

POLLUTION REPORT (POLREP)

Removal Site Evaluation

Wescott Plantation

Dorchester County

Summerville, South Carolina

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USEPA Region 4

Emergency Response and Removal Branch

Chronological Events of the Removal Site Inspection

In June of 2007, the South Carolina Department of Health and Environmental Control (SCDHEC) requested that the EPA Emergency Response and Removal Branch (ERRB) perform a removal site evaluation (RSE) as per Title 40 Code of Federal Regulations Protection of Environment part 300 section 410 (40 CFR 300.410) at Wescott Plantation. SCDHEC requested the RSE because explosive levels of methane had been noted in independent, reports at two homes in Wescott Plantation, a local residential subdivision. While the RSE commonly refers to Wescott Plantation, the area of concern is the Pebble Creek community of Wescott Plantation.

After conducting a briefing with the SCDHEC personnel on June 26th, 2007, the EPA On-Scene Coordinator (OSC) determined it necessary to monitor for methane in local homes under a removal site inspection as per 40 CFR 300.410(a). A list of homeowners that had requested air monitoring was available through the local homeowners association. The State estimated that requests would be received for monitoring at between 20 and 30 homes. Prior to the monitoring event, notifications were made to the North Charleston Fire Department, Police Department, North Charleston City Management, Dorchester County, and SCDHEC. Consistent with 40 CFR 300.410(c)(ii), the OSC also consulted with the Agency for Toxic Substances Disease Registry (ATSDR) concerning public health threat levels associated with methane that might be encountered during the removal site inspection.

At 10:00 am on June 27, 2007, the OSC conducted a Unified Command meeting at the fire station nearest to Wescott Plantation with members of the above notified parties. In addition, several representatives of the homebuilder (Lennar) were in attendance.

Public relations were coordinated through an EPA Community Involvement Coordinator (CIC) and included representatives from SCDHEC and the City of North Charleston. Fact sheets were developed with the EPA CIC and distributed to local residents.

The City of North Charleston provided a Mobile Command Post (MCP), manned by the North Charleston Fire Department. The Fire Chief represented the City during the monitoring event.

SCDHEC provided additional support through program management, emergency responder, and community involvement personnel. SCDHEC personnel were used to contact residents, brief the OSC on historical areas of concern, and provide oversight after EPA's departure.

Lennar provided historical documentation and contractor representatives to address previous methane monitoring and remediation. In addition, Lennar also provided requested historical aerial pictures and plot development overlays.

Air monitoring was conducted by EPA ERRB in 19 homes over a two day period. All homes were significantly below the lower explosive limit (LEL) for methane, including the two original homes of concern. All homeowners were notified of their individual results via letter report on June 29, 2007. Updated removal site inspection information fact sheets were distributed to concerned citizens. Additional requests for air monitoring of methane were conducted by Lennar with oversight from the SCDHEC district emergency responder.

Following the discovery of elevated methane levels in 2006, subsurface venting systems were installed at the request of Lennar at the two homes in which elevated levels of methane were found. Based on the ERRB monitoring data and supplemented by Lennar's report on the two systems, both these systems appeared to have significantly reduced indoor methane concentrations.

During the removal site inspections, health concerns ranging from headaches to fatigue were expressed by some homeowners and questions were posed regarding the possibility of additional gases (not limited to methane) being emitted into their homes from the subsurface. After reviewing Lennar-generated historical air sampling results that included volatile organic compounds (VOCs), the decision was made during the removal site inspection to sample the off-gases of the existing subsurface soil venting system in the two homes that had previously displayed higher levels of methane. According to ATSDR, both the historical air sampling data and the removal site inspection generated analytical results indicated no total organic compounds or individual organic constituents which would present a public health threat. The homeowners were notified of ATSDR's findings and they were posted on the epaosc.net website.

Additional historical reference documents, such as Phase 1 type investigations have been of particular public interest in both the media and local community. In the interest of expedient public dissemination, Lennar agreed to make these documents available to the OSC. The documents were made available to the public via the epaosc.net website.

Findings and Regulatory Framework

40 CFR 300.415 provides the criteria for determining what is "the appropriate extent of response" to be taken for a release of a hazardous substance, pollutant or contaminant. The prerequisite for this evaluation is the need to determine if a *release* has occurred to

the environment. A *release* is defined by 40 CFR 300.5 as: “any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing in the environment”.

In this particular case, methane (a pollutant or contaminant as defined by 40 CFR 300.5) and other VOCs (hazardous substances as defined by 40 CFR 300.5 and designated under 40 CFR 302.4) have been found to be present in the indoor air of some residential homes and elevated methane readings had been recorded in soil boring investigations executed by Lennar.

The September 2006 Lennar subsurface exploration findings document the presence of elevated methane levels in soil borings around the 2 houses located on Lenora Drive and at the property perimeter boundaries, ***thus providing documentation for one of two potential sources of the methane release into the environment.*** The above mentioned subsurface exploration was biased to the homes that produced the highest indoor methane levels and thus provides a conservative representation of potential sources of methane within the area of concern. Supporting lines of evidence for potential methane producing pockets exist in the review of historical aerial images for the area of concern. For most of its known history, the subject area was comprised of densely wooded, swamp-like acreage. The first evidence of large-scale clearing appeared in the 2005 aerial which is consistent with development history. A review of this aerial presents the possibility that the two homes with the previously highest methane readings may have been built adjacent to an area possessing relatively higher soil moisture conditions. When combined with the September 2006 findings that heavy organic material zones were present at the property boundaries, this observation of potentially higher soil moisture conditions provides a potential explanation for the methane producing pockets. Methane gas is a typical byproduct of organic matter degradation in moist environments. The second potential source of the methane release is the documented sewer line dysfunctions beneath the two homes that recorded the previously highest levels of methane. According to Lennar, this sewer system has been repaired since its discovery.

The July/August 2007 Lennar subsurface exploration findings which included soil boring and groundwater results did not indicate the existence of a VOCs source outside the homes. The location of the August 2007 investigation is biased towards the home that provided the highest indoor readings of VOCs and is thus conservative in representing potential sources of VOCs releases for the area of concern. Community speculation of random dumping is not supported by a review of the following lines of evidence.

Based on the review of available aerial photographs, the natural state of the area was first disturbed in 1951 when a dirt road was constructed from Dorchester Road and extended northeast into the property boundary, crossing over Coosaw Creek. The aerial photograph dated 1955 shows that the dirt road leads to a clearing north of the Pebble Creek subdivision in the area south of where Chisolm Court is now located. The aerial photograph dated 1971 shows a second road from the southeast and intersects the previously mentioned dirt road in the area where Folklore Drive is now located. This road and the previously mentioned dirt road bound outside the area of concern and do not

present a route of transport into the Pebble Creek area of concern. Based on the Coosaw Creek surface water drainage pathways, it is highly unlikely that material from this cleared area would have migrated toward the Pebble Creek subdivision and does not provide a route for transportation into the area of concern. The location biased soil boring results of the August 2007 investigation provide a further weight of evidence that possible overland flooding migration of a potential source is nonexistent. Groundwater across the area of concern generally flows from the northeast to the southwest. The biased locations of the groundwater sampling of the July/August 2007 investigation reasonably eliminate any potential sources of groundwater sourced contamination concerning this RSE. Finally, the elevated indoor VOC readings for this home are confounded by the use of solvents needed to clean the house after a sewerage spill within the home. This historical air sample was taken shortly after the home was cleaned. Based on the above weight of evidence, it is ***reasonable to conclude that a potential release of VOCs to the environment has not occurred.***

According to 40 CFR 300.415(b)(1) “at any release, regardless of whether the site is included on the NPL, where the lead agency makes the determination based on the factors in paragraphs (b)(2) of this section, that there is a *threat* to the public health or welfare of the United States or the environment, the lead agency may take appropriate removal action ... “. Given the weight of evidence generated during the removal site evaluation, ***no removal action is recommended.*** The supporting evidence for the recommendation is summarized below.

40 CFR 300.415(b)(2) lists eight factors that shall be considered in determining the appropriateness of a removal action. Of these, two are most relevant to the subject area:

1. 40 CFR 300.415(b)(2)(iv) “High level of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate;”
2. 40 CFR 300.415(b)(2)(vi) “Threat of fire or explosion”.

Regarding exposure of nearby populations to the subject area, methane had been detected at levels above the LEL in and around two adjacently located homes. Both these homes have undergone corrective action in the form of soil vapor extraction systems. Recent follow-up monitoring by Lennar has shown these systems to be successful in reducing the threat. Random screening in additional homes conducted under the removal site inspection portion of the RSE has shown that additional homes and their residents are not subject to a public health threat. As follow-up, Lennar has agreed to conduct continued monitoring in homes where residents express concern and the SCDHEC has agreed to offer oversight, as needed.

In accordance with 40 CFR 300.410(f)(1) through (7), the OSC considers the RSE terminated. To summarize, while there has been a release of methane (which falls into the category pollutant or contaminant as opposed to hazardous substance) which at one time presented an imminent and substantial danger; corrective actions, removal site inspection investigations, and follow through monitoring have mitigated the danger. The RSE also

concludes that no release of other VOCs (defined as hazardous substances) to the environment have occurred and thus has terminated that aspect of the investigation.

Additional Actions and Recommendations

Notwithstanding the provisions of the above conclusions, continued community concerns revolve around VOCs, namely benzene. In the interest of clarity, the OSC has additionally coordinated his efforts with the Technical Support Services (TSS) of EPA Region 4 and has asked that they coordinate their communications with ATSDR. TSS has concurred with ATSDR's findings that the VOC levels found in the homes do not present a public health threat. Further inquiries regarding EPA's RSE can be made through the OSC, Mr Leo Francendese of EPA at 404-562-8772. The SCDHEC point of contact for this RSE is Mr Terry Yarborough and he can be reached at 843-953-0166. The OSC has referred community and individual homeowner questions concerning the health and safety of indoor air levels to ATSDR. The general contact phone number for ATSDR is 1-800-CDC-INFO. Further inquiries regarding the health and safety of indoor air levels can be made by contacting Mr. Richard Nickle of ATSDR at 770-488-3430. In addition, the OSC has encouraged Lennar to communicate with concerned residents and continue to offer methane monitoring as well as other appropriate air monitoring and/or sampling. The ATSDR toxicological profile excerpt for benzene is described below:

ATSDR Toxicological Profile for Benzene (2005)

- Benzene is ubiquitous in the atmosphere. It has been identified in air samples of both rural and urban environments and in indoor air.
- The general population is exposed to benzene primarily by tobacco smoke (both active and passive smoking) and by inhaling contaminated air (particularly in areas with heavy motor vehicle traffic and around filling stations).
- Benzene is present in passenger car tailpipe emissions at compositions ranging from 2.9 to 15% of the total tailpipe hydrocarbon composition (Black et al. 1980).
- Benzene is also released by off-gassing from particle board (Glass et al. 1986)
- Gasoline vapors vented into the home from attached garages can also increase indoor air exposure to benzene (Wallace 1989a, 1989b). Depending on airflow from garage to living areas, mean indoor benzene concentrations in houses with a garage were 2–5 times higher than outdoor levels in most homes (Thomas et al. 1993). Benzene levels in four garages during different times in a day ranged from 0.94 to 61.3 ppb. The higher concentrations of benzene in these garages were not only from vehicular activity, but also in varying proportions from stored gasoline, paints, and benzene-containing consumer products (Thomas et al. 1993). Inhalation exposure to off-gassing from benzene-containing products and to evaporative emissions from automobiles in attached garages has been estimated to be 150 µg/day (Wallace 1989a).
- The major source of exposure to benzene is cigarette smoke. A smoker of 32 cigarettes per day (the U.S. average per smoker) would have a benzene intake of approximately 1.8 mg/day (at least 10 times the average nonsmoker's intake) (Wallace 1989a).

The complete ATSDR link can be found at:

<http://www.atsdr.cdc.gov/toxprofiles/tp3.html>