CALIFORNIA HORSE RACING BOARD

Report

Date : October 3, 2013

To : **Dr. Rick Arthur, Equine Medical Director**

From : Jeffery Salmon, Safety Steward

Subject : ENVIRONMENTAL TOXICOLOGY SCREENING AT BETFAIR HOLLYWOOD PARK IN SUPPORT OF SUDDEN DEATH INVESTIGATION

This report details the environmental toxicology investigation conducted at Betfair Hollywood Park (BHP) racetrack in August and September of 2013. The report consists of: 1) A short **Summary** of the investigation and associated results; 2) An **Introduction** that provides the background that led to the decision to conduct the testing; 3) The **Sampling and Analysis** plan that was designed and executed to screen for environmental toxins; 4) The **Results** of the sampling and testing; and, 5) The **Conclusion** reached based on the test results.

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ENVIRONMENTAL TOXICOLOGY SCREENING AT BETFAIR HOLLYWOOD PARK IN SUPPORT OF SUDDEN DEATH INVESTIGATION

SUMMARY

An investigation was conducted into possible links between environmental factors and the sudden deaths of 9 horses at the BHP racetrack over the period from November 2011 through March 2013. Seven of the nine horses were stabled in a single barn (Barn 61) and had a common trainer. Typically, this barn has 3-5% of the total starters and horses stabled at BHP. During the reference period, the barn had 78% of the sudden death fatalities. This statistical cluster from Barn 61 was the reason that the decision was made to conduct environmental toxicology sampling and analysis.

CHRB staff consulted with the head of the California Animal Health & Food Safety Laboratory System (CAHFS) toxicology laboratory on the case. A collaborative decision established sampling and laboratory test matrices to evaluate potential sources of environmental toxins.

The CHRB contracted with Babcock Laboratories of Riverside, Ca to conduct Barn 61 soil sampling and laboratory analysis. They analyzed Barn 61 debris and soil samples for heavy metals, volatile hydrocarbons, pesticides and herbicides. Portions of their two samples were also shipped to the UC Davis CAHFS toxicology laboratory to test for anticoagulant compounds used in rodent poisons.

The CHRB also contracted with Aurora Industrial Hygiene of San Diego, Ca to conduct air sampling in Barn 61, along the path from Barn 61 to the synthetic race track and adjacent to the synthetic race track. The air samples were analyzed for total particulates, respirable-sized particulates, total volatile hydrocarbons and the compound Bromadiolone. Bromadiolone is the active ingredient in the specific rodent poison used at BHP.

The soil and debris testing conducted for Barn 61 samples showed very low, insignificant levels of four heavy metals. No other potential toxins were detected. The UC Davis testing did not detect any concentration of seven different anticoagulant compounds.

The air sampling testing showed very low, non-threatening levels of total particulates and volatile hydrocarbons at locations near the synthetic racetrack and inside Barn 61. No respirable particulates were measured. The rodent poison Bromadiolone was not detected in two air samples taken inside Barn 61. It is concluded that the environmental toxins that were screened were well below OSHA Permissible Exposure Levels (PEL) and are not the reason for the BHP cardiopulmonary sudden deaths.

INTRODUCTION

On March 04, 2013 'Horse #7' collapsed and died while galloping during training at Betfair Hollywood Park. The cause of death was described as acute respiratory failure in the necropsy report issued by CAHFS. The necropsy did not reveal any drug or toxin findings that explained the reason that the horse died.

Necropsy records show that this was the seventh sudden death case for Trainer Bob Baffert over the previous 17 months. All seven of these cases were for horses that were stabled in Barn 61 at Betfair Hollywood Park. Over this same period, only two other cases occurred at Hollywood Park for all other trainers on the grounds.

The CHRB Executive Director (ED) ordered an investigation into these seven sudden death cases. This investigation was conducted by Investigator Rick Amieva, under the supervision of supervising investigator Bill Westermann. The ED also requested Safety Steward Jeff Salmon to examine the sudden death necropsy data to determine if the sudden deaths could be understood as a function of time, the racetrack, the racing surface or the responsible trainer.

The following conclusions were reached:

1) For the over 6 year period from 2007 to early 2013, there is no indication that the sudden death cases are more apt to occur at particular racetracks.
2) For the same period, there is no bias to a particular type of training/racing surface. Over the same period of time, 30 cases occurred for horses training/racing on dirt surfaces and 26 cases occurred for horses training/racing on synthetic surfaces.

3) The statistic that was most significant was that, for the seventeen month period from November 4, 2011 to March 4, 2013, Trainer Baffert and Barn 61 had 78% of the sudden death cases at BHP with a population of only 3-5% of the horses on the grounds. The predominance of Baffert-trained/stabled case horses at Hollywood Park strongly suggests that this specific barn area should be thoroughly examined and tested for potential hazardous substances.
4) Previous exposure assessments for synthetic racetracks were reviewed to understand total particulate, respirable particulate and total hydrocarbon levels. Based on this review, it was concluded that it is highly unlikely that the training/racing surface is the source of hazardous materials that link to the sudden death cases.

Dr. Robert Poppenga of the CAHFS Toxicology Laboratory at UC Davis was consulted (on April 30, 2013) as to how to proceed with an inspection of Barn 61 at BHP. Dr. Poppenga suggested that it would be prudent to gather specific information, prior to any inspection or evidence gathering, to help guide the activities. After discussion, Mr. Salmon produced the memorandum shown in Attachment (1) and provided it to the supervising investigator. These questions did not lead to any additional information that would point to a particular toxin source. The barn map that is included as Attachment (2) was produced to show where each of the seven deceased horses were stabled.

At this point in the investigation, the CHRB's Equine Medical Director (EMD), Dr. Rick Arthur, made the decision to conduct environmental toxicology screening at BHP, even though the evidence did not point to a particular toxin source for the deaths. The environmental screening would include separate soil and air sampling activities. The soil sampling would focus on the environment in Barn 61. The air sampling would also check for air-bourne toxins in Barn 61, but would, in addition, include air sampling on the path to the synthetic racetrack and adjacent to the synthetic surface. Water sampling was eliminated from consideration because BHP operates on a municipal water source. Mr. Salmon was directed to investigate environmental firms that could provide consultation, sampling expertise and analytical laboratory capabilities.

SAMPLING AND ANALYSIS

A. SOIL SAMPLING AND ANALYSIS

Mr. Salmon located E.S. Babcock & Sons, Inc. Environmental Laboratories (ESB) in Riverside, Ca. ESB is approved for the independent laboratory testing of drinking water, wastewater, groundwater, soils and hazardous waste in the fields of Bacteriology, Inorganic Chemistry, Toxic Chemical Elements, Organic Chemistry and Extraction Tests. They also offer field sampling capability. They provided complete listings of their standard test suites for soils. Dr. Poppenga of UC Davis reviewed these test suites and recommended that soil and solid debris from Barn 61 be tested for: Metals, Volatile Organics (i.e., hydrocarbons), Organochlorine Pesticides, Organophosphorus Pesticides and Chlorophenoxy Herbicides. A contract between the CHRB and ESB was executed on August 08, 2013.

Field sampling was conducted on August 29, 2013. Dr. Rick Arthur and Mr. Jeff Salmon represented the CHRB and Mr. Mark Tomes, Plant Superintendant, represented BHP management. Mr. Jason Cabral was the assigned field technician for ESB. Dr. Arthur and Mr. Salmon inspected the barn area and elected to create two composite samples. The first composite sample would be made up of four soil samples from the ground surface of the shed row. The second composite sample would be made up of six debris samples from three of the two-compartment feed/straw rooms in the barn. The composite sample approach was employed to allow collection of a significant number of different samples while not having to analyze each sample separately. If a significant finding was made, the data could be used to design the collection of additional samples to determine the approximate location of the toxin source. The locations for the samples are shown in Attachment (3). S-1 through S-4 indicates the locations of the four shed row soil samples and F-1 through F-6 indicates the locations of the six feed/straw room debris samples.

On the next two pages, three pictures are shown that were taken during the soil and debris sampling activity at BHP. Figure 1 shows the east wing of Barn 61 looking north from stalls 43 and 68. Figure 2 shows a gray trap just to the left of the bright red bucket against the back wall. Figure 3 captures the ESB field technician taking a sample in front of stall 46.

Figure 1. Barn 61Shedrow, Stall 48 North

Figure 2. Feed room Rodent Trap

Figure 3. Soil Sampling

The feed rooms contained multiple numbers of rodent traps. Mark Tomes of Hollywood Park provided the specification sheet for the anti-coagulant described as MAKI MINI BLOCKS, one of the poisons used in the barn. The active ingredient in this bait is the compound Bromadiolone. ESB could not provide testing for this compound or other anti-coagulants. Dr. Poppenga of UC Davis confirmed that the CAHFS toxicology laboratory could test for Bromadiolone and a group of other anti-coagulants. ESB was instructed to preserve a 20 gram sample from each of the two composite samples for testing at UC Davis.

B. AIR SAMPLING AND ANALYSIS

As mentioned in the Introduction of this report, Mr. Salmon reviewed previous Industrial Hygiene reports to understand data for total particulate, respirable particulate and total hydrocarbon levels emanating from synthetic racing surfaces. These reports concluded that, for the Del Mar synthetic surface and a Tapeta surface similar to Golden Gate Fields, it is highly unlikely that the training/races surfaces are the source of hazardous materials that link to the subject sudden death cases.

Mr. Salmon contacted Mr. Eual Wyatt at BHP and he was not aware of any industrial hygiene study that was previously conducted for the BHP 'Cushion Track' surface. This surface was manufactured and installed by Equestrian Surfaces of Burnley, England in 2006. The Del Mar and Golden Gate Fields synthetic surfaces were installed by different vendors.

Because of a lack of data for the BHP surface and to ensure that all possible sources of toxins were investigated, the decision was made to conduct air sampling in Barn 61, on the horse pathways to the main track and adjacent to the synthetic main track surface. Mr. Salmon contacted Ms. Karen Shockley at Aurora Industrial Hygiene (AIH) in San Diego. This firm had previously conducted two sets of air quality studies at Del Mar. A contract between the CHRB and AIH was executed on August 20, 2013.

Air sampling was conducted on September 18, 2013 at BHP. Mr. Salmon represented the CHRB and Mr. Mark Tomes represented Hollywood Park management. Mr. Matt Froehlich was the assigned Field Industrial Hygienist from AIH.

Mr. Salmon and Mr. Froehlich agreed on three outside locations (3 pumps at each location) for standard air sampling for total particulates, respirable-sized particulates and total petroleum hydrocarbons (volatile compounds). One location was adjacent to the synthetic surface near the Stable Café outside rail, the second was at the confluence of the receiving barn gap entrance and the synthetic surface and the third was at the entrance to Cassidy Lane across from Barn 60. The sampling took place during morning training and continued during track renovation activity after training.

Locations 4 and 5 were inside Barn 61 as shown in Attachment (4). These locations also had three pumps for standard air sampling. In addition, a fourth pump was added at locations 4 and 5 inside Barn 61 to specifically sample for the anti-coagulant Bromadiolone.

On the next page, there are two pictures that show how the air sampling was conducted. Figure 4 shows the sampling pumps and air collectors located at the intersection of the VIP gap (next to the receiving barn) and the main track. Figure 5 shows four pumps that were suspended between Stalls 40 and 41 in Barn 61.

RESULTS

A. Soil Sample Analysis Results

The final report from ESB for the soil sampling testing that was conducted on August 29, 2013 is Attachment (5) to this report. The report lists the laboratory results for the Feed Room Composite sample first and the Shed Row Composite sample second. There are five test groups for each composite: 1) Metals and Metalloids; 2) Organochlorine Pesticides and PCBs; 3) Organo Phosphorous Pesticides; 4) Chlorinated Herbicides; and, 5) Volatile Organic Compounds.

Figure 4. Air Sampling at Gap Main Track

Figure 5. Air Sampling – Stall 40/41

Under each of the five test groups every compound that was tested for is listed. None of the Pesticide, Herbicide or Hydrocarbon compounds were detected. Over 150 different compounds were screened. Trace amounts (less than 50 ppm) of the metals Barium, Copper, Vanadium and Zinc were found in the Feed Room Composite sample and in the Shed Row composite sample. These levels are not considered to be hazardous.

As mentioned previously, a portion of each composite sample was sent to UC Davis for analysis for anticoagulant compounds. The final report for the laboratory analysis is shown in Attachment (6). Seven different compounds were screened and none were detected.

B. Air Sample Analysis Results

The final report from AIH for the air sampling testing that was conducted on September 18, 2013 is Attachment (7) to this report. The federal government and the state of California have defined Permissible Exposure Limits (PEL) for chemical exposures in the workplace. These limits refer to airborne contaminants to which nearly all workers may be exposed daily for a working lifetime without adverse effect. It is unknown exactly how these limits translate to interpretation of healthy levels for horses.

The Cal-OSHA PELs are as follows:

Particulates Not Otherwise Regulated (PNOR), or Total Particulates-10 mg/m3

Respirable-Sized Particulates- 5 mg/m3

Total Petroleum Hydrocarbons- 300 ppm

Total petroleum hydrocarbons and total particulates were detected in some of the area air samples, at levels well below the PELs. Respirable-sized particulates and Bromadiolone were not detected in any of the air samples.

CONCLUSION

The soil and debris sampling analysis conducted by Babcock Labs in Barn 61 did not show any significant levels of potentially toxic chemicals or metals. The UC Davis screening for anticoagulants did not detect any toxins. The air sampling conducted by Aurora Industrial Hygiene near the synthetic racing surface, between Barn 61 and the racing surface and in Barn 61 did not show significant levels of total particulates, respirable particulates, volatile hydrocarbons or Bromadiolone. It is concluded that environmental toxins were not the cause of the seven cardiopulmonary sudden deaths that occurred for horses stabled in Barn 61 over the period from November 04, 2011 to March 04, 2013.

Attachment 1

To: Kirk Breed April 30, 2013

From: Jeff Salmon

Subject: Request for Investigative Support-Equine Sudden Deaths

Reference: (a) Salmon, J.W. to K.E. Breed, 'Environmental Toxicology Evaluation for Equine Sudden Death Cases', April 24, 2013

The study summarized in Reference (a) showed that trainer Baffert had seven sudden deaths at his Hollywood Park barn over the period from November 2011 through March of 2013. It was concluded that the predominance of Baffert-trained case horses at Hollywood Park strongly suggests that this specific barn area should be thoroughly examined and tested for potential hazardous substances.

Dr. Robert Poppenga of the CAHFS Toxicology Laboratory at UC Davis was consulted (on April 30, 2013) as how to proceed with an inspection of the Baffert barn area at Hollywood Park. He suggested that it would be prudent to gather specific support information, prior to any inspection or evidence gathering, to help guide the activities.

It is recommended that an investigator(s) be assigned to develop the information for the period of interest that is summarized in the eight items shown below:

1) Are there any identifiable illness patterns in the barn over the period of interest? Establish the illness types, associated periods, names of specific horses and medications given (i.e., subpoena veterinarian records).

2) Develop a barn map identifying each stable by number. Establish where each of the seven horses was stabled and indicate the locations on the map.

3) For each of the case horses, determine over what period they were housed in their particular stable.

4) Determine the different diet types used in the barn and associate each case horse with a particular diet type.

5) Determine any barn renovation, material removal or repairs that were conducted.

6) Were there any issues with insect, fly or rodent controls?

7) Were there any changes to stall cleaning procedures?

8) Were there any vendor changes (i.e., feed, straw, supplements, etc.)?

After these questions are answered, the information will be reviewed with Dr. Poppenga and he will consult as to what specific evidence, if any, should be gathered at the subject barn.

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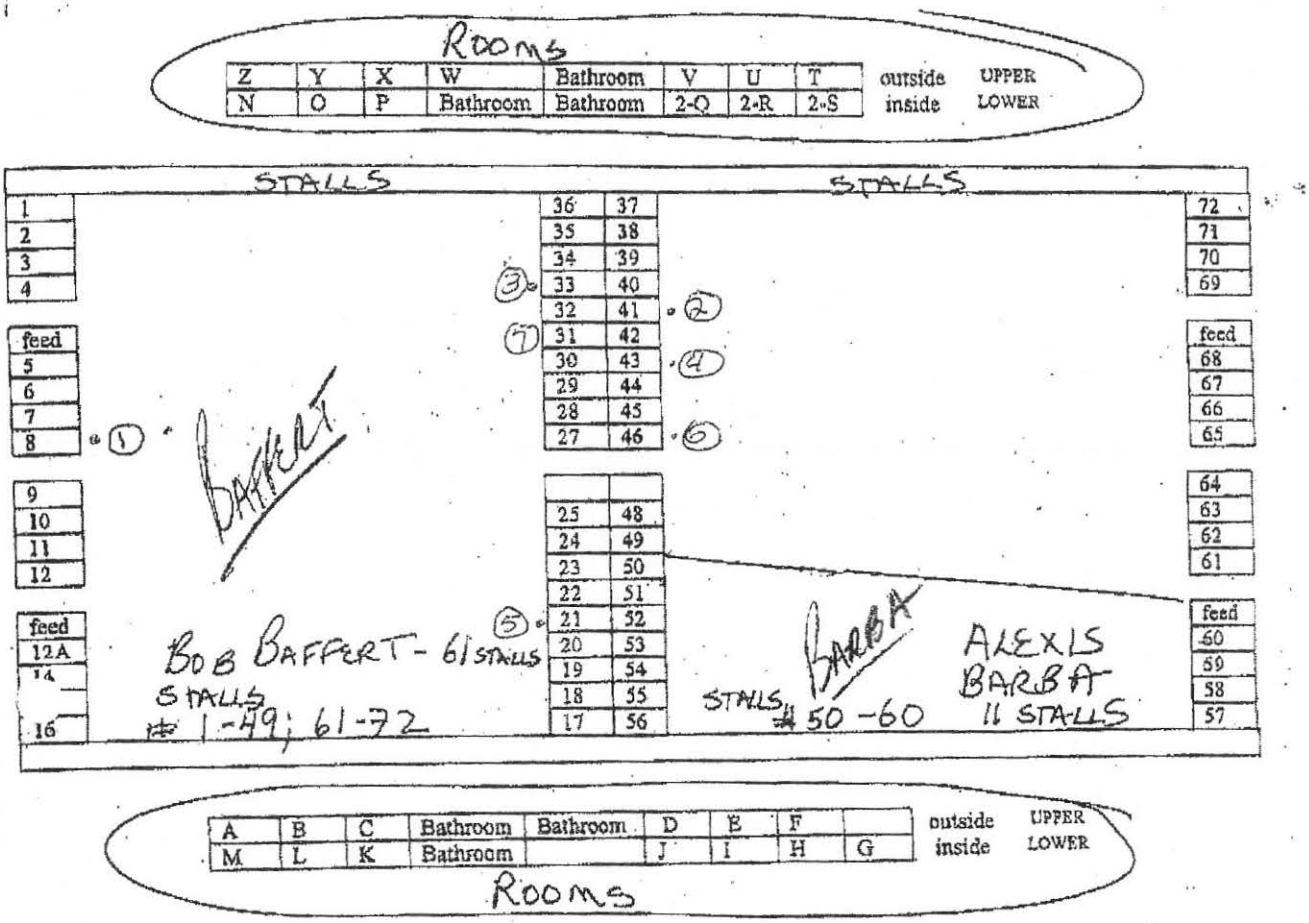
Attachment 2

BARN 61
TACK ROOMS

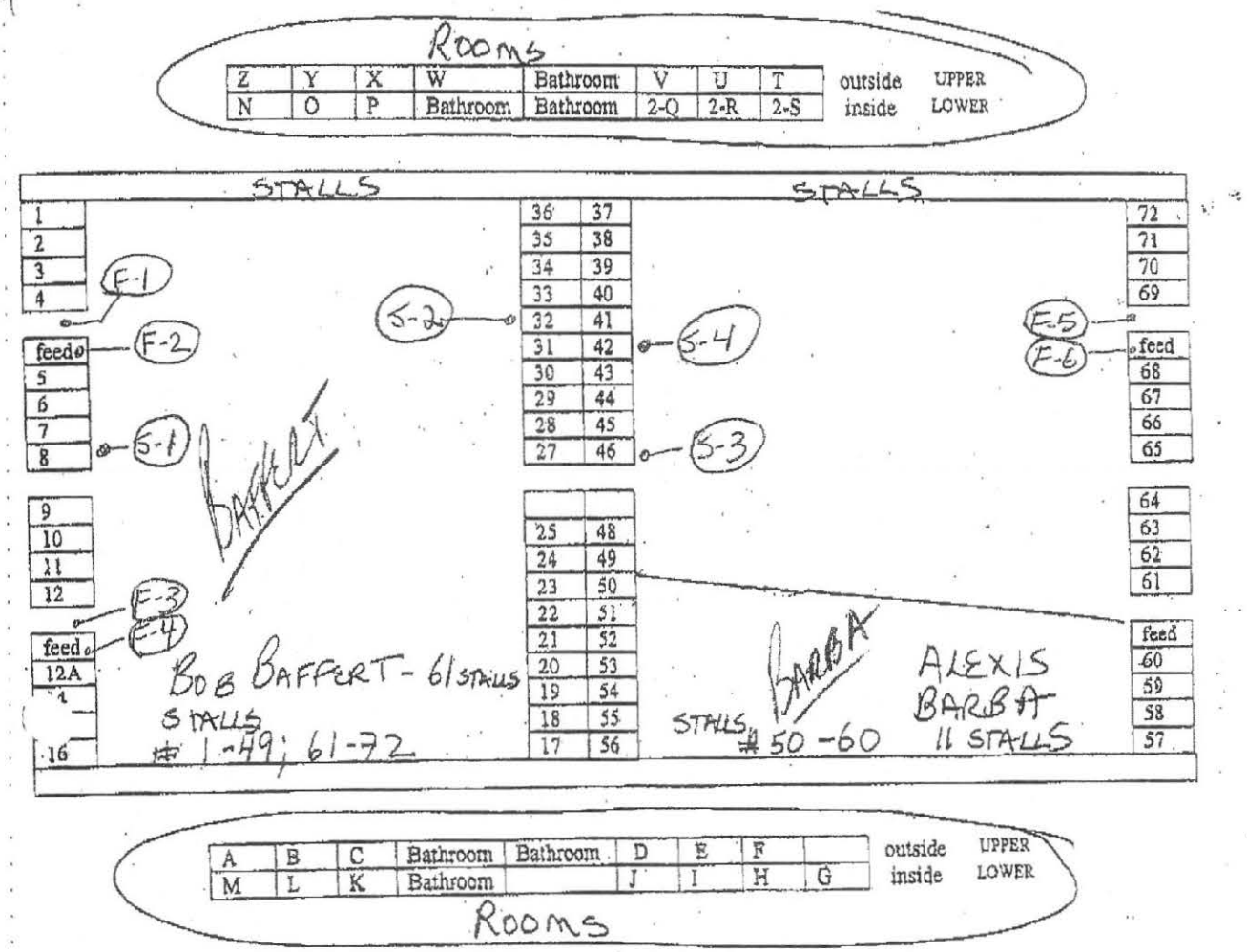


1. HORSE #1 — 11-4-2011
2. HORSE #2 — 11-26-2001
3. HORSE #3 — 01-06-2012
4. HORSE #4 — 06-15-2012
5. HORSE #5 — 08-20-2012
6. HORSE #6 — 12-21-2012
7. HORSE #7 — 03-04-2013

SUDDEN DEATH CASES - STALL LOCATIONS

BN 61

BARN 61
TACK ROOMS

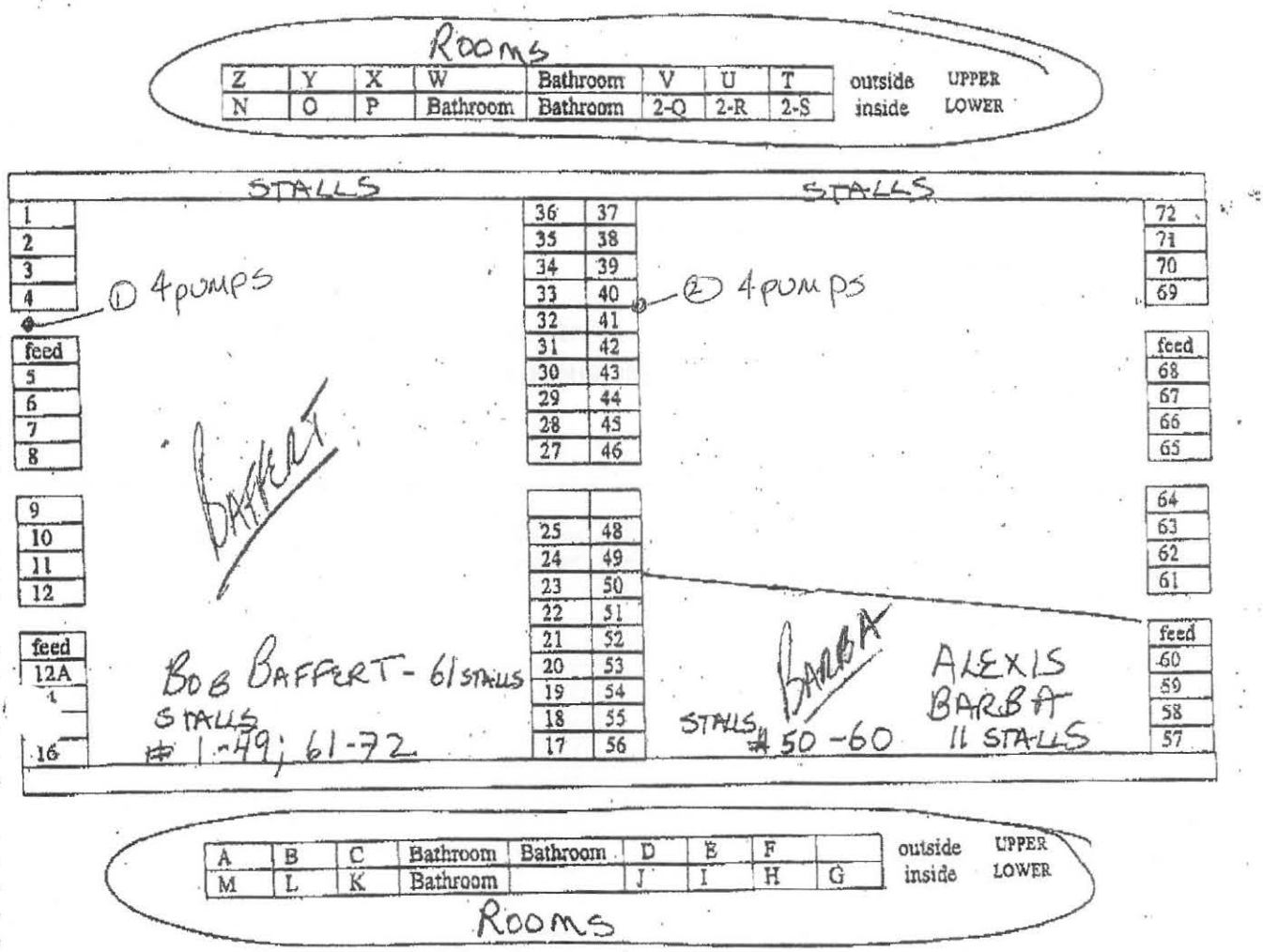


S-1, S-2, S-3 & S-4 COMBINED FOR SHED ROW COMPOSITE
F-1, F-2, F-3, F-4, F-5, F-6 FEED ROOM COMPOSITE

LOCATIONS of SAMPLES in BARN 61

BN 61

BARN 61
TACK ROOMS



Air Sampling Pump Locations - Barn 61

Bn 61