

## **EXHIBIT A**

### **Scope of Work**

**GRANTEE and FISCAL AGENT (if different) – The Greenway Foundation**

**PROJECT NAME - South Platte River Recreation and Habitat Improvement Preliminary Design**

**GRANT AMOUNT – \$250,000**

#### **INTRODUCTION AND BACKGROUND**

In 2008, The Greenway Foundation (TGF) and the City and County of Denver (Denver) initiated a planning and implementation effort to establish a vision for a healthy and prosperous South Platte River through Denver. The River North Greenway Master Plan (RINO) was completed in March 2009, focusing on recreation and habitat improvements within the three mile reach of the South Platte River between 20th St. and the Denver/Adams County Boundary. Immediately thereafter, the River South Greenway Master Plan (RISO) was initiated and focused on the seven miles of South Platte River habitat and recreation improvements upstream of RINO between 20th St., upstream to the Denver/Arapahoe County Boundary. In 2010, TGF developed the South Platte River Vision Implementation Plan (RVIP) to prioritize all of the recommendations within RINO and RISO in to a series of short, mid and long term recommendations as well as develop cost opinions for the five short term RVIP priority projects.

This project will progress the development of prioritized recreation and habitat improvements identified over the last three years. Specifically, WSRA funding will be used to establish design criteria, prepare preliminary design drawings and specifications and identify required permits for river improvements in the following reaches described in the South Platte RVIP: Grant Frontier Park and Overland Regional Park reach, and the Vanderbilt and Johnson-Habitat Park reach. Improvements target non-consumptive needs including boating, tubing, fishing and wildlife enhancements in this urban environment.

The project includes design development of pool and riffle habitat and recreation opportunities, bank stabilization and additional riparian habitat. By decreasing the side slopes along the river, new wetland and riparian habitats will be created with self sustaining native vegetation. In addition to providing recreation and habitat benefits, these areas will be designed to help treat urban stormwater runoff from adjacent neighborhoods that previously discharged directly into the South Platte River.

#### **OBJECTIVES**

The overall project objective is to improve the limited river access and recreation opportunities, improve the river's wildlife habitat and provide a water quality benefit in these reaches. Improvements in these two reaches include multi-use river access facilities, channel bank modifications to provide additional habitat, and modification of existing drop structures to

provide state-of-the-art boating and fishing experiences. Specific objectives of this preliminary design project include the following:

- promote collaboration between the Metro and South Platte Basin Roundtables through the kickoff meeting and project workshop
- obtain topographic and planimetric survey information of the channel within the project reach
- Obtain geotechnical information for design of structural improvements (foundation recommendations, soil bearing strength, etc.)
- establish design criteria and develop preliminary design report
- prepare preliminary design drawings and specifications
- identify required permits for river improvements

## **TASKS**

The following provides a detailed description of each task associated with South Platte River Recreation and Habitat Improvement Preliminary Design

### **TASK 1 – Project Management and Meetings**

#### Description of Task

This task includes project management activities and meeting/workshop facilitation required to meet the project intent.

#### Method/Procedure

Upon Notice to Proceed, the project team will initiate preparation of a Project Management Plan (PMP) to detail the project approach, quality management procedures, design change notice and log, contact list, communication protocols, budget, and schedule for the project. The PMP will define project tracking using a variety of tools including a Project Risk Register, constructability review and conflict resolution. The PMP will also include the detailed scope, schedule including key milestones and deliverables, project team, and budget. As part of the PMP, the team will work with the stakeholders to define expectations including required input on the channel design features and the deliverables including plans and specifications. The PMP will also include a summary of anticipated coordination between stakeholders and permitting agencies. The final section of the PMP will address quality assurance and quality control, including names of technical reviewers and technical review milestones. The PMP is anticipated to contain the following sections:

#### 1.0 Summary of Work and Schedule

- a. Scope of work
- b. Stakeholder expectations
- c. Budget
- d. Schedule with tasks, meetings, milestones and delivery dates

#### 2.0 Project Team

- a. Team structure, including subconsultants
- b. Team contact list

### 3.0 Communications and Document Management

- a. Meeting schedule
- b. Regulatory requirements
- c. Outside agency coordination
- d. Communications protocol
- e. Project file index and directory structure

### 4.0 Quality Management

- a. QA/QC Plan
- b. Project team responsibilities
- c. Constructability review
- d. Project risk register
- e. Conflict resolution
- f. Design changes and acceptance

A detailed project schedule will be developed and updated on an as needed basis to reflect any substantive changes in the plan.

The team will provide monthly progress reports which will accompany invoices and include task status, critical decisions, planned activities, an updated schedule and changes to the PMP.

The team will maintain a project eRoom to facilitate scheduling, project documents, and related coordination. Members will be added to the e-Room at the stakeholders' request. The team will hold biweekly internal conference calls to update project progress, schedule, and specific design issues. Summaries from these meetings will be posted to the eRoom.

The team will submit monthly invoices for review and approval. Invoices will include the monthly progress report and a schedule update.

#### Deliverable

- Project Management Plan
- eRoom start-up and maintenance
- Monthly progress reports
- Bi-weekly progress meetings and summaries

### **TASK 2 – Data Acquisition**

#### Description of Task

The work associated with this task includes collection of existing information required to develop a constructible preliminary design that meets the intent of this project.

#### Method/Procedure

The Team will conduct/participate in a project kick-off meeting with stakeholders. The kick-off meeting will address the following:

- Project and scope overview
- Schedule
- Communications procedures
- Review of information currently available
- Requests for Additional Information
- Goals and expectations

The kick-off meeting will include a visit to the project site by The Team and interested stakeholders to assess and confirm site conditions and further identify project issues.

The Team will obtain information regarding the project and project site, as available. The Team will contact Denver City staff and Urban Drainage and Flood Control District to identify the existence of current aerial photography, a Flood Hazard Area Delineation (FHAD), Systems Outfall Planning Study, and updated hydrologic information and/or hydraulic modeling. The Team will review all information obtained and incorporate pertinent data into the project on an as-needed basis.

The Team's land surveyor will obtain topographic, planimetric and utility surveys of the project area. Project site mapping (Channel corridor) will include a topographic survey accurate to 0.25-foot and the development of 0.5-foot contour topography using NAVD88-92 vertical datum. Surveyor will identify tributary drainage facilities including storm drain and culvert inverts. Project area topographic mapping will be developed so that the data can be used in AutoCAD 3D 2007/2008 software to cut cross-sections and analyze project volumetrics. Planimetric mapping will include all surface features including the identification of adjacent property boundaries, easements or rights-of-way that may be affected by the proposed work. The utility survey will include subsurface, surface and overhead utility structures in the vicinity of the existing channel that could be affected by the proposed construction, initially using record drawings from Utilities and Agencies. Major utility crossings that may be affected by proposed improvements will be visually located using either invasive or non-invasive means, depending on the risk associated with excavation near the utility.

The Team's land surveyor will establish project benchmarks tied to permanent land survey system monuments that will be utilized throughout the project to locate existing and proposed facilities.

The Team's land surveyor will identify storm drain invert elevations at up to 20 locations in the project area tributary watershed. Where major utilities are identified (water transmission, sewer or high-pressure gas interceptor pipelines and fiber optic or other communication conduit bundles) the Team will visually locate the horizontal and vertical location of the crossing through potholing or other means, as necessary. For budgeting purposes, the Team has assumed that up to ten crossing will be located in this way using up-to two (2) potholes each.

The Team's geotechnical consultant will obtain necessary information to develop a design for the improvements, describe the field exploration, testing and analysis of the settlement under the design loading conditions. The goal of the geotechnical design is to limit non-uniform settlement of the improvements, and provide recommendations required for design and construction

including structural foundation recommendations, concrete mix recommendations, and soil bearing strengths.

The Team's geotechnical consultant will complete geotechnical borings to determine the geologic condition and groundwater regime beneath the channel and at locations of interests (drop structures). Ground water levels will be noted at each borehole. It is anticipated the 10 borings will be completed to an average depth of approximately 20 feet or until 10 feet of firm, competent material is encountered, whichever is deeper. The borings will be completed using a drill rig supplied and operated by a local drilling company. An engineer or geologist will observe the drilling, obtain samples, and prepare a descriptive field log of each exploration.

Samples obtained from the exploration program will be tested to determine pertinent index and engineering properties. The laboratory tests may include moisture content, moisture/density relationship, grain size distribution, Atterberg limit determination, swell tests, and laboratory resistivity tests. Chemical testing will be performed to assess corrosion potential and the possible existence of hazardous materials.

The Team will evaluate general geotechnical and groundwater conditions along the channel based on the results of the subsurface exploration program and field and laboratory testing. The Team will prepare a geotechnical report signed by a professional engineer registered in the State of Colorado. Information presented in the report will include: boring logs; laboratory test results; a discussion of subsurface conditions; the anticipated location of the groundwater table as it may affect the project; geologic hazards; geotechnical parameters for use in the design; geotechnical construction considerations and recommendations for bedding material, suitability of reusing on site materials as fill, and backfill recommendations.

#### Deliverable

- the Team will provide a kick-off meeting and site visit summary.
- a summary of existing data obtained will be incorporated as background information in the Preliminary Design Report.
- the Team will provide project base mapping developed in this task.
- project mapping will be included in the Final Preliminary Design Report
- geotechnical related design considerations will be included in the Preliminary Design Report

### **TASK 3 – Site Planning**

#### Description of Task

This task consists of analysis and outreach required to develop a constructible design, including development of stakeholder consensus regarding improvements, hydraulic modeling, and regulatory outreach to identify potential permits that may be required to construct the improvements.

#### Method/Procedure

The Team will perform site planning activities that will confirm preferred channel improvements utilizing existing hydrology and updated hydraulic analyses. Existing and proposed conditions flow characteristics within the project reach will be evaluated. The Team will utilize this site-specific information to refine conceptual channel improvements. The Team will utilize HEC-RAS and modify the effective hydraulic model to predict hydraulic characteristics of the improvements. The Team is assuming that one-dimensional, steady-state modeling will be sufficient for assessing existing and proposed conditions, but will be prepared to conduct dynamic modeling if required.

The Team will facilitate a meeting with stakeholders to review and refine the proposed channel improvements.

The Team will identify necessary regulatory approval for implementation of the proposed channel improvements. This task will include initial contact with relevant regulatory agencies, as necessary, to identify submittal and permit application requirements, permit and submittal review schedules and application and submittal fees, if any. Permits, agreements and approvals for the channel will be required from several local, state and federal agencies as described below.

The South Platte River is considered Waters of the U.S. and, therefore, subject to the permitting requirements contained in Sections 401 and 404 of the Clean Water Act as administered by the USACE. The Team will conduct an on-site pre-application conference with representatives of the USACE Tri-Lakes District Office to assess site conditions and identify 404 Permit application requirements. The Team assumes that an Individual 404 Permit will be required. The Team will perform a jurisdictional wetland delineation, habitat and threatened and endangered species survey to include in a Preliminary Design Report.

Investigation of the presence and location of existing utilities will be required. The Team is assuming that pressure and/or gravity pipelines may be present and may require crossing agreements to be obtained from the utility owners. In addition, construction access and other agreements may be needed from adjacent property owners. The team will assist with identifying required agreements with adjacent property owners.

The Team will summarize the results of Tasks 1 through 3 in a Draft Preliminary Design Report (PDR). The PDR will include modeling results, permitting requirements and critical path permits, constructability review, recommended design standards, and geotechnical recommendations. An electronic copy (PDF) of the Draft PDR will be uploaded to the eRoom. The Team will attend a meeting with stakeholders to discuss comments on the Draft PDR prior to finalization. The Team will finalize the PDR by addressing comments received in the draft PDR review meeting. The final PDR will also be posted to the eRoom (in PDF format).

#### Deliverable

- Proposed Conditions HEC-RAS analysis using range of flows
- Hardcopy and electronic file model input and output data will be included in the Preliminary Design Report
- Proposed Improvement Workshop
- Preliminary Design Report Review Workshop

- Workshop documentation

## **TASK 4 – Preliminary Design**

### Description of Task

This task includes development of preliminary design drawings and draft specifications.

### Method/Procedure

The Team will develop preliminary design drawings that will be taken to a 30 percent design level of completion. These pre-design drawings will be included in the Final Preliminary Design Report.

The intent of the 30 percent deliverable is to set-up the plan and profile sheets, and provide typical details for structures and improvements; not all site-specific details will be included in the drawings. Preliminary Design drawings will be developed for the following improvements:

#### A. Preliminary Design of Grant – Frontier Park to accommodate:

- Laying back of river banks
- Creation of larger emergent bench to accommodate wetland filtration basins
- Wetlands design
- Fishing access design
- Boat launch with fish habitat design
- Trail and boardwalk design
- Revegetation and riparian habitat restoration

All existing active recreation features would remain, for example the playground, Greenway Trail and parking.

#### B. Preliminary Design of Pasquinel’s Landing Park to accommodate:

- The creation of a backwater pond
- Laying back of river banks
- Creation of larger emergent bench to accommodate wetland filtration basins
- Wetlands design
- Boat launch with fish habitat design
- Fishing access design
- Trail design (relocation of Greenway Trail)
- Revegetation and riparian habitat restoration

All existing active recreation features would remain, for example the playground.

#### C. Preliminary design of the River access and boat launch just south of West Florida

Avenue.

- D. Preliminary design of riparian habitat along the River from West Dartmouth Avenue to West Florida Avenue.
- E. Preliminary design of fish habitat adjacent to river banks for both game fish and high planes fish.

Deliverable

- Preliminary and Final PDR PDFs, including 30 percent complete design drawings and a list of required technical specifications included in the Final PDR.

**REPORTING AND FINAL DELIVERABLE**

Reporting: The applicant will provide the CWCB a progress report every 6 months, beginning from the date of the executed contract. The progress report will describe the completion or partial completion of the tasks identified in the statement of work including a description of any major issues that have occurred and any corrective action taken to address these issues.

Final Deliverable: At completion of the project, the applicant will provide the CWCB a final Preliminary Design Report that summarizes the project and documents how the project was completed. This report may contain photographs, summaries of meetings and engineering reports/designs.



**Budget & Timeline Table**

Task	Description	Target Start Date	Target Completion Date	CWCB Funds	Other Funding Cash*	Total
1	Project Management and Meetings	1/2/2012	6/28/2013	\$35,490		35,490
2	Data Acquisition	1/2/2012	3/30/2012	\$41,760		41,760
3	Site Planning	3/4/2012	6/29/2012	\$77,430		77,430
4	Preliminary Design	6/4/2012	6/3/2013	\$95,320		95,320
	<b>TOTALS</b>			<b>\$250,000</b>	<b>\$1,700,000</b>	<b>1,950,000</b>

\*On October 18, 2011, The Colorado Natural Resource Trustees awarded \$1.7 million to aid in the restoration of the South Platte River.

These funds will be available to construct the habitat improvements included in this CWCB scope of work. Additional funding sources are also being aggressively pursued.