



## Regional and Local Pesticide and Ground Water Monitoring Results, 2016 Executive Summary

ISDA Technical Summary #53

Curtis A. Cooper, PhD

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### Introduction and Background

The Idaho State Department of Agriculture (ISDA) Ground Water Program implements the Idaho Pesticide Management Plan (PMP) (2001), and the Rules Governing Pesticide Management Plans for Ground Water Protection (IDAPA 02.03.01) (Idaho PMP Rule). The Idaho PMP Rule requires the ISDA to conduct monitoring and response actions associated with pesticide detections in Idaho ground water and to help prevent further contamination that may result in exceeding drinking water standards. ISDA staff collected samples from 238 wells from major aquifers throughout Idaho. These wells are primarily used for domestic drinking water. ISDA submitted ground water samples to be tested for more than 100 pesticides or their breakdown components at the Idaho Food Quality Assurance Laboratory (IFQAL), Twin Falls, ID. The testing methods at IFQAL allow pesticides to be detected at low levels; these pesticides detected in drinking water do not indicate a health risk until reference points are exceeded. A sub-set of select wells was also tested for 82 Volatile Organic Compounds (VOC).

Detections of pesticides are compared against reference points to determine response and recommendations. In order to be protective of the water resources, there are response levels in the Idaho PMP Rule that occur at various percentages of a reference point, such as a drinking water standard. Most of the response requirements at the lower levels are to monitor and educate, with increasing needs to identify potential pesticide sources. The first and second response levels are at pesticide concentrations where there are expectations of the water being acceptable for drinking water without health risks. However, at the third and fourth response levels there is a greater concern that the water is no longer drinkable and the pesticide concentrations could lead to human health issues.

The Idaho PMP Rule divides pesticide detections into the following response levels:

**Level 1:** Detection above the laboratory detection limit to less than 20% of the reference point.

**Level 2:** Detection at 20% to less than 50% of the reference point.

**Level 3:** Detection at 50% to less than 100% of the reference point.

**Level 4:** Detection at or greater than 100% of the reference point.

There were measurable detections of pesticides in 108 of the 238 monitored wells. On average, at wells with pesticides detected, the concentrations were at 2% of the reference point, falling into the Level 1 response category. Over 95% of the wells tested fall into or below the Level 1 response category of the Idaho PMP Rule, which is protective of human health. Two wells were found with pesticide concentrations at levels of concern. One well had detectable pesticide concentrations that were greater than half the recommended levels (Level 2 category) for both Atrazine and Desethyl atrazine, the combined concentrations of these Atrazine-based products also included this well into a Level 3 category. The other well exceeded the reference point for herbicide Triallate; this is in a location with a known historical and site-specific problem south of Lewiston, ID. This well falls into the Level 4 category and there are concerns that this water should not be used as drinking water. Both of these wells are discussed in more detail below and in Annual Technical Summaries. Other wells near to these locations do not have these pesticide concentrations,

indicating that these are isolated problems. In the Dacthal restriction area, monitoring results were inconclusive in 2016, monitoring will continue in 2017.

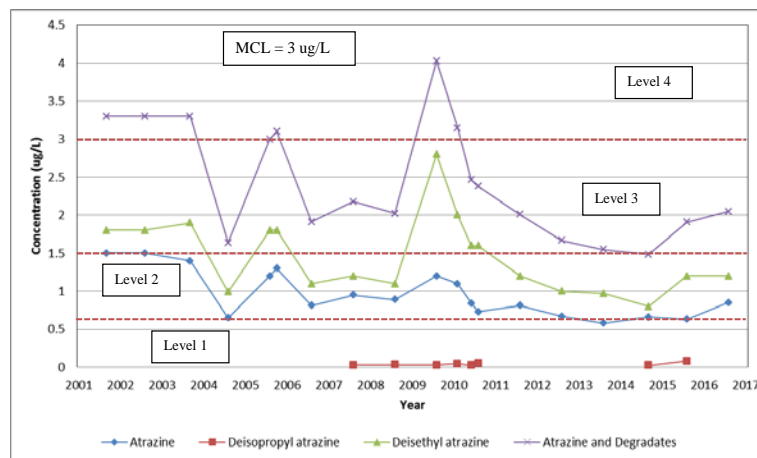
In eastern Idaho, a new long-term project was developed and initiated in 2015. This project was created to monitor for methyl bromide and its breakdown components and the potential ground water impacts at wells near locations within the Pale Cyst Nematode Eradication Program Area. There were no measured pesticides or their breakdown products associated with the nematode eradication program in these wells.

Detailed analyses of the 2016 results are available in the *Regional and Local Pesticide and Ground Water Monitoring Results, 2016: Technical Summary #54*.

## Water Quality Findings

Monitoring of 238 wells occurred in the following counties: Ada, Bingham, Bonneville, Canyon, Cassia, Elmore, Fremont, Gem, Gooding, Idaho, Jefferson, Jerome, Kootenai, Latah, Lewis, Minidoka, Nez Perce, Owyhee, Payette, Twin Falls, and Washington. There were 24 different pesticides, metabolites/breakdown products or VOCs detected in 2016 (Table 1). Atrazine (and its breakdown products) is the most commonly identified pesticide in the ground waters of Idaho. The vast majority of these detections are within the Level 1 response. The Atrazine concentrations are examined individually, along with the summed product of Atrazine and the breakdown products, Desethyl atrazine and Deisopropyl atrazine (Table 1). Frequent detections of pesticides occur from sampling domestic wells, especially in vulnerable aquifer areas. Of the 238 monitored wells, there were no measurable detections of pesticide residues in 130 wells, low-level detections in 106 wells and 2 wells with pesticide concentrations at levels of concern. Two wells that have pesticide concentrations above the Level 3 boundary are described below and in the Annual Technical Summaries.

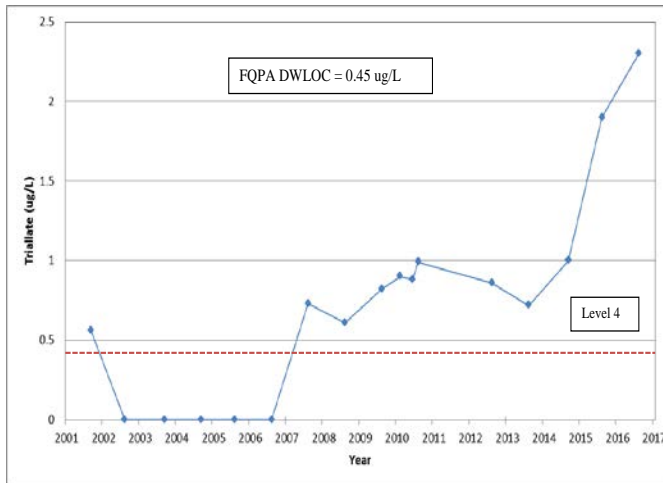
### Nez Perce County Atrazine sub-project



The Nez Perce County Atrazine sub-project area is located south of Lewiston and Lewiston Orchards along Waha Road. The project was initiated in response to an elevated detection of Atrazine in a well from the Clearwater Plateau Regional Project. Multiple wells were sampled in this area in 2016; wells up and down gradient were not identified with any pesticide concentrations near those found in well 9501901. Atrazine and its breakdown products are known to persist in ground water significantly longer than in surface water, which may account for

some of these long-term concentrations. There is annual monitoring of this well, but the surrounding well data suggest that these concentrations are from an isolated source that remains unidentified. At this time the water quality does not exceed the drinking water standard, if concentrations continue to increase there is concern that this water may no longer be a suitable drinking water source and an alternate drinking water source should be identified.

## Greencreek Triallate sub-project



Wells in the Greencreek Triallate sub-project are a subset of the Clearwater Plateau Regional Project and are specific to concerns surrounding well 9501401. Four wells north of Greencreek were sampled for pesticides in 2016 as part of the sub-project. Triallate detection in well 9501401 was at a Level 4 detection, which is a detection above the reference point. Triallate is listed by the US EPA as a potential carcinogen and the concentrations identified over that past 10 years suggest that this water should not be used as a drinking water source. Wells sampled nearby did not have any detections of Triallate. However, only recommended levels are being exceeded, no drinking water standards are being exceeded.

## Conclusions

Of the 238 monitored wells in 2016, there were no measurable detections of pesticide residues in 130 wells, low-level detections in 106 wells and 2 wells with pesticide concentrations at levels of concern. Testing of regional, local and PMP projects resulted in detections of pesticides in ground water throughout Idaho. Frequent detections of pesticides occur from sampling domestic wells, especially in vulnerable aquifer areas. As previously discussed, the Atrazine-products and Triallate are the only pesticides detected over 20% of a health-based reference point. ISDA is responding to those situations with education, use inspections, promotion of management techniques, and locally intensive monitoring. Twenty-eight pesticides were detected at low concentrations and several pesticides appear to have increasing concentrations, such as Atrazine in multiple wells across the state. Long-term monitoring is required to determine the magnitude and longevity of those increases. Statewide response processes have been implemented, primarily consisting of educational outreach and continued monitoring. Except for the two wells with pesticide concentrations at levels of concern, ground water quality is significantly below drinking water standards and recommendations in Idaho.

## Recommendations

ISDA will respond to the pesticide detections from this project in accordance with the response section of IDAPA 02.03.01 Rules Governing Pesticide Management Plans for Ground Water Protection. ISDA will continue to follow-up and conduct monitoring in 2017. ISDA personnel will continue to educate the pesticide applicators on the importance of adhering to label requirements and to apply all pesticides according to federal and state laws. ISDA personnel will continue to educate home and well owners. ISDA shares our data with the Idaho Department of Environmental Quality (DEQ), US EPA, our cooperators and inspectors. ISDA will continue to monitor ground water and aquifers throughout the State of Idaho.

## Acknowledgments

ISDA Water Program staff would like to thank the homeowners in the Project areas who allowed us to access and sample their wells. Without their participation and cooperation, these Projects would not be possible. Prevention is the key to protecting Idaho's aquifers and maintaining pesticide registrations and uses in Idaho. We would also like to recognize the United States Environmental Protection agency and our various grant supporters, without whose contribution, these reports would not be possible.

A very special thank you goes to the ISDA Field Staff and to IFQAL staff, all of whom went above and beyond to work with the ISDA Division of Agricultural Resources staff to meet project goals. The author would like to thank Elizabeth Palmateer of ISDA for editorial review of this document.

**Table 1. Summary of Pesticide Detections from ISDA Regional Projects in 2016.**

Pesticide	Number of Detections	Maximum (ug/L)	Average (ug/L)	Minimum Detection Limit (ug/L)	Reference Point (ug/L) and Source	County with Detection and Number
1,2,3-Trichloropropane	2	0.89	0.76	0.500	100 -- DWEL	Ada (2)
Aldicarb sulfone	2	0.160	0.155	0.050	2 -- MCL	Ada (2)
Atrazine	42	0.850	0.087	0.025	3 -- MCL	Canyon (3), Cassia (12), Elmore (2), Fremont (1), Gem (1), Gooding (1), Jefferson (1), Minidoka (5), Nez Perce (2), Owyhee (2), Payette (3), Twin Falls (6), Washington (3)
Atrazine (sum of products)*	76	2.05	0.143	N/A	----**	----
Bentazon	9	1.900	0.385	0.050	200 -- MCL	Ada (1), Canyon (2), Minidoka (1), Payette (2), Washington (3),
Bromacil	13	1.000	0.211	0.050	3500 -- DWEL	Elmore (1), Gooding (1), Minidoka (1), Owyhee (1), Payette (2), Twin Falls (1), Washington (6)
Bromoxynil	1	0.052	0.052	0.050	3.11 -- HHBP	Washington (1)
Chlorpyrifos	2	0.041	0.040	0.025	10 -- DWEL	Owyhee (2)
Deisopropyl atrazine	1	0.054	0.054	0.050	----**	Minidoka (1)
Desethyl atrazine	72	1.200	0.099	0.025	----**	Ada (7), Canyon (6), Cassia (12), Elmore (3), Fremont (1), Gem (1), Gooding (2), Jefferson (1), Jerome (1), Minidoka (7), Nez Perce (2), Owyhee (5), Payette (3), Twin Falls (8), Washington (13)
Dinoseb	2	0.520	0.335	0.050	7 -- MCL	Fremont (1), Washington (1)
Diuron	4	0.100	0.056	0.025	100 -- DWEL	Bingham (1), Minidoka (2), Nez Perce (1)
Ethoprop	1	0.036	0.036	0.025	11.4 -- HHBP	Payette (1)
Hexazinone	4	0.063	0.050	0.025	400 -- HAL	Cassia (2), Jefferson (1), Minidoka (1)
Imidacloprid	4	0.060	0.044	0.025	360 -- HHBP	Bonneville (1), Fremont (1), Minidoka (2)
Metolachlor	1	0.085	0.085	0.050	700 -- HAL	Washington (1)
Metribuzin	9	0.460	0.152	0.050	70 -- HAL	Ada (2), Cassia (1), Fremont (1), Jefferson (4), Owyhee (1)
Norflurazon	1	0.049	0.049	0.025	96 -- HHBP	Elmore (1)
Pentachlorophenol	1	0.140	0.140	0.050	1 -- MCL	Idaho (1)
Prometon	1	0.210	0.210	0.025	400 -- HAL	Minidoka (1)
Propazine	1	0.037	0.037	0.025	10 -- HAL	Nez Perce (1)
Simazine	14	0.140	0.052	0.025	4 -- MCL	Canyon (1), Cassia (6), Minidoka (7)
Tebuthiuron	1	0.270	0.270	0.025	500 -- HAL	Fremont (1)
Terbacil	4	0.320	0.182	0.050	90 -- HAL	Ada (4)
Triallate	1	2.300	2.300	0.050	0.45 -- FQPA DWLOC	Idaho (1)

\*\*Summation of Atrazine, Desethyl atrazine and Deisopropyl atrazine. All three are not always detected together.

\*Breakdown product(s) of Atrazine. No reference point available, Atrazine MCL of 3 ug/L is used.

MCL – EPA Maximum Contaminant Level, 2012 Edition of the Drinking Water Standards and Health Advisories

HAL – EPA Lifetime Health Advisory, 2012 Edition of the Drinking Water Standards and Health Advisories

DWEL – EPA Drinking Water Equivalent Level, 2012 Edition of the Drinking Water Standards and Health Advisories

HHBP – Human Health Benchmarks for Pesticides, 2017

FQPA DWLOC – Food Quality Protection Act Drinking Water Level of Concern value listed in EPA RED document DWEL

*For additional information about this program or projects, please contact Curtis Cooper, Idaho State Department of Agriculture at (208) 332-8597 or email at [curtis.cooper@isda.idaho.gov](mailto:curtis.cooper@isda.idaho.gov)*