UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF INSPECTOR GENERAL
MID-ATLANTIC DIVISION
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August 31, 2000

MEMORANDUM

SUBJECT: Memorandum of Review on EPA's Management
of the Abex Superfund Site
Report Number 2000-S-00006

FROM: Carl A. Jannetti
Divisional Inspector General for Audit
Mid-Atlantic Division (3AI00)

TO: Bradley M. Campbell
Region III Administrator (3RA00)

PURPOSE

Senator Charles Robb requested we perform a review of Region III's management of the Abex Superfund site as it pertained to the residents of nearby Washington Park Housing (WPH) apartments. His letter primarily asked us to address the following topics:

- EPA's sampling of the soil in the area of WPH apartments,
- Testing inside of the heating ducts in the WPH apartments,
- Blood lead tests offered by EPA throughout the cleanup,
- Consideration of temporary and/or permanent relocation of WPH residents, and
- Whether EPA conducted a poll of WPH residents.

SCOPE AND METHODOLOGY

This review was conducted in response to Senator Robb's letter asking specific questions related to the Abex Superfund site. In order to determine whether EPA's

decisions and actions were reasonable pertaining to the specific issues noted above, we interviewed numerous EPA Region III officials, as well as an official from the Department of Justice. We also conducted a review of Region III's Abex Superfund site files and received technical assistance from our Engineering and Science Staff. On March 15, 2000, we met with Region III officials to discuss Senator Robb's request. In addition, on April 3, 2000, we met with Senator Robb's staff to discuss agreed upon procedures for addressing their concerns. The agreed upon procedures are substantially less in scope than an audit made in accordance with generally accepted auditing standards. As a result, this report was prepared in accordance with Generally Accepted Government Auditing Standards Section 2.10. Throughout our review we maintained continuous communication with Senator Robb's staff and Region III personnel regarding the contents and format of our response. The fieldwork was started on March 15, 2000 and completed on June 29, 2000.

We issued a draft memorandum to the Regional Administrator on July 13, 2000. EPA submitted its response to us on August 22, 2000. Based on this response, we made minor modifications to our report. After our recommendation on page 6, we included a summary of EPA's response to the draft report, as well as our evaluation of the Region's response. A complete copy of the response is included in Appendix 1. Based on discussions with Region III officials, we agreed that an exit meeting was not necessary because the Region concurred with the issues and recommendation in the report.

ACTION REQUIRED

In accordance with EPA 2750, you are required to provide our office with a written response within 90 days of the date of this memorandum. When you provide your written response, please include a copy of Region III's memorandum informing others of its experience with testing lead in heating ducts.

GENERAL BACKGROUND

Once a site containing hazardous substances is identified, a preliminary assessment (PA) is conducted to determine if the site poses a potential threat to human health. If the site poses a serious imminent threat, EPA will conduct an emergency "removal" action. However, if the PA shows the contamination problem is not imminent, EPA will conduct a site inspection (SI), which involves sampling to further determine the existence of a threat from the contamination. Based on the information obtained from the PA and SI, EPA uses the Hazard Ranking System to evaluate the potential risks to public health and the environment. The most serious sites are included on the National Priorities List (NPL) and qualify for long-term cleanups with Superfund money.

After placing a site on the NPL, EPA will proceed with a remedial response that has two main phases: 1) the remedial investigation and the feasibility study (RI/FS), and 2) the remedial design/remedial action (RD/RA). During the RI/FS, conditions at the site are studied, problem(s) identified, and alternative cleanup methods evaluated. The RI/FS is an interactive process that may take two or more years to complete, and may be performed by the potentially responsible party (PRP) or EPA. During the RI/FS phase, the preferred remedy is identified and finalized in a Record of Decision (ROD). The remedial design phase, which generally takes one year or longer to complete, specifically defines how the cleanup will occur and what will be done. The remedial action then implements the design and the cleanup is undertaken. If at anytime during this process, an imminent threat is discovered, a removal action will be performed. After the remedial action is completed, continuing site operation and maintenance (O&M) activities are conducted to maintain the effectiveness of the remedy, and to ensure that no new threat to human health or the environment arises.

RESULTS OF REVIEW

The following are the results of our review related to the topics raised in Senator Robb's letter.

1. Additional Soil Samples

EPA officials stated that initial sampling was performed within a 700-foot radius of the Abex Foundry. This somewhat arbitrary boundary was established by the Commonwealth of Virginia. After assuming responsibility for this site in 1992, EPA decided to conduct more extensive soil sampling both in and outside the 700-foot radius. Although more contamination was found, EPA officials explained that on average, the soil contamination did not cause an immediate threat to residents and could be addressed during the remedial action. The results of the additional sampling were provided to the City of Portsmouth and the WPH residents.

The remedial design work plan is a blueprint for implementing the cleanup method selected and the remedial design is a more specific description of how the cleanup will proceed. As the responsible party, Abex had a contractor initially draft the remedial design work plan, which did not include the additional sample data. Region III finalized the remedial draft work plan without realizing that not all sample data was included in the cleanup plan.

EPA officials stated there was an unusual amount of turnover during the design phase and that three remedial project managers (RPMs) were assigned to this site in a 14-month period. They added that this turnover contributed to the misunderstanding of what area was required to be cleaned. For example, the RPM who finalized the remedial design was not involved in the early phases of that

effort, which could have caused the sampling data to be omitted. However, in this case, we found evidence that the RPM was aware of the additional sample data, but inadvertently approved the final plan without including the data.

Shortly after the remedial design for the soil excavation was finalized, another RPM assumed responsibility for the Abex site. His primary task was to oversee the cleanup and the temporary relocation of the WPH residents. Realizing that the residents had already been temporarily relocated once to demolish the Abex foundry, the RPM wanted to be certain that all of WPH would be cleaned during this remedial action. While reviewing the site files, he found portions of WPH that had been found contaminated, but were not included in the planned remedial action. This type of omission could jeopardize human health and the environment. However, in the case of Abex, EPA officials emphasized there was no adverse effect. They said additional cleanup work would not have been conducted any sooner because the average lead levels in the soil were not high enough to justify immediate action. Therefore, there was no adverse impact on the environment or public health.

EPA officials acknowledged that the 1993 sampling data, from samples taken in and outside of the 700-foot radius, should have been included in the remedial design work plan. However, residents were tested throughout the project period, and blood screenings indicated there was no imminent health threat. In addition, the RPM identified the data prior to completing work at the site and as a result, avoided the need for relocating residents another time and unnecessarily extending the project period.

Although there was confusion over what areas of WPH needed to be cleaned, we agree there was no adverse environmental impact and public health was protected. However, we believe that because RPM turnover is inherent to the Superfund program, there is potential for similar occurrences at other EPA remedial cleanups. As a result, we plan to conduct a review of the RPM turnover issue to identify methods that EPA can implement to ensure turnover does not negatively impact future sites. Preliminary discussions with Region III personnel indicated that this is a worthwhile initiative and they have agreed to work collaboratively with our office on this review.

2. Heating Duct Cleanup

As part of the remedial cleanup, EPA collected wipe samples from the interior and exterior of the WPH apartments before and after the excavation. This sampling included the areas around the heating vents, which did not show high levels of lead contamination. WPH residents suggested to the RPM that some residents may have cleaned their floors before being temporarily relocated, which may have biased the results of the sampling. In addition, some of the residents were not satisfied

with EPA testing outside the vents and wanted the inside of the heating ducts also tested.

According to the EPA toxicologist and the RPM, the reason the inside of the vents was not initially tested was because the residents did not have access to this area and it was not "living space." Also, the wipe sampling initially conducted did not indicate elevated levels of lead. Moreover, EPA was concerned that the source of lead in the duct work could not be identified. Subsequently, EPA agreed to test the inside of the ducts because the wipe samples could have been biased and the WPH residents were threatening to not return to their apartments. The concerns of the WPH citizens were well founded because sampling results indicated high levels of lead contamination in the large volumes of dust found in the ducts.

EPA's response to our draft report provided additional information supporting their decision to not test the duct work. In the early 1990's, the U.S. Housing and Urban Development (HUD) performed a lead paint abatement in the WPH apartments. HUD's sampling data showed the units were clean after the lead paint abatement. Also, EPA officials said they conducted a tremendous amount of wipe sampling data between 1997 and 1999. The results showed only a very small percentage of the units had any lead dust problems and these were almost always attributable to tracking contaminated soil in from outside.

Because the RPM had little knowledge about cleaning lead in duct work, he held numerous discussions with EPA officials such as his supervisor, on-scene coordinators involved with lead contaminated sites, and the EPA public relations specialist. The RPM also contacted EPA's national liaison for lead to determine whether other EPA regions had experience with lead in duct work. Additionally, the RPM researched the internet for companies that specialized in cleaning ducts and contacted the Centers for Disease Control representative to the Philadelphia lead program. The research found no prior history of cleaning lead in heating ducts. Ultimately, EPA contracted with the US Army Corps of Engineers to conduct the cleanup.

Because samples detected high levels of contamination, we believe EPA should have tested the ducts prior to the residents' request. However, we could find no proof that EPA was aware of a dangerous situation that Agency personnel wished to hide. We came to this conclusion because we confirmed that EPA personnel did not routinely consider performing lead abatement cleanups inside ducts. What does appear evident is that because of what happened at the Abex site, Agency personnel have learned more about lead abatement in duct work and have said that it will be considered in future cleanups.

RECOMMENDATION:

We recommend Region III inform other EPA Regions about its experience testing inside ducts for lead contaminants. This could be accomplished through EPA's national lead liaison.

EPA Response

EPA agreed with our recommendation and the RPM is going to issue a memorandum to Region III RPMs and OSCs describing his experience with lead in the duct work of the WPH apartments. Region III also plans to forward the memo to the coordinator of the Superfund Program's National Lead Workgroup, requesting that he inform each of the Regions about this issue. The milestone date for the memorandum to be completed is September 30, 2000.

Region III responded that it looks forward to working with us in evaluating how to better prevent changes in project managers from affecting the quality of the work on Superfund projects.

OIG Evaluation

We agree that a widely circulated memorandum will raise EPA awareness of Region III's experience with lead found in the duct work, and will help to ensure that duct work is tested during future cleanups.

3. Blood Lead Studies

In 1992, EPA took over the cleanup project from the Commonwealth of Virginia for the remedial action planned at Abex. One of the Region's first actions was to have the City of Portsmouth offer blood lead level screenings to residents living near the Abex site. In addition to the 1992 screenings, EPA offered screenings in 1994 and two more in 1999. Three were performed by the Portsmouth Department of Public Health. Because one of the residents requested a different testing venue, the Children's Hospital of King's Daughters in Norfolk conducted the fourth screening. EPA does not have specific policies establishing numerical thresholds for how much lead contamination in soil necessitates blood lead testing. Region III officials said each Superfund site is handled on a case by case basis with the health and safety of residents as a priority. Lacking its own numerical thresholds, EPA used guidance established by the Centers for Disease Control (CDC). Below is a table found in the CDC's "Screening Young Children for Lead Poisoning: Guidance for State and Local Public Health Officials" (November 1997) that provides suggested actions based on the blood lead level detected:

- When less than 10 micrograms per deciliter (µg/dL), reassess or rescreen in 1 year. No additional action necessary unless exposure sources change.

- When between 10-14 µg/dL are found, provide family lead education and follow-up testing. Also, refer to social services if necessary.

- When between 15-19 µg/dL are found, same as above. If another test, at least 3 months later, shows lead in this range or worse, proceed according to actions for the next level.

- When between 20-44 µg/dL provide the following: coordination of care (case management); clinical management; environmental investigation and lead hazard control.

- When between 45-69 µg/dL, same as above except action is required within 48 hours.

- When ≥70 µg/dL hospitalize child and begin medical treatment along with the above actions immediately.

Adverse health effects resulting from lead exposure include lowering a child's intelligence quotient (IQ), hearing problems, speech and language handicaps, and a short attention span. These health effects have been associated with blood lead levels as low as 10 µg/dL. According to Agency personnel, lead exposure is common in urban areas and the negative impacts can be reduced through education on cleanliness and nutrition.

CDC's National Health and Nutrition Examination Surveys (NHANES) have been the primary source for monitoring blood lead levels in the United States. To determine the significance of lead contamination, we compared the national average for blood lead levels to the blood lead levels found in the WPH residents.

For children ages 1-5 years old, Phase 2 of the NHANES III survey results showed that 4.4 percent of the children had blood lead levels equal to or more than 10 µg/dL. In July and August 1992, 542 people living in or around WPH apartments were tested for lead. The results indicated that 21 children, or 4 percent had elevated blood lead levels equal to or more than 10 µg/dL. Eighteen of the 21 children were in the range of 10-14 µg/dL and the 3 remaining children were in the 15-19 µg/dL range. Elevated blood lead levels at WPH were less than the national average.

The NHANES III survey also reported that blood lead levels equal to or more than 10 µg/dL for the U.S. population aged 1 year and older was 2.2 percent. The December 1999 screening conducted by the Children's Hospital of King's Daughters

in Norfolk revealed that of the 415 people tested, 5 people or 1 percent had elevated blood lead levels. Two people were in the range of 10-14 µg/dL and three were in the 15-19 µg/dL range. Again, WPH blood lead levels were below the national average.

According to EPA officials, the blood lead level results for all of the testings did not detect exceptionally high lead levels. As a result, the blood screenings for the Abex site did not support soil excavation through an emergency removal or the permanent relocation of residents. After comparing the screening results at WPH to CDC data, we believe EPA took reasonable measures to determine the effect of the Abex lead contamination on the WPH residents.

4. Temporary and/or Permanent Relocation

Temporary relocation is required when a health assessment determines that a cleanup will expose citizens to contaminants that present a significant risk to human health. The Region's remedial design included a detailed plan for temporarily relocating residents of WPH while the cleanup was performed. Permanent relocation is considered an option only when a site cannot be returned to a safe level to protect human health, or temporary relocation would exceed one year. In the WPH case, EPA believed they could clean the soil and return the site to a safe level.

EPA officials emphasized that the contamination at this site was not difficult to clean, however, it was made more complicated by the ongoing litigation and the temporary relocation of the residents. For those residents who did not believe that WPH was safe for them or their families, the 1994 Record of Decision stated that Portsmouth Redevelopment Housing Authority (PRHA) offered residents relocation to other public housing developments in the Portsmouth area.

5. EPA Polls

Included in Senator Robb's request was concern that EPA conducted a poll that contained leading questions trying to persuade the WPH residents to say they did not want permanent relocation. However, according to Region III officials, they did not conduct a poll. Also, because EPA concluded that the Abex site could be restored to safe living conditions, permanent relocation was not an issue.

An Abex contractor conducted a survey of the WPH residents that included questions about whether the residents liked living in WPH apartments. This survey was not directed or requested by Region III. It was intended to generate resident feedback regarding both the overall project and all aspects of the remediation process, including the site excavation, restoration work and temporary relocation. The Abex contractor was also interested in learning the opinions and

perceptions of WPH residents toward EPA, Abex's contractors, and the PRHA. No final report was issued and the results were not shared with EPA. Information obtained regarding quality of life was to be provided to PRHA, however, EPA officials did not know if the results were forwarded to PRHA. Our review of the survey indicated that the questions appeared to be presented fairly and did not include leading questions related to relocation issues.

When EPA received hesitation from some of the WPH residents about the 1997 temporary relocation, EPA hired a third party from the Department of Justice (DOJ) to serve as a mediator between residents, EPA, and the PRHA. Some of the residents were reluctant to temporarily relocate because they did not trust EPA and PRHA. According to the DOJ mediator, this was prompted by one resident alleging that WPH residents would not be able to return to their homes after being temporarily relocated. Because the mediator worked directly with the residents, she received anecdotal information about how the residents felt about WPH apartments. However, her role was to improve communications between residents, EPA, and PRHA. In addition, the DOJ mediator advised EPA on how to present technical issues in a nontechnical manner when communicating with the residents. In conclusion, EPA did not conduct a survey at Abex, and the survey conducted by the Abex contractor did not include what we considered to be leading questions.

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APPENDIX I

AGENCY RESPONSE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

August 22, 2000

SUBJECT: Response to the Office of the Inspector General's Draft Memorandum of Review on EPA's Management of the Abex Superfund Site (dated July 13, 2000), Assignment Number 2000-000860

FROM: Bradley M. Campbell
Regional Administrator (3RAOO)

TO: Carl A. Jannetti, Divisional Inspector General for Audit
Mid-Atlantic Division (3AI00)

This memorandum is written in response to your "Draft Memorandum of Review on EPA's Management of the Abex Superfund Site (Assignment Number 2000-000860), dated July 13, 2000. I appreciate the opportunity to review your findings and to discuss the Agency's response to your recommendation. In your memo, you requested that I address the factual accuracy of the draft report, state my concurrence or nonconcurrence with the recommendation, and discuss plans and milestone dates for taking any necessary corrective action. I will address each of the areas below, as well as provide several other comments.

Factual Accuracy

1. On page 4, paragraph 2, the report states "that two prior EPA removals resulted in temporarily relocating some of the residents." Some residents had been temporarily relocated prior to the 1999 soil excavation work, but this occurred only one other time when the foundry was demolished as part of the remedial, not removal, action.

2. On page 6, the report discusses responses that should be taken to address various levels of blood lead. It is EPA's understanding that the Center for Disease Control (CDC) would not characterize the 10-14 µg/dl blood lead level range as "borderline." According to CDC, "Blood lead levels as low as 10 micrograms/deciliter (ug/dL) are associated with harmful effects on children's learning and behavior" (CDC's web page - http://www.cdc.gov/nceh/lead/guide/1997/docs/factlead.htm). CDC's manual entitled "Screening Young Children for Lead Poisoning: Guidance for State and Local Public Health Officials" (11/97) states that family lead poisoning prevention education should be provided when a child's blood lead level is in the 10-14 µg/dl range.

3. On pages 6-7, data is provided regarding the average blood lead levels in the United States and the percentage of American children that exceed the CDC's 10 µg/dl level of concern. We were unable to substantiate the average numbers in the report. The Agency for Toxic

Substances and Disease Registry (ATSDR) has provided us with the following information (taken from several documents that reference data from Phase 2 of the Third National Health and Nutrition Examination Survey [NHANES III] from 1991-1994 [NHANES III is a national representational survey of the civilian, noninstitutionalized U.S. population]):

a. The overall mean blood lead level for the U.S. population aged 1 year and older (including adults) was 2.3 µg/dI. 2.2% of this population had blood lead levels equal to or over 10 µg/dl, the level of health concern for children.

b. Among U.S. children aged 1-5 years, the mean blood lead level was 2.7 µg/dl. 4.4% of this population had elevated (i.e., above 10 µg/dl) blood lead levels.

Concurrence/Nonconcurrence

I concur with your recommendation to inform other Regions about our experience testing the inside of heating ducts for lead contaminants.

Plans and Milestone Dates

In implementing your recommendation, I have asked Randy Sturgeon, EPA's Remedial Project Manager for the Abex Site, to issue a memo to the other Region III RPMs and OSCs describing his experience with the lead in the duct work at the Washington Park Housing Complex and to forward his memo to Shahid Mahmud, the coordinator of the Superfund Program's National Lead Workgroup, requesting that he inform each of the Regions about this issue. I have requested that this memo be issued by September 30, 2000.

Other Comments

1. On page 3, reference is made to additional sampling data that was "inadvertently omitted from the remedial design work plan and the final remedial design." While this is true, it was the potentially responsible parties that originally omitted the data from the remedial design work plan. Had the first RPM remained the project manager, he would likely have caught this oversight early in the remedial design.

2. On pages 3 and 4, reference is made to the third RPM's involvement with the additional sampling data. Although it is correct to state that some of this additional data was reviewed by the third RPM and yet was not included in the final remedial design which was approved during his tenure (probably due to his overall short time in managing this project), his review of this and other data led to EPA's 2020 Chestnut Street removal action adjacent to the Abex Site which involved cleaning up approximately 40 residential yards.

3. On page 5, the report concludes that "because samples detected high levels of contamination we believe EPA should have tested the ducts prior to the residents request." This, however, is a case of 20-20 hindsight. Prior to the time of our testing, a large amount of information indicated that there was not widespread lead contamination in the apartments and therefore no need to continue to look for sources of lead. Additionally, EPA had U.S. Housing and Urban Development sampling data which showed the units

were clean after the lead paint abatement which occurred in the early 1990's. EPA also had a tremendous amount of wipe sampling data from 1997 and 1999 which showed only a very small percentage of the units had any lead dust problems and these were almost always easily attributable to tracking contaminated soil in from outside. In other words, there was no evidence that the ducts were a source of lead in the units. Our initial concern was based not on dust regularly blowing out, but on maintenance activities possibly knocking the dust loose. The amount of dust found in the ducts and its lead content, however, lead us to conclude that your recommendation is nonetheless a prudent one.

4. Lastly, EPA looks forward to working with you to evaluate how to better prevent changes in project managers from affecting the quality of the work on Superfund projects.

Again, I thank you for evaluating our performance at the Abex Superfund Site and being an integral part in helping the Agency protect human health and the environment. If you have any questions regarding this matter, do not hesitate to contact Peter Ludzia at 215-814-3224 or Peter Schaul at 215-814-3183.

cc: Abraham Ferdas
Jim Newsom
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