

WWDC Water Planning Program

Powder/Tongue and Northeast
Wyoming River Basins

Scope of Work

HKM/Lord Consulting

River Basin Water Planning

- 1 How much water is available for use?
- 2 How much of this water is currently being used?
- 3 How much excess water is currently available (or how extensive are the current water shortages)?
- 4 What water uses can be expected in the future?
- 5 Will water be available for these uses (or how can water be made available for these uses)?

Scope of Work

- Task 1 – Meetings
- Task 2 – Basin Water Use Profile
- Task 3 – Available Surface and Groundwater Determination
- Task 4 – Demand Projections
- Task 5 – Future Water Use Opportunities
- Task 6 – Basin Advisory Group Discretionary Fund
- Task 7 – Basin Planning Report

Task 1 — Meetings

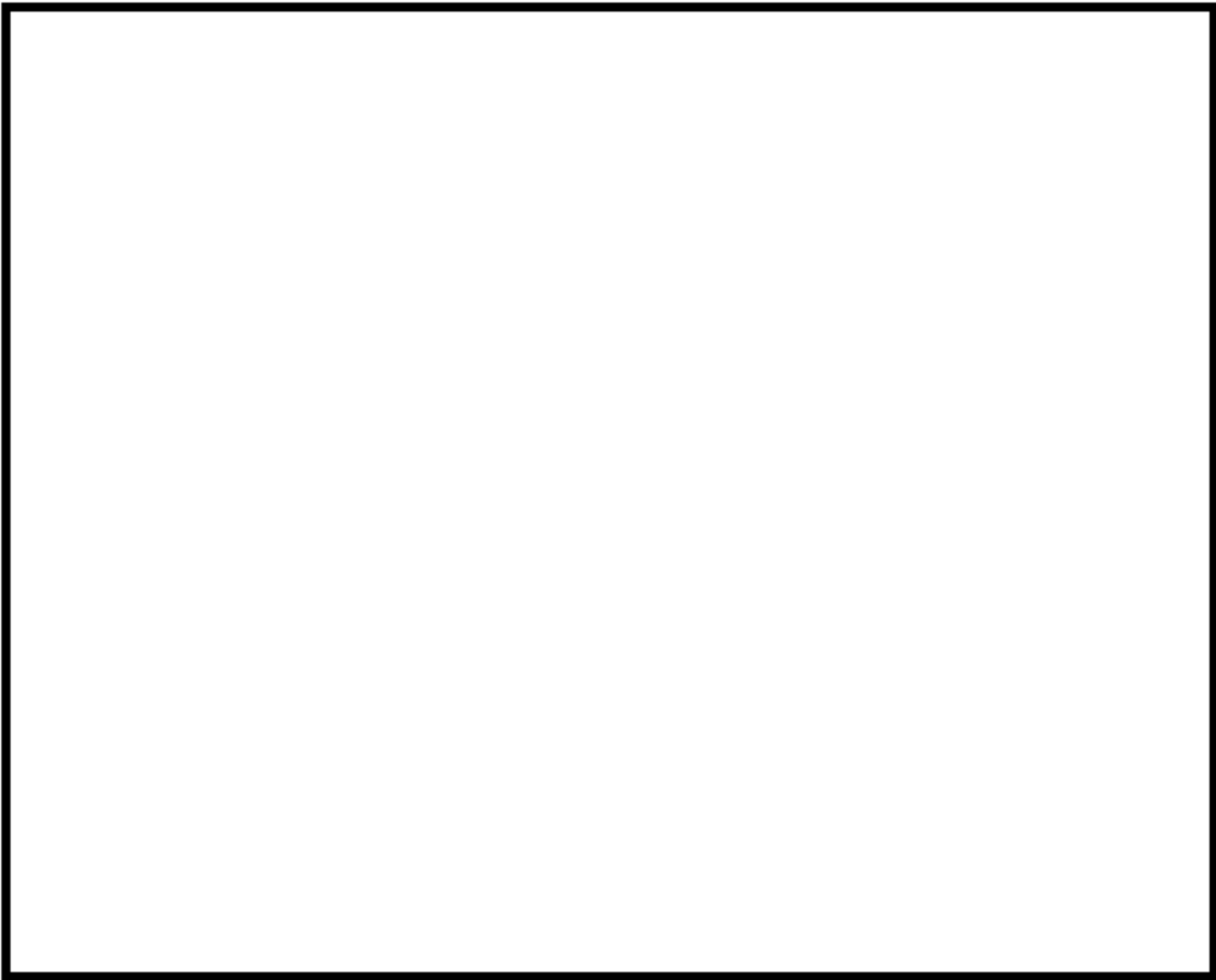
- BAG Meetings
- Project Meetings

Task 2 — Basin Water Use Profile

- **Purpose:** To inventory existing Water Uses.

Task 2 — Basin Water Use Profile

- Agricultural Use
 - Irrigated Acreage
 - Crop Types
 - Crop Consumptive Use
 - Source of Supply
 - Surface Water
 - Supplemental Reservoir Storage
 - The water rights associated with the irrigated lands will be determined and shown on a Water rights GIS layer
 - GW Wells GIS layer for > 50 gpm wells
 - Compile diversion records for key ditches



Task 2 — Basin Water Use Profile

- **Municipal and Domestic Use**
 - Water use by municipal and domestic water systems
 - State of Wyoming 2000 Water System Survey Report
 - Update information by contacting municipal water users
 - **Source of Supply**
 - GW Wells GIS layer for municipal wells > 50 gpm and for domestic use aggregated together into representative groups.

Task 2 — Basin Water Use Profile

- **Industrial Use**
 - Identify industrial water users not supplied by municipal water systems
 - **Source of Supply**
 - GW Wells GIS layer for industrial wells > 50 gpm and for all CBM wells.

Task 2 — Basin Water Use Profile

- Recreation Use
 - Compile existing data of recreational uses as an indicator of water-related recreational activity.
 - Reservoir storage levels and streamflows that promote maximum use will be estimated.

Task 2 — Basin Water Use Profile

- Environmental Use

- **Water uses to enhance fisheries and wildlife habitat will be identified**
 - GIS layer of instream flow requirements by stream segment
 - Existing GIS layers of environmental uses will be identified

Task 2 — Basin Water Use Profile

- Water Use from Storage
 - Key reservoirs used to supplement water supplies for agricultural, municipal, industrial uses will be identified
 - Operation memorandums will be developed for each key reservoir
 - Diversions served by the reservoirs will be shown on a GIS layer

Task 3 — Available Surface and Groundwater Determination

- **Purpose:** To identify water shortages or surplus water available during average, wet, and dry years under existing conditions.

Task 3 – Available Surface and Groundwater Determination

- Surface Water Data Collection and Study Period Selection
 - Use USGS streamflow records supplemented by other records as available
 - Select study period to represent average, wet, and dry years

Task 3 — Available Surface and Groundwater Determination

- Surface Water Data Synthesis and Spreadsheet Model Development
 - Three spreadsheet models will be developed to assess the water availability in the basin (One for an average year, one for a wet year, and one for a dry year)
 - Model nodes will be established at key points of diversion or storage regulation
 - Virgin flows will be determined for all model nodes

Task 3 — Available Surface and Groundwater Determination

- Surface Water Model Calibration
 - Model simulated results will be compared to actual measured flows at the streamflow gages
 - The model will be adjusted until the model simulates existing conditions reasonably well

Task 3 – Available Surface and Groundwater Determination

- Available Surface Water Determination
 - The calibrated spreadsheet model will be used to identify the location and extent of surplus water under existing conditions for average, wet, and dry years.

Task 3 — Available Surface and Groundwater Determination

- Available Groundwater Determination
 - Compile existing information on aquifer locations, storage, and yield potential from previous groundwater studies
 - The impacts of CBM development will be characterized using previous studies and the Coal Bed Methane Environmental Impact Study
 - A memorandum will be developed discussing the potential for additional groundwater development

Task 4 — Demand Projections

- *Performed by Watts & Associates, Gary Watts*
- **Purpose:** To project future water requirements for 3 growth scenarios (low, medium, and high)
 - municipal
 - industrial
 - agricultural
 - recreational and environmental

Task 5 – Future Water Use Opportunities

- **Purpose:** To evaluate future water use opportunities as a guide for water development planning.

Task 5 – Future Water Use Opportunities

- Describe issues affecting future water use opportunities
- Define screening criteria (preliminary list)
 - Water availability
 - Technical feasibility
 - Economics
 - Environmental impact
 - Legal and institutional constraints
 - Public acceptance
 - Water quality impacts
 - Ability to satisfy multiple demands

Task 5 – Future Water Use Opportunities

- Develop long-list of future water use opportunities (preliminary list)
 - Structural opportunities
 - Non-structural opportunities
- Develop short-list of future water use opportunities
 - Fatal flaw analysis

Task 5 – Future Water Use Opportunities

- Apply screening criteria to rank short-list of future water use opportunities
 - Methodology to be determined
- Water quality issues
 - Identify basin-wide opportunities to enhance and protect water quality
 - Identify current programs and investigations
 - Identify opportunities for cooperation and coordination

Task 6 — Basin Advisory Group Discretionary Fund

- Address issues identified by the BAG that are not covered in the scope of work

Task 7 — Basin Planning Report

- Dual format: hardcopy and digital
- Results presentation meetings: WWDC and local

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