

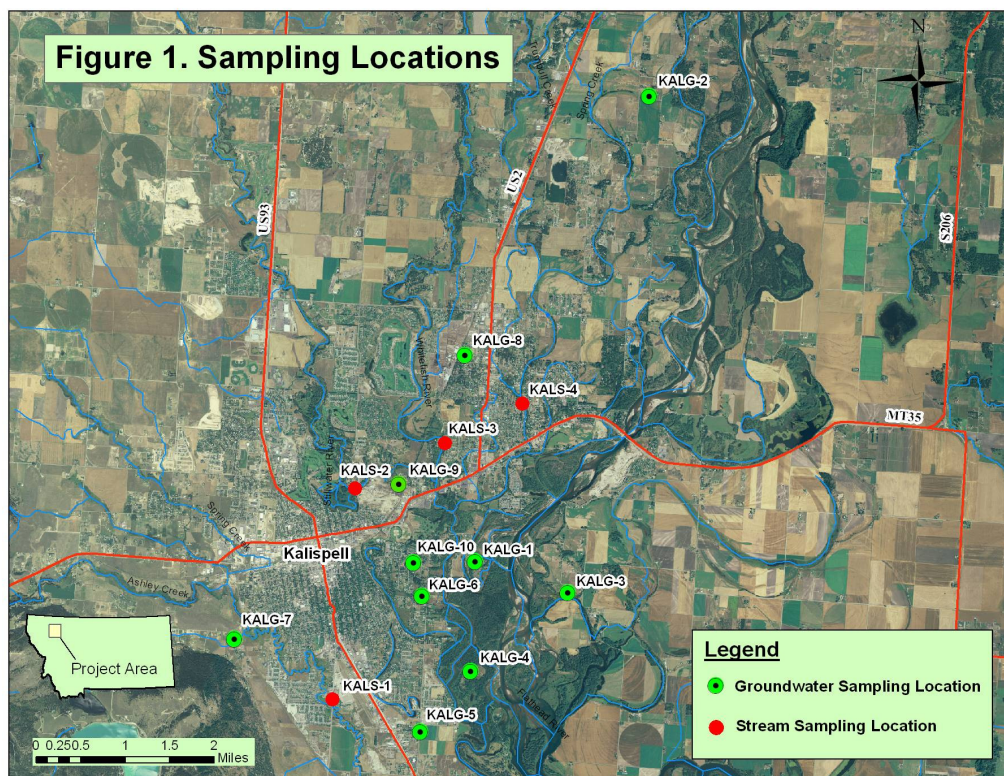
Summary Report: Groundwater and Surface Water Monitoring for Pesticides and Nitrate in Kalispell, Montana, 2011

Montana Department of Agriculture, Groundwater Protection Program

Project Summary

In July and August, 2011, the Montana Department of Agriculture (MDA) collected ten groundwater samples and eight samples from four streams in the Kalispell area to test for pesticides and the nutrient nitrate (Figure 1). Groundwater samples were collected from shallow wells obtaining water from alluvial aquifers. Because the aquifer is shallow, permeable, and overlain by permeable soils, it is susceptible to impacts by human activities at the surface. The streams sampled included Ashley Creek, Stillwater River, Whitefish River, and Spring Creek.

Pesticides are commonly used in residential and urban settings to control weeds and insects around homes, parks, golf courses, road sides, and other areas. Fertilizers are also commonly used in gardens and lawns. The purpose of this project was to determine if urban uses of pesticide and fertilizers in Kalispell was having an impact on water resources.



Samples collected during this project were taken to the MDA Analytical Laboratory Bureau at Montana State University and analyzed for 94 pesticide compounds (herbicides, insecticides, and fungicides) and nitrate. A summary of laboratory results are included in Table 1.

Pesticide Results

The most common pesticide detected in groundwater was prometon, followed by imazapyr, deethyl atrazine, and tebuthiuron. Prometon, imazapyr, and tebuthiuron, are all herbicides used as soils sterilants in non-crop settings. Deethyl atrazine is a degradate of atrazine an herbicide used in corn and soy bean crops. There were also single detections of 2,4-D, aminopyralid, bromacil, diuron, hexazinone, MCPA, and sulfometuron. All of these are herbicides. Nitrate was detected in seven of ten groundwater samples, but all concentrations were low (Table 1).

Pesticide detections in streams were similar to groundwater detections except that 2,4-D was the most commonly detected pesticide. 2,4-D is an herbicide used in numerous crops and is also used in many non-crop settings and is frequently detected in streams across Montana. All of the pesticide detections in both surface water and groundwater were at very low concentrations, and none of the concentrations exceeded or approached the human health drinking water standard or aquatic life benchmarks where applicable (Table 1). Nitrate was detected in five of eight stream samples but all concentrations were low.

Table 1. Summary of Groundwater Pesticide and Nitrate Detections							
Pesticide Compound	Number of Samples	Number of Detections	Percent of Samples with Detections	Summary of Detections		Human Health Standard for Drinking Water (µg/L)	Lowest Available Aquatic Life Benchmark (µg/L)
				Median Concentration (µg/L)	Maximum Concentration (µg/L)		
2,4-D	10	1	10	--	<0.0045	70	N/A
Aminopyralid	10	1	10	--	<0.053	4,000	N/A
Bromacil	10	1	10	--	0.15	90	N/A
Deethyl Atrazine	10	3	30	--	<0.017	3	N/A
Diuron	10	1	10	--	0.025	10	N/A
Hexazinone	10	1	10	--	<0.0059	400	N/A
Imazapyr	10	4	40	0.0056	0.06	21,000	N/A
MCPA	10	1	10	--	<0.0023	4	N/A
Nitrate	10	7	70	1.1 mg/L	2.6 mg/L	10 mg/l	N/A
Prometon	10	6	60	0.012	0.032	100	N/A
Sulfomuterun	10	1	10	--	0.13	2,000	N/A
Tebuthiuron	10	3	30	0.0068	0.0099	500	N/A
Summary of Surface Water Pesticide and Nitrate Detections							
2,4-D	8	6	75	0.017	0.03	70	13.1
Deethyl Atrazine	8	2	25	0.0032	0.0045	3	1,000
Imazapyr	8	2	25	--	<0.0035	21,000	24
MCPP	8	1	13	--	<0.0022	7	14
Nitrate	8	5	63	0.44 mg/L	0.74 mg/L	10 mg/L	N/A
Prometon	8	3	38	0.0063	0.0065	100	98
Tebuthiuron	8	2	25	0.0022	0.0024	500	50

Summary

While pesticides were detected in the groundwater and streams around Kalispell the number and frequency of detections was lower than in other parts of the state. All of the detections were at very low concentrations that did not exceed or approach drinking water standards or aquatic life benchmarks. A majority of the pesticides detected – prometon, imazapyr, and tebuthiuron – are herbicides commonly used on non-crop lands such as urban areas. Nitrate, while frequently detected, was at concentrations generally considered below background levels.



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