EXHIBIT B

SCOPE OF WORK

Task Overview

We envision three major data acquisition tasks and one data delivery task will be required to conduct this project. In the first task, we will capture log assets that have already been located and scanned in available public-domain datasets. These will require the least effort and will serve to prioritize areas with data gaps for the more labor-intensive tasks. The second major task will be to determine geographic locations for unscanned logs, select logs for scanning based on location, depth range, and log type, and scan the selected logs. We anticipate that this task will be the most challenging, require the most effort, and ultimately may struggle to achieve the desired number of scanned logs mentioned in the TWDB request owing to limited project duration and unknown ultimate geographic extent. Once the first task is complete and the size of the scanning project is known, TWDB and project staff will meet to discuss the best approach to maximize the number of logs to be scanned and delivered and prioritize geographic coverage.

The third task will be to populate the TWDB-designed Access database with the desired log attributes. The final task will be to report results and deliver the scanned logs and populated Access database.

Task 1. Capture existing scanned logs from public-domain databases

The purpose of Task 1 is to gather accessible public-domain geophysical logs that have already been located and scanned and are already in major databases such as the Bureau's IGOR (Integrated Core and Log Database) or the TCEQ/BEG Surface Casing Estimator.

Subtask 1-1. Establish location and depth range criteria to identify eligible well logs.
TWDB staff have stipulated that there be a well density of one log per 2.5-minute quadrangle and that preference be given to wells with locational information, top log depths of 200 ft or shallower, and a log suite that includes an induction or resistivity log that would be used to interpret groundwater salinity. These parameters may be subject to adjustment depending on log availability, vintage, and geographic distribution, in consultation with TWDB staff.

Table 1. Task 1 estimated staff effort: capturing existing scanned logs.

Staff	Role	Estimated Effort (months)
J. Paine	Manage task, develop log selection criteria, identify non-BEG databases	.33
D. Ortuno	Facilitate log identification and delivery of scanned logs from BEG's IGOR database	.50
E. Collins	Identify and provide scanned TCEQ/BEG surface casing logs	.75
A. Averett	Manage GIS queries and database import/export from IGOR and Surface Casing Estimator databases	.50

Table 2. Estimated duration of tasks 1, 2, 3, and 4. Total project duration is assumed to be eight months, beginning on January 1, 2011 and ending on August 31, 2011.

Task	1	2	3	4	5	6	7	8
1	X	X						
2			X	X	X	X		
3	X	X	X	X	X	X	X	X
4								X

Subtask 1-2. Capture all located and scanned logs that fit the TWDB criteria
Logs that will require the least effort to capture are those that have already been located, scanned, and cataloged in the IGOR database hosted at the Bureau's Geophysical Log Facility. This database contains more than 300,000 geophysical logs, most of which have been provided by the RRC from October 1985 to present. Logs that fit the selection criteria and have already been scanned will be captured in this task. Another initial source for logs in select counties will be the BEG/TCEQ Surface Casing Estimator database (www.beg.utexas.edu/tceq/index.html and www.tceq.state.tx.us/nav/permits/surface_casing.html), which contains scanned images of shallow-depth resistivity logs from TCEQ's Q-log collection for 27 counties in the north-central and southeast parts of the state. Other regionally significant sources of located and scanned logs that are in the public domain, including the University Lands Well Library (www.utlands.utsystem.edu/techdata.aspx), will be searched for logs with locations and attributes that meet the project criteria. Digital criteria-matching logs from all secondary sources will be captured in this task.

Task 2. Identify unscanned logs from public-domain sources that meet selection criteria and scan them
Subtask 2-1. Capture all located (unscanned) logs in the Bureau's IGOR database and TCEQ's surface-casing database that geographically complement logs captured in task 1 and scan them. The majority of the geophysical logs contained in the Bureau's IGOR database, TCEQ's surfacecasing database, and other public-domain databases have yet to be scanned. In this task, we will conduct county-by-county database searches for unscanned geophysical logs that fit the selection criteria and complement the already scanned and captured logs geographically. These logs will be scanned for delivery to TWDB.

Table 3. Task 2 estimated staff effort: identify and scan unscanned logs from public domain sources.

Staff	ROLE	Estimated effort (months)
J. Paine	Manage task; identify non-BEG databases; estimate effort needed to scan logs	.50
D. Ortuno	Manage identification and scanning of unscanned logs in IGOR database and TCEQ collection (may include managing numerous technical assistants); estimate effort and equipment needed to scan logs; procure scanners and supporting hardware and software as necessary	2.0

A. Averett	Manage import of newly scanned logs and attributes into Access database (may include managing numerous technical assistants)	.50
Technical staff	Locate logs, determine log suitability, scan logs	6.5 per person (6 persons)

Subtask 2-2. Capture geographically complementary logs in the Bureau's uncataloged paper collection or TCEQ's surface casing collection that fit the criteria and scan them. Nearly 80 percent of the approximately 1.5 million geophysical logs that are housed in the Geophysical Log Facility have been donated to the Bureau over the years and have not been cataloged or scanned. These logs will require the most effort to select and capture for the BRACS project. Similarly, the TCEQ's surface casing log collection and the RRC's pre-1985 log collection are also largely unscanned. We will focus on areas where we have insufficient geographic coverage from logs identified in task 1. Our approach will be to (1) pull logs from underrepresented areas that fit the selection criteria, (2) determine latitude and longitude coordinates through searches of online well databases, and (3) scan the logs if they fall within a 2.5-minute quadrangle for which we have no scanned logs already. Until task 1 is complete, the magnitude of this effort is unclear, as is the effort required to provide the desired geographic coverage and well density. We anticipate that this task is the most labor and equipment intensive and is associated with the most uncertainty in required time and effort. The magnitude and scope of this task depends on the number of geophysical logs captured in task 1. Meetings will be held with TWDB project staff to determine the appropriate scope and timeline of this aspect of the project when task 1 is complete. The Bureau intends to acquire additional scanning equipment and hire temporary technical staff to maximize the number of logs captured during the project (or perhaps partner with a firm specializing in log scanning), but cannot determine a specific number of scanned logs to be delivered owing to uncertainty in the project duration, geographic scope, and the eventual number of logs requiring manual determination of location, log and well attributes, and subsequent scanning.

Task 3. Populate Access database with well-log attributes.
Information from internal and commercial well-log databases, well-log headers, and GIS data from the RRC will be used to populate fields in the BRACS geophysical log database using automated and manual efforts. Data for scanned and unscanned logs meeting the selection criteria that are already in the Bureau's well-log database will be imported into the Access database. Database fields include the file name of the scanned log, data source, county, total depth, logged depth (top and bottom), API number (if available), location (latitude and longitude), log type, grid cell, and surface elevation. Data from other logs will be manually entered as they meet the location, depth range, and log-type criteria and are scanned. All geophysical logs that meet the selection criteria and are scanned will be entered into the database for delivery to TWDB.

Table 4. Task 3 estimated staff effort: populate Access database with well log attributes.

STAFF	**ROLE**	**ESTIMATED EFFORT (MONTHS)**
J. Paine	Manage task	.50
D. Ortuno	Direct technical staff to enter well-log attributes from header information	1.0

A. Averett	Assist D. Ortuno in overseeing technical staff to enter well-log attributes from header information	0.5
Technical Staff	Enter well log attribute data in TWDB-formatted Access database	2.0 per person (six persons)

Task 4. Deliver scanned images, populated Access database, and summary explanatory report to TWDB

At the end of the project term, the Bureau will deliver to TWDB a brief report summarizing project activities and status, a collection of scanned geophysical logs that meet the location and attribute criteria, and an Access database containing data fields developed by TWDB and populated with the attributes of the scanned log images. The total number of geophysical logs to be delivered to TWDB depends on the results of initial project activities and cannot be estimated until those tasks (including the capture of already scanned and located well logs) are complete. We anticipate that the large majority of the well logs that will constitute the database are currently unlocated and only in paper format, which will likely require the Bureau to consider augmenting our technical staff and scanning capability to select criteria-meeting well logs, determine their geographic locations, scan the logs, and enter them into the database.

Table 5. Task 4 staff effort: Populate Access database with well log attributes.

STAFF	ROLE	ESTIMATED EFFORT (MONTHS)
J. Paine	Manage task; lead report author	.50
D. Ortuno	Contribute to report; recommend scope of remaining effort	.50
A. Averett	Manage production of electronic deliverables (scanned images and Access database); contribute to report; recommend scope of remaining effort	.50

Project Timeline, Meeting, and Deliverables Schedule

Project deliverables include a draft and final summary report, scanned geophysical logs, and a populated Access database containing information on the scanned logs in a TWDB-designed format. The draft final summary report will be submitted to TWDB for review by July 31, 2011. The final summary report will be due one month after TWDB review comments have been received. Final versions of the geophysical logs and Access database will be due at the end of the contract on August 31, 2011.

Monthly progress reports will be submitted to TWDB that summarize project status, activity, and progress toward deliverable completion. Informal consultations by email, in person, or by telephone will be held with TWDB staff as needed to monitor project progress or modify procedures.

Estimated duration of tasks 1, 2, 3, and 4
Total project duration is assumed to be eight months, beginning on January 1, 2011 and ending on August 31, 2011

Task	1	2	3	4	5	6	7	8
1	X	X						
2			X	X	X	X		
3	X	X	X	X	X	X	X	X
4								X

Task 1 Capture existing scanned logs from public-domain databases
Task 2 Identify unscanned logs from public-domain sources that meet selection criteria and scan them
Task 3 Populate Access database with well-log attributes
Task 4 Deliver scanned images, populated Access database, and summary explanatory report to TWDB