

Table No. 1
ATMOSPHERIC LACTOSE CONCENTRATIONS
Study Date: February 17, 2005

FARR AIR POLLUTION CONTROL
Jonesboro, Arkansas

Sample Number	Photo Number(s) ^a	Location	Time Start/Stop	Concentration (µg/M ³)
<u>GENERAL AREA BACKGROUND SAMPLES</u>				
(Collected before the system was charged, prior to the Drum Discharge BIBO and Filter Change BIBO Operations)				
09-FA-2	2	Test Unit, Lower Section Collected above the System Fan Control Panel, 62 inches above the floor, attached to the north support frame member.	0854/1030	<0.021
09-FA-3	3	Test Room, West Corner Collected 26 inches to the left of the pedestrian doorway, 61 inches above the floor, and 31 feet away from the test unit.	0854/1030	0.078
09-FA-4	4	Test Room, East Corner Collected 67 inches to the left of the east corner of the room, 56 inches above the floor, and 13 feet away from the test unit.	0854/1030	<0.021
<u>OPERATOR'S BREATHING ZONE SAMPLES (Single-Event Samples)</u>				
(Each Single-Event Sample was collected during a single cycle of the operational test as specified below)				
09-FA-6	11, 13-22, 25	Mike Walters – Event No. 1 ^b Collected during the first drum discharge BIBO task.	1246/1326	<0.05
09-FA-9	27	Mike Walters – Event No. 2 ^b Collected during the second drum discharge BIBO task.	1346/1416	0.29
09-FA-12	-	Mike Walters – Event No. 3 ^b Collected during the third drum discharge BIBO task.	1429/1459	0.12
09-FA-18	37-45	Mike Walters – Event No. 4 ^c Collected during the first filter change BIBO task, conducted at the left filter access port.	1610/1721	0.38

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09-FA-25	-	Mike Walters – Event No. 5 ^c Collected during the first filter change BIBO task, conducted at the right filter access port.	1729/1825	1.3
09-FA-26	-	Mike Walters – Event No. 6 ^d Collected during pulse cleaning of all 4 filters, and the third filter change BIBO task, conducted at the right filter access port.	1847/1943	1.0
			TWAE (4.7 Hours)	0.6 ^{e, f}
09-FA-7	11, 13-22, 25	Gene Pierce – Event No. 1 ^b Collected during the first drum discharge BIBO task.	1246/1326	0.39
09-FA-10	27	Gene Pierce – Event No. 2 ^b Collected during the second drum discharge BIBO task.	1346/1416	0.079
09-FA-13	-	Gene Pierce – Event No. 3 ^b Collected during the third drum discharge BIBO task.	1429/1459	0.15
09-FA-19	37-45	Gene Pierce – Event No. 4 ^c Collected during the first filter change BIBO task, conducted at the left filter access port.	1610/1721	0.7
09-FA-24	-	Gene Pierce – Event No. 5 ^c Collected during the second filter change BIBO task, conducted at the right filter access port.	1729/1825	1.4

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09-FA-27	-	Gene Pierce – Event No. 6 ^d Collected during pulse cleaning of all 4 filters, and the third filter change BIBO task, conducted at the right filter access port.	1847/1943	5.4
			TWAE (4.7 Hours)	1.6 ^f
<u>OPERATORS' BREATHING ZONE SAMPLES (Multi-Event Samples)</u>				
(Each Multi-Event Sample was collected during two cycles of the filter change BIBO operation)				
09-FA-16	37-45	Mike Walters Collected during the first two cycles of the filter change BIBO operation (i.e. Events numbers 4 and 5).	1610/1825	1.4
09-FA-17	37-45	Gene Pierce Collected during the first two cycles of the filter change BIBO operation (i.e. Events numbers 4 and 5).	1610/1825	3.0
<u>GENERAL AREA EVENT SAMPLES</u>				
(Each Event Sample was collected during one or more cycles of the operational test as specified below)				
09-FA-8	12-22, 25	Collection Drum – Event No. 1 Collected 3 inches away from the west side of the separation point of the collection drum and cover during the first drum discharge BIBO task.	1246/1326	0.16
09-FA-11	27	Collection Drum – Event No. 2 Collected 3 inches away from the west side of the separation point of the collection drum and cover during the second drum discharge BIBO task.	1346/1416	4.6

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09-FA-14	28	Collection Drum – Event No. 3 Collected 3 inches away from the west side of the separation point of the collection drum and cover during the third drum discharge BIBO task.	1429/1459	0.54
09-FA-21	34	Filter Access Port – Events Numbers 4 and 5 Collected 6 inches above the flange at the top of the left filter access port during filter change BIBO tasks at the left and right filter access ports.	1610/1826	0.77
09-FA-22	35	Filter Access Port – Events Numbers 4 and 5 Collected 6 inches away from the flange at the bottom left corner of the left filter access port during filter change BIBO tasks at the left and right filter access ports.	1610/1826	0.16
09-FA-23	36	Filter Access Port – Events Numbers 4 and 5 Collected 6 inches away from the flange at the bottom right corner of the right filter access port during filter change BIBO tasks at the left and right filter access ports.	1610/1826	4.5
09-FA-28	-	Filter Access Port – Event No. 6 Collected 6 inches above the flange at the top of the right filter access port during pulse cleaning of all 4 filters, and the third filter change BIBO task, conducted at the right filter access port.	1847/1944	1.9
09-FA-29	-	Filter Access Port – Event No. 6 Collected 6 inches away from the flange at the bottom right of the right filter access port during pulse cleaning of all 4 filters, and the third filter change BIBO task, conducted at the right filter access port.	1847/1944	14

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<u>GENERAL AREA BACKGROUND SAMPLES</u>				
(Collected while the specified operations were being conducted at the dust collector)				
09-FA-5	-	Test Room, East Corner Collected 67 inches to the left of the east corner of the room, 56 inches above the floor, and 13 feet away from the test unit during the three cycles of the drum discharge BIBO task (i.e. Events numbers 1 through 3).	1245/1504	0.046
09-FA-20	-	Test Room, East Corner Collected during the first two cycles of the filter change BIBO operation (i.e. Events numbers 4 and 5) at the same location detailed above for sample 09-FA-5.	1610/1828	0.2

µg/M³ denotes *micrograms of lactose per cubic meter of air*.

^a This column lists the digital photograph(s) that correspond to the specified air sample. The digital photographs are listed in Appendix 2 and provided in Appendix 3.

^b The sequence of activities during Event No. 1 included opening the drum, manually manipulating the bag to help transfer additional material from the collar into the bag, cinching the bag using two plastic zip ties and two metal band clamps, cutting the bag between the band clamps, applying duct tape on both crimped remnants of the cut bag, lifting the full bag out of the drum, installing a new bag over the bag remnant on the collar, and replacing the drum cover. The fan was on and the slide gate was closed during the above activities. The above sequence of activities took the entire sample period of 40 minutes.

The same sequence of activities was performed during Event No. 2. A small tear was observed in the full collection bag above the metal clamp used to seal it onto the collar. M. Walters applied duct tape to the ripped area before removing the clamp. There was no visible leakage observed. The entire sequence of activities conducted during Event No. 2 was finished in 24 minutes. The Operators stayed in the general area during the remaining 6 minutes of the sample period.

The same sequence of activities was also performed during Event No. 3, and was finished in 24 minutes. The Operators stayed in the general area during the remaining 6 minutes of the sample period.

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- ^c The sequence of activities during Event No. 4 included unrolling the existing bag attached to filter access port flange, moving two dirty filters out into the bag, crimping the bag with two plastic zip ties, removing and replacing one of these zip ties because they were initially placed too close together, placing and tightening two metal band clamps between the zip ties, cutting the bag between the two metal band clamps, applying duct tape on both crimped remnants of the cut bag, lowering the crimped bag with the dirty filters off of the platform, loading two new filters into a new bag, advancing the crimped bag remnant to the front position on the filter access port flange, attaching the new bag with the new filters to the rear position on the flange over the remnant, detaching the remnant from the flange within the new bag, moving the new filters into the dust collector, rolling the new bag up against the port and strapping it in place. The entire system was off during this entire sequence of activities.
- The same sequence was followed for Event No. 5, except the zip ties were positioned correctly on the first attempt during this event and the filter access port door was closed at the end of the sequence.
- ^d The sequence of activities performed during Event No. 6 was the same as described above, except each of the four filters were pulse cleaned twice with the fan off.
- ^e When multiple samples are collected to evaluate an employee's exposures, and the analytical results for those samples are a combination of actual concentrations and "less than" numbers, the time-weighted average exposure (TWAE) is calculated as if the "less than" numbers were in effect zero. The formula used to calculate the TWAE is shown in Appendix No. 1.
- ^f These values also represent the estimated 8-hour time-weighted average exposures (ETWAE) for the respective employees. They were determined by assuming the measured concentrations (or calculated TWAE) would remain the same during the remainder of the work shift. This assumption was made because a worker reportedly may conduct similar operations throughout an entire workshift at certain installations depending upon the number of dust collectors present.

Table No. 2
LACTOSE SURFACE SWAB SAMPLE RESULTS
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Sample Number	Photo Number(s) ^a	Location	Time	Lactose Concentration (µg) ^b
<u>BACKGROUND SAMPLES</u>				
(Collected before the system was charged, prior to the Drum Discharge BIBO and Filter Change BIBO Operations)				
09-FS-2	6	Collection Drum Collected from the vertical surface inside of the drum.	1002	0.089
09-FS-3	7	Drum Collection Bag Collar Collected from the surface of the outside diameter near the top of the sleeve.	1003	<0.025
09-FS-4	8	Left Filter Access Port – Top Flange Surface Collected from the top of the horizontal flange surface at the top of the access port at the junction with the vertical exterior surface of the filter housing.	1009	<0.025
09-FS-5	9	Test Room Floor Collected from the floor surface at the south east side of the test unit.	1011	<0.025
09-FS-6	10	Exhaust Ductwork Collected inside of the Test Room from the top of the horizontal positive-pressure section of the exhaust duct from the test unit.	1013	<0.025
<u>IN-PROCESS AND POST-PROCESS SAMPLES</u>				
(Collected during and after the Drum Discharge BIBO and Filter Change BIBO Operations)				
09-FS-11	23	Collection Drum – vertical interior surface on north side Collected from the inside of the drum after the first drum discharge BIBO task was completed (i.e. after Event No. 1).	1317	<0.025
09-FS-12	-	Collection Drum – vertical interior surface on east side Collected from the inside of the drum after the first drum discharge BIBO task was completed (i.e. after Event No. 1).	1318	<0.025

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Sample Number	Photo Number(s) ^a	Location	Time	Lactose Concentration (µg) ^b
09-FS-13	24	Drum Collection Bag Collar – exterior surface on north side Collected near the top of the collar after the first drum discharge BIBO task was completed (i.e. after Event No. 1).	1319	<0.025
09-FS-14A	-	Drum Collection Bag Collar – exterior surface on east side Collected near the top of the collar after the first drum discharge BIBO task was completed (i.e. after Event No. 1).	1320	0.23
09-FS-14B	26	Full Drum Collection Bag No. 1 Collected from the outside surface of the full bag after it was removed from the drum at the end of the first drum discharge BIBO task.	1332	0.027
09-FS-15	-	Collection Drum – vertical interior surface on east side Collected from the inside of the drum after the third drum discharge BIBO task was completed (i.e. after Event No. 3).	1440	<0.025
09-FS-16	-	Collection Drum – vertical interior surface on west side Collected from the inside of the drum after the third drum discharge BIBO task was completed (i.e. after Event No. 3).	1440	<0.025
09-FS-17	-	Drum Collection Bag Collar – exterior surface on east side Collected near the top of the collar after the third drum discharge BIBO task was completed (i.e. after Event No. 3).	1441	0.14
09-FS-18	-	Drum Collection Bag Collar – exterior surface on west side Collected near the top of the collar after the third drum discharge BIBO task was completed (i.e. after Event No. 3).	1441	<0.025

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Sample Number	Photo Number(s) ^a	Location	Time	Lactose Concentration (µg) ^b
09-FS-19	-	Full Drum Collection Bag No. 3 after Event No. 3 Collected from the outside surface of the full bag after it was removed from the drum at the end of the third drum discharge BIBO task.	1445	0.032
09-FS-7	31	Left Filter Access Port – Top Flange Surface after Event No. 3 Collected from the flange surface at the top of the port after the three drum discharge BIBO tasks were completed, but before the filter access port door was opened.	1555	<0.025
09-FS-8	32	Left Filter Access Port – Left Flange Surface after Event No. 3 Collected from the flange surface at the left side of the port after the three drum discharge BIBO tasks were completed, but before the filter access port door was opened.	1557	<0.025
09-FS-9	33	Left Filter Access Port – Bottom Flange Surface after Event No. 3 Collected from the flange surface at the bottom of the port after the three drum discharge BIBO tasks were completed, but before the filter access port door was opened.	1558	<0.025
09-FS-20		Left Filter Access Port – Top Flange Surface after Event No. 4 Collected from the flange surface at the top of the port after the first filter change BIBO task was completed.	1724	0.15
09-FS-21	-	Left Filter Access Port – Left Flange Surface after Event No. 4 Collected from the flange surface at the left side of the port after the first filter change BIBO task was completed.	1724	0.084
09-FS-22	-	Left Filter Access Port – Bottom Flange Surface after Event No. 4 Collected from the flange surface at the bottom of the port after the first filter change BIBO task was completed.	1725	0.44

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Sample Number	Photo Number(s) ^a	Location	Time	Lactose Concentration (µg) ^b
09-FS-23	47	Exhaust Ductwork – After Event No. 5 Collected inside of the Test Room from the top of the horizontal positive-pressure section of the exhaust duct from the test unit. Events 1 through 5 were completed, but Event No. 6 which included pulse cleaning and the third filter change BIBO had not yet been conducted.	1833	0.06

µg denotes *micrograms*.

^a This column lists the digital photograph(s) that correspond to the specified air sample. The digital photographs are listed in Appendix 2 and provided in Appendix 3.

^b All surface swab samples were collected by swabbing an area of approximately 25 square centimeters