



MEMORANDUM

EUGENE WATER & ELECTRIC BOARD
ENVIRONMENTAL MANAGEMENT

Rely on us.

TO: Commissioner Farmer, Brown, Cassidy, Cunningham and Ernst
FROM: Karl Morgenstern
DATE: November 12, 2009
SUBJECT: Update on the PCP plume from International Paper Containerboard Plant in Springfield

Issue

The Weyerhaeuser Company and now the International Paper Company have been working with the Oregon Department of Environmental Quality (DEQ) since 1995 to address groundwater contamination associated with its Springfield mill site located at 785 North 42nd Street, near the vicinity of the McKenzie River (Figure 1). EWEB should periodically evaluate the progress of this cleanup to make sure the McKenzie is not threatened from the pentachlorophenol (PCP) groundwater plume migrating northward from the IP plant

Background

Weyerhaeuser began operations at its Springfield facility in 1948. Until 1987, some of the lumber products produced at this location were surface treated in on-site tanks with pentachlorophenol (PCP), a wood preservative. PCP has not been used at the site since that time. When the sawmill facility was removed in 1991, Weyerhaeuser discovered that the past practices of spraying and dipping of wood with PCP had contaminated surface soils and groundwater at the mill site. The company signed a Consent Order with the DEQ in September 1995, agreeing to investigate the contamination and identify potential solutions to protect human health and the environment.

During the investigation, Weyerhaeuser took a number of interim corrective actions to minimize the contamination and to protect public drinking water. These actions included removal and secure disposal of contaminated soil, asphalt paving in the area where PCP was applied to prevent the infiltration of precipitation, and sediment removal from a storm water ditch where PCP-related compounds had been detected in sediments. In addition, many groundwater monitoring wells were drilled at various depths in the vicinity of the site, and groundwater samples were collected (Figure 2). PCP was detected at concentrations equal to or exceeding 1 part per billion (ppb or ug/L), which is the U.S. Environmental Protection Agency maximum contaminant level for pentachlorophenol in drinking water. Weyerhaeuser coordinated with Springfield Utility Board (SUB) and Rainbow Water District (RWD) to collect groundwater samples from the operating municipal production wells. These wells are located northwest of the plant site (Figure 2).

To be protective of the SUB/RWD well field, Weyerhaeuser installed a carbon filtration system in 1996 to treat water from the SUB and RWD wells should PCP be detected. In September 2002, the Oregon Department of Environmental Quality (DEQ) approved the Remedial Design/Remedial Action (RD/RA) Workplan requiring continued monitoring and reporting on effectiveness of institutional controls at the site to minimize exposure to residual soil and sediment contamination, operation and maintenance of the well field treatment system (as necessary), and monitoring and reporting on the progress and concentrations of the groundwater PCP plume as it migrates to the northwest toward the SUB/RWD supply wells and McKenzie River. The original groundwater modeling, done as part of the remedial investigation, indicated that low levels of PCP contamination were likely to begin showing up in the SUB/RWD wells around 2007.¹

Summary of Analytical Results

In May 2008, low levels of PCP were detected in one of the SUB/RWD supply wells (well 2 at 0.21 ug/L). In 2008 SUB/RWD started up the carbon filtration unit to treat the water pumped from the well field. The carbon treatment system operated from approximately May to October. Based on conversations with DEQ, the treatment system will be operated annually during this time period when various unconfirmed detections of PCP are showing up in SUB/RWD supply wells.

Analytical results from eight years of groundwater monitoring indicate that ***PCP levels have increased*** in the following monitoring wells (see Figure 2 for locations)²:

- **Well MW-5D** (screened depth 79-89' below ground surface (bgs)) increased from 23.0 ug/L in 2001 to 56.0 ug/L in 2006 (latest data collected 1/27/09 indicates 44.0 ug/L).
- **Well MW-5I** (screened depth 67.5-77.5' bgs) increased from 23.0 ug/L in 2001 to 59.0 ug/L in 2007 (latest data collected 1/27/09 indicates 44.0 ug/L).
- **Well MW-19D** (screened depth 79-89' bgs) increased from 9.0 ug/L in 2001 to 30.0 ug/L in 2008 (latest data collected 1/27/09 indicates 20.0 ug/L).
- **Well MW-21D** (screened depth 75-85' bgs) increased from <0.5 ug/L (not detected) in 2001 to 43.0 ug/L in 2009.

Analytical results from eight years of groundwater monitoring indicate that ***PCP levels have decreased*** in the following monitoring wells (see Figure 2 for locations):

- **Well MW-22D** (screened depth 80-90' bgs) decreased from 120.0 ug/L in 2002 to 12.0 ug/L in 2009.
- **Well MW-22I** (screened depth 36-46' bgs) decreased from 210.0 ug/L in 2001 to 22.0 ug/L in 2009.
- **Well MW-27D** (screened depth 68-78' bgs) decreased from 320.0 ug/L in 2001 to 88.0 ug/L in 2009.

These data indicate that levels of PCP in the source area have started to decrease while levels are increasing farther downgradient as the plume move to the northwest. Based on conversations with DEQ, it appears the assumptions used in the initial groundwater model have not played out as the plume moves to the northwest. It appears actual concentrations are higher than what was modeled approximately eight years ago. EWEB has indicated to DEQ in these conversations that the model

1. Weyerhaeuser Springfield Cleanup Project Fact Sheet, January 2000 and Remedial Investigation Report, August 1999; DEQ Remedial Action Recommendation, June 2000.

2. International Paper Springfield Mill RD/RA Progress Report 56 (and 2008 Annual Report), April 15, 2009; International Paper Springfield Mill RD/RA Progress Report 58, October 15, 2009.

should be recalibrated to incorporate new data and ran to determine future potential concentrations in the groundwater and McKenzie River.

EWEB Hayden Bridge and Drinking Water Source Protection staff have been collecting water samples from Keizer Slough, 42nd and 52nd Street Stormwater channels, and raw water at the treatment plant since 2002 on a regular basis for pentachlorophenol analysis (among other analytes). There have been seven detections out of 127 samples submitted for PCP analysis. Results indicate low levels of PCP were detected in water samples collected from Keizer Slough (0.47 ug/L) and 42nd Street stormwater channel (0.20 ug/L) in May 2005. Low levels of PCP were also detected in 42nd Street and 52 Street stormwater channels in March and April 2005 ranging from 0.08 to 0.16 ug/L. There have been no detections of PCP in raw water at the EWEB treatment plant above laboratory detection limits.

In 2007, EWEB and the U.S. Geological Survey (USGS) installed a number of passive sampling devices (including at EWEB's treatment plant for raw water) that accumulate organic contaminants over a 30-day period. The USGS recently published a report on the use and results of this technique (see <http://pubs.usgs.gov/sir/2009/5178/>). These results indicate that a PCP degradation product, pentachloroanisole, was detected in all three sample locations (i.e., Cedar Creek, Camp Creek and EWEB's intake) at very low concentrations. Levels detected in the raw water at EWEB's filtration plant ranged from 18 to 65 picograms/liter or parts per quadrillion (equivalent to 0.000018 ug/L). Use of this technique allows EWEB to evaluate the presence of dissolved organic contaminants at extremely low detections limits. However, in this case it is still difficult to determine if the low levels of pentachloroanisole found at the intake are from the groundwater PCP plume since this contaminant was also detected in other creeks that are not near the PCP plume.

Discussion

The key question of concern for EWEB is whether or not the contaminant plume that has likely reached the McKenzie River poses a risk to our drinking water supply. Because of the following circumstances, we believe the plume poses a low risk.

- First, the source of the contamination (i.e. the PCP-contaminated soils) has been removed and PCP concentrations in groundwater downgradient of the source area have decreased over the last several years. It is likely that natural biodegradation processes, dispersion, and soil adsorption are contributing to this trend.
- Second, as PCP-contaminated groundwater discharges to the McKenzie River, mixing of groundwater with the large volume of surface water will substantially reduce waterborne chemical concentrations. The original model projections indicate that the highest PCP concentration migrating to the McKenzie will be 5 ug/l or ppb, probably discharging approximately .8 miles above Hayden Bridge. Considering the groundwater flows of approximately 1"/day and the volume of surface flow, the maximum PCP concentration in the McKenzie River at the point of discharge is estimated to be 0.0004 ppb. This is well below commercial and USGS laboratory detection limits for water grab samples (0.5 and 0.0048 ug/L, respectively), and well below the 1.0 ppb maximum contamination level for drinking water. Even with groundwater levels being higher than the model predicted, concentrations in the McKenzie will likely be below analytical detection limits. As indicated above, EWEB was able to detect pentachloroanisole at parts per quadrillion levels, which is a degradation product of PCP, but these low levels cannot be tied to the groundwater plume since it was also detected in other upstream samples.
- Third, Hayden Bridge and Drinking Water Source Protection staff have and will continue to monitor surface water samples collected from stormwater channels, Keizer Slough and the

McKenzie River for PCP. Detection limits have been reduced to 0.0048 ug/L by using the USGS laboratory (as compared to detection limits of 0.5 ug/L at commercial labs). In addition, EWEB will start using passive sampling techniques at the filtration plant on a more regular basis to allow detections down to the part per quadrillion level. This will allow better tracking of early detections that can trigger additional actions associated with the PCP groundwater plume.

- Fourth, the SUB/RWD well field acts as a groundwater capture zone effectively drawing PCP contamination toward the pumping wells before contaminants can enter the river. Use of the carbon treatment system will strip these contaminants from the water prior to distribution to Springfield residents.
- Fifth, Hayden Bridge has the capability to use powered activated carbon for treating PCP if it should be detected in the raw water.
- Sixth, the initial computer modeling predicts that there will be non-detectable levels of PCP in all the monitoring wells by the year 2010. Obviously, the modeling needs to be updated to reflect current conditions and reran, however the trend information is still useful in evaluating the anticipated movement of the plume over time.

Recommendations

This memo is for information purposes. Staff is monitoring the situation and does not believe it poses a threat to EWEB's drinking water quality. Staff will continue to communicate with DEQ around the need to update the groundwater model to gain better insight as to the potential concentrations entering the McKenzie River. The future use of passive sampling may allow EWEB to work with DEQ to place devices upstream and downstream of the PCP plume to measure what is actually entering the river.

Requested Action

No formal action is requested at this time.