

Proposed Task Orders
The Flatwater Group

Task No.	Description	Cost
5	Augmentation Study	\$ 40,000.00
6	Computer Code Revision for Quick Response Wells	\$ 10,000.00
7	Summarize Conservation Measures	\$ 20,000.00
8	Explore and prepare for Rainfall/Runoff model	\$ 45,000.00
9	Explore and prepare for Surface Water Operations model	\$ 45,000.00
Total		\$ 160,000.00

**Task Order 5
To
Consulting Agreement Between
The Nebraska Department of Natural Resources
And
The Flatwater Group, Inc.
(DNR Contract 03-04)**

The Flatwater Group, Inc. (TFG) has been assigned Task Order 5 by the Department to evaluate the availability and feasibility of using imported water for release to the Republican River. Completion of this task order will provide the Department with conceptual level feasibility of developing water projects downstream of Harlan County Reservoir to augment streamflow. The work product will consist of estimates in acre-ft of available water, analyses of timing of flows to maximize water use, cost per acre-ft comparisons to other water programs in the basin, identification of constraints and associated conceptual level costs for design and construction using present worth analysis. This work would be meant to supplement and not duplicate ongoing BOR evaluations of Lower Basin water supply. The focus will be on providing Nebraska options for offsetting uses in water short years and storing water in years where there is full water supply.

We anticipate four primary activities. These include:

- Importing water from the Little Blue Basin by leasing or purchasing existing wells, developing new well fields or a combination of both. This water could be stored in a reservoir for timed release or transported downstream directly.
- Install river pump(s) to capture rivers gains (and/or imported water coming into the river) below the Courtland Canal diversion and pumping this water up and into the Courtland Canal. This structure(s) may need to consider the priority date of instream flow requirements set by Kansas.
- Construct reservoirs to collect and deliver water at specific times to the river. These reservoirs could hold imported water, pumped groundwater, and capture flood flows. This task would look at facilities upstream and downstream of the Courtland Diversion.
- Document findings in a technical memorandum to the Department.

We anticipate using available data and information with limited field work. Some reconnaissance level evaluation of field conditions for siting of potential structures would be required. We would also anticipate working closely with the department personnel in using available GIS and database information. TFG will coordinate activities with subcontractors and with assigned Department personnel. This task could be complete in 3-4 months.

Estimated contract amounts are listed below:

TFG	\$25,000
HDR (subcontractor)	<u>\$15,000</u>
Contract Total	\$40,000

THE FLATWATER GROUP, INC.
"PROJECT CONSULTANT"

BY: Thomas E Riley

DATE: 16 May 2007

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DEPARTMENT OF
NATURAL RESOURCES

BY: _____

DATE: _____

NAME: Ann Bleed
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**Task Order 6
To
Consulting Agreement Between
The Nebraska Department of Natural Resources
And
The Flatwater Group, Inc.
(DNR Contract 03-04)**

The Flatwater Group, Inc. (TFG) has been assigned Task Order 6 by the Department to assist with revising the current applied irrigation water distribution routine used in the creation of the input data sets for the Republican River Settlement Model. The current distribution routine assigns a single average depth of application per county per irrigation type class (ground water exclusive, surface water exclusive, commingled ground water, and commingled surface water). The revised routine will allow for the establishment of two averages per county per irrigation type class: one average the irrigated acreage inside the quick response area (or similar type of geographically defined management area), and one for irrigated acreage outside of the quick response area (or other management area).

Primary activities for this task include:

- Revision of existing computer code
- Testing of revised code
- Documentation of computer code revisions

The cost estimate below is based on keeping the revised routines in the same Microsoft Access/VBA environment which the existing routine currently operates.

Estimated contract amounts are listed below:

TFG	<u>\$10,000</u>
Contract Total	<u>\$10,000</u>

**THE FLATWATER GROUP, INC.
"PROJECT CONSULTANT"**

BY: *Marc Groff*

DATE: 5/16/2007

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**Task Order 7
To
Consulting Agreement Between
The Nebraska Department of Natural Resources
And
The Flatwater Group, Inc.
(DNR Contract 03-04)**

The Flatwater Group, Inc. (TFG) has been assigned Task Order 7 by the Department to assist with activities related to accounting for the effects of conservation measures as required in the current version of the Groundwater Management and Protection Act (refer to Section 46-715, paragraph 4c for example language of the requirement).

The primary focus of TFG's efforts conducted under this task order are to assist the Department with identifying existing sources of information related to the timing, type, and quantity of conservation measure adoption within the Republican River basin. It is anticipated that primarily DNR staff will be used to collect the actual information. TFG will assist with organizing, developing presentation formats, and using the collected information in the course of evaluating potential effects from these conservation measures.

Primary activities for this task include:

- Development of a technical memorandum identifying existing sources of conservation practice information known to TFG.
- Assistance as requested with the collection, organization, and presentation of conservation practice information.
- Assistance as requested with evaluating the effects from these conservation measures. This evaluation may include determining the appropriateness and/or the use of various watershed hydrology tools and models to represent conservation measure effects.

The actual effort required for this task will be subject to the actual amount and format of available conservation practice information. The contract amount listed below represents an initial estimate of effort based on our previous work experience in the basin. The amount below may need to be amended as additional information becomes available during the course of this task.

Estimated contract amounts are listed below:

TFG	<u>\$20,000</u>
Contract Total	\$20,000

**THE FLATWATER GROUP, INC.
"PROJECT CONSULTANT"**

BY: *Marc Groff*

DATE: 9/16/2004

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**Task Order 8
To
Consulting Agreement Between
The Nebraska Department of Natural Resources
And
The Flatwater Group, Inc.
(DNR Contract 03-04)**

The Flatwater Group, Inc. (TFG) has been assigned Task Order 8 by the Department to assist with activities related to developing a watershed runoff model for the Republican River basin. Such a model is a necessary and valuable tool for understanding, addressing, and communicating the complex and geographically varied relationships between precipitation, runoff, and streamflow.

Under this task order, TFG will work with the Department on identifying key operational components of the runoff model and connectivity issues with other models used in the basin (e.g. the Republican River Groundwater Model, or a potential surface water operations model) in the process of identifying appropriate models for potential use. The initial product of this task order will be a document that presents the following:

- A list of criteria for model selection
- A recommended model to use
- An estimated level of effort for development of a runoff model for the Republican River Basin using the selected model. During the course of the development of this document, a decision will be made as to whether the actual construction of the model will be conducted by DNR staff, an outside consultant, or a combination of both.

Following completion of this document, TFG will assist with initial model development and oversight to the degree requested. The actual effort required for this task will be subject to the final conclusions of the developed document. The contract amount listed below represents an initial estimate of effort based on our previous work experience with this type of project. The amount below may need to be amended as decisions are made during the course of this task.

Estimated contract amounts are listed below:

TFG	\$45,000
Contract Total	\$45,000

**THE FLATWATER GROUP, INC.
"PROJECT CONSULTANT"**

BY: Marc Groff

DATE: 5/16/2007

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**Task Order 9
To
Consulting Agreement Between
The Nebraska Department of Natural Resources
And
The Flatwater Group, Inc.
(DNR Contract 03-04)**

The Flatwater Group, Inc. (TFG) has been assigned Task Order 9 by the Department to assist with activities related to developing a surface water operations model for the Republican River basin. Such a model is a necessary and valuable tool for evaluating how operational changes related to the usage of stored water may benefit Nebraska in terms of compliance with the Republican River compact. An operations model would also allow tracking of potential water accounts (e.g. natural flow water, imported mound water, etc.) through the surface water distribution system.

Under this task order, TFG will work with the Department on identifying key operational components of the operations model and connectivity issues with other models used in the basin (e.g. the Republican River Groundwater Model, or a potential watershed runoff model) in the process of identifying appropriate models for potential use. The initial product of this task order will be a document that presents the following:

- A list of criteria for model selection
- A recommended model to use
- An estimated level of effort for development of a runoff model for the Republican River Basin using the selected model. During the course of the development of this document, a decision will be made as to whether the actual construction of the model will be conducted by DNR staff, an outside consultant, or a combination of both.

Following completion of this document, TFG will assist with initial model development and oversight to the degree requested. The actual effort required for this task will be subject to the final conclusions of the developed document. The contract amount listed below represents an initial estimate of effort based on our previous work experience with this type of project. The amount below may need to be amended as decisions are made during the course of this task.

Estimated contract amounts are listed below:

TFG	<u>\$45,000</u>
Contract Total	<u>\$45,000</u>

**THE FLATWATER GROUP, INC.
"PROJECT CONSULTANT"**

BY: *Marc Groff*
DATE: 5/16/2007

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