

JH BAXTER SOURCE TEST PLAN FOR EMISSIONS TESTING IN 2021

Questions from Beyond Toxics on behalf of Bethel Community Residents & LRAPA's response.

September 29, 2021

1. Can LRAPA make the JHB source-testing plan for the carbon adsorption unit, penta stack, and additional permanent total enclosure (PTE) verification available to the members of the Core Team? We feel it is critical for transparency and community engagement that the plan be reviewed by the Core Team members PRIOR to approval by LRAPA. Perhaps the Tech Team has already done a review of the testing plan, but that would exclude the community members of the "Team."
 - o The DEQ has provided sampling plans to community groups to review for other CAO facility call-in procedures. The same community engagement should also take place for the JHB CAO assessment.
 - o Ideally, sampling plans should be posted on the LRAPA [CAO website for JH Baxter](#).

LRAPA Response: Yes, the carbon adsorption unit, pentachlorophenol (penta) stack, and additional permanent total enclosure (PTE) verification testing plan can be made available once received. The initial plan received on August 6, 2021 is no longer current. After discussions about complexities and uncertainties with the penta and creosote/carbon adsorption testing, LRAPA agreed for the ammonia testing to occur in September as planned and has requested a separate new test plan be submitted to address the carbon adsorption unit and penta stack testing at a later date. LRAPA will post the plan and any approval letter on the CAO website for JH Baxter.

2. Similarly, will LRAPA post the results of the ammonia scrubber tests and the summary table of all validated liquid sample data?

LRAPA Response: Yes, LRAPA will post the results of the ammonia scrubber testing once it has been reviewed by LRAPA for quality assurance/control. The summary table of all validated liquid sample data was posted on September 24th, 2021 and it is available [here](#).

3. What is the procedure for making sure that the resorts are operating at full capacity when testing is taking place? Who is ensuring that testing is taking place under all possible operational scenarios? What about when wood is wetter versus drier? When different types of products are being introduced into the retorts (i.e., telephone poles versus RR ties)?

LRAPA Response: Testing is observed by LRAPA. LRAPA reviews testing parameters and compares them with historical capacities and rates. The testing is designed to get results that are representative of the emissions from an entire treating cycle (i.e., a full treatment cycle includes all the steps from when the wood is placed in the retort to when it is removed and placed on the drip pad). The reference test methods include quality control and quality assurance requirements that must be met; LRAPA verifies that these requirements are met when reviewing the source test report. Additionally, the facility is required to verify that the process data and operations were representative and accurate as part of LRAPA's source test report requirements. Wood is typically kiln dried to a specified dryness and moisture content doesn't vary greatly. Wood that

does have higher moisture contents than others would take more steam to be supplied from the natural gas-fired boilers but shouldn't affect the amount of treatment chemical usage. Emissions are presented on a pound per cubic foot of product treated and lb/gal of treatment chemical.

- Is there a need to test during the start-up of the retort? We would like to know if the procedures for running the retorts requires a period of "heating up the temperature." The reason being that dioxins/furans and other persistent organic pollutants are often created as heat is gradually increased during startup.

LRAPA Response: As mentioned in the response to Question 3 above, testing is designed to obtain results that are representative of the emissions from an entire treating cycle including "startup" (i.e., a full treatment cycle includes all the steps from when the wood is placed in the retort to when it is removed and placed on the drip pad). For example, Appendix B, Chart 3 from the [source testing plan](#) (page 22 of 24) outlines the time estimates for the ACZA (ammonia-based) treating cycles and the associated test runs:

**Appendix B, Chart 3
Time Estimates for ACZA Treating Cycles
J.H. Baxter & Co.—Eugene, OR**

Treatment Step	Step No.	ACZA Preservative Solution—Retort 84			
		0.4-Lumber Charge (min)	Total Test Run Length (hr)	Temperature Range (°F)	Flow or No Flow at Stack Outlet?
Steam Conditioning	1	180	--	60-240	No Flow
Vacuum	2	150	3	60-240	Flow
Fill Retort 2	3	30		80-100	Flow
Press Period	4	360	--	100-130	No Flow
Empty Retort 2	5	30	--	100-130	No Flow
Vacuum 3	6	180	3	60-130	Flow
Steam Cleanup	7	240	--	60-200	No Flow
Final Vacuum	8	120	3	60-200	Flow
Draw Off Fumes (Crack & Vac)	9	60 ⁽¹⁾		60-80	Flow
Door Opened	10	15	--	--	--
Removed	11	25	--	--	--
Total Source Test Time (min)		1390	540	--	--
Total Source Test Time (hrs)		23.2	9	--	--
Test Run 1 (min)		--	180	--	--
Test Run 2 (min)		--	180	--	--
Test Run 3 (min)		--	180	--	--

REFERENCES:

(1) Best Management Practice requirement is 1 hour

- We would like to know more about this part of your report: "extra steps have been taken for Baxter's samples to assure the data acquired is accurate and representative of Baxter's processes." Specifically, did LRAPA or DEQ supervise the collection of the liquid samples? Where were the samples taken from on the property? Why does the sampling require "extended time" and how is LRAPA or DEQ verifying the veracity of this statement?

LRAPA Response: The quoted phrase is from Travis' 9/24/21 email to the Core Team and is in reference to the lab work described in the [letter](#) explaining the delays in the liquid sampling results posted to the JH Baxter CAO webpage on September 24, 2021.

LRAPA did not observe the collection of the original samples in February of 2021 and re-sampling in July of 2021. Section 4 of the revised liquid sampling plan outlines the quality assurance and control measures taken.

The locations of the sample collection points is described in Section 3.1 of the [revised Liquid Sampling Plan](#).

The reasons for the “extended time” for the independent third-party laboratories to finish analyzing is described in the [letter](#) explaining the delays in the liquid sampling results posted to the JH Baxter CAO webpage on September 24, 2021. As the letter describes, preliminary results showed that some samples needed to be reanalyzed and that some new sampling locations needed to be analyzed.

6. In addition to stack testing, is JHB also required to test for fugitive emissions from the outdoor drying process AND test at the fence line? If not, why not?

LRAPA Response: As included in the September 7th, 2021 presentation from LRAPA to the Core Team about the JH Baxter emission inventory, the current plan is to use the liquid sampling to provide site-specific data for emission estimates from fugitive emissions such as treated wood storage. J.H. Baxter’s [technical memo](#) submitted May 5, 2020 has details regarding the scientific approach used as a basis for the liquid sampling plan.

Fenceline monitoring is expensive to conduct correctly and provide meaningful results. Some of it has to do with detection levels for various toxics in the test methods not being sensitive enough to pick up ambient level concentrations; other parts of it are the laboratory cost, and the time needed to capture all representative operating and meteorological conditions.

Using pentachlorophenol as an example, LRAPA did fenceline monitoring in 2005-2007 and did not detect penta in any of the ~30 samples. So, measuring penta at the stack and then running it through conservative air dispersion models, including the worst-case conditions for five (5) years of actual meteorological data is more accurate/effective than fenceline monitoring.

Similarly, LRAPA does not sample for dioxins/furans (D/F) in the ambient air at any of our permanent locations, but it is likely D/F may also not be detected if we were to sample ambient air at the fenceline. Sampling D/F at the stack will likely give better, more quantifiable results since it is present in such low amounts that are difficult to measure.

Perimeter or fenceline monitoring can provide an indicator of the level of emissions at JH Baxter but it is expensive to do correctly for many reasons. One reason is that there are numerous lab methods required to analyze for all the COCs (contaminants of concern): one method for metals, another one for aldehydes, one for PAHs, one for D/F, and one for volatiles. Stack testing combined with air dispersion modeling can more accurately estimate emissions/exposures over a wide range of meteorological conditions for a wide variety of COCs than fenceline monitoring can.

7. Please provide the list of chemicals (out of the 600 required by CAO) that JHB is required to test for and to ensure that their emissions inventory is as accurate as possible? What research does

LRAPA rely on to determine that JHB is reporting all possible toxic chemicals covered under CAO that result from their operations?

LRAPA Response: The summary table of all validated liquid sample data was posted on September 24th, 2021 and it is available [here](#) contains all the chemicals out of the 600 required by CAO for which the facility has tested. Additional stack testing will also include a subset of those chemicals: dioxins/furans, PAHs, PAH-derivatives, pentachlorophenol, ammonia, and volatiles. A PAH, PAH-derivative, and D/F analyte list for the Method 23 testing planned for the outlets of the carbon adsorption unit and the penta stack is included on the following page.

LRAPA relies on numerous methods and means to ensure the emission inventory will be complete: information we obtain from EPA, DEQ, and other states and local air agencies, as well as the facility and their third-party consultants and source testers. Additionally, the liquid sampling and some of the stack testing include testing for all chemicals in certain classes such as total metals, total and individual dioxins/furans, and all individual PAHs and PAH-derivatives, etc.

Modified Method 23 Analyte List and Analytical Detection Limits			
Pollutant	CAS	Analytical Detection Limit	Category
Acenaphthene	83-32-9	30	PAH
Acenaphthylene	208-96-8	30	PAH
Anthracene	120-12-7	10	PAH
Benz[a]anthracene	56-55-3	6	PAH
Benzo[a]pyrene	50-32-8	6	PAH
Benzo[b]fluoranthene	205-99-2	6	PAH
Benzo[c]fluorene	205-12-9	6	PAH
Benzo[e]pyrene	192-97-2	6	PAH
Benzo[g,h,i]perylene	191-24-2	6	PAH
Benzo[j]fluoranthene	205-82-3	6	PAH
Benzo[k]fluoranthene	207-08-9	6	PAH
Carbazole	86-74-8	6	PAH
Chrysene	218-01-9	6	PAH
Cyclopenta[c,d]pyrene	27208-37-3	6	PAH
Dibenz[a,h]acridine	226-36-8	6	PAH
Dibenz[a,j]acridine	224-42-0	6	PAH
7H-Dibenzo[c,g]carbazole	194-59-2	6	PAH
Dibenz[a,h]anthracene	53-70-3	6	PAH
Dibenzo[a,e]pyrene	192-65-4	6	PAH
Dibenzo[a,h]pyrene	189-64-0	6	PAH
Dibenzo[a,i]pyrene	189-55-9	6	PAH
Dibenzo[a,l]pyrene	191-30-0	6	PAH
Fluoranthene	206-44-0	30	PAH
Fluorene	86-73-7	30	PAH
Indeno[1,2,3-cd]pyrene	193-39-5	6	PAH
2-Methylnaphthalene	91-57-6	60	PAH
Naphthalene	91-20-3	150	PAH
Perylene	198-55-0	6	PAH
Phenanthrene	85-01-8	60	PAH
Pyrene	129-00-0	30	PAH
7,12-Dimethylbenz[a]anthracene	57-97-6	6	PAH-Derivative
3-Methylcholanthrene	56-49-5	6	PAH-Derivative
5-Methylchrysene	3697-24-3	6	PAH-Derivative

DIOXINS	CAS	Abbreviation	Analytical Detection Limit (pg)	Category
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	TCDD	5	PCDD
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321-76-4	PeCDD	5	PCDD
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6	HxCDD	5	PCDD
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653-85-7	HxCDD	5	PCDD
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408-74-3	HxCDD	5	PCDD
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	HpCDD	5	PCDD
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	3268-87-9	OCDD	20	PCDD
Total Tetrachlorodibenzo-p-dioxin	41903-57-5	--	5	PCDD
Total Pentachlorodibenzo-p-dioxin	36088-22-9	--	5	PCDD
Total Hexachlorodibenzo-p-dioxin	34465-46-8	--	5	PCDD
Total Heptachlorodibenzo-p-dioxin	37871-00-4	--	5	PCDD
FURANS				
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	TcDF	5	PCDF
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	PeCDF	5	PCDF
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	PeCDF	5	PCDF
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	HxCDF	5	PCDF
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	HxCDF	5	PCDF
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	HxCDF	5	PCDF
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	HxCDF	5	PCDF
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	HpCDF	5	PCDF
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	HpCDF	5	PCDF
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	39001-02-0	OCDF	20	PCDF
Total Tetrachlorodibenzofuran	55722-27-5	--	5	PCDF
Total Pentachlorodibenzofuran	30402-15-4	--	5	PCDF
Total Hexachlorodibenzofuran	55684-94-1	--	5	PCDF
Total Heptachlorodibenzofuran	38998-75-3	--	5	PCDF