Georgia Department of Natural Resources

Environmental Protection Division-Land Protection Branch
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Judson H. Turner, Director

May 30, 2014

VIA E-MAIL AND REGULAR MAIL
AXA Equitable Life Insurance Company
c/o Mr. Preston McFarland, Asset Manager
Morgan Stanley Real Estate, Inc.
3424 Peachtree Road, NE
Suite 800
Atlanta, Georgia 30326

Re: Voluntary Remediation Program
Compliance Status Report – Comments
March 2013 Semiannual Progress Report
Former Vogue Cleaners, HSI # 10394
4018 Washington Road, Martinez, Columbia County

Dear Mr. McFarland:

The Georgia Environmental Protection Division (EPD) has completed its review of the Voluntary Remediation Program (VRP) Compliance Status Report (CSR) dated December 4, 2013 and the March 2013 Fourth Semi-Annual Progress Report dated April 4, 2013. EPD commends AXA for diligently exploring and implementing remediation options at the above site through the past few years. However, EPD has some concerns with the modeling groundwater flow assumptions used to simulate contaminant fate and transport at the Vogue site. EPD has also reviewed the letter submitted on behalf of Dr. Singh and 5C Washington Road LLC (5C letter), dated January 7, 2014, and AXA's response letter dated April 10, 2014, regarding the subject CSR. Except as noted herein, the response letter and CSR adequately address the concerns raised in the 5C letter. Our comments on the CSR, progress report and response letters are provided below:

BIOCHLOR Modeling

1. The section titled Model Calibration in the Fate &Transport Modeling Evaluation indicates that the groundwater analysis results from 1999 were used to establish concentration targets for model calibration and that the model simulation time was set to 4 years based on a source material termination date of 1996, which is near the time when dry cleaning ceased at the site. The model simulation time should be based on the time when the source began, not when it ended. Also, note that the source of a dissolved phase PCE plume is not necessarily ended when the dry cleaner closes. In fact, source concentrations may persist for many years because of the presence of pure phase PCE, regardless of whether or not the pure phase can be found. Therefore, set the model simulation time based on the date when the dry cleaner began operation, which was reportedly in 1976, then allow some additional time before spillage from the operation began to impact groundwater, for example five years, so a possible start date of the calibration simulation is 1981. If the date of the sampling that establishes the calibration target concentrations is 1999, the simulation time then would be 18 years. Further, the PCE source concentration for the calibration run should not be 1.8 mg/L; that was the source concentration on August 7, 2013. The source concentration should be based on the concentration thought most prevalent during the 18 year span, which should be estimated from historical sampling results. Because the start time of the release and the source concentration are uncertain, they can be varied in the calibration run to produce a suitable match between model prediction and target well observations.

2. The section titled Model Assumptions in the Fate &Transport Modeling Evaluation indicates that PCE is the only constituent of concern (COC) that was modeled because it is the only COC present

in downgradient monitoring wells. TCE is present at MW-5 at 26 ug/L, which is over 5 times its risk reduction standard (RRS). Also, TCE is present at the source at a concentration of 1,300 ug/L (August 7, 2013 monitoring results) and is subject to transport from the source, and to production and transformation downgradient. Therefore, include TCE in the BIOCHLOR model as a contaminant present in the source at a concentration of 1,300 ug/L. Also, show the model prediction for TCE and for all other PCE transformation products.

3. Some of the parameters used in the BIOCHLOR model are incorrect or inappropriate. The model should be updated with the new parameter values described below and re-calibrated before attempting to predict future concentrations at the Point of Exposure (POE).

   a. The ratio between the transverse dispersivity and the longitudinal dispersivity [(Alpha y)/(Alpha x)] is set to 1.5. This value causes the transverse (y) dispersivity to be greater than the longitudinal (x) dispersivity, which will lead to a shorter, wider plume and to an under-estimate of the plume centerline concentration downgradient. The ratio (Alpha y) /(Alpha x) should be set to 0.1 unless field data supports a different value.

   b. The normalized distribution coefficients (K_{OC}) used in the model are taken from the BIOCHLOR documentation. These should be taken from the U.S. EPA Regional Soil Screening (RSS) Tables, Chemical Specific Data. The K_{OC} values in the RSS Chemical Specific Data table are (in L/kg): 94.94 for tetrachloroethene (PCE); 60.7 for trichloroethene (TCE); 39.6 for 1,2-dichloroethene (DCE, both isomers); and 21.73 for vinyl chloride (VC). Because these values are lower than those currently used in the model, the retardation factor will also be lower, resulting in a higher retarded velocity and higher predicted concentrations at the receptor.

   c. The fraction organic carbon, foc, value used in the model is 0.003. The fourth bullet in the Model Calibration section implies that this is a EPD default value; however, it is not clear how this is a default value, and no reference is given. Use a value of 0.002 for foc unless a higher value is justified by site analytical data. Setting the foc to the lower value will have the effect of decreasing the retardation factor, resulting in a higher retarded velocity and higher predicted concentrations at the receptor.

4. The graphical model results for PCE indicate a problem with the model. The curve shown in blue for each model scenario, which is the model response when 1st order decay is included, is always shown somewhat below and parallel to the curve shown in red, which is the model response assuming no decay. The blue curve should begin at the same point as the red curve and gradually deviate from it. The rate of deviation depends on the 1st order decay coefficient used in the model. The curves should not be parallel. EPD could not duplicate this problem, but it does indicate that something is wrong with the model. Investigate and, if necessary, download and re-install a new BIOCHLOR package.

5. Note that if, after re-calibrating the model with new parameters as described above, showing that the site meets RRS depends on model predictions that include biodegradation, evidence must be presented that reductive dechlorination is occurring at the site. The BIOCHLOR User Manual (V1.0) provides useful information on how this can be done.

6. It appears that the slug tests were rerun using the revised input values suggested in EPD's November 2, 2012 correspondence. However, the slope lines used on the y/yo versus time graphs for the monitoring wells tested include data points that may not necessarily be representative of the water-bearing unit tested, i.e., data points acquired very early and /or late in the testing period. For example, a "break-point", such as on the graphs presented for MW-22 and POD -1, are plotted. In these situations, the early field measurements are likely to represent filter pack conditions rather than the water-bearing unit being evaluated and these data points should not be used for

estimating hydraulic conductivity. As referenced in USGS Open File Report 02-197, the user should be able to shift the slope line to fit the plotted data as appropriate and all of the slug test output sheets must be reviewed and "best-fit" slope lines adjusted as necessary. Please re-calculate hydraulic conductivity (and groundwater velocity) using the site specific test data and provide the following:

a. Provide original time-drawdown field data sheets if available.

b. Provide a summary table with input values used in the calculations and the source(s).justification for these values.

c. Confirm that the correct well data input values (i.e., casing radius, static water column, total well penetration, etc.) were entered into the calculations. For example, static water column ranges from 1 ft to 120 ft on the summary sheets.

d. Confirm and provide justification for the aquifer input values. In addition, the use of an anisotropy ratio of 0.5 must be justified.

7. As noted in Comment 5.a. of EPD's November 2, 2012 letter, it is not clear that the POD well, POD-1, is near the plume centerline. In fact, there are two other wells, MW-12D and MW-5, both within 40 feet of POD-1, where the concentration of PCE is currently higher and has historically been higher than at POD-1, indicating that these wells are nearer the plume centerline. Also, MW-5 was used as the target well for model calibration, in which plume centerline concentration predicted by the model is compared to the well concentration. Therefore, either continue to use MW-5 as the plume centerline POD well, or else provide a map that shows plume isoconcentration contours for historical and current PCE and TCE data, from which the plume centerline may be inferred, then locate the POD well on the inferred plume centerline.

8. Monitoring of select wells should continue for ongoing calibration and validation of the modeling results and for ongoing evaluation of plume dynamics, until such time as EPD concurs that monitoring is no longer required. As noted in Comment 7 of our November 2, 2012 letter, if the revised model continues to demonstrate that impacted groundwater will migrate off-property, above cleanup standards, ongoing monitoring or corrective action, such as filing of a uniform environmental covenant (UEC), may be required for those properties to comply with the Voluntary Remediation Program Act (Act). The VRP plans for Tax Parcel J10 079 133 will address this requirement, as described in Comment 9.

<u>General comments on the CSR</u>

9. In the response to the 5C letter, AXA contends that the detections at MW-5 are a result of the release at the 5C property. However, MW-5 is directly downgradient of the Vogue Cleaners source area, based on the potentiometric map. Although there may be comingled plumes in the vicinity of MW-5, AXA has not demonstrated that the former Vogue Cleaners is not at least a partial source of the impacts. However, 5C has proposed to place a UEC on their property to restrict groundwater usage, thereby addressing that potential exposure pathway.

10. As mentioned in EPD's November 2, 2012 letter there was inconsistency between the potentiometric flow direction and the location of the POD well. Section 3.4 of the CSR indicates that Reed Creek, located approximately 1,200 feet west-northwest of the site is the nearest surface water body. Section 3.5 states that on-site potentiometric data indicates that groundwater flow is to the north-northeast, but also that groundwater likely discharges to the nearest surface water body 1,200 feet northwest of the site. A clear understanding of the groundwater flow at the site and of its path to discharge points is required to properly asses the fate and transport of contaminants from the site and to identify potential receptors and properties that may require restrictive covenants for

groundwater. Please clarify the pathway of groundwater flow from the site to a POE. Additional piezometers off-property would help in this determination.

11. The potentiometric maps in the 4th progress report and the CSR are not accurately drawn. All measurements collected during a given field event should be used in constructing the potentiometric contours unless justified (i.e., measurements collected from wells screened at deeper elevations, such as MW-12D). EPD noted that groundwater elevations and the corresponding potentiometric contours are inconsistent. For example, MW-6 had an elevation of 350.67 in August 2013, but is drawn downgradient of the 350.6 contour. Based on our revision of the potentiometric surface using the CSR data, it appears that groundwater is flowing to the east north-east.

12. It is not clear why MW-5 and MW-8R needed to be redeveloped and resampled after the August 7, 2013 sampling event or why a bailer was used. Please note that the use of bailers for purging and sampling monitoring wells is discouraged as discussed in USEPA SESDPROC-301-R3. If specific well conditions require that the well be purged or sampled with a bailer, an explanation must be provided and the bailer should be a Teflon closed-top-bailer. Concentrations of PCE and TCE in both wells were significantly lower after resampling on August 23, 2013. The PCE concentration decreased from 1,800 ug/L to 26 ug/L in MW-8R after resampling, and the TCE concentration decreased from 1,300 ug/L to below 5 ug/L. Because an accurate understanding of contaminant concentrations at the source is necessary for modeling the contaminant plume and making regulatory decisions based on the modeling, these wells must be resampled.

13. No groundwater sampling logs were included in the CSR and the logs provided in the 4th Progress Report are incomplete. Groundwater sampling logs are required to establish that the samples were collected in accordance with SESDPROC-301-R3. Field sampling records should include a description of purging and sample acquisition methods, the specific method by which the final water samples were withdrawn from the wells (i.e. peristaltic pump/vacuum jug, downhole pump or bailer), purge rate, depth to water during the purge process, and depth to the pump intake during the purge process. The sampling log should state whether the low flow/low stress or low flow/low volume purging techniques were employed and should include a demonstration that purging achieved geochemical stabilization as defined in the USEPA guidelines. Please provide field sampling records for the August 2013 sampling events and for all future groundwater sampling.

14. As noted in Section 5.2.2, soil concentrations appear to meet Type 1 RRS based on the analytical results presented to EPD. Please inform EPD if there are any mitigating circumstances that would prevent AXA from certifying to Type 1 RRS for soils at the site. If AXA is unable to certify soils to Type 1-4 RRS, the proposed UEC must include language regarding maintenance of the existing covers as referenced in Comment 32 of the 5C letter.

15. Comment 15 of the 5C letter correctly notes that potential construction worker exposure to impacted groundwater should be considered due to the shallow depth to water. Comment 31 of the 5C letter proposes on-property groundwater standards which are protective of future construction workers. These values are correct using the same exposure assumptions applied for the soil pathway. Since recent groundwater sampling results exceed these values, the proposed UEC must include language to protect those receptors. The covenant should also include language regarding proper disposal of groundwater, should dewatering be necessary.

16. The locations of MW-5 and MW-12D have moved significantly between figures in previous reports and in the CSR. Please explain the reason for this change and confirm the correct location of these wells. The cross-sections presented in the CSR inaccurately depict the extent of contamination by showing isolated 'spots' at each well rather than a continuous plume.

Vapor Intrusion Comments

17. Section 5.4.1 stated that SVE wells were shut down in July of 2013, and sub-slab vapor samples were collected in August. No information was presented as to whether the system was allowed to equilibrate before sampling. EPD recommends that an additional round of sub-slab vapor samples be collected for verification.

18. EPD calculated screening values slightly different than those presented in Table 5 of the CSR. If the table is recreated, please ensure that the most current and updated versions of the EPA Regional Screening Level (RSL) and the Vapor Intrusion Screening Level (VISL) Tables are used in your evaluation before submittal. The most current ones are updated to 2013 and not April 2012 as shown on Table 5.

19. EPD concurs with Comment 27 of the 5C letter that the use of a surface-weighted average is not appropriate to screen out the Hazard Quotient (HQ) exceedance at SV-4. As suggested, a greater number of sub-slab sampling points would be necessary to use that approach. The additional sub-slab sampling proposed above will be a more appropriate line-of-evidence regarding the vapor intrusion pathway. Note that since PCE and TCE do not affect the same target organs, based on EPA's IRIS Non-Cancer Toxicity Table, the HQs for PCE and TCE do not need to be summed and therefore remain below 1.

20. The UEC should include requirements to evaluate and /or mitigate potential vapor intrusion for any new enclosed structures built in the vicinity of the plume and for any modifications to existing structures which could change potential vapor intrusion assumptions.

AXA Equitable Life Insurance Company must address these comments to EPD's satisfaction in order to demonstrate compliance with the provisions, purposes, standards and policies of the Act. EPD may, at its sole discretion, review and comment on documents submitted by AXA. However, failure of EPD to respond to a submittal within any timeframe does not relieve AXA from complying with the provisions, purposes, standards, and policies of the Act.

Please submit a progress report or revised CSR, which addresses the above comments, by November 1, 2014. If you have any questions, please contact Mr. Montague McPherson at (404) 657-0483.

Sincerely,

Charles D. Williams

Charles D. Williams
Program Manager
Response and Remediation Program

C: Martin Shelton, Esq.
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