

Northern Owyhee County DCPA Response Project

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The Idaho State Department of Agriculture (ISDA) is the lead agency in implementing the Rules Governing Pesticide Management Plans (PMP) for Ground Water Protection, or PMP Rule (IDAPA 02.03.01). ISDA has the authority to implement pesticide programs through a cooperative working agreement with the Environmental Protection Agency (EPA), Idaho state laws, and department rules. The Idaho PMP Rule outlines processes to protect ground water from pesticides and defines pesticide detections based on the concentration of the detection compared to a Reference Point, or health standard. The PMP Rule categorizes pesticide detections into the following 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 100% of the Reference Point.
- Level 4:** Detection greater than 100% of the Reference Point.

The Idaho State Department of Agriculture (ISDA) monitors ground water from approximately 300 domestic wells around the state of Idaho each year for 110 different pesticides. From 2001 to 2006, ISDA detected the general use product dimethyl tetrachloroterephthalate (DCPA) in varying concentrations in 12.6% of the total wells tested for pesticides. DCPA is commonly known by the trade name “Dacthal®”. The EPA Lifetime Health Advisory (HA) for DCPA is 70 micrograms per liter (µg/L). Ground water samples collected from a domestic well (ID number 3100101) located south of Homedale in Owyhee County have consistently had elevated concentrations of DCPA (Fox and Carlson, 2003). In 2005, the concentration of DCPA at well 3100101 exceeded the Lifetime HA, with a concentration of 85 µg/L. In response to the DCPA detection over the health standard, ISDA created the Northern Owyhee County DCPA Response Project (Figure 1) and sampled additional wells to determine the extent of the DCPA contamination. Between 13 to 14 wells in the project area were sampled once in 2005, quarterly in 2006, and once in 2007. This fact sheet summarizes the DCPA detections in the ground water for this project. For information regarding inorganic constituents sampled in this project (such as nitrate or nitrite), please refer to the ISDA website at: <http://www.agri.idaho.gov/Categories/Environment/water/gwinorganics.php>.

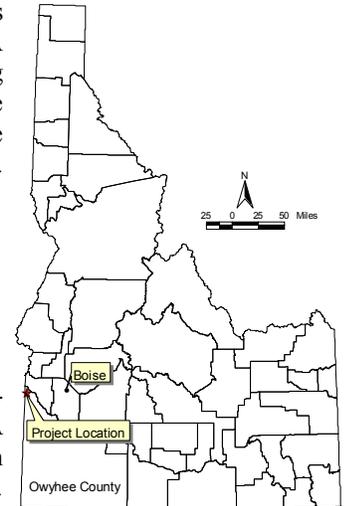


Figure 1. Northern Owyhee County DCPA Response Project location.

Hydrogeology

Ground water used for domestic purposes in the project area appears to come from two sources: (1) a shallow aquifer of coarse grained sands and gravels and (2) a deeper aquifer of a characteristic sandy blue clay that is separated from the shallow system by a blue-colored clay of varying thickness. Well logs indicate that most of the elevated concentrations of DCPA are found within the shallow aquifer. The shallow aquifer is composed of alluvial deposits, mainly sand and gravel, with local interbedded clay layers. The shallow subsurface alluvial deposits are vulnerable to leaching of contaminants. Potential sources of recharge to the shallow aquifer are applied irrigation waters, canal leakage, and precipitation. The blue clay layer that separate the shallow and deep aquifers has low permeability characteristics that can produce confined aquifer conditions (Othberg, 1994). In the project area, well logs indicate the top of blue clay layer is found

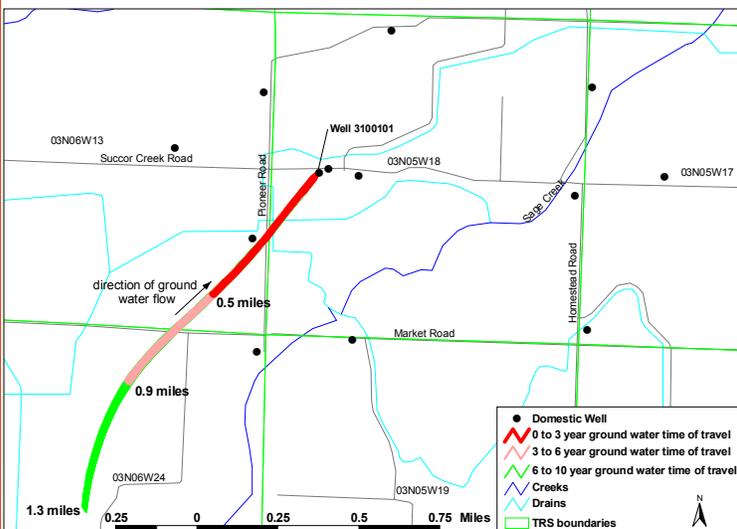


Figure 2. Ground water travel time to well 3100101 with elevated DCPA detections.

approximately 35 to 50 feet below ground surface (bgs). Several wells within the project area penetrate the blue clay layer which ranges from 70 to 154 feet thick and overlies the deeper aquifer. The deeper aquifer is generally found at depths of 120 to 195 feet bgs in the project area. The general ground water movement in the regional area appears to be toward the Snake River, which is an area of probable ground water discharge (Carlson et al., 2001). However, local shallow ground water flow direction may be influenced by nearby Sage Creek and Succor Creek. Figure 2 shows the time of travel flow path of ground water flowing to well 3100101, which had the Level 4 DCPA detection. The EPA WhAEM ground water flow model was used to estimate the time of travel for ground water in Figure 2. The model predicts that it takes ground water located 0.5 miles southwest of well 3100101 approximately 3 years to reach the well under normal pumping conditions. The flow path of the ground water to well 3100101 shows that within the project area the general direction of ground water flow is to the northeast, with some slight deviations possibly caused by influences from local drains and creeks.



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DCPA Detections

Table 1 presents a summary of DCPA concentrations from the project area from the 2005 to 2007 sampling efforts. Between five to seven wells have had non-detects or concentrations below the laboratory detection limit of 0.08 µg/L for DCPA since the beginning of the project. Five to seven wells have had Level 1 DCPA detections, or 38% to 50% of the wells sampled during the project. One well has fluctuated between Level 1, 2, and 3 detections, and another well has fluctuated between Level 2 and 3 detections from 2005 through 2007.

Table 1. DCPA detections from Northern Owyhee County DCPA Response Project, 2005 through 2007.

DCPA Concentration Range	August 2005 (14 wells)	February 2006 (13 wells)	May 2006 (14 wells)	August 2006 (14 wells)	November 2006 (13 wells)	June 2007 (13 wells)
Non Detect	4 (29%)	3 (23%)	2 (14%)	6 (43%)	3 (23%)	6 (46%)
BDL ¹	2 (14%)	2 (15%)	4 (29%)	0	3 (23%)	1 (8%)
Level 1	7 (50%)	6 (46%)	6 (43%)	6 (43%)	5 (38%)	5 (38%)
Level 2	1 (7%)	1 (8%)	0	2 (14%)	1 (8%)	1 (8%)
Level 3	0	1 (8%)	2 (14%)	0	1 (8%)	0
Level 4	0	0	0	0	0	0

¹BDL - Below laboratory detection limit of 0.08 µg/L.

The most recent sampling occurred in 2007, when 13 wells were analyzed for DCPA, along with other pesticides (Figure 3). Six wells, or 46% of wells sampled, had DCPA detections; two wells, or 15% of wells sampled, had desethyl atrazine detections; and one well had an atrazine detection. Of the six wells that had DCPA detections, one well (3100101) had a Level 2 DCPA detection, the remaining five wells that had DCPA detections had Level 1 concentrations. Six wells had no pesticides detected in the ground water and one well had a DCPA concentration below the detection limit of 0.08 µg/L.

Future Actions

In response to the elevated DCPA detections, ISDA has developed a DCPA Pesticide Management Plan that includes restrictions and an educational program for a four square mile area near the elevated detections. ISDA has been working with pesticide applicators in the area regarding the DCPA contamination and will continue the effort by educating them about the restrictions. ISDA will continue to monitor this project on an annual basis to determine if restrictions and the educational program are working to decrease the DCPA concentrations. In addition to the DCPA restrictions and education program, ISDA is encouraging all pesticide applicators to use BMPs when applying any type of pesticide. To find out more information about the core BMPs that ISDA recommends, please see the fact sheet found at <http://www.agri.idaho.gov/Categories/Environment/water/waterPDF/factSheets/pesticides/Core-BMPs.pdf>.

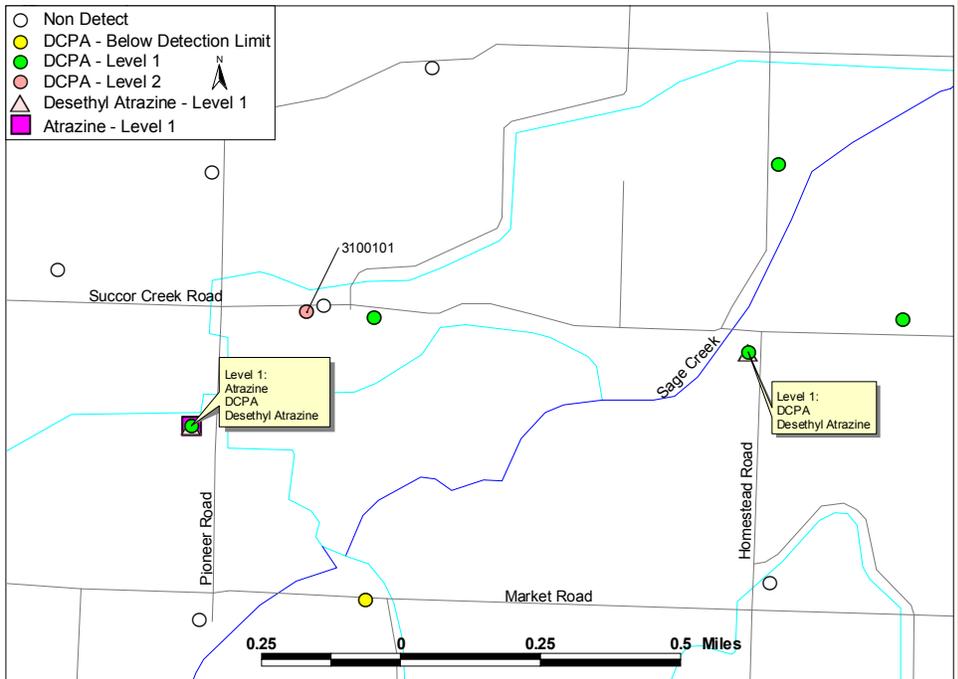


Figure 3. Pesticide results from 2007 sampling of Northern Owyhee County DCPA Response Project.

References

Carlson, R., G. Bahr, and L. Boyle, 2001. Ground Water Quality Monitoring Results for Northwest Owyhee County, Idaho. Idaho State Department of Agricultural Technical Summary #6.

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Othberg, Kurt L., 1994. Geology and Geomorphology of the Boise Valley and Adjoining Areas, Western Snake River Plain, Idaho. Idaho Geological Survey. 54 p.