

Agenda Item: 6.

MEMORANDUM

To: WP6 and WP7 Regional Detention Structures Ad-Hoc Consultant Selection Subcommittee
From: Amanda Grint, Water Resources Engineer
Date: March 31, 2015
Re: Contract for Engineering Services with FYRA Engineering

On March 5, 2015, the Subcommittee interviewed and selected FYRA Engineering (FYRA) with which to negotiate a professional services contract for the planning, permitting, and design of West Papillion Regional Basin Number 6 and West Papillion Regional Basin Number 7 (WP6 and WP7). Since that time, District staff and representatives from FYRA have worked together to prepare the enclosed detailed scope, and schedule for your review and consideration. Due to the complexity of this project, work tasks are planned to be divided into three phases. Phase 1 is presented in the attached detailed scope and provides the feasibility and preliminary conceptual design of WP6 and WP7. Scope and fees for Phase 2, permitting, final design and land rights acquisition, and Phase 3, construction administration, will be presented at a later date.

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

- Project Management will include monthly stakeholder meetings, kickoff meeting with Nebraska Department of Natural Resources and presentation of proposed concept to the Papio NRD Board.
- Water quality and Reservoir Planning will develop nutrient loading and reservoir response models. Water quality sampling is proposed in conjunction with the Nebraska Department of Environmental Quality. Additionally, in this phase it is proposed that a kick off meeting with Nebraska Game and Parks be scheduled to discuss the possibility of funding fisheries enhancements at these two locations. This section will establish parameters for the project designs.
- Preliminary project design consists mainly of hydrology and hydraulics for three dam design alternatives, fuse plug, auxiliary spillway and fixed crest. Land rights and design criteria will provide information that will be contained in a technical memorandum recommending a concept for final design.
- Project permitting will include a wetland delineation and preliminary meetings with the US Corps of Engineers and other federal and state agencies to receive feedback on proposed project design.

A proposed detailed scope of work, cost estimate and schedule are attached. FYRA would provide the professional services for Phase 1 of the WP6 and WP7 projects on an hourly basis not to exceed the amount of \$265,245.

Management recommends that the Subcommittee recommend to the Board that the General Manager be authorized to execute a Professional Services Agreement with FYRA Engineering for Phase 1 of the WP6 and WP7 projects in an amount not to exceed \$265,245, subject to changes deemed necessary by the General Manager and approval as to form by District Legal Counsel.

Attachment 1 to Exhibit A

1 PROJECT MANAGEMENT

1.1 Stakeholder Coordination Meetings

Preparation for and attendance of up to four (4) meetings with the Papio-Missouri River Natural Resources District (P-MRNRD), City of Papillion, Sarpy County and any other stakeholders deemed necessary for the project or particular coordination meeting. Coordination meetings will occur monthly to discuss design progress. Meeting minutes and project task lists will be prepared by FYRA and distributed after each meeting.

1.2 Monthly Invoicing & Project/Schedule Updates

Preparation of monthly project invoices, incorporation of sub-consultant invoices and a summary of work completed during the invoicing period. Invoices will be sent to the P-MRNRD prior to the first of the month. Updates will include budget and schedule tracking.

1.3 NRD Board of Directors Update

Preparation for and attendance of one meeting with the P-MRNRD Board of Directors at their regularly scheduled meeting to make presentation discussing design progress.

1.4 Development Coordination Meetings

Preparation for and attendance of up to four (4) meetings with the developers actively planning development around the two reservoirs. The purpose of the meetings are to coordinate any utility/transportation corridor design, assess grading synergies, and any other pertinent information. Meeting minutes and project task lists will be prepared by FYRA and distributed after each meeting.

1.5 NDNR Kickoff meeting

Preparation for and attendance of kickoff meeting with the Dam Safety Division of the Nebraska Department of Natural Resources. The purpose of the meeting is to discuss the dam type, size location, design criteria, deliverables, etc. to obtain a permit to impound water and construct a dam. Meeting minutes and project task lists will be prepared by FYRA and distributed after each meeting.

2 WATER QUALITY / RESERVOIR PLANNING

2.1 Calculate Sediment/Nutrient Loadings to Reservoirs



Maximizing the use of available information, generate reservoir loadings for existing, transitioning and future land uses in the watershed to properly assess the storage needed for the reservoir during its lifetime.

2.2 Develop Reservoir Response (Mass Balance) Model

Develop a numerical model to predict reservoir responses to eutrophication and continued nutrient loading. The model will be used to predict reservoir life and water quality under several elevation/storage levels.

2.3 Reservoir Sustainability Assessment

Considering all the factors that determine water quantity and quality factors, determine useful reservoir life for up to four elevations for each dam site.

2.4 Water Quality Sampling

Perform grab samples during six runoff events at one location on each primary tributary. Water quality parameters include total suspended solids, suspended sediment concentration, total phosphorous, kjeldahl nitrogen, nitrate-nitrite nitrogen, atrazine, alachlor, metolachlor, and E.coli bacteria.

2.5 Reservoir Grading – Development Earthwork Balance

Work with development liaisons to identify and quantify potential synergies in surrounding development grading plans. The goal would be to allow developers to borrow from the pool areas to create depth diversity or additional reservoir storage where it would be beneficial.

2.6 Conceptual Design – Water Quality Basins

If deemed necessary, identify locations and potential configurations for water quality basins at the head of the reservoirs.

2.7 Fishery Enhancement Coordination / Concept Plans

Work with NGPC to identify a "wish list" for fishery enhancements for each reservoir and determine the potential funding levels available through applicable grants and funding avenues.

2.8 Develop Reservoir Design TM

Prepare technical memorandum detailing all of the design factors considered in the design of the reservoir at each dam site.

3 PRELIMINARY PROJECT DESIGN

3.1 Develop Inflow Hydrographs

Using the most recent rainfall information, develop a hydrologic model to generate inflow design hydrographs for the three design storms (PSH, SDH, FBH), including both 100-year and 500-year frequency storms for the principal spillway hydrograph storms.

3.2 Develop Stage-Storage-Discharge Curves

For all alternatives to be considered, develop pertinent stage-storage reservoir data for hydraulic routings. For non-typical spillway configurations, develop stage-discharge curves for spillway alternatives.

3.3 Perform Reservoir Routings

Using SITES software or custom spreadsheet routing tool, perform reservoir routings to determine dam control elevations for all alternatives considered. Three dam configurations at each site with possible multiple permanent pool elevations are possible.

3.4 Conceptual Dam Layouts

Prepare plan view layouts and sample profiles for up to six dam configurations as determined by the hydraulic routings performed at each site. Layouts will be used to generate earthwork quantities and land rights requirements.

3.5 Transportation/Utility Infrastructure Conceptual Design

Prepare conceptual plans to address any conflicts with adjacent transportation or utility corridors. Design to be complete enough to get "buy off" by affected entity.

3.6 Develop Preliminary Land Rights Maps

Based on dam layout and control elevations that determine permanent and flood pool elevations, prepare a preliminary land rights map to determine land acquisition boundaries and costs.

3.7 Develop Recreational Master Plan(s)

Using public input provided by P-MRNRD from WP-5 recreational planning process and input from City of Papillion and Sarpy County during monthly stakeholder coordination meetings, prepare recreational master plans for each site (or one map that addresses both sites) with any details required to develop preliminary costs and get stakeholder "buy in." The Plans should address regional trail connections and other interconnectivity with the surrounding developments.

3.8 Develop Conceptual Costs / Project Economics

Using information obtained in preliminary design tasks, prepare a conceptual level opinion of costs for all work associated with the project. Based on project costs, assess project economics including the collective benefits (flood reduction, recreation, water quality, etc.) required to meet Water Sustainability Fund requirements.

3.9 Prepare Preliminary Design TM

Document all design processes, data, and costs generated in the preliminary design phase and prepare recommendation for final design.

4 PERMITTING

4.1 Wetland Delineation

Wetland delineation of both project sites and Ordinary High Water Mark (OHWM) determination on all sites. This includes field work and the preparation of all documents required for wetland delineation and OHWM determinations. This also includes the preparation of one (1) final report outlining all of the project findings which will be included with the permit applications for all sites.

4.2 Initial Consultation with NGPC, NeSHPO and Other Agencies

Prepare initial consultation letters with all agencies required by permitting or funding requirements.

4.3 Coordination Meetings with USACE Regulatory

Using wetland delineation and project impacts of preliminary design, prepare for, conduct and document both initial consultation (kickoff) meeting with USACE Regulatory regarding the 404 permit and alternatives analysis required during final design and preliminary screening meeting upon completion of preliminary design.

Project Schedule MILESTONE CHART

2015





Exhibit C - Attachment 1
Dam Sites WP 6&7 Preliminary Design
 Papio-Missouri River Natural Resources District
 Sarpy County, NE
 FYRA Project No. 001-14-03

Tasks ¹	FYRA Engineering						LakeTech		FHU Consulting			Vireo			E&A Consulting Group							Expenses	Total	
	Prj Manager	Sr Scientist	Prj Engineer	Prj Engineer	EI	Clerical	Sr. Scientist	Scientist	Principal I	Env Sci V	Env Sci III	Principal	Proj. LA	LA Assist	Proj Mgr	EngVIII	Eng II	Structural	SvyMgr	Tech	Sparty			
	Sotak	Holz	Gregalunas	McCreedy	Dayton	Bosley	Brakhage	Mohr	Zlotzky	Baumert	Jurzenski	Ciaccio	Bentley	Fordyce	Westergard	Walter	Zipperlin	Ficenec	Headley	Stoll	Morton			
Project Management																								
Stakeholder Coordination Meetings (4) ²	48					8	24		24			12	12		24									
Monthly Invoicing & Project/Schedule Updates (4 months)	4					8	4		4				4		4									
NRD Board of Directors Update (1)	6											3	3											
Development Coordination Meetings (4)	32											8	8		32									
NDNR Kickoff Meeting	8		4																					
Project Management Task Total	\$18,130	\$0	\$440	\$0	\$0	\$1,040	\$3,080	\$0	\$4,760	\$0	\$0	\$3,450	\$3,105	\$0	\$10,800	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$44,805
Water Quality / Reservoir Planning																								
Calculate Sediment/Nutrient Loading to Reservoirs	6					32																		
Develop Reservoir Response (Mass Balance) Model		48				24																		
Reservoir Sustainability Assessment (4 Elevs Each Site)	12			40	20																			
Water Quality Sampling ³							29	48															\$1,500	
Reservoir Grading - Development Earthwork Balance	8			30								2	8		4	20	40		4	8	16			
Conceptual Design - Water Quality Basins	10	20		40			10					2	12		4	20	40							
Fishery Enhancement Coordination / Concept Plans	4	8		24								2	8											
Develop Reservoir Design TM	16	16				20	10																	
Water Quality / Reservoir Planning Task Total	\$10,360	\$16,560	\$0	\$12,730	\$6,460	\$1,300	\$5,390	\$4,320	\$0	\$0	\$0	\$900	\$3,220	\$0	\$1,440	\$6,000	\$6,800	\$0	\$580	\$600	\$16	\$1,500	\$78,176	
Preliminary Project Design																								
Develop Inflow Hydrographs (Q100 PSH, Q500 PSH, SDH, FBH)	6		20	40																				
Develop Stage-Storage Discharge Curves (Fuse, AS, Fixed Crest)	6			24																				
Perform Reservoir Routings	4			40																				
Conceptual Dam Layouts (6 Total)	48			96											2	20	50	6						
Transportation/Utility Infrastructure Conceptual Design	8														2	20	40							
Develop Preliminary Land Rights Maps	4				30																			
Prepare Recreational Master Plan(s)												40	80	48										
Develop Conceptual Costs / Project Economics	30		40	20								2	12		2	8	4	6						
Prepare Preliminary Design TM	60						10					2	10		2									
Preliminary Project Design Task Total	\$30,710	\$0	\$6,600	\$20,900	\$2,550	\$0	\$1,100	\$0	\$0	\$0	\$0	\$6,600	\$11,730	\$3,840	\$1,440	\$7,200	\$7,990	\$1,800	\$0	\$0	\$0	\$0	\$102,460	
Project Permitting																								
Wetland Delineation								32		60	100													
Initial Consultation with NGPC, NeSHPO and Other Agencies									2		40													
Coordination Meetings with USACE Regulatory	4								32		32													
Permitting Task Total	\$740	\$0	\$0	\$0	\$0	\$0	\$0	\$2,880	\$5,780	\$8,400	\$19,780	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$37,580	
Subtotal Hours	324	92	64	354	106	36	87	80	62	60	172	73	157	48	76	88	174	12	4	8	16	\$0	\$37,580	
Subtotal Costs	\$59,940	\$16,560	\$7,040	\$33,630	\$9,010	\$2,340	\$9,570	\$7,200	\$10,540	\$8,400	\$19,780	\$10,950	\$18,055	\$3,840	\$13,680	\$13,200	\$14,790	\$1,800	\$580	\$600	\$2,240	\$1,500	\$265,245	

¹ All tasks performed for both Sites WP6 and WP7, unless otherwise stated
² Assumes monthly meetings for project time span of four months
³ TSS, Nutrients, Bacteria, Pesticides