Jeremy Johnson
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STATE OF MISSOURI Bob Holden, Governor • Stephen M. Mahfood, Director

DEPARTMENT OF NATURAL RESOURCES

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Mr. Joseph Haake
Group Manager
The Boeing Company
Dept. 464C, Bldg. 220
Mail Code S221-1400
P.O. Box 516
St. Louis, MO 63166-0516

RE: Comments on the Draft Environmental Field Investigation Report for Boeing Tract 1 South Property, January 10, 2003, Hazelwood, Missouri; Permit# MOD00818963

Dear Mr. Haake:

The Missouri Department of Natural Resources' Hazardous Waste Program (HWP) has completed review of the Draft Environmental Field Investigation Report for Boeing Tract 1 South Property dated January 10, 2003. This report summarizes the results of the Tract 1 South investigation conducted on the property sold to the Airport Authority (AA). This review is focused on determining whether or not the identified contamination is adequately characterized so that the site-wide Resource Conservation and Recovery Act Facility Investigation (RFI) may be approved and development of risk-based clean up levels initiated. The department's HWP has several comments that must be addressed by Boeing prior to the HWP concurring that the site has been adequately characterized for these purposes.

GENERAL COMMENTS

1. A considerable amount of data was generated as part of the latest investigation on the Tract I South property. In addition, a considerable amount of data and information exists for the previous investigations at SWMU 17 and the GKN Property. Ultimately, all of the data and information for the Tract I South property needs to be integrated into a comprehensive,

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site-wide conceptual model to complete the RFI. To date, this has not been accomplished, thus the review of the latest investigation findings to identify data gaps and recommendations for future investigation was rendered significantly more difficult. The observations and recommendations contained herein are based solely on the information presented in the subject report and do not consider the broader context of available information. It should be noted that this broader information may, in some cases, address the comments and questions raised herein thereby mitigating the need for further investigation in certain areas.

Contaminants of concern for the Boeing property for which soil and groundwater contamination contour maps should possibly be generated in the Final RFI Report include the following:

a.) Perchloroethylene (PCE) and any relevant breakdown products (i.e., Trichyloroethylene (TCE), Cis-1,2-DCE, vinyl chloride)
b.) Total Petroleum Hydrocarbon (TPH) including any relevant subsets (i.e., gasoline, diesel, mineral spirits)
c.) Benzene, Toluene, Ethyl Benzene, Xylene (BTEX)
d.) 1,4-dioxane
e.) Metals
f.) Polychlorinated Biphenyl (PCBs)

2. In using TPH regulatory criteria to screen contamination it is necessary to use Environmental Protection Agency (EPA) Method 8015 OA1/OA2 and add all concentrations from these methods together to obtain a value for Total TPH. The tabulated detections should include an additional row for Total TPH, which contains the regulatory criteria for TPH. It would be possible to use EPA Method 8015M if motor oil or #6 fuel oil is shown not to be present. (The upper range of 8015M is 430°C; boiling points for motor oil and #6 fuel oil exceed this range.)

   In some areas where TPH contamination was detected, it appears that some of the contamination may be due to leaking pipelines. The method for characterizing this type of release is different than typical corrective action characterization. It is recommended that federal guidance for pipeline sampling (such as that found at Subpart M - Pipeline Sampling (40 CFR 761.240-761.257)) be utilized to facilitate the characterization of these areas.

3. Data provided by the AA, strongly suggests that ITLs may need to be developed for soil and groundwater for the following compounds:

   beryllium, copper, manganese, nickel, thallium, zinc, 1,4-dioxane

Elevated metals concentrations in the groundwater appear to relate to the highly turbid nature of the samples. Boeing allowed samples to settle before decanting the groundwater into containers while the AA did not. This may explain some of the differences between the AA and Boeing data. Boeing did not analyze for all of the same compounds as the AA during the latest round of investigation. Preliminary review of the AA's findings suggests the presence of elevated levels of certain compounds. Further sampling and analysis appears necessary to determine the origin of these new COCs and whether they are an artifact of the sampling methodology previously employed and, if not, whether they represent a localized or site-wide problem.

SPECIFIC COMMENTS

1. SWMU 17

The shallow zone at SWMU 17 (both soil and groundwater) appears to be adequately characterized including delineating the source area. This information could be used to design an excavation for source removal. However, there is limited data on the deep subsurface conditions at SWMU 17. MW-11D is the only deep monitoring well in the vicinity, and no deep groundwater grab samples have been collected in the area. Contamination in MW-11D is relatively low, but the local groundwater flow direction is hard to determine due to the low permeability of the subsurface environment and the man made subsurface structures (i.e., concrete basins, ramps, and sewer lines). Indications of deeper contamination include the relatively stable concentrations in MW-5I (100 mg/L TCE), the detection of TCE in the most recent sampling event at MW-8I (8.9 µg/L TCE), and the sporadic detections in MW-11D (1-5 µg/L TCE). In addition, PCE as free product is known to cause shrinkage in clay units which it contacts resulting in vertical migration through otherwise relatively impermeable clays. This could explain why the deep sample collected at building 41 detected PCE at 125 µg/L at the bedrock interface. The main concern at SWMU 17 is characterization for removal of the contaminant source which includes whether or not there is Dense Non-Aqueous Phases Liquid at the soil/bedrock interface which could act as a source for future groundwater contamination. Additional deep groundwater sampling appears necessary to adequately characterize the deep zone at SWMU 17 for the purpose of considering and evaluating potential remedial alternatives.

2. UST Site #2 SE of Building 48

Soil (B48S-1, 3, 5, 8)

Gasoline Range Organics (GRO) were detected in these borings (6-10' bgs) from 38-300 mg/kg. AA data detected 650 mg/kg TPH in B48S-1 compared to Boeing data detecting 297 mg/kg TPH. In addition, it is unclear if lead was analyzed in the samples that may be related to the gasoline contamination. Lead and Methyl Tertiary Butyl Ether should be

included in the analyte list when investigating gasoline petroleum contamination; however, if the GRO contamination is proven to be jet fuel rather than gasoline this would not be necessary. Based upon the AA data it appears that the GRO in the B48S-1 area is mainly gasoline/kerosene. However, these constituents may be the result of the breakdown of an old jet fuel spill (as jet fuel degrades it looks more and more like gasoline/kerosene). More information must be submitted related to the fuels stored here to determine the original source. Benzene was also detected in these samples above ITLs. Step out borings conducted outside of these detections for benzene include B48S-2, 6, 7, 9 & 10. Step out borings outside of the TPH contamination include B48S-2, 3, 5, 6, 7, 8. Further stepout borings should be conducted using both benzene and TPH as the investigation drivers (i.e., step out until benzene or TPH is detected below ITLs). To date, B48S-1 soil data has demonstrated the highest concentration of these contaminants. Depth of the borings should be restricted to the vadose zone. This would be considered delineation of the source area, and this information would be useful in designing any source reduction remediation and/or risk assessment.

Groundwater (B48S-1W, 2W, 3W, 5W, 7W, 8W)
Benzene was detected in these borings above the ITL (1 & 2 were two orders of magnitude above the ITL) and GRO was detected above the ITL (5 & 7 were two orders of magnitude above the ITL). Step out borings conducted outside of these detections for benzene that were below ITLs include B48S-6, 9, and 10. Step out borings conducted outside of these detections for TPH that are below ITLs (depending on detection limits) include B48S-1W, 2W, 3W, 6W, 8W, 9W, and 10W (9W,10W substituted GRO for OA2 and no evidence was submitted showing fuel oil #6 or motor oil is not present). Stepout borings should be conducted to delineate the extent of the groundwater contamination. Because TPH compounds tend to be concentrated at the water table, the investigation should focus on the top 10 feet of the groundwater table. This groundwater investigation should consider B48S1 & 2 a source area for benzene and B48S5 & 7 a source area for GRO.

3. UST Site #3 Buildings 45L, C, D, E

Soil (6' bgs) & Groundwater (Shallow & Deep)
All soil and groundwater samples were ND according to Tables 5-3 and 5-4. I could not locate the raw analytical data to find the detection limits. If it can be shown that the detection limits are reasonable, this site needs no further investigation at this time.

4. UST Site #4 South of Building 45

Soil (B45S-2, 3, 7, 10)
GRO was detected in these borings (6-7' bgs) from 68-200 mg/kg. Benzene was detected in samples B45S-2, 3, and 10 above ITLs. AA data also detected benzene and TPH above

ITLs in B45S-7 (279 mg/kg and 350 mg/kg). Based upon the AA data it appears that the GRO in the B45S-3 area is mainly gasoline/diesel. However, these constituents may be the result of the breakdown of an old gasoline fuel spill (as gasoline degrades it looks more and more like diesel). More information must be submitted related to the fuels stored here to determine the original source. Step out borings for benzene conducted outside of these detections that were below ITLs include B45S-1, 4, 6, 8, 9. Step out borings for TPH conducted outside of these detections that were below ITLs include B45S-1, 4, 6, 8, 9. The western edge of the soil benzene and TPH contamination has not been defined. Step out borings should be conducted using benzene and TPH as the investigation drivers. A source area for both benzene and TPH appears to be B48S-2 and 3. Depth of the borings should be restricted to the vadose zone. This would be considered delineation of the source area, and this information would be useful in designing any source reduction remediation.

Groundwater (B45S-2W, 3W, 7W, 8W, 9W, 10W)
Benzene was detected in borings 2W, 3W, and 7W above the ITL and GRO was detected above the ITL in borings 2W, 7W, 8W, 9W, 10W (8W was an order of magnitude above the ITL). Step out borings for benzene impacts that were below ITLs include B45S-1W, 4W, 5W, 6W, 8W, 9W, 10W, MW-22, MW-A27 and it does not appear necessary to further delineate the benzene groundwater contamination. Step out borings for TPH impacts that may be below ITLs (depending on detection limits) include B45S-1W, 4W, 5W, 6W, 8W, 9W, 10W. Step out borings should be conducted to delineate the extent of the TPH groundwater contamination . Because TPH compounds tend to be concentrated at the water table, investigation should focus on the top 10 feet of the groundwater table. This investigation should consider B45S8W as a source area for GRO. AA data also detected elevated metals in B45S-2W, which must be further evaluated.

5. Building 40 Former Drum Storage
Soil (6' bgs) & Groundwater (Shallow)
All soil and groundwater samples were ND according to Tables 5-5 and 5-6 with the exception of B40E1W which detected TCE at 1.1 μg/L. If it can be shown that the detection limits are reasonable, this site needs no further investigation at this time.

6. Building 41 Tank Farm and Paint Solvent Storage

Soil (B41N-1, S-3D)
Diesel and mineral spirit compounds were detected in B41S-3D (4' bgs). Some of these compounds do not currently have an established ITL. ITLs should be developed for these compounds. Benzene was detected in B41N-1 (8' bgs) at approximately three times the ITL. This should be considered a source area for the benzene contamination. It is unclear whether this contamination is associated with building 41 or the industrial sewer, however,

this location is flanked by MW-18 and B2N1 along the sewer line which were below ITLs. Stepout borings should be conducted from B41N-1 until benzene is detected below ITLs. Utilizing data collected as part of the former fabrications operations may help delineate the contamination to the north. If additional borings are necessary, depths should be restricted to the vadose zone. This would be considered delineation of the source area, and this information would be useful in designing any source reduction remediation.

AA data detected TPH in B41N-1 at 12,960 μg/kg (possibly jet fuel). This may be useful in delineating the TPH contamination in this area. Metal contamination in soil (beryllium) was also detected above ITLs.

Groundwater (B41N1W, B41S3DW, MW-5)
Benzene was detected in boring B41N-1 above the ITL (135 μg/L) and n-propylbenzene was detected in B41S3DW (117 μg/L). PCE was detected above the ITL in boring B41S3D (125 μg/L) and close to the ITL in MW-5 (4.8 μg/L). Duplicate data from the AA shows detections of vinyl chloride in MW-5 and B41S2W at 13 μg/L. AA data also detected higher benzene concentrations in B41N-1W (312 μg/L) and TPH (30,271 μg/L). This information may be useful in delineating the TPH groundwater contamination in this area. Step out borings should be conducted to delineate the extent of the groundwater contamination (benzene and PCE.) The source of the PCE contamination needs to be identified, and because it was not detected in the shallow subsurface, it is possible that it has migrated to this area.

AA also detected 1,4-dioxane in MW-5 (26 μg/L) above the current CALM GTARC value of 3 μg/L. An ITL should be developed for this compound, and it should be included in the analysis for any future borings in this area and any other areas that have detected 1,1,1-TCA or paint solvents. Data from the AA detected Manganese above ITLs in MWs 5, 7 and B41S2W. More investigation will be necessary to determine if this is a soil (well turbidity) or a true groundwater problem.

7. Building 2 Paint Accumulation Area

Soil (B2I-1, B2W-1)
Diesel and mineral spirit compounds were detected in B2W1 (6' bgs). Some of these compounds do not currently have an established ITL. Some, such as isopropyl benzene have an ITL for soil, but not for groundwater. ITLs should be developed for the compounds as appropriate. Benzene was detected in this same boring below the soil ITL (21 μg/L). This may be related to the benzene detected in B41N1 and may be used to

delineate that source area. However, the diesel detected in B2W1 is twice that seen in B41S3D. Both of the detections were below the ITL for TPH, but it does not appear that a total TPH was included in the analysis. Similar compounds were detected in B2I1 but at higher levels and diesel was not analyzed. Step out borings may be necessary to locate the source for the diesel contamination.

There appears to be a discrepancy between AA's soil data and Boeing's soil data in these borings. B2W-1 detected 47,000 µg/kg in Boeing's data and ND in AA's data, while B2I-1 was NA in Boeing's data and 61,820 µg/kg in AA's data. Is it possible that data was transposed? In addition, AA detected 1,4-dioxane in B2W-1 at 190 µg/kg which is above the CALM Leach value of 10 µg/kg. 1,4-dioxane should be added to the ITLs and included in future analyses in this area.

Groundwater (B2I-1W, B2W-1W)
Benzene was detected in B2W-1W just above the ITL (6.3 µg/L) and vinyl chloride was detected above the ITL in B2I-1W (5.6 µg/L). These detections can be used to help delineate the benzene contamination at B41N-1 and the PCE-related contamination in this area.

AA data showed detections of TPH (754 µg/L) and 1,4-dioxane (380 µg/L) in B2W-1. This may help delineate the TPH contamination in this area and cause further delineation of the 1,4-dioxane. Some metals were detected exceeding ITLs. Manganese in particular was two orders of magnitude above the ITL, and further investigation will be required to determine if this is a soil (groundwater turbidity) or a true groundwater problem.

8. Industrial Sewer Line

Soil (B2N-3, B2N-4, B44-N-1)
Benzene was detected in the soil of B44N-1 (9' bgs) and can possibly be useful in delineating the benzene contamination detected at B41N-1. PCE was detected in B2N-3 and B2N-4 at very low levels. This information may be useful in delineating the PCE related contamination in this area.

Groundwater (B2N-3W, B2N-4W, B44-N-1W)
PCE and TCE were detected in B2N-3W and B2N-4W above the respective ITLs. This information will be useful in the delineation of the PCE related compounds. Metals were elevated in all groundwater samples and may be related to a release(s) from the industrial sewer. It must be determined if the metals contamination is a soil (turbidity) or a true groundwater problem. All data collected in the area of the sewer line should be utilized when delineating the extent of contamination.

AA data also detected metals in the groundwater greatly exceeding ITLs in B2N-3, 4, 5 and B41E-1. These borings were conducted near the industrial sewer. The elevated levels in groundwater could be related to releases from the industrial sewer. Further investigation must be conducted to determine if these exceedances are due to turbidity in the groundwater samples. If so, a localized soil contamination problem may be indicated. If not, further investigation of groundwater in this area may be necessary. In either case, the nature and extent of contamination may need to be further defined including the establishment of ITLs for compounds not included on the current list.

9. UST Area between Buildings 4 and 5
Soil (10-14' bgs) & Groundwater (Shallow & Deep)
All soil and groundwater samples were well below ITLs according to Tables 5-17 and 5-18. If it can be shown that the detection limits are reasonable for these samples, this site needs no further investigation.

10. Shooting Range Bunkers
Soil (6' bgs) & Groundwater (Shallow)
All soil sample results were below ITLs according to Tables 5-19 and 5-20. Lead and arsenic slightly exceeded the groundwater ITLs but if it can be illustrated that this contamination is not a groundwater problem (due to the turbidity of the samples) further investigation may not be necessary.

11. Data must be generated/compiled related to surface water and sediment in Coldwater Creek. This information will be necessary to determine impacts to the creek and evaluate risks associated with this impact. Analytes must include those detected in groundwater at the site. Information concerning flood control should also be submitted in order to evaluate potential risk pathways associated with this operation.

Please submit three copies of a work plan addendum and/or a response to comments for the Tract 1 South Investigation addressing the above comments within 30 days of receipt of this letter. This work plan should include preliminary contaminant contour maps for the contaminants of concern listed in the general comment incorporating data collected at the GKN property as well as the Tract 1 South property. Decisions about further characterization should be based upon this data. This can be an abbreviated work plan that references the original Tract 1 South

Investigation Work Plan. If you have any questions concerning this comment letter or require any additional information, please do not hesitate to contact me at the Missouri Department of Natural Resources, HWP, P.O. Box 176, Jefferson City, MO 65102-0176, or by phone at (573) 751-3553.

Sincerely,

HAZARDOUS WASTE PROGRAM

PM. Q

Patrick Quinn
Environmental Engineer
Permits Section

PQ:mj

c: Ms. Joletta Golik, Airport Authority
Mr. Jeremy Johnson, U.S. EPA Region VII ✓
St. Louis Regional Office