

9551.1990(08)

NO-MIGRATION PETITION FOR ARCO PRODUCTS, WA

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

OCT 24 1990

Mr. Fielding Formway
ARCO Products Company
Post Office Box 1127
Ferndale, Washington 98248

Re: No-Migration Petition submitted for ARCO Products Company's
Ferndale, Washington Land Treatment Facility (F-90-NCPP-
FFFFF)

Dear Mr. Formway:

I am writing in regard to your September 5, 1989 "no-migration" petition, which requests a variance under 40 CFR §268.6 to allow ARCO Products Company (ARCO) to continue the land treatment of restricted wastes (EPA Hazardous Waste Nos. K050 and K051) at ARCO's Ferndale, Washington Land Treatment Facility No. 7 (LTF-7). After a careful review of your petition, we have concluded that your facility does not meet the standard for a no-migration finding. Therefore, we will recommend to the Assistant Administrator for Solid Waste and Emergency Response that the petition be denied.

Our decision to recommend denial of the petition is based on several concerns:

- The ground-water monitoring system is inadequate for the purpose of a no-migration variance, because it will not detect migration at the earliest time.
- The separation between the bottom of the treatment unit and the top of the seasonally high-water table exceeds the minimum requirement.
- Unsaturated zone monitoring for benzene, chrysene, and selenium indicate that hazardous constituents have already migrated beyond the unit boundary, and are likely to

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continue to do so in the future.

- Your air modeling shows concentrations of benzene at the unit boundary that exceed the allowable health-based standard.

The details of our concerns are described below.

Ground-Water Monitoring System

We have concluded that ARCO has failed to meet the requirements of 40 CFR §268.6(a)(3) and (4). Specifically, we believe that ARCO has not adequately determined background conditions in both the ground water and soil-pore water underlying LTF-7. First, ARCO proposed well AW-45 as an upgradient well and wells AW-47, 48, 49, and 50 as downgradient wells. ARCO notes elsewhere in the petition, however, that because of the transient nature of the water table, wells 45 and 63 are considered downgradient as well as upgradient (V.1, page 5-30 and Section 6.6). We conclude, therefore, that ARCO's ground-water monitoring system at LTF-7 does not have an upgradient monitoring well that is capable of consistently providing samples of ground water unaffected by the treatment unit.

Second, we question whether ARCO can collect samples of soil-pore water which are representative of background conditions, as required by 40 CFR §264.278(b)(1). Specifically, ground-water contours shown in Figure 3-7 of the petition indicate a ground-water divide trending generally to the west across Plot-7C. Although ground water is shown to flow generally to the northwest under LTF-7, the presence of the ground-water divide, as well as the southwesterly ground-water flow shown for LTF-45 and LTF-47, indicate that ground water may flow to the southwest from LTF-7 to the background plot and, thus, to the background lysimeters located south of the southwest corner of Plot-7C, (Figure 5-1 on page 5-14). (This means that one of the background lysimeters may be downgradient of LTF-7.) We are concerned that this flow pattern may be present since only the general direction of ground-water flow is shown (e.g., an annual average) and not its seasonal patterns. If ground water periodically flows from LTF-7 to the background lysimeters for -Plot-7C, soil-pore water samples taken from these lysimeters could not be reliably used to establish background

concentrations.

Maintaining Minimum Separation

Federal regulations require that the depth to ground water at land treatment facilities should be no less than three feet from the bottom of the treatment zone to the seasonal high water table (see 40 CFR §264.271(c)(2)). As ARCO acknowledged in its petition (V: 1, page 3-12), the ground water beneath LTF-7 sometimes rises to a level that is within the lower treatment zone of LTF-7 (i.e., above a depth of five feet) due to the low permeability of the subsoil and the area's humid climate. Figure 3-8 of the petition displays the results of bi-weekly readings of water levels in three sets of paired, shallow piezometers conducted from July 1988 to April 1989. These data show that ground water was present during this period at depths in the treatment zone as high as 2.8 feet below the ground surface and that, in general, ground water was present at depths at or above five feet below the ground surface between November and April of the sampling period.

ARCO's inability to maintain the minimum separation between the bottom of the treatment zone and the top of the seasonally high ground-water table is further supported by information presented in Table E-4 of ARCO's petition. Our evaluation of the data presented in Table E-4 revealed that between January and April 1987, ground water beneath LTF-7 was measured at depths ranging from 0.89 to 6.1 feet below "top of casing." Although, ARCO did not provide information on the distance between the ground surface and the "top of casing," typical distances from the ground surface to the top of the well casing are generally between one and three feet.¹ Thus, even if the distance between the ground surface and the "top of casing" was three feet, the water table would only have been 3.89 to 9.1 feet below the ground surface during the January - April 1987 period.

Presence of Constituents Below the Treatment Zone (BTZ)

Various data indicate that migration of hazardous constituents below the treatment unit has recently occurred. The petition noted (V.1, page 5-18), that chrysene was detected in ground-water monitoring well No. 43 in January, 1988 at 3.3 ppb, which is in excess of the health-based level (HBL) of 0.2 ppb used in no-migration decisions. Furthermore, correspondence

between ARCO and Washington Department of Ecology (WDOE) (November 6, 1989 and January 24, 1990) that has been shared with us indicates that benzene, chrysene, and selenium have also been detected in soil-pore liquids beneath the treatment zone at hazardous concentrations. We present these data below in Table 1.

 1 Table E-5 of Appendix A presents for monitoring wells other than those listed on Table E-4, elevation measurements made at the top of casing and surface grade. These data indicate that the distance between the ground surface and the top of the well casing ranged from a low of 0.59 feet (well number AP-46) to a high of 2.15 feet (well number AP-64).

TABLE 1

Soil-Pore Liquids Monitoring Data

Constituents	Lysimeter No.	HBL(ppb)	Concentration(ppb)	Date
Benzene	22	5	6.4	8/89
			7.4	9/89
			10.0	12/89 1/
Chrysene	Composite 2/	0.2	1.4	9/88
Selenium	Composite 3/	10	14.0	2/87

 1/ Composite sample (Based on page 1-5 of ARCO's January 24, 1990 letter to Mr. Richard A. Burkhalter, Washington Department of Ecology).

2/ Composite sample containing samples collected from lysimeter numbers 21GB, 22GB, and 23GB.

3/ Composite sample containing samples collected from lysimeter numbers 21PC, 22PC, and 23PC.

As shown above in Table 1, benzene, chrysene, and selenium have migrated past the unit boundary at concentrations in excess of the HBL used in no-migration petition decision-making. We note that concentrations of the above constituents may actually have been detected at an individual lysimeter at concentrations higher than those reported, due to the averaging effect obtained from compositing the lysimeter samples.

ARCO's January 24, 1990 letter also stated that toluene, ethylbenzene, and xylene were detected in lysimeters, which "indicates a problem with the current operating practices for landfarm Plot-7B." ARCO indicates that hairline fractures in the clay may be aiding contaminant transport from Plot-7B (Attachment page 1-4) but also suggests that these hairline fractures are a local phenomenon because similar lithology was not detected in other borings. Because the petition states that fractures in the clay are a source of recharge for the underlying ground water, we conclude that future migration will continue to occur. ARCO believes it can address this concern by decreasing waste loadings made to Plot-7B. If this leads to an increase in waste loadings made to Plots-7C and 7A, we are concerned that this increase may cause additional migration.

Lastly, data presented in Table 5-8 of the petition, show that chrysene was detected below the treatment zone at concentrations of 130 ppb for separate sampling periods in July, 1987 and January, 1988. We do not believe that ARCO can explain the presence of chrysene as resulting from a recent, one-time over application and the recurring presence of chrysene beneath the treatment unit at concentrations in excess of the health-based level of 55 ppb is a further basis for petition denial. The presence of chrysene beneath the treatment zone, will also obscure future determinations of whether chrysene is continuing to migrate.

Air Monitoring

In its petition, ARCO stated that the CHEMDAT6 model predicted concentrations of benzene at the unit boundary in excess of the health-based standard by a factor of 1.4; therefore, ARCO is "exploring waste minimization, pretreatment, and operation modifications which can effectively reduce the predicted emissions for benzene to meet appropriate standards if

necessary" (V.1, Executive Summary, pages 6-7). In fact, the petition indicates (V.1, page 8-12) that the predicted annual average concentration of benzene in the air at the unit boundary is 1.0 ug/m³, which exceeds the health-based level of 0.12 ug/m³. Elsewhere in the petition (V.1, page 7-11), the average concentration of benzene in the air at the unit boundary is reported as 1.56 ug/m³ (including a May 1985 waste sampling event), which also exceeds the health-based level. Therefore, ARCO's predicted benzene concentrations (1.0 ug/m³) at the unit boundary fail to satisfy the no-migration standard of 0.12 ug/m³.²

Finally, our review indicates that the petition is incomplete and that information and clarification in areas beyond those highlighted above, would be needed to complete the petition. However, because of the problems above, we believe we have enough information at this time to move toward a denial of your petition.

It is our practice to give petitioners the option of

2 Based on our review of Tables E-24 through E-27, it appears that the values of predicted maximum long-term ambient air concentrations in Table 7-3 were not corrected based on the results of the confirmatory monitoring program discussed in Appendix E. If corrected for monitored concentrations, the predicted concentrations of benzene at the unit boundary actually may be higher than reported in the petition. In addition, it is likely that ARCO's confirmatory monitoring program may not have been performed during worst-case emission and dispersion conditions. As a result, the concentration of benzene may actually be higher than measured and an even higher correction factor may be warranted.

withdrawing their petitions to avoid a negative publication in the Federal Register. If you prefer this option, you must send us a letter withdrawing your petition and acknowledging that the petitioned wastes are still considered to be restricted wastes subject to the Third Third Land Disposal prohibitions scheduled to be effective November 8, 1990. This letter should be forwarded to the following address within two weeks of the date of receipt of today's correspondence:

Elizabeth A. Cotsworth, Chief
Assistance Branch (OS-343)
Office of Solid Waste
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

If you choose not to withdraw your petition, we will recommend that a proposed denial decision be published in the Federal Register.

Any questions regarding our findings may be submitted in writing to Mr. James Michael of my staff.

Sincerely,

Original Document signed

Jeffery D. Denit, Deputy Director
Office of Solid Waste

cc: Michael Gearheard, Region X
Carrie Sikorski, Region X
Dave Bartus, Region X
Kim Anderson, WDOE
Elizabeth Cotsworth, EPA HQ
James Michael, EPA HQ
Terry Keidan, EPA HQ