U.S. ENVIRONMENTAL PROTECTION AGENCY

OFFICE OF INSPECTOR GENERAL

Cleaning Up Communities

Independent Environmental Sampling Shows Some Properties Designated by EPA as Available for Use Had Some Contamination

Project No. 15-P-0221 **July 21, 2015**

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This is one of the U.S. Environmental Protection Agency Office of Inspector General's products related to assessing the EPA's designations of sites with former or current contamination as being "ready for anticipated use." For details on related reports, go to:

http://www.epa.gov/oig/reports/2014/20140929-14-P-0364.pdf
http://www.epa.gov/oig/reports/2014/20140926-14-N-0360.pdf

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Abbreviations

EPA	U.S. Environmental Protection Agency
ICP	Inductively Coupled Plasma
OIG	Office of Inspector General
RAU	Ready for Anticipated Use
RCRA CA	Resource Conservation and Recovery Act Corrective Action
XRF	X-ray fluorescence

Cover photo: North 22nd Street Mixed Use Site, Tampa, Florida, in April 2013. Vacant lot is within a residential neighborhood. (EPA OIG photo)

U.S. Environmental Protection Agency
Office of Inspector General

15-P-0221
July 21, 2015

At a Glance

Why We Did This Review

We sampled sites that were designated ready for reuse to determine whether the U.S. Environmental Protection Agency's (EPA's) data supporting the designations were accurate. The sampling results reported here were used to support two prior Office of Inspector General (OIG) reports: (1) *EPA Needs to Improve Its Process for Accurately Designating Land as Clean and Protective for Reuse*, which assessed the EPA's designations of sites with former or current contamination; and (2) *Hyperspectral Imaging Can Be a Useful Evaluation Tool for Office of Inspector General Reviews Focused on Contaminated Land*, which identified the usefulness of a tool to identify certain conditions at contaminated sites. The complete sampling results are reported here for the first time.

This report addresses the following EPA goal or cross-agency strategy:

- *Cleaning up communities and advancing sustainable development.*

Send all inquiries to our public affairs office at (202) 566-2391 or visit www.epa.gov/oig.

The full report is at: www.epa.gov/oig/reports/2015/20150721-15-P-0221.pdf

Independent Environmental Sampling Shows Some Properties Designated by EPA as Available for Use Had Some Contamination

What We Found

The EPA OIG, in collaboration with scientists from the U.S. Geological Survey, conducted soil sampling at 21 Brownfields and Resource Conservation and Recovery Act Corrective Action sites in Florida and South Carolina (both in EPA Region 4) and in Louisiana and Texas (both in EPA Region 6). The OIG soil sample results are not EPA-validated data, but are considered screening-level data.

Some OIG sampling results showed contamination was still present at sites designated by the EPA as ready for reuse. This was unexpected and could signal a need to implement changes to ensure human health protection.

Most results of the soil samples we collected from sites that had been designated by the EPA as "ready for anticipated use" met the standards to protect human health. However, unexpectedly, some results showed contamination was present. Specifically, and commendably, 241 results, or 95 percent, met standards, while 14 results, or 5 percent, did not meet standards. We did not expect soil samples at sites designated by EPA as ready for reuse to have the contamination our sampling detected. The contamination detected could result in the need to remove the sites' designations as ready for reuse or other actions to ensure the sites are safe for humans. The OIG soil results that did not meet health standards need to be evaluated by the regions in the context of other site-specific information to determine whether changes in site designations or other actions need to be completed to ensure site protectiveness.

Recommendations and Agency Corrective Actions

We recommend that EPA Regions 4 and 6 add the information in this report to the appropriate site-specific case files. We also recommend that those regions assess the soil sampling results that that did not meet the established standards in the context of other information on site conditions and uses, order confirmatory sampling if appropriate, and take action as needed with the site owners and states to ensure that the sites meet standards for their designated uses. Further, based on the outcomes, the two regions should reevaluate the sites' ready-for-anticipated-use designations and modify as appropriate based on other actions recommended here. The agency agreed to take sufficient corrective actions, and actions on the recommendations have either been completed or are underway.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

THE INSPECTOR GENERAL

July 21, 2015

MEMORANDUM

SUBJECT: Independent Environmental Sampling Shows Some Properties Designated by EPA as Available for Use Had Some Contamination
Report No. 15-P-0221

FROM: Arthur A. Elkins Jr.

TO: Heather McTeer Toney, Regional Administrator
Region 4

Ron Curry, Regional Administrator
Region 6

This is our report on the subject evaluation conducted by the Office of Inspector General (OIG) of the U.S. Environmental Protection Agency (EPA). This report contains findings that describe the problems the OIG has identified and corrective actions the OIG recommends. This report represents the opinion of the OIG and does not necessarily represent the final EPA position. Final determinations on matters in this report will be made by EPA managers in accordance with established audit resolution procedures.

In Region 4, the Resource Conservation and Recovery Act Division is responsible for the areas reviewed. In Region 6, the Superfund Division and the Multimedia Planning and Permitting Division are responsible for the areas reviewed.

You are not required to provide a written response to this final report because you provided agreed-to corrective actions and planned completion dates for the report recommendations. Should you choose to provide a final response, we will post your response on the OIG's public website, along with our memorandum commenting on your response. Your response should be provided as an Adobe PDF file that complies with the accessibility requirements of Section 508 of the Rehabilitation Act of 1973, as amended. The final response should not contain data that you do not want to be released to the public; if your response contains such data, you should identify the data for redaction or removal along with corresponding justification.

We will post this report to our website at http://www.epa.gov/oig.

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Appendices

Purpose and Prior Reports

In 2013, the Office of Inspector General (OIG) of the U.S. Environmental Protection Agency (EPA) collected soil samples at 21 Brownfields and Resource Conservation and Recovery Act Corrective Action (RCRA CA) sites in four states—Florida, South Carolina, Louisiana and Texas. We did this sampling in collaboration with scientists from the U.S. Geological Survey. This sampling work was used to support work discussed in two previously issued OIG reports:

- **EPA Needs to Improve Its Process for Accurately Designating Land as Clean and Protective for Reuse** (Report No. 14-P-0364), issued September 29, 2014: This sampling work was used as we assessed the EPA's designations of sites as being "ready for anticipated use" (RAU). http://www.epa.gov/oig/reports/2014/20140929-14-P-0364.pdf

- **Hyperspectral Imaging Can Be a Useful Evaluation Tool for Office of Inspector General Reviews Focused on Contaminated Land** (Report No. 14-N-0360), issued September 26, 2014: This sampling work was used to evaluate the usefulness of hyperspectral imaging technology to identify certain conditions at contaminated sites. http://www.epa.gov/oig/reports/2014/20140926-14-N-0360.pdf

Responsible Offices

In Region 4, the Resource Conservation and Recovery Act Division is responsible for the areas reviewed. In Region 6, the Superfund Division and the Multimedia Planning and Permitting Division are responsible for the areas reviewed.

Scope and Methodology

We conducted our work from April 2013 to March 2015. We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

We contracted with the U.S. Geological Survey and conducted soil sampling in Regions 4 and 6 from April to August 2013. The soil sample results are not EPA-validated data, but are considered screening-level data. We collected 242[1] near-surface grab samples in a rough, widely spaced grid that covered the sites. When available, we used a portable X-ray fluorescence (XRF) unit to obtain a field scan

[1] Fifteen of the 242 X-ray fluorescence samples were analyzed for confirmatory sampling. Each of the 15 samples were analyzed for the presence of 17 different contaminants, for a total of 255 results.

of the metal composition of the soil prior to taking each soil sample. Near where we observed high metal concentrations with the portable unit or observed stress in the vegetation, we departed from the grid-sampling pattern and took additional samples. For some sites we were unable to use the portable XRF because either the soil was too saturated with water from a rain event to obtain an accurate field scan or the unit needed calibration. All samples collected were dried and analyzed in a U.S. Geological Survey research laboratory with a mounted XRF unit. In July 2013, we provided Region 4 the XRF results for the sites we sampled in Florida.[2]

We sent 15 of the soil samples we collected (6.2 percent) to an independent laboratory for confirmatory analysis by use of inductively coupled plasma (ICP) methods (EPA methods 3050 and 6010). Samples that presented high metal concentrations based on the XRF analysis were intentionally selected, along with a few additional random samples.

Summary of Soil Sampling

Most of the ICP samples met standards established to protect human health. However, as shown in Table 1, some samples showed contamination that did not meet the standards. Specifically, and commendably, of the 255 total samples we reviewed, 14 samples, or 5 percent, did not meet standards.

Table 1: Summary of ICP Samples

State	Total samples	Number of samples that showed contamination not meeting standards
Florida	102	8
South Carolina	51	5
Louisiana	85	0
Texas	17	1
Total	**255**	**14**

Source: OIG analysis.

The number of samples we collected and analyzed by ICP was limited. However, we did not expect soil samples at sites designated by the EPA as ready for reuse to have the contamination our sampling detected. The contamination detected could result in the need to remove the sites' designations as RAU, or to take other actions to sustain site protectiveness. The OIG soil results that did not meet health standards need to be evaluated by the regions in the context of other site-specific information to determine whether changes in site designations or other actions need to be completed to ensure site protectiveness.

[2] Soil sampling results at four sites showed contamination above the Florida soil cleanup target levels, including for arsenic, a known carcinogen. We reported the results to the EPA so that it could take any immediate steps it deemed appropriate to protect human health and the environment.

The results of the ICP analysis are in Appendix A. Information on the sites we visited is in Appendix B. Below is a summary of our soil sampling results and activity in each of the four states.

Florida Soil Sample Results

In April 2013, we collected soil samples from five Brownfield sites in Florida that were designated RAU. We collected field measures with the portable XRF unit at all sites. We report on confirmatory ICP analyses performed on six samples collected at three sites.

The concentration of barium in the one sample from the 22nd Street Mixed Use site showed contamination. Based on our XRF data, EPA Region 4 conducted additional sampling, and its results showed contamination that did not meet the residential standards for arsenic, barium and lead in some samples. However, the region concluded that no additional action was needed.

For the Clearwater Automotive Salvage Yard site, where we obtained four samples, all four ICP results showed contamination that did not meet the residential standard for at least one metal—arsenic, copper or lead. The arsenic in two samples was great enough to also not meet the industrial standard. Arsenic is known to cause cancer; copper can be harmful at high levels, and exposure to lead can seriously harm a child's health. Based on our sampling results, EPA Region 4 agreed to conduct additional sampling at this site, but the site owner—the city of Clearwater—denied access to EPA Region 4.

Contamination at Clearwater Site Could Pose Risk to Nearby Residents

We expected that metal concentrations would be low in the soil samples we collected at the Clearwater Automotive Salvage Yard site because the site records showed it had been cleaned up and was designated in EPA records as RAU. According to EPA's records, the agency provided over $322,000 to the city of Clearwater for site assessment work, plus more than $45,000 and loans totaling $700,000 to clean up the site. Also, the city provided nearly $500,000 for assessment and cleanup. Therefore, in total, nearly $1.6 million was provided for assessing and cleaning up the site. On July 1, 2009, following completion of site assessment and cleanup activities, the state issued an order that declared that contaminants of concern in the soil—including arsenic—met state residential standards. The order included no restrictions on residential development of the site and, when work started at the site in 2007, Clearwater anticipated using the site as a mixed-use development that included affordable housing. When we conducted our work in April 2013, we observed that the Clearwater site was adjacent to residential areas and was undeveloped, and site access was poorly controlled.

Clearwater Automotive Site, Clearwater, Florida, in April 2013. Vacant lot is within a residential neighborhood. (EPA OIG photo)

South Carolina Soil Sample Results

In June 2013, we sampled seven sites in South Carolina—five Brownfield and two RCRA CA. We obtained field measures with the portable XRF unit at five sites. Confirmatory ICP analysis was performed on three samples. All ICP results showed at least one metal concentration that did not meet the standard. One sample, from the North Street Dump site, showed contamination that did not meet the residential and industrial standards for arsenic. The other sample from this site showed contamination that did not meet the residential standard for lead. Chromium in both samples from the North Dump site and the one sample from neighboring Arkwright Mills showed contamination that did not meet the industrial standard. However, the analyses were not conducted in a manner that allowed us to determine whether the chromium was in the more toxic form for which the standard is set.

Louisiana Soil Sample Results

In July 2013, we sampled five sites in Louisiana—two RCRA CA and three Brownfield. We obtained field measures with the portable XRF unit at four sites. At the Marathon Petroleum Company RCRA CA site, the soil was too saturated with water from a rain event to obtain accurate field scans. Confirmatory ICP analysis was performed on five samples from four sites. All of the ICP results on these samples met the standards.

Texas Soil Sample Results

In August 2013, we sampled four sites in Texas—two RCRA CA and two Brownfield. The portable XRF unit was unavailable for field use, which prevented us from obtaining a field scan of the metal composition of the soil prior to sampling. Confirmatory ICP analysis was performed on one sample from the Cadiz/Lamar Brownfield site. The lead concentration in that sample did not meet the industrial standard.

Recommendations

We recommend that the Regional Administrators, Regions 4 and 6:

1. Add the information in this report to the appropriate site-specific case files for each of these sites.

2. Assess the soil sampling results that that did not meet the established standards in the context of other information on site conditions and uses, and order confirmatory sampling if appropriate. Take action as needed with the site owners and states to ensure that the sites meet standards for their designated uses.

3. Based on the outcome from implementing Recommendation 2, reevaluate the sites' RAU designations and modify as appropriate.

Summary of Agency Response to Draft Report and OIG Evaluation

We received comments on the draft report from the Region 4 and Region 6 Administrators on May 14, 2015, and met with regional management to discuss their comments.

Based on our discussions with EPA regional management, we revised Recommendation 1, as shown above. Regional management provided a planned completion date, and Recommendation 1 is resolved with agreed-to corrective actions pending.

EPA regional management did not agree with Recommendations 2 and 3, indicating the OIG did not apply proper quality assurance protocols to the sampling, rendering EPA unable to verify the accuracy of the results. EPA did, however, meet the intent of Recommendations 2 and 3 as it did assess the usefulness of the OIG data and whether any action should be taken. In addition, based on our discussions with regional management, we clarified in this report that the soil sample results are not EPA-validated data, but are considered screening-level data. We consider Recommendations 2 and 3 to be complete, and they are closed upon issuance of this final report. We made changes to the report where appropriate. Appendix C contains the agency's complete response and OIG comments on that response.

Status of Recommendations and Potential Monetary Benefits

RECOMMENDATIONS						POTENTIAL MONETARY BENEFITS (in $000s)	
Rec. No.	**Page No.**	**Subject**	**Status[1]**	**Action Official**	**Planned Completion Date**	**Claimed Amount**	**Agreed-To Amount**
1	4	Add the information in this report to the appropriate site-specific case files for each of these sites.	O	Regional Administrators, Regions 4 and 6	9/30/15		
2	4	Assess the soil sampling results that that did not meet the established standards in the context of other information on site conditions and uses, and order confirmatory sampling if appropriate. Take action as needed with the site owners and states to ensure that the sites meet standards for their designated uses.	C	Regional Administrators, Regions 4 and 6	5/14/15		
3	4	Based on the outcome from implementing Recommendation 2, reevaluate the sites' RAU designations and modify as appropriate.	C	Regional Administrators, Regions 4 and 6	5/14/15		

[1] O = Recommendation is open with agreed-to corrective actions pending.
C = Recommendation is closed with all agreed-to actions completed.
U = Recommendation is unresolved with resolution efforts in progress.

Soil Sampling Results

Florida ICP[a] Soil Sampling Results

	Florida Cleanup Target Level		22nd Street Mixed Use	St. Vincent de Paul	Clearwater Automotive Salvage Yard			
Metal	Residential (ppm[b])	Industrial/ Commercial (ppm)	Sample 1 (ppm)	Sample 1 (ppm)	Sample 1 (ppm)	Sample 2 (ppm)	Sample 3 (ppm)	Sample 4 (ppm)
Antimony	27	370	<1.25[c]	<1.25	<1.25	<1.25	<1.25	4.50
Arsenic	2.1	12	<6.24[d]	<6.24[d]	**6.57[e]**	**25.8[f]**	<6.24	**16.4**
Barium	120	130,000	**136**	13.5	93.1	73.7	76	53.5
Beryllium	--	--	<0.299	<0.300	<0.300	<0.300	<0.299	<0.299
Cadmium	82	1,700	1.85	0.487	5.32	13.8	7.98	22.1
Chromium	210	470	12.8	8.90	12.8	57.6	20.3	42.7
Cobalt	1,700	42,000	0.357	0.589	4.15	2.84	2.58	17.7
Copper	150	89,000	27.8	15.7	62.8	98.7	**155**	**1140**
Lead	400	1,400	345	33.9	**869**	250	328	**516**
Mercury	3	17	<4.99[d]	<4.99[d]	<4.99[d]	<4.99[d]	<4.99[d]	<4.99[d]
Molybdenum	440	11,000	<6.24	<6.24	<6.24	<6.24	<6.24	<6.23
Nickel	340	35,000	2.54	142	11	65.4	25.3	143
Selenium	440	11,000	<0.873	<0.874	<0.874	<0.874	<0.873	<0.873
Silver	410	8,200	<2.49	<2.50	<2.50	<2.50	<2.49	<2.49
Thallium	6.1	150	<0.773	<0.774	<0.774	<0.774	<0.773	<0.773
Vanadium	67	10,000	1.58	25.2	6.34	<0.250	1.05	<0.249
Zinc	26,000	630,000	333	103	200	621	510	560
Latitude (decimal degrees)			27.97313	27.96528	27.96331	27.96298	27.96292	27.9624
Longitude (decimal degrees)			-82.43443	-82.7928	-82.7913	-82.7912	-82.7916	-82.7916

Source: EPA OIG.

[a] EPA methods 3050 and 6010.
[b] ppm = parts per million = milligram per kilogram in soil.
[c] Results less than the analytical reporting level are designated by <, followed by the reporting limit.
[d] Analysis was performed with a higher reporting limit than the residential standard.
[e] Values that show contamination that did not meet the residential standard are in yellow shade.
[f] Values that show contamination that did not meet the industry standards are in gray shade.

South Carolina ICP [a] Soil Sampling Results

	EPA Standards		North Street Dump		Arkwright Mills
Metal	Residential (ppm[b])	Industrial/ Commercial (ppm)	Sample 1 (ppm)	Sample 2 (ppm)	Sample 1 (ppm)
Antimony	31	410	<1.25[c]	<1.25	<1.25
Arsenic	0.61	2.4	**10.2**[d]	<6.24[e]	<6.25[e]
Barium	15,000	190,000	207	157	162
Beryllium	160	2,000	0.536	<0.299	<0.300
Cadmium	70	800	7.40	9.04	2.62
Chromium	0.29[f]	5.6[f]	**34.3**[f]	**28.9**[f]	**13.9**[f]
Cobalt	23	300	7.22	5.85	3.16
Copper	3,100	41,000	55.2	199	26.9
Lead	400	800	345	**406**[g]	125
Mercury	10	43	<4.99	<4.99	<5.00
Molybdenum	390	5,100	<6.24	<6.24	<6.25
Nickel	1,500	20,000	10.1	16.2	3.94
Selenium	390	5,100	<0.873	<0.873	<0.875
Silver	390	5100	<2.50	<2.49	<2.50
Thallium	0.78	10	<0.774	<0.773	<0.775
Vanadium	390	5,100	35.9	26.1	19.6
Zinc	23,000	310,000	355	338	383
Latitude (decimal degrees)			34.92029	34.92029	34.92551
Longitude (decimal degrees)			-81.92716	-81.92730	-81.92975

Source: EPA OIG.

[a] EPA methods 3050 and 6010.
[b] ppm = parts per million = milligram per kilogram in soil.
[c] Results less than the analytical reporting level are designated by <, followed by the reporting limit.
[d] Values that show contamination that did not meet the industry standard are in gray shade.
[e] Analysis was performed with a higher reporting limit than the residential standard.
[f] Standards presented for chromium VI. The results are unspeciated. The EPA has not set standards for total chromium.
[g] Value that shows contamination that did not meet the residential standards is in yellow shade.

Louisiana ICP [a] Soil Sampling Results

	Louisiana Standards		2750 Nicholson Drive		1705 Highland Road	Former Personal Touch Car Wash	Syngenta Crop Protection
Metal	Residential (ppm[b])	Industrial/ Commercial (ppm)	Sample 1 (ppm)	Sample 2 (ppm)	Sample 1 (ppm)	Sample1 (ppm)	Sample 1 (ppm)
Antimony	3.1	82	<1.25[c]	<1.25	<1.25	<1.25	<1.25
Arsenic	12	12	<6.24	<6.24	<6.24	<6.24	<6.25
Barium	550	14,000	72.6	115	168	140	148
Beryllium	16	410	<0.300	<0.299	<0.300	<0.300	<0.300
Cadmium	3.9	100	1.12	1.73	2.66	2.34	1.75
Chromium	23[d]	610[d]	5.43	6.50	8.91	7.10	7.23
Cobalt	470	12,000	2.11	5.22	4.62	5.71	3.72
Copper	310	8,200	14.6	13.4	29.3	14.6	16.1
Lead	400	1,400	26.1	20.1	157	70.4	12.9
Mercury	2.3	61	<4.99[e]	<4.99[e]	<5.00[e]	<4.99[e]	<5.00[e]
Molybdenum	--	--	<6.24	<6.24	<6.24	<6.24	<6.25
Nickel	160	4,100	7.59	11.9	10.7	10.8	11.7
Selenium	39	1,000	<0.874	<0.873	<0.874	<0.874	<0.875
Silver	39	1,000	<2.50	<2.49	<2.50	<2.50	<2.50
Thallium	0.55	14	<0.774[e]	<0.773[e]	<0.774[e]	<0.774[e]	<0.775[e]
Vanadium	55	1,400	10.7	3.75	5.59	6.95	3.00
Zinc	2,300	61,000	50.2	59.9	259	76.6	295
Latitude (decimal degrees)			30.42225	30.42280	30.43224	30.43552	30.24115
Longitude (decimal degrees)			-91.18794	-91.18817	-91.18264	-91.18507	-91.09788

Source: EPA OIG.

[a] EPA methods 3050 and 6010.
[b] ppm = parts per million = milligram per kilogram in soil.
[c] Results less than the analytical reporting level are designated by <, followed by the reporting limit.
[d] Standards presented for chromium VI. The results are unspeciated. Louisiana has not set standards for total chromium.
[e] Analysis was performed with a higher reporting limit than the residential standard.

Texas ICP [a] Soil Sampling Results

	Texas Protective Correction Levels		800 Cadiz/ 1005 Lamar
Metal	Residential (ppm[b])	Industrial/ Commercial (ppm)	Sample 1 (ppm)
Antimony	15	310	< 1.25[c]
Arsenic	24	200	< 6.25
Barium	8,100	120,000	134
Beryllium	38	250	< 0.300
Cadmium	52	850	3.28
Chromium (total)	33,000	120,000	25.3
Cobalt	21	280	3.72
Copper	550	39,000	33.9
Lead	500	1,600	**2,490[d]**
Mercury	3.6	6.2	< 5.00[e]
Molybdenum	160	4,500	< 6.25
Nickel	840	8,800	8.95
Selenium	310	4,900	< 0.875
Silver	97	2,300	< 2.50
Thallium	6.3	78	< 0.775
Vanadium	76	620	5.76
Zinc	9,900	250,000	209
		Latitude (decimal degrees)	32.77005
		Longitude (decimal degrees)	-96.79966

Source: EPA OIG.

[a] EPA methods 3050 and 6010.
[b] ppm = parts per million = milligram per kilogram in soil.
[c] Results less than the analytical reporting level are designated by <, followed by the reporting limit.
[d] Value that shows contamination that did not meet the industry standards is in gray shade.
[e] Analysis was performed with a higher reporting limit than the residential standard.

Appendix B

Site Visit Information

Florida Sites

Site name	Address	Number of samples analyzed		Date sampled
		Laboratory XRF	ICP	
Blue Chip Bar[a] (Brownfield)	1317 North Martin Luther King Jr. Ave., Clearwater	12	0	April 29, 2013
Clearwater Automotive Salvage Yard[a] (Brownfield)	205, 317, and 319 South Martin Luther King Jr. Ave., Clearwater	9	4	April 29, 2013
St. Vincent de Paul[a] (Brownfield)	1015 Cleveland St., Clearwater	4	1	April 29, 2013
Pro-fit Development[a] (Brownfield)	4407 Taliaferro Ave., Tampa	7	0	April 30, 2013
22nd Street Mixed Use[a] (Brownfield)	3115 Holmes St., Tampa	20	1	April 30, 2013

Source: EPA OIG.

[a] The portable XRF was used at this site to guide our sampling.

South Carolina Sites

Site name	Address	Number of samples analyzed		Date sampled
		Laboratory XRF	ICP	
Taylor Street [a] (Brownfield)	1221 Taylor St., Columbia	10	0	June 10, 2013
Roy Metal Finishing Company [a] (RCRA CA)	112 Conestee Road, Conestee	5	0	June 11, 2013
622/624 Green Avenue [a] (Brownfield)	622/624 Green Ave., Greenville	9	0	June 11, 2013
Arkwright Mills [a] (Brownfield)	971/975 South Liberty, Spartanburg	8	1	June 12, 2013
North Street Dump (Brownfield)	971/975 South Liberty, Spartanburg	6	2	June 12, 2013
IWG High Performance Conductors [a] (RCRA CA)	1570 Compton Road, Inman	9	0	June 12, 2013
Union Mill (Brownfield)	201 N. Enterprise Drive, Union	12	0	June 13, 2013

Source: EPA OIG.

[a] The portable XRF was used at this site to guide our sampling.

Louisiana Sites

Site name	Address	Number of samples analyzed		Date sampled
		Laboratory XRF	ICP	
2750 Nicholson Drive[a] (Brownfield)	2750 Nicholson Drive, Baton Rouge	9	2	July 22, 2013
Marathon Petroleum Company, LLC (RCRA CA)	Highway 61 at Marathon Ave., Garyville	13	0	July 23, 2013
Syngenta Crop Protection, LLC[a] (RCRA CA)	3905 Highway 75, St. Gabriel	11	1	July 23, 2013
1705 Highland Road[a] (Brownfield)	1705 Highland Road, Baton Rouge	6	1	July 24, 2013
Former Personal Touch Car Wash[a] (Brownfield)	1320 Highland Road, Baton Rouge	8	1	July 24, 2013

Source: EPA OIG.

[a] The portable XRF was used at this site to guide our sampling.

Texas Sites

Site name	Address	Number of samples analyzed		Date sampled
		Laboratory XRF	ICP	
Former Transportation Maintenance Facility (Brownfield)	7215 New York Ave., Arlington	15	0	August 12, 2013
800 Cadiz/1005 Lamar (Brownfield)	800 Cadiz/1005 South Lamar St., Dallas	11	1	August 13, 2013
Sheppard Air Force Base (RCRA CA) • Fire Training Area • Former Landfill #2 • Former Landfill #3	111 D Ave., Wichita Falls	Total Samples: 30 5 10 15	0	August 13, 2013
US Air Navy Joint Reserve Base (Carswell) (RCRA CA) • Landing Field-23 • Landing Field-24 • Landing Field-25 • Landing Field-26	Military Parkway, Fort Worth	Total Samples: 28 6 6 9 7	0	August 14, 2013

Source: EPA OIG.

Agency Response to Draft Report and OIG Evaluation

May 14, 2015

MEMORANDUM

SUBJECT: Response to Office of Inspector General Draft Report "Independent Environmental Sampling Shows Some Properties Designated by EPA as Available for Use Had Some Contamination," dated March 13, 2015

FROM: Heather McTeer Toney
Regional Administrator, Region 4

Ron Curry
Regional Administrator, Region 6

TO: Arthur A. Elkins, Jr.
Inspector General

Thank you for the opportunity to respond to the issues and recommendations in the subject audit report. Following is a summary of the agency's overall position, along with its position on each of the report recommendations. Regions 4 and 6 do not agree with the report recommendations and we have, therefore, explained our position and, as applicable, proposed alternatives to the recommendations. For your consideration, we have included a Technical Comments Attachment to supplement this response.

AGENCY'S OVERALL POSITION

To date, the Office of the Inspector General (OIG) has not supplied EPA with the information it needs to ensure its sample results were obtained following established EPA policy and consistent with mandatory Agency-wide Quality Systems requirements. Under these circumstances, EPA can neither rely on the accuracy of the OIG's results, nor can it replicate those results to independently verify sample accuracy.

OIG Response 1: Although we explained our data collection and analysis methods to EPA regional management earlier in the evaluation, we agreed to make revisions to the Scope and Methodology section of this report to further explain the soil sampling we conducted and what those results represent.

EPA Order CIO 2105.0, dated May 5, 2000, establishes Agency policy and program requirements for the preparation and implementation of organizational or programmatic management systems pertaining to quality and contains the minimum requirements for the mandatory Agency-wide Quality System. This policy requires participation by all the EPA organizations (office, region, national center or laboratory) supporting environmental programs and by non-EPA organizations performing work for EPA through extramural agreements. It further requires that all environmental programs performed by EPA or directly for EPA through EPA-funded extramural agreements be supported by individual quality systems that comply fully with the American National Standard ANSI/ASQC E4-1994, *Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs.* This is a national consensus standard authorized by the American National Standards Institute (ANSI) and developed by the American Society for Quality Control (ASQC) and is widely followed, as well, by organizations outside of the EPA. The policy includes requirements for Quality Assurance Project Plans (QAPPs), use of environmental data from other sources (secondary data), and establishing appropriate training for all levels of management and staff. All EPA Regions, including Regions 4 and 6, strive to produce data of known quality, through the use of current, project-specific QAPPs, with samples collected and properly handled in accordance with Standard Operating Procedures, to support EPA decisions and defend EPA actions. Deviation from these procedures can render data unusable due to such factors as cross-contamination of samples resulting from improper sample collection procedures, tampering with samples because of a lack of chain of custody requirements, or questions about laboratory practices when no data validation protocols are established.

For the subject report, as you know, we have had many conversations regarding, in particular, the OIG's sampling efforts in Florida in 2013. We have raised serious concerns with your sampling protocols and have further detailed these concerns in the Technical Comments Attachment.

AGENCY'S RESPONSE TO REPORT RECOMMENDATIONS

Disagreements

No.	Recommendation	Agency Explanation/Response	Proposed Alternative
1	Provide our soil sampling results to the site owners and place these results in the EPA's files for the sites.	The OIG/USGS did not apply proper quality assurance protocols for sampling activities, therefore the sampling results cannot be verified.	The EPA will first label the Final Audit Report, "Independent Environmental Sampling Shows Some Properties Designated by EPA as Available for Use Had Some Contamination," as unverified sampling, attach the Agency response/explanation and then add documents to appropriate programmatic files that are available, subject to applicable records retention schedules. The EPA will not contact sites/properties owners.
2	Assess the soil sampling results that are greater than the established standards in the context of other information on site conditions and uses, and order confirmatory sampling if appropriate. Take action as needed with the site owners and states to ensure that the sites meet standards for their designated uses.	The OIG/USGS did not apply proper quality assurance protocols for sampling activities, therefore the sampling results cannot be verified.	No actions or proposed alternative.
3	Based on the outcome from implementing Recommendation 2, reevaluate the sites' RAU designations and modify as appropriate.	There is no verifiable data available to reevaluate the sites' RAU designations.	No actions or proposed alternative.

CONTACT INFORMATION

If you have any additional questions regarding this response, please contact Michael Norman, Chief, RCRA Cleanup and Brownfields Branch in Region 4 at 404-562-8792 or Anthony Talton, Acting Associate Director, Revitalization and Resources Branch at 214-665-7205 in Region 6.

Attachment

cc: Dorothy Rayfield, Chief, Grants and Acquisition Management Branch, U. S. EPA Region 4
Susan Jenkins, Chief, Accounting Services Section, U. S. EPA Region 6

TECHNICAL COMMENTS ATTACHMENT

Background

On May 30, 2013, the Office of Inspector General (OIG) contacted EPA Region 4 staff to provide an "early warning" that samples it had collected at three sites in Tampa and Clearwater, Florida indicated the presence of environmental contaminants at levels of concern. As EPA Region 4 staff began to inquire about the nature of the investigation, it became clear that several fundamental omissions of Agency quality assurance protocols raised serious questions about the validity of the data produced by the OIG. Despite these very serious shortcomings, EPA Region 4 agreed to conduct sampling on the 22nd Street site in Tampa, FL. The property had not been sampled previously but had been the subject of a 2008 Phase I Environmental Site Assessment (ESA) through a Brownfields grant. The Phase I ESA was conducted in accordance with the Agency's All Appropriate Inquiries Final Rule (40 CFR Part 312) and ASTM E1527-05, and the investigation did not identify any recognized environmental conditions (RECs). Prior to conducting the EPA assessment at 22nd Street, Region 4 reviewed the 2008 Phase I report, prepared a detailed QAPP, then traveled to the site to conduct soil sampling during the week of September 9, 2013. The results of this investigation identified 5 of the 37 samples collected with lead levels exceeding EPA risk-based standards but no samples were found to have elevated levels of arsenic, antimony or barium above the EPA's levels. A risk evaluation of the data concluded that no further investigation or cleanup would be required. EPA Region 4 also attempted to conduct follow-up sampling at the Clearwater Auto Salvage property in Clearwater, FL, but was denied access because City of Clearwater staff maintain that the OIG had collected its samples without the City's permission.

Regarding Region 6 Brownfields and RCRA site sampling activities, the Region could not verify the sample results, which included the 800 Cadiz/1200 Lamar brownfields site, since the data was not collected following the Agency's Quality Assurance policy.

Response to IG's Findings and Recommendations

The OIG's findings are based on two general levels of quasi-analytical results. The first level of results was obtained from soil samples collected on site and analyzed using a handheld x-ray fluorescence (XRF) device. The 2014 USGS report on which much of this audit report is based, entitled *An Evaluation of Remote Sensing Technologies for the Detection of Residual Contamination at Ready-for-Anticipated Use Sites*, indicates that the XRF instrument provided "suspicious results," and was sent back to the manufacturer for repair. The report also acknowledges that "the study was not setup in a way that the source of the unreliability of the XRF results could be determined." As we understand the sequence of events, where samples could not be field screened due to site conditions or instrument calibration, samples were shipped to a USGS lab where they were dried, and analyzed with a lab-mounted XRF. It is not clear if all field samples were shipped to a lab to be dried and analyzed or just a subset of field samples (where either site soils were too wet or the XRF unit needed calibration). The second level of analysis took place at an undisclosed independent lab where a small subset of soil samples were tested using the inductively coupled plasma (ICP) method of analysis.

The basis for questioning the OIG's analytical results lies in the many stringent requirements EPA has established for what we would consider valid, defensible, reproducible data and how this data is collected, analyzed and reported. The basis for this is the Quality Assurance Project Plan or QAPP.

A site-specific or project-specific QAPP is an Agency requirement, yet apparently no such plan exists for the OIG's project. The OIG has provided an unsigned 2008 U.S. Department of the Interior - USGS research project plan. It contains a reference, on page 5, to a QAPP, but based on our review of the document, does not meet the content requirements or the intent of an EPA-required QAPP. Shortcomings of the IG's work include:

- **No QAPP**. Without a QAPP, the overall intended use of the data cannot be determined. The EPA requested copies of site-specific QAPPs, but the OIG only provided an unsigned 2008 USGS document entitled *Research Implementation and Quality Assurance Project Plan: An Evaluation of Hyperspectral Remote Sensing Technologies for the Detection of Fugitive Contamination at Selected Superfund Hazardous Waste Sites.* This document appears to EPA to be an umbrella document prepared for a previous audit, where soil sampling was conducted to research the use of hyperspectral imagery as a possible remote sensing technology. The portion of the document identified as the Quality Assurance Project Plan does not meet EPA requirements to produce sufficient data of the quality necessary to characterize a site and adequately characterize site risks.
- **No formal sampling plan**. The OIG report states that samplers deviated from a proposed sampling grid where they observed conditions which might indicate greater contamination levels. Samples collected were reportedly grab samples. This approach of looking for "hot spots" does not reflect site-wide conditions or properly characterize a site. Randomized grab samples may be used to identify potential contaminants at a site but do not support site characterization.
- **Improper decontamination of sampling equipment**. In calls with the OIG, Regional staff were told that the sampling team did not decontaminate sampling equipment between individual samples collected and/or did not use pre-cleaned instruments for each aliquot collected. Our discussion with the OIG's project staff suggests samples were obtained with shovels and/or trowels and no decontamination of sampling equipment was performed between sample aliquots. When samples are collected in a manner contrary to accepted practices and equipment is not properly decontaminated, the potential for cross-contamination renders results invalid for all but the most cursory uses. Data of this quality does not satisfy EPA data quality standards and would not be released to the public as indicative of actual site conditions.
- **Improper use of sample containers**. In calls with the OIG, Regional staff were told that samples were collected and placed in plastic baggies as opposed to approved glassware provided by an analytical laboratory or a lab supply company.
- **Improper and/or no use of required personnel protective equipment (PPE)**. Based on our calls with the OIG, Regional staff are concerned that standard operating procedures regarding the use of PPE may not have been followed. The EPA sampling standard operating procedures require, at a minimum, approved gloves which must be changed for each sample aliquot collected. Samples collected without the use of proper PPE are subject to cross-contamination and the results cannot be validated.

- **Lack of chains of custody for samples**. The OIG did not provide evidence of use of chain of custody seals or chain of custody paperwork, and Region 4 did not receive copies of the sample acceptance forms from the labs. This creates concern over sample integrity if sample containers were to be breached or otherwise opened between the time the samples were collected and eventually analyzed. Additionally, there is no evidence that samples were shipped at the required 4 degrees Celsius (+/- 2 degrees) or received at that temperature by the lab for ICP analysis.
- **No data validation**. For samples shipped to the independent lab, there is no information about lab accreditation, no chain of custody, no information about PE samples, matrix spike/matrix spike duplicate analysis, rinsate blanks, trip blanks, sample temperature, etc. Nor have the Regions been provided a lab data validation package of analytical results or lab QA/QC information. Without this, data produced from these samples cannot be used to support Agency decision-making or used for public dissemination.

In short, without an approved QAPP and documentation to show that QAPP requirements were fully satisfied, there is no assurance about either the quality or reproducibility of the data. Region 4 has previously requested that the OIG provide the data quality information discussed above, however, to date that information has not been forthcoming. Without that information, the OIG's sample results can only be considered as draft or screening data. Per EPA Executive Order CIO 2105.0 (formerly 5360.1 A2), the OIG's data is of insufficient quality to support Agency decision making, and would not be released to the public.

Based on the above findings in response to the OIG's recommendations, we would first request that the OIG make available all documentation which would be required to validate the data upon which it is basing its recommendations. This would include a complete QAPP which has been reviewed and signed by a person with the requisite qualifications. The QAPP would include a detailed sampling plan for each site, discussion of data quality goals and objectives (which would explain how its targeted sampling approach supports site characterization), chain of custody forms, results from analysis of trip blanks, rinsate blanks, performance evaluation samples, matrix spike/matrix spike duplicate analytical results, lab QA/QC documentation, field log books including photo documentation, lab data validation and so forth. If the information provided by the OIG meets the requirements set forth in EPA Executive Order CIO 2105.0, it will be incumbent upon the regions to address the OIG's recommendations and take appropriate action for each site where the data show action is necessary. Those steps may include notifying State environmental regulatory agencies, property owners, former grantees, or the municipality in which the sites are located; conducting additional sampling investigations to reassess the sites (as funding permits); and revisiting the Ready for Anticipated Use (RAU) determinations.

Brief Discussion of Risk Assessment Practices

A consistent challenge in responding to the OIG's concerns since our earliest discussions has been the OIG's position that a single elevated reading or a number of elevated readings of a contaminant or contaminants justifies or even requires taking action such as notifying the property owner or changing the RAU status of the property. In fact, this is a challenge similar to what the Agency often experiences when trying to explain "risk" to the public. There are certainly times when EPA will take biased grab samples to try to determine if hazardous

substances are present at a site. However, this is merely an initial screening and cannot be used to make final site decisions or be used to notify the public. It merely provides a snapshot of aspects of the site and does not adequately characterize a site. It answers the question, "are there potentially hazardous substances present at the site," but nothing more. When we conduct screening in this manner, it is always considered an initial site investigation and does not provide the rigorous level of detail required by this Agency for making decisions such as notifying the public or taking a response action.

In looking at the OIG's XRF levels for the Florida sites, we can use the Florida Soil Cleanup Target Levels (FLSCTLs) as a screening guide. There are many FLSCTLs which are applicable for use in site screening in that they are equal to our final risk based remedial levels, such as lead. For other chemicals however, the FLSCTLs are significantly lower than EPA risk based remedial levels such as arsenic, antimony and barium. In fact, some of the FLSCTLs are not based on actual risk calculations (antimony and arsenic for example) but on less rigorous factors. When a Brownfields grantee is enrolled in a state program, they are encouraged to use assessment and cleanup standards endorsed by their respective state (which, more often than not, are based on or defer to EPA's standards). However, in evaluating whether EPA would take steps such as informing a property owner, we would defer to EPA's toxicity based screening levels. For the Florida sites, our risk assessor states, "(f)or detected soil constituents, EPA Superfund uses toxicity based screening levels based on child only exposure. For constituents that fail this screen, EPA performs a risk assessment which assumes chronic (adult + child) exposure unless the particular constituent is known to cause developmental effects that could occur in a shorter exposure duration. For lead in soil, the toxic effect of concern is to young children; thus the residential soil screening level is equivalent to the recommended remedial level for residential soil. Arsenic, antimony, and barium are not developmental toxicants, and therefore EPA's recommended risk-based remedial levels for residential soil are higher than the initial (FLSCTL) screening levels."

Upon review of the OIG's XRF data for the Florida sites and comparing to EPA's risk based levels, there is a solitary exceedance of the EPA Removal Management Level (RML) for arsenic at Clearwater Automotive which is less than 2 parts per million (ppm) above the risk level of 67 ppm, one (1) exceedance for the RML for lead at 22nd Street and six (6) exceedances for lead at Clearwater Automotive. An EPA Region 4 risk assessor looked at the entire set of XRF results for each Florida site. Averaging the contaminant levels across each site, the risk assessor concluded that there is no basis for the OIG's concerns. There are elevated readings but the levels are not consistently high enough to warrant implementing the OIG's recommended actions. In other words, the IG screening data does not adequately characterize site risk and, in and of themselves, are not sufficiently elevated to present a human health risk. This is further supported by Region 4's assessment at 22nd Street where only five (5) samples of the 37 sample locations exceeded the RML for lead and there were no exceedances for antimony, arsenic or barium.

Conclusion

EPA Order CIO 2105.0, dated May 5, 2000 establishes EPA's Agency-wide quality system and applies to all EPA organizations and non-EPA organizations performing work on behalf of EPA.

Data obtained which does not adhere to this standard cannot be used as a basis for decision making. To date, the OIG has not provided information which supports use of the data in the manner proposed by the OIG. The OIG continues to maintain that elevated readings, in and of themselves, are a basis for taking action. This contradicts the Agency's risk-based model for decision making. Subsequent sampling conducted by Region 4 further discredits the OIG's findings.

OIG Response 2: We agree that our sampling results are screening data and should be used for the purpose stated in the agency's response.

We do not agree that Region 4's subsequent sampling discredits our findings. Region 4 agreed to conduct confirmatory sampling at a couple of the Florida sites we sampled. Due to access issues, the region collected samples at only one site, 22nd Street Mixed Use. The region's results showed contamination above the Florida residential cleanup target levels for arsenic, barium and lead in some samples. Overall, these exceedances of the state cleanup target levels agreed with OIG sampling results.

Based on these facts, the only action EPA can take at this time is to review the supporting data quality information as described and requested above. In the absence of an approved Quality Assurance Project Plan, no further steps are supportable based on the screening information provided by the OIG.

Appendix D

Distribution

Office of the Administrator
Assistant Administrator for Solid Waste and Emergency Response
Regional Administrator, Region 4
Regional Administrator, Region 6
Agency Follow-Up Official (the CFO)
Agency Follow-Up Coordinator
General Counsel
Associate Administrator for Congressional and Intergovernmental Relations
Associate Administrator for Public Affairs
Principal Deputy Assistant Administrator for Solid Waste and Emergency Response
Deputy Regional Administrator, Region 4
Deputy Regional Administrator, Region 6
Director, Office of Brownfields and Land Revitalization, Office of Solid Waste and Emergency Response
Audit Follow-Up Coordinator, Office of Solid Waste and Emergency Response
Audit Follow-Up Coordinator, Region 4
Audit Follow-Up Coordinator, Region 6