



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 4

ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

APR 23 2012

Mr. Doug White
Florida Dept. of Environmental Protection
3900 Commonwealth Blvd.
Tallahassee, FL 32399-3000

Mr. Doug Jones
Florida Dept. of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: Solana Road Radiation
Ponte Vedra Beach, Florida

Dear Mr. White and Mr. Jones:

The U.S. Environmental Protection Agency's Emergency Response and Removal Branch (ERRB) conducted a Removal Site Evaluation (RSE) at the above referenced site for potential removal action eligibility under the National Contingency Plan (NCP).

Based on the information collected during the RSE, the On-Scene Coordinator (OSC) recommends this site be given priority for removal eligibility under EPA's Superfund Removal Program (see enclosed RSE memo). Concurrent with this recommendation, EPA may also begin its enforcement activities to determine potentially responsible parties for this Site.

A final determination of removal eligibility will be made by the OSC assigned to the site. A decision to conduct a removal action will be documented in an Action Memorandum and a copy will be forwarded to the State. Should the OSC make a final determination that a removal action is not warranted you will be subsequently notified of this determination.

Should you have any questions concerning ERRB's determination, please contact Terry Stilman, OSC, at (404) 562-8748, or Matt Taylor, Chief of Removal Operations Section, at (404) 562-8759.

Sincerely,

A handwritten signature in black ink, appearing to read "A. Shane Hitchcock".

A. Shane Hitchcock, Chief
Emergency Response & Removal Branch

Enclosure

cc: Dawn Taylor, Debbie Jourdan, Tony Moore, Matt Taylor, Terry Stilman, Kerri Sanders, A. Hughes


U.S. ENVIRONMENTAL PROTECTION AGENCY
POLLUTION/SITUATION REPORT
Solana Road Radiation
Removal Site Evaluation POLREP



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region IV

Subject: POLREP #1
Removal Site Evaluation
Solana Road Radiation
7 Solana Road
Ponte Vedra Beach, St. Johns County, Florida

Latitude: 30.228138 ° N
Longitude: -81.376525 ° W

To: Matt Taylor, USEPA R4 ERRB
From: Terry Stilman, On-Scene Coordinator 
Date: April 17, 2012
Reporting Period: 06/06/2011 – 04/12/12

1. Introduction

Site Number: B4K3
Response Authority: CERCLA
Response Type: Time-Critical
Response Lead: EPA
Incident Category: Removal Assessment
NPL Status: Non NPL

1.1 Site Description

During a May 2011 golf-tournament in Ponte Vedra, Florida, the Florida Department of Transportation (FDOT), with assistance from the United States Department of Energy (DOE) Radiological Assistance Program (RAP), performed a radiation survey of the surrounding area using a truck-mounted portable scanner. DOT and DOE reported an instance of elevated gamma radiation from an empty lot at 7 Solana Road (7 Solana). Dose rates are typically measured in Roentgen-equivalent man (rem) units. Calculated dose rates from DOT and DOE measurements on the 7 Solana Road property were found to be as high as 1.21 millirem per hour (mrem/hr). This roughly correlates to an annual exposure of 7.623 millirem per year (mrem/yr). The Florida Department of Health (DOH) responded and collected samples of soil for analysis by gamma spectroscopy. Samples collected by DOH showed thorium²³² at 80 picocuries per gram (pCi/g) and radium²²⁶ at 47 pCi/g. Based on the levels of contamination found, DOH requested EPA assistance to further characterize the nature and scope of the contamination at 7 Solana.

1.2 Preliminary Removal Assessment/Removal Site Inspection Results

The levels FDOT and DOE detected while screening were found to be above the Florida DOH annual exposure limit of 500 mrem/year over the background rate. Annual exposure rates are determined by estimating a person's exposure to the soil for 18 hours per day over 350 days of exposure. Naturally occurring background concentrations of thorium²³² are approximately 0.4 pCi/g in the north Florida area. Analysis of the sample collected by DOH showed thorium²³² levels 200 times the background level. Total radium background levels for all isotopes average around 0.9 pCi/g. The analysis by DOH indicated the presence of just one radium isotope, radium²²⁶, at 47.4 pCi/g, about 50 times background. Based on these preliminary findings, DOH requested EPA assistance.

1.3 Site Location

Ponte Vedra Beach is a golfing resort community on the Florida Atlantic coast, about 30 minutes southeast of downtown Jacksonville, Florida. The area is mainly residential with some light commercial. 7 Solana is an empty lot in a residential neighborhood just a few hundred yards from the Atlantic Ocean. The previous residence on the property was removed by the current owner. The property is now for sale. The site coordinates are 30.228138 ° N, -81.376525 ° W. The property is bound by residential homes to the east and west, Solana Road to the south, and a lake to the north, which is part of the Ponte Vedra Golf Club course. The site is currently unsecured.

Prior to development into a beachside resort and golfing community, the city of Ponte Vedra was known as "Mineral City". The National Lead Company operated a sand mine along 17 miles of oceanfront, removing the small percentages of heavy metal-bearing minerals in the sands. Minerals such as rutile and illmenite were recovered for their titanium content, which was needed during World War I for steel production. The operation was started in 1914 and continued into the 1920s when the mine was closed due to a depressed demand for steel after the war. One of the ancillary minerals in the sand is monazite. Though not commercially recovered at the time of the National Lead operation in Mineral City, another sand mine in the area which operated until the 1970s is known to have produced monazite as a byproduct. Although monazite is a naturally-occurring radioactive material (NORM), it is believed that concentrating monazite during the mineral separation process may have produced tailings piles. While actual production records are not available, it is believed that this technologically-enhanced naturally-occurring radioactive material (TENORM) could have later been used as fill or simply knocked down and spread out once the mine closed and the property was developed.

2.0 Removal Site Evaluation

In response to a request from the DOH, the EPA Region 4 Emergency Response and Removal Branch (ERRB), with assistance from the Environmental Response Team, conducted an investigation at the site on June 6, 2011. ERT surveyed the 7 Solana property with a GPS-tracked ATV-mounted survey detector. The collected data was used to generate a contour map detailing the location of two 'hotspots' on the property. Both of these hotspots trailed off to the edge of the 7 Solana property and extended onto a neighboring property and into Solana Road. ERT concluded that the gamma radiation levels on the property were approximately 200 times [the] normal background of 6 microrem per hour (µrem/hr). ERT also recommended further assessment.

In order to investigate the possibility that tailings were used over large areas of Ponte Vedra Beach, EPA and DOH initiated a neighborhood-wide assessment in November of 2011. ERRB requested assistance from the Radiological Emergency Response Team (RERT). RERT and the Superfund Technical Assistance and Response Team (START) performed a survey of over 600 acres of residential properties surrounding 7 Solana using a truck-mounted scanner that is able to determine radiation levels at a distance. Prior to surveying, RERT determined the average background concentration in the area, which

was confirmed to be 6 $\mu\text{rem/hr}$, or about 38 mrem/year. The van travelled the public thoroughfares and compared the readings to background levels. The site-specific threshold for determining whether further characterization was warranted on a property was 100 mrem/yr over the background level, which equates to 138 mrem/year.

Once characterization for a given property was complete, the property was assigned to one of three tiers based on the exposure dose rate of the occupants.

- Tier 1 – If the derived dose rate is less than 100 mrem/yr above background, no further investigation will be conducted under this program.
- Tier 2 - If the derived dose rate is below 500 mrem/yr above background but exceeds 100 mrem/yr above background, further action may be warranted on a case-by-case basis.
- Tier 3 - If the derived dose rate exceeds 500 mrem/yr above background prioritization for further action should be given.

Only the properties surrounding 7 Solana exhibited gamma radiation levels above the threshold of 138 mrem/yr. RERT and START collected dose rate data from points on the 7 Solana property as well as along the roadway and public sidewalks down Solana Road and Rutile Drive. Although exposure values with hand-held instruments taken from the roadway did not indicate any areas with exposure values over the site-specific threshold of 138 mrem/year, the more sensitive instrumentation on the van-mounted scanner indicated several areas which possibly exceeded this threshold located at some distance off the roadway coinciding with 13 properties near 7 Solana. Therefore, additional assessment is recommended for these other properties.

Only one property, 7 Solana Road, is currently assigned to Tier 3. The 4 properties immediately adjacent to and across the street from 7 Solana should be considered as Tier 2 properties. Additional assessment is required to confirm the RERT readings. Nine additional properties surrounding 7 Solana may be included in Tier 2, but additional investigation is necessary to fully define them. All other properties surveyed as part of the RSE are considered to be in Tier 1 and will not be investigated further unless new information is presented.

RERT also collected samples of the soil on 7 Solana and submitted it to the National Air and Radiation Environmental Laboratory (NAREL) for spectrographic analysis. NAREL confirmed the presence of both thorium and uranium decay-chain daughter products. After review of the data by EPA toxicologists, it was determined that radium²²⁶ and radium²²⁸ were the two leading risk radionuclides on the property. Spectrographic analysis showed the average activity of radium²²⁶ in the top 10 inches of soil was 281 pCi/g and fell to 85.3 pCi/g at approximately 30 inches below the surface. Radium²²⁸ activity ranged from 643 pCi/g to 112 pCi/g within the same depth range.

3.0 Anticipated Activities

Radium²²⁶ and radium²²⁸ are hazardous substances as defined by CERCLA 101 (14) and listed in Title 40 of the Code of Federal Regulations (CFR), Section 302.4. The EPA's Technical Services Section has reviewed the results of the removal site evaluation and determined there is a threat to public health and the environment resulting from the elevated gamma radiation present at the site.

Radium isotopes present on Site pose the following threats to public health or welfare as listed in Section 300.415 (b)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP):

Section 300.415 (b)(2)(i) *Actual or potential exposure to nearby human populations, or the food chain from hazardous substances pollutants or contaminants;* The elevated gamma radiation on 7 Solana presents potential exposure for persons who may come to live on the property. Although no structure is currently on the property, the lot is for sale. Additionally, exposure to persons living on adjacent property is likely given the orientation of the radiation contours developed by ERT during the June 2011 assessment. These contours indicate neighboring properties may be at increased risk due to contamination on 7 Solana. Additionally, the elevated radiation poses risk for persons travelling on or past the property. The site has unrestricted access to passersby and the area is frequented by walkers, joggers, and persons travelling to and from the nearby beach.

Section 300.415 (b)(2)(iv) *High levels of hazardous substances or pollutants or contaminants in the soils largely at or near the surface, that may migrate;* The analytical results of soil samples collected by RERT show activity of radium²²⁶ and radium²²⁸ in the top 10 inches of soil several orders of magnitude greater than normal background. This high concentration of radium is responsible for the increased gamma radiation at the site. The radium is contained within the monazite mineral crystals. These crystals are small and are capable of being blown by wind onto neighboring properties. Additionally, any future construction activity at the site will contribute to a loss of vegetative cover, increasing the possibility of both aeolian transmission and offsite transportation on equipment and personnel leaving the site.

Section 300.415 (b)(2)(v) *Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released;* Drought conditions may contribute to the potential for migration of monazite-containing soils. Wind action during dry conditions can lead to migration of fine-grained particles from contaminated surface soil.

Section 300.415 (b)(2)(vii) *The availability of other appropriate federal or state response mechanisms to respond to the release;* There are no other federal agencies available to respond. The State of Florida has requested EPA assistance with the removal action at 7 Solana Road and has indicated it lacks the resources necessary to deal with the threat.

Based on the presence of elevated gamma radiation emanating from radium-bearing soils identified during the removal site investigation and the suggestions provided in the Human Risk Assessment Memorandum by EPA's Technical Services Section, the EPA Region 4 Emergency Response Removal Branch recommends the removal of the radium-contaminated soil from the property. Such removal should be performed until the remaining soil exhibits gamma radiation levels less than twice the naturally occurring background level. Further assessment activities on neighboring properties will be conducted by the DOH.

Concar - Matt Taylor
4/17/2012