Agenda Item: 6.

MEMORANDUM

To: Zorinsky Water Quality Basin Number 2 Project Ad-Hoc Consultant Selection Subcommittee
From: Amanda Grint, Water Resources Engineer
Date: April 7, 2016
Re: Professional Services Contract with HDR Engineering, Inc.

On March 3, 2016, the Subcommittee interviewed and selected HDR Engineering, Inc. (HDR) with which to negotiate a professional services contract for the planning, permitting, and design of Zorinsky Water Quality Basin Number 2 (ZB2). Since that time, District staff and representatives from HDR have worked together to prepare the enclosed detailed scope, and schedule for your review and consideration. Work tasks of this contract are designed to be completed in phases to have a better understanding of the scope. Phase 1 is presented in the attached detailed scope and provides the preliminary design, planning and permitting of ZB2. Scope and fees for Phase 2, final design, and Phase 3, construction administration, will be presented at a later date.

A summary of the major activities for Phase 1 (Preliminary Design) is as follows:

- Project Management
- Development Coordination
- USACE 404 Permitting
- Spillway Alternatives Evaluation
- Geotechnical Evaluation
- Conceptual Design Plans
- Right of Way Assistance

A proposed detailed scope of work, cost estimate and schedule are attached for review. HDR would provide the professional services for Phase 1 of the ZB2 project on an hourly basis not to exceed the amount of $470,200.

Management recommends that the Subcommittee recommend to the Board that the General Manager be authorized to execute a Professional Services Agreement with HDR Engineering, Inc. for Phase 1 of the Zorinsky Water Quality Basin Number 2 project in an amount not to exceed $470,200, subject to changes deemed necessary by the General Manager and approval as to form by District Legal Counsel.

DWG: F:\Projects\007-0823\WTRRES\Exhibits\DWG Exhibits\Sheets\ZB2 details.dwg USER: skruse
DATE: Oct 11, 2007 11:22am XREFS: Zorinsky Number 2 Plan

LANDOWNER	LAND RIGHTS AREA
SKRUPA	11.5 AC
POSPICHAL	22.5 AC
BACKHAUS	24.0 AC
NIELSEN	0.5 AC
DONAHOO	7.0 AC

N

0' 200' 400'
SCALE IN FEET

HWY 275

HWY 6

PROPERTY LINE (TYP.)

54" WATER MAIN

POTENTIAL STREAM MITIGATION (TYP.)

STREAM MITIGATION BUFFER (TYP.)

FLOOD POOL ELEV. 1187.5

TOP OF DAM ELEV. 1194.5

40' WIDE COMBINED SPILLWAY

EARTH EMBANKMENT

ROCK RIPRAP WAVE PROTECTION

PERMANENT POOL ELEV. 1181.5

PERMANENT STORAGE POOL BOUNDARY
100 ACRE-FEET OF VOLUME STORAGE

SKRUPA

SKRUPA

DONAHOO

POSPICHAL

NIELSEN

BACKHAUS

BACKHAUS

BACKHAUS

F STREET

PROJECT NO: 007-0823 DRAWN BY: SKA DATE: 9/5/07	ZORINSKY BASIN 2 ALTERNATIVE 4 ZORINSKY WATER QUALITY BASIN PAPIO-MISSOURI RIVER NRD	OLSSON ASSOCIATES	2120 South 72nd Street Suite 1400 Omaha, NE 68124-6316 TEL 402.341.1116 FAX 402.341.5895	FIGURE A-15

Papio-Missouri River Natural Resources District
Preliminary Design of Zorinsky Basin No. 2
Papillion Creek Watershed (Douglas County, NE)

ENGINEERING PROPOSAL

BACKGROUND AND BASIS OF PROPOSAL

HDR Engineering, Inc. was selected by the P-MRNRD to provide planning, permitting, preliminary and final design and construction contract administration services for Zorinsky Basin No. 2. Zorinsky Basin No. 2 is a proposed regional detention basin to be located upstream of Zorinsky Lake on Boxelder Creek located in Douglas County and is located near 204th and F Streets in Omaha, Nebraska. The contributing drainage area at the proposed retention basin is approximately 1.6 square miles. The drainage area of Zorinsky Basin No. 2 is primarily agricultural land, but urbanization is actively surrounding the area.

To more concisely respond to project requirements, a phased approach is proposed. In Phase I, preliminary design will be conducted. After the preliminary details of the project have been determined through Phase I, the Phase II scope of services, generally including preparing final design documents and providing bidding assistance will be developed and associated fees negotiated. Following completion of Phase II, the Phase III scope of services detailing construction contract administration services will be developed and associated fees negotiated.

A1.01 Phase I - Preliminary Design Phase

This Scope of Services is to document Phase I professional services to the Papio-Missouri River NRD (P-MRNRD) for the preliminary design of Zorinsky Basin No. 2 (Project).

The Phase I scope of work is segmented into 10 task series:

- Task Series 100 – Project Management
- Task Series 200 – Coordination with Others
- Task Series 300 – USACE Section 404 Permit and Section 401 Water Quality Certification
- Task Series 400 – Modeling and Spillway Alternatives Evaluation
- Task Series 500 – Geotechnical Investigation and Evaluation
- Task Series 600 – Conceptual Design Elements
- Task Series 700 – Not Used
- Task Series 800 – Right-of-Way Assistance
- Task Series 900 – Grant Funding Application
- Task Series 1000 – Phase I Environmental Site Assessment
- Task Series 1100 – Preliminary Design Report

HDR proposes to provide the following professional services over an anticipated eight (8) – month project period from the time of contract authorization. This schedule assumes an Individual Permit (IP) will be required for the Project. The 8-month schedule assumes submittal of the IP application but does not include the Section 404 authorization.

TASK SERIES 100 – PROJECT MANAGEMENT

Task Objective: Develop effective project communication; confirm that Project elements are being completed. Discover and disseminate project information to improve quality and efficiency.

HDR Activities: **Task 110 Project Management.** Conduct general project management tasks. Includes development of project initiation forms including the development of a project management plan, monthly invoicing, monthly progress report, project close out activities and other project administrative activities. Conduct Project Approach and Resource Review (PARR) review.

Task 120 Client Coordination Meetings. Coordination meetings will be conducted with P-MRNRD during the Project.

120.1 Kickoff Meeting. Meet with P-MRNRD and City personnel to discuss project details and review the project scope.

120.2 Board/Subcommittee Presentation. Conduct a presentation to the P-MRNRD Board/Subcommittee to provide the results of the Phase I design efforts. A PowerPoint presentation will be prepared. One preparation meeting with P-MRNRD staff for the presentation is assumed.

Task Deliverables:

- Monthly invoices and progress reports
- PowerPoint presentation for P-MRNRD Board/Subcommittee Presentation

Key Understandings:

- The duration of the project is 8 months.
- Meetings will be held at the offices of the P-MRNRD and attended by 3 HDR professionals.

TASK SERIES 200 – COORDINATION WITH OTHERS

Task Objective: Develop effective project communication; confirm that Project elements are being completed. Discover and disseminate project information to improve quality and efficiency.

HDR Activities: **Task 210 Coordination Meetings.** Coordination meetings will be conducted with P-MRNRD, City of Omaha, MUD and adjacent developers during the Project.

210.1 P-MRNRD/City of Omaha Parks/Planning/Public Works. Meet with P-MRNRD and City personnel to discuss project details. Assume a total of 4 meetings through the duration of the project.

210.2 MUD. Meet with P-MRNRD and MUD personnel regarding water main mitigation. Assume a total of 3 meetings through the duration of the project.

210.3 Adjacent Developers. Meet with P-MRNRD personnel and adjacent developers to review and discuss Project progress and coordinate planning efforts. Assume a total of 4 meetings through the duration of the project.

Task Deliverables:

- Meeting agenda and notes

Key Understandings:

- Meetings will be held at the offices of the P-MRNRD and attended by 3 HDR professionals.
- Eleven (11) coordination meetings are assumed.

TASK 300 USACE SECTION 404 PERMIT AND SECTION 401 WATER QUALITY CERTIFICATION

Task Objective: Secure necessary Section 404 approvals for Zorinsky Basin No. 2 in accordance with Section 404 and Section 401 of the Clean Water Act.

Activities:

Task 310 Data Collection and Evaluation. Environmental data collected for the project area proposed for Zorinsky Basin No. 2 include:

- Data on recorded archaeological and historic/architectural sites (coordinated through the Nebraska State Historical Society, State Historic Preservation Office).
- Data on threatened or endangered species known locations (obtained via the USFWS Information for Planning and Conservation website and Nebraska Game and Parks Commission county species list)
- National Wetland Inventory (NWI) mapping
- Surface water quality impaired streams inventory from NDEQ (2014 Water Quality Integrated Report)

Task 320 Waters of the U.S Identification. HDR will identify wetlands and jurisdictional waters of the U.S. on Zorinsky Basin No. 2 project lands.

320.1 Wetland Determination. A wetland determination will be performed using NWI mapping and NRCS aerial photography with site verification to preliminarily identify potential wetland impacts to aid in initial determination of impacts. Identification of wetlands in agricultural environments will be performed using the most recent NRCS agricultural wetland determination methodology.

320.2 Wetland Delineation. Investigate the study area for the presence of Clean Water Act jurisdictional waters (including wetlands). Delineate and characterize the type, size, and location of waters of U.S. A formal wetland delineation [in accordance with the U.S. Army Corps of Engineers (USACE) 1987 Wetland Delineation Manual] shall be provided for areas within the normal pool area and limits of construction of the structure(s).

320.3 Stream Functional Assessment. Perform a stream functional assessment of all impacted stream and associated riparian areas for assessment of stream impacts and potential mitigation requirements. The Nebraska Stream Capability Assessment Procedure (May 2012) will be used to perform the functional assessment.

Task 330 USACE/Agency/Tribal Coordination. Coordinate with USACE and other Federal, state and local agencies.

330.1 USACE Project Coordination. Meet with USACE at key points during permit development. This would include a pre-application meeting, after development of purpose and need, alternative screening criteria, initial screening, and draft stage of the Section 404 permit application. Meeting materials and meeting notes will be developed for each meeting. A total of 5 meetings are assumed.

330.2 Agency Coordination. Prepare contact mailing list of agencies. Prepare and distribute an agency scoping document describing the project and requesting information on impacts to their resources to obtain input from federal/state agencies, and special interest groups. Coordinate as needed with other agencies on project specific issues. Assumes only telephone calls and effort is limited to the number of hours and personnel shown on the fee estimate.

330.3 Tribal Coordination. A list of potential Native American Tribes that may have interest in the project will be developed. The list will be provided to USACE for their use in government-to-government consultation. A generic consultation letter will be drafted for USACE distribution at their discretion.

Task 340 Section 404 Authorization. Based on initial identification of permitting issues, HDR will develop a permit application for the Project. It is assumed that Section 404 authorization will either be secured through an IP. An alternatives analysis will be conducted to identify potential alternatives that are practicable according to the 404(b)(1) Guidelines. HDR will coordinate the development of the Section 404 permit application with USACE.

340.1 Project Need and Purpose. HDR will identify the need for the project and the primary and secondary purposes of the Project. This will be done in a manner to best justify the location of the project while limiting the alternatives analysis to the minimum required by the USACE.

340.2 Range of Alternatives. In addition to the proposed alternative (as defined and established in Task Series 400), alternatives may include, but not limited to:

- low impact development strategies
- multiple small detention basins

340.3 Screening Criteria. Establish the screening criteria to evaluate alternatives for the project. The screening criteria will establish the practicability of the alternatives as described in Subpart B §230.10 (a) of the Guidelines. A practicable alternative is considered "available and capable of being done after taking into consideration cost, existing technology, and logistics while also fulfilling the basic purpose of the proposed activity".

340.4 Alternative Screening. Apply screening criteria to each of the alternatives for determination of alternative practicability.

340.5 Factual Determinations. Apply Section 230.11(a)-(h) to evaluate the potential short- or long-term effects of the practicable alternatives on the aquatic environment. Indirect and cumulative impacts will be considered.

340.6 Applicants Preferred Alternative. Summarize the findings of the project and identify the alternative for which the P-MRNRD is applying for.

340.7 Section 404 Application Submittal. Prepare permit application and supporting documentation.

340.8 Wetland and Stream Mitigation Plan. HDR will coordinate with USACE to incorporate wetland and stream channel mitigation concepts required to obtain the Section 404 permit. It is assumed that the wetland and stream channel mitigation will be on-site. The concept plans will depict the type, size and location of the mitigation resource and will follow 33 CFR 332.4 (c)(2-14).

Task 350 Cultural Resources (Section 106) Assessment. The USACE is the federal agency responsible for Section 106 compliance as a result of their federal action (issuance of a Section 404). USACE typically requires information from the applicant that documents potential impacts to cultural resources. HDR will identify previously recorded historic properties (archaeological sites, historic buildings, and properties of traditional religious and cultural importance to an Indian tribe or Native group [TCP]) and cultural resources surveys within the Project area (as identified in Task 310). A cultural resources project critical issues analysis (CIA) report will be prepared summarizing these findings. These CIA will be supplied to USACE for their review and coordination with the Nebraska State Historic Preservation Office (SHPO). A Phase I Archaeological survey (pedestrian survey) can be provided as Additional Services, if required.

Task 360 Section 401 Water Quality Certification. Submit Section 401 Water Quality Certification application to the State of Nebraska.

Task Deliverables:

- Wetland Delineation Report and Stream Functional Assessment
- Pre-application meeting agenda and notes
- USACE meeting agenda's and notes
- Agency contact list
- Agency scoping document
- Native American Tribal contact list

- Section 404 Permit Application including:
  - Purpose and Need Technical Memorandum
  - Alternatives Matrix (range of alternatives and practicability screening, included screening methods and results)
- Cultural Resources Project Critical Issues Analysis
- Section 401 Water Quality Certification application

Key Understandings:

- Right of entry with landowners to conduct cultural resources and wetland surveys will be coordinated by P-MRNRD.
- Native American Tribal coordination would occur between USACE and tribes as government-to-government consultation. No additional effort to assist USACE in this consultation is anticipated.
- No agency scoping meeting is planned.
- HDR will seek project approval under an individual Section 404 permit from the USACE; however, HDR will evaluate the potential for the project to qualify for Nationwide Permit #43 Stormwater Management Facilities. Should the project qualify for Nationwide Permit #43, subtasks 340.2-340.7 and Task 360 would not be required. A pre-construction notification would be developed if Nationwide Permit #43 is applicable.
- Scope and fee are based on assumption that project will not require an Environmental Impact Statement (EIS) or an Environmental Assessment (EA).
- Assumes no other practicable alternative exists that would require wetland delineation and/or stream assessment.
- Any wetland and stream impacts will be mitigated on-site.
- No tree mitigation (excluding forested wetlands) will be required.
- Sources for the CIA will include:
  - A file pull from the Nebraska SHPO that will include:
    - Archaeological sites located within the Project area
    - Historic buildings located within the Project area
    - Properties of traditional religious and cultural importance to an Indian tribe or Native group (TCP)
    - NRHP listed sites or buildings within the Project area
    - Cultural resources surveys conducted within the Project area
  - The online database of the National Register of Historic Places (NRHP)
  - A review of General Land Office (GLO) maps
- If needed, copies of historic property site forms will be requested from Nebraska SHPO for an additional cost (determined by Nebraska SHPO)
- An intensive level architectural survey (standing structures survey) will not be required.
- No Phase I Archaeological survey (pedestrian survey) will be conducted. If required by USACE, work will be completed as Additional Services.
- No threatened or endangered species surveys will be required and no Section 7 of the Endangered Species Act informal or formal consultation will be required.
- The Section 401 Water Quality Certification application will consist of a copy of the Section 404 Individual Permit Authorization with cover letter addressed to NDEQ.
- A joint public notice for Section 404 and Section 401 will be issued.

TASK 400 MODELING AND SPILLWAY ALTERNATIVES EVALUATION

Task Objective: Develop hydrologic model for use in evaluating and optimizing dam features for Zorinsky Basin No. 2. Impacts of varying pool levels will also be determined.

Activities:

Task 410 Data Collection and Evaluation.

410.1 Data Collection. Data to be evaluated includes:

- Zorinsky Basin No. 2 Conceptual Report (2007)
- Zorinsky Alternatives Report (2009)
- Hydrology Update Evaluation of Zorinsky Basin 2 (2015)
- LiDAR data for West Papillion Creek Subwatershed obtained in 2010.
- Aerial photography for Douglas County flown in 2014.
- Adjacent development plans

410.2 Stage-Storage Data Verification. Verify the stage-area-storage relationship for the dam and reservoir using HDR's hydrologic model from the 2015 Hydrology Update for Zorinsky Basin No. 2 and LiDAR topographic mapping. Evaluate impact of grading changes to stage-storage data for the water quality basin, pool area, and any wetland and channel mitigations.

Task 420 Hydrologic Model Development. HEC-HMS will be used to route design hydrographs through the proposed water quality basin. The hydrologic model prepared for the 2015 Hydrology Update for Zorinsky Basin No. 2 will be further refined using information obtained from NOAA Atlas 14 . The basis of this model was documented in the 2010 USACE Hydrologic Analysis for the Papillion Creek Watershed. The principal spillway hydrograph, auxiliary spillway hydrograph, and freeboard hydrographs will be determined per NRCS Technical Release No. 60 (TR-60) for low and significant hazard structures. In addition, 10-, 50-, 100-, and 500-yr hydrographs will be defined. One storm-centering will be used in the hydrologic analysis.

420.1 HEC-HMS Model Update. Key hydrologic parameters such as land use and percent impervious areas will be updated to future conditions that correspond to anticipated future development conditions and coordinated with the conceptual land use plans developed adjacent to Zorinsky Basin No. 2. Update rainfall distributions using NOAA Atlas 14 Midwest Region 3 temporal distribution for Nebraska.

420.2 Breach Analysis. Conduct a breach analysis in accordance with TR-60 requirements to determine the hazard classification. HEC-RAS model will be developed using current LiDAR. The model will extend approximately 500 feet downstream of 204th Street.

Task 430 Spillway Refinement. The 2015 Hydrology Update for Zorinsky Basin No. 2 included a normal pool EL of 1181.5, which maximizes normal pool surface area. Top of dam was found to be EL 1191 and an auxiliary spillway crest of EL 1182.9.

430.1 Dam Features for Alternatives. Variations in the spillway configurations will be investigated to further maximize the normal pool surface area (and therefore sediment storage and trap efficiency) and minimize impacts to infrastructure, land and environmental resources. Variations in spillway design, such as structural chutes and two-stage spillways will be investigated. Rating curves for various spillways will be developed for use in reservoir routing. Up to 5 spillway alternative configurations will be investigated.

430.2 Reservoir Routing. HEC-HMS model will be used to route hydrographs through Zorinsky Basin No. 2. Top of dam elevations will be established through these routings based on NRCS TR-60 and State of Nebraska Dam Safety criteria.

430.3 Sediment Loading. Determine at-reservoir sediment yield from upland erosion and channel bank sources using RUSLE, or other appropriate estimating technique. Compare to findings in 2009 Zorinsky Alternative Report.

430.4 Design Life. Provide for a minimum of a 50-year service life. Compute the trap efficiencies of the proposed sediment basin to quantify sediment deposition in cubic yards and percentage of basin volume.

430.5 Impact Evaluation. Infrastructure impacts for each design hydrograph will be determined for each alternative. Potential mitigation measures for impacted infrastructure will be investigated.

430.6 Alternative Summary. A summary of the spillway alternatives investigated will be prepared that provides a comparison of key features, including:

- Normal Pool Elevation
- Top of Dam Elevation
- ROW acquisition requirements
- Spillway costs
- Infrastructure impacts
- Wetland/permitting impacts
- Sediment Storage
- Capture efficiency/Design Life

Task 440 Draft Report Section. Prepare preliminary and final draft of modeling and dam alternatives section of the design report.

440.1 Preliminary Draft Report Section. Document analysis in a preliminary draft dam alternative section of the design report.

440.2 Final Draft Report Section. Document analysis in a final draft dam alternative section of the design report. Incorporate review comments.

Task Deliverables:

- Draft and final dam alternatives section of design report.

Key Understandings:

- The hydrologic analysis will be performed using the HEC-HMS model developed by USACE in 2010 for the Papillion Creek Watershed as a basis. This is the same model used in the 2015 Hydrology Update Evaluation of the site.
- The probable maximum precipitation event will be defined by the December 2008 Study entitled "Site-Specific Probable Maximum Precipitation (PMP) Study for Nebraska".
- A maximum of 5 spillway configurations will be evaluated.
- Structure will be classified as a low or significant hazard structure.
- Effects of climate change will not be considered beyond what is described in the proposed approach.

TASK 500 GEOTECHNICAL INVESTIGATION AND EVALUATION

Task Objective: Conduct subsurface geotechnical investigation and conduct geotechnical evaluation of embankment. It is intended that the geotechnical design elements will be advanced to approximately the 90 percent design level.

Activities:

Task 510 Data Collection and Review. Data to be reviewed include:

- Available geotechnical data from adjacent roadway projects.

Task 520 Subsurface Investigation Plan. HDR to conduct a geotechnical investigation to evaluate the subsurface conditions along the dam centerline, spillway, and borrow areas. HDR to prepare a boring plan showing the location of the borings and a laboratory testing program assigning tests to specific samples.

The laboratory testing program requirements is anticipated to include:

- Atterberg Limits (silts and clays, per ASTM D 4318). A total of 30 tests are assumed.
- Grain size analyses with hydrometer (sands, silts, and clays per ASTM D 422). A total of 30 tests are assumed.
- Moisture Content/Dry Density tests (tube and bag samples, per ASTM D 2166, ASTM D 7263). A total of 60 moisture and 40 dry density tests are assumed.
- Standard Proctor compaction test. A total of 4 tests are assumed.
- Unconfined Compressive Strength tests (tube samples, per ASTM D 2166). A total of 8 tests are assumed.

- Triaxial compression tests (UU and CU-bar) on undisturbed and recompacted samples (tube samples, per ASTM D 2850). A total of 8 UU and 6 CU-bar (2 undisturbed and 4 recompacted) tests are assumed.
- Consolidation tests (tube samples, per ASTM D 2435). A total of 6 tests are assumed.
- Pin-hole dispersion tests. A total of 4 tests are assumed.
- Sieve analyses. A total of 10 tests are assumed.

Task 530 Subsurface Investigation Exploration. Thiele Geotech to conduct field exploration and sampling, conduct laboratory tests and prepare geotechnical material data report. Geotechnical data report includes boring logs and laboratory test data. E&A will survey the location of the borings (pre- and then post-drilling).

Task 540 Preliminary Geotechnical Design and Analysis.
Preliminary geotechnical design will be performed. The design includes:
- Review field and lab data.
- Prepare geologic cross-sections
- Select design foundation section and shear strengths
- Select trial embankment sections (with internal drainage, if needed)
- Perform slope stability analyses for end of construction case
- Perform seepage analyses (does not include reservoir water balance)
- Evaluate foundation underseepage
- Evaluate seepage through the embankment
- Perform slope stability analyses for rapid drawdown, steady state seepage and earthquake cases
- Perform settlement analyses along:
  - Embankment centerline
  - Drawdown pipe

550 Final Geotechnical Design and Analysis. Final geotechnical design will be performed. The design includes:
- Specify final embankment section
- Specify, size, and locate the chimney drain, horizontal blanket drain and finger drain outlets, if needed
- Refine upstream slope geometry, if needed
- Evaluate spillway alignment, stability and settlement
- Evaluate slope stability of embankment closure section

Task 560 Geotechnical Investigation and Evaluation Documentation. Prepare geotechnical evaluation report documenting the results of the geotechnical investigation and design.

560.1 Draft Geotechnical Investigation and Design Report. Document the results of the field investigation, laboratory testing program, and engineering evaluations.

560.2 Final Geotechnical Investigation and Design Report. Incorporate review comments and revise geotechnical report.

Task Deliverables:

- Draft and Final Geotechnical Investigation and Design Reports

Key Understandings:

- Thiele Geotech, as a subconsultant to HDR, will conduct field investigation and laboratory testing program.
- Fee estimate is based on a total of 630 feet (plus 100 feet of contingency) of borings drilled to non-yielding material (glacial till or bedrock) and 150 feet of cone penetrometer tests.
- E&A, as a subconsultant to HDR, will survey the pre- and post locations of the boring holes.
- Geotechnical investigation and design will be completed to approximately to a 90 percent level.

- The final geotechnical report will be ready for inclusion in the NDNR dam safety permit application. Preparation of NDNR dam safety permit is not included in this Phase I scope of services and will be prepared in Phase II.
- Instrumentation and upstream face slope protection will be evaluated during Phase II.
- It is intended that the geotechnical investigation in Phase I be adequate for completion of design. Should additional subsurface information be required to complete design, the scope will be documented and included in Phase II services.

TASK 600 CONCEPTUAL DESIGN ELEMENTS

Task Objective: To define major design elements and prepare set of drawings to approximately a 30% level.

Activities:

Task 610 Data Collection and Evaluation.

610.1 Data Collection. Collect necessary data. Data to be evaluated includes:
- Existing GIS mapping including aerials, topographic data, and parcels
- Private and public utilities (existing and proposed data available at time of evaluation) potentially impacted by the Project including: communication lines, sanitary sewer lines, water lines, gas lines, and fiber-optic lines.

610.2 Topographic Survey. Conduct a topographic survey of the proposed water quality basin embankment/spillway footprint. Include a limited topographic survey, including drainage structure information (approx. 200 feet upstream and downstream of the existing drainage structure centerline).

610.3 Topographic Base Map. Topographic survey will be supplemented with LiDAR topographic data. Merge topographic data with LiDAR data and proposed grading from adjacent developments.

Task 620 Drawing Production - Develop conceptual design of Zorinsky Basin No. 2. A preliminary drawing list of sheets includes:
- Title Sheet (1 sheet)
- General Notes, Legend, Abbreviations, Hydrologic/Hydraulic Data (1 sheet)
- Topographic Maps of Pool Area (1 sheet)
- Plan View of Site (1 sheet)
- Profile of Drawdown (1 sheet)
- Grading Plan and Embankment Drain Plan (1"= 50', 3 sheets)
- Drain Details (e.g. embankment drain detail and toe drain detail, 1 sheet)
- Spillway Plan and Section (e.g. spillway configuration, 2 sheets)
- Miscellaneous Details (1 sheet)
- Geological Boring Location Plan (1 sheet)
- Geological Profiles (2 sheets)

Task 630 Conceptual Opinion of Probable Construction Costs. Develop conceptual level opinion of probable construction costs for the construction of Zorinsky Basin No. 2 Included in the cost estimate will be dam construction costs and infrastructure relocation costs.

Task 640 Design Analysis Documentation. Prepare a design analysis report for the construction elements section of the report.

Task Deliverables:
- Conceptual Design Drawings (approximately 30% level)
- Design Analysis Report

Key Understandings:
- E&A, as a subconsultant to HDR, will provide the land surveying services.
- Preliminary design will be for one (1) recommended alternative
- Drawings will be provided in 11" x 17" format.
- Technical specifications will not be prepared during Phase I.

- One (1) electronic copy and one (1) hard copy of Design Analysis Report will be provided to P-MRNRD.
- P-MRNRD will be responsible for report reproduction.

TASK 700 NOT USED

TASK 800 RIGHT-OF-WAY ASSISTANCE

Task Objective: To determine right-of-way (ROW) requirements based on a preliminary design and determine legal descriptions in support of public hearings and appraisal/title searches to be conducted by P-MRNRD.

Task 810 Acquisition and ROW Plan Development. This task includes defining the preliminary acquisition/boundary plans preparing preliminary ROW tract maps for up to 6 parcels, and performing limited baseline survey in support of the final acquisition/boundary survey to be conducted in Phase II.

820.1 Real Property Work Maps. Prepare property work maps based on the proposed outline of Project area necessary for the construction of the dam, reservoir and public areas. Coordinate with P-MRNRD and determine boundary extents for acquisition.

820.2 Preliminary Acquisition/Boundary Plans. Conduct field survey to locate section corners and establish initial control. Develop preliminary ROW map tract plans based on current title commitments, dimensional control provided by recorded subdivision plats, utility records, and other recorded surveys and documentation at the Douglas County Surveyor's office and Douglas County Register of Deeds Office. Items depicted on these plans include: top of proposed dam elevation and other construction outside this limit to aid P-MRNRD personnel with appraisals along with acquisition and easement negotiations. Determine acreages for acquisition.

820.3 Legal Descriptions. Provide title commitment and develop legal descriptions for acquisition of 2 parcels.

Task Deliverables:

- Real Property Work Maps based on proposed limits of construction
- Preliminary Acquisition/Boundary Plans for initial public ROW hearings and subsequent appraisal and fee title searches activities.

Key Understandings:

- P-MRNRD will provide title documentation for the properties affected by this project
- P-MRNRD is responsible for securing appraisals along with acquisition and easement negotiations.
- No permanent monuments will be set (to be performed during Phase II)
- It is assumed that the number of revisions to the preliminary boundary is limited to 1 per parcel.

TASK 900 GRANT FUNDING APPLICATION

Task Objective: Prepare grant funding applications.

Activities: **Task 910 Nebraska Environmental Trust Grant.** Prepare Nebraska Environmental Trust General Grant application.

910.1 Environmental Trust Meeting. Meet with staff from Nebraska Environmental Trust to review the grant application.

910.2 Grant Application Preparation. Prepare electronic Nebraska Environmental Trust Grant. Parts of the application include:

- General Project Information.
- Narrative Section
- Budget Summary and Budget Justification
- Project Sponsor Financial Information

- Timeline
- Partners
- Real Estate/Site Plan

Task 920 NDEQ Section 319 Grant. Prepare NDEQ Section 319 Grant.

920.1 NDEQ Meeting. Meet with staff from NDEQ to review the grant application.

920.2 Grant Application Preparation. Prepare online NDEQ Section 319 Grant application. Parts of the application include:

- General Project Information. Project Title, Sponsor Contact Information, Partners, Project Location, Executive Summary, Project Period, and Project Type
- Budget (source of funds)
- Project Implementation Plan
- Project Map
- Supporting Documents

Task 930 NE Water Sustainability Fund Grant. Prepare Water Sustainability Fund Grant.

930.1 Draft Section A – Administration Information. Section A includes:

930.1.1 General information regarding the project

930.1.2 Level of funding requested and the basis for that level of funding

930.1.3 Permitting requirements

930.2 Draft Section B – DNR Director's Findings. The basis of this section will be that the project is considered a non-structural proposal as no construction or operation of the proposed project will result from the project. Section B includes:

930.2.1 Technical Feasibility. The technical feasibility includes:

- Plan development
- Description of field and other investigations utilized to substantiate the project concept
- Description of the water and/or land rights required for the project
- Description of the anticipated effects of the project when developed
- Description of other alternatives and why the proposed project is the most technically and economically feasible option
- Explanation of how the project minimizes impacts on the natural environment and the probable environmental and ecological consequences resulting from the project.
- Explanation of the project considering programs of the State and resource development plans
- Description of land rights required for the project and how these will be acquired

930.2.2 Economic Feasibility. The economic feasibility includes:

- Description of project costs including engineering, capital, O&M and replacement costs, if any
- Description of project benefits (tangible and intangible)
- Table of benefit/cost information to indicate annual cash flow for life of proposal

930.2.3 Financial Feasibility. The financial feasibility includes:

- Evidence that annual revenues are available to repay the reimbursable costs and to cover operation and maintenance costs for project
- Explanation of how the P-MRNRD is qualified, responsible and legally capably of carrying out project

930.3 Draft Section C – NRC Scoring. Provide a written response to the 15 Categories for NRC Scoring. These responses will detail the goals and objectives of the project and be responsive toward each question to ensure that the P-MRNRD's application maximizes in scoring potential. The NRC Scoring Categories include:

1. Remediates or mitigates threats to drinking water (0, 2, 4,or 6 pts);
2. Meets the goals and objectives of an approved integrated management plan or ground water management plan (0, 2, 4, or 6 pts);
3. Contributes to water sustainability goals by increasing aquifer recharge, reducing aquifer depletion, or increasing streamflow (0, 2, 4, or 6 pts);
4. Contributes to multiple water supply goals, including, but not limited to, flood control, agricultural use, municipal and industrial uses, recreational benefits, wildlife

habitat, conservation of water resources, and preservation of water resources (0, 2, 4, or 6 pts);

5. Maximizes the beneficial use of Nebraska's water resources for the benefit of the state's residents (0, 2, 4, or 6 pts);
6. Is cost-effective (0, 2, 4, or 6 pts);
7. Helps the state meet its obligations under interstate compacts, decrees, or other state contracts or agreements or federal law (0, 2, 4, or 6 pts
8. Reduces threats to property damage or protects critical infrastructure that consists of the physical assets, systems, and networks vital to the state or the Untied States such that their incapacitation would have a debilitating effect on public security or public health and safety (0, 2, 4, or 6 pts);
9. Improves water quality (0, 1, 2, or 3 pts);
10. Has utilized all available funding resources of the local jurisdiction to support the program, project, or activity (0, 1, 2, or 3 pts);
11. Has a local jurisdiction with plans in place that support sustainable water use (0, 1, 2, or 3 pts);
12. Addresses a statewide problem or issue (0, 1, 2, or 3 pts);
13. Contributes to the state's ability to leverage state dollars with local or federal government partners or other partners to maximize the use of its resources (0, 1, 2, or 3 pts);
14. Contributes to watershed health and function (0, 1, 2, or 3pts);
15. Uses objectives described in the Annual Report and Plan of Work for the State Water Planning and Review Process (Annual Report) issued by the department (0, 1, 2, or 3pts)

930.4 Draft Section D – Project Description. Complete the information required for Section D, which includes:

- Project Overview
- Project Tasks and Timeline
- Partnerships
- Project Funding, Inclusive of Other Sources of Funding
- Support/Opposition

930.5 Finalize Funding Application. Finalize the application package to incorporate P-MRNRD' s comments.

Task Deliverables:

- Grant Applications

Key Understandings:

- Deadline for Nebraska Environmental Trust is September 6, 2016.
- Deadline for NDEQ Section 319 Grant is September 6, 2016.
- Deadline for Water Sustainability Fund is July 31, 2016.
- A Papio-Missouri River Water Quality Management Plan is under development in accordance with Section 319 requirements. It is assumed that the basin plan is advanced to a point where ZB-2 is eligible for funding.
- Nebraska ET – P-MRNRD to seek confirming participation letters from all partners.
- Nebraska ET – P-MRNRD to provide financial information of the sponsor(s).
- Water Sustainability Fund Section A - P-MRNRD to assist in defining which elements of the project that the application will include and to define proposed schedule for project.
- Water Sustainability Fund Section B – P-MRNRD to provide supplemental information required to complete the application including revenue information, legal authority to complete project and land acquisition authority and timely review of the Feasibility portion of the application.
- Water Sustainability Fund Section C – P-MRNRD to provide supplemental information required to complete the application and provide timely review of the written responses for the 15 categories of review
- Water Sustainability Fund - the Federal Mandate Bonus criteria does not apply to this project and response to that criteria will not be prepared.

- Water Sustainability Fund Section D – P-MRNRD to provide supplemental information required to complete the application and provide timely review of the Section D of the application
- Submission of Funding Application does not guarantee receipt of funding through the Sustainability Fund for the project.
- All deliverables will be provided in electronic pdf format

TASK 1000 PHASE I ENVIRONMENTAL SITE ASSESSMENT

Task Objective: Identify Recognized Environmental Conditions (RECs) that either exist or have existed on or around the Site as defined under the ASTM Method E1527-13 Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process.

Task 1010 Database Research. Conduct a database search and a search of existing public records to document RECs.

1010.1 Database Research. Utilize a database research firm to provide a regulatory database search of the Site and surrounding properties that will include: federal standards, state standards, and federal supplemental, state supplemental, and local and brownfields databases within the regulatory minimum-search distance of the property, as defined by ASTM E1527-13. If available, the database report will also include Sanborn, city directory, and historical topographical maps. If necessary, HDR will attempt to obtain additional file information for site(s) listed in the database that, in the view of an HDR environmental professional, may pose an impact to the Site.

1010.2 Landuse Survey. Provide a historical land-use review based on a review of readily-available sources of information as stated in ASTM E1527-13, such as aerial photographs, USGS 7.5-minute topographic maps, fire-insurance maps, local street-directories search, property-tax files, building-department records, recorded land title/deed records, and zoning/land-use records.

1010.3 Geology/Soil Conditions. Review regional and local geology/soil conditions as documented by USGS.

1010.4 Floodplain Maps. Review readily-available site-related floodplain maps.

Task 1020 Site Visit & Interviews. Conduct a site visit and interviews to document RECs.

1020.1 Site Visit. Perform a site visit for purposes of reconnaissance of the Site and surrounding properties. The site reconnaissance will be conducted in order to identify potential RECs located on the Site or surrounding properties. The site reconnaissance will document the general site setting and exterior and interior observations.

1020.2 Landowner Interviews. Conduct interviews with the property owner and a Duonix representative, as available, to determine current and past uses of the property. If conditions warrant interviews with surrounding property owners, they will be conducted at the time of the site visit. A narrative will be prepared to document the past use(s) of the property.

1020.3 Other Interviews. Interviews will be conducted, as appropriate, with local government officials who may have specific information on the property, including the local fire department, health department, planning department and historical society/library to determine any additional information on the historical land usage of the property and surrounding properties.

Task 1030 Phase I ESA Report Preparation & Submittal. Prepare a draft and final Phase I report.

1030.1 Draft Phase I. HDR will prepare a draft Phase I Environmental Site Assessment report that complies with the All Appropriate Inquiries standard as found at ASTM E1527-13, except as noted below. The report will include opinions and/or recommendations of the environmental professional.

1030.2 Final Phase I. HDR will prepare a final Phase I Environmental Site Assessment report based on review comments.

Task Deliverables:

- Draft Phase I Report, electronically
- Final Phase I Report, electronically and 2 hard copies.

Key Understandings:

- P-MRNRD will verify the tract location and approximate area that are the subject of this site assessment.
- Client to arrange access to the site and provide contact information for Site owner that may be aware of Site's history.
- No invasive site work, quantitative chemical analysis, asbestos, lead-based paint, components of building materials, radon, wetlands, archaeological or threatened & endangered species reviews are included in the scope of this ESA.
- The ASTM standard currently requires a real-estate assessment to be completed in the event there is a significant devaluation of the subject property due to an environmental condition. HDR's professional services do not include this assessment and this will be noted as an exception to the ASTM standard.
- This task covers the Phase I ESA only, and does not include any services related to additional investigation of any portion of the Site and/or Phase II ESA services.

TASK 1100 PRELIMINARY DESIGN REPORT

Task Objective: Prepare preliminary design report summarizing results of the evaluations and design.

Task 1110 Draft Preliminary Design Report. Compile final draft reports for the designs into a single design report.

Task 1120 Final Preliminary Design Report. Incorporate review comments and prepare final preliminary design report.

Task Deliverables:

- Draft Preliminary Design Report
- Final Preliminary Design Report

Key Understandings:

- Reports to be provided in electronic format only.

EXHIBIT "C", APPENDIX 1
PAPIO-MISSOURI RIVER NATURAL RESOURCES DISTRICT
PRELIMINARY DESIGN OF ZORINSKY BASIN 2
FEE ESTIMATE - APRIL 8, 2016

		HDR Engineering, Inc. Estimated Hours/Costs									Expenses					HDR	Sub-Consultant Estimated Costs			Est. Total Cost
	TASKS	Project Manager	Specialist	Principal Staff	Senior Staff	Technical Staff	Tech Support	Clerical	Total Hours	Total Labor Cost	Tech. Fee	Printing	Travel	Misc.	Total Expenses	Totals	E&A	Thiele Geotech	Total Sub-Consult.	
		$ 215.00	$ 230.00	$ 210.00	$ 170.00	$ 145.00	$ 110.00	$ 95.00												
TASK SERIES 100 – PROJECT MANAGEMENT																				
Task 110	**Project Management (8 months)**	48	24		4			28	104	$19,180	$385				$385	$19,565			$0	$19,565
Task 120	**Client Coordination Meetings**																			
Subtask 120.1	Kickoff Meeting	4		8	8				20	$3,900	$74		$14		$88	$3,988			$0	$3,988
Subtask 120.2	Board/Subcommittee Presentation	6				8			14	$2,450	$52		$14		$66	$2,516			$0	$2,516
	Estimated Task Hours Subtotal	**58**	**24**	**8**	**12**	**8**	**0**	**28**	**138**											
	Estimated Task Cost Subtotal	**$12,470**	**$5,520**	**$1,680**	**$2,040**	**$1,160**	**$0**	**$2,660**		**$25,530**	**$511**	**$0**	**$28**	**$0**	**$538**	**$26,068**	**$0**	**$0**	**$0**	**$26,068**
TASK SERIES 200 – COORDINATION WITH OTHERS																				
Task 210	**Coordination Meetings**																			
Subtask 210.1	P-MRNRD, City of Omaha Parks/Planning/Public Works (4 meetings)	16		32	32		32		112	$19,120	$414		$55		$469	$19,589			$0	$19,589
Subtask 210.2	MUD (3 meetings)			12	12				24	$4,560	$89		$41		$130	$4,690			$0	$4,690
Subtask 210.3	Adjacent Developers (4 meetings)			16	32		32		80	$12,320	$296		$55		$351	$12,671			$0	$12,671
	Estimated Task Hours Subtotal	**16**	**0**	**60**	**76**	**0**	**64**	**0**	**216**											
	Estimated Task Cost Subtotal	**$3,440**	**$0**	**$12,600**	**$12,920**	**$0**	**$7,040**	**$0**		**$36,000**	**$799**	**$0**	**$151**	**$0**	**$950**	**$36,950**	**$0**	**$0**	**$0**	**$36,950**
TASK 300 – USACE SECTION 404 PERMIT AND SECTION 401 WATER QUALITY CERTIFICATION																				
Task 310	**Data Collection and Evaluation**						8		8	$880	$30				$30	$910			$0	$910
Task 320	**Waters of the U.S Identification**																			
Subtask 320.1	Wetland Determination						4		4	$440	$15				$15	$455			$0	$455
Subtask 320.2	Wetland Delineation				4		68		72	$8,160	$266	$20	$22	$184	$492	$8,652			$0	$8,652
Subtask 320.3	Stream Functional Assessment				2		4		6	$780	$22		$14		$36	$816			$0	$816
Task 330	**USACE/Agency/Tribal Coordination**																			
Subtask 330.1	USACE Project Coordination (5 meetings)				60		40		100	$14,600	$370		$55		$425	$15,025			$0	$15,025
Subtask 330.2	Agency Coordination				8		20		28	$3,560	$104				$104	$3,664			$0	$3,664
Subtask 330.3	Tribal Coordination			2	2				4	$760	$15				$15	$775			$0	$775
Task 340	**Section 404 Authorization**																			
Subtask 340.1	Project Need and Purpose				12	12	28		52	$6,860	$192				$192	$7,052			$0	$7,052
Subtask 340.2	Range of Alternatives				16	8	4		28	$4,320	$104				$104	$4,424			$0	$4,424
Subtask 340.3	Screening Criteria				8	8	4		20	$2,960	$74				$74	$3,034			$0	$3,034
Subtask 340.4	Alternative Screening				16	8	10		34	$4,980	$126				$126	$5,106			$0	$5,106
Subtask 340.5	Factual Determinations				8		8		16	$2,240	$59				$59	$2,299			$0	$2,299
Subtask 340.6	Applicants Preferred Alternative				8		8		16	$2,240	$59				$59	$2,299			$0	$2,299
Subtask 340.7	Section 404 Application Submittal			4	4	16	4		28	$4,280	$104				$104	$4,384			$0	$4,384
Subtask 340.8	Wetland and Stream Mitigation Plan				4	20	16	2	42	$5,530	$155				$155	$5,685			$0	$5,685
Task 350	**Cultural Resources (Section 106) Assessment**				16		4		20	$3,160	$74				$74	$3,234			$0	$3,234
Task 360	**Section 401 Water Quality Certification**				8		12		20	$2,680	$74				$74	$2,754			$0	$2,754
	Estimated Task Hours Subtotal	**0**	**0**	**6**	**176**	**72**	**242**	**2**	**498**											
	Estimated Task Cost Subtotal	**$0**	**$0**	**$1,260**	**$29,920**	**$10,440**	**$26,620**	**$190**		**$68,430**	**$1,843**	**$20**	**$91**	**$184**	**$2,137**	**$70,567**	**$0**	**$0**	**$0**	**$70,567**
TASK SERIES 400 – MODELING AND SPILLWAY ALTERNATIVES EVALUATION																				
Task 410	**Data Collection and Evaluation**																			
Subtask 410.1	Data Collection					4			4	$580	$15		$14		$29	$609			$0	$609
Subtask 410.2	Stage-Storage Data Verification					4	4		8	$1,020	$30				$30	$1,050			$0	$1,050
Task 420	**Hydrologic Model Development**																			
Subtask 420.1	HEC-HMS Model Update					4	12		16	$1,900	$59				$59	$1,959			$0	$1,959
Subtask 420.2	Breach Analysis					8	24		32	$3,800	$118				$118	$3,918			$0	$3,918
Task 430	**Spillway Refinement**																			
Subtask 430.1	Dam Features for Alternatives			4		4	12		20	$2,740	$74				$74	$2,814			$0	$2,814
Subtask 430.2	Reservoir Routing					4	16		20	$2,340	$74				$74	$2,414			$0	$2,414
Subtask 430.3	Sediment Loading					4	20		24	$2,780	$89				$89	$2,869			$0	$2,869
Subtask 430.4	Design Life					2	8		10	$1,170	$37				$37	$1,207			$0	$1,207
Subtask 430.5	Impact Evaluation					4	4		8	$1,020	$30				$30	$1,050			$0	$1,050
Subtask 430.6	Alternative Summary			4		4	16		24	$3,180	$89				$89	$3,269			$0	$3,269
Task 440	**Draft Report Section**																			
Subtask 440.1	Preliminary Draft Report Section			4		40	24	8	76	$10,040	$281				$281	$10,321			$0	$10,321
Subtask 440.2	Final Draft Report Section			2		16	12	8	38	$4,820	$141				$141	$4,961			$0	$4,961
	Estimated Task Hours Subtotal	**0**	**0**	**14**	**0**	**98**	**152**	**16**	**280**											
	Estimated Task Cost Subtotal	**$0**	**$0**	**$2,940**	**$0**	**$14,210**	**$16,720**	**$1,520**		**$35,390**	**$1,036**	**$0**	**$14**	**$0**	**$1,050**	**$36,440**	**$0**	**$0**	**$0**	**$36,440**

EXHIBIT "C", APPENDIX 1
PAPIO-MISSOURI RIVER NATURAL RESOURCES DISTRICT
PRELIMINARY DESIGN OF ZORINSKY BASIN 2
FEE ESTIMATE - APRIL 8, 2016

		HDR Engineering, Inc. Estimated Hours/Costs									Expenses					HDR	Sub-Consultant Estimated Costs			Est. Total Cost
	TASKS	Project Manager	Specialist	Principal Staff	Senior Staff	Technical Staff	Tech Support	Clerical	Total Hours	Total Labor Cost	Tech. Fee	Printing	Travel	Misc.	Total Expenses	Totals	E&A	Thiele Geotech	Total Sub-Consult.	
TASK SERIES 500 – GEOTECHNICAL INVESTIGATION AND EVALUATION																				
Task 510	**Data Collection and Review**		2				4		6	$900	$22				$22	$922			$0	$922
Task 520	**Subsurface Investigation Plan**		8				12		20	$3,160	$74		$22		$96	$3,256			$0	$3,256
Task 530	**Subsurface Investigation Exploration**	4	4				12		20	$3,100	$74		$100	$200	$374	$3,474	$3,707	$51,065	$54,772	$58,246
Task 540	**Preliminary Geotechnical Design and Analysis**		40				120	40	200	$26,200	$740				$740	$26,940			$0	$26,940
Task 550	**Final Geotechnical Design and Analysis**		24				40		64	$9,920	$237				$237	$10,157			$0	$10,157
Task 560	**Geotechnical Investigation and Evaluation Documentation**																			
Subtask 560.1	Draft Geotechnical Investigation and Design Report		16				40	8	64	$8,840	$237				$237	$9,077			$0	$9,077
Subtask 560.2	Final Geotechnical Investigation and Design Report		8				24	4	36	$4,860	$133				$133	$4,993			$0	$4,993
	Estimated Task Hours Subtotal	**4**	**102**	**0**	**0**	**0**	**252**	**52**	**410**											
	Estimated Task Cost Subtotal	**$860**	**$23,460**	**$0**	**$0**	**$0**	**$27,720**	**$4,940**		**$56,980**	**$1,517**	**$0**	**$122**	**$200**	**$1,839**	**$58,819**	**$3,707**	**$51,065**	**$54,772**	**$113,591**
TASK 600 – CONCEPTUAL DESIGN ELEMENTS																				
Task 610	**Data Collection and Evaluation**																			
Subtask 610.1	Data Collection				8		8		16	$2,240	$59				$59	$2,299			$0	$2,299
Subtask 610.2	Topographic Survey	4		4	8				16	$3,060	$59				$59	$3,119	$25,442		$25,442	$28,561
Subtask 610.3	Topographic Base Map				4		16		20	$2,440	$74				$74	$2,514			$0	$2,514
Task 620	**Drawing Production**		4	24	76		136		240	$33,840	$888	$2			$890	$34,730			$0	$34,730
Task 630	**Conceptual Opinion of Probable Construction Costs**		2	8	8	8	16		42	$6,420	$155				$155	$6,575			$0	$6,575
Task 640	**Design Analysis Documentation**			2	16	8			26	$4,300	$96	$10			$106	$4,406			$0	$4,406
	Estimated Task Hours Subtotal	**4**	**6**	**38**	**120**	**16**	**176**	**0**	**360**											
	Estimated Task Cost Subtotal	**$860**	**$1,380**	**$7,980**	**$20,400**	**$2,320**	**$19,360**	**$0**		**$52,300**	**$1,332**	**$12**	**$0**	**$0**	**$1,344**	**$53,644**	**$25,442**	**$0**	**$25,442**	**$79,086**
TASK SERIES 700 - NOT USED																				
TASK SERIES 800 - RIGHT-OF-WAY ASSISTANCE																				
Task 810	**Acquisition and ROW Plan Development**																			
Subtask 820.1	Real Property Work Maps				4		16		20	$2,440	$74				$74	$2,514			$0	$2,514
Subtask 820.2	Preliminary Acquisition/Boundary Plans				16	2	16		34	$4,770	$126				$126	$4,896	$15,684		$15,684	$20,580
Subtask 820.3	Legal Descriptions				2	2		2	6	$820	$22				$22	$842			$0	$842
	Estimated Task Hours Subtotal	**0**	**0**	**0**	**22**	**4**	**32**	**2**	**60**											
	Estimated Task Cost Subtotal	**$0**	**$0**	**$0**	**$3,740**	**$580**	**$3,520**	**$190**		**$8,030**	**$222**	**$0**	**$0**	**$0**	**$222**	**$8,252**	**$15,684**	**$0**	**$15,684**	**$23,936**
TASK SERIES 900 – GRANT FUNDING APPLICATION																				
Task 910	**Nebraska Environmental Trust Grant**																			
Subtask 910.1	Environmental Trust Meeting			4			4		8	$1,280	$30		$28	$25	$82	$1,362			$0	$1,362
Subtask 910.2	Grant Application Preparation			4			20	4	28	$3,420	$104				$104	$3,524			$0	$3,524
Task 920	**NDEQ Section 319 Grant**																			
Subtask 920.1	NDEQ Meeting			4			4		8	$1,280	$30		$28	$25	$82	$1,362			$0	$1,362
Subtask 920.2	Grant Application Preparation			8			40		48	$6,080	$178				$178	$6,258			$0	$6,258
Task 930 NE Water Sustainability Fund Grant																				
Subtask 930.1	Draft Section A – Administration Information			2			24	4	30	$3,440	$111				$111	$3,551			$0	$3,551
Subtask 930.2	Draft Section B – DNR Director's Findings																			
Subtask 930.2.1	Technical Feasibility			8		24	40	4	76	$9,940	$281				$281	$10,221			$0	$10,221
Subtask 930.2.2	Economic Feasibility			4		48	24	4	80	$10,820	$296				$296	$11,116			$0	$11,116
Subtask 930.2.3	Financial Feasibility			8		8	16	4	36	$4,980	$133				$133	$5,113			$0	$5,113
Subtask 930.3	Draft Section C – NRC Scoring			2		4	16		22	$2,760	$81				$81	$2,841			$0	$2,841
Subtask 930.4	Draft Section D – Project Description			2		2	24	4	32	$3,730	$118				$118	$3,848			$0	$3,848
Subtask 930.5	Finalize Funding Application			2			16	2	20	$2,370	$74				$74	$2,444			$0	$2,444
	Estimated Task Hours Subtotal	**0**	**0**	**48**	**0**	**86**	**228**	**26**	**388**											
	Estimated Task Cost Subtotal	**$0**	**$0**	**$10,080**	**$0**	**$12,470**	**$25,080**	**$2,470**		**$50,100**	**$1,436**	**$0**	**$55**	**$50**	**$1,541**	**$51,641**	**$0**	**$0**	**$0**	**$51,641**

EXHIBIT "C", APPENDIX 1
PAPIO-MISSOURI RIVER NATURAL RESOURCES DISTRICT
PRELIMINARY DESIGN OF ZORINSKY BASIN 2
FEE ESTIMATE - APRIL 8, 2016

		HDR Engineering, Inc. Estimated Hours/Costs									Expenses					HDR	Sub-Consultant Estimated Costs			Est. Total Cost
	TASKS	Project Manager	Specialist	Principal Staff	Senior Staff	Technical Staff	Tech Support	Clerical	Total Hours	Total Labor Cost	Tech. Fee	Printing	Travel	Misc.	Total Expenses	Totals	E&A	Thiele Geotech	Total Sub-Consult.	
TASK SERIES 1000 – PHASE I ENVIRONMENTAL SITE ASSESSMENT																				
Task 1010	**Database Research**																			
Subtask 1010.1	Database Research						2		2	$220	$7			$500	$507	$727			$0	$727
Subtask 1010.2	Land use Survey						2		2	$220	$7				$7	$227			$0	$227
Subtask 1010.3	Geology/Soil Conditions						2		2	$220	$7				$7	$227			$0	$227
Subtask 1010.4	Floodplain Maps						2		2	$220	$7				$7	$227			$0	$227
Task 1020	**Site Visit & Interviews**																			
Subtask 1020.1	Site Visit						8		8	$880	$30		$28	$100	$157	$1,037			$0	$1,037
Subtask 1020.2	Landowner Interviews					2	2		4	$510	$15				$15	$525			$0	$525
Subtask 1020.3	Other Interviews					2	4		6	$730	$22				$22	$752			$0	$752
Task 1030	**Phase I ESA Report Preparation & Submittal**																			
Subtask 1030.1	Draft Phase I		2			24	8	2	36	$5,010	$133				$133	$5,143			$0	$5,143
Subtask 1030.2	Final Phase I		2			8	2	2	14	$2,030	$52	$10			$62	$2,092			$0	$2,092
	Estimated Task Hours Subtotal	**0**	**4**	**0**	**0**	**36**	**32**	**4**	**76**											
	Estimated Task Cost Subtotal	**$0**	**$920**	**$0**	**$0**	**$5,220**	**$3,520**	**$380**		**$10,040**	**$281**	**$10**	**$28**	**$600**	**$919**	**$10,959**	**$0**	**$0**	**$0**	**$10,959**
TASK SERIES 1100 – PRELIMINARY DESIGN REPORT																				
Task 1110	**Draft Preliminary Design Report**		8		24	40	16	12	100	$14,620	$370				$370	$14,990			$0	$14,990
Task 1120	**Final Preliminary Design Report**		4		8	16	8	4	40	$5,860	$148				$148	$6,008			$0	$6,008
	Estimated Task Hours Subtotal	**0**	**12**	**0**	**32**	**56**	**24**	**16**	**140**											
	Estimated Task Cost Subtotal	**$0**	**$2,760**	**$0**	**$5,440**	**$8,120**	**$2,640**	**$1,520**		**$20,480**	**$518**	**$0**	**$0**	**$0**	**$518**	**$20,998**	**$0**	**$0**	**$0**	**$20,998**
	TOTAL HOURS	**82**	**148**	**174**	**438**	**376**	**1,202**	**146**	**2,566**											
	TOTAL COST (ROUNDED)	**$14,200**	**$31,300**	**$13,900**	**$56,100**	**$34,000**	**$97,700**	**$9,900**		**$363,300**	**$9,500**	**$0**	**$500**	**$1,000**	**$11,100**	**$374,300**	**$44,800**	**$51,100**	**$95,900**	**$470,200**

EXHIBIT "C", APPENDIX 1
PAPIO-MISSOURI RIVER NATURAL RESOURCES DISTRICT
PRELIMINARY DESIGN OF ZORINSKY BASIN 2
INITIAL SCHEDULE - APRIL 8, 2016

		Apr 2016			May					Jun				Jul				Aug				Sep				Oct					Nov				Dec 2016			
TASK SERIES 100 – PROJECT MANAGEMENT																																					
Task 110	**Project Management (8 months)**																																				
Task 120	**Client Coordination Meetings**																																				
Subtask 120.1	Kickoff Meeting						KM																														
Subtask 120.2	Board/Subcommittee Presentation																									BM											
TASK SERIES 200 – COORDINATION WITH OTHERS																																					
Task 210	**Coordination Meetings**																																				
Subtask 210.1	P-MRNRD, City of Omaha Parks/Planning/Public Works (4 meetings)										CM							CM							CM					CM							
Subtask 210.2	MUD (3 meetings)													MM									MM							MM							
Subtask 210.3	Adjacent Developers (4 meetings)							DM				DM				DM				DM																	
TASK 300 – USACE SECTION 404 PERMIT AND SECTION 401 WATER QUALITY CERTIFICATION																																					
Task 310	**Data Collection and Evaluation**																																				
Task 320	**Waters of the U.S Identification**																																				
Subtask 320.1	Wetland Determination																																				
Subtask 320.2	Wetland Delineation																																				
Subtask 320.3	Stream Functional Assessment																																				
Task 330	**USACE/Agency/Tribal Coordination**																																				
Subtask 330.1	USACE Project Coordination (5 meetings)								404					404					404					404			404										
Subtask 330.2	Agency Coordination																																				
Subtask 330.3	Tribal Coordination																																				
Task 340	**Section 404 Authorization**																																				
Subtask 340.1	Project Need and Purpose																																				
Subtask 340.2	Range of Alternatives																																				
Subtask 340.3	Screening Criteria																																				
Subtask 340.4	Alternative Screening																																				
Subtask 340.5	Factual Determinations																																				
Subtask 340.6	Applicants Preferred Alternative																																				
Subtask 340.7	Section 404 Application Submittal																																				
Subtask 340.8	Wetland and Stream Mitigation Plan																																				
Task 350	**Cultural Resources (Section 106) Assessment**																																				
Task 360	**Section 401 Water Quality Certification**																																				
TASK SERIES 400 – MODELING AND SPILLWAY ALTERNATIVES EVALUATION																																					
Task 410	**Data Collection and Evaluation**																																				
Subtask 410.1	Data Collection																																				
Subtask 410.2	Stage-Storage Data Verification																																				
Task 420	**Hydrologic Model Development**																																				
Subtask 420.1	HEC-HMS Model Update																																				
Subtask 420.2	Breach Analysis																																				
Task 430	**Spillway Refinement**																																				
Subtask 430.1	Dam Features for Alternatives																																				
Subtask 430.2	Reservoir Routing																																				
Subtask 430.3	Sediment Loading																																				
Subtask 430.4	Design Life																																				
Subtask 430.5	Impact Evaluation																																				
Subtask 430.6	Alternative Summary																																				
Task 440	**Draft Report Section**																																				
Subtask 440.1	Preliminary Draft Report Section																																				
Subtask 440.2	Final Draft Report Section																																				
TASK SERIES 500 – GEOTECHNICAL INVESTIGATION AND EVALUATION																																					
Task 510	**Data Collection and Review**																																				
Task 520	**Subsurface Investigation Plan**																																				
Task 530	**Subsurface Investigation Exploration**																																				
Task 540	**Preliminary Geotechnical Design and Analysis**																																				
Task 550	**Final Geotechnical Design and Analysis**																																				
Task 560	**Geotechnical Investigation and Evaluation Documentation**																																				
Subtask 560.1	Draft Geotechnical Investigation and Design Report																																				
Subtask 560.2	Final Geotechnical Investigation and Design Report																																				

EXHIBIT "C", APPENDIX 1
PAPIO-MISSOURI RIVER NATURAL RESOURCES DISTRICT
PRELIMINARY DESIGN OF ZORINSKY BASIN 2
INITIAL SCHEDULE - APRIL 8, 2016

		Apr 2016				May				Jun				Jul				Aug				Sep				Oct				Nov				Dec 2016			
TASK 600 – CONCEPTUAL DESIGN ELEMENTS																																					
Task 610	**Data Collection and Evaluation**																																				
Subtask 610.1	Data Collection																																				
Subtask 610.2	Topographic Survey																																				
Subtask 610.3	Topographic Base Map																																				
Task 620	**Drawing Production**																																				
Task 630	**Conceptual Opinion of Probable Construction Costs**																																				
Task 640	**Design Analysis Documentation**																																				
TASK SERIES 700 - NOT USED																																					
TASK SERIES 800 - RIGHT-OF-WAY ASSISTANCE																																					
Task 810	**Acquisition and ROW Plan Development**																																				
Subtask 820.1	Real Property Work Maps																																				
Subtask 820.2	Preliminary Acquisition/Boundary Plans																																				
Subtask 820.3	Legal Descriptions																																				
TASK SERIES 900 – GRANT FUNDING APPLICATION																																					
Task 910	**Nebraska Environmental Trust Grant**																																				
Subtask 910.1	Environmental Trust Meeting																																				
Subtask 910.2	Grant Application Preparation																																				
Task 920	**NDEQ Section 319 Grant**																																				
Subtask 920.1	NDEQ Meeting																																				
Subtask 920.2	Grant Application Preparation																																				
Task 930 NE Water Sustainability Fund Grant																																					
Subtask 930.1	Draft Section A – Administration Information																																				
Subtask 930.2	**Draft Section B – DNR Director's Findings**																																				
Subtask 930.2.1	Technical Feasibility																																				
Subtask 930.2.2	Economic Feasibility																																				
Subtask 930.2.3	Financial Feasibility																																				
Subtask 930.3	Draft Section C – NRC Scoring																																				
Subtask 930.4	Draft Section D – Project Description																																				
Subtask 930.5	Finalize Funding Application																																				
TASK SERIES 1000 – PHASE I ENVIRONMENTAL SITE ASSESSMENT																																					
Task 1010	**Database Research**																																				
Subtask 1010.1	Database Research																																				
Subtask 1010.2	Land use Survey																																				
Subtask 1010.3	Geology/Soil Conditions																																				
Subtask 1010.4	Floodplain Maps																																				
Task 1020	**Site Visit & Interviews**																																				
Subtask 1020.1	Site Visit																																				
Subtask 1020.2	Landowner Interviews																																				
Subtask 1020.3	Other Interviews																																				
Task 1030	**Phase I ESA Report Preparation & Submittal**																																				
Subtask 1030.1	Draft Phase I																																				
Subtask 1030.2	Final Phase I																																				
TASK SERIES 1100 – PRELIMINARY DESIGN REPORT																																					
Task 1110	**Draft Preliminary Design Report**																																				
Task 1120	**Final Preliminary Design Report**																																				

KM	Denotes a kickoff meeting with P-MRNRD, City and HDR Project Team
CM	Denotes a coordination meeting with P-MRNRD, City and HDR Project Team.
BM	Denotes a P-MRNRD Subcommittee or Board meeting
MM	Denotes MUD meeting
404	Denotes USACE Section 404 Meeting
PK	Denotes Parks Meeting

E & A CONSULTING GROUP, INC.
Engineering Answers

10909 Mill Valley Road, Suite 100 • Omaha, NE 68154-3950
P 402.895.4700 • F 402.895.3599
www.eacg.com

March 29, 2016

Laurie Carrette, c/o Papio NRD
HDR Inc.
1120 N. 103rd Plaza
Omaha NE. 68114

RE: Proposal for Professional Services
Survey Services – Dam Site ZB-2
E&A Project Number #P2016.177.001

Dear Laurie,
Thank you for providing E & A Consulting Group, Inc. ("E&A") the opportunity to provide you a proposal for land surveying services. E&A will conduct all of the required office and field work to provide surveying services to you for the Dam Site ZB-2 project per the following scope:

I. **Mobilization and Project Set-up**
   a. Locate all section corners that surround the entire project.
   b. Create a working coordinate system for the entire project.

II. **Task 610 - Topography**- Ground topography to 0.10' will be used to accompany the existing Lidar data and also utilized for design on significant areas of the project for the following areas:
   a. 125' wide embankment/spillway –ground survey of entire area, including existing drainage structure and also 200' upstream and downstream of said structure.
   b. Bridge – provide creek meander topography for proposed bridge.
   c. Cross sections – survey 5 cross sections across proposed lake to validate lidar information.

Cost for Task 610 = $24,308.00

III. **Task 700 – Park Planning Topography** Task 700 Removed from Scope of Work 4/8/2016
   a. Trail – provide topography 50' each side of proposed trail centerline. Trail is approximately 2.5 miles that surrounds the project.
   b. Park – provide topography on 5 acre Neighborhood Park.

Cost for Task 700 = $13,068.00

IV. **Task 810 - Boundary/ROW**
   a. Certify a complete boundary survey over entire project.
   b. Retain title commitments and provide a Tract Survey for up to 2 property owners. Tract survey will include boundary, utilities, structures, and any easements that affect the property. Survey will be used to determine boundary for acquisition.
   c. Write legal descriptions for two acquisitions and any new easement (up to four)

Cost for Task 810 = $16,817.00

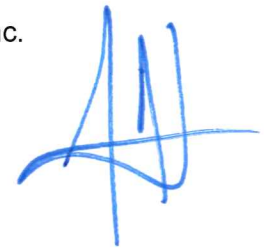
V. **Task 530 - Bore hole Location Survey at WP-5**
   a. Stake location for 22 bore holes (before and after drilling)
   b. Stake and Record data on for settlement plates at Prairie Queen Recreation Area (two trips).

Cost for Task 530 = $3707.00

Our cost based on our hourly rates to complete the above services is **$57,900.00**. Any additional requests will be charged at our normal hourly rates.

Sincerely,

E & A Consulting Group, Inc.



Jason Headley, RLS 604
Project Manager

I have received and read the above proposal for professional services. By signing, this proposal for professional services becomes the agreement and is executed.

Date: _____

Signature: _____

Name: _____

Client: _____

Address: _____

City, State, ZIP: _____

Phone: _____

Project No: P2016.177.001
Project Name: Dam Site ZB-2
Survey PM: Jason Headley
Date: 3/29/2016

Task	Task Code	Survey Crew	Survey Tech I	Survey Tech II	Survey Tech III	Survey Tech IV	RLS I	RLS II	RLS III	RLS IV	Misc.	Totals
Office Work												
Mobilization	610				4.00	4.00				4.00		$1,260.00
Topo Embankment	610				40.00	4.00				8.00		$4,632.00
Topo Bridge	610				12.00	2.00				2.00		$1,400.00
Topo Cross Sections	610				12.00	2.00				2.00		$1,400.00
Topo Park	700				16.00	4.00				4.00		$2,184.00
Topo Trail	700				16.00	4.00				4.00		$2,184.00
Boundary	810				20.00	4.00				8.00		$3,092.00
Tract Map Survey (2)	810				24.00	4.00				8.00		$3,400.00
Legals for Acquisition	810				8.00	2.00				2.00		$1,092.00
Bore Hole	530				2.00	1.00				1.00		$392.00
Settlement Plates	530				1.00	1.00				1.00		$315.00
Field Work												
Mobilization	610	20.00									20.00	$3,000.00
Topo Embankment	610	48.00										$7,200.00
Topo Bridge	610	12.00										$1,800.00
Topo Cross Sections	610	9.00										$1,350.00
Topo Park	700	18.00										$2,700.00
Topo Trail	700	40.00										$6,000.00
Boundary	810	24.00										$3,600.00
Tract map Surveys	810	20.00										$3,000.00
Legals for Acquisitions	810	10.00										$1,500.00
Bore Hole	530	10.00										$1,500.00
4 Settlement Plates	530	10.00										$1,500.00
Total Hours		221.00	0.00	0.00	155.00	32.00	0.00	0.00	0.00	44.00	20.00	472
Hourly Charge Out Rates		$150.00	$62.00	$67.00	$77.00	$88.00	$100.00	$115.00	$130.00	$150.00	$170.00	$50,001.00
Fee		$33,150.00	$0.00	$0.00	$11,935.00	$2,816.00	$0.00	$0.00	$0.00	$6,600.00	$3,400.00	$57,901.00

Fee Subtotal	$57,901.00
Expenses	$0.00
Fee Total	$57,901.00

Thiele Geotech Inc

13478 Chandler Road
Omaha, Nebraska 68138-3716
402.556.2171 Fax 402.556.7831
www.thielegeotech.com

April 1, 2016

Mr. Bryan Kumm, P.E.
HDR Engineering, Inc.
1120 North 103rd Plaza
Omaha, NE 68114

RE: PROPOSAL FOR GEOTECHNICAL EXPLORATION
ZORINSKY BASIN NUMBER 2, 204TH STREET & WEST CENTER ROAD, DOUGLAS COUNTY, NE

Dear Mr. Kumm:

Enclosed is our proposal for geotechnical exploration related to the proposed Zorinsky Basin Number 2 project to be located near the intersection of 204th Street and West Center Road in Douglas County, Nebraska. The accompanying proposal describes our approach and proposed scope of services and the estimated cost of the study.

Thiele Geotech is a service-oriented firm offering geotechnical, material, and environmental engineering. Our focus is on providing quality engineering solutions based on each individual client's needs. Our professional staff has extensive experience with similar projects, and we have the equipment and resources available to complete this study.

We look forward to working with you and your design team on this project. If you have any questions, please call. If the accompanying proposal is acceptable, please return an executed copy to our office.

Respectfully,
Thiele Geotech, Inc.

Cody Kimball, E.I.

Enclosures

R:\PROPOSAL\ZORINSKY BASIN NUMBER 2.DOCX

Geotechnical Exploration Proposal
Zorinsky Bain Number 2
204th Street & West Center Road
Douglas County, Nebraska
April 1, 2016

Thiele Geotech, Inc. is pleased to submit our proposal for geotechnical exploration related to the referenced project. The following sections detail our understanding of the project, our proposed scope of services, and the cost of the study. The Geotechnical Cost Estimate is attached in Exhibit A. This proposal will be held open for a period of 45 days from the above date.

PROJECT DESCRIPTION

Our understanding of the project is based upon information provided by HDR Engineering, Inc.

The project consists of a new dam to be constructed across Boxelder Creek south of Center Street and west of 204th Street in Douglas County, Nebraska. The dam will be constructed of compacted earth, and the principal spillway (if constructed) will be cut into the north abutment. Water impoundment will extend south of the dam.

Based on previous experience in the area, the soils on the site are expected to consist of alluvium, and Peoria loess deposits overlying older loess and till deposits.

SCOPE OF SERVICES

Our proposed geotechnical drilling and testing will consist of test borings to obtain geologic information and samples of the site soils, laboratory tests to determine the relevant engineering properties of the various soil strata, and a report of the boring logs and laboratory test data.

We understand that the current test boring scope is as follows.

- Along the embankment centerline: borings will be advanced at regular intervals into non-yielding material (glacial till or bedrock). Borings are to extend until there is 10 feet penetration into cohesive glacial till or a minimum depth of 40 feet, whichever is deeper. If bedrock is encountered, borings are to extend until auger and sampler refusal on the bedrock or until 10 feet penetration into bedrock.
- Abutment borings are to extend to a depth of 40 feet.
- Borrow areas: borings to 15 feet in reservoir area. Collect a 30-pound bulk sample of each soil type encountered in each borings. Companion borings will be drilled if necessary to obtain sufficient quantities of soil.
- CPTu's shall be advanced to refusal in accordance with ASTM D5778.
- All borings will be backfilled with cement bentonite grout slurry.
- 630 feet of auger drilling/sampling and 150 feet of CTPu is estimated.
- 100 feet of contingency boring is estimated.

The borings will be sampled at intervals of 2.5 feet in the top 10 feet and every 5 feet thereafter. All Shelby tube samples will be left in the tubes, sealed in the field, and properly transported to the lab. Samples will be extruded immediately before testing. Pocket penetrometer readings will be taken on each cohesive sample in the field. Split-spoon samples shall be obtained in sands, materials too stiff to push tubes, where

tube sample recovery is less than 6 inches, or where push tubes encounter sand. The automatic hammer is to have been calibrated within the last 12 months.

Based on the results of the test borings, a laboratory testing program will be established to evaluate the engineering properties of the various soil strata. We understand that laboratory testing may include the following tests and quantities.

- 30 Atterberg limits
- 30 grain size with hydrometer analysis
- 10 sieve analyses
- 40 moisture/density
- 60 moisture content
- 8 unconfined compressive strength
- 8 UU triaxial strength
- 2 CU triaxial strength on undisturbed samples (shipped to Geo Testing Express)
- 4 CU triaxial strength on remolded samples (shipped to Geo Testing Express)
- 6 consolidation
- 4 Standard Proctors
- 4 pinhole dispersion

A data report including all typed logs and lab test data will be provided upon completion of the lab testing. No engineering analysis is included in our scope of work.

The proposed scope of services does not include an evaluation of potential contamination on or near the site. If the environmental condition of the property is a concern, an environmental site assessment can be provided as an additional service.

ESTIMATED COST & SCHEDULE

Professional services will be billed at the unit rates listed in Exhibit A. Based on the indicated work scope, the total cost for this work is estimated at $51,065. This maximum amount will not be exceeded for the geotechnical work unless additional work is authorized.

Approximately 4 to 6 weeks from your notice to proceed will be required to complete the work. The schedule is somewhat dependent on weather, site access conditions, and other factors including the actual subsurface conditions identified in the test borings. If this proposed schedule does not meet your project requirements, we would be happy to discuss alternate schedules.

ADDITIONAL SERVICES

Subsequent to completion of the geotechnical exploration report, additional services are often required that are not included in the above estimate. These include consultation with the design team and review of the final plans and specifications. In addition, construction phase quality control testing is an additional service not included in the above estimate. An environmental assessment, if required, can also be performed as an additional service. If we are requested to provide additional services including, but not limited to the above, you will be billed in accordance with our normal fee schedule. We would be happy to provide cost estimates for any additional services at your request.

EXHIBITS

Exhibit A – Geotechnical Cost Estimate

THIELE GEOTECH, INC.

By: _____

Robert K. Lapke

13478 Chandler Road

Omaha, Nebraska 68138-3716

402/556-2171 Fax 402/556-7831

Geotechnical Cost Estimate

Exhibit A

Zorinsky Basin Number 2 **4/1/2016**
204th Street & West Center Road, Douglas County, NE

Description			Estimated Quantity	Unit Rate	Estimated Cost
Drilling					
Mobilization (Zone 1)			1.0	500.00	500.00
Exploratory Drilling (hollow stem augers) (/ft.)			730.0	15.50	11,315.00
Cone Penetrometer Testing (/ft.)			150.0	11.00	1,650.00
Staff Engineer (/hr.)	utilies & field coordination		10.0	90.00	900.00
Grouting Boreholes (/ft.)			880.0	7.00	6,160.00
Crop Damage			1.0	2,000.00	2,000.00
Trip Charge - Zone 1 (/trip)	support truck		10.0	57.00	570.00
Laboratory Analysis					
Atterberg Limits (/set)			30.0	80.00	2,400.00
Hydrometer Analysis (ea.)	with sieve		30.0	110.00	3,300.00
Sieve Analysis (ea.)			10.0	75.00	750.00
Unit Weight Test (ea.)			40.0	20.00	800.00
Moisture Content (ea.)			60.0	7.00	420.00
Unconfined Compression Test (ea.)			8.0	30.00	240.00
UU Triaxial Compression Test (ea.)			8.0	120.00	960.00
CU Triaxial Compression Test (ea.)			2.0	1,725.00	3,450.00
CU Triaxial Compression Tes		remolded	4.0	1,875.00	7,500.00
One-Dimensional Consolidation Test (ea.)			6.0	300.00	1,800.00
Standard Proctor (ea.)			4.0	160.00	640.00
Pinhole Test on undisturbed sample (ASTM D4647) (ea.)			4.0	130.00	520.00
Shipping (lump sum)	CU triax samples		1.0	500.00	500.00
Hold samples in Shelby tubes (ea.100/month)			4.0	350.00	1,400.00
Project Management					
Data Report Preparation (/hr)			20.0	110.00	2,200.00
Senior Engineer (/hr.)			5.0	170.00	850.00
CPT Analysis (per sounding)			2.0	120.00	240.00
				Total	51,065.00