CITY OF CORPUS CHRISTI
AMENDMENT NO. 1
CONTRACT FOR PROFESSIONAL SERVICES

The City of Corpus Christi, a Texas home rule municipal corporation, P.O. Box 9277, Corpus Christi, Nueces County, Texas 78469-9277 (City) acting through its duly authorized City Manager or Designee (Director of Engineering Services) and **LNV, Inc.**, a Texas corporation, 801 Navigation, Suite 300, Corpus Christi, Nueces County, Texas 78408, (Architect/Engineer – A/E), hereby agree as follows:

1. SCOPE OF PROJECT

O.N. Stevens Water Treatment Plant High Service Building No. 3 (E11066) - This project provides for a new High Service Building as the repair/replacement of the existing High Service Building No. 1 and its equipment is not feasible or cost effective. The New High Service Building will have the capability to deliver treated water to the distribution system from the existing clear-well No. 1, clear-well No. 2 and future programmed clear-well No. 3. Completion of this project will enable the City to decommission and take out of service High Service Building No. 1.

2. SCOPE OF SERVICES

The A/E hereby agrees, at its own expense, to perform professional services necessary to review and prepare plans, specifications, and bid and contract documents. In addition, A/E will provide monthly status updates (project progress or delays, gantt charts presented with monthly invoices) and provide contract administration services, as described in **Exhibit "A" and "A-1"**, to complete the project. Work will not begin on Additional Services until requested by the A/E (provide breakdown of costs, schedules), **and** written authorization is provided by the Director of Engineering Services.

A/E services will be "Services for Construction Projects"- (Basic Services for Construction Projects") which are shown and are in accordance with "Professional Engineering Services- A Guide to the Selection and Negotiation Process, 1993" a joint publication of the Consulting Engineer's Council of Texas and Texas Society of Professional Engineers. For purposes of this contract, certain services listed in this publication as Additional Services will be considered as Basic Services.

3. ORDER OF SERVICES

The A/E agrees to begin work on those authorized Basic Services for this contract upon receipt of the Notice to Proceed from the Director of Engineering Services. Work will not begin on any phase or any Additional Services until requested in writing by the A/E and written authorization is provided by the Director of Engineering Services. The anticipated schedule of the preliminary phase, design phase, bid phase, and construction phase is shown on **Exhibit "A"**. This schedule is not to be inclusive of all additional time that may be required for review by the City staff and may be amended by or with the concurrence of the Director of Engineering Services.

The Director of Engineering Services may direct the A/E to undertake additional services or tasks provided that no increase in fee is required. Services or tasks requiring an increase of fee will be mutually agreed and evidenced in writing as an amendment to this contract. A/E shall notify the City of Corpus Christi within three (3) days of notice if tasks requested requires an additional fee.

4. INDEMNITY AND INSURANCE

A/E agrees to the mandatory contract indemnification and insurance requirements as set forth in **Exhibit "B"**.

5. FEE

The City will pay the A/E a fee, as described in **Exhibit "A"**, for providing services authorized, a revised fee not to exceed **$2,358,103.00 (Two Million Three Hundred Fifty-Eight Thousand One Hundred Three Dollars and Zero Cents)** for a total restated fee not to exceed **$2,405,603.00 (Two Million Four Hundred Five Thousand Six Hundred Three Dollars and Zero Cents.** Monthly invoices shall be submitted in accordance with **Exhibit "C"**.

6. TERMINATION OF CONTRACT

The City may, at any time, with or without cause, terminate this contract upon seven days written notice to the A/E at the address of record. In this event, the A/E will be compensated for its services on all stages authorized based upon A/E and City's estimate of the proportion of the total services actually completed at the time of termination.

7. LOCAL PARTICIPATION

The City Council's stated policy is that City expenditures on contracts for professional services be of maximum benefit to the local economy. The A/E agrees that at least 70% of the work described herein will be performed by a labor force residing within the Corpus Christi Metropolitan Statistical Area (MSA). Additionally, no more than 30% of the work described herein will be performed by a labor force residing outside the Corpus Christi Metropolitan Statistical Area (MSA.)

8. ASSIGNABILITY

The A/E will not assign, transfer or delegate any of its obligations or duties in this contract to any other person without the prior written consent of the City, except for routine duties delegated to personnel of the A/E staff. If the A/E is a partnership, then in the event of the termination of the partnership, this contract will inure to the individual benefit of such partner or partners as the City may designate. No part of the A/E fee may be assigned in advance of receipt by the A/E without written consent of the City.

The City will not pay the fees of expert or technical assistance and consultants unless such employment, including the rate of compensation, has been approved in writing by the City.

9. OWNERSHIP OF DOCUMENTS

All documents including contract documents (plans and specifications), record drawings, contractor's field data, and submittal data will be the sole property of the City, may not be used again by the A/E without the express written consent of the Director of Engineering Services. However, the A/E may use standard details that are not specific to this project. The City agrees that any modification of the plans will be evidenced on the plans, and be signed and sealed by a professional engineer prior to re-use of modified plans.

10. DISCLOSURE OF INTEREST

A/E further agrees, in compliance with City of Corpus Christi Ordinance No. 17112, to complete, as part of this contract, the *Disclosure of Interests* form.

CITY OF CORPUS CHRISTI

Mark Van Vleck, P.E., Date
Interim Assistant City Manager for
Public Works & Utilities

RECOMMENDED

Daniel Biles, P.E., Date
Director of Engineering Services

10-1-13
Operating Department Date

APPROVED

Office of Management Date
and Budget

ATTEST

Armando Chapa, City Secretary

LNV, INC.

9/26/13
Dan S. Leyendecker, P.E., Date
President
801 Navigation, Suite 300
Corpus Christi, Texas 78408
(361) 883-1984 Office
(361) 883-1986 Fax

ENTERED
SEP 24 2013
CONTRACT MANAGER

Project No: E11066
Fund Source No: 550950-4093-00000-E11066
Fund Name: Water 2013 CIP (RevBds)
Encumbrance No: _____

EXHIBIT A
CITY OF CORPUS CHRISTI, TEXAS

ONSWTP HIGH SERVICE PUMP BUILDING NO. 3
CITY PROJECT E11066
CITY RFQ NO. 2011-05

I. SCOPE OF SERVICES

A. Basic Services.

1. **Preliminary Phase.** The A/E will:

It is the intent of the Preliminary Phase to provide a study and report of project scope with economic and technical evaluation of alternatives, and upon approval, proceed with a **Preliminary Engineering Report (PER)** which includes preliminary designs (30%), drawings, and written description of the project. This report shall include:

a. Provide scope of soil investigations, borings, and laboratory testing and make recommendations to the City. Coordinate all required services with the Geotech Lab. (The City Engineering Services Department will provide necessary soil investigation and testing under one or more separate contracts.)
b. Confer with the City staff regarding the design parameters of the Project. The A/E will participate in multiple formal meetings with City staff, provide agenda and purpose for each formal meeting; document and distribute meeting minutes and meeting report within seven (7) working days of the meeting as described in Exhibit A-1. The A/E will discuss the project with the operating department and other agencies, such as the Texas Department of Transportation (TxDOT) and Texas Commission on Environmental Quality (TCEQ) as required to satisfactorily complete the Project.
c. Submit one (1) copy in an approved electronic format, and one (1) paper copy of the **PER**, for review with City staff. **PER** will include the following (with **CONSTRUCTABILITY** being a major element in all the following items):
    1) Review the Project with the respective Operating Department(s) and discussions including clarification and definition of intent and execution of the Project. The A/E will meet with City staff to collect data, discuss materials and methods of construction, and identify design and construction requirements.
    2) Review and investigation of available records, archives, and pertinent data related to the Project including taking photographs of the Project site, list of potential problems and possible conflicts, intent of design, and improvements required, and conformance to relevant Master Plan(s).
    3) Identify results of site field investigation including site findings, existing conditions, potential right of way/easements to be acquired, and probable Project design solutions (which are common to municipalities), in accordance with S.U.E. (Subsurface Utility Engineering) standards (CI/ASCE 38-02). Subsurface investigation will be paid as an additional service.
    4) Provide a presentation of pertinent factors, sketches, designs, cross-sections, and parameters which will or may impact the design, including Engineering design basis, preliminary layout sketches, identification of needed additional services, preliminary details of construction of critical elements, identification of needed permits, identification of specifications

to be used, identification of quality and quantity of materials of construction, and other factors required for a professional design (CONSTRUCTABILITY).

5) Advise of environmental site evaluations and archeology reports that are needed for the Project (environmental issues and archeological services to be an Additional Service).
6) Identify and analyze requirements of governmental authorities having jurisdiction to approve design of the Project including permitting, environmental, historical, construction, and geotechnical issues; meet and coordinate with agencies such as RTA, CDBG, USPS, CCISD, community groups, TDLR, etc.
7) Confer, discuss, and meet with City operating department(s) and Engineering Services staff to produce a cohesive, well-defined proposed scope of design, probable cost estimates and design alternatives.
8) Provide a letter stating that the A/E and Sub-consultant Engineers have checked and reviewed the PER prior to submission.
~~9) Provide an analysis on project impacts towards "re-Engineering" and effects on cost savings toward City operations, which this project will affect.~~

City staff will provide one set only of the following information (as applicable):

a. Record drawings, record information of existing facilities, and utilities (as available from City Engineering files)
b. The preliminary budget, specifying the funds available for construction
c. Aerial photography for the Project area
d. Through separate contract, related GIS mapping for existing facilities.
e. A copy of existing studies and plans, as available from City Engineering files.
f. Field location of existing city utilities. (A/E to coordinate with City Operating Department.)
g. Provide applicable Master Plans.
h. Provide bench marks and coordinates.

2. **Design Phase.** Upon approval of the preliminary phase, designated by receiving authorization to proceed, the A/E will:
   a. Study, verify, and implement **PER** recommendations including construction sequencing, connections to the existing facilities, and restoration of property and incorporate these plans into the construction plans. Development of the construction sequencing will be coordinated with the City Operating Department(s) and Engineering Services staff.
   b. Prepare one (1) set of the **construction bid and contract documents** (electronic and full-size hard copies using City Standards as applicable), including contract agreement forms, general conditions and supplemental conditions, notice to bidders, instruction to bidders, insurance, bond requirements, and preparation of other contract and bid related items; specifications and drawings to fix and describe, for **one (1)** bid, the size and character of the entire Project; description of materials to be utilized; and such other essentials as may be necessary for construction and cost analysis.
   c. Provide assistance to identify testing, handling and disposal of any hazardous materials and/or contaminated soils that may be discovered during construction (to be included under additional services).

d. Prepare final quantities and estimates of probable costs with the recommended construction schedule. The construction schedule will provide a phased approach to track progress and payments.

e. For the 60% and Pre-Final (100%) submittal stages, A/E shall furnish one (1) set of the **Interim plans** (electronic and full-size hard copies using City Standards as applicable) to the City staff for review and approval purposes with estimates of probable construction costs. Show existing elevations resulting from topographic survey. Show locations of utility lines, structures and their respective elevations resulting from the S.U.E. Use the City's numbering system for utility manholes. Identify distribution list for plans and bid documents to all affected utilities including City and all other affected entities. **Required** with the interim plans is a "Plan Executive Summary" which will identify and summarize the project by distinguishing key elements such as:
    - Pipe Size or Building Size
    - Pipe Material, etc.
    - Why one material is selected over another
    - Pluses of selections
    - ROW requirements and why
    - Permit requirements and why
    - Easement requirements and why
    - Embedment type and why
    - Constructability, etc.
    - Specific requirements of the City
    - Standard specifications
    - Non-standard specifications
    - Any unique requirements
    - Cost, alternatives, etc.
    - Owner permit requirements and status

f. Assimilate all review comments, modifications, additions/deletions and proceed to next phase, upon Notice to Proceed.

g. Compile comments and incorporate any requirements into the plans and specifications, and advise City of responding and non-responding participants.

h. Provide Quality Assurance/Quality Control (QA/QC) measures to ensure that submittal of the interim, pre-final (if required), and final complete plans and complete bid documents with specifications accurately reflect the percent completion designated and do not necessitate an excessive amount of revision and correction by City staff. **The A/E shall submit a letter declaring that all Engineering disciplines of all phases of the submittals have been checked, reviewed, and are complete prior to submission, and include signature of all disciplines including but not limited to structural, civil, mechanical, electrical, etc.**

~~i. If required, provide traffic controls including a Traffic Control Plan, illumination, markings and striping, signalization, and as delineated by the City Traffic Engineering Department.~~

~~j. Provide one (1) set of the final (100%) plans (unsealed and unstamped - electronic and full-size hard copies using City Standards as applicable) for City's final review.~~

~~k. Assimilate all final review comments (if any).~~

l. Upon approval by the Director of Engineering Services, provide one (1) set of the **final plans and contract documents** (electronic and full-size hard copies using City Standards as applicable) suitable for reproduction. Said bid documents henceforth become the sole property and ownership of the City of Corpus Christi.

m. The City agrees that any modifications of the submitted final plans (for other uses by the City) will be evidenced on the plans and be signed and sealed by a professional Engineer prior to re-use of modified plans.
n. Prepare and submit monthly status reports with action items developed from monthly progress and review meetings.
o. Provide a Storm Water Pollution Prevention Plan, if required.

The City staff will:

a. Designate an individual to have responsibility, authority, and control for coordinating activities for the construction contract awarded.
b. Provide the budget for the Project specifying the funds available for the construction contract.
c. Provide the City's standard specifications, standard detail sheets, standard and special provisions, and forms for required bid documents.

3. **Bid Phase.** The A/E will:

a. Participate in the pre-bid conference and provide a recommended agenda for critical construction activities and elements impacted the project.
b. Assist the City in solicitation of bids by identification of prospective bidders, and review of bids by solicited interests.
c. Review all pre-bid questions and submissions concerning the bid documents and prepare, in the City's format, for the Engineering Services' approval, any addenda or other revisions necessary to inform contractors of approved changes prior to bidding.
d. Attend bid opening, analyze bids, evaluate, prepare bid tabulation, and make recommendation concerning award of the contract.
e. In the event the lowest responsible bidder's bid exceeds the project budget as revised by the Engineering Services in accordance with the A/E's design phase estimate required above, the A/E will, at its expense, confer with City staff and make such revisions to the bid documents as the City staff deems necessary to re-advertise that particular portion of the Project for bids.

The City staff will:

a. Arrange and pay for printing of all documents and addenda to be distributed to prospective bidders.
b. Advertise the Project for bidding, maintain the list of prospective bidders, receive and process deposits for all bid documents, issue (with the assistance of the A/E) any addenda, prepare and supply bid tabulation forms, and conduct bid opening.
c. Receive the A/E's recommendation concerning bid evaluation and recommendation and prepare agenda materials for the City Council concerning bid awards.
d. Prepare, review and provide copies of the contract for execution between the City and the contractor.

4. **Construction Phase.** The A/E will perform contract administration to include the following:

a. Participate in pre-construction meeting conference and provide a recommended agenda for critical construction activities and elements impacted the project.
b. Review for conformance to contract documents, shop and working drawings, materials and other submittals.
c. Review field and laboratory tests.
d. Provide interpretations and clarifications of the contract documents for the contractor and authorize required changes, which do not affect the contractor's price and are not contrary to the general interest of the City under the contract.

e. Make regular visits to the site of the Project to confer with the City project inspector and contractor to observe the general progress and quality of work, and to determine, in general, if the work is being done in accordance with the contract documents. This will not be confused with the project representative observation or continuous monitoring of the progress of construction.
f. Prepare change orders as authorized by the City (coordinate with the City's construction division); provide interpretations and clarifications of the plans and specifications for the contractor and authorize minor changes which do not affect the contractor's price and are not contrary to the general interest of the City under the contract.
g. Make final inspection with City staff and provide the City with a Certificate of Completion for the project.
h. As applicable, review and assure compliance with plans and specifications, the preparation of operating and maintenance manuals (by the Contractor) for all equipment installed on this Project. These manuals will be in a "multimedia format" suitable for viewing with Microsoft's Internet Explorer, version 3.0. As a minimum the Introduction, Table of Contents, and Index will be in HTML (HyperText Markup Language) format, with HyperText links to the other parts of the manual. The remainder of the manual can be scanned images or a mixture of scanned images and text. Use the common formats for scanned images - GIF, TIFF, JPEG, etc.. Confirm before delivery of the manuals that all scanned image formats are compatible with the image-viewing software available on the City's computer - Imaging for Win95 (Wang) and Microsoft Imaging Composer. Deliver the manuals on a CD-ROM, not on floppy disks.
i. Review construction "red-line" drawings, prepare record drawings of the Project as constructed (from the "red-line" drawings, inspection, and the contractor provided plans) and deliver to the Engineering Services a reproducible set and electronic file (AutoCAD r.14 or later) of the record drawings within two (2) months of final acceptance of the project. All drawings will be CADD drawn using dwg format in AutoCAD, and graphics data will be in dxf format with each layer being provided in a separate file. Attribute data will be provided in ASCII format in tabular form. All electronic data will be compatible with the City GIS system.

The City staff will:

a. Process applications/estimates for payments to contractor
b. Conduct the final acceptance inspection with the A/E

B. Additional Services (ALLOWANCE)

This section defines the scope (and ALLOWANCE) for compensation for additional services that may be included as part of this contract, but the A/E will not begin work on this section without specific written approval by the Director of Engineering Services. Fees for Additional Services are an allowance for potential services to be provided and will be **negotiated** by the Director of Engineering Services as required. The A/E will, with written authorization by the Director of Engineering Services, do the following:

1. **Permit & Agency Coordination.** **(AUTHORIZED)**

Furnish the City all Engineering data and documentation necessary for all required permits as described in Exhibit A-1. The A/E will prepare this documentation for all required signatures. The A/E will prepare and submit all permits **as applicable** to the appropriate local, state, and federal authorities, including, but not limited to:

a. Wetlands Delineation and Permit
b. Temporary Discharge Permit
c. NPDES Permit/Amendments
d. Texas Commission of Environmental Quality (TCEQ) Permits/Amendments
e. Nueces County
f. Texas Historical Commission (THC)
g. U.S. Fish and Wildlife Service (USFWS)
h. U.S. Army Corps of Engineers (USACE)
i. United States Environmental Protection Agency (USEPA)
j. Texas Department of Licensing and Regulation (TDLR)

2. **Topographic Survey.** **(AUTHORIZED)**

A/E will provide field surveys, as required for design including the necessary control points, coordinates and elevations of points (as required for the aerial mapping of the Project area - aerial photography to be provided by City). Establish base survey controls for line and elevation staking (not detailed setting of lines and grades for specific structures or facilities). All work must be tied to and conform with the City's Global Positioning System (GPS) control network and comply with Category 6, Condition I specifications of the Texas Society of Professional Surveyors' Manual of Practice for Land Surveying in the State of Texas, Ninth Edition. Include reference to a minimum of two (2) found boundary monuments from the project area. Topographic Survey services to be provided as described in Exhibit A-1.

A/E will also provide subsurface utility engineering (SUE) and land acquisition services as described in Exhibit A-1 and as required by the project. These services must be authorized by the City prior to commencement of work.

3. **Environmental Issues.** **(AUTHORIZED)**

Provide environmental site evaluations and Archaeology Reports that are needed for the Project. Identify and develop a scope of work for any testing, handling and disposal of hazardous materials and/or contaminated soils that may be discovered during construction.

4. **Construction Observation Services.** **(TBD)**

Provide a Construction Management Team consisting of a Project Representative (PR), Project Construction Inspector (PCI), and Project Administrative Assistant (PAA). Through such additional observations of Contractor's work in progress and field checks of materials and equipment by the PR and assistants, the Engineer shall endeavor to provide further protection for the City against defects and deficiencies in the work. The duties and responsibilities of the PR are described as follows:

a. General: PR will act as directed by and under the supervision of Engineer, and will

confer with the Engineer regarding PR's actions. PR's dealings in matters pertaining to the Contractor's work in progress shall in general be with the Engineer and Contractor, keeping the City advised as necessary.

b. Conference and Meetings: Attend meetings with Contractor, such as pre-construction conferences, progress meetings, job conferences and other project-related meetings as required by the City, and prepare and circulate copies of minutes thereof.

c. Liaison:
   1) Serve as liaison with Contractor, working principally through Contractor's superintendent and assist in understanding the intent of the Contract Documents.
   2) PR shall communicate with the City with the knowledge of and under the direction of the Engineer

d. Interpretation of Contract Documents: Report when clarifications and interpretations of the Contract Documents are needed and transmit to Contractor clarifications and interpretations as issued.

e. Shop Drawings and Samples:
   1) Receive Samples, which are furnished at the Site by Contractor, and notify of availability of Samples for examination.
   2) Record date of receipt of Samples and approved Shop Drawings.
   3) Advise Contractor of the commencement of any portion of the Work requiring a Shop Drawing or Sample submittal for which PR believes that the submittal has not been approved.

f. Review of Work and Rejection of Defective Work:
   1) Conduct on-Site observations of Contractor's work in progress to assist the Engineer in determining if the Work is in general proceeding in accordance with the Contract Documents.
   2) Report whenever PR believes that any part of Contractor's work in progress will not produce a completed Project that conforms to the Contract Documents or will prejudice the integrity of the design concept of the completed Project, or has been damaged, or does not meet the requirements of any inspection, test or approval required to be made; and advise City and the Engineer of that part of work in progress that PR believes should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection or approval.
   3) Observe whether Contractor has arranged for inspections required by Laws and Regulations, including but not limited to those to be performed by public agencies having jurisdiction over the Work.

g. Records:
   1) Maintain orderly files for correspondence, reports of job conferences, reproductions of original Contract Documents including all Change Orders, Field Orders, Work Change Directives, Addenda, additional Drawings issued subsequent to the Contract, Engineer's clarifications and interpretations of the Contract Documents, progress reports, Shop Drawing and Sample submittals received from and delivered to Contractor, and other Project related documents.
   2) Prepare a daily report utilizing approved City format, recording Contractor's hours on the Site, weather conditions, data relative to questions of Change Orders, Field Orders, Work Change Directives, or changed conditions, Site visitors, daily activities, decisions, observations in general, and specific observations in more detail as in the case of observing test procedures; and send copies to the Engineer and the City.

h. Reports:
   1) Furnish periodic reports as required of progress of the Work and of Contractor's

compliance with the progress schedule and schedule of Shop Drawing and Sample submittals.

2) Report immediately to the City and the Engineer the occurrence of any Site accidents, any Hazardous Environmental Conditions, emergencies, or acts of God endangering the work, and property damaged by fire or other causes.
3) Provide project photo report on CD-ROM at the rate of a minimum of two photographs per day, including an adequate amount of photograph documentation of utility conflicts.

i. Completion:
1) Before the issue of Certificate of Completion, submit to Contractor a list of observed items requiring completion or correction.
2) Participate in a final inspection in the company of the Engineer, the City, and Contractor and prepare a final list of items to be completed or corrected.
3) Observe whether all items on final list have been completed or corrected and make recommendations concerning acceptance and issuance of the Notice of Acceptability of the Work.

5. Start-up & Training Services.

Provide on-site services and verification for all start-up procedures during actual start-up of major project components, systems, and related appurtenances if needed and required, as described in Exhibit A-1.

Provide Training services as described in Exhibit A-1.

Provide factory witness testing as described in Exhibit A-1.

6. Warranty Phase.

Provide a maintenance guaranty inspection toward the end of the one-year period after acceptance of the Project. Note defects requiring contractor action to maintain, repair, fix, restore, patch, or replace improvement under the maintenance guaranty terms of the contract. Document the condition and prepare a report for the City staff of the locations and conditions requiring action, with its recommendation for the method or action to best correct defective conditions and submit to City Staff. Complete the inspection and prepare the report no later than sixty (60) days prior to the end of the maintenance guaranty period.

7. SCADA & Equipment O&M Documentation.

Provide standardized SCADA documentation, which will include PFDs, P&IDs, loop sheets, logics, SCADA architecture, DCS I/O lists, instrument lists, tie-in lists, piping lists, equipment lists, and instrumentation specification sheets. The construction documents will include the requirements within the Construction Contract and specifications that the Contractor is to prepare SCADA documents as specified, for submission to the A/E for review and approval. A/E will provide the final SCADA documentation to City in organized format when approved.

8. **Public Involvement.** **(N/A)**

9. **Electronic Operations O&M Manual.** **(TBD)**

   Provide electronic operations O&M manual as described in Exhibit A-1.

10. **Conformed Contract Documents.** **(TBD)**

    Provide conformed contract documents services as described in Exhibit A-1.

11. **Existing Facilities Condition Assessment.** **(TBD)**

    Provide existing facilities condition assessment services as described in Exhibit A-1.

12. **Windstorm Certification.** **(AUTHORIZED)**

    Provide all required services for Windstorm Certification as described in Exhibit A-1.

13. **Peer Review Coordination & Response.**

    Provide authorized peer review coordination and response services as described in Exhibit A-1.

14. **High Service Pumping System Energy Audit & Energy Conservation Evaluation.** **(TBD)**

    Provide energy audit services as described in Exhibit A-1.

15. **Physical Laboratory Scale Hydraulic Modeling Study.** **(TBD)**

    Provide physical lab scale hydraulic modeling study services as described in Exhibit A-1.

16. **Disinfection CT Evaluation.** **(TBD)**

    Provide disinfection CT evaluation services as described in Exhibit A-1.

17. **Plant Process and Hydraulic Evaluation.** **(TBD)**

    Provide plant process and hydraulic evaluation services as described in Exhibit A-1.

18. **Electrical Studies.** **(AUTHORIZED)**

    Provide electrical studies services as described in Exhibit A-1.

    Provide HS No. 1 contaminant inspection services as described in Exhibit A-1.

19. **Control Logic & Application Development Support.** **(AUTHORIZED)**

    Provide control logic and application development services as described in Exhibit A-1.

20. **Control System Integration Coordination. (AUTHORIZED)**

Provide control system integration services as described in Exhibit A-1.

21. **Project Manual. (AUTHORIZED)**

Provide Project Manual development and services as described in Exhibit A-1.

22. **Program Management & Projects Coordination.**

Provide program management and projects coordination services as described in Exhibit A-1.

Provide the services above authorized in addition to those items shown on Exhibit "A-1" Task List, which provides supplemental description to Exhibit "A." *Note:* The Exhibit "A-1" Task List does not supersede Exhibit "A."

2. SCHEDULE

The detailed project schedule for each design task and construction phase is provided in Appendix B. In addition, a preliminary project cost breakdown by fiscal year is shown for design, construction, contingency and inspection.

3. FEES

A. **Fee for Basic Services.** The City will pay the A/E a fixed fee for providing for all "Basic Services" authorized as per the table below. The fees for Basic Services will not exceed those identified and will be full and total compensation for all services outlined in Section I.A.1-4 above, and for all expenses incurred in performing these services. **The fee for this project is subject to the availability of funds. The A/E may be directed to suspend work pending receipt and appropriation of funds.** For services provided in Section I.A.1-4, A/E will submit monthly statements for basic services rendered. In Section I.A.1-3, the statement will be based upon ENGINEER's estimate (and City concurrence) of the proportion of the total services actually completed at the time of billing. For services provided in Section I.A.4, the statement will be based upon the percent of completion of the construction contract. City will make prompt monthly payments in response to A/E's monthly statements.

B. **Fee for Additional Services.** For services authorized by the Director of Engineering Services under Section I.B. "Additional Services," the City will pay the A/E a not-to-exceed fee as per the table below:

C. Summary of Fees Table

	ORIGINAL CONTRACT	AMD. NO. 1	CONTRACT TOTAL
BASIC SERVICES			
1. Preliminary Phase	$ 47,500.00	$ 381,371.00	$ 428,871.00
2. Design Phase	-	$ 963,767.00	$ 963,767.00
3. Bid Phase	-	$ 35,219.00	$ 35,219.00
4. Construction Administration Phase	-	$ 277,453.00	$ 277,453.00
Subtotal Basic Services (Authorized)	**$ 47,500.00**	**$1,657,810.00**	**$1,705,310.00**
ADDITIONAL SERVICES (ALLOWANCE)			
1. Permit & Agency Coordination (AUTHORIZED)	-	$ 24,026.00	$ 24,026.00
2. Topographic Survey (AUTHORIZED)	-	$ 58,346.00	$ 58,346.00
3. Environmental Issues (AUTHORIZED)	-	$ 31,088.00	$ 31,088.00
4. Construction Observation Services	-	TBD	-
5. Start-Up Services	-	$ 77,927.00	$ 77,927.00
6. Warranty Phase	-	$ 53,906.00	$ 53,906.00
7. SCADA & Equipment O&M Documentation	-	$ 51,175.00	$ 51,175.00
8. Public Involvement (N/A)	-	N/A	-
9. Electronic Operations O&M Manual	-	TBD	-
10. Conformed Contract Documents	-	TBD	-
11. Existing Facilities Condition Assessment	-	TBD	-
12. Windstorm Certification (AUTHORIZED)	-	$ 19,800.00	$ 19,800.00

13. Peer Review Coordination & Response	-	$ 153,393.00	$ 153,393.00
14. High Srvc. Pumping Sys. Energy Audit & Conservation Evaluation	-	TBD	-
15. Physical Laboratory Scale Hydraulic Modeling Study	-	TBD	-
16. Disinfection CT Evaluation	-	TBD	-
17. Plant Process and Hydraulic Evaluation	-	TBD	-
18. Electrical Studies (AUTHORIZED)	-	$ 51,150.00	$ 51,150.00
19. Control Logic & Application Development Support (AUTHORIZED)	-	$ 28,416.00	$ 28,416.00
20. Control System Integration Coordination (AUTHORIZED)	-	$ 28,416.00	$ 28,416.00
21. Project Manual (AUTHORIZED)	-	$ 23,650.00	$ 23,650.00
22. Program Management & Projects Coordination	-	$ 99,000.00	$ 99,000.00
Subtotal Additional Services	-	$ 700,293.00	$ 700,293.00
TOTAL AUTHORIZED FEE	**$ 47,500.00**	**$ 2,358,103.00**	**$ 2,405,603.00**

LNV Solutions Today with a Vision for Tomorrow
engineers | architects | contractors

CDM Smith

EXHIBIT A-1

SCOPE OF WORK

CITY OF CORPUS CHRISTI

ONSWTP HIGH SERVICE PUMP BUILDING NO. 3

CITY PROJECT NO. E11066

TABLE OF CONTENTS

TABLES

General Information

The O.N. Stevens Water Treatment Plant (ONSWTP) was originally constructed in 1954 and supplies water for municipal and industrial use in a seven-county service area covering 140 square miles and is the sole provider of treated water to the City of Corpus Christi, Texas. High Service No. 1 was originally constructed with a maximum capacity of 82.2 million gallons per day (MGD) and a firm capacity of 66.4 MGD. ONSWTP underwent a major plant wide expansion in 1981. The expansion included a new High Service No. 2 which has a maximum capacity of 97.9 MGD and a firm capacity of 73.4 MGD. The 1981 expansion also included the addition of a new River Pump Station (raw water pump station), Raw Water Receiving Unit, Sedimentation Basins, Filters and a 10 million gallon (mg) Clearwell No. 2. These additions essentially brought a second treatment train into service and more than doubled the overall capacity of the plant. The plant is currently rated at 161.5 MGD and treats approximately 25 billion gallons per year. In order for ONSWTP to maintain its current treatment rating and meet the future water demands of Corpus Christi and the surrounding area, the aging plant will require a series of improvements and upgrades, one of which being the addition of High Service Pump Building No. 3 (HSPB #3) to replace the 59 year old High Service Pump Building No. 1 (HSPB #1).

Scope Limiting Assumptions

The following scope limiting assumptions have been defined:

- The total scope of the project will be delivered via one single contract (i.e. one set of contract documents).
- The Preliminary Project Schedule assumes the project will receive Notice to Proceed from the City no later than October 2013.
- The City or Contractor will pay all fees associated with permit applications and plan review including City of Corpus Christi Development Services, Nueces County, TCEQ, and other agencies as required.
- The starting point for this Design is based upon the data collection, evaluation and system recommendations developed in the Initial Phase Effort.

High Service Pump Building No. 3 Site Plan, Construction Estimate and Project Schedule

The High Service Pump Building No. 3 Conceptual Site Plan at ONSWTP is shown in Appendix A. The Preliminary Construction Estimates are provided in Appendix B and the Preliminary Project Schedule is provided in Appendix C. The Preliminary Project Schedule takes into account the 104.2 MGD capacity High Service Pump Building No. 3 improvements and may require modification throughout the course of the Project if phasing is required.

Design Team

The firms involved in this Project are listed below in Table 1 with their respective disciplines:

Table 1 Design Team

Firm	Disciplines
LNV, Inc.	Project Management General, Civil and Site Design Structural Design Condition Assessment – Structural Windstorm Certification Topographic Survey Subsurface Utility Engineering (SUE) Cost Estimating – QA/QC SWPPP Construction Administration (TBD) Start-Up & Training Services Warranty Energy Audit (TBD)
CDM Smith	Process Unit Design & Criteria Condition Assessment – Mech/Process Process/Mechanical Design Cost Estimating Constructability Review Start-Up & Training Services Construction Administration (TBD)
Bath Group	Electrical Design (All facilities) Instrumentation & Controls Design (All Facilities) Start-Up & Training Services SCADA & O&M Documentation
Govind Development	Condition Assessment – Structural Structural Design
Turner & Ramirez	Architectural Design Landscape Architectural Design (TBD)

Design Standards

The Engineer will be responsible for providing the work to meet the City of Corpus Christi standards. The Engineer will also comply with the following standards:

- All applicable Uniform and National codes along with the City amendments as adopted by ordinance
- AWWA, NSF, HI, TAC, ACI, ASTM, ANSI, etc., as applicable

Basic Services

Services to be provided as described in Exhibit A

Project Management

The Engineer will manage project activities in order to achieve timely project delivery, encourage the consistent application of cost control strategies, and devote the utmost attention to quality control. The Engineer will also track the Final Design and Construction Administration budget and schedule, coordinate and manage sub-consultants, prepare and submit invoices, and coordinate with the City's Project Manager. The Engineer will prepare and distribute monthly progress reports. LNV's Principal-in-Charge and Project Manager will meet monthly with the City's Project Manager to discuss the status and progress of the project. Manage the services of the firms providing design and construction management services for the completion of this project. Review the progress of the services being performed, prepare subconsultant agreements, determine correctness of partial payment requests, and process payment requests.

Deliverables:

- Project Manual
- Monthly progress reports
- Monthly invoices

Project Meetings

The Engineer will prepare and distribute written minutes of these meetings to the City and the Project Team. Action items and decisions shall be clearly identified in the notes.

Kickoff Meeting

The Engineer will conduct a project kickoff meeting with representatives of City and Project Team. The purpose of this meeting will be to initiate the project and develop a working understanding of the following:

- Introduce the Project Team
- Review project Scope of Work
- Review project schedule
- Identify information needed from the City
- Identify City contacts
- Establish communication protocol and project procedures
- Develop a project meeting schedule

Deliverables:

- Agenda

- Meeting notes

Workshop Meetings

Engineer will conduct regular meetings with the City and Project Team members, as appropriate, to address technical and administrative issues related to the project. These meetings will be used to conduct technical workshops. A maximum of twelve (12) workshop meetings during the Preliminary Design and Design phases are expected. Table 2 summarizes the anticipated workshop topics.

Table 2 Project Workshops

Topic of Workshop	Subject Matter
Condition Assessment Results and Recommendations	Results of condition assessment of existing equipment to remain in service
Pump Type Alternative Analysis	Results of the pump type evaluation
Energy Audit	Results of the evaluations and discussions on recommendations
Basis of Design/Site Layout	Redundancy, piping, system interconnectivity, site layout
I&C/SCADA	SCADA protocol, equipment tagging, I&C standards, control system
Electrical/Power Distribution	One-line diagrams, MCCs, alternate power, etc.
Equipment Preferences	Identify the preferred equipment by manufacturer based on past experiences, availability, and maintenance
Construction Phasing	Constructability, maintaining operation, etc.
Architectural & Landscape Programming	Color palette, design concepts, landscape concepts, etc.
Preliminary (30%) Design	Present Draft Preliminary Design Reports
60% Design	Present 60% design and cost estimate
100% Pre-Final Design	Present 100% Pre-final design & cost estimate

The purpose of these meetings will be to present design concepts and receive the City's opinions and comments. Items to be specifically addressed could be as follows:

- Confirm configuration of process
- Confirm systems and site layout
- Identify control concepts
- Identify architectural and structural preferences
- Identify maintenance requirements and plant staff capability

- Identify operational schemes
- Identify tag numbering system
- Gather data, records, drawings, and miscellaneous information
- Identify project coordination and interfacing needs required to meet the project schedule

Deliverables:

- Agendas
- Meeting Notes

Project Meetings

This task provides for meetings that pertain to the management of the project. The planned meetings and frequency are described below. The Engineer will prepare and distribute written results of these meetings to the City and the Team. Action items and decisions shall be clearly identified in the notes as a decisions log with the date the issue was identified, the individual raising the issue, the individual responsible for responding, the resolution/solution to the issue, and the resolution date.

- Conduct monthly status meetings with the City project team to provide an update on project progress; receive information; coordinate the proposed design and construction activities under this contract with other proposed and ongoing design, construction, and maintenance activities; and to obtain direction and decisions from the City. Meetings will occur throughout Preliminary Design, Design, Bidding, and Construction phases of the project and will last approximately 2 hours, not including preparation and meeting notes. A total of 50 monthly meetings are planned over the duration of the project.
- A total of six (6) targeted meetings with the City project team to discuss project issues will be scheduled. These meetings will be scheduled in advance to facilitate a focused, in-depth discussion.

Deliverables:

- Agenda
- Meeting Notes

Internal Team Meetings

The Project Team will meet on a bi-weekly basis to coordinate efforts and keep all team members informed about the project. The Engineer will conduct interdisciplinary coordination review meetings with its sub-consultants at the 30%, 60%, and 100% Pre-Final submittal stages. A total of 40 internal meetings are planned during the Preliminary and Design Phases.

Deliverables:

- Agenda
- Meeting Notes

Design and CAD Standards

This task includes the development of design and CAD standards for the project. Design standards and typical design details will be developed for use on all portions of the project. Standard drawing setup, layering, and production standards will be implemented on all portions of the project.

QA/QC Program

This program includes the development and enforcement of QA/QC procedures and design and CAD Standards for Design. Reviews will be conducted for the 30%, 60% and 100% Pre-final level of design completion.

Design Quality Control Review

The Engineer will provide the services of a Design Quality Control Committee (DQCC). The DQCC will be led by a Senior Engineer that will meet independently from the Design Team to review the 30%, 60% and 100% Pre-final progress milestone submittals for technical merit, completeness of the drawings and specifications, and interdisciplinary coordination prior to submittal to the City. The Design Team and the DQCC will meet to review and resolve DQCC comments and suggested modifications to the progress milestone submittals. The comments and resolutions will be documented in a memorandum. The DQCC will be responsible for the following focused areas of review for each design submittal:

- Consistency with the intent of the design concepts established in the Preliminary Design
- Technical merit
- Conformance with Engineer's Design Checklist
- Conformance with Regulatory Agency and Development Services Design Checklists
- Constructability
- Operability and Maintainability

Deliverables:

- Project QA/QC Manual
- Quality Control memo with review comments on design submittals

Construction Quality Control Review

The Engineer will provide the services of a Quality Control Committee (QCC) that will be led by the Project Manager that will meet independently to review the quality of construction and possible resolutions to construction situations that way arise. The QCC will be responsible for the following focused areas of review.

- Construction Quality
- Constructability
- Operability and Maintainability

1 PRELIMINARY DESIGN PHASE

Prior to the preparation of detailed plans and specifications, the Engineer will develop a Preliminary Design (30% Design) for the High Service No. 3 project elements. The purpose of the Preliminary Design phase is to develop an adequate definition of the Project to enable the Detailed Design phase to proceed without significant changes. A prerequisite to the preparation of plans and specifications is the development of a specific design agenda that incorporates the project site conditions and constraints, summarizes the rationale for each major detailed design decision, and contains design criteria including process control criteria and process descriptions for each component and system incorporated into the project. Another objective of Preliminary Design is to identify desirable equipment types, as well as the need to specify sole source procurement and/or equipment pre-purchase options. The selection and design of major equipment will be based on technical factors, operability, and optimal lifecycle cost analysis.

The results of Preliminary Design phase will be compiled into a single DRAFT Preliminary Design Report (PDR) for the General Design Criteria tasks and major project elements. The PDR will establish the design parameters, criteria, and concepts necessary for preparation of detailed plans and specifications. The PDR will be delivered and presented to the City for a four (4) week staff review period followed by a resolution of comments at a regularly scheduled progress meeting. The PDR along with comments from the City will be incorporated in the FINAL Preliminary Engineering Report (PER), as appropriate, which will be submitted to TCEQ.

Deliverables:

- Three (3) copies of DRAFT PER
- Three (3) copies of the FINAL PER and schematic drawings

1.1 General Design Criteria

The Engineer will develop general Process Flow Diagrams and Design Criteria for all of the major equipment and systems associated with High Service No. 3. Also, a device numbering system, general notes, legends and symbols will be developed.

Deliverables:

- Process Design Criteria, Process Flow Diagrams, Device Numbering System

1.1.1 Civil-Site Design Concept

The Engineer will develop preliminary site plans taking into consideration setbacks, site access, interface with ONSWTP access roads, topography, existing utilities, and landscaping. The Engineer will develop preliminary yard piping and grading and paving plans reflecting the proposed improvements. Preliminary site plans should include setbacks, floodplain delineations, topography, proposed structure locations, vehicular circulation (plant drives), finished floor or top of structure elevations, drainage patterns and major drainage features. The Engineer will identify items required by the City for initial site plan approval and make sure those features are shown on the site plan.

1.1.2 Preliminary Drainage Report

The Engineer will update the on-site management of storm water runoff taking into consideration the proposed facilities. A Preliminary Drainage Report will be submitted to the City. Also included will be a draft update to the Storm Water Pollution Prevention Plan.

Deliverable:

- Preliminary Drainage Report
- Draft Updated Storm Water Pollution Prevention Plan

1.1.3 Power Distribution, Alternate Power, and One-Line Diagrams

The Engineer will develop preliminary electrical one-line diagrams showing major equipment and method of providing power, determine estimated electrical equipment sizes for housing requirements and develop preliminary electrical load calculations. The Engineer will recommend appropriate alternate power provisions.

Deliverables:

- Power Feed Criteria, Alternate Power Criteria, One-Line Diagrams

1.1.4 Control System Planning and System Architecture Diagrams

For High Service No. 3, the Engineer will develop a control system architecture diagram, a process and instrumentation diagram, basic control logic description, and the method of control.

Deliverables:

- Preliminary P&IDs
- Control System Architecture Diagram
- Preliminary Process Control Descriptions

1.1.5 1.1.5 High Service No. 3 Support Systems

The Engineer will develop design criteria for the support systems at High Service No. 3. This task includes the plant, potable, and fire protection water systems.

1.2 High Service Pump Station No. 3 Design Criteria

1.2.1 Pump Duty Conditions

The Engineer will develop general design criteria and preliminary evaluation documentation for the duty conditions of High Service No. 3. The duty condition design criteria will include design flow capacity (firm) and design pressure capacity. This evaluation will account for population and demand projections as well as the TCEQ-approved Alternative Capacity Requirement (ACR) Exception. The criteria will also include recommendations for redundancy of pumping capacity, future provisions and plant re-rating goals.

Deliverables:

- Duty Condition Design Criteria and Preliminary Evaluation Documentation
- Equipment Data Sheets

1.2.2 Pump Types

The Engineer will develop general design criteria and preliminary evaluation documentation for the proposed pump types of High Service No. 3. This general design criteria and evaluation will provide a sound recommendation of proposed pump type (i.e. vertical turbine vs. split-case centrifugal). These criteria will also include recommendations for redundancy of pumping capacity and future provisions.

Deliverables:

- Pump Type Design Criteria and Preliminary Evaluation Documentation
- Equipment Data Sheets

1.2.3 Piping

The Engineer will develop general design criteria and preliminary evaluation documentation for the proposed piping associated with High Service No. 3. Considerations for net positive suction head (NPSH), clearwell connectivity and operational flexibility will be provided. These criteria will also include recommendations for redundancy of valving and future provisions.

Deliverables:

- Piping Design Criteria and Preliminary Evaluation Documentation
- Equipment Data Sheets

1.2.4 System Controls

The Engineer will develop general design criteria and preliminary evaluation documentation for the proposed system controls associated with High Service No. 3. Considerations for enhanced automation and integration with existing ONSWTP controls will be provided. Additionally, design criteria and evaluation for upgrading the existing controls at High Service No. 2 will be provided.

Deliverables:

- System Controls Design Criteria and Preliminary Evaluation Documentation
- Equipment Data Sheets

1.2.5 Electrical Design

The Engineer will develop general design criteria and preliminary evaluation documentation for the proposed electrical design associated with High Service No. 3. Considerations for use of existing infrastructure and alternate power will also be provided.

Deliverables:

- Electrical Design Criteria and Preliminary Evaluation Documentation
- Equipment Data Sheets

1.2.6 Risk Management

The Engineer will develop general design criteria and preliminary evaluation documentation for the management of risk associated with the design of High Service No. 3. Findings, data and baseline evaluations obtained in the initial phase of this project will be expounded upon to finalize the assessment of risk associated with each design parameter. Risk and Decision matrices that were also utilized in the initial phase of the project will be implemented in the preliminary design phase of the project. Additionally, the risk management to be performed by the Engineer will include a tabulation of Critical Success Factors (CSFs) and Potential Processes Activities and Tasks (PATs) that were also established in the initial phase of the project, which will ensure that all project objectives and goals are satisfied. Finally,

Deliverables:

- Risk Management Plan
- Risk and Decision Matrices
- Tabulation of CSFs
- Tabulation of PATs

1.2.7 Preliminary P&IDs

The Engineer will develop preliminary Process & Instrumentation Diagrams (P&ID), a control system architecture diagram, basic control logic description, and the method of control for all of the equipment that will be in service after the completion of High Service No. 3.

Deliverables:

- Preliminary P&IDs
- Preliminary Equipment Control Descriptions
- Preliminary Instrumentation List
- Preliminary Input/Output (I/O) Point Count List

1.2.8 Future Facilities

The Engineer will update the Site Plan to reflect how the ONSWTP could be expanded in the future after High Service No. 3 is complete.

Deliverables:

- Updated Site Plan for High Service No. 3 and future phase(s)

1.3 Geotechnical Coordination

The Engineer will identify the extent of subsurface geotechnical investigations as required to support the design of the new facilities and will coordinate this effort with the City's selected Geotechnical Engineer. The Engineer will prepare a draft scope of work for the Geotechnical Engineer that includes a vicinity map for the site, identifies the number of bores and bore locations (the Geotechnical Engineer will be consulted in identifying bore locations), and creates the bore location exhibit. The Engineer also will review the draft geotechnical report findings and recommendations. The report prepared by the Geotechnical Engineer should include discussions on the laboratory and test analyses, findings and recommendations of the investigation, exhibits, boring logs, detailed descriptions of surface and subsurface conditions, seismic conditions, geotechnical profile, and recommendations for all required foundations(including piers, if necessary) and roadways, and recommendations of any additional geotechnical investigations that are required for design. Geotechnical findings and recommendations should include soil bearing loads, lateral earth pressures, trenching, excavation and over-excavation, fill and backfill, structural and foundation design parameters, soil corrosiveness, and design pavement section design criteria.

Deliverables:

- Draft Scope of Work for Geotechnical Engineer

1.4 Architectural Concepts Development

The architectural concepts of the existing High Service Pump Building No. 2 will be used to develop an architectural program for the proposed High Service Pump Building No. 3. The Engineer will provide the initial architectural concepts and will prepare architectural drawings, renderings and 3-D model to illustrate what the proposed building will look like. This task includes the evaluation of various building horizontal and vertical relief elements, architectural treatments, construction materials, surface finishes, and color palettes, and the cost impacts of the various alternatives. The goal of this task is to select a cost-effective architectural programming and aesthetic concept so that the building will be compatible with the architecture of ONSWTP.

Deliverables:

- Preliminary Architectural Program

1.4.1 Landscaping Concept

The landscaping concept of the existing facilities will be used to develop a landscaping program for proposed improvements at ONSWTP. The Engineer will provide initial landscaping concepts to illustrate what the landscaping improvements will look like for High Service Pump Building No. 3. The concepts developed under this task will be used by the Engineer to prepare a preliminary site plan illustrating the location of the proposed landscaping improvements.

Deliverables:

- Preliminary Landscaping Site Plan

1.5 Preliminary Design Package

The process for distributing the final basic design criteria for this project will include preparation of a DRAFT and FINAL Preliminary Engineering Report (PER) that includes documentation of changes made subsequent to the Regulatory Compliance and Implementation Plan and documentation of the recommendations from the Preliminary Design Tasks.

The PER will describe the modifications, upgrades, types of materials and equipment, layouts, and other design criteria. It will also include preliminary drawings developed to a 30 percent level of completion. The capital costs will be developed to a Class 3 cost level, as defined by the Association for the Advancement of Cost Engineering (AACE). Annual O&M costs, including any cost savings that may occur by implementing the recommended alternative, will also be developed.

Deliverables:

- Level 3 Cost Estimate (included in PER)
- Three (3) copies of the DRAFT Preliminary Design Report (PDR)
- Three (3) copies of the FINAL Preliminary Engineering Report (PER)

2 DESIGN PHASE

The Engineering services to be provided under this stage of work will include services related to the final detailed design of the ONSWTP High Service Pump Building No. 3.

The intent of the Design Phase of this project is to prepare a set of Contract Documents to define the work of the ONSWTP High Service Pump Building No. 3 project in such a manner that satisfies the needs of the City, the requirements of governing regulatory agencies, and clearly and completely conveys the design intent and requirements to the prospective Bidders and the awarded Contractor. The Engineer will prepare final detailed plans and technical specifications in accordance with the Preliminary Design and any adjustments to the Preliminary Design as suggested and authorized by the City.

2.1 General Design

2.1.1 General

The Engineer will update the Process Flow Diagrams and Design Criteria for all of the major equipment and systems from the Preliminary Design. Also, the device numbering system, general notes, legends, abbreviations, and symbols will be updated.

2.1.2 Civil Site Design

The Engineer will finalize the site plans taking into consideration setbacks, site access, access roads, topography, existing utilities, and landscaping. The Engineer will finalize the yard piping and the grading and paving plans reflecting the proposed improvements. Site plans should include final property boundaries, easements, setbacks, zoning, floodplain delineations, topography, proposed structure locations, vehicular circulation (plant drives), finish floor or top of structure elevations,

drainage patterns and major drainage features. The Engineer will identify items required by the Planning Department for site plan approval and make sure those features are shown on the site plan.

2.1.3 Final Drainage Report

The Engineer will update the on-site containment of storm water runoff taking into consideration the proposed facilities. The Engineer will also finalize the SWPPP for the ONSWTP High Service Pump Building No. 3.

2.1.4 Power Distribution, Alternate Power, and One-Line Diagrams

The Engineer will update the electrical one-line diagrams showing major equipment and method of providing power, determine estimated electrical equipment sizes for housing requirements and develop preliminary electrical load calculations. The Engineer will update the alternate power provisions defined in the PDR along with one-line diagrams, electrical site plans, site lighting plans, conduit schedules, and panel schedules.

2.1.5 Pump Station Control System

The proposed High Service No. 3 controls will include a new SCADA system as described in the PDR. The system network diagram and the individual points to be monitored, measured, alarmed and controlled described in the PDR will be updated.

2.1.6 ONSWTP High Service Pump Building No. 3 Support Systems

The Engineer will design the potable water, site fire protection systems, and site security upgrades.

2.1.7 Maintenance of Plant Operations

The Engineer will prepare Maintenance of Plant Operations (MOPO) plans to provide information to allow the Contractor to avoid interrupting the operation of new or existing treatment processes or units other than as coordinated with the City. The purpose of the MOPOs is to provide the Contractor a sequence to perform their construction activities in such a manner that uninterrupted treatment of water flows and continuous operation of all essential plant services and facilities are maintained throughout the construction period so that the ONSWTP is in compliance with all of the regulatory requirements at all times.

This task also includes development of a plan for testing, startup, and initial operation of the High Service No. 3 improvements that is consistent with the anticipated sequence of construction. This plan will be developed with input from the City's operation and maintenance staff.

2.2 High Service Pump Station No. 3 Design

2.2.1 Pump Duty Condition Design

The Engineer will finalize the design and provide design calculations and documentation for the duty conditions of High Service No. 3. The duty condition design will include design flow capacity (firm) and design pressure capacity. This final design will account for population and demand projections as well as the TCEQ-approved Alternative Capacity Requirement (ACR) while including recommendations for redundancy of pumping capacity, future provisions and plant re-rating goals. Also included in this

effort is the generation, by hydraulic modeling software, of multiple system curves for the City's distribution system to account for the variety of duty conditions that the High Service No. 3 pumps will be required to satisfy. The model-generated system curves will account for existing and future elevated storage tanks and the minimum, average and maximum daily demands under each storage tank scenario. Additionally, the duty condition design will account for HI standards for High Service No. 3 suction and discharge piping.

Deliverables:

- Duty Condition Design and Final Selection Documentation
- Equipment Data Sheets (Pump Curves & Design Points)

2.2.2 Pump Type Design

The Engineer will finalize the design and provide finalized evaluation documentation for the selection of the proposed pump types of High Service No. 3. The design and evaluation will provide a sound recommendation of proposed pump type (i.e. vertical turbine vs. split-case centrifugal). The design will also include recommendations for redundancy of pumping capacity and future provisions.

Deliverables:

- Pump Type Design and Final Selection Documentation
- Equipment Data Sheets (Pump Curves & Design Points)

2.2.3 Piping Design

The Engineer will finalize the design and provide design calculations for the proposed piping associated with High Service No. 3. Considerations for net positive suction head (NPSH), clearwell connectivity and operational flexibility will be provided. The design will also include recommendations for redundancy of required valving and future provisions in accordance with HI standards.

Deliverables:

- Piping Design and Final Calculation Documentation
- Equipment Data Sheets

2.2.4 System Controls Design

The Engineer will finalize the design and provide final documentation for the proposed system controls associated with High Service No. 3. Considerations for enhanced automation and integration with existing ONSWTP controls will be provided. Additionally, design and evaluation for upgrading the existing controls at High Service No. 2 will be provided.

Deliverables:

- System Controls Design and Final Proposed Design Documentation
- Equipment Data Sheets

2.2.5 Architectural, Mechanical and Electrical Design

The Engineer will provide architectural design services for the new High Service Pump Building No. 3 and associated electrical room and generator building extension, as needed. This includes preparing final architectural drawings and specifications based upon the Preliminary Design. The drawings will include a site plan and for each building, floor plans, roof plans, room finish schedules, door and window schedules, elevations, building sections, wall sections, stair plans and sections, and details for building components. Specifications anticipated include masonry, concrete, floor sealers, roofing system, metal flashings, miscellaneous metals, ladder to roof, stairs, railings, metal doors, finished hardware, windows, glass and glazing, sealants, stucco, paint and stain finishes, fire extinguishers and bridge crane.

The Engineer will provide heating, ventilation, and air conditioning (HVAC), plumbing, and electrical design services for the High Service Pump Building No. 3 and associated electrical room and generator building, as needed. This includes preparing final drawings and specifications based upon Preliminary Design. The drawings will include floor plans, sections, schematics, fixture and equipment schedules, panel board schedules, and details for the HVAC, plumbing, and electrical building components. Specifications anticipated include ventilation, HVAC equipment, air ducting, plumbing fixtures, and light fixtures.

2.2.6 Structural

The Engineer will provide structural engineering design services. This includes preparing final structural drawings and specifications based upon the building layouts, foundations and miscellaneous structures developed in the Preliminary Design.

2.2.7 Landscape Architecture

The Engineer will provide, through a qualified sub-consultant, landscape architecture design services. This includes preparing final landscape and irrigation drawings and specifications based upon the Landscape Concept developed in the Preliminary Design.

Deliverables:

- Graphic exhibits illustrating landscape design

2.3 60% Design – Plans & Speci ications

The 60 percent design will include the preliminary front-end documents, preliminary technical specifications for major equipment items, development of control system strategies, preliminary piping, preliminary equipment lists, and instrumentation lists. Under this task, the conceptual drawings prepared under Preliminary Design will be developed into the 60% Design level. The 60% drawings will include dimensioned piping and equipment drawings; structural and architectural layouts, elevations, and sections; and detailed P&ID schematics, and equipment electrical one-line diagrams, power plans, and lighting plans.

The LNV Team will prepare 60 percent level of completion plans, which will be defined and consist of a level of completion by disciplines as follows:

- Cover/Title Sheet 70%
- Sheet List 90%
- General/Standard Sheets 70%
- Demolition 70%
- Process Mechanical 70%
- Civil 70%
- Structural 70%
- Architectural 70%
- HVAC and Plumbing 60%
- Instrumentation/Control 50%
- Electrical One-Lines 60%

The Team will prepare 60% complete specifications, which will generally include:

- Specification index
- Preliminary front end documents (Division 0)
- General requirements (Division 1)
- Completed equipment specifications
- Preliminary specifications for support disciplines

2.4 100% Pre-final Design - Plans and Specification

The 100% Pre-final Design segment is the continuation of detailing the plans and specifications. Work generally consists of addressing the review comments from the 60% design, completing typical and project details, completing specifications, and completing coordination between civil, process, mechanical, structural, architectural, electrical and control system designers. The Team will prepare 100% level of completion plans.

The Team will prepare 100% complete specifications, which will generally include:

- Revised front end documents (Division 0).
- Revised general requirements of contract (Division 1)
- O&M Manual equipment requirements (Division 1)
- Curricula and O&M training requirements (Division 1)

- Divisions of technical specifications (Division 2 to 48, as needed)

All technical specifications will be prepared in accordance with the guidelines established by the Construction Specifications Institute (CSI) for Divisions 1 to 48.

2.5 FINAL Design – Construction Documents

The intent of the FINAL Design is to assist the City with obtaining Building Permits, industrial exemptions and regulatory approvals from other agencies. The FINAL Design will incorporate the comments received from the City and regulatory agencies, and comments received from the Design Quality Control Committee (DQCC) into a set of Contract Documents. All plans, specifications, and calculations required for the building permit and regulatory submittals will be sealed and signed by a Professional Engineer, Architect, and Landscape Architect, as appropriate, who is registered in the State of Texas. The calculations will include those calculations required for permit review and approval (e.g. structural, plumbing, HVAC, electrical, and drainage). Specifications will be delivered as an 8-1/2" x 11" set and on a CD-ROM in Microsoft Word (version 2007 or as directed by City) and in Adobe PDF. Plans will be submitted as both full size and ½-size and on a CD-ROM in electronic files for the project in AutoCAD R2007, or as directed by City. Upon the receipt of the final comments from City and the regulatory agencies, the Engineer will incorporate the final comments into the construction documents and prepare them for distribution to the City, bidding Contractors, and the Team.

Deliverables:

- Response memos to review comments (60%, 100% and FINAL)
- Sets of Plans (60%, 100% and FINAL)
- Sets of Specifications (60%, 100% and FINAL)
- Construction Cost Estimates (60%, 100% and FINAL)
- Maintenance of Plant Operations (MOPO) (60%, 100% and FINAL)
- Operations and Commissioning Plan (60%, 100% and FINAL)
- One (1) CD of Specifications/Drawings (PDF, Word and CAD files)
- Sealed calculations (incl. process, structural, HVAC, plumbing, and electrical)

3 BIDDING PHASE

This task will consist of assisting the City with conducting a Pre-Bid Conference, preparing the Pre-Bid Conference minutes, responding to bidder questions, preparing addenda, and evaluating the bids, and recommending an award to the Contractor. The City will advertise the bid and distribute the bidding documents (plans, specifications, and addenda) to the interested bidders and suppliers.

3.1 Pre-Bid Conference

Approximately 3 weeks after the notice of bids has been advertised by the City, the LNV Team will assist the City in conducting a Pre-Bid Conference to review the details of the project and solicit questions regarding the Bid Documents. The Team will prepare a draft agenda for City review, address the review comments and finalize the agenda, and document the conference in writing within 5 working days.

Deliverables:

- Meeting Agenda

3.2 Bidding Coordination and Addenda Preparation

The Team will answer City and Contractor questions, develop written responses in the form of Contract Addenda, provide (1) set of any required addenda for distribution to Bidders, and provide overall support to City during the bid advertisement period. The addenda will include, as needed, (1) full size and (1) half-size sets of addenda drawings for distribution by the City to interested Bidders.

Deliverables:

- Contract Addenda as necessary

3.3 Bid Evaluation and Recommendation of Award

The Team will tabulate and review all bids received for compliance with the requirements of the bid documents, including addenda. After consultation with City, the team will prepare a written award recommendation based on this review and knowledge of proposed contractors' and subcontractors' past performance records.

Deliverables:

- Bid Tabulation
- Contract Award Recommendation Letter

4 CONSTRUCTION PHASE

The intent of the Construction Phase is to assist the City in confirming that construction of the Project is carried out in accordance with the requirements of the Contract Documents and the requirements of the City and regulatory agencies, within the project schedule, and with a minimum of disruption to ongoing activities at the facility. The construction Contract Documents are defined as the Agreement between the City and the Contractor, general conditions, supplemental conditions, drawings, standard details, specifications, addenda, approved project schedule, and executed change orders prepared for the construction of the project. The construction services effort will have the goal of facilitating the construction to enable the Work to progress in an efficient and cost-effective manner, while maintaining operations. The anticipated construction duration is **27 months**.

During the construction phase of the project, the following terms will apply:

- In regards to the review of submittals from construction contractors, LNV will review and approve or take other appropriate action upon construction contractor(s)' submittals such as shop drawings, product data and samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents. LNV's action will be taken with such reasonable promptness as to cause no delay in the work while allowing sufficient time in LNV's professional judgment to permit adequate review. Review of such submittals will not be conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities.
- If Engineer is called upon to observe the work of City's construction contractor(s) for the detection of defects or deficiencies in such work, Engineer will not bear any responsibility or liability for such defects or deficiencies or for the failure to so detect. Engineer will not make inspections or reviews of the safety programs or procedures of the construction contractor(s), and will not review their work for the purpose of ensuring their compliance with safety standards.
- Engineer will not assume any responsibility or liability for the performance of construction services, or for the safety of persons and property during construction, or for compliance with federal, state and local statutes, rules, regulations and codes applicable to the conduct of the construction services. Engineer will have no influence over the construction means, methods, techniques, sequences or procedures. Construction safety will remain the sole responsibility of the construction contractor(s).
- All contracts between the City and its construction contractor(s) will contain broad form indemnity and insurance clauses in favor of City and LNV, in a form satisfactory to LNV.

4.1 General Project Administration and Meetings

As the designated Design Consultant for the project, LNV will consult with and advise the City and act as its representative during construction. LNV will serve as the central point of contact for the Contractor. Instructions from the City to the Contractor(s) will be issued through LNV, who will have authority to act on behalf of the City to the extent provided in this Scope of Work, except as otherwise provided in writing. However, LNV will not be responsible for the means, methods, techniques, sequences or procedures of construction selected by the Contractor(s) (except as otherwise specified in the Contract Documents) or the safety precautions and programs incident to the Work of the Contractor(s). Subconsultant personnel and other engineering and architectural disciplines from the design team will also provide a presence on the site through scheduled coordination meetings and inspections to provide quality control and monitoring for conformance with the design intent.

LNV and other Project Team members will conduct specific architectural, electrical, and structural inspections required by governing Codes, prepare applicable documentation and records of such inspections, and certify compliance with design requirements and governing Codes. LNV will accompany visiting inspectors representing public or other agencies having jurisdiction over the Project and will record and report the outcome of these inspections.

LNV or other Project Team members will review factory test reports as required by the Contract Documents and verify that the data reported meets the requirements of the contract documents. LNV will review test reports, whether by the Contractor or the Design Consultant, for compliance with quality

standards and will take appropriate action to obtain additional data if necessary regarding the quality of materials and work in-place.

The efforts of LNV will be directed toward providing a greater degree of confidence for the City that the completed Work of the Contractor conforms to the Contract Documents. However, LNV will not be responsible for the failure of Contractor to perform the Work in accordance with the Contract Documents.

On the basis of onsite examination of materials, equipment, and workmanship, LNV will keep the City informed of the progress of the Work, will endeavor to guard the City against defects and deficiencies in such Work, and may disapprove or reject Work failing to conform to the Contract Documents. This task will include the following items:

- Conduct a pre-construction conference. At the conference, LNV will identify field services to be provided and discuss appropriate coordination procedures. LNV will prepare an agenda for the meeting and will prepare and distribute the meeting notes.
- Provide construction administration, quality control, value engineering support and coordination: LNV will provide construction administration and quality control services during the course of the project to assure that the overall technical correctness of the construction phase services and that specified procedures are being followed and LNV's schedules are being met. LNV will provide coordination functions during the construction phase as follows:
- Hold coordination meetings with the City and Contractor.
- Coordinate with regulatory and approving agencies and utilities as required.
- Coordinate the work of specialty sub-consultants assigned to the project.
- Maintain and provide detailed project records and documentation during the construction phase. Project records will include correspondence, schedules, submittals, test data, project data, payments, change orders, meeting minutes, clarifications, mark-ups of drawings and specifications, and other such documentation. Project records will be delivered to the City's representative upon completion of the construction contract. Records will be maintained at the LNV's office.
- Project Manuals.
- Status reports for the construction contract will be provided.

4.2 Change Orders

LNV will review cost and time estimates for change orders and for Contractor's claims for additional cost or compensation due to differing site conditions, force majeure, material or equipment shortages, or other causes. LNV will also provide an estimate of the additional Design Consultant costs (if any) that would be incurred as a result of the change order.

LNV will evaluate Contractor's claims to determine whether they are justified under the Contract and will review Contractor's proposals for additional compensation, credits, and/or time relating to changes or claims. LNV will make recommendations to the City's Project Manager on the amount of additional

compensation, credit, or time extension due to the Contractor. In addition, LNV will clarify matters and work to resolve discrepancies with the Contractor.

LNV, with other Project Team members, will perform necessary design revisions in connection with change orders to reflect modifications requested by the City, or as required by unforeseen conditions. Coordination of the resulting change order requests and any additional Design Consultant research and design efforts, up to a maximum number of hours as shown in the fee schedule, are included in this scope.

LNV, with input from other Project Team members, will consider and evaluate Contractor's suggestions for changes in the Contract Drawings or Specifications and respond as appropriate or as required by the Contract Documents. LNV will coordinate with the City and provide recommendations pertaining to the suggested design modifications.

LNV, with other Project Team members, will also perform necessary design revisions authorized by the City in connection with change orders to reflect modifications requested by the Contractor and will perform services in evaluating substitutions proposed by Contractor. Coordination of the resulting change order requests and any additional Design Consultant research and design efforts, up to a maximum number of hours as shown in the fee schedule, are included in this scope.

Deliverables:

- Design Recommendations and Revisions as necessary

4.3 Perform Site Visits

In addition to field services described above, LNV and other Project Team members' staffs and/or managers will conduct regular visits to the site (**at least two (2) per month**) to familiarize themselves with the status of work, make spot checks of work-in-progress, verify conformance with the design intent, and conduct detailed coordination of construction issues. Field reports will be kept to document progress and issues. A total of **54 site visits** are anticipated for the duration of construction.

Deliverables:

- Field Reports as necessary

4.4 Review Submittals and Test Results

LNV will receive, log and distribute for review and approval the submittals, shop drawings, samples, test results, operations and maintenance manuals, and other data that Contractor is required to submit. LNV will distribute and file the submittals after review action has been taken. LNV will follow-up to verify that revisions are made and resubmitted as required and will verify that such required submittals are received and approved prior to installation or payment for the materials covered. LNV will also perform a review of the schedule of shop drawing submissions and schedule of values prepared by Contractor and will discuss status of the submittals at construction progress meetings. LNV will be responsible for completing the submittal reviews within 15 business days and for monitoring the status and timeliness of responses.

LNV, with other Project Team members, will review and approve product data, shop drawings, samples, test results, operations and maintenance manuals, and other data that the Contractor is required to

submit. However, such reviews will be conducted only for conformance with the design concept of the Project and compliance with the information given in the Contract Documents. Such review and approval or other action will not extend to means, methods, sequences, techniques or procedures of construction selected by Contractor, or to safety precautions and programs incident thereto.

As part of this task, LNV will maintain a submittal log showing dates of submittal, transmittal action to other sub-consultants, dates of return and review action. Copies of the log will be furnished to the City and the Contractor monthly. LNV will also evaluate the Contractor's request for substitutions. Submittal review efforts are based on a maximum of two (2) reviews per submittal and that no more than fifty percent (50%) of the total number of first submittals will require two (2) reviews. The level of effort for this task is based on receiving 100 shop drawing submittals. Not included in the scope of work for this task is the witnessing of specification compliance testing at manufacturer's factories.

Deliverables:

- Monthly Updated Submittals Log
- Reviewed Submittals with Submittal Status
- Test Data Reviews

4.5 Issue Interpretations and Clarifications

LNV will act as main point of contact for interpretation of the requirements of the Contract Documents and judge of the acceptability of the work based on the requirements shown or specified. LNV will be responsible for responding to Requests for Information (RFI) within 5 business days and for monitoring the status and timeliness of responses.

As part of this task, LNV will maintain a RFI log showing dates of submittal, transmittal action to other sub-consultants, dates of return, and a summary of the response. Copies of the log will be furnished to the City and the Contractor monthly. The level of effort for this task is based on receiving 50 RFIs.

As specified in the General Conditions of the Contracts, LNV will interpret and issue decisions on claims of the Contractor(s) or the City relating to the acceptability of the work or the interpretation of the requirements of the Contract Documents or pertaining to the execution and progress of the work. LNV will also have authority, as the City's representative, to require special inspection or testing of the work.

LNV and other Project Team members will issue interpretations and clarifications of the Contract Documents, as requested by the Contractor(s) or as deemed necessary by the Resident Engineer, to facilitate proper fabrication, construction, or installation of work. LNV will render interpretations or decisions in good faith and in accordance with the requirements of the Contract Documents (e.g., within 10-days).

In the event of a claim or dispute by the Contractor, LNV will interpret the requirements of the Contract Documents and judge the acceptability of the work. LNV will make written recommendations to the City on all claims of the Contractor related to acceptability of the work, or the interpretation of the requirements of the Contract Documents pertaining to the execution and progress of work, or additional work as deemed necessary by the City.

Deliverables:

- Monthly Updated RFI Log
- RFI Responses
- Contractor or City-Requested Change Reviews as necessary
- Contract Document Interpretations and Clarifications as necessary

4.6 Landscape Architecture

The Engineer will provide, through a qualified subconsultant, landscape architecture construction phase services. This includes attendance at three progress meetings, four site visits, plant material review at nurseries, submittal reviews, clarifications and responses to RFIs, punch list reviews, and preparation of record drawings.

Deliverables:

- Field Reports
- RFI Responses
- Reviewed Submittals with Submittal Status

4.7 Substantial Completion/Final Acceptance Inspection

Following notice from the Contractor, LNV and other Project Team members will conduct an inspection to determine if the Project is substantially complete in accordance with the construction documents. If LNV considers the work substantially complete, then LNV will deliver to City and the Contractor a Certificate of Substantial Completion and a list of observed items requiring completion or correction (punch list), date for completion for the punch list, and recommendation for division of responsibilities between the City and the Contractor.

LNV and other Project Team members will conduct a final inspection to determine if the finished Work has been completed to the standard required by the Contract Documents and that Contractor has fulfilled its obligations as required. This inspection will be based on the punch list and any other functional or operational deficiencies that occur in the time period between when the punch list is generated and the Final Inspection. A final list of items to be completed or corrected in accordance with the requirements of the construction documents will be prepared and submitted to the Contractor.

After the Contractor has completed the work of the final punch list and upon written notice from the Contractor, LNV will review and determine that items on the final list have been completed or corrected and make recommendations to the City concerning acceptance and final payment.

Deliverables:

- Substantial Completion Recommendation
- Substantial Completion Punch List
- Final Completion Recommendation

- Final Completion Punch List

4.8 Record Drawings

LNV and the project team will prepare and deliver to the City record drawings of the constructed work both in hard copy and complete electronic files for the project in AutoCAD and PDF. Record drawing information will be obtained from redlined drawings prepared by the Contractor.

Deliverables:

- 1 full-size sets of drawings
- 1 ½-size sets of drawings
- 1 CD of drawings in AutoCAD and PDF format

ADDITIONAL SERVICES (ALLOWANCE)

1 PERMITTING & AGENCY COORDINATION (AUTHORIZED)

1.1 Building Permit/ Industrial Exemption Affidavit

The Engineer will prepare building permits and/or industrial exemption applications, make Final Design submittals to the City Development Services Department, and respond to comments received from the Department until the exemptions/building permits are approved. The actual cost of the permit(s) will be paid by the City and/or Contractor and the permit will be obtained by the Contractor prior to the start of construction.

Deliverables:

- Building Permit Applications or Exemptions
- Response Documents to City Comments

1.2 General Agency Coordination

Engineer will provide coordination with the personnel at the governing State/Federal agencies to seek approval needed to construct and operate the High Service No. 3 improvements. This will involve correspondence with TCEQ during the preliminary design and design phases to work toward their timely approval of the proposed process improvements and/or modifications and to maintain compliance with the City's CT Study, Monitoring Plan, Monthly Operating Report and ACR Exception. The Engineer will provide backup documentation, clarifications, answers as requested by the permitting agencies. The Engineer will provide technical assistance to the City when such support is necessary to coordinate meetings and materials required for the Project.

The City will take the lead for permit coordination with all governing agencies except for the permits indicated below. The Engineer will provide technical assistance to City when such support is necessary to coordinate and reconcile permitting requirements for the proposed project. The anticipated major coordination and permitting activities are listed in the tabulation below in terms of the project stakeholders involved and the project components requiring coordination. The actual cost of the permit(s) will be paid by the City.

Table 3 Permitting Coordination

Stakeholder	Project Component(s)	Lead
Design Review Board (Scope is based on approval of the concept at the staff level).	Building Architecture	LNV City
Planning and Development Services Department	Building Permits	LNV City
Water Dept, Fire Department	Hazardous Materials Management Plan (HMMP), Site Plan Building Permit	LNV City
Texas Commission on Environmental Quality (TCEQ)	Review & Decommissioning (Approval to Construct and Approval of Construction)	LNV CDM Smith
Texas Commission on Environmental Quality (TCEQ)	CT Study, Monitoring Plan, Monthly Operating Report, ACR Exception Compliance and Review and Evaluation	LNV CDM Smith

This task will also include agency coordination meetings to be attended and conducted by the Engineer or the City. These meetings will discuss the project components outlined above and will include the stakeholders listed above (City – 4 meetings, County/State – 4 meetings, and Private – 2 meetings). This task assumes that the total number of meetings will not exceed 10 two hour meetings

Deliverables:

- Agency Meeting Minutes
- Meeting Exhibits
- CT, MP and MOR submittals to TCEQ
- Response Documents to TCEQ Comments

2 TOPOGRAPHIC SURVEY (AUTHORIZED)

2.1 Site Survey

The Engineer shall provide a site survey of the entire project limits. This will consist of the High Service Pump Building No. 3 site, which includes approximately 21 acres of developed land with paving and existing structures, and 12 acres of undeveloped land. The Surveyor will perform a boundary and topographic survey of the sites, identify all setbacks, easements, rights-of-way, major features and structures at the plant and tie all survey work to the plant's existing horizontal and vertical coordinate system. Contours will be provided for every foot of elevation change, and results of this task will be presented in AutoCAD drawings which can be used as civil backgrounds. The total area to be surveyed is approximately 32 acres.

In addition, the Surveyor will set two (2) permanent horizontal control points/benchmarks on the site that will be used for the entire Phase 2 design and construction work.

Deliverables:

- AutoCAD files with all spot elevations and 1 foot contours
- Two permanent survey control markers

2.2 Subsurface Utility Engineering (SUE)

The A/E shall perform engineering services which will result in accurately identifying the location of subsurface utilities, and for acquiring and managing that level of information during the development of the project. These services shall conform to standards and guidelines as described in FHWA and ASCE Subsurface Utility Engineering publications. The final work shall be completed such that all known utilities with potential conflicts are graphically depicted in both a digital and hard copy / plan sheet format.

As the design progresses and when necessary, the A/E may be required to locate utilities that have a high potential for conflicts with the proposed improvements. For the purpose of this agreement, "locate" means to obtain precise horizontal and vertical position of the utility line by excavating a test hole. The test holes shall be done using vacuum excavation or comparable nondestructive equipment in a manner as to cause no damage to the utility line. After excavating a test hole, the A/E shall perform a field survey to determine the exact location and position of the utility line. This work is considered quality level A.

The SUE tasks shall include –

Develop a test hole Location Plan based upon the guidelines set forth in the document: Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data, published by the ASCE, current edition, and obtain utility company records as required.

1. Neatly cut and remove existing pavement with the cut area not to exceed 144 square inches. Excavate using a method enabling vertical and horizontal exploration through this cut.
2. Excavate test holes in such a manner as to prevent any damage to wrappings, coatings, or other protective coverings, such as vacuum excavation or hand digging.
3. Backfill with approved material around utility structure.
4. Furnish, install, and color code a permanent above ground marker (i.e. P.K. nail, peg, steel pin, or hub) directly above the centerline of the structure and record the elevation of the marker.
5. Provide a permanent restoration of the pavement within the limits of the original cut at the time of backfill. If the test hole is excavated in an area other than the roadway pavement, the area disturbed shall be restored to equal or better than the condition before excavation.
6. Identify utility locations in digital and reproducible certified plan sheet format. At a minimum, the A/E shall provide the following test hole information:
    - Elevation of top and/or bottom of utility tied to datum of the furnished plan.
    - Elevation of existing grade over utility test hole.

- Horizontal location referenced to project coordinate datum. The A/E shall perform all required survey work.
- Outside diameter of pipe or width of duct banks and configuration of non-encased multi-conduit systems.
- Utility structure material compositions and condition.
- Identification of benchmarks used to determine elevations.
- Elevations shall have an accuracy of +/- 0.1-ft and certified accurate to the benchmarks used to determine elevations.
- Horizontal data accurate to within +/- 0.2 ft or applicable survey standards, whichever is more precise.

Provide the above SUE services **(up to 120 field crew hrs)**, including hydro-excavator and operating crew, as required by the contract documents and/or as requested by the City.

3 ENVIRONMENTAL ISSUES (AUTHORIZED)

- Provide Phase 1 Environmental Site Assessment (ESA) and Archeology Reports in order to identify areas posing a risk of requiring action/remediation, extending the schedule, and/or exceeding the budget.
- The ESA identifies areas likely exposed to a release of a hazardous material or petroleum product in the past or present, or at risk of being exposed to a release in the near future. A release could be into a structure on the property or into the ground, groundwater, or surface water on the property.
- A typical Phase 1 ESA consists of a visual site inspection, inspection of property records, and State and Federal database research.
- Identify and develop a scope of work for any testing, handling, and disposal of hazardous material and/or contaminated soils that may be discovered or disturbed during construction.
- Provide inspection and testing services for hazardous materials directly related to High Service No. 1. This will be conducted prior to the demolition of High Service No. 1 in order to determine what, if any, precautions are necessary while demolishing the existing building and equipment. The inspection will include specific and methodical sampling and testing of the components that will be demolished in this project (Pumps, motors, valves, piping, floor and wall connections, etc.). The results of the testing will be used to develop a mitigation plan and recommendations as to the best way to proceed with the demolition and classify materials for proper disposal.

Deliverables:

- Phase 1 ESA and Archeological Report

- High Service No. 1 Hazardous Materials Inspection Report
- Test Results

4 CONSTRUCTION OBSERVATION SERVICES (TBD)

Provide construction observation services as described in Exhibit A

5 START-UP & TRAINING SERVICES

5.1 Facilities Start-Up

LNV and other Project Team members will provide start-up services sufficient to transfer finished work from a construction status to an operating, functional system(s). Such services may include review of Contractor's start-up plan, preparation and coordination of a start-up plan and procedures for City personnel to use, observation and monitoring during start-up procedures, and assistance to City personnel during a period of initial operation (commissioning). The commissioning services will provide SCADA system installation inspection services and attend and lead FAT and SAT (IV&V) testing for SCADA systems. Having the engineer perform the factory acceptance testing and the site acceptance testing, as well as providing detailed construction inspection services provide additional quality assurance for the plant and help to ensure that the final product will meet all of the owner's expectations.

LNV will coordinate with the Contractor and City in advance of scheduled major systems tests or start of important phases of the work. LNV will validate that the testing program submitted by the Contractor is in conformance with the Contract Documents and will adequately assure that the system(s) will respond properly during normal operations and anticipated unusual conditions. LNV will observe conduct of testing and startup and will verify that the approved testing program is followed and the reports provided are accurate and complete.

LNV and other Project Team members will review the Contractor's training plan and instruction materials for compliance with Contract Documents. Contractor or Manufacturer training presentations will be scheduled and coordinated with City personnel and facility operation.

Start-up services budget shall be based on providing a Project Engineer (as needed, up to 4 weeks @ 40 hrs/wk), Process Specialist (as needed, up to 3 weeks @ 40 hrs/wk), Electrical Engineer (as needed, up to 2 weeks @ 40 hrs/wk), and an Instrumentation & Controls Engineer (as needed, up to 2 weeks @ 40 hrs/wk) during facilities start-up.

5.2 Training Support

To supplement the training from the Contractors and Manufacturers, LNV and other Project Team members will also provide training support to plant operating personnel on the project objectives, design intent, and system operational procedures. A total of 4 training support sessions that will last approximately 4 hours are planned. The training will be both classroom and hands-on and is intended to

supplement the information presented in the O&M Manual. Training support budget is limited to a total of **48 hours.**

Deliverables:

- Review Comments on Contractor or Manufacturer Training Outlines and Lesson Plans
- Outlines and Lesson Plans for Training of Operations and Maintenance Staff

5.3 Factory Witness Testing

Provide specialty engineer to witness factory testing of the special equipment as required by the contract documents. Provide the services of Engineer's staff and other team members **(as needed, up to 26 hrs)** as required by the contract documents and as requested by the City.

6 WARRANTY PHASE

LNV and other Project Team members will provide services after completion of the construction phase, such as inspections during the 12-month warranty period, reporting observed discrepancies under guarantees called for in the construction documents, and provide assistance for resolution of defects to be corrected under warranty. The correction of any defects observed in the inspections is the responsibility of the Contractor and their subcontractors and suppliers. This scope assumes that such services may be required for up to **140 hours per 12-month** warranty periods.

Deliverables:

- Correspondence with Contractor and equipment manufacturers
- Reports on warranty inspections

7 SCADA & EQUIPMENT O&M DOCUMENTATION (OPTIONAL)

The Engineering Consulting services to be provided under this stage of work will include services related to the SCADA system and the preparation of an operations and maintenance manual for the High Service Pump Building No. 3 improvements.

7.1 SCADA Documentation and Equipment O&M Documentation

Provide standardized SCADA documentation, which will include PFDs, P&IDs, loop sheets, logics, SCADA architecture, DCS I/O lists, instrument lists, tie-in lists, piping lists, equipment lists, and instrumentation specification sheets. The construction documents will include the requirements within the Construction Contract and specifications that the Contractor is to prepare SCADA documents as specified, for submission to the A/E for review and approval. A/E will provide the final SCADA documentation to City in organized format when approved.

Prepare an Equipment Operation and Maintenance Manual for submittal to the City. Incorporate review comments from the City, ONSWTP operations personnel and Program Manager and develop a FINAL Equipment O&M Manual.

8 PUBLIC INVOLVEMENT (N/A)

9 ELECTRONIC OPERATIONS AND MAINTENANCE MANUAL (TBD)

To date the extent of the operations and maintenance documentation for the ONSWTP has been limited to an existing operations manual and individual equipment manuals. While these documents are sufficient to guide the operations and maintenance of the equipment and systems at the facility, the City has indicated a desire to compile a comprehensive plant Operations and Maintenance (O&M) manual that would bring together the information required to operate and maintain the overall facility. The major objective is to provide operations and maintenance staff with quick access to the information that is essential to performing their jobs. The Engineer, in this contract, will only provide the electronic O&M Manual for the ONSWTP High Service Pumping System (HSPS) which can be incorporated into a comprehensive plant O&M Manual.

With today's technology, LNV does not believe that an O&M manual should be a static document that is stored on a shelf, but rather should be an interactive web-based tool providing nearly instantaneous access to the stores of information that should be available to the operators. The LNV approach to developing electronic O&M manuals in the most efficient way is to focus on five fundamental issues:

- Making sure the content is correct and current.
- Developing good interface aesthetics and graphics to provide a pleasing user experience.
- Making the manual usable through attention to proper organization and coherent navigation.
- Providing a system that can be easily modified and/or expanded.
- Making technology decisions that allow for integration of new technologies, without an excessive technology-maintenance burden on the City.

Beyond any other consideration, the content must be correct and focused on what the O&M staff needs to know. The electronic O&M manual format provides the opportunity to keep write-ups on procedures, control descriptions, etc. short and to the point (a fundamental in any web page design as well as in a successful O&M manual). Yet deeper levels of detail can be provided through links in the documents to allow the user to research a problem to its fullest extent, if necessary, for the task at hand.

A key to the success of an O&M manual project, in whatever format, is the involvement of the end users. O&M staff at the facility must be provided the opportunity to contribute to the development process in a way that doesn't increase their workload, but does allow meaningful contributions. LNV will work directly with the users in developing and verifying our O&M manual content. The on-line format allows for immediate feedback as the content is being developed – it is published on-line, as it is developed (after our internal QC check), at which time users on all shifts may review and comment directly to the authors. This allows updates to be made the next day in some cases.

Deliverables:

- Draft submittal of HSPS O&M manual content shell and format for City review and approval
- Draft HSPS O&M manual in electronic format for City review and approval

- 1 paper copy of the Draft HSPS O&M manual for City review and approval
- 1 presentation to City on Draft HSPS O&M manual
- Final HSPS O&M manual in electronic format
- 1 paper copy of the Final HSPS O&M manual
- 1 presentation to City on Final HSPS O&M manual

9.1 Organize Electronic Format and Security

LNV will work with the City operations and IT staff to determine the best approach to the electronic format and security access issues. LNV will develop a content shell for review by the City prior to installing the content. This task will include coordination with the City's systems integrator, security coordinator, and technical staff as well as the end users. LNV will organize the electronic O&M manual format to address the user's needs in six areas:

- Content
- Aesthetics
- Usability/Features
- Information Maintenance/Expansion
- Technology/Implementation
- Information Security

The site will be designed with the following basic layout:

- Functional navigation buttons (help, search, feedback) at the very top of the site.
- Topical navigation menu on the left side of the screen. An expanding tree menu system will be used to organize content by process area and topic.

The look and feel of the site will be managed using cascading style sheets to make it easy to modify aesthetics across the site. The O&M manual will be developed as a web site, suitable for access using a web browser from a CD, LAN, intranet, or Internet connection. The documents will be in HTML format with supporting graphics in formats described below.

The following hardware and software will be used to access/host the O&M manual. Existing City hardware and software will be utilized as much as possible. Any additional equipment or software will be included in the Contract Documents and will be furnished by the Contractor.

- Microsoft Internet Explorer with Java and JavaScript enabled
- Internet Information Server
- 27" monitor with 1200 x 1080 resolution

9.2 Compile Background Information

LNV will research and inventory the historical information and documents that exist for the ONSWTP HSPS by examining the records found at the site and from the central City office files. In addition, LNV will assemble the large quantity of reports and drawings gained from City through previous project work on the Preliminary Design. The information to be researched and inventoried will include the following types of documents relating to the ONSWTP:

- Original Equipment Manufacturer Manuals
- Design Reports
- Construction Drawings and Specifications
- Regulatory Applications and Approvals
- Materials Safety and Data Sheets
- Written Facility and City Policies

LNV will compile these documents and coordinate the copying or transfer of the information into the appropriate electronic format.

After a review of the design drawings and specifications, manufacturer's manuals, and existing HSPS data systems (CMMS, etc.), an inventory of the HSPS equipment will be conducted in which nameplate information will be collected for major pieces of equipment. That information will be used in the Design Phase.

9.2.1 Standard Process-Level Content Sections

The O&M manual content will be developed with several standard sections. The purpose and format for those standard sections are described here. Each of these sections will be presented as topics within a given HSPS. Any section that is lengthy will be provided with an index at the top of the page to allow jumping directly to sections within the page.

9.2.1.1 Opening Page

HSPS will open with a file that contains the name of the process area and a schematic showing an overview of the area.

9.2.1.2 Overview

The Overview section will provide a brief (2 pages maximum) description of the HSPS including the HSPS objectives and brief descriptions of how those objectives are accomplished and components used in the area. Schematic diagrams of the area will accompany the description. Each Overview will contain the following headings:

- Purpose & Objectives.
- HSPS Fundamentals and General Description.
- Sub-Systems.
- Relations to Other Systems or Processes.

9.2.1.3 Theory

The Theory section is used to briefly describe HSPS theory (where applicable) and specific application of that theory to this HSPS. The section includes sample calculations.

9.2.1.4 Design

The Design section presents design criteria for the HSPS. This section presents process-level design criteria and major equipment design characteristics; equipment data are provided in the Components section. The criteria will be presented in two-column tabular format, with the HSPS parameter in the left column and the design value in the right. When the design criteria are longer than a single screen, an index will be provided at the top of the page to sections in the page.

9.2.1.5 Control

The Control section presents a description of typical modes of control and control strategies for the major control loops in the HSPS. The strategies will include interlocks, permissives, and alarms. Specific operating procedures are given in the Procedures page. For each meter, gauge, and other analytical equipment, ranges and set points will be displayed. A screen shot of each control panel will also be included, with callouts for major items on the panel along with a description of those items.

9.2.1.6 Procedures

Standard operating procedures (SOPs) will be developed with the following sections:

- General Overview.
- Normal Operation.
- Abnormal Operation.
- Emergency Operation.

9.2.1.7 Safety

This section will include safety information specific to the HSPS, including descriptions of area-specific hazards and precautions. Each HSPS-Specific safety section will contain the following headings:

- Hazardous Materials
- MSDS Links
- Personal Protective Equipment Requirements
- Confined Spaces
- Fire System (extinguisher locations, sprinkler systems, hydrant locations)

The section will also contain an area-map locating safety-related items (chemical locations, fire extinguishers, fire hydrants, emergency eye wash, etc.)

9.2.1.8 Drawings

The Drawings section provides a listing of all CAD drawings pertinent to the HSPS. The summary list will indicate Drawing ID, Title and Discipline. The list will also provide links to view details about the drawing or to view the drawing itself.

9.2.1.9 Components

The Components section provides a listing of all major equipment components within this HSPS. Information will be presented in a tabular format and include the following columns:

- Name - The common name for the component
- Equipment Number - The component ID tag as specified on the design drawings
- Characteristics - The characteristic size, capacity, etc. for the component
- Function - A brief description of the component's function in the process

Each equipment number will be a link to a detailed report for each component, which will include basic equipment data (manufacturer, model, etc.) as well as lists of photos, design drawings, manufacturer manuals, and recommended routine maintenance. The equipment data will be developed from an inventory of all of the equipment in the HSPS.

9.2.1.10 Troubleshooting

The Troubleshooting section presents, in a tabular format, typical problems, possible causes, and remedies for HSPS-level problems. The table will include the following columns:

- Symptom
- Possible Cause
- Remedy

9.2.1.11 Alarms

The Alarm Response section will be similar to the troubleshooting guide both in scope and organization. Alarm summaries will be listed first by the alarm name followed by the numerical designation. Following this information will be a list of possible causes and suggested responses. The set of causes and responses will be listed like a troubleshooting guide, organized to present the most obvious cause of the alarm first and the least likely cause of the alarm last.

9.2.1.12 Routine Maintenance

The Routine Maintenance guide will identify the maintenance tasks recommended by the manufacturer to be performed for each piece of equipment. They will be organized in the database and presented in the detailed report for each piece of equipment.

9.2.2 Facility-Wide Reference Sections

As part of the on-line system LNV will also develop non-specific information areas that will assist in the overall management and operation of the HSPS. These areas are listed below.

9.2.2.1 Home Page

The Home Page will be a map of the HSPS with links to treatment units.

9.2.2.2 Directives

This page will be used by the Senior Operators to post operational directives for other operators. These directives will include:

- Operating set points.
- Equipment Out of Service.
- Shift Schedules.

It is anticipated that the page content will be updated on up to a daily basis.

9.2.2.3 Regulatory Documentation & Reports

Links to PDF versions of the major facility regulatory documentation and reports are provided here. These include Storm Water Pollution Prevention, Spill Prevention, Control and Countermeasure, CT Study, Monitoring Plan, Monthly Operating Report.

9.2.2.4 Drawings

This section allows users to search and display PDF Record drawings related to the plant.

9.2.2.5 MSDS

This section allows users to search and display lists of Materials Safety and Data Sheets and to review the resulting MSDS.

9.2.2.6 Manufacturers O&M Manuals

This section allows users to search the database of scanned manufacturer manuals, and view the resulting PDF files (where available).

9.2.2.7 Help/About

This will be a help file that describes how to use the manual

10 CONFORMED CONTRACT DOCUMENTS (TBD)

The Team will incorporate the addenda changes into the plans and specifications to provide conformed Contract documents. All drawings will be stamped conformed. Half-scale plans will be provided with laminated covers bound with either GBC comb or spiral binders.

Deliverables:

- Contract Addenda as necessary
- Pre-Bid Meeting Agenda, Presentation, and Meeting Minutes for Addenda

- Bid Tabulation
- Contract Award Recommendation Letter
- Conformed Plans and Specifications
- 3 copies of the Conformed Plans and Specifications (half-scale plans)
- CD in electronic character recognition Adobe PDF and Word 2007 format

11 EXISTING FACILITIES CONDITION ASSESSMENT (TBD)

The Engineer will evaluate the condition and treatment reliability of the existing facilities at the ONSWTP to define the condition of the existing structures and equipment that will remain in service after the High Service No. 3 improvements are complete. The purpose of the condition assessment is to evaluate the suitability of the existing structures to provide up to XX years of reliable service and equipment to provide up to XX years of reliable service. Engineer will make appropriate recommendations for improvements to achieve the XX and XX year goals. Table 4 presents the processes, structures, and equipment that will be evaluated.

Table 4 Condition Assessment - Structures & Equipment

High Service No. 2	Building, Equipment, Controls, etc.
Clearwell No. 2	Structure
Yard Piping Including Valves	Connectivity, Condition, Age, Operability
Electrical Infrastructure	MCCs, PCRs, VFDs, Alternate Power
Instrumentation	Flows, Pressures, Vibration, Temperature Chlorine, and Ammonia

As the design and construction tasks that may result from the condition assessment cannot be defined exactly at this time, they are excluded from this scope of work. The Engineer must have authorization from the City to proceed with such design and construction tasks.

Deliverables:

- Condition Assessment PDR

12 WINDSTORM CERTIFICATION (AUTHORIZED)

Engineer will perform Windstorm calculations, inspections, and provide certification for the following structures:

1. High Service Pump Building No. 3 & Electrical Room
2. Alternate Power Building Extension and Fuel Storage
3. Cable Tray Supports

- Prepare WPI-1 form in accordance with the requirements of the Texas Department of Insurance (TDI) for Windstorm for the each of the New Structures; including foundations.
- Review design calculations for new building structures and foundations to insure design is in accordance with the International Building Code 2003/2006 and Texas Dept. of Insurance for Windstorm compliance.
- Perform wind pressure calculations in accordance with the International Building Code 2003/2006 for all building envelopes to insure all component and cladding elements meet or exceed the requirements of TDI for Windstorm.
- Review all necessary submittals for foundation reinforcing, wall and floor framing, windows/frames/anchoring, doors/frames/anchoring, louvers/frames/anchoring and roofing for compliance with TDI. Initial submittal review and one (1) re-submittal review is included in this contract. Additional review of re-submittal's will be performed at an hourly rate of $150.00.
- Perform necessary inspections during the entire construction process for all buildings and their respective foundation systems as required to visually verify that all foundation reinforcing, anchorage, primary and secondary framing, connections, sheathing installation, doors, windows and louvers are all constructed as designed. Additional re-inspections will be performed at an hourly rate of $150.00.
- Submit WPI-2 –BC-5 forms upon completion of construction to receive the WPI-8 Windstorm Certificate.

Windstorm Certification Requirements:

The Contractor/Owner shall be responsible for providing all necessary Design / Assembly Documentation for all windows, doors, louvers...etc. to the Windstorm Engineer / Inspector as required to conform to the requirements of the Texas Department of Insurance. All windows, doors, louvers...etc., at a minimum, shall meet all positive (inward) and negative (outward) wind pressures for "Components and Cladding" in accordance with the International Building Code 2006 (IBC 2006 with latest Texas Revisions) as calculated by Texas Registered Professional Engineer for the specific project. All Custom-Built Doors / Windows must be tested for the appropriate wind design pressures with a certified facility as approved by the Texas Dept. of Insurance prior to receiving any certification.

13 PEER REVIEW COORDINATION AND RESPONSE

Anticipated effort is based on providing these services over the course of the **20 month** preliminary design/design periods consisting of 12 workshops and 5 preliminary and design submittals.

- The City has retained the services of Peer Review Team to review Project Deliverables and provide comments to City and Engineer. Engineer will respond to standard review comments from the City's Peer Review Team. Design revisions based upon Peer Review Comments are not included in this Scope.
- Participate as directed by the City in Peer Review of the project with the City and a Peer Review Team, a separate dedicated engineering team for peer review that is contracted by the City.

14 HIGH SERVICE PUMPING SYSTEM ENERGY AUDIT & ENERGY CONSERVATION EVALUATION (TBD)

Energy represents the largest controllable cost of providing water services to the public. Many facilities were designed and built without energy costs as a major concern. With large pumps, drives, motors, and other equipment operating 24 hours a day, water utilities can account for some of the largest individual energy expenses incurred by a local community.

At a time when many communities are striving to reduce operating costs and greenhouse gas emissions, an energy audit can provide the tools and resources necessary to help eliminate energy waste and lower operating costs of wastewater utilities. A review or thorough study of a facility's energy performance will identify areas for operational improvements and cost savings such as labor, chemicals, maintenance, and disposal costs. A thorough energy assessment may alert managers to other issues that can be identified and explored for further energy reduction measures. An unexplained increase in energy consumption discovered through a utility bill analysis may be indicative of equipment failure, an obstruction, or other problems associated with facility operation that may have not been exposed otherwise.

A water facility energy audit by LNV allows the facility owner to discover ways to save money by improving the energy efficiency of current operations. LNV will examine controls systems and high service pumping to offer recommendations for operational improvements. Typically these may include variable frequency drives for speed control, SCADA control systems, pumping operations, scheduling, building-related inefficiencies, and other upgrades to help your facility use less energy.

As part of the energy audit, LNV will provide a High Service Pumping System energy analysis and strategic operating plan offering recommendations for retrofitting, replacement, and energy conservation opportunities. The plan contains a financial payback analysis, including estimated annual savings, estimated cost to implement, simple payback, and a savings-to-investment ratio (SIR) for each recommendation. This allows the owner an opportunity to prioritize energy efficiency measures according to your capital budget and allows you to forecast for future capital expenditures.

LNV will provide the City with a strategic commercial energy management plan which prioritizes the most cost-effective recommendations for energy savings. The plan includes:

- A comprehensive list of recommended energy investments with the best paybacks and savings to investment ratios
- A detailed list of low-cost opportunities for energy savings
- Recommendations for energy improvements that could be implemented with the High Service No. 3 construction
- Current and projected energy use
- Annual electric consumption/costs
- A comprehensive analysis of existing energy inefficiencies
- A list of potential energy rebates, incentives, grants, and other funding opportunities
- Renewable energy opportunities and feasibility
- Energy management strategies and how they can be implemented
- Inventory and description of existing conditions

14.1 Elements of the Audit Report

LNV will prepare an Energy Audit Report that incorporates each of the following elements:

14.1.1 Historic Energy Consumption

1. Compile energy usage and costs for the High Service Pumping System for the twelve months prior to the audit including kW, kWh, BTUs, therms, etc. and shall include billing meter readings that corroborate usage.
2. Identify the utility rate schedule under which services are provided to each meter.
3. Enter the required building and utility data into the U.S. Environmental Protection Agency's (EPA) Portfolio Manager energy benchmarking system for comparable water energy performance.

14.1.2 High Service Pump Building or Measure Description:

Characterize facility usage and occupancy profiles, size, construction features including an assessment of the building envelope (windows, doors, insulation, etc.) and pump equipment description and operations.

14.1.3 Equipment List:

Provide a detailed inventory of equipment, which contains pertinent information for all energy consuming equipment including estimate of equipment efficiency and remaining useful life. For example, for pumping and controls (i.e. VFDs, actuated valves, etc.), provide power ratings, manufacturer-claimed efficiencies, power consumption and current energy costs per pump.

14.1.4 Energy Conservation Measures:

Provide a narrative summary for each energy conservation measure recommended. For example, for lighting recommendations, for each area of each building, provide proposed fixture type, proposed lamp type, proposed lamp count, proposed ballast type, total watts per proposed fixture, projected energy savings per room, projected energy cost savings per room and before and after lighting levels. Similar detail will be provided for other measures. Clearly document the key assumptions made in analyzing each measure and describe the method of analysis.

The Energy Audit and Analysis Fee includes:

- Preliminary engineering consulting services to provide the City with the preliminary scope of work, estimated installed cost, estimated annual kWh production and resultant energy savings, and a financial analysis including all available incentives.
- (2) Bound color copies of the Feasibility Analysis
- Electronic Copy on disk
- (4) Engineering site visits
- Client consultation
- Presentation of Energy Assessment

14.1.5 Limitations

1. LNV, Inc. will rely on the accuracy of any information submitted to us by the City in the performance of our services, and will not be held responsible for errors or inaccuracies contained in information provided to us.
2. Detailed Pump Station energy simulations will not be performed. The study will employ techniques that rely on historical information compiled over the years from similar facilities. Individual Pump Station performance will not be modeled in great detail. Rather, Pump Station type, size and occupancy will be used to form a rough calculation model of the Pump Station (or specific equipment) energy usage for use in determining the estimated results of energy conservation measures. Likewise, construction costs will also be based on historic data compiled from similar installations, and engineering opinion.

Deliverables:

- Draft and Final Feasibility Analysis

15 PHYSICAL LABORATORY SCALE HYDRAULIC MODELING STUDY (TBD)

Conduct a physical hydraulic modeling study for proposed pump station design. The hydraulic modeling study will construct a laboratory scale model to simulate the pump station and piping system, evaluate proposed piping and pump station layout to identify abnormal flow conditions, and recommend

improvements. The other objective of the study will be to evaluate piping design alternatives for cost savings if desired by the City. The laboratory scale hydraulic modeling study will be performed upon completion of 30% preliminary design based on City-selected design option.

Deliverables:

- Final Physical Laboratory Scale hydraulic Modeling Study Report.

16 DISINFECTION CT EVALUATION (TBD)

Review current disinfection CT report and perform a disinfection CT evaluation based on proposed HSPS No. 3, Clearwell No. 3, and piping improvements and disinfection application point modifications. Determine disinfection CT deficiency as a result of increased treatment capacity and recommend improvement options for implementation in a separate project. Modify current CT report to reflect revised disinfection zones and associated detention times to obtain disinfection credit. Coordinate with TCEQ and submit revised CT study report. The disinfection CT evaluation will be performed in the final design phase of the project and will be coordinated with the Clearwell No. 3 project.

Deliverables:

- TCEQ-approved CT Study.

17 PLANT PROCESS AND HYDRAULIC EVALUATION (TBD)

Assess the hydraulic and process ratings for the plant and identify any regulatory, operations, or capital improvement requirements to treat increased production capacity of 178 MGD to meet ACR requirements by year 2025 and the 200 MGD plant re-rating goal. Review TCEQ design standard for each process units including coagulation, flocculation, sedimentation, filtration, chemical system and solids residual handling process (The raw water pump station and raw water delivery system are currently being evaluated under a different project). Interconnection piping and pumping system between the process units will be reviewed also to identify any hydraulic limitation for increased capacity. Review the hydraulic profiles for the plant and identify hydraulic bottlenecks at a higher plant capacity. Develop strategies to achieve a higher plant rating. Prepare technical memorandum to summarize the evaluation results.

Deliverables:

- Technical Memorandum

18 ELECTRICAL STUDIES (AUTHORIZED)

Provide study for High Service Pumping System and Alternate Power electrical short circuit prevention, coordination study, and motor starting study for medium voltage service. These studies are

recommended to develop detailed relay protection schemes to protect the distribution system while managing Arc Flash and fault current hazards. These studies are important to maintain the safe and reliable operation of the plant, as well as minimizing plant down time.

Deliverables:

- Technical Memorandum

19 CONTROL LOGIC & APPLICATION DEVELOPMENT (AUTHORIZED)

Assist the City with defining and documenting the User Requirements Specifications (URS) for the control system. Control Logic and Application Development is a necessary step in designing, writing, and implementing the proper control logic. This task also insures that the control logic and applications meet the owner's expectations and requirements and that the components function properly before being integrated into the rest of the system.

- Provide engineering services required to develop and document the Detailed Functional Specification (DFS) based on URS.
- Provide engineering services required to develop and document the control system's Sequence of Operation (SOO) based on DFS.
- Provide engineering services required to coordinate the integrators development of the Human Machine Interface (HMI) graphics for the operator work stations.
- Provide engineering services required to coordinate the integrators programming of the specified PLC platform according to the SOO.
- Provide engineering services to coordinate the integrators verification and demonstrate to the City that the PLC and HMI operator workstation function as designed prior to installation in field.

Deliverables:

- Technical Memorandum (for each task)

20 CONTROL SYSTEM INTEGRATION (AUTHORIZED)

Provide engineering services to determine and specify all control system configuration parameters such as PID parameters, set points, and alarm levels required to achieve correct operation, alarming, emergency notification, and response associated with the automated control system. Engineer will include parameters for new pumps and equipment as well as modification to control system parameters for existing equipment. Provide engineering services to oversee integration of the new PLC panel into the existing SCADA system. Configure Historical server, integrate HMI screens into existing system-wide HMI. Verify and demonstrate to Owner stability of the new, integrated system. This task is

subsequent to the Control Logic and Application Development. After the logic and applications have been developed the operating parameters will be programmed into the logic. The applications will then be integrated into the existing system and the pertinent equipment. Once integrated, the systems will be tested for proper functionality.

21 PROJECT MANUAL (AUTHORIZED)

Provide a complete Project Manual that will serve as a communication tool and work plan. The Project Manual will be a living document that will evolve throughout the life of the project. The Project Manual will include, at a minimum, the following elements:

- Project specific summary and background information
- A list of key stakeholders and their responsibilities
- A discussion of the project parameters
- Project Schedule
- Project Budget
- Key Success Factors
- Key Risk Factors including a Comprehensive Risk Management Strategy
- QA/QC program and strategy
- Communication Plan

Under this task, the Engineer will prepare a Project Manual (PM) that will be distributed to all project team members. The Manual will be prepared by LNV's Project Manager and will contain the scope of work, project directory, communication protocols, schedule, budget, calendar, standards, and Quality Assurance/Quality Control procedures for the project. The PM will document the plan to achieve timely project delivery, encourage the consistent application of cost control strategies, and devote the utmost attention to quality control. The Project Manual will be developed and maintained throughout the life cycle of the project. This comprehensive document shall continuously evolve and govern all project activities in order to enable the Owner to demonstrate, at any time and to any stakeholder, that the project fits into the Owner's mission and clearly contributes to achieving the Owner's strategic objectives. The Project Manual will also ensure that the project is planned and managed appropriately to limit risk and efficiently produce the desired outcome.

Deliverables:

- Approved Project Manual

22 PROGRAM MANAGEMENT & PROJECTS COORDINATION

The A/E shall attend additional Program Management and project coordination meetings as needed. The additional coordination services shall be provided as needed (Project Manager up to 400 hrs).

These services will be provided for the purpose of coordinating the efforts of the various related Water System projects with this High Service Pump Building No. 3 project. The A/E will coordinate with the City, Water Program Manager, and other design consultants on the various Water System projects. Coordination shall consist of A/E's attendance of meetings to jointly discuss and communicate project requirements and various other correspondences to promote continuity across multiple Water projects.

City of Corpus Christi

O.N. Stevens Water Treatment Plant, High Service Pump Building No. 3

September 6, 2013

LNV Project No. E11066

FINAL - MANHOUR BREAKDOWN FOR SERVICES BY A/E CONSULTANT

Task No.	Description / FUNCTIONAL TASKS	LNV Labor Estimate																			
		Principal	Project Manager	Project Engineer	Engineer III	Engineer I	Designer	Senior Cadd Tech	Cadd Tech	PR	PAA	Admin	RPLS	Dir of Survey Parties	PCI	(Field Crew (3-Men)	LNV Total	Sub-Consult	Direct Expenses	Admin Fees	Task Total Cost
BASIC SERVICES																					
1	PRELIMINARY DESIGN PHASE	20	33	52	52	-	6	20	-	-	-	15	-	-	-	-	$27,075	-		-	
-	1.1 General Design Criteria	2	19	20	26	32	26	32	36	-	-	-	-	-	-	-	$21,109	26,000	-	2,600	
-	1.2 Pump System Design Criteria	2	29	32	32	39	39	46	52	-	-	-	-	-	-	-	$29,518	148,000	-	14,800	
-	1.3 Geotechnical Coordination	1	2	2	2	3	2	2	3	-	-	-	-	-	-	-	$1,998	-	-	-	
-	1.4 Architectural Concepts Development	1	3	7	-	-	2	3	5	-	-	-	-	-	-	-	$2,682	15,000	-	1,500	
-	1.5 Preliminary Design Package (30% Design)	7	59	78	98	130	130	170	210	-	-	12	-	-	-	-	$91,109	-	-	-	
1	TASK 1 Sub total of Hours	33	145	191	210	204	204	273	316	0	0	27	0	0	0	0	$197				
1	TASK 1 Sub total of Cost	$6,402	$27,885	$27,888	$24,780	$18,972	$18,360	$23,751	$23,679	$0	$0	$1,758	$0	$0	$0	$0	$173,471	$189,000	$0	$18,900	$381,371
2	DESIGN PHASE	8	30	26	26	-	-	-	-	-	-	5	-	-	-	-	$14,471	-		-	
-	2.1 General Design	1	10	10	15	15	10	15	20	-	-	-	-	-	-	-	$10,474	469,600		46,960	
-	2.2 Pump System	2	10	13	15	15	15	20	39	-	-	-	-	-	-	-	$13,425	289,500		28,950	
-	2.3 60% Design - Plans & Specifications	2	39	25	30	36	45	66	106	-	-	3	-	-	-	-	$34,036	-		-	
-	2.4 100% Pre-final Design - Plans & Specifications	2	25	25	30	36	45	65	106	-	-	3	-	-	-	-	$33,949	-		-	
-	2.5 Final Design Plans & Specifications	1	18	16	20	25	30	40	86	-	-	3	-	-	-	-	$22,402	-		-	
2	TASK 2 Sub total of Hours	16	118	117	136	134	145	206	333	0	0	14	0	0	0	0	1219				
2	TASK 2 Sub total of Cost	$3,104	$22,638	$17,082	$16,048	$12,462	$13,050	$17,922	$23,841	$0	$0	$910	$0	$0	$0	$0	$126,787	$758,100	$0	$75,910	$960,797
3	BIDDING PHASE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$0	21,300		2,130	
-	3.1 Pre-Bid Conference	1	1	1	2	-	-	-	-	-	-	-	-	-	-	-	$787	-		-	
-	3.2 Bidding Coordination & Addenda Preparation	1	7	10	17	30	-	10	14	-	-	-	-	-	-	-	$8,735	-		-	
-	3.3 Bid Evaluation and Recommendation of Award	1	1	1	2	5	-	-	-	-	-	-	-	-	-	-	$1,232	-		-	
3	TASK 3 Sub total of Hours	3	9	12	21	35	0	10	14	0	0	0	0	0	0	0	104				
3	TASK 3 Sub total of Cost	$562	$1,710	$1,752	$2,479	$3,255	$0	$870	$1,078	$0	$0	$0	$0	$0	$0	$0	$11,734	$21,300	$0	$2,130	$35,219
4	CONSTRUCTION PHASE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$0	163,500		16,350	
-	4.1 General Project Administration & Meetings	15	15	75	120	120	-	-	-	-	-	-	-	-	-	-	$42,045	-		-	
-	4.2 Change Orders	1	3	7	14	19	-	-	11	-	-	-	-	-	-	-	$6,055	-		-	
-	4.3 Perform Site Visits (2 per month @ 27 mnths = 54 Visits)	7	8	15	16	16	-	-	-	-	-	-	-	-	-	-	$5,452	-		-	
-	4.4 Review Submittals and Test Results	1	5	11	23	35	-	-	-	-	-	-	-	-	-	-	$6,724	-		-	
-	4.5 Issue Interpretations and Clarifications	2	11	23	35	69	-	-	-	-	-	-	-	-	-	-	$16,394	-		-	
-	4.6 Landscape Architecture	-	1	1	2	-	-	-	-	-	-	-	-	-	-	-	$573	-		-	
-	4.7 Substantial Completion/Final Acceptance Inspection	1	2	3	3	7	-	-	-	-	-	-	-	-	-	-	$2,019	-		-	
-	4.8 Record Drawings	-	2	4	9	12	23	35	86	-	-	-	-	-	-	-	$13,341	-		-	
4	TASK 4 Sub total of Hours	27	47	139	222	278	23	35	77	0	0	0	0	0	0	0	849				
4	TASK 4 Sub total of Cost	$6,239	$8,977	$20,294	$26,196	$25,884	$2,070	$3,045	$5,929	$0	$0	$0	$0	$0	$0	$0	$97,603	$163,500	$0	$16,350	$277,453

Appendix A1

City of Corpus Christi

O.N. Stevens Water Treatment Plant, High Service Pump Building No. 3

September 5, 2013

LNV Project No. E11006

FINAL - MANHOUR BREAKDOWN FOR SERVICES BY A/E CONSULTANT

Task No.	Description FUNCTIONAL TASKS	LNV Labor Estimate																			
		Principal	Project Manager	Project Engineer	Engineer III	Engineer I	Designer	Senior Cadd Tech	Cadd Tech	PR	PAA	Admin	RPLS	Dir of Survey Parties	PCI	Field Crew (3-Man)	LNV Total	Sub-Consult	Direct Expenses	Admin Fees	Task Total Cost
ADDITIONAL SERVICES (ALLOWANCE)																					
1	PERMITTING & AGENCY COORDINATION	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$0	-		-	
-	1.1 Building Permit / Industrial Exemption Affidavit	-	1	1	4	7	-	-	-	-	-	-	-	-	-	-	$1,460	-		-	
-	1.2 General Agency Coordination	9	21	38	47	54	-	-	9	-	-	-	-	-	-	-	$22,566	-		-	
-	1.3 Permit Amendment Application	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$0	-		-	
-	1.4 Special Permitting Services	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$0	-		-	
1	TASK 1 Sub total of Hours	9	22	39	51	61	0	0	9	0	0	0	0	0	0	0	191				
1	TASK 1 Sub total of Cost	$1,746	$4,202	$5,694	$6,018	$5,673	$0	$0	$693	$0	$0	$0	$0	$0	$0	$0	$24,028	$0	$0	$0	$24,028
2	TOPOGRAPHIC SURVEY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$0	-		-	
-	2.1 Site Survey	2	2	4	8	-	4	8	16	-	-	-	2	8	-	100	$26,446	-		-	
-	2.2 Subsurface Utility Engineering	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$0	20,000		2,900	
2	TASK 2 Sub total of Hours	2	2	4	8	-	4	8	16	-	-	-	2	8	-	100	152				
2	TASK 2 Sub total of Cost	$388	$382	$584	$708	$0	$360	$696	$1,232	$0	$0	$0	$328	$768	$0	$21,000	$26,446	$20,000	$0	$2,900	$58,346
3	ENVIRONMENTAL ISSUES	2	16	24	80	120	-	-	-	-	-	40	-	-	-	-	27,786	3,000	-	300	
3	TASK 3 Sub total of Hours	2	16	24	80	120	0	0	0	0	0	40	0	0	0	0	282				
3	TASK 3 Sub total of Cost	$388	$3,056	$3,504	$7,080	$11,160	$0	$0	$0	$0	$0	$2,600	$0	$0	$0	$0	$27,786	$3,000	$0	$300	$31,086
4	CONSTRUCTION OBSERVATION SERVICES - TBD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			-	
-	4.1 Construction Management Team	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			-	
4	TASK 4 Sub total of Hours	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
4	TASK 4 Sub total of Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$0	$0	$0
5	START-UP & TRAINING SERVICES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			-	
-	5.1 Facilities Start-Up	1	28	39	55	-	-	-	-	-	-	-	-	-	-	-	15,600	24,000		2,400	
-	5.2 Training Support	2	11	24	42	-	-	-	-	-	-	-	-	-	-	-	10,949	10,000		1,000	
-	5.3 Factory Witness Testing	-	9	12	23	-	-	-	-	-	-	-	-	-	-	-	6,185	7,000		700	
5	TASK 5 Sub total of Hours	3	48	95	120	0	0	0	0	0	0	0	0	0	0	0	233				
5	TASK 5 Sub total of Cost	$582	$8,806	$9,490	$14,160	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$32,827	$41,000	$0	$4,100	$77,927
6	WARRANTY PHASE	2	14	34	43	52	-	-	-	-	-	-	-	-	-	-	17,936	32,700		3,270	
6	TASK 6 Sub total of Hours	2	14	34	43	52	0	0	0	0	0	0	0	0	0	0	145				
6	TASK 6 Sub total of Cost	$388	$2,674	$4,964	$5,074	$4,638	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$17,936	$32,700	$0	$3,270	$53,906
7	SCADA AND O&M DOCUMENTATION	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			-	
-	7.1 SCADA Documentation	1	3	4	19	30	-	-	-	-	-	14	-	-	-	-	7,175	40,000		4,000	
-	7.2 Electronic Operations and Maintenance Manual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	
7	TASK 7 Sub total of Hours	1	3	4	19	30	0	0	0	0	0	14	0	0	0	0	70				
7	TASK 7 Sub total of Cost	$194	$573	$664	$2,124	$2,780	$0	$0	$0	$0	$0	$910	$0	$0	$0	$0	$7,175	$40,000	$0	$4,000	$51,175
8	PUBLIC INVOLVEMENT - N/A																				
8	TASK 8 Sub total of Hours	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
8	TASK 8 Sub total of Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
9	ELECTRONIC OPERATIONS O&M MANUAL - TBD																				
9	TASK 9 Sub total of Hours	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
9	TASK 9 Sub total of Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
10	CONFORMED CONTRACT DOCUMENTS - TBD																				
10	TASK 10 Sub total of Hours	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
10	TASK 10 Sub total of Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
11	EXISTING FAC. CONDITION ASSESSMENT - TBD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			-	
11	TASK 11 Sub total of Hours	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
11	TASK 11 Sub total of Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

Appendix A1

City of Corpus Christi

O.N. Stevens Water Treatment Plant, High Service Pump Building No. 3

September 6, 2013

LNV Project No. E11066

FINAL - MANHOUR BREAKDOWN FOR SERVICES BY A/E CONSULTANT

Task No.	Description: FUNCTIONAL TASKS	LNV Labor Estimate: Principal	Project Manager	Project Engineer	Engineer III	Engineer I	Designer	Senior Cadd Tech	Cadd Tech	PR	PAA	Admin	RPLS	Dir of Survey Parties	PCI	Field Crew (3-Man)	LNV Total	Sub-Consult	Direct Expenses	Admin Fees	Task Total Cost
12	WINDSTORM CERTIFICATION	-															-	18,000		1,800	
12	TASK 12 Sub total of Hours	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
12	TASK 12 Sub total of Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$18,000	$0	$1,800	$19,800
13	PEER REVIEW COORDINATION & RESPONSE	30	96	96	160	247	-	-	-	-	-	-	-	-	-	-	629	66,700		6,670	
13	TASK 13 Sub total of Hours	30	96	96	160	247	-	-	-	-	-	-	-	-	-	-	629				
13	TASK 13 Sub total of Cost	$5,820	$18,336	$14,016	$18,880	$22,971	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$80,023	$66,700	$0	$6,670	$153,393
14	HS #1, PUMPING SYS. ENERGY AUDIT & CONSERVATION EVAL. - TBD																-	-		-	
14	TASK 14 Sub total of Hours	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0				
14	TASK 14 Sub total of Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
15	PHYS. LAB SCALE HYDR MODEL STUDY - TBD	-															-				
15	TASK 15 Sub total of Hours	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0				
15	TASK 15 Sub total of Hours	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
16	DISINFECTION CT EVALUATION - TBD																-				
16	TASK 16 Sub total of Hours	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0				
16	TASK 16 Sub total of Hours	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
17	PLANT PROCESS AND HYDR EVAL - TBD																-				
17	TASK 17 Sub total of Hours	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
17	TASK 17 Sub total of Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
18	ELECTICAL STUDIES																-	46,500		4,650	
18	TASK 18 Sub total of Hours	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0				
18	TASK 18 Sub total of Cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$46,500	$0	$4,650	$51,150
19	CONTROL LOGIC & APPL DEV. SUPPORT	2	2	8	18	-	-	-	-	-	-	-	-	-	-	-	30	4,052	22,140	2,214	
19	TASK 19 Sub total of Hours	2	2	8	18	-	-	-	-	-	-	-	-	-	-	-	30				
19	TASK 19 Sub total of Hours	$388	$382	$1,168	$2,124	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$4,062	$22,140	$0	$2,214	$28,416
20	CONTROL SYSTEM INTEGRATION COORDINATION	2	2	8	18	-	-	-	-	-	-	-	-	-	-	-	30	4,052	22,140	2,214	
20	TASK 20 Sub total of Hours	2	2	8	18	-	-	-	-	-	-	-	-	-	-	-	30				
20	TASK 20. Sub total of Hours	$388	$382	$1,168	$2,124	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$4,062	$22,140	$0	$2,214	$28,416
21	PROJECT MANUAL	-	30	40	-	60	-	-	-	-	-	100	-	-	-	-	230	23,650	-	-	
21	TASK 21 Sub total of Hours	-	30	40	-	60	-	-	-	-	-	100	-	-	-	-	230				
21	TASK 21 Sub total of Hours	$0	$5,730	$5,840	$0	$5,880	$0	$0	$0	$0	$0	$8,000	$0	$0	$0	$0	$23,650	$0	$0	$0	$23,650
22	PROGRAM MANAGEMENT & PROJECTS COORDINATION	-	200	300	100	-	-	-	-	-	-	80	-	-	-	-	680	99,000	-	-	
22	TASK 21 Sub total of Hours	-	200	300	100	-	-	-	-	-	-	80	-	-	-	-	680				
22	TASK 21 Sub total of Hours	$0	$38,200	$43,800	$11,800	$0	$0	$0	$0	$0	$0	$6,400	$0	$0	$0	$0	$99,000	$0	$0	$0	$99,000
	UNIT RATES	$194.00	$191.00	$146.00	$118.00	$83.00	$80.00	$87.00	$77.00	$160.00	$75.00	$80.00	$164.00	$96.00	$125.00	$210.00	$758,560	$1,454,130	$0	$145,413	
																	Subconsultants TOTAL	$1,454,130	TOTAL	$ 2,358,103	
																	LNV TOTAL	$903,973			

Appendix A1

LNV
engineers | architects | contractors

In association with:
CDM Smith: Yue Sun, P.E.
Bath: Bill Stark, P.E.

DATE: August 30, 2013
BY: MJN & YS & BS

PROJECT: ONSWTP High Service Pump Building No. 3
PROJECT NO: E11066

CONCEPTUAL ESTIMATE OF PROBABLE CONSTRUCTION COST

Item	Description	Qty	Unit	Unit Price	Total Price
1	Mechanical Including Pumps, Motors, Piping, Valving, & Crane	1	LS	$ 3,175,000	$ 3,175,000
2	Yard Piping Including Valving and Tie-Ins (CWs, WWSPS, & HSPB2)	1	LS	$ 2,265,000	$ 2,265,000
3	Pump Building Including Foundations & Vaults	12000	SF	$ 200	$ 2,400,000
4	High Service No. 3 Electrical, Instr, & Control	1	LS	$ 4,100,000	$ 4,100,000
5	Civil Site Work Including Grading, Roads, Parking, Drainage, Demo, & Misc. Structures	1	LS	$ 1,100,000	$ 1,100,000
				HIGH SERVICE NO. 3 SUB TOTAL	$ 13,040,000
6	Alternate Power Electrical, Instr. & Control Including New Generator	1	LS	$ 2,000,000	$ 2,000,000
7	Alternate Power Building Extension & Fuel Tank Foundation	1400	SF	$ 225	$ 315,000
				ALTERNATE POWER SUB TOTAL	$ 2,315,000
				COMBINED SUB TOTAL	$ 15,355,000
	CONTINGENCY (30%)				$ 4,606,500
				CONSTRUCTION SUB TOTAL (2013 $)	$ 19,961,500
	DESIGN - BASIC SERVICE (8.0%)				$ 1,597,000
	ENGINEERING - ADDITIONAL SERVICES (2.0%)				$ 400,000
	TOPOGRAPHIC SURVEY (0.3%)				$ 60,000
	CONTRACT ADMINISTRATION (3.0%)				$ 599,000
	ENGINEERING SERVICES (3.5%)				$ 699,000
	CONSTRUCTION INSPECTION (3.5%)				$ 699,000
	TESTING (1.0%)				$ 200,000
	BOND INSURANCE (1.0%)				$ 200,000
	MISC. (PRINTING, ETC) (0.5%)				$ 100,000
				ADMINISTRATIVE SUB TOTAL	$ 4,560,000
				PROJECT TOTAL (2013 $)	$ 24,521,500

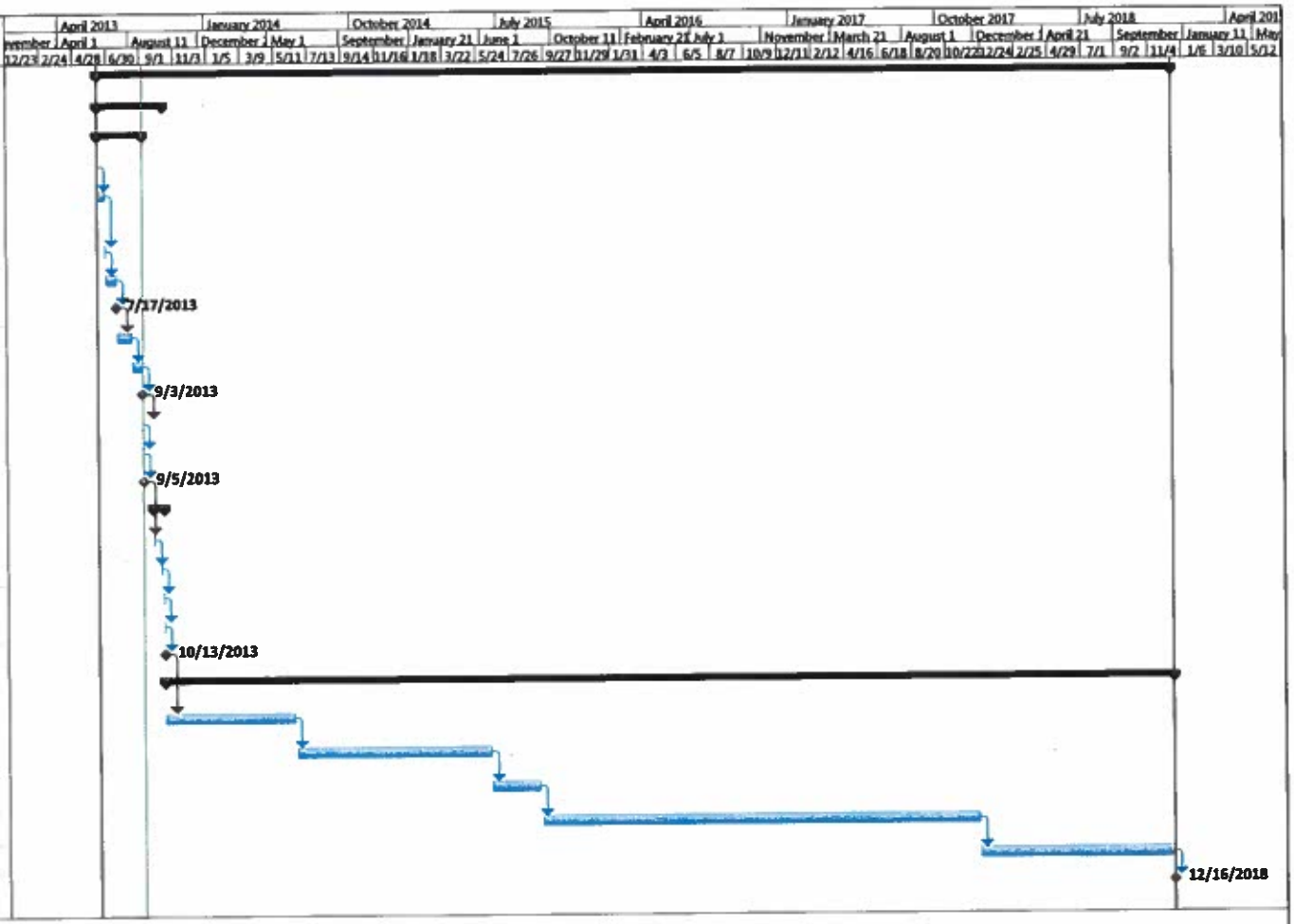
CONSTRUCTION TOTAL (2016 $)[Note 1]	$21,813,000
PROJECT TOTAL (2016 $)[Note 1]	$26,373,000

NOTES:

1. Preliminary construction prices are based on recent and historical data on local projects in Corpus Christi and costs should be escalated 3% per yr to the midpoint of construction in 2013 dollars.
2. Items not included in the estimate are any structures or equipment identified during the condition assessment as requiring upgrades, rehabilitation, or replacement.

Appendix A2

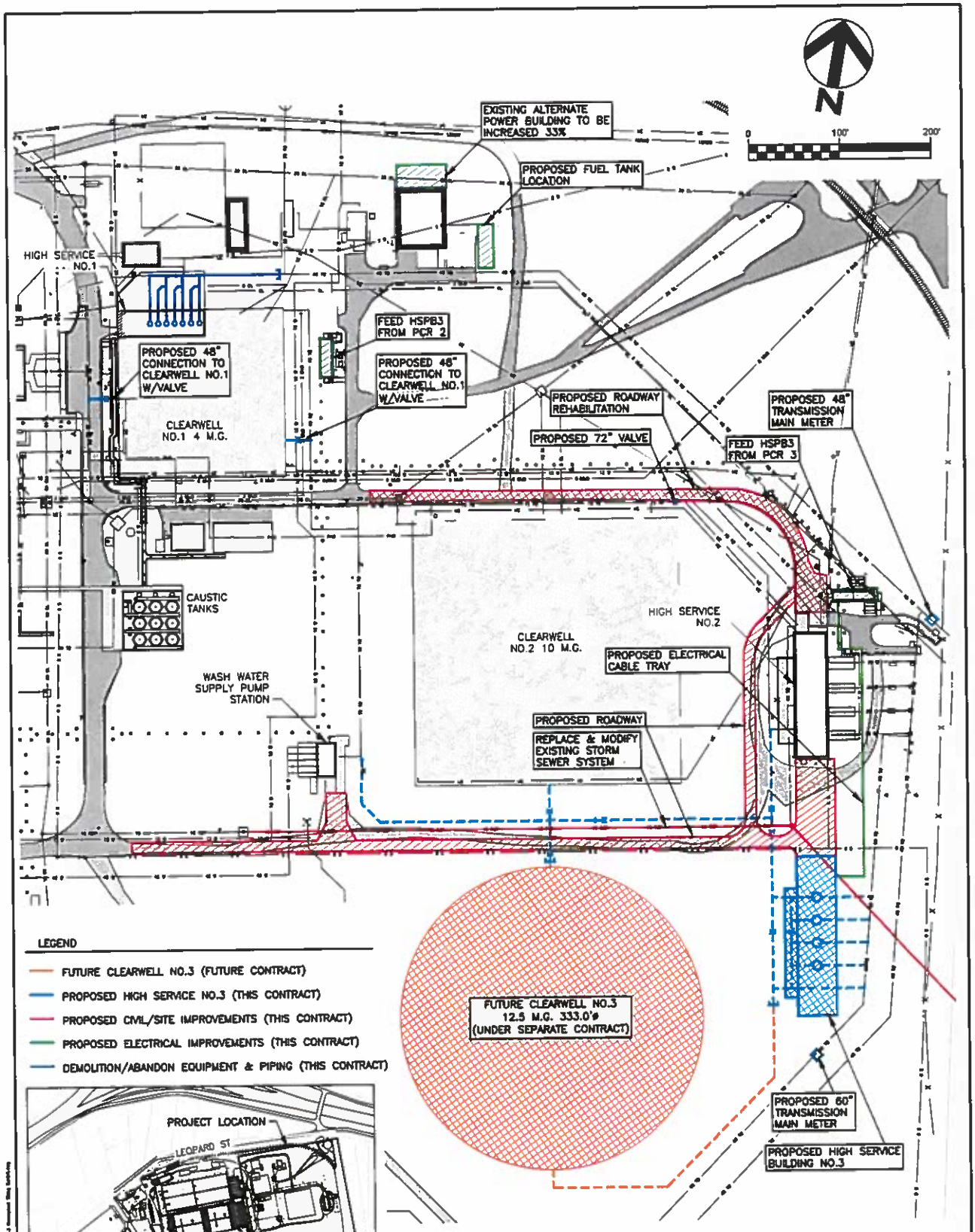
ID	Task Name	Duration	Start	Finish
0	HS#3 Project Schedule	1437 da	Thu 6/13/13	Sun 12/16/18
1	High Service No. 3 Initial Phase	87 days	Thu 6/13/13	Sun 10/13/13
2	ELR Submittal and Review	61 days	Thu 6/13/13	Thu 9/5/13
3	Draft ELR Meeting	1 day	Thu 6/13/13	Thu 6/13/13
4	Incorporation of Draft ELR Meeting Items	9 days	Fri 6/14/13	Wed 6/26/13
5	User Requirements Meeting	1 day	Thu 6/27/13	Thu 6/27/13
6	90% Draft ELR & Large A/E Submittal	14 days	Fri 6/28/13	Wed 7/17/13
7	90% Draft ELR & Large A/E Milestone	0 days	Wed 7/17/13	Wed 7/17/13
8	City Review	29 edays	Wed 7/17/13	Thu 8/15/13
9	Final Draft ELR & Large A/E Submittal	19 edays	Thu 8/15/13	Tue 9/3/13
10	Final Draft ELR & Large A/E Milestone	0 days	Tue 9/3/13	Tue 9/3/13
11	City Review	1 eday	Tue 9/3/13	Wed 9/4/13
12	Final Large A/E Amd. #1 Submittal	1 eday	Wed 9/4/13	Thu 9/5/13
13	Final Large A/E Amd. #1 Milestone	0 days	Thu 9/5/13	Thu 9/5/13
14	Council Approval	14 days	Tue 9/24/13	Sun 10/13/13
15	Council Presentation of Large A/E	1 day	Tue 9/24/13	Tue 9/24/13
16	Council meeting for Action	1 day	Tue 10/8/13	Tue 10/8/13
17	Design NTP Issued	1 eday	Fri 10/11/13	Sat 10/12/13
18	Design Kickoff	1 eday	Sat 10/12/13	Sun 10/13/13
19	Design Kickoff Milestone	0 days	Sun 10/13/13	Sun 10/13/13
20	High Service No. 3 Project Phase	1350 days	Sun 10/13/13	Sun 12/16/18
21	Preliminary Design Phase	243 edays	Sun 10/13/13	Fri 6/13/14
22	Design Phase	365 edays	Mon 6/16/14	Tue 6/16/15
23	Bid Phase	90 edays	Tue 6/16/15	Mon 9/14/15
24	Construction Phase	820 edays	Fri 9/18/15	Sat 12/16/17
25	1 Year Warranty	365 edays	Sat 12/16/17	Sun 12/16/18
26	1 Year Warranty Milestone	0 days	Sun 12/16/18	Sun 12/16/18



Project:ONSWTP High Service Pump Building No. 3 (City Project No. E11066)

Task — Milestone — Manual Milestone — Summary

Appendix B



Appendix C

LNV
engineers | architects | contractors

CITY OF CORPUS CHRISTI, TEXAS
O.N. STEVENS WATER TREATMENT PLANT
HIGH SERVICE NO. 3 CONCEPTUAL SITING EXHIBIT

THIS DOCUMENT IS FOR INTERIM REVIEW AND IS NOT INTENDED FOR CONSTRUCTION, BIDDING, PERMIT OR OTHER UNAUTHORIZED PURPOSES. THESE DOCUMENTS/PLANS WERE AUTHORIZED TO BE RELEASED.

BY: MARCUS J. NAISER P.E.
LICENSE NO.: 92814 DATE: 7/16/13

EXHIBIT "B"
MANDATORY INSURANCE REQUIREMENTS & INDEMNIFICATION
FOR A/E PROFESSIONAL SERVICES/CONSULTANT SERVICES
(Revised October 2010)

A. Consultant must not commence work under this agreement until all insurance required herein has been obtained and such insurance has been approved by the City. The Consultant must not allow any subcontractor to commence work until all similar insurance required of the subcontractor has been obtained.

B. Consultant must furnish to the City's Risk Manager, two (2) copies of Certificates of Insurance, showing the following minimum coverages by insurance company(s) acceptable to the City's Risk Manager. The City must be named as an additional insured for all liability policies, and a blanket waiver of subrogation is required on all applicable policies.

TYPE OF INSURANCE	MINIMUM INSURANCE COVERAGE
30-Day Written Notice of Cancellation, non-renewal or material change required on all certificates	**Bodily Injury & Property Damage Per occurrence - aggregate**
COMMERCIAL GENERAL LIABILITY including: 1. Broad Form 2. Premises - Operations 3. Products/ Completed Operations 4. Contractual Liability 5. Independent Contractors	$1,000,000 COMBINED SINGLE LIMIT
AUTOMOBILE LIABILITY to included 1. Owned vehicles 2.. Hired – Non-owned vehicles	$1,000,000 COMBINED SINGLE LIMIT
PROFESSIONAL LIABILITY including: Coverage provided shall cover all employees, officers, directors and agents 1. Errors and Omissions	$1,000,000 per claim / $2,000,000 aggregate (Defense costs not included in face value of the policy) If claims made policy, retro date must be prior to inception of agreement; have extended reporting period provisions and identify any limitations regarding who is an Insured
WORKERS' COMPENSATION EMPLOYERS' LIABILITY	Which Complies with the Texas Workers Compensation Act 500,000/500,000/500,000

C. In the event of accidents of any kind, Consultant must furnish the Risk Manager with copies of all reports within (10) ten days of accident.

D. Consultant must obtain workers' compensation coverage through a licensed insurance company in accordance with Texas law. The contract for coverage must be written on a policy and endorsements approved by the Texas Department of Insurance. The coverage provided must be in amounts sufficient to assure that all workers' compensation obligations incurred will be promptly met.

E. Consultant's financial integrity is of interest to the City; therefore, subject to Successful Consultant's right to maintain reasonable deductibles in such amounts as are approved by the City, Consultant shall obtain and maintain in full force and effect for the duration of this Contract, and any extension hereof, at Consultant's sole expense, insurance coverage written on an occurrence basis, by companies authorized and admitted to do business in the State of Texas and with an A.M. Best's rating of no less than A-VII.

F. The City shall be entitled, upon request and without expense, to receive copies of the policies, declarations page and all endorsements thereto as they apply to the limits required by the City, and may require the deletion, revision, or modification of particular policy terms, conditions, limitations or exclusions (except where policy provisions are established by law or regulation binding upon either of the parties hereto or the underwriter of any such policies). Consultant shall be required to comply with any such requests and shall submit a copy of the replacement certificate of insurance to City at the address provided below within 10 days of the requested change. Consultant shall pay any costs incurred resulting from said changes. All notices under this Article shall be given to City at the following address:

City of Corpus Christi
Attn: Risk Management
P.O. Box 9277
Corpus Christi, TX 78469-9277
Fax: (361) 826-4555

G. Consultant agrees that with respect to the above required insurance, all insurance policies are to contain or be endorsed to contain the following required provisions:

i. Name the City and its officers, officials, employees, volunteers, and elected representatives as additional insured by endorsement, as respects operations and activities of, or on behalf of, the named insured performed under contract with the City, with the exception of the workers' compensation and professional liability policies;

ii. Provide for an endorsement that the "other insurance" clause shall not apply to the City of Corpus Christi where the City is an additional insured shown on the policy;

iii. Workers' compensation and employers' liability policies will provide a waiver of subrogation in favor of the City; and

iv. Provide thirty (30) calendar days advance written notice directly to City of any suspension, cancellation, non-renewal or material change in coverage, and not less than ten (10) calendar days advance written notice for nonpayment of premium.

H. Within five (5) calendar days of a suspension, cancellation, or non-renewal of coverage, Successful Consultant shall provide a replacement Certificate of Insurance and applicable endorsements to City. City shall have the option to suspend Consultant's performance should there be a lapse in coverage at any time during this contract. Failure to provide and to maintain the required insurance shall constitute a material breach of this contract.

I. In addition to any other remedies the City may have upon Consultant's failure to provide and maintain any insurance or policy endorsements to the extent and within the time herein required, the City shall have the right to order Consultant to stop work hereunder, and/or withhold any payment(s) which become due to Consultant hereunder until Consultant demonstrates compliance with the requirements hereof.

J. Nothing herein contained shall be construed as limiting in any way the extent to which Successful Consultant may be held responsible for payments of damages to persons or property resulting from Consultant's or its subcontractors' performance of the work covered under this agreement.

K. It is agreed that Consultant's insurance shall be deemed primary and non-contributory with respect to any insurance or self insurance carried by the City of Corpus Christi for liability arising out of operations under this contract.

L. It is understood and agreed that the insurance required is in addition to and separate from any other obligation contained in this contract.

INDEMNIFICATION AND HOLD HARMLESS

Consultant shall indemnify, save harmless and defend the City of Corpus Christi, and its agents, servants, and employees, and each of them against and hold it and them harmless from any and all lawsuits, claims, demands, liabilities, losses and expenses, including court costs and attorneys' fees, for or on account of any injury to any person, or any death at any time resulting from such injury, or any damage to any property, which may arise or which may be alleged to have arisen out of or in connection with the negligent performance of Consultant's services covered by this contract. The foregoing indemnity shall apply except if such injury, death or damage is caused by the sole or concurrent negligence of the City of Corpus Christi, its agents, servants, or employees or any other person indemnified hereunder.

Sample form for:
Payment Request
Revised 07/27/00

COMPLETE PROJECT NAME
Project No. XXXX
Invoice No. 12345
Invoice Date:

Basic Services:	Contract	Amd No. 1	Amd No. 2	Total Contract	Amount Invoiced	Previous Invoice	Total Invoice	Percent Complete
Preliminary Phase	$1,000	$0	$0	$1,000	$0	$1,000	$1,000	100%
Design Phase	2,000	1,000	0	3,000	1,000	500	1,500	50%
Bid Phase	500	0	250	750	0	0	0	0%
Construction Phase	2,500	0	1,000	3,500	0	0	0	0%
Subtotal Basic Services	$6,000	$1,000	$1,250	$8,250	$750	$1,500	$2,500	30%
Additional Services:								
Permitting	$2,000	$0	$0	$2,000	$500	$0	$500	25%
Warranty Phase	0	1,120	0	1,120	0	0	0	0%
Inspection	0	0	1,627	1,627	0	0	0	0%
Platting Survey	TBD	TBD	TBD	TBD	TBD	TBD	TBD	0%
O & M Manuals	TBD	TBD	TBD	TBD	TBD	TBD	TBD	0%
SCADA	TBD	TBD	TBD	TBD	TBD	TBD	TBD	0%
Subtotal Additional Services	$2,000	$1,120	$1,627	$4,747	$500	$0	$500	11%
Summary of Fees								
Basic Services Fees	$6,000	$1,000	$1,250	$8,250	$750	$1,500	$2,500	30%
Additional Services Fees	2,000	1,120	1,627	4,747	500	0	500	11%
Total of Fees	$8,000	$2,120	$2,877	$12,997	$1,250	$1,500	$3,000	23%

EXHIBIT "C"
Page 1 of 1

SUPPLIER NUMBER _____
TO BE ASSIGNED BY CITY
PURCHASING DIVISION

City of Corpus Christi

CITY OF CORPUS CHRISTI
DISCLOSURE OF INTEREST

City of Corpus Christi Ordinance 17112, as amended, requires all persons or firms seeking to do business with the City to provide the following information. Every question must be answered. If the question is not applicable, answer with "NA". See reverse side for Filing Requirements, Certifications and definitions.

COMPANY NAME: LNV, INC.

P. O. BOX: N/A

STREET ADDRESS: 801 Navigation, Ste 300 **CITY:** Corpus Christi **ZIP:** 78408-

FIRM IS: 1. Corporation ☒ 2. Partnership ☐ 3. Sole Owner ☐
4. Association ☐ 5. Other ☐ _____

DISCLOSURE QUESTIONS

If additional space is necessary, please use the reverse side of this page or attach separate sheet.

1. State the names of each "employee" of the City of Corpus Christi having an "ownership interest" constituting 3% or more of the ownership in the above named "firm."

Name	Job Title and City Department (if known)
N/A	

2. State the names of each "official" of the City of Corpus Christi having an "ownership interest" constituting 3% or more of the ownership in the above named "firm."

Name	Title
N/A	

3. State the names of each "board member" of the City of Corpus Christi having an "ownership interest" constituting 3% or more of the ownership in the above named "firm."

Name	Board, Commission or Committee
Dan S. Leyendecker	Marina Advisory Board

4. State the names of each employee or officer of a "consultant" for the City of Corpus Christi who worked on any matter related to the subject of this contract and has an "ownership interest" constituting 3% or more of the ownership in the above named "firm."

Name	Consultant
N/A	

FILING REQUIREMENTS

If a person who requests official action on a matter knows that the requested action will confer an economic benefit on any City official or employee that is distinguishable from the effect that the action will have on members of the public in general or a substantial segment thereof, you shall disclose that fact in a signed writing to the City official, employee or body that has been requested to act in the matter, unless the interest of the City official or employee in the matter is apparent. The disclosure shall also be made in a signed writing filed with the City Secretary. [Ethics Ordinance Section 2-349 (d)]

CERTIFICATION

I certify that all information provided is true and correct as of the date of this statement, that I have not knowingly withheld disclosure of any information requested; and that supplemental statements will be promptly submitted to the City of Corpus Christi, Texas as changes occur.

Certifying Person: Dan S. Leyendecker, P.E. (Type or Print) **Title:** President

Signature of Certifying Person: _____ **Date:** 1-22-13

DEFINITIONS

a. "Board member." A member of any board, commission, or committee appointed by the City Council of the City of Corpus Christi, Texas.

b. "Economic Benefit". An action that is likely to affect an economic interest if it is likely to have an effect on that interest that is distinguishable from its effect on members of the public in general or a substantial segment thereof.

c. "Employee." Any person employed by the City of Corpus Christi, Texas either on a full or part-time basis, but not as an independent contractor.

d. "Firm." Any entity operated for economic gain, whether professional, industrial or commercial, and whether established to produce or deal with a product or service, including but not limited to, entities operated in the form of sole proprietorship, as self-employed person, partnership, corporation, joint stock company, joint venture, receivership or trust, and entities which for purposes of taxation are treated as non-profit organizations.

e. "Official." The Mayor, members of the City Council, City Manager, Deputy City Manager, Assistant City Managers, Department and Division Heads, and Municipal Court Judges of the City of Corpus Christi, Texas.

f. "Ownership Interest." Legal or equitable interest, whether actually or constructively held, in a firm, including when such interest is held through an agent, trust, estate, or holding entity. "Constructively held" refers to holdings or control established through voting trusts, proxies, or special terms of venture or partnership agreements."

g. "Consultant." Any person or firm, such as engineers and architects, hired by the City of Corpus Christi for the purpose of professional consultation and recommendation.