

## TECHNICAL MEMORANDUM

TO: Matt Kadlec, Air Quality Program, Washington State Department of Ecology

CC: Chuck Gruenenfelder, Toxics Cleanup Program, Washington State Department of Ecology

FROM: Mark Brunner *MUB*

DATE: January 27, 2015

**RE: SUPPLEMENTAL EXPOSURE ASSESSMENT FOR BASIN DISPOSAL INC.  
SECOND-TIER HEALTH IMPACT ASSESSMENT  
PASCO SANITARY LANDFILL  
PASCO, WASHINGTON**

### INTRODUCTION

This technical memorandum has been prepared on behalf of the Industrial Waste Area Generators Group III (IWAG) as a supplement to the Second-Tier Health Impact Assessment (HIA) for the Pasco Sanitary Landfill (PSL) Site and in support of the application for a Notice of Construction of a Regenerative Thermal Oxidizer (RTO). This supplemental assessment provides an alternate evaluation of potential air quality impacts by the RTO to Basin Disposal Inc. (BDI) and specifically evaluates the maximally-impacted commercial receptor (MICR) on that property. For information on the hazard identification process, dose-response assessment, exposure assessment, and risk characterization for receptors beyond the BDI operation, and other information on the methods used for conducting second-tier health impact assessments please refer to the HIA Report (Landau Associates 2014) submitted to the Washington State Department of Ecology (Ecology) on October 23, 2014.

In accordance with Ecology protocol for conducting second-tier HIAs, the HIA Report evaluated only human health impacts resulting from RTO emissions for offsite receptors or onsite receptors where there could be a reasonable opportunity for public exposure (i.e., along Dietrich Road or areas that have been leased out for agricultural production). Project-related impacts were evaluated for BDI by confirming that exposure thresholds were met at the upwind property boundaries of the BDI property with the conservative assumption that downwind exposures would similarly be in compliance. However, during a teleconference with Ecology on January 5, 2015, Mr. Chuck Gruenenfelder of the Ecology Toxics Cleanup Program requested that a supplement to the HIA be prepared that also evaluates air quality impacts on the BDI property. Additional discussions with Mr. Matt Kadlec of Ecology's Air Quality Program indicated that the supplemental assessment should evaluate the maximum 8-hour time-weighted average (TWA) for hydrogen chloride (HCl) and hydrogen fluoride (HF) for the MICR on BDI resulting from modeled RTO emissions.

## SUPPLEMENTAL EXPOSURE ASSESSMENT

The U.S. Occupational Safety and Health Administration (OSHA) developed Permissible Exposure Limits (PELs) to protect workers against the health effects of exposure to hazardous substances. The OSHA 8-hour TWA PELs for HCl and HF are 7,000 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) and 2,500  $\mu\text{g}/\text{m}^3$ , respectively (USDL website 2015).

Landau Associates conducted air dispersion modeling using AERMOD<sup>1</sup> to estimate the maximum 8-hour and 24-hour TWA HCl and HF exposures to offsite receptors and limited onsite receptors, which include the buildings and outdoor areas at the BDI facility. For additional information on the methods used for air dispersion modeling, refer to Section 4.3.2 of the HIA Report (Landau Associates 2014). Figure 1 presents the modeled 8-hour TWA HCl concentrations at the alternate MICR. Electronic modeling files are provided on DVD in Attachment 1.

As shown on Figure 1, the maximum modeled 8-hour TWA HCl concentration at BDI of 123  $\mu\text{g}/\text{m}^3$  occurs at a receptor located on the northwest corner of the facility yard. The maximum modeled 8-hour TWA HF concentration at the same BDI receptor is 3.1  $\mu\text{g}/\text{m}^3$ . Note, the maximum 8-hour HF TWA concentration was derived using a dispersion factor<sup>2</sup> that was calculated based on the 8-hour TWA result for HCl. Table 1 provides the maximum 8-hour average HCl and HF concentrations at BDI compared to the OSHA PELs. As shown in Table 1, the maximum 8-hour average HCl and HF concentrations are well below the OSHA PELs. Therefore, HCl and HF emissions from the RTO are unlikely to result in adverse health effects to occupational receptors at the alternate MICR on the BDI property.

During the January 5 teleconference, Mr. Gruenfelder also requested an update of Figure 4-3 from the HIA Report showing 24-hour average HCl concentrations above the Washington Acceptable Source Impact Level at the alternate MICR. As requested, Figure 4-3 from the HIA Report has been updated and reproduced in this technical memorandum as Figure 2.

## SUMMARY

As indicated above, using an alternate MICR on the BDI property, the predicted maximum 8-hour TWA for HCL is 123  $\mu\text{g}/\text{m}^3$  which is well below the OSHA PEL of 7,000  $\mu\text{g}/\text{m}^3$ . Similarly, using an alternate MICR on the BDI property, the predicted maximum 8-hour TWA for HF is 3.1  $\mu\text{g}/\text{m}^3$ , which is

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<sup>1</sup> American Meteorological Society (AMS)/U.S. Environmental Protection Agency (EPA) regulatory model (AERMOD).

<sup>2</sup> When stack parameters (i.e., stack location, exhaust exit velocity and temperature, and stack diameter and height) and meteorological inputs in an air dispersion model remain unchanged, changes to the maximum modeled ambient concentrations for non-reactive compounds are directly proportional to changes to the emission rate input for a specific time-weighted average. Therefore, a dispersion factor was calculated (based on the 8-hour average HCl model) to estimate the maximum HF concentration at BDI.

well below the OSHA PEL of 2,500  $\mu\text{g}/\text{m}^3$ . Based on this evaluation, there are unlikely to be unacceptable risks to commercial workers on the BDI property as a result of the operation of the RTO proposed for the PSL Site.

## REFERENCES

Landau Associates. 2014. Revised Report: *Second-Tier Risk Analysis for Hydrogen Chloride Emissions, Pasco Sanitary Landfill, Pasco Washington*. Prepared for Industrial Waste Area Generators Group III. October 23.

USDHHS website. 2015. *Permissible Exposure Limits – Annotated Tables, Tables Z-1 and Z-2*. Occupational Safety and Health Administration, U.S. Department of Labor. <https://www.osha.gov/dsg/annotated-pels/index.html>. Accessed January 12.

## ATTACHMENTS

- Figure 1: 8-Hour Average HCl Modeling Results for the Alternate Maximally Impacted Commercial Receptor
- Figure 2: 24-Hour Average HCl Concentrations Caused by Emissions from RTO
- Table 1: Maximum 8-Hour Average Impact to Alternate Maximally Impacted Commercial Receptor
- Attachment 1: Electronic Modeling Files (on DVD)

PROJECT TITLE:

**Pasco Landfill RTO**



COMMENTS:  HCl 8-hr Avg	SOURCES:  <b>1</b>	COMPANY NAME:  <b>Landau Associates</b>	
	RECEPTORS:  <b>6945</b>	MODELER:  <b>Mark Brunner</b>	
	OUTPUT TYPE:  <b>Concentration</b>	SCALE:  1:1,923	
	MAX:  <b>159 ug/m^3</b>	DATE:  <b>1/12/2015</b>	PROJECT NO.:  <b>1295001.010.015</b>

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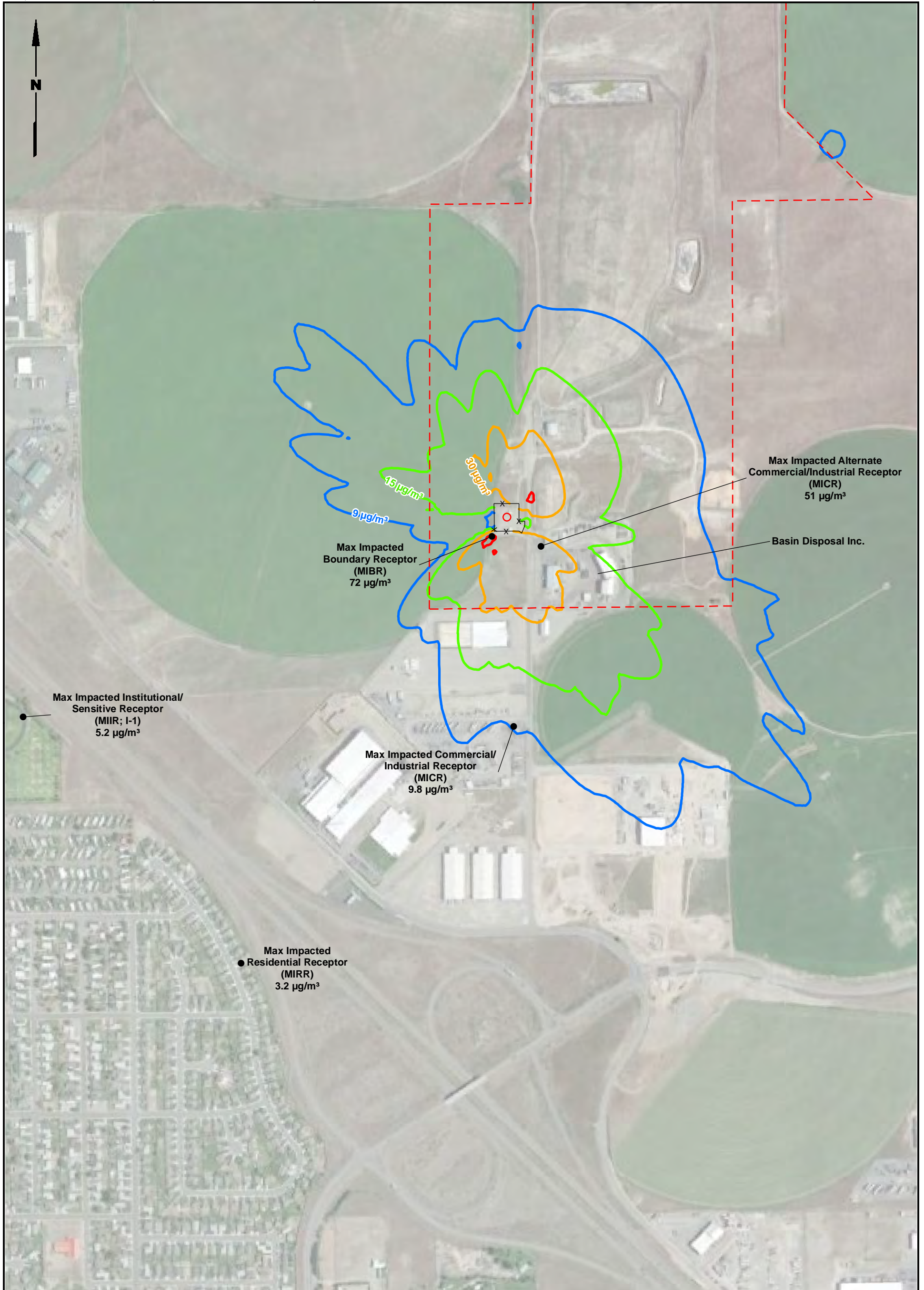


Pasco Sanitary Landfill  
Pasco, Washington

**8-Hour Average HCl Modeling  
Results for the Alternate Maximally  
Impacted Commercial Receptor**

Figure  
**1**



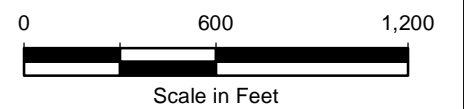


**Legend**

- |  |                           |
|--|---------------------------|
| ● Sensitive Receptors                  | <b>HCl Concentrations</b> |
| ○ Proposed Location of RTO Stack       | — 9 µg/m <sup>3</sup>     |
| × Fenceline                            | — 15 µg/m <sup>3</sup>    |
| [- -] Pasco Sanitary Landfill Boundary | — 30 µg/m <sup>3</sup>    |
|  | — 60 µg/m <sup>3</sup>    |

**Note**

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.



Data Sources: Franklin County GIS; 2014 Google © USGS.

**TABLE 1**  
**MAXIMUM 8-HOUR AVERAGE IMPACT TO ALTERNATE MAXIMALLY IMPACTED COMMERCIAL RECEPTOR**  
**PASCO SANITARY LANDFILL**  
**PASCO, WASHINGTON**

Toxic Air Pollutant	Emission Rate (lbs/hour)	Maximum 8-Hour Average Impact Concentration Alternate MICR ( $\mu\text{g}/\text{m}^3$ )	OSHA PEL 8-Hour TWA ( $\mu\text{g}/\text{m}^3$ )
Hydrogen Chloride (HCl)	4.91	123	7,000
Hydrogen Fluoride (HF)(a)	0.123	3.1	2,500

## Notes:

Alternate MICR = Maximally impacted onsite commercial/industrial receptor, identified as Basin Disposal Inc.

OSHA PEL = Occupational Safety and Health Administration Permissible Exposure Limit

TWA = Time-weighted average

(a) HF emission rates calculated with the following equation:

$$HF \text{ Concentration} = \frac{HCl \text{ Concentration}}{HCl \text{ Emission Rate}} \times HF \text{ Emission Rate}$$