

Montana Bureau of Mines and Geology NGWMN Final Technical Report

Award Number: G16AC00411

Agency Name: Montana Bureau of Mines and Geology

Title: Montana Bureau of Mines and Geology State-Wide Groundwater Level and Groundwater Quality Monitoring Network, Current Data Provider Maintenance Funding – Round II

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## Background

The Montana Bureau of Mines and Geology (MBMG) maintains a statewide groundwater monitoring network to collect water-level and water-quality data from about 850 wells. Many of these wells are completed in Principal Aquifers that include the heavily developed intermontane basin aquifers in the west (S100NRMTIB), and the less intensively developed but widely used alluvial (N100ALLUVL), Lower Tertiary (N300LTRTRY), Upper Cretaceous (N300UPCTCS), Lower Cretaceous (N300LCRTCS), and Paleozoic aquifers (N500PLOZOC) in the east. MBMG became a NGWMN data provider in 2015 and at the start of this project provided water-level data for 227 sites, and water-quality data for 58 sites.

- **Description of work done to support the NGWMN as a data provider**

The work performed for award G16AC00411 was under Objective 3: Filling Gaps in Information at NGWN sites, and Objective 4: Well Maintenance as described in Program Announcement/Funding Opportunity G16AS00043. Specific tasks included: 1) Using a Trimble Geo7x Centimeter Edition GPS receiver to obtain survey grade latitude, longitude, and land-surface altitudes at 33 wells, and adding this information to the NGWMN Well Registry; and 2) installing protective casing or posts around 12 wells.

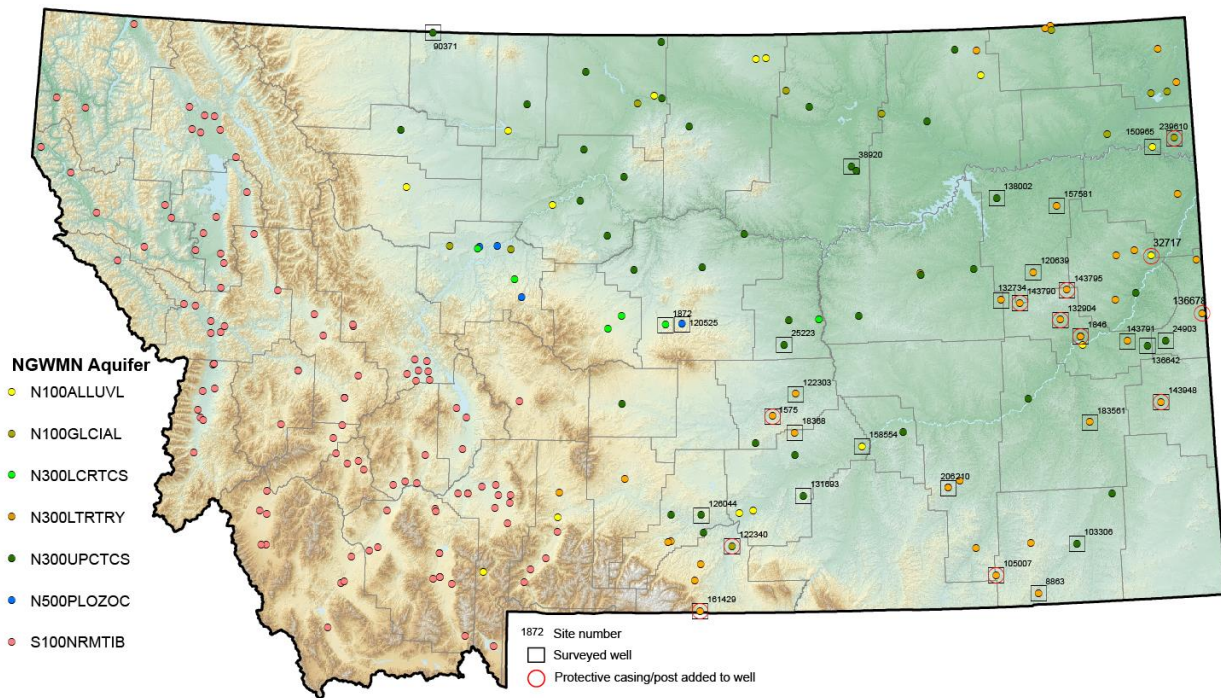


Figure 1. MBMG National Network Sites

Figure 1 shows the distribution of MBMG wells in the NGWMN, and the locations of wells that were surveyed and/or had protective casing or posts installed. Table 1 details the work done under Objective

3 (surveying) and the work done under Objective 4 (installation of protective casing/posts). Examples of work done are shown in figures 2 – 5.

NGWMN Site ID	National Aquifer	Objective 3	Objective 4	Aquifer Type	Well Depth (ft)	WL Network?	QW Network?
		Surveyed?	Casing?				
MBMG-1575	Lower Tertiary aquifers	Y	Y	UNCONFINED	152	Yes	Yes
MBMG-1846	Upper Cretaceous aquifers	Y	Y	CONFINED	860	Yes	Yes
MBMG-105007	Lower Tertiary aquifers	Y	Y	CONFINED	110	Yes	No
MBMG-122340	Sand and gravel aquifers (glaciated regions)	Y	Y	UNCONFINED	22.6	Yes	Yes
MBMG-132904	Lower Tertiary aquifers	Y	Y	CONFINED	440	Yes	No
MBMG-143790	Lower Tertiary aquifers	Y	Y	UNCONFINED	160	Yes	No
MBMG-143795	Lower Tertiary aquifers	Y	Y	CONFINED	379.8	No	No
MBMG-143948	Lower Tertiary aquifers	Y	Y	CONFINED	362	Yes	No
MBMG-161429	Lower Tertiary aquifers	Y	Y	UNCONFINED	190	Yes	No
MBMG-239610	Sand and gravel aquifers (glaciated regions)	Y	Y	UNCONFINED	177	Yes	No
MBMG-206	Lower Tertiary aquifers	Y		UNCONFINED	225	Yes	Yes
MBMG-210	Lower Tertiary aquifers	Y		UNCONFINED	149	Yes	Yes
MBMG-1872	Lower Cretaceous aquifers	Y		CONFINED	705	Yes	Yes
MBMG-8863	Lower Tertiary aquifers	Y		CONFINED	410	Yes	Yes
MBMG-18368	Lower Tertiary aquifers	Y		UNCONFINED	150	Yes	No
MBMG-24903	Upper Cretaceous aquifers	Y		CONFINED	100	Yes	No
MBMG-25223	Upper Cretaceous aquifers	Y		CONFINED	120	Yes	No
MBMG-38920	Upper Cretaceous aquifers	Y		CONFINED	351	Yes	No
MBMG-90371	Upper Cretaceous aquifers	Y		CONFINED	118	Yes	No
MBMG-103306	Upper Cretaceous aquifers	Y		CONFINED	499	Yes	No
MBMG-120525	Paleozoic aquifers	Y		UNCONFINED	37.3	Yes	No
MBMG-120639	Lower Tertiary aquifers	Y		UNCONFINED	100	Yes	No
MBMG-122303	Lower Tertiary aquifers	Y		UNCONFINED	80	Yes	No
MBMG-126044	Upper Cretaceous aquifers	Y		CONFINED	70	Yes	No
MBMG-131693	Upper Cretaceous aquifers	Y		CONFINED	205	Yes	No
MBMG-132734	Lower Tertiary aquifers	Y		UNCONFINED	103	Yes	No
MBMG-136642	Upper Cretaceous aquifers	Y		CONFINED	1467	Yes	No
MBMG-138002	Upper Cretaceous aquifers	Y		CONFINED	300	Yes	No
MBMG-143791	Lower Tertiary aquifers	Y		UNCONFINED	63	Yes	No
MBMG-150965	Alluvial aquifers	Y		UNCONFINED	21	Yes	No
MBMG-157581	Lower Tertiary aquifers	Y		UNCONFINED	196.4	Yes	Yes
MBMG-158554	Alluvial aquifers	Y		UNCONFINED	18.5	Yes	No
MBMG-183561	Lower Tertiary aquifers	Y		UNCONFINED	126	Yes	No
MBMG-32717	Alluvial aquifers		Y	UNCONFINED	51	Yes	No
MBMG-136678	Lower Tertiary aquifers		Y	UNCONFINED	114	Yes	No



Figure 2. MBMG-239610 survey and steel protective casing.



Figure 3. MBMG-132904 survey and steel protective casing



Figure 4. MBMG-137987 steel protective casing and post.



*Figure 5. MGMG-143948 steel protective post and survey.*

- **Description of any updates made to web services during period of award**

Web services were not part of this project.

- **Description of any problems encountered in serving data to the NGWMN data portal**

There were no problems serving data to the NGWMN data portal during this project.

- **Notice of any changes in databases or web services that are being planned that would impact future integration of the web services with the NGWMN data portal**

There are no planned changes to the MBMG web services.