



STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

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May 20, 2004

Mr. Bruce A. Sheppard
Environmental Remediation
Burlington Northern Santa Fe Railroad
2454 Occidental Avenue South, Suite 1A
Seattle, Washington 98134-1451

Re: Former Maintenance and Fueling Facility, Skykomish, Washington (site)
Dispute Resolution

Dear Mr. Sheppard:

I have reviewed the information submitted by Burlington Northern Santa Fe Railroad (BNSF) Skykomish site. On September 9, 2003, BNSF requested that the dispute resolution process be invoked at the aforementioned site, as per the Agreed Order No DE9ITC-N213, between the Department of Ecology (Department) and BNSF dated September 16, 1993. BNSF made a request of the Department on October 21, 2003, to consider five issues regarding cleanup decision-making at the BNSF Skykomish site. The five issues were:

- (1) Should the four-phase model be used to develop soil cleanup levels to protect groundwater at the site?
- (2) Should groundwater cleanup levels be established to protect aquatic organisms in sediment at the site?
- (3) Should soil cleanup levels be established to protect air quality at this site?
- (4) Should Ecology's default residual saturation concentration be used to define "free product" at this site? and
- (5) Should the restoration time frame be fixed at five years for this site?

In a subsequent letter from BNSF dated March 26, 2004, the Railroad indicated that there "appears to be no dispute with regard to" issue number five. Accordingly, my review of the disputed issues focused on items one through four.

Information provided by Northwest Regional Office staff dated March 15, 2004, and subsequent BNSF submittal dated March 26, 2004 (Identification and Response to Factual Errors in March 15, 2004 Submittal by Northwest Regional Office), were used in review of the disputed items. Additional TCP staff with expertise in site management, TPH chemistry, and sediment cleanup, were asked to support me in this review. These staff are not assigned to the NWRO nor were they

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involved in the preparation of the March 15, 2004, NWRO staff memorandum on the Skykomish site dispute resolution request. The standard of my review for the purposes of dispute resolution was to determine if staff assigned to this site appropriately interpreted and applied the relevant MTCA regulations to the particulars at this site. Based on this review, I have determined the following:

(1) SHOULD THE FOUR-PHASE MODEL BE USED TO DEVELOP SOIL CLEANUP LEVELS TO PROTECT GROUNDWATER AT THIS SITE?

Yes, and it should include both EPH and VPH fractions. BNSF believes that only the EPH fractions are required in the four-phase model under WAC 173-340-747(6)(d)(i) and Table 830-1; however, these are the minimum requirements of that portion of the regulation (i.e.; EPH constituents should be used). Site-specific information can appropriately be expanded to include the VPH fraction.

Smear zone sampling at the site shows both Diesel Range Organics as well as Gasoline Range Organics are present at the site. Given the history and nature of railroad maintenance activity at the site, it is possible that waste oil was released at this site. Smear zone data would seem to confirm that assumption. Table 830-1 requires the use of VPH data where waste oil is present.

Inclusion of VPH as well as EPH fractions will yield a more conservative cleanup level. BNSF has tried to demonstrate empirically through groundwater data and leaching tests claims of false-positives and high bias in the VPH data. Our analysis of these demonstrations, including the chemical methods used, indicate that they do not accurately predict actual groundwater impacts.

Based on the nature of contamination and site characteristics (shallow groundwater discharging to surface water; presence of free product; contamination underneath residences and other structures), it is appropriate to use conservative values to ensure protection of human health and the environment. The four-phase model using both EPH and VPH data, is appropriate for use at this site in order to establish soil cleanup levels.

(2) SHOULD GROUNDWATER CLEANUP LEVELS BE ESTABLISHED TO PROTECT AQUATIC ORGANISMS IN SEDIMENTS AT THIS SITE?

Yes. When groundwater has been impacted, the MTCA rules require that cleanup levels are to be protective of the highest beneficial use (WAC 173-340-720(1)(a)). Moreover, the rules require that cleanup levels prevent subsequent violations of surface water, sediment, soil or air cleanup standards (WAC 173-340-720(1)(c)). Finally, Ecology may also require more stringent cleanup levels when necessary to protect other beneficial uses, human health or the environment, including sensitive subgroups, potential food chain contamination and nearby surface water (WAC 173-340-720 (1)(d)(i-iv)).

The Skykomish River is designated Class AA, Extraordinary, "...to be protected for the designated uses of salmon and trout spawning, core rearing and migration; and extraordinary primary contact recreation." (WAC 173-201A-130(97)). Furthermore, the state Water Quality

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Standards (and by direct reference to those standards, MTCA) specifically protect against acute or chronic toxicity to the most sensitive biota dependent upon a particular water body (WAC 173-201A-40). The recognized high quality of the Skykomish River and its beneficial uses are protected under MTCA. It is reasonable to include the benthic community in that protection. The presence of a productive and healthy benthic community is one of a number of requisite conditions on which the Class AA beneficial use is dependent (i.e., use as a core rearing area for salmon requires a productive and uncontaminated prey species).

The MTCA rules require protection of the sediments and follow SMS to establish standards and methods for achieving that protection.

(3) SHOULD SOIL CLEANUP LEVELS BE ESTABLISHED TO PROTECT AIR QUALITY AT THIS SITE?

Yes. Our review found that the air quality investigations conducted at the site detected volatile organic compounds (VOC's) in some of the homes at the site in excess of regulatory levels. It is reasonable to believe that the soil-to-vapor pathway is a potential source of exposure at this site, given the relationships among the extent of contamination, its close proximity to the surface, and the distribution of community infrastructure over the plume (i.e., businesses, schools, residences).

(4) SHOULD ECOLOGY'S DEFAULT RESIDUAL SATURATION CONCENTRATION BE USED TO DEFINE "FREE PRODUCT" AT THIS SITE?

No. First, the question itself is a nonsequitur. Second, the information presented by BNSF cannot be relied on to establish the residual saturation concentration at the site.

BNSF has inappropriately linked the term "free product" with that of "residual saturation concentration" in forming the question. The default residual saturation concentration cannot be used to define free product at this or any other site because under the MTCA rules, free product has a specific definition: A nonaqueous-phase liquid that is present in the soil, bedrock, groundwater or surface water as a [distinct] separate layer. (WAC 173-340-200). One of the characteristics of free product, as defined by the MTCA rules, is that it is "capable of migrating independent of the direction of flow of the groundwater or surface water." *Id.* Thus, under the MTCA rules, free product is an observable condition which either is, or is not, present at the site.

Conversely, residual saturation is the "concentration of hazardous substance in the soil at equilibrium conditions...at concentrations above residual saturation, the NAPL will continue to migrate due to gravimetric and capillary forces and may eventually reach groundwater, provided that sufficient volume of NAPL is released." (WAC 173-340-747 (10) (b)). As noted above, free product is a distinct layer of NAPL, while the residual saturation concentration is the point beyond which all NAPL (not just free product) will continue to migrate. The movement of free product at a site can inform the analysis necessary to determine the residual saturation concentration, but does not define it.

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Site data, witnessed by the extensive smear zone at this site, indicates that free product is present and fluctuates vertically and laterally both with and against the groundwater gradient within the smear zone and, eventually, migrates to the Skykomish River. Residual saturation, on the other hand, becomes necessary for determining at what concentration the petroleum remaining in the vadose zone will migrate downward to the smear zone.

MTCA regulations allow for site-specific determination of residual saturation values. In accordance with WAC 173-340-747 (10)(d)(ii), BNSF proposed to use a site-specific screening level for residual saturation. The value proposed by BNSF, derived from literature values and not site-specific conditions, was 12,250 mg/kg total petroleum hydrocarbons in the unsaturated (vadose) zone. Site-specific conditions at this site would include an assessment of groundwater monitoring data, soil concentration data, as well as soil texture, grain size and water content. None of this site-specific information was correlated to the literature value proposed for use at this site. Consequently, because the residual concentration proposed by BNSF is not supported and verified by site data, BNSF must use the default residual concentration value of 2,000 mg/kg TPH for this site as per WAC 173-340-747(10)(d)(i).

I am hopeful that BNSF can now expeditiously move toward fulfilling its obligations per the Agreed Order. Should the Railroad find the current arrangements under the Order not workable in terms of timely completion of the draft Cleanup Action Plan, the Department stands prepared to complete this portion of the work with its own resources.

I hope BNSF now has the clarity it needs. Should you have any further questions, please advise. I can be reached at (360) 407-7177.

Sincerely,



James J. Pendowski, Program Manager
Toxics Cleanup Program

JJP:nh

cc: The Honorable Charlotte L. Mackner, Mayor of the Town of Skykomish
Craig Trueblood, Preston, Gates and Ellis
Michael Dunning, Office of the Attorney General
Louise Bardy, Toxics Cleanup Program, NWRO