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September 9, 2003

Ms. Becky Cole
Austin Community College
9101 Tuscany Way
Austin, Texas 78754

Telephone: (512) 223-1015
Facsimile: (512) 223-1030

Re: Mercury (Hg) Vapor Sampling
Rio Grande Campus
1212 Rio Grande, Austin, Texas
HBC Project No. 96037425

Dear Ms. Cole:

On August 16, 2003, a Mercury (Hg) vapor investigation was conducted in select portions of the Austin Community College (ACC) Rio Grande campus by HBC/Terracon with side-by-side readings using a similar instrument conducted by Bolton Laboratories personnel. The investigation was requested to further evaluate whether any mercury vapor accumulation exists in the vicinity of the chemistry laboratories at the campus. The scope of the assessment included indoor and outdoor air sampling for mercury vapor in order to assess air quality and the presence of airborne mercury vapors from the areas sampled and background levels.

AIR SAMPLING FOR MERCURY

On August 16, 2003, a total of 111 locations were tested for airborne mercury levels outside the building and in various 2nd and 3rd Floor locations within the ACC Rio Grande Campus. The air samples were collected from laboratories and rooms adjacent to and below laboratories as well as from hallway, restroom and classroom areas in the vicinity of the laboratories. The outdoor samples were collected as background samples. Table 1-Mercury Vapor Analysis lists sample locations and analysis results in the Results/Conclusion Section of this report.

Both HBC/Terracon and Bolton Laboratories utilized a Jerome® 431-X™ Mercury vapor analyzer to collect and analyze the air samples. The Jerome® 431-X™ is an ambient air analyzer with a range of 0.001 to 0.999 milligrams per cubic meter (mg/m³ Hg) with an accuracy of +/- 5% at 0.1 (mg/m³ Hg). Mercury has a unique ability to alter the resistance of gold film and this property is used to detect airborne mercury in the instrument. The 431-X sensor has two gold films configured in a circuit, which detects small changes in electrical resistance. One of the gold films is sealed off and not exposed to potential airborne mercury (reference) while the second film (sensor) is exposed to mercury (air flow from sample pump) resulting in resistance changes which are measured by the circuit. An internal microprocessor computes the concentration and displays the results.

In the SAMPLE mode, a sample cycle lasts 12 seconds. The analyzer has an internal pump which draws the sample air into a scrubber for two (2) seconds and then is bypassed to an acidic gas filter, which removes acidic gases which interfere with the sensors response to mercury, and then over a gold film sensor. This sensor absorbs and integrates the mercury vapor. The measured concentration of the analyzer is then displayed in milligrams/cubic meter. The digital display automatically zeroes at the start of each sample. In the SURVEY mode, the Jerome® 431- X™ Mercury vapor analyzer operates as described before, however the analyzer takes samples every 3 seconds automatically which allows the analyzer to be moved about a general area in order to assess broad areas for potential mercury concentrations.

A Certificate of Instrument Calibration was obtained with analyzer from Arizona Instrument which manufactures the instrument. The certificate certifies that the Jerome X-431 was calibrated with standard units traceable to the National Institute of Standards and Testing (NIST). This certificate is included as Appendix A. The instrument was shipped ready for sampling, however a regeneration run was performed prior to sampling.

The temperature outside during the site visit was 22° C with a 42% relative humidity. The instrument's operating temperature range is 0-40° C.

POTENTIAL INTERFERENCE

The Jerome mercury vapor analyzer interference includes chlorine, NO_2 , Hydrogen Sulfide (H2S), most mercaptans (organic sulfur compounds or "thiols"). A representative of the manufacturer's technical support department indicated that other interference not listed in the operating manual include burning of tobacco products, ammonia compounds, and

jarring the instrument. All of this interference can sometimes cause erroneously high readings. In addition, the filter can become saturated with these highly volatile compounds. In the operating manual, it is recommended that if any of the volatile compounds which may interfere with the instrument are present, the gases be allowed to dissipate before sampling for the less volatile mercury vapor. Water vapor condensation can also cause harm to the sensor.

RESULTS/CONCLUSIONS

Table 1-Mercury Vapor Analysis shows sample locations and analysis results collected from the Jerome 431-X Mercury Vapor Analyzer collected on August 16, 2003. The analyzer has a sampling range of 0.001 to 0.999 milligrams per cubic meter (mg/m³ Hg) with an accuracy of +/- 5% at 0.1 mg/m³ Hg and a sensitivity of 0.003 mg/m³ Hg. All samples were recorded and are listed in Table 1-Mercury Vapor Analysis. During the sampling routine there was one instance of readings which indicated the sampling sensor may have become saturated or the instrument filters were becoming overloaded. As the operating manual directed, the operators ran an additional Regeneration (clean contaminants from gold film) and calibration followed by collection of zero readings from other areas within the building.

TABLE 1-MERCURY VAPOR ANALYSIS
(8/16/03)

01.	Outside north entry	0.000
02.	Outside north entry	0.000
03.	Outside east entry	0.000
04.	Outside east entry	0.000
05.	2nd Floor west stairwell @ hallway	0.000
06.	2nd Floor west stairwell @ hallway	0.000
07.	2nd Floor west stairwell @ hallway	0.000
08.	Room 221 – Survey Mode	0.000
09.	Room 221 – Plenum area/ southeast corner	0.000
10.	Room 221 – Plenum area/ West central portion above door	0.000
11.	Room 221 – Plenum area/ Northwest office central portion	0.000

12.	Room 221 – 4' elevation - West central portion	0.000
13.	Room 221 – 4' elevation – Northeast corner	0.000
14.	Room 221 – 4' elevation – Southeast corner	0.000
15.	Room 221 – 4' elevation – Southwest corner	0.000
16.	Room 221 – 4' elevation – Central portion	0.000
17.	Room 221 – 4' elevation – Northwest corner of the northwest office	0.000
18.	Room 222.2 – 4' elevation – Central portion	0.000
19.	2nd Floor women's restroom - 4' elevation – Central portion	0.000
20.	Room 220 – Above the 2nd Ceiling – Southwest corner	0.000
21.	Room 220 – Above the 2nd Ceiling – Northwest corner	0.000
22.	Room 220 – Above the 2nd Ceiling – Central portion	0.000
23.	Room 220 – 2' Elevation – Northwest corner	0.000
24.	Room 220 – 4' Elevation – Southwest corner	0.000
25.	Room 220 – 4' Elevation – Northeast corner	0.000
26.	Room 220 – 4' Elevation – Southeast corner	0.000
27.	Room 220 – 2' Elevation – Central Portion	0.000
28.	Room 219 – Above the 2nd Ceiling – Northeast corner	0.000
29.	Room 219 – Above the 2nd Ceiling – Northwest corner	0.000
30.	Room 219 – 4' Elevation – Northeast corner	0.000
31.	Room 219 – 4' Elevation – Southeast corner	0.000
32.	Room 219 – 4' Elevation – Southwest corner	0.000
33.	Room 219 – 2' Elevation – Central Portion	0.000
34.	3rd Floor Hall - 4' Elevation - Outside the chemical storeroom	0.000
35.	Room 318.1 - Breathing level – Survey Mode	0.000
36.	Room 318.1 – 1' Elevation – Northeast corner	0.000
37.	Room 318.1 – 1' Elevation – Southeast corner	0.000
38.	Room 318.1 – 4' Elevation – Central portion	0.000
39.	Room 318.1 – 1' Elevation – Northwest corner	0.000
40.	Room 318 – 1' Elevation & Breathing level – Survey mode	0.000
41.	Room 318 – 4' Elevation – East central portion	0.000
42.	Room 318 – 1' Elevation – Southeast corner	0.000
43.	Room 318 – 1' Elevation – Southwest corner	0.000

44.	Room 318 – 4' Elevation – Central portion	0.000
45.	Room 318 – 1' Elevation – Above floor drain	0.000
46.	Room 318 – 4' Elevation – North central portion	0.000
47.	Room 318 – 4' Elevation – Above northwest sink drain	0.000
48.	Room 318 – 4' Elevation – Above northeast sink drain	0.000
49.	Room 318 – 4' Elevation – Above east central sink drain	0.000
50.	Room 316 – 1' Elevation – Northwest corner	0.000
51.	Room 316 – 4' Elevation – Central portion	0.000
52.	Room 316 – 1' Elevation – Central portion	0.000
53.	Room 316 – 2' Elevation – Above lab drain	0.000
54.	Room 316 – 1' Elevation – South central portion	0.000
55.	Room 316 – 2' Elevation – South drain trough	0.000
56.	Room 316 – 1' Elevation – Southeast entry	0.000
57.	Room 316 – 4' Elevation – Southwest corner	0.000
58.	Room 316 – 4' Elevation – Above southwest floor drain	0.000
59.	Room 316 – 4' Elevation – Above south central floor drain	0.000
60.	Room 316 – 4' Elevation –West central portion	0.000
61.	Room 316 – 0.1' Elevation –East central lab table	0.000
62.	Room 316 – 0.1' Elevation –West central lab table	0.000
63.	Room 316 – Survey Mode	0.000
64.	Room 323 – Survey Mode	0.000
65.	Room 323 – 4' Elevation – Central portion	0.000
66.	Room 323 – 1' Elevation – Central portion	0.000
67.	Room 324 – 1' Elevation –Survey Mode	0.000
68.	Room 324 – 4' Elevation –Survey Mode	0.000
69.	Room 324 – 1' Elevation – Rear portion	0.000
70.	Room 324 – 4' Elevation – Rear portion	0.000
71.	Room 326 – 1' & 4' Elevation –Survey Mode	0.000
72.	Room 326 –4' Elevation – Southwest corner	0.000
73.	Room 326 –4' Elevation – Northwest corner	0.000
74.	Room 326 –4' Elevation – Northeast corner	0.000
75.	Room 326 –4' Elevation – Southeast corner	0.000
76.	Room 326 – 1' Elevation –Central Portion	0.000
77.	Room 325.1 – 4' Elevation –Central Portion	0.000

78.	Room 325.1 – 1' & 4' Elevation –Survey mode	0.000
79.	Room 325.3 – 1' & 4' Elevation –Survey mode	0.000
80.	Room 325.3 – 4' Elevation –Central Portion	0.000
81.	Room 327 – 1' & 4' Elevation –Survey mode	0.000
82.	Room 327 – 4' Elevation – Northwest corner	0.000
83.	Room 327 – 1' Elevation – Northeast corner	0.000
84.	Room 327 – 4' Elevation – Southeast corner	0.000
85.	Room 327 – 1' Elevation – Southwest corner	0.000
86.	Room 327 – 4' Elevation –Central portion	0.000
87.	Room 328 – 1' & 4' Elevation –Survey mode	0.000
88.	Room 328 – 4' Elevation – Southeast corner	0.000
89.	Room 328 – 4' Elevation – Northeast corner	0.000
90.	Room 328 – 1' Elevation – Northwest corner	0.000
91.	Room 328 – 1' Elevation – Southwest corner	0.000
92.	Room 328 – 4' Elevation –Central portion	0.000
93.	Room 312.1 – 1' & 4' Elevation –Survey mode	0.000
94.	Room 312.1 – 4' Elevation –Central portion	0.000
95.	Room 312.0 – 1' & 4' Elevation –Survey mode	0.000
96.	Room 312.0 – 1' Elevation – Southwest corner	0.000
97.	Room 312.0 – 4' Elevation – Northwest corner above sink drain	0.000
98.	Room 312.0 – 4' Elevation – Northeast corner	0.000
99.	Room 312.0 – 1' Elevation – Southeast corner	0.000
100.	Room 312.0 – 4' Elevation –Central portion	0.000
101.	Room 310 – 1' & 4' Elevation –Survey mode	0.000
102.	Room 310 – 4' Elevation – Southwest corner beside sink	0.000
103.	Room 310 – 4' Elevation – Southwest corner above sink drain	0.000
104.	Room 310 – 4' Elevation – Southeast corner	0.000
105.	Room 310 – 1' Elevation – Northeast corner	0.000
106.	Room 310 – 4' Elevation – Northwest corner	0.000
107.	Room 310 – 4' Elevation –Central portion	0.000
108.	Room 312 – 4' Elevation – South portion above sink drain	0.000
109.	Room 312 – 1' Elevation – South portion below sink drain	0.000

110.	Room 315 – 1' & 4' Elevation –Survey mode	0.000
111	Room 315 – 1' Elevation – Central portion	0.000

A total of 111 locations were sampled utilizing the Jerome 431-X Mercury Vapor Analyzer on August 16, 2003. As indicated in Table 1, there was no mercury vapor detected.

The relative humidity and temperature was collected from a portion of the areas sampled for mercury vapors. Table 2 indicates the relative humidity and temperature readings collected during the site visit.

TABLE 2-RELATIVE HUMIDITY AND TEMPERATURE

Location	Temperature °F	% Relative Humidity
Outside – North entry	97.6	42
2nd floor – west stairwell/hallway	88.4	59.3
Room 220	87.6	60.0
3rd floor hall	87.3	58.0
Room 318	86.7	59.4

STANDARD OF CARE

The standard of care for conducting Mercury (Hg) Vapor Gas surveys in commercial buildings has not been well established. Changes and improvements to assessment methods are expected to occur over time. HBC/Terracon conducted this assessment in general accordance with our referenced proposal and guidelines established by the instrument manufacturer.

GENERAL CONDITIONS AND LIMITATIONS

This Mercury (Hg) Vapor Gas survey was conducted at the subject building on August 16, 2003 at the request of Austin Community College at the Rio Grande campus in Austin, Texas. The level of effort and associated tasks completed for this assessment were limited to the scope of services outlined and defined and the limitations of the General Terms and Conditions previously agreed upon by Austin Community College. HBC/Terracon did not conduct any remedial operations in the subject building.

The results, findings, conclusions and recommendations expressed in this report are based on conditions observed during the August 16, 2003 assessment. Many factors such as weather conditions, building occupancy and use, ventilation patterns and seasonal variations can affect the conditions observed. The information contained in this report should not be relied upon to represent conditions that existed previously or at a later date. HBC/Terracon does not warrant the services of regulatory agencies, laboratories or other third parties supplying information, which may have been used in the preparation of this report. No warranty, express or implied is made.

This report is for the exclusive use of the client for the project being discussed. No other individual or entity may rely on this report without written permission of HBC/Terracon and Austin Community College. Reliance on this report by Austin Community College and all authorized parties will be subject to the key understandings and limitations stated in the proposal, this report and the General Terms and Conditions. The limitation of liability defined in the General Terms and Conditions is the aggregate limit of HBC/Terracon's liability to Austin Community College and all relying parties.

We appreciate the opportunity to perform these services for you, and do not hesitate to contact HBC/Terracon if you have any questions regarding this project.

Respectfully Submitted,

HBC/Terracon

Richard Ian Howes
Project Manager

Hilary D. Johns, P.G.
Senior Technical Review

Certificate of Instrument Calibration

1912 W. 4th Street • Tempe, AZ 85281 • (602) 470-1414 • (800) 528-7411 • Fax (480) 804-0656 • www.azic.com

Arizona Instrument Manufacturers of Computrac® Moisture Analyzers and Jerome® Toxic Gas Analyzers

R2326

Company Response Ashtead Tech

Address 1057 E. Henrietta Road

Rochester NY 14623

This is to certify that the JEROME X431-0002 Gold Film Mercury Analyzer,110 VAC Serial Number 2554 with Sensor Number 98-8-6-z1c, was calibrated with standard units traceable to NIST

Calibration Status as Received: Out of Calibration

Incoming:	Actual	Calibration Gas	Allowable Range
Level 1	.111	0.104 mg/m3 Hg	.0988-.1092 (+/-5%)
RSD	3.01		<3%
Outgoing:	Actual	Calibration Gas	Allowable Range
Level 1	.1058	0.104 mg/m3 Hg	.0988-.1092 (+/-5%)
RSD	.95		<3%
Level 2	N/A	0.025 mg/m3 Hg	0.020 - 0.030 mg/m3
SD	N/A		<0.005 mg/m3
Level 3	N/A	0.010 mg/m3 Hg	0.005 - 0.015 mg/m3
SD	N/A		<0.005 mg/m3

Calibration Status as Left: In Calibration

Estimated Uncertainty of Calibration System: 3.5%

Ambient conditions during calibration:

Temperature degrees F: 73.5 % Relative Humidity: 35.0

Calibration Date 4/10/03 **Re-Calibration Date** 4/8/04

Approved By: V. Dorr **Date:** 4/11/03

Title: Vince Dorr - Tech Support/Quality Control

Equipment Used

Permeation Tube		S/N: 498-3663	NIST: 153337-1
Calibration Date:	2/4/03	Calibration Date Due: 2/4/04	
DynaCalibrator		S/N: M978	NIST: 255085,95;NBS Buret #81 and #K10
Calibration Date:	1/16/03	Calibration Date Due: 1/17/04	
Flowmeter		S/N: 014273	NIST: 821/263310-00; 821/256504-97;
Calibration Date:	6/11/02	Calibration Date Due: 6/11/03	
Digital Multimeter		S/N: 408312	NIST: D5076
Calibration Date:	5/15/02	Calibration Date Due: 5/15/03	

Calibration Procedure Used: 3J09-0005