December 14, 2018

MEMORANDUM

Subject: Browns Tree Care Dump – Evaluation of Air Sampling Results

From: Katie Mooney
Environmental Scientist Weston Solutions

To: Matthew Loesel
On-Scene Coordinator

Summary:

This memorandum provides an evaluation of air sampling results for the most recent Browns Tree Care Dump facility near Bella Vista, Arkansas. Twenty-four-hour air samples for volatile organic compounds (VOCs) were collected from December 10, 2018 through December 11, 2018 and From December 11, 2018 through December 12, 2018. The air samples were collected at four locations, which included an on-site sample location (BVF-SUM-013). The following paragraphs contain a short description of each of the sample locations and the VOCs detected during the sample collection:

BVF-SUM-013 Sample location is at the Site. The following VOC compounds were identified above the laboratory detection limits:

- Ethanol
- Acetone
- 2-Propanol
- Hexane
- 2-Butanone (Methyl Ethyl Ketone)
- Tetrahydrofuran
- Benzene
- Heptane
- Toluene
- Ethyl Benzene
- m,p-Xylene
- o-Xylene
- 4-Ethyltoluene
- 1,2,4-Trimethylbenzene
- Methyl Acetate

BVF-SUM-011- located approximately 0.25 miles north and west of the site. This sample location is at a higher elevation than the site. The following VOC compounds were identified above the laboratory detection limits:

- Acetone

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- 2-Butanone (Methyl Ethyl Ketone)
- Tetrahydrofuran
- Benzene
- Toluene
- m,p-Xylene

BVF-SUM-012- located approximately 0.1 miles north and east of the site. This sample location is at a higher elevation than the site. The following VOC compounds were identified above the laboratory detection limits:

- Benzene
- Toluene

BVF-SUM-014- located approximately 0.25 miles south and east of the site. This sample location is at a higher elevation than the site. No VOC compounds were identified above the laboratory detection limits for samples collected at this location during the two sampling events.

EPA Regional Screening Levels (RSLs) for residential air are used to identify compounds that need additional evaluation and are not intended to be directly used as air action levels. The results of the VOC sampling were compared to both the chronic RSL (70 years) and the subchronic (2 weeks to 7 years) RSL for residential air. The RSLs represent levels which are without adverse non-cancer effects over a time period.

VOCs detected at each of the three off-site sample locations (BVF-SUM-011, BVF-SUM-012, and BVF-SUM-014) did not exceed the chronic RSLs.

The maximum concentration of Benzene was identified at the on-site sample location (BVF-SUM-013) at a level of 70 $\mu g/m^3$ which exceeds the chronic RSL of 31 $\mu g/m^3$. However, the on-site benzene level of 70 $\mu g/m^3$ is below the sub-chronic RCL of 82 $\mu g/m^3$ and therefore does not represent an immediate health concern.

Discussion of each VOC compound detected above the detection limit compared to screening levels is as follows.

- Ethanol – Ethanol was only detected at BVF-SUM-013 (on-site) with a concentration of 6.2 $\mu g/m^3$. There is no EPA screening level for ethanol and the screening level for methanol of 21,000 $\mu g/m^3$ is used as a surrogate. Therefore, ethanol is unlikely to cause adverse health effects.

- Acetone – Detected at two locations BVF-SUM-011 (north and west of site) and BVF-SUM-013 (on-site) at a maximum concentration of 28 and 150 $\mu g/m^3$. Acetone has a screening level of 32,000 $\mu g/m^3$. Therefore, acetone is unlikely to cause adverse health effects. In addition, acetone is a common laboratory contaminant.

- 2-propanol (isopropanol) - Location BVF-SUM-013 (on-site) had the only detection at a concentration of 15 $\mu g/m^3$. Isopropanol has a screening level of 210 $\mu g/m^3$. Therefore, isopropanol is unlikely to cause adverse health effects.

- Hexane – Hexane was only detected at location BVF-SUM-013 (on-site) with a concentration 6.5 $\mu g/m^3$. Hexane has a screening level of 730 $\mu g/m^3$. Therefore, hexane is unlikely to cause adverse health effects.

- 2-butanone (methyl ethyl ketone (MEK)) – Detected in sample BVF-SUM-011 (north and west of site) and BVF-SUM-013 (on-site) at maximum concentration of 9.5 and 40 $\mu g/m^3$. MEK has a screening level of 5,200 $\mu g/m^3$. Therefore, MEK is unlikely to cause adverse health effects. In addition, MEK is a common laboratory contaminant.

- Tetrahydrofuran - Detected at two locations BVF-SUM-011 (north and west of site) and BVF-SUM-013 (on-site) at a maximum concentration of 4.3 and 22 $\mu g/m^3$. the screening level for tetrahydrofuran is 2,100 $\mu g/m^3$; therefore, tetrahydrofuran is unlikely to cause adverse non-cancer health effects.

- Benzene – On-site sample location (BVF-SUM-013) had the highest benzene level (70 $\mu g/m^3$) and two off-site sample locations (BVF-SUM-011 and BVF-SUM-012) had maximum concentrations of 18 and 9.7 $\mu g/m^3$. Benzene has a chronic (i.e., 70 years) non-cancer screening level of 31 $\mu g/m^3$. On-site sample (BVF-SUM-013) was the only location to exceed the chronic (i.e., 70 year) non-cancer screening level of 31 $\mu g/m^3$. The off-site sample locations do not exceed the chronic (i.e., 70 years) non-cancer screening level for benzene and do not appear to present an unacceptable health risk. Therefore, all off-site sample results for benzene in air are at an acceptable level.

  Benzene has a subchronic (i.e., 2 weeks to 7 years). non-cancer screening level of 82 $\mu g/m^3$. Subchronic non-cancer screening levels represent levels which are without adverse non-cancer effects over an intermediate time period (i.e., up to 7 years). The on-site benzene level of 70 $\mu g/m^3$ is below the subchronic non-cancer screening level of 82 $\mu g/m^3$. Therefore, the benzene level of 70 $\mu g/m^3$ at the on-site sample location does not represent an immediate health concern. Benzene has an Acute Exposure Guideline Levels (AEGLs). The AEGL-1 is the level of a compound that is predicted that the public, including sensitive individuals, could experience discomfort and irritation. However, the effects are not disabling, are temporary and reversible upon cessation of exposure. The eight-hours AEGL-1 for benzene is 28,000 $\mu g/m^3$. The twenty-four-hour on-site sample location level of 70 $\mu g/m^3$ was over 300 times less than the eight-hour AEGL-1 for benzene.

- Heptane - Heptane was only detected at location BVF-SUM-013 (on-site) with a concentration 5.2 $\mu g/m^3$. Heptane has a screening level of 420 $\mu g/m^3$. Therefore, heptane is unlikely to cause adverse health effects.

- Toluene - Location BVF-SUM-013 (on-site) had the highest concentration (49 $\mu g/m^3$). Detected at two locations BVF-SUM-011 (north and west of site) and BVF-SUM-012 (north of the site) at a maximum concentration of 16 and 6.3. Toluene has a screening level of 5,200 $\mu g/m^3$. No location exceeded the screening level. Therefore, toluene is unlikely to cause adverse effects.

- Ethyl benzene - Ethyl benzene was only detected at location BVF-SUM-013 (on-site) with a concentration 7.5 $\mu g/m^3$. Ethyl benzene has a non-cancer screening level of 1,000 $\mu g/m^3$. Therefore, ethyl benzene is unlikely to cause adverse non-cancer health effects.

- m,p-Xylene - m,p-Xylene was detected at two locations BVF-SUM-011 (north and west of site) and BVF-SUM-013 (on-site) at a maximum concentration of 4.5 and 15 $\mu g/m^3$. m,p-Xylene has a screening level of 100 $\mu g/m^3$. Therefore, m,p-Xylene is unlikely to cause adverse health effects.

- o-Xylene - o-Xylene was only detected the on-site location (BVF-SUM-013) with a concentration of 6.3 $\mu g/m^3$. o-Xylene has a screening level of 100 $\mu g/m^3$. Therefore, o-xylene is unlikely to cause adverse health effects.

- 4-Ethyltoluene – 4-Ethyltoluene was only detected at BVF-SUM-013 (on-site) with a concentration of 5.0 $\mu g/m^3$. There is no EPA screening level for 4-ethyltoluene and the screening level for toluene of 5,200 $\mu g/m^3$ is used as a surrogate. Therefore, 4-ethyltoluene is unlikely to cause adverse health effects.

- 1,2,4-Trimethylbenzene - 1,2,4-Trimethylbenzene was only detected at the on-site location (BVF-SUM-013) with a concentration of 4.1 $\mu g/m^3$. 1,2,4-Trimethylbenzene has a screening level for toluene of 63 $\mu g/m^3$ and is unlikely to cause adverse health effects.

- Methyl Acetate – Location BVF-SUM-013 (on-site) detected at a concentration of 55 $\mu g/m^3$. There is no EPA screening level for methyl acetate and the screening level for ethyl acetate of 73 $\mu g/m^3$ is used as a surrogate. Therefore, methyl acetate is unlikely to cause adverse health effects.