Hazardous Waste Section

File Room Document Transmittal Sheet

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Your Name:	Mary Siedlecki
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AOC 5-Year Review Checklist

Facility Name: Ashland, Inc.
EPA ID: NCD 088 560 032
AOC Docket #: 2011-008
Five Year Review Date: May 19, 2016
Review Performed By: Mary Siedlecki

Section I- Post Closure Care
(*Only For Regulated Unit*)

Type of Unit: Ashland is currently maintaining a regulated disposal unit (former 1,000-gallon hazardous waste underground storage tank (UST closed with waste in place)) under 40 CFR 265.117, incorporated by reference in 15A NCAC 13A .0110, post-closure provisions. These provisions require groundwater monitoring and regular inspections of the concrete cap overlying the former UST.
SWMU#: SWMU 1

Waste Management Unit	Reference	Comments
Cap Integrity	40 CFR 264.117(c)	Closure and Post-Closure Care Plans were approved by the Hazardous Waste Section in October 1992. Closure plans included installation of a concrete cap. Post-closure care included cap inspection and maintenance. These activities are performed on annual basis. Memorandums of Cap Inspection are submitted annually.
Final Cover	40 CFR 264.117(c)	See above.

Security	40 CFR 264.14, 264.117(b)	Property fences, gates, signs, existing RCRA pad, other existing concrete and asphalt surfaces, and grass/vegetation are inspected annually as part of post-closure care activities. Required maintenance and repairs are documented in Memorandum of Cap Inspection.
Inspection Schedule	40 CFR 264.15, 264.117(a)	Inspection of the RCRA concrete cap was performed on a semi-annual basis. The schedule was changed to annually in 2013.
Compliance Monitoring Program	40 CFR 264.117(a), 264.99	A monitoring program has been designed and implemented to identify hazardous waste constituents of concern, constituent concentrations in relation to applicable standards, and trends in concentration as a function of time. The monitoring program is detailed in the January 30, 2013, *Sample and Analysis Plan.*

1. List Monitoring Wells/Sample Frequency/Constituents of Concern:

   Groundwater samples are collected from MW-1, MW-3, MW-3D, MW-5, MW-7, MW-8R, MW-8DR, MW-12D, MW-14OB, MW-14TZ, MW-16OB, MW-18BR, MW-22, MW-23, MW-23D, MW-23BR, MW-24, MW-25, and MW-26.

   Samples are collected annually from 2013 until 2017. Following completion of the 2017 sampling event, sampling frequency will transition to biennially (every two years). Biennial sample collection will be conducted from 2019 through 2027, after which sampling frequency will transition to every five years. This sampling schedule assumes that no trigger events occur that require follow up actions.

   Samples are analyzed for SW-846 Method 8260B.

   Source: *Sample and Analysis Plan*, January 30, 2013.

2. Recommendations for modification:

   Ashland Raleigh is fully in compliance and no modifications to the Alternate Mechanism in lieu of Post-Closure Permit are required.

Section II-Groundwater Monitoring System

Category	Comments	Other
<u>Sampling & Analysis Plan</u> -Sample Methods -Analytical Methods -Well Integrity -Field Parameters Measured -Adjustment to Sample Season	• Due to slow recovery rates, low flow/low volume purging techniques are used to purge monitoring wells. Low flow/low volume dedicated pumps are installed in ~half the sampled wells. Stainless steel submersible pumps or PDBs are used in the remainder of the wells. PDBs are used in the wells installed in the wetland area near Walnut Creek (MW-23, MW-23D, MW-23BR, MW-24, and MW-26). • Groundwater samples are analyzed for SW-846 Method 8260B. • Measured field parameters include water	Date of currently approved Plan: January 30, 2013

	elevation, pH, specific conductivity, temperature, dissolved oxygen, oxygen-reduction potential, and turbidity. • Groundwater samples are collected on an annual basis in March of each year. No adjustment is made for seasonal variations. • Surface water samples are collected in addition to the groundwater samples. • Three surface water samples are collected on an annual basis in March of each year. • Surface water samples are analyzed for SW-846 Method 8260B.	
<u>Monitoring Wells</u> -Sufficient Onsite Wells Sampled	• Samples are collected from four onsite monitoring wells	

-Sufficient Offsite Wells Sampled -Sufficient Hydraulic zones sampled -Background Well Sampled -Add/Remove/Replace Wells	(MW-1, MW-3, MW-3D, and MW-7). • Samples are collected from 15 offsite monitoring wells (MW-5, MW-8R, MW-8RD, MW-12D, MW-14OB, MW-14TZ, MW-16OB, MW-18BR, MW-22, MW-23D, MW-23BR, MW-24, MW-25, and MW-26). • Groundwater quality is monitored in both the shallow and deep (partially weathered rock) aquifer systems. • Monitoring Well MW-4 was the designated background well. MW-4 was consistently non-detect for target compounds for multiple years' prior development of the Corrective Measures Report. MW-4 was omitted from continued sampling. • The groundwater monitoring plan was developed as part of the corrective measures study. • The existing groundwater monitoring program is	

	well established and robust. Ashland Raleigh may want to evaluate potential spatial redundancies of monitored wells. Should Ashland Raleigh identify wells that are potentially eligible for removal from the existing monitoring program, Ashland Raleigh may submit a revised *Sampling and Analysis Plan* with supporting documentation.	
<u>Constituents of Concern</u> -Historical Results -Plume Maps -Horizontal Gradients -Vertical Gradients -Add/Remove Constituents	• The list of analytics impacting groundwater quality include carbon tetrachloride; 1,1-dichlorothane; *cis*-1,2-dichloroethene; perchoroethylene; 1,1,1-trichlorethane; trichloroethylene; and vinyl chloride. Benzene is measured in downgradient wells (benzene is associated with the Dumas Oil facility). • Due to the relatively stable water level conditions historically present at the site, a comprehensive depth to water gauging	

	program is no longer required to establish horizontal and vertical gradients and/or flow directions. Water elevation data are collected only for those wells that are sampled. Groundwater flow direction is toward the south-southeast. The average horizontal hydraulic gradient in the shallow aquifer zone and downgradient areas is ~ 0.014 foot per foot (ft/ft) based on groundwater elevation differences between monitor wells MW-1 and MW-14OB (March 2015). • Vertical gradients across the Site have been collected over the course of the past 10 years to evaluate the propensity of the groundwater (and thus groundwater constituents) to migrate into deeper aquifer zones. The data includes twelve double and/or triple well nests from gauging events from	

	March 2005 through March 2015. Approximately 186 (~84%) of the 221 individual vertical gradient results determined to be in an upward direction. These data indicate that the Site and the downgradient properties, under which the groundwater plume resides, are located predominantly in a discharge zone of the regional aquifer system. • There is no basis to support the addition or removal of monitored analytes.	

1. List all Monitoring Wells/Sample Frequency/Screened Intervals/List of Constituents of Concern/Total Depth/Hydrogeologic zone of screened Interval.

Well	Sampling Frequency	Screened Interval [1] (feet)	Total Depth (feet)	Hydrogeologic Unit	Constituents of Concern [2]
MW-1	Annual	18.5-28.5	28.5	Shallow	*Cis*-1,2-DCE; PCE; 1,1,1-TCA; TCE
MW-2		18.5-28.5	28.5	Shallow	
MW-2D		63.5-73.5	73.5	Intermediate	
MW-3	Annual	23.5—33.5	33.5	Shallow	*Cis*-1,2-DCE; 1,1-DCA; PCE; TCE
MW-3D	Annual	61-71	71	PWR	*Cis*-1,2-DCE; PCE; TCE
MW-4		20.5-30.5	30.5	Shallow	
MW-5	Annual	18.5-28.5	28.5	Shallow	*Cis*-1,2-DCE; PCE; TCE
MW-6		18.5-28.5	28.5	Shallow	
MW-7	Annual	18.5-28.5	28.5	Shallow	*Cis*-1,2-DCE; 1,1-DCA; 1,1,1-TCA; PCE; TCE
MW-7D		59.8-69.8	69.8	PWR	
MW-8S		17-27	27	Shallow	
MW-8R	Annual	17-27	27	Shallow	*Cis*-1,2-DCE; 1,1-DCA; PCE; TCE
MW-8D		49-59	59	Intermediate	
MW-8DR	Annual	44-54	54	PWR	*Cis*-1,2-DCE; PCE; TCE
MW-11D		50-55	55	Competent Bedrock	
MW-11R		27-37	37	PWR	
MW-12D	Annual	29.58-34.58	34.58	PWR	PCE, TCE

Well	Sampling Frequency	Screened Interval [1] (feet)	Total Depth (feet)	Hydrogeologic Unit	Constituents of Concern [2]
MW-12TZ		44-59	59	PWR	
MW-12BR		160-170	170	Competent Bedrock	
MW-13D		70.12-75.12	75.12	PWR	
MW-14OB	Annual	12.5-22.5	22.5	Shallow	Carbon tetrachloride: *cis*-1,2-DCE; PCE; TCE
MW-14TZ	Annual	30-35	35	PWR	PCE, TCE
MW-15OB		14-24	24	Shallow	
MW-15TZ		42.5-44.5	44.5	PWR	
MW-16OB	Annual	11-21	21	Shallow	PCE
MW-16TZ		45-47	47	PWR	
MW-16BR		70-85	85	Competent Bedrock	
MW-17OB		6-16	16	Shallow	
MW-17TZ		45-50	50	PWR	
MW-18TZ		33-35	35	PWR	
MW-18BR	Annual	70-80	80	Competent Bedrock	PCE, TCE
MW-19		9-19	19	Shallow	
MW-20		5-20	20	Shallow	
MW-20D		35-45	45	No well log	
MW-20BR		73-83	83	No well log	
MW-21		15-25	25	No well log	
MW-22	Annual	15-25	25	No well log	<1.0
MW-22D		33-43	43	No well log	
MW-22BR		98-108	108	No well log	
MW-23	Annual	11-21	21	Shallow	Benzene[3]; *cis*-1,2-DCE; PCE; TCE; vinyl chloride

Well	Sampling Frequency	Screened Interval [1] (feet)	Total Depth (feet)	Hydrogeologic Unit	Constituents of Concern [2]
MW-23D	Annual	51-61	61	PWR	Carbon tetrachloride; *cis*-1,2-DCE; PCE; TCE; vinyl chloride
MW-23BR	Annual	74-84	84	Competent Bedrock	Carbon tetrachloride; PCE; TCE
MW-24	Annual	11-21	21	Shallow	Benzene; *cis*-1,2-DCE; PCE; TCE; vinyl chloride
MW-25	Annual	13-23	23	Shallow	PCE
MW-26	Annual	13-23	23	Shallow	Benzene; *cis*-1,2-DCE; vinyl chloride
SWS-1	Annual				< 2B
SWS-2	Annual				< 2B
SWS-3	Annual				< 2B

[1] Source: Driller's Logs contained in Appendix B of the *Sample and Analysis Plan* (January 30, 2013). "Hydrogeologic unit" was defined based on drilling logs. Boring logs indicate that wells are screened in unconsolidated sands and silts; at the top of the PWR (auger refusal); or in competent bedrock.

[2] Source: March 2015 Annual Groundwater Monitoring Report, Tables 3 and 4 (May 20, 2015).

[3] The source of benzene is not the Ashland Raleigh Facility.

Notes:

- Constituents of concern are listed only for those wells that are currently monitored.
- SWS designates surface water sampling locations.

2. Recommendations for modification:

The monitoring program is comprehensive and robust. No modifications to the Alternate Mechanism in lieu of Post-Closure Permit are warranted. However, the Sampling and Analysis Plan (January 2013) indicates that groundwater and surface water samples are collected annually from 2013 until 2017. Sampling frequency transitions to every two years after 2017. Sampling frequency transitions to every five years after 2027. Sampling frequency was based on the recommendations made in the Corrective Measures Study Work Plan (May 2010) and the Corrective Measures Study (Revision 1, June 2012).

The proposed change in monitoring frequency reflected the understanding that onsite contaminant concentrations would be characterized by stable or decreasing concentrations. However, onsite concentrations fluctuate with no significant trends, indicating that the plume is stable. The Section cannot approve the proposed change in sampling frequency after 2017. The Section requires that the Sampling and Analysis Plan be revised to reflect continued annual sampling.

Section III-Corrective Action

Category	Comments	Other
Ashland Raleigh has completed investigation of onsite soils, offsite soils, groundwater, surface water, and offsite soil gas. The results are reported in myriad investigative reports and groundwater monitoring reports. Ashland Raleigh has also designed and implemented various corrective actions, including pump and treat, soil vapor extraction, and monitored natural attenuation.	• Soil Sampling Plan (December 1985) • Subsurface Investigation Report (January 1986) • Phase I Soil Sampling Report (February 1986) • Phase II Soil Sampling Report (March 1986) • Soil Remedial Action Plan (May 1986) • Report of Preliminary Environmental Site Assessment (May 1989) • Soil Boring Assessment and Petroleum Hydrocarbon Soil Removal (August 1990) • Phase I Investigation (March 1994) • Phase II Assessment (September 1994) • Environmental Site Assessment (June 1995) • Vapor Extraction System Effectiveness Evaluation Report (November 1995)	Historic soils data were re-evaluated in comparison to Inactive Hazardous Sites Branch (IHSB) Preliminary Screening Remediation Goals (PSRG) for Industrial Settings, Residential Settings, and for Protection of Groundwater (April 2016). This evaluation was required because soils data had previously been compared to US EPA Regions 3, 6, and 9 Screening Levels for Industrial and Residential Soil. Although this comparison was correctly performed at the time, IHSB has since developed PSRG levels that are significantly more conservative than US EPA values. Based on the US EPA values, the contaminants of concern impacting <u>onsite</u> soils was limited to chloroform, PCE, and

	• Corrective Action Plan (April 1998) • Report of Limited Site Assessment (October 1999) • Phase I Environmental Site Audit (April 2000) • Report of Phase II Environmental Site Assessment (February 2001) • Phase III Groundwater Assessment (August 1997) • Biological Assessment of Walnut Creek near the Ashland Chemical Company Site (November 1997) • Phase IV Groundwater Assessment Report (March 1998) • RCRA Facility Assessment (June 2003) • Preliminary Groundwater Flow and Transport Modeling (May 2009) • Corrective Measures Study Work Plan (May 2010) • Updated Habitat Assessment Along Walnut Creek (January 2011) • Soil Gas Sample Results and Vapor	TCE. Comparison to the April 2016 screening values resulted in a larger suite of contaminants of concern impacting <u>onsite</u> soils. The suite of contaminants was expanded to include carbon tetrachloride, methylene chloride, 1,1-dichloroethene, ethylbenzene, toluene, 1,1,1-trichloroethane, and xylenes. The <u>onsite</u> soils data spanned December 1985 to September 1995. A Soil Vapor Extraction (SVE) system became fully operational in 1989 to remediate contaminated <u>onsite</u> soils. The SVE system consisted of seven SVE points and was operated until 1995. Woodward-Clyde Consultants, Inc., evaluated the effectiveness of the SVE system in 1995. As part of the evaluation, soil samples were collected in close proximity to soil samples collected in 1986. Based on the results of this work,

	Migration Modeling (February 2011) • Monitored Natural Attenuation Evaluation Report (November 2011) • Corrective Measures Study Revision 1 (June 2012)	limited contaminant impacts remained in soils when compared to US EPA Regions 3, 6, and 9 Screening Levels for Industrial Soils. No contaminants were detected in three of the nine soil samples. PCE was detected in five of the nine soil samples, but at concentrations less than the US EPA Regions 3, 6, and 9 Screening Levels for Industrial Soils. Only one sample, located at the eastern boundary of the former Aboveground Solvent Storage Tank Farm (SWMU 7), was characterized by exceedances of the US EPA Regions 3, 6, and 9 Screening Levels for Industrial Soils. It was concluded that contaminant concentrations in soil were significantly reduced due to operation of the SVE system (Woodward-Clyde 1995). The 1995 soils data were compared to IHSB (PSRG) for Industrial Settings and Protection

		of Groundwater (April 2016). PCE was the only contaminant measured in soils in 1995 at concentrations exceeding the ISHB Protection of Groundwater Standard. Soil samples have been collected offsite property. Results for offsite soil samples have not been re-evaluated as part of this five-year review. The chemical signature characterizing onsite soils and the groundwater contaminant plume is different enough to suggest that Ashland Raleigh is not the primary source of impacts to offsite soils in the drainage ditch and swampy area adjacent to Walnut Creek. In conclusion, significant soil sampling has been completed on the interior and along the facility boundaries. Although contaminant concentrations in soils are significantly reduced due to operation of the SVE system, impacted soils remain onsite.

		Potential exposures are controlled by an Environmental Covenant that restricts use of the site to non-residential development and restricts groundwater use. The Environmental Covenant also specifies that future building constructions shall include vapor barriers and minimal use of subsurface footers.
Remedy Effectiveness -Describe three (3) lines of evidence that each component of the selected remedy is effective	Contaminated media associated with the facility include onsite soils; offsite soils; groundwater; and surface water. [1] Multiple phases of corrective action have been implemented to address contaminated media. Early phases will be identified below. The five-year review will focus on the final approved corrective action: monitored natural attenuation. A groundwater remediation system was installed <u>onsite</u> in September 1987. Three recovery wells were installed in 1987 for the purpose of groundwater extraction and treatment. Three additional	Multiple lines of evidence support the effectiveness of the final remedy (institutional controls combined with MNA). MNA is supported by bio-geochemical parameters measured in groundwater; evaluation of contaminant signatures and concentrations a function of time; stable carbon isotope composition in four groundwater samples and two soil samples; direct measurement of microbial populations in groundwater; and measurement of organic carbon in swamp soil and walnut creek sediment.

	recovery wells were installed from 1990 to 1992 for the purpose of creating a hydraulic barrier in addition to groundwater recovery and treatment. The groundwater recovery system operated until February 1995 when it was concluded that the voluntary remediation system had reached its limit of efficiency. A Soil Vapor Extraction (SVE) system became fully operational in 1989 to remediate contaminated <u>onsite</u> soils. The SVE system consisted of seven SVE points and was operated until 1995 (see above for evaluation of system effectiveness). To address the groundwater contaminant plume that had migrated <u>offsite</u>, an offsite air sparge/soil vapor extraction (AS/SVE) system became operational in November 2005. The Section approved Ashland's request to deactivate and remove the SVE/AS remediation system on April 22, 2009. This decision was based on the	This evaluation focuses on lines of evidence supporting the effectiveness of MNA. Specifically, the evaluation of contaminant signatures and concentrations a function of time. • PCE was the primary COC in groundwater beneath the site. Detections of TCE, *cis*-1,2-DCE, and VC provide evidence of in-situ biodegradation of PCE via reductive dechlorination. • Concentrations of degradation daughters indicate that the most robust zone of reductive dechlorination is occurring in the vicinity of MW-7, MW-8DR, MW-12D, MW-140B, MW-18BR, MW-20, MW-23, MW-24, and MW-26. • PCE and TCE concentrations decrease along the groundwater flow path, with the highest concentrations observed at MW-5

	negligible impact on overall remediation of the offsite groundwater contaminant plume combined with the presence of a strongly reducing zone that encompasses the area of MW-22D and MW-26 near the swamp. A corrective measures study was submitted in June 2012. The approved remedy includes institutional controls in the form of onsite land use restrictions, onsite access restrictions, and maintenance of the RCRA cap. Institutional controls are combined with long-term monitored natural attenuation (MNA) to address the offsite groundwater contaminant plume.	and MW-8DR. In contrast, *cis*-1,2-DCE fluctuates along the flow path as it is both degraded to vinyl chloride and generated during reduction of TCE. • Groundwater sample results from the shallow wells located within the swamp (MW-23, MW-24, MW-25, and MW-26) indicate that PCE and TCE are present at very low to non-detectable concentrations, whereas, *cis*-1,2-DCE and vinyl chloride are detected at higher concentrations. In conclusion, evidence supports the fact that monitored natural attenuation is effective at addressing the offsite groundwater contaminant plume. However, contaminant concentrations in the source area are elevated and show no sign of decreasing concentration. In the absence of active remediation in the onsite

		source area, it is likely that decades will be required to achieve applicable standards.
Potential Receptors/Land Use Restrictions - Onsite Personnel -Offsite Personnel (residential, schools, daycares) -Ecological (lakes, rivers, streams, biological, etc.)	EPA's corrective action event codes (CA725 and CA750) were evaluated after receipt of the *Corrective Measures Study Work Plan* (dated May 12, 2010). The findings are that both current human exposures and migration of contaminated groundwater are under control (June 7, 2011). Four potential exposure pathways were evaluated as part of the Corrective Measures Study (June 2012), including groundwater to potable well exposures; onsite soils to site worker; groundwater to indoor air; and groundwater to surface water. A receptor survey was conducted in 1998 to evaluate potential groundwater receptors located within ½ mile of the site. The survey focused primarily on the residential area southeast	EPA's corrective action event codes (CA725 and CA750) are accurate and representative of current conditions. No additional evaluation is warranted at this time. Results of the two potable well surveys indicate that groundwater to potable well exposures are not present within the vicinity of the site.

	of the facility. The survey was conducted in two parts. The first part consisted of visiting the City of Raleigh GIS Mapping Office and City of Raleigh Engineering Department to obtain tax maps and utility maps. The second part included a site reconnaissance trip to verify the findings on the city maps and to ensure that city water was available to all residences within the study area. A visual check was made for the presence of private water wells during the reconnaissance trip. It was concluded that water and sewer service is available to all residential and commercial buildings within the survey area. No private water wells were evident in the survey area. To further to verify the absence of groundwater receptors, Ashland conducted a follow up windshield drive-by reconnaissance in October 2010 of all areas within 1,500 feet of the	

	site. No evidence of water supply wells is observed. The Wake County Health Department confirmed that the county did not have any records of water supply wells within 1,500 feet of the site. The City of Raleigh Public Utilities Department confirmed that all properties within 1,500 feet of the site receive water and sewer services.	
	The only identified exposure pathway for exposure to soils is exposure during subsurface construction/excavation activities (for current and future land use scenarios). This exposure pathway is currently controlled with an Environmental Covenant that restricts use of the Site to non-residential development and restricts groundwater use. The Environmental Covenant also specifies that future building constructions shall include vapor barriers and minimal use of subsurface footers.	Although impacted soils remain onsite, potential exposures are controlled by an Environmental Covenant that restricts use of the Site to non-residential development and restricts groundwater use. The Environmental Covenant also specifies that future building constructions shall include vapor barriers and minimal use of subsurface footers.

	The Environmental Covenant was filed by the current Site owner, Select Commercial, LLC, on April 28, 2006 with the Wake County Register of Deeds. The potential for groundwater to impact indoor air has been evaluated. Soil gas samples were collected from three locations and two depth intervals at the Apropos building, which is located downgradient of the Ashland facility. The purpose of sample collection was to evaluate whether site-related constituents discovered in groundwater may represent a potential source of vapor migration into the building. Exposure to constituents in soil gas was evaluated assuming site worker exposure. Model results indicated that the risk posed was less than NC DEQ's benchmark of 1×10^{-6}, which is designed to be protective of public health. Non-cancer hazards were all below the benchmark of 1.	Indoor air quality in offsite structures has been evaluated. Model results indicate that that the risk posed was less than NC DEQ's benchmark of 1×10^{-6}, which is designed to be protective of public health. Non-cancer hazards were all below the benchmark of 1. Although the potential for indoor air issues on offsite property has been evaluated, the potential for indoor air issues in onsite, pre-2006 structures has not been evaluated. Currently, there is one large warehouse building onsite and several open air sheds. All of these structures are located within 100 feet of the groundwater contaminant plume. It is recommended that the potential for indoor air impacts be evaluated.

	Groundwater to surface water impacts are evaluated by surface water sampling on an annual basis. Contaminant concentrations are measured at less than the laboratory method detection limit in March 2015. Habitat and ecological assessments indicate that there is extensive plant and animal life in the marshy lowland downgradient of the facility and that there is no mortality indicative of chemical impacts in the swampy area along Walnut Creek. Impacts to surface water in Walnut Creek are evaluated on an annual basis.	Potential exposures to surface water monitored on an annual basis. Potential risk is negligible based on monitoring results. Biological assessments were conducted in 1997 and in 2010. Results indicate that potential discharges to Walnut Creek do not appear to be negatively impacting biological communities within Walnut Creek.

1. Recommendations for modification or additional confirmatory investigation required:

- Although an Environmental Covenant does exist, there is no means by which the Section can ensure continued compliance with the specified restrictions. If DPLUR are recorded, the Section is assured of annual certifications.
- Although the potential for indoor air issues on offsite property has been evaluated, the potential for indoor air issues in onsite, pre-2006 structures has not been evaluated. Currently, there is one large warehouse building onsite and several open air sheds. All of these structures are located within 100 feet of the groundwater contaminant plume. It is recommended that the potential for indoor air impacts be evaluated.
- Evidence supports the fact that monitored natural attenuation is effective at addressing the offsite groundwater contaminant plume. However, contaminant concentrations in the source area are elevated and show no sign of decreasing concentration. In the absence of active remediation in the onsite source area, it is likely that decades will be required to achieve applicable standards.

Section IV-Financial Assurance

Item	Comments	Other
Cost Estimate	Adequate (Yes/**No**)	Ashland Raleigh has financial assurance for $240, 497. The cost estimate projects costs for environmental monitoring, project management, and agency oversight. Costs are estimated from 2013 through 2042 (~30 years). It is clear that cleanup standards WILL NOT be achieved in 30 years. Do we have the authority to require a longer period of time? ALSO, costs to inspect the RCRA cap are estimated only to 2022 (NOT the full 30 years).
Financial Mechanism	Adequate (**Yes**/No)	See Financial Officer for Assistance

Section V-New Regulations/Guidance

Item	Comments	Other
State Rules and Statues		
Federal Rules		
Standards		SSLs, 2L, Regional Screening Levels, Soil to Groundwater
Guidance Documents		Specify Guidance Document Used

Section VI-AOC Specific Items
(Information Completed/Revised subsequent to issuance of date of AOC)

Document/Date	Comments	Other
Inspection and Maintenance Plan	Completed as per the AOC	
Personnel Training Plan	Completed as per the AOC	
Part A	Completed as per the Biennial Report	
Groundwater Sampling & Analysis Plan	Most recently approved January 2013	Requested revisions as per our five-year review
Corrective Measures Study Plans/Reports	Completed in 2010	
Interim Measures Study Plans/Reports	NA	
Corrective Action Plan/Report	Completed 2012	
Other (confirmation Sampling, Risk Based, SWMU investigations, Vapor Intrusion Investigation, etc.)		Requested as per our five-year review