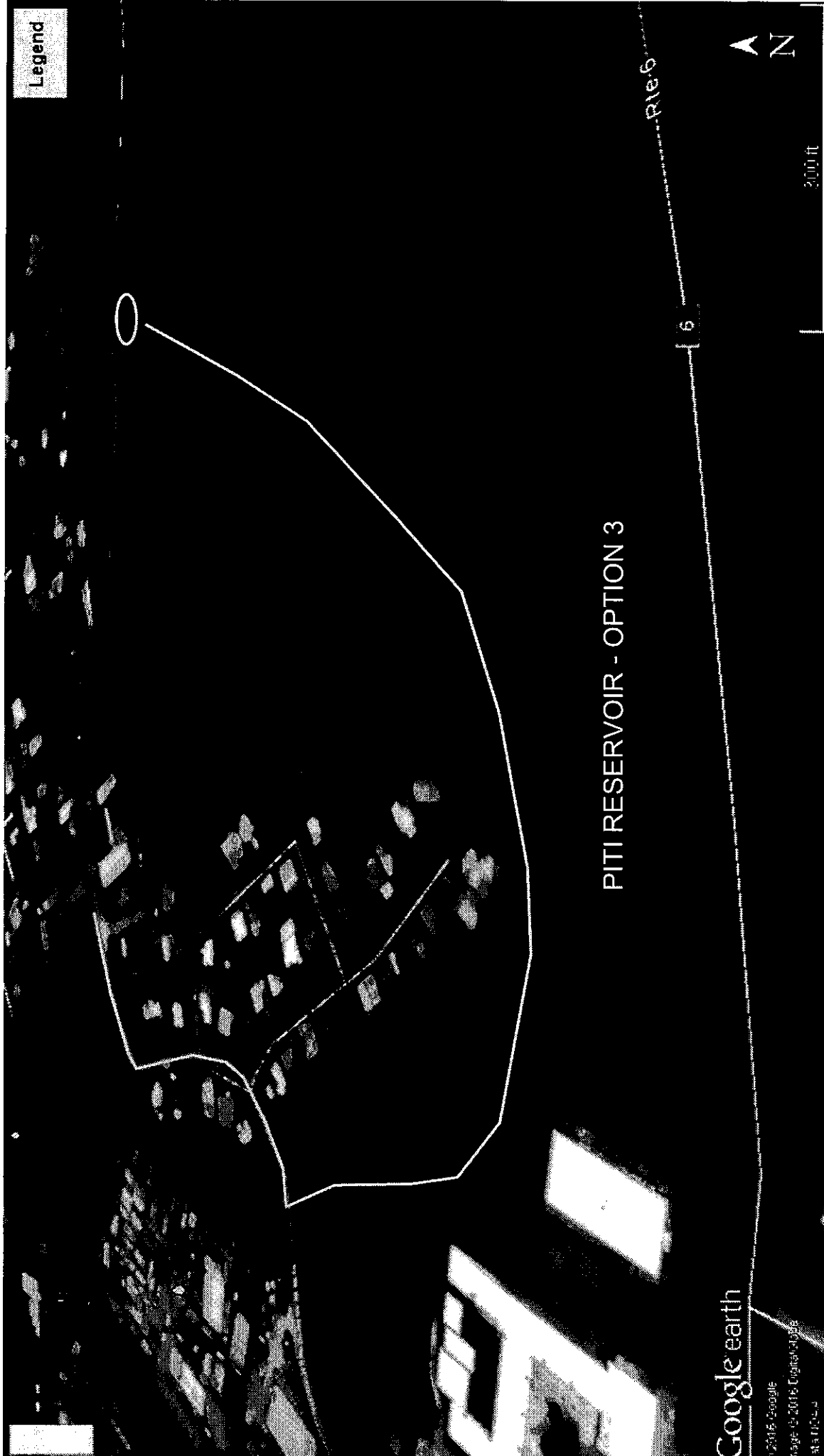

SITE PLAN: WELL A-32
 SCALE: _____ N.T.S.

	TRANSMISSION	DISTRIBUTION
A32_A	OPEN	CLOSED
A32_B	CLOSED	OPEN

SINAJANA & AGANA HEIGHTS WATER TRANSMISSION LINES

TITLE: **WELL A-32
FIGURE 12**

Issued By: **KMR**
 Scale: **N.T.S.**
 Date: **DEC. 28, 2011**
 Drawing No. _____
 Sheet No. ____ of ____



Legend

PITI RESERVOIR - OPTION 3

R16-6

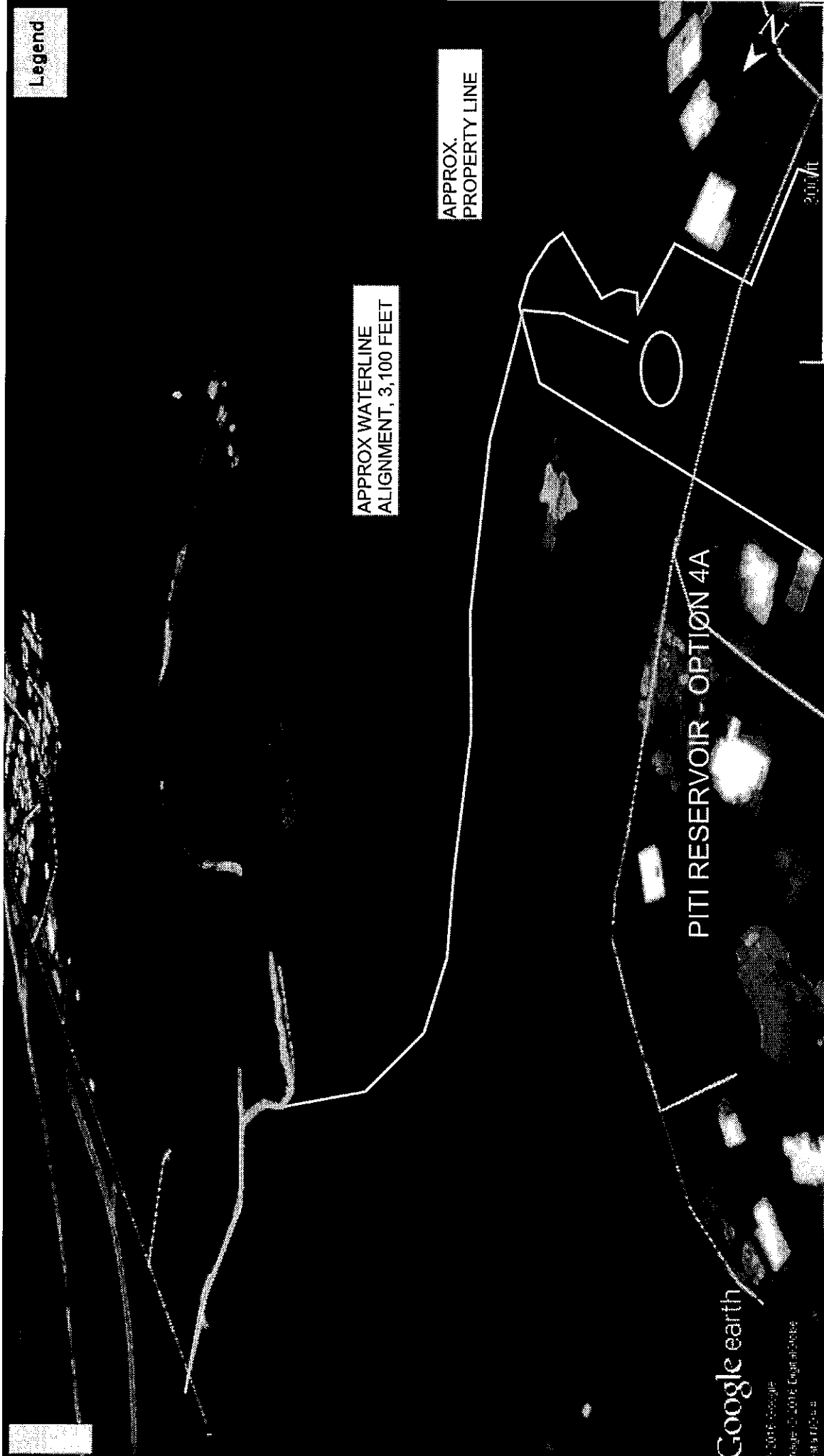
6

200 ft



Google earth

© 2016 Google
Image © 2016 DigitalGlobe
Data © 2016



Legend

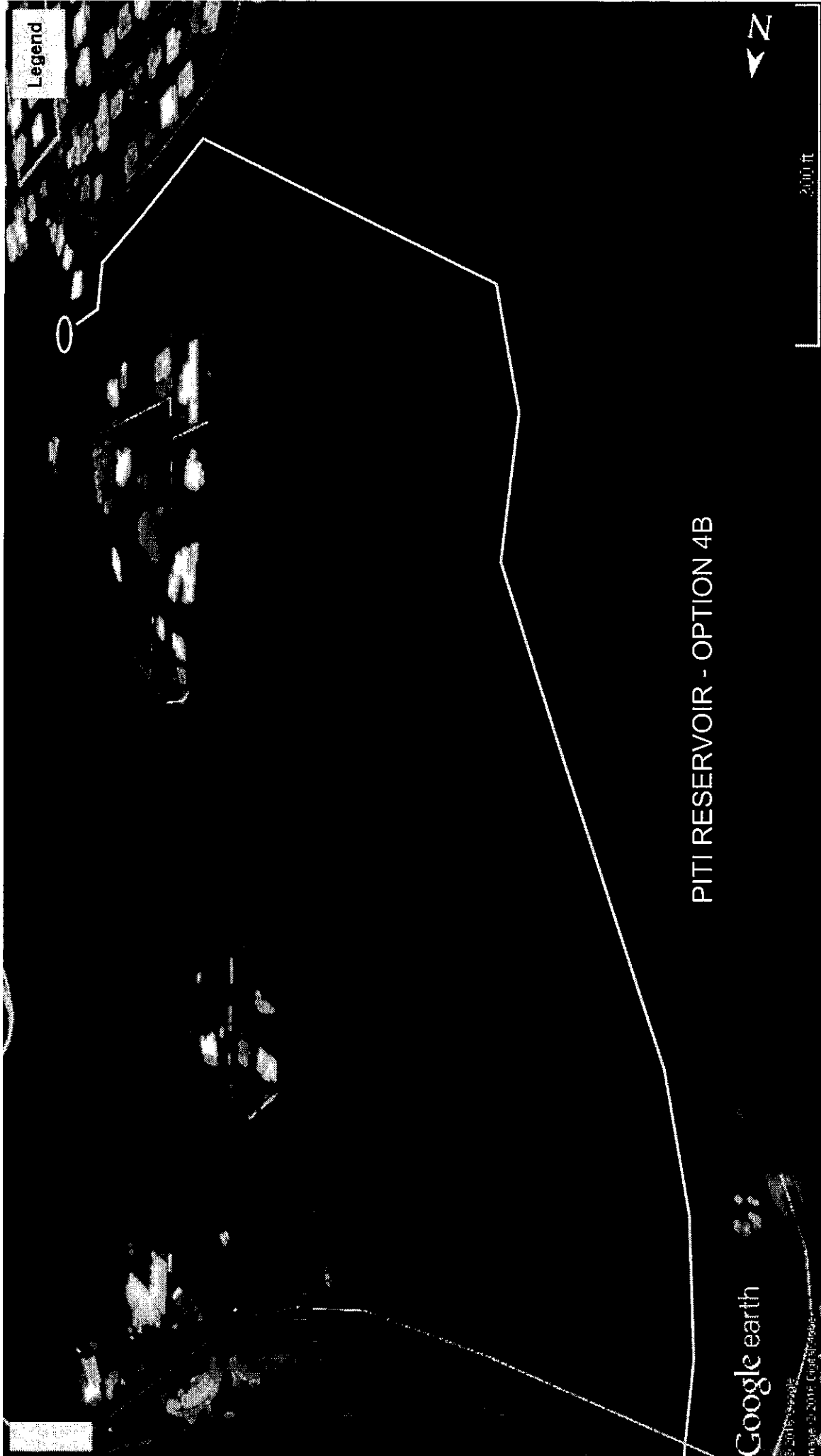
APPROX WATERLINE ALIGNMENT, 3,100 FEET

APPROX. PROPERTY LINE

PITI RESERVOIR - OPTION 4A

Google earth

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Image © 2006 DigitalGlobe
Data © 2004



Legend



200 ft

PITI RESERVOIR - OPTION 4B



Google earth

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