PUBLIC HEALTH CONSULTATION

Redmond Tallow Drinking Water Wells
And Surrounding Water Wells

Redmond, Deschutes County, Oregon
EPA Facility ID: ORD050956333

Prepared by:
Oregon Department of Human Services
Superfund Health Investigation & Education Program

Under Cooperative Agreement with the
U.S. Department of Health and Human Services
Agency for Toxic Substances and Disease Registry

Purpose and Health Issues

The Superfund Health Investigation and Education (SHINE) Program in the Oregon Department of Human Services developed this health consultation to address groundwater contamination related to historical rendering plant activities at the Redmond Tallow Company. The principal contaminant of concern is nitrate found in the well water on the site. On the basis of the most recent sampling data and the known health effects of nitrates, SHINE considers this site to be a *no apparent public health hazard.* A new treatment system is in place and the most recent sampling result is below the maximum contaminant level (MCL) for nitrates. The water system is presently in compliance with state drinking water rules. However, the well water nitrate levels are required to be monitored quarterly until the samples remain consistently below 50 percent of the state and federal MCL of 10 parts per million (ppm). Based on these recent sampling results, SHINE withdraws its previous recommendation to people living and working on the site to avoid using the drinking water system. SHINE will reinstate this recommendation if the nitrate levels again exceed the current state and federal drinking water standards of 10 ppm.

Background

In February 2002, the Deschutes County Health Department (DCHD) and the Deschutes County Environmental Health Department (DCEHD) contacted the SHINE program of the Oregon Department of Human Services (ODHS) to assist in assessing the potential for human exposure to contaminated water on the site and from nearby private wells.

Redmond Tallow Company is an animal carcass rendering plant located on rural land in Central Oregon approximately three miles northeast of the city of Redmond, in Deschutes County. The rendering plant, located on a 40-acre site, consists of buildings that house the rendering plant facilities and a waste holding pond. The owner/operator resides on the property, as well as employees of the rendering plant that are housed in six to eight mobile homes. At any time, approximately ten to 25 residents, including children, live on the property. The majority of the workers are primarily Spanish speaking. All residences and rendering facilities on the property receive water from a single water system consisting of two on-site wells, pumps, and piping for distribution of the water.

The plant has operated continuously at the site since the early 1920s, disposing of large animal carcasses from the immediate vicinity. In recent years, the plant has been receiving and processing carcasses from all over the state as the number of rendering plants has decreased across Oregon. Neighbors have made numerous complaints to the Oregon Department of Environmental Quality (ODEQ) about the odor that comes from facility operations.

Historical waste management practices on the Redmond Tallow site have contributed to the groundwater contamination. The waste lagoon was previously unlined, and the facility discharged wastewater containing organic waste from the cooking operation on the property. Another important source of past and present contamination is the now

abandoned practice of burying paunch manure (the contents of the rumen) on the site. The previous owner reportedly engaged in this practice for many years. Finally, site employees briefly attempted to deposit steam in one drill-hole on the property in an effort to decrease odors (Walt West, Oregon Department of Environmental Quality, personal communication, Feb. 19, 2004). Due to the historical sources of contamination and to remedy active sources of contamination, three agencies took action to correct the nitrate problem in the onsite wells. ODEQ ordered the owner/operator of Redmond Tallow to retain a private consulting firm to further evaluate and determine the extent of groundwater contamination at the site and to propose remediation for any conditions found to be hazardous [1]. The Oregon Drinking Water program issued a notice of violation and remedial order in July 2002, detailing corrective actions required by the facility to achieve compliance. The SHINE program released an earlier, public comment version of this document in April 2003 that found this site to be a public health hazard.

In cooperation with ODEQ and DCEHD, the Redmond Tallow Company has worked to address neighbors' concerns as well as reduce existing sources of groundwater contamination. In early 2002, the facility responded to a Notice of Noncompliance by ODEQ and installed a plastic liner in the previously unlined waste holding pond [2]. The owner has committed to ultimately eliminating the outdoor waste holding pond and replacing it with a series of holding tanks that contain the effluent wastewater. The collected wastewater would be treated for land application and/or be removed by tanker truck for appropriate off-site disposal. After a neighboring well located approximately 300 feet south of the property was found to have nitrate levels of 6.1 ppm, new wells were voluntarily drilled by the facility for two adjacent property owners. In December 2003, a reverse osmosis system was placed on the well that provides domestic water to households on the property to reduce the nitrate levels of the formerly untreated drinking water (Jeff Freund, Deschutes County Environmental Health Department, personal communication, Feb. 19, 2004). Currently, measures are being taken by ODEQ and the facility to halt the present and future source of contamination from the paunch manure. The plans include covering the existing piles with plastic to eliminate leaching into groundwater and removal of the pile over time until the soil nitrate concentrations are reduced to a level that will support plant growth [3]. At a site visit made by SHINE staff in May 2003, the pile of paunch manure was observed on the eastern side of the property and uncovered[1].

The Redmond Tallow Company water system was not previously identified for public use. Under Oregon law and administrative rules a "public drinking water system" is defined as any water system serving four or more individual connections [4]. The ODHS Drinking Water Program, as a result of becoming aware of the water system usage, has now recognized it as a public water system and it is thereby subject to routine monitoring, reporting, and public notification requirements (John Odisio, Oregon Department of Human Services, Drinking Water Program, personal communication, Feb. 18, 2004).

[1] SHINE staff included Michael Heumann, Ken Kauffman, and Amanda Guay. Carl Chaco, the owner of the plant, and Paul Speck guided staff through the plant and answered questions. Walt West from the Oregon Department of Environmental Quality was also present.

Data/Discussion

In September 2001, Deschutes County Environmental Health Department tested drinking water samples from the water system serving the rendering plant. Samples from the two source wells contained 22.4 ppm and 25.6 ppm nitrate-nitrogen [5]. The well having 22.4 ppm provides domestic water to the households on the property. DCEHD immediately required the Redmond Tallow Company to provide bottled water for well users for ingestion and cooking. DCEHD, with assistance from the Deschutes County Health Department and ODHS, developed the handout "Deschutes County Health Effects Information-Nitrates" in English and Spanish. They visited each household on the Redmond Tallow site property, advised residents of the nitrate hazard, provided a handout, and recommended that residents not use water from the on-site system until the water was brought into compliance with all drinking water criteria, including the MCL for nitrate-nitrogen (Jeff Freund, DCEHD, personal communication, July 2, 2002; and Rachel Wood, Deschutes County Health Department, personal communication, July 1, 2002). Adjacent property owners also reported to the county environmental health office that they had found elevated levels of nitrate thought to be attributable to the rendering plant.

Table 1. Nitrate-Nitrogen Results from Onsite and Neighboring Wells

Sample Number	Nitrate-N Level (mg/L)	**Sample Number**	Nitrate-N Level (mg/L)	**Sample Number**	Nitrate-N Level (mg/L)
002[1]	24.3	**010**	1.22	**018**	1.53
003[1]	16.0	**011**	1.22	**019**	1.79
004	1.10	**012**	1.42	**020**	0.79
005	1.23	**013**	6.05	**021**	0.744
006	1.40	**014**	2.51	**022**	0.528
007	1.34	**015**	1.58	**023**	0.525
008	1.34	**016**	1.64	**024**	1.23
009	1.49	**017**	1.54	**025**	1.68

[1]Samples 002 and 003 are from two on-site wells (all other samples are from neighboring wells) [5]. The EPA and Oregon drinking water MCL for nitrate-nitrogen is 10 ppm or mg/L [6].

In March 2002, DCEHD and ODEQ designed a well sampling study to evaluate all domestic wells located within one half mile of the rendering plant property [1]. They collected and tested water from 22 private wells on surrounding properties, and they retested the two on-site wells. Results are shown in Table 1. The on-site wells again showed nitrate-nitrogen levels of approximately 24 and 16 ppm. Tests of the 22 neighboring wells found 20 of them to have nitrate-nitrogen levels ranging from 0.5 to 1.8 ppm. Two of the 22 off-site wells were found to have 6.1 and 2.5 ppm nitrate-nitrogen. None of the off-site wells reached or exceeded the current Environmental Protection Agency (EPA) drinking water MCL of 10 ppm nitrate-nitrogen [6]. This suggests that the nitrate contamination is relatively contained [1]. The offsite well with a 6.1 ppm nitrate-nitrogen level located just south of the tallow property was replaced with

new wells for two adjacent property owners, however the old well will remain for ODEQ monitoring purposes.

Health Effects and Child Health Considerations

Nitrate-nitrogen in drinking water at levels above 10 ppm is potentially harmful to humans and animals that consume large quantities of water. Nitrate-nitrogen causes methemoglobinemia, or the inability of the blood to carry oxygen to vital tissues of the body, in infants, pregnant women, and others who are susceptible to the disorder. Adult susceptibility can be congenital or it can be induced by occupational exposure or by medicinal exposure to a variety of amine-containing chemical compounds [7]. Nitrate-nitrogen above 10 ppm in drinking water is also thought to contribute to early miscarriage in susceptible women [8]. Nitrate ingestion may lead to an increased risk of gastric or bladder cancer in persons regularly ingesting the water; however, this link has not been firmly established [9] [10] [1].

Factors that affect an individual's susceptibility to health effects from nitrates include the dose and frequency of exposure, age, diet and nutrition, and predisposing conditions. Infants six months of age and younger are particularly susceptible to methemoglobinemia and receive the greatest exposure from drinking water because most of their food is in liquid form. No cases have been observed below the 10 ppm MCL. Baby formula mixed with nitrate containing well water or nitrate in the milk of nursing mothers will affect the infant directly.

Community Health Activities

Several community health activities have occurred at Redmond Tallow. ODHS gave a presentation at the public meeting jointly held by ODEQ and ODHS on May 15, 2003 and responded to questions and concerns. The Deschutes County Health Department prepared informational materials in both English and Spanish that were distributed to the residents before the remediation took place.

Conclusions

1. SHINE concludes that this site currently poses *no apparent public health hazard* because nitrate levels in the two onsite wells have declined to less than 10 ppm. The most recent sampling of well water from the on-site wells at the Redmond Tallow Company is below the state and federal MCL for nitrates. Nitrates in groundwater can result in adverse health effects, especially in young children and pregnant or nursing women at levels above the MCL; for this reason, this site is considered a past public health hazard.
2. Wells on and around the Redmond Tallow facility must be monitored regularly to ensure that nitrate levels remain the same or diminish with time, as would be expected if the nitrate source(s) is properly addressed and abated [1].

Recommendations

1. If testing confirms nitrate levels above 10 ppm, SHINE recommends that water from the present on-site wells not be used for any ingestion purposes.
2. DEQ should continue the full evaluation of the contamination plume, both on- and off-site, and require appropriate remedial actions if impacts are demonstrated.
3. SHINE recommends that the Redmond Tallow Company immediately notify employees and tenants relying on the on-site water supply about any changes to the suitability of the water for ingestion purposes, as required by state law. Additionally, any new employees or tenants should also be informed of the potential adverse health effects from nitrate-nitrogen in drinking water.

Public Health Action Plan

The Public Health Action Plan (PHAP) for the Redmond Tallow site contains a description of actions that have been or will be taken at the site by SHINE, other government agencies, and the site owner. The purpose of the PHAP is to ensure that this PHA not only identifies public health hazards associated with the site, but also provides a plan of action to prevent or minimize the potential for adverse human health effects from exposure to site-related hazardous substances.

Actions Completed

1. The Deschutes County Health Department prepared informational materials in both English and Spanish that were distributed to the residents before the remediation took place.

2. The property owner provided bottled water to the residents and employees until the wells could once again be used.

3. The owner has worked with the various agencies to bring the system into compliance.

Actions Ongoing and Planned

1. The owner has committed to continuing efforts to remedy sources of contamination.

2. SHINE will continue to review sampling results for the Redmond Tallow Company and reevaluate the public health classification if needed. New sampling data, especially data that demonstrates that the water system is once again out of compliance will result in additional actions at this site. The community will be notified of new recommendations or findings.

SHINE will reevaluate and expand the PHAP as needed. New environmental, toxicological, or health outcome data may determine the need for additional actions at this site.

Public Comments

ODHS gave a presentation at the public meeting jointly held by ODEQ and ODHS on May 15, 2003 and responded to questions and concerns. The draft version of this public health consultation was available at that meeting and was also available on the web at www.healthoregon.org/superfund. The report was available for public comment until June 16, 2003. One comment was received and the comment and a response to it can be found in Appendix A.

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References:

[1] Report from Jeff Freund, Deschutes County Community Development Department to Deschutes County Board of Commissioners. 2002. (Based on laboratory analyses by Oregon Department of Environmental Quality Laboratory, Apr., 2002).

[2] Oregon Department of Environmental Quality. 2001. Notice of Noncompliance, WQ-ERB-2001-7969, WQ-Deschutes County, Redmond Tallow Company, WPCF # 1400-B/File # 109224.

[3] Paunch Manure Removal Plan. 2004. Redmond Tallow Company, Redmond, OR, prepared for Oregon Department of Environmental Quality, Bend, OR.

[4] Oregon Revised Statutes ORS 448.115 (13). 2002. Oregon Administrative Rules OAR 3330610020 (112).

[5] Oregon Department of Environmental Quality. 2001, 2002. Data sheet concerning DEQ Sampling Results for Nitrate-Nitrogen in Groundwater Near the Redmond Tallow Company. Bend, Oregon.

[6] USEPA corrections to Phase V Synthetic Organic Chemicals rule.1994. And Oregon Administrative Rules 333-061-0030 (1). 2002.

[7] Oregon Health Division, Environmental Toxicology Section. 2001. Nitrate, Technical Bulletin, Health Effects Information.

[8] Morbidity and Mortality Weekly Report.1996. Spontaneous abortions possibly related to ingestion of nitrate-contaminated well water-LaGrange County, Indiana, 1991-1994. MMWR Jul 5; 45(26): 569-72.

[9] Eichholzer M, Gutzwiller F. 1998. Dietary Nitrates, Nitrites, and N-Nitroso Compounds and Cancer Risk: A Review of the Epidemiologic Evidence. Nutrition Reviews 56(4): 95-105.

[10] Morales-Suarez-Varela M, Llopis-Gonzalez A, Tejerizo-Perez ML. 1995. Impact of nitrates in drinking water on cancer mortality in Valencia, Spain. European Journal of Epidemiology 11:15-21.

[11] Ward MH, Cantor KP, Riley D, Merkle S, Lynch CF. 2003. Nitrate in public water supplies and risk of bladder cancer. Epidemiology 14 (2): 183-191.

Appendix A- Responses to Public Comments

Forcum
& Speck
ATTORNEYS AT LAW

IN REPLY, REFER TO OUR FILE NO.

June 9, 2003

VIA FACSIMILE

CHIEF
PROGRAMS EVALUATION, RECORDS AND
INFORMATION SERVICES BRANCH
DIVISION OF HEALTH ASSESSMENT AND
CONSULTATION
ATSDR MAILSTOP EWE
1600 CLIFTON ROAD NE
ATLANTA GA 30333

Re: Redmond Tallow

To whom it may concern:

This office represents Redmond Tallow. We have concerns regarding the Public Health Report issued by Kennedy Kaufman of the Oregon Department of Human Services in cooperation with ATSDR.

The report declares Redmond Tallow to be a public health hazard. No citation to applicable state or federal regulations is made to give support or a legal basis for that conclusion.

The provisions of 42 CFR Section 90 et seq. do not appear to give any separate legal authority to a state employee to declare that a site is a public health hazard. The federal regulations do appear to allow ATSDR to issue a "health advisory." 42 CFR § 90.9.

1123 N.W. Bond Street / Bend, Oregon
) 388-1107/ Fax No. (541) 389-0969
RICHAR
SPECK

Oregon state statutes provide a mechanism for handling problems associated with excessive nitrates in a "public" (i.e., at least four connections to a common source) water supply. Those regulations can be found at Oregon Revised Statutes Chapter 448 et seq. The statutes do not provide for any action by the Health Division without notice and an opportunity to be heard by the operator of the system. ORS 448.255. No such notice was ever given in this case.

The fact of the matter is that Redmond Tallow was working with the Oregon Department of Environmental Quality and the Deschutes County Health Department. Both agencies were fully and adequately dealing with the issues presented by excessive amounts of nitrates in the "on-site" water supply.

In this instance, there is no evidence of an off-site problem. There is no evidence that the one off-site well which did have excessive nitrates is directly related to Redmond Tallow. That well site is already at normal levels.

The owners of Redmond Tallow contracted with PBS Environmental and Engineering to perform a remedial investigation/feasibility study. That report, issued in August of 2002, demonstrated no off-site contamination consistent with localized groundwater flow patterns. A copy of the text of that report without exhibits is attached as Exhibit "A."

There is also a significant question whether or not excessive nitrate build up constitutes a "release" of a hazard substance, since localized nitrates are not themselves a hazardous substance.

Based on the applicable statutes and state and federal environmental regulations, there is no legal basis to publicly declare that Redmond Tallow is a "public health hazard." Furthermore, no declaration can be made without giving notice and an opportunity to be heard.

A request is therefore made that ATSDR order that the State of Oregon de-list Redmond Tallow and that the public notice be changed to a health advisory for those persons using the well on the property. Any other notice would be inconsistent with applicable law.

Respectfully submitted,

PAUL J. SPECK

PJS:pln
Enclosures
cc: Redmond Tallow
Dick Nichols, DEQ
Ken Kaufman, Health Division
Deschutes County Health Department

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Agency for Toxic Substances and
Disease Registry
Atlanta GA 30333

June 26, 2003

Paul J. Speck
Forcum and Speck
1123 N.W. Bond Street
Bend, Oregon 97701

Dear Mr. Speck:

This is in response to your letter of June 9, 2003, to the Chief of Program Evaluation, Records, and Information Services Branch in the Agency for Toxic Substances and Disease Registry (A TSDR) regarding the Redmond Tallow Public Health Consultation (PHC). Thank you for providing comments on this document and for your interest in the activities of the Oregon Department of Human Services (ODHS) and A TSDR. Your comments and my responses will be included the final release of the Redmond Tallow PHC.

A focus of your letter is the use of the term "public health hazard". A TSDR and states like Oregon which do work under a cooperative agreement with A TSDR use this term to consistently categorize sites where adverse health effects are possible due to exposure to site contaminants. On page 4 of the Redmond Tallow, it is stated that, "OPHS-DHS concludes that the nitrate in the wells around Redmond Tallow could result in adverse health effects, especially in young children. On the basis of this information, ODHS concludes that this site is a *public health hazard."* Thus, ODHS clearly identified what this phrase meant. My review of the data for this site, including the report that you provided with your letter, include that this statement in the PHC is correct.

Regarding your concern about identifying Redmond Tallow as a public health hazard, A TSDR is authorized by Congress to evaluate problems such as those found at Redmond Tallow and to delegate this authority to states. This is documented in Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by Superfund Amendments and Reauthorization Act of 1986 (SARA), Section 104. In addition, the State of Oregon provided the Oregon Department of Human Services (ODHS) the responsibility to address situations like Redmond Tallow under ORS 431.110.

You suggested that A TSDR issue a health advisory for Redmond Tallow. Issuing a public health advisory is done for sites where there are extensive exposures which demand quick action and is rarely done. Redmond Tallow does not meet that level of concern.

You requested that A TSDR "delist" Redmond Tallow. This site is not on the Federal Superfund List. As indicated in the Redmond Tallow PHC, ODHS performed this evaluation at the request of the Deschutes County Health Department. A TSDR continues to support the conclusions made by ODHS about Redmond Tallow.

Please contact me at 404-498-0441 or JCrellin@cdc.gov if you have questions or wish to discuss your concerns further .

Sincerely, J

John R. Crellin, Ph.D.
Senior Environmental Epidemiologist
and Technical Project Officer for Oregon
Superfund Site Assessment Branch Division of Health Assessment
and Consultation

cc:
Dick Nichols, Oregon DEQ
ODHS/SHINE
Michael Holcomb -ODHS
Michael Heumann -ODHS
Ken Kauffman -ODHS
Deschutes County Health Department

Certification

The Superfund Health Investigation and Education Program of the Oregon Department of Human Services prepared the Redmond Tallow Drinking Water Wells Health Consultation under a cooperative agreement with the Agency for Toxic Substances and Disease Registry. This document is in accordance with approved methodology and procedures.

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John R. Crellin, Ph.D.
Technical Project Officer for Oregon, SSAB, DHAC

I have reviewed this health consultation, as the designated representative of the Agency for Toxic Substances and Disease Registry and concur with its findings.

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Roberta Erlwein
Leader, Cooperative Agreement Team, SSAB, DHAC