(DRAFT)Lower Boise Watershed Phosphorus TMDL Addendum Strategy Paper

Date: September 5, 2012

Introduction

The Lower Boise River (River) is a 64 mile reach of river from Lucky Peak Dam to the Snake River. The reach flows through Ada and Canyon Counties and through the Cities of Boise, Garden City, Eagle, Star, Middleton, Caldwell, Notus, and Parma. The watershed drains 1290 square miles of range, forest, agricultural, and urbanized lands. Major tributaries include Fifteenmile Creek, Willow Creek, Mason Creek/Drain, Hartley Gulch, Indian Creek, Conway Gulch, and Dixie Slough.

Section 303(d) of the Federal Clean Water Act and EPA regulations at 40 CFR 130 describe the statutory and regulatory requirements of approvable TMDLs. States are required to identify impaired waters and develop a Total Maximum Daily Load (TMDL) for impaired waters that reduce pollutant loads to levels that support water quality standards. TMDLs are defined in 40 CFR Part 130 as the sum of the individual Waste Load Allocations (WLA) for point sources and Load Allocations (LA) for nonpoint sources, including a margin of safety and natural background conditions.

EPA requires TMDLs to include: a submittal letter; scope of the TMDL (pollutant, pollutant sources, and allowable load); applicable standards and numeric target; load capacity; load and wasteload allocations; margin of safety; seasonal variation; and reasonable assurance.

The River from Middleton to the confluence with the Snake River, Mason Creek/Drain, and two segments of Sand Hollow Creek, a tributary to the Snake River, are listed as impaired by phosphorus for which TMDLs are required (2010 Integrated Report Category 5, Table 1). The River, Mason Creek/Drain and Sand Hollow Creek have designated beneficial uses of aquatic life and secondary contact recreation and the suspected pollutant is Total Phosphorus (TP). Therefore, the Boise Regional Office (BRO) of the Idaho Department of Environmental Quality (IDEQ) in cooperation with the Lower Boise Watershed Advisory Council (LBWC) need to develop and submit a TMDL to the Environmental Protection Agency (EPA) for review and approval.

Monitoring and Model Development

A TP TMDL will be developed using a flow and phosphorus mass balance model developed by BRO in coordination with the United States Geologic Survey (USGS), LBWC, and EPA for the River from Diversion Dam to the Snake River (Figure 1). Model inputs for total and dissolved phosphorus, periphyton, nitrogen, flows, and other appropriate parameters will consist of both existing and new data gathered by USGS in 2012 and 2013.

The USGS study may provide insight into nutrient cycling of total dissolved phosphorus (TDP), orthophosphorus, and sediment. TDP has not been extensively analyzed in samples from the Boise River basin and may be useful in determining the source of organic phosphorus and orthophosphorus. The study will also determine seasonal total-phosphorus to dissolved-phosphorus ratios in relation to suspended sediment concentrations. The USGS study will also

provide a snapshot of the effectiveness of Best Management Practices (BMP) implementation, waste load allocations in NPDES permits (per SR-HC .07 mg/L target), and other phosphorus reducing measures as a result of the LBWC implementation efforts (for example 319 projects). The new data will also be used to update the current Lower Boise River Nutrient Subbasin Assessment.

Total Phosphorus Target Development

In accordance with Idaho Code 39-3611(6) a pollutant target will be established in the TMDL that will prevent nuisance aquatic growth in the River and to meet the seasonal 0.07 mg/L TP target downstream allocation in the SR-HC TMDL. The River TP TMDL will establish wasteload allocations for point sources and load allocations for non-point sources in the watershed. Natural background conditions will also be considered along with a margin of safety. Pollutant trading will be authorized in the TMDL and the existing Lower Boise Pollutant Trading Framework will be updated to reflect new information and if necessary establish updated trading ratios.

Idaho Water Quality Standards (58.01.02.200.06) express narrative rather than numeric limits for nutrients:

"Surface waters of the state shall be free from excess nutrients that can cause visible slime growths or other nuisance aquatic growths impairing designated beneficial uses"

The narrative standard could lead to a subjective interpretation and bias and poses a challenge to the development of a pollutant target for preventing nuisance aquatic growth in the River. IDEQ has not clearly defined the parameters nor developed policy and guidance for the narrative nutrient standard. However, through the TMDL process, BRO will work with the LBWC to develop an adaptive management-type of approach to qualify targets and quantify a set of numeric metrics that correlate with the impairment of the nuisance aquatic growth and address a watershed wide target for TP.

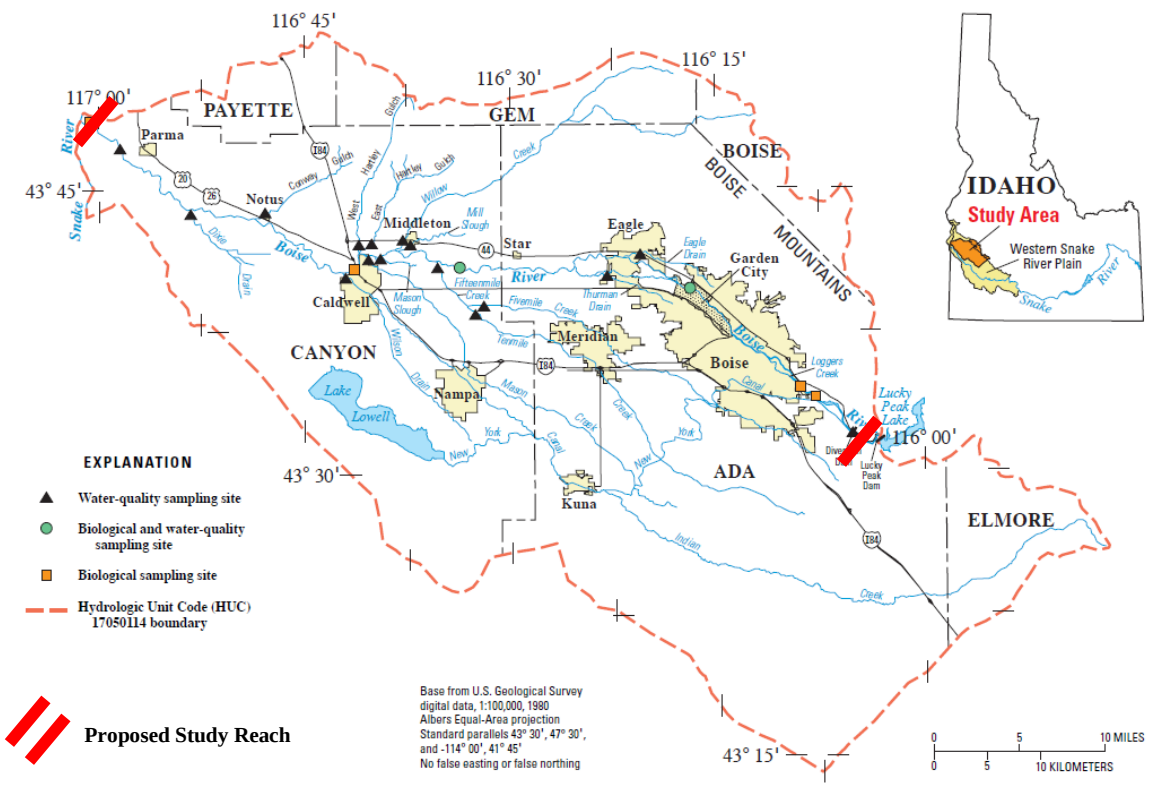

Figure 1: USGS study reach of the Lower Boise River

Table 1. Phosphorus TMDL Assessment Units in Category 5 of 2010 Integrated Report**.**

Assessment Unit	Beneficial Use	Impairment
Boise River- Middleton to Indian Creek ID17050114SW005_06b	PCR CWAL	Total Phosphorus
Boise River- Indian Creek to Mouth ID17050114SW001_06	PCR CWAL	Total Phosphorus
Mason Creek-Entire Watershed ID17050114SW006_02	SCR CWAL	Nutrients suspected impairment
Sand Hollow Creek-C-Line Canal to I-84 and Sharp Road -Snake River ID17050114SW016_03 ID17050114SW017_06	SCR CWAL CWAL	 Nutrients suspected impairment Nutrients suspected impairment(Assessment Data Base)

Flow

The River from Lucky Peak to the mouth is listed as flow and habitat modified in Category 4c (Waters Impaired by Pollution, no TMDL required) in the 2010 Integrated Report (IR). Section 4c of the IR explains why a TMDL is not necessary for flow alteration and habitat modification:

"…habitat modification and flow alteration, which may adversely affect beneficial uses, are not pollutants under Section 303(d) of the Clean Water Act. There are no water quality standards for habitat or flow, nor are they suitable for estimation of load capacity or load allocations". The flow mass balance for the LBR will be developed by comparing historic flow data with new measurements from the USGS study and by working closely with the Boise Project and all of the irrigation districts in the LBR watershed.

During the summer months the impaired reach of the River, Middleton to the mouth, is significantly impacted by flow modification as a result of agricultural and urban irrigation diversions and returns. Return irrigation waters contain nutrients, sediment, bacteria, pesticides, and heat. The flow of the River from Lucky Peak to the confluence with the Snake is highly managed year around for irrigation storage, season (April-October) and flood control, and other uses. There are more than 32 diversions and 15 returns to the River. Additionally, there is a transfer of irrigation water from the Payette River (300,000 acre feet to the Black Canyon Irrigation District) and a transfer of a similar amount of water from the Boise River to the Snake River watershed. The Payette transfer provides for a significant portion of the base flow of River in the two listed AUs and Sand Hollow Creek. The Payette River water is traded for irrigation water diverted into the New York Canal and Lake Lowell that drains directly to the Snake River. The Payette and Snake water transfers will be included in the TMDL assessment and mass balance model.

LBWC Facilitation

BRO will actively coordinate with the EPA throughout the TMDL development process (for example, see attachment: Lower Boise River TMDL Target and Metric Identification and Assessment Process). BRO attends the monthly LBWC meetings to coordinate activities associated with the Lower Boise River TMDL. The LBWC has established a Technical Advisory Committee (TAC) for the development of the TP TMDL that will meet on a regular basis to provide technical review and advice to BRO.

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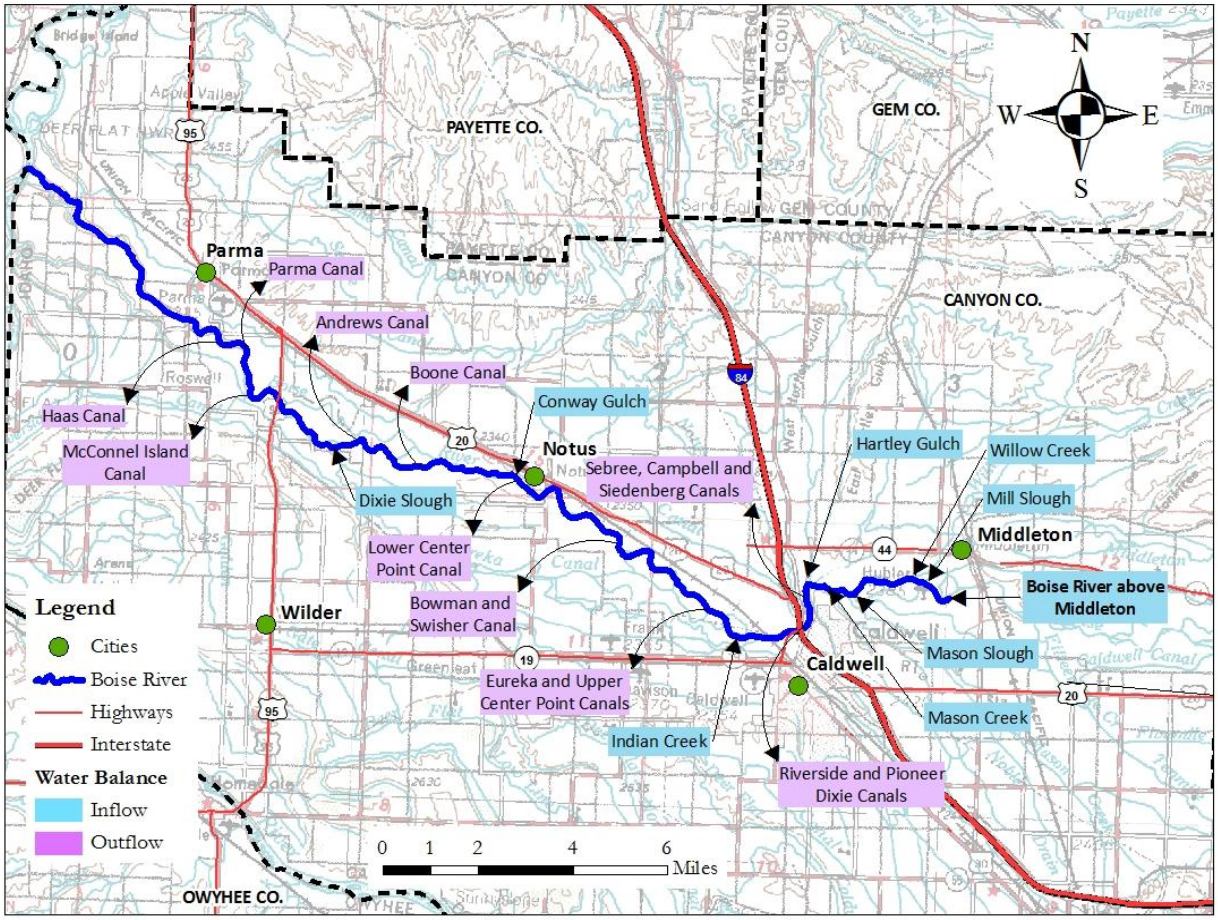
EPA Coordination

BRO will also actively coordinate with the EPA throughout the TMDL development process. It is imperative to have EPA's buy-in into the TP TMDL development strategy and process. EPA Region 10 has agreed to provide modeling support and additional assistance from the Region 10 Boise Office.

Phosphorus TMDL Timeline

May 2012: Draft of Strategy Paper for the TP TMDL
June 2012: Lower Boise LBWC/TAC review of Draft Strategy Paper and share with EPA
June-August 2012: USGS begins data mining and identification of sampling sites
August 2012- USGS begins first of three synoptic sampling events
September 2012: Draft discussion of TMDL Targets and Allocations with LBWC and EPA
October 2012: USGS conducts second sampling event
March 2013: USGS conducts third sampling event
November 2013: Draft TMDL review by LBWC/TAC and EPA
November 2013: Finalize Draft TMDL with LBWC and EPA
December 2013: Public Comment
January 2014: Respond to Public Comment and TMDL Revision
February 2014: Submit Final TMDL to EPA

Figure 2. Map of Impaired segment of the Boise River for which a TMDL will be developed.



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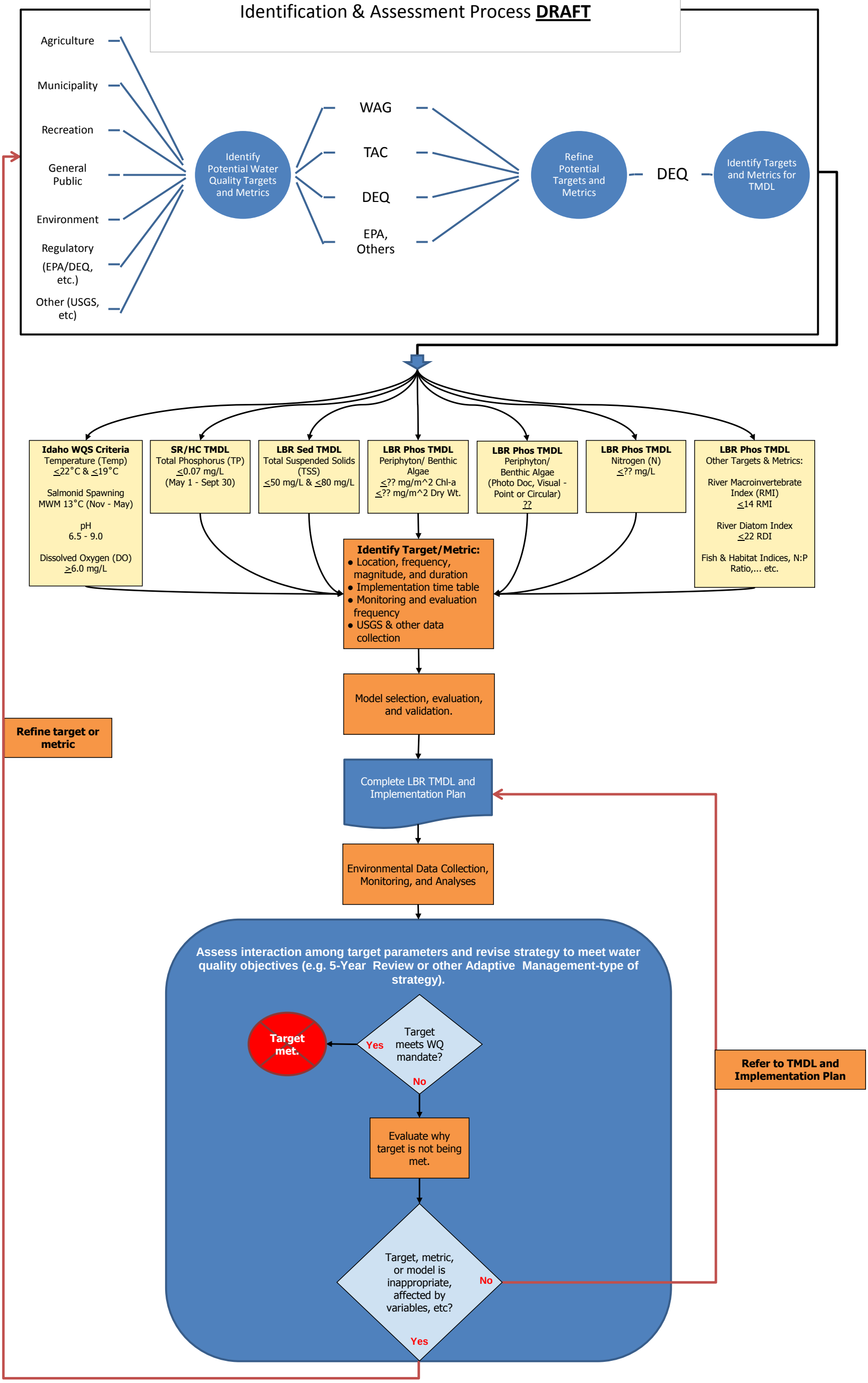
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