Court file no.:

IN THE COURT OF QUEEN'S BENCH OF ALBERTA
JUDICIAL DISTRICT OF EDMONTON

BETWEEN:

TOVE REECE, ZOOCHECK CANADA INC.
and PEOPLE FOR THE ETHICAL TREATMENT OF ANIMALS INC.

Applicants

-and-

CITY OF EDMONTON

Respondent

AFFIDAVIT OF DR. PHILIP K. ENSLEY

I, Dr. Philip K. Ensley, of the City of San Diego in the State of California in the United States of America, MAKE OATH AND SAY THAT:

1. I have been asked and I am willing to provide an expert opinion regarding whether Lucy the elephant is in distress at Valley Zoo in Edmonton, Alberta and the impact that the conditions and standard of care at the Valley Zoo have had upon her health. As a result of my professional qualifications (described below) as well as my review of relevant records and documents (listed below) I have knowledge of the matters herein deposed.

Professional Qualifications

2. I am a veterinarian with more than 30 years of experience in zoo and wild animal medicine. I retired from active clinical practice in zoo and wild animal medicine in 2005. I discuss my qualifications below, and have included a list of my publications as part of my *Curriculum Vitae*, a copy of which is attached as **Exhibit A.**

3. I obtained my Doctor of Veterinary Medicine degree from Tuskegee University in Alabama in 1970. Following graduation I served for two years in the US Army Veterinary Corps. I subsequently completed an internship in small animal medicine and

surgery at the Henry Bergh Memorial Hospital of the American Society for the Prevention of Cruelty to Animals in New York City. I also completed a post doctoral internship in zoo animal medicine and surgery at the Smithsonian Institution National Zoological Park in Washington, D.C.

4. In 1976 I joined the Zoological Society of San Diego as an associate veterinarian. I remained employed by the Zoological Society of San Diego in that capacity for twenty-nine years. The Zoological Society of San Diego is a non-profit organization that operates the San Diego Zoo in Balboa Park, the San Diego Zoo's Wild Animal Park in Escondido, and the San Diego Zoo's Institute for Conservation Research.

5. During my tenure at the Zoological Society of San Diego I worked with Asian and African elephants in addition to a broad range of rare and endangered species of mammals, birds, amphibians, and reptiles, at both the San Diego Zoo and at the Wild Animal Park. I worked in a group practice which gave me the opportunity to work with several excellent zoologists, behaviorists, conservationists, veterinarians and specialists in veterinary medicine. While employed with the Zoological Society of San Diego I was able to monitor the health of Asian and African elephants at the Balboa Park facility during an eleven year period of time when they were managed under a free contact management system, not unlike the program at the Edmonton Zoo. At the Wild Animal Park I was able to monitor Asian and African elephants under both a free contact management system as well as during the period of transition to a protected contact management system. Several changes were required for the Wild Animal Park to move to a protected contact management program. Structural design changes to the elephant housing facilities were necessary as well as with the elephant management standard operating procedures. During the time I was at the Wild Animal Park there were active breeding programs for both Asian and African elephants. Between the Park and the Zoo I participated in a variety of elephant medical procedures to include the repair of a jaw fracture, treatment of foot problems such as split toe nails, foot trims, foot or toe abscesses, arthritis, and degenerative joint disease, eye infections, lameness, digestive upsets, abdominal surgeries, anesthesia procedures, reproductive and birthing problems, routine annual examinations, and post mortem examinations.

6. I became a diplomat of the American College of Zoological Medicine in 1993.

The American College of Zoological Medicine (A.C.Z.M.) is the body that administers the certification examination to qualify specialists in zoological medicine. For three years (1994-1997) I served on the credentials committee of the College, and for three years (1999-2001) I was chairperson of the examination committee. My duties while serving on the credentials committee included reviewing the applications and credentials of veterinarians requesting to sit the specialty board examination to become Diplomats of the A.C.Z.M. In addition as a member of the credentials committee I reviewed applications submitted by zoo and veterinary school teaching programs to determine if they satisfied the criteria for recognition by the College to become an accredited teaching program. As chairperson of the College's examination committee I supervised the formation of the College's annual exam and the work of the committee members to hold and administer the exam to veterinarians sitting the two day exam.

7. I have provided testimony on a number of occasions relating to elephant, and other species' health and management:

(a) **San Diego Wild Animal Park 1988-1989**

8. As an employee of the San Diego Zoo I gave testimony during an investigation by the City of San Diego District Attorney's Office concerning alleged abuse of an African elephant, Medundamela, following the animal's move from the San Diego Zoo to the San Diego Wild Animal Park. The San Diego District Attorney decided that no criminal charges would be filed by their office.

(a) Kurtes Quesinberry, Janet Yocum, and Gwenn G.W. Nordahl, Plaintiffs, vs. John F. Cuneo, Jr.; The Hawthorn Group, et. al. Defendants. Civil No. 94-4783-12 October 1996

9. I reviewed case material and provided an opinion for plaintiff's attorney concerning the management of African elephant, Tyke. I gave a deposition for the plaintiff's attorney, Law Offices Of William Fenton Sink, Honolulu, Hawaii. This case was settled out of Court. I am not aware of the terms of the settlement.

(b) Portland Zoo/Alleged Abuse of Elephant (Rose Tu) by Keeper Case #00-66799. November 2000-January 2001

10. I reviewed case material, and provided an opinion to Ms. Dana Campbell, Staff Attorney, Animal Legal Defense Fund, and Mr. Jeff Howess, Deputy District Attorney,

Portland, Oregon. I am not aware of the final results of this case.

(c) Ringling Bros. Barnum and Bailey Circus-San Jose Arena-HSSCV Case #A99-015840. January 2000

11. I reviewed case material, regarding alleged abuse of elephants, and provided an opinion for Deputy District Attorney Robin B. Wakshull, San Jose, California. I am not aware of the final results of this case.

(d) The People of The State Of California, County of Riverside Vs. John Hans Weinhart/Marla Jean Smith, Court Number RIF110175. February 2005

12. This was a case of alleged animal abuse involving tiger cubs in which I testified as an expert witness at the preliminary hearing, and in court for Deputy District Attorney Stephanie B. Weissman, Riverside, California. I am not aware of the final results of this case.

(e) American Society For The Prevention Of Cruelty To Animals, et al. v. Ringling Brothers And Barnum & Bailey Circus, et al. Civ. No. 03-2006 (D.D.C.) Judge: Emmet G. Sullivan, Magistrate Judge: John M. Facciola March 2008-March 2009

13. Following a review of case documents and participation in two site visits I provided an expert report for plaintiffs' attorneys. I gave a deposition in this case, and subsequently testified in Court as an expert witness. The Court entered judgment in favor of defendant.

14. In Tove Reece, Zoocheck Canada Inc. and People for the Ethical Treatment of Animals Inc. v. the City of Edmonton I base my opinion on the leading academic material in the field of elephant care as well as on my own experiences and training in the field. Some of the academic material and some of my own experiences are related to African elephants (*Loxodonta africana*). However, it is widely acknowledged that many of the principles relating to the care of African elephants are equally applicable to Asian elephants (*Elaphas maximus*). For example, the Elephant Husbandry Resource Guide points out that the social behaviors of African and Asian elephants are similar. Also, the AZA Standards specifically state that they are equally applicable to African and to Asian elephants.

15. I have listed all of the academic sources I rely on in this affidavit and have attached them as **Exhibit B**.

Documents and Records Reviewed for this Affidavit

16. Julianne Woodyer of Zoocheck Canada Inc., one of the plaintiffs in this matter, provided me with the following records, documents, photographs and video recordings relating to Lucy which she either obtained from the City of Edmonton through freedom of information requests, compiled from the documents and records she obtained from the City of Edmonton or made herself (the photographs and video recordings).

(a) Lucy's Veterinary Medical Records from May 19, 1977 through June 24, 2009, a copy of which are attached as **Exhibit C**;

(b) Lucy's Daily Log Books from January 1, 2008 through July 14, 2009, a copy of which are attached as **Exhibit D**;

(c) Lucy's 2008 Walk Log, a copy of which is attached as **Exhibit E**;

(d) Lucy's March-July 2009 Walk Log, a copy of which is attached as **Exhibit F**;

(e) Six photographs of Lucy, copies of which are attached and collectively included as **Exhibit G**;

i. Lucy inside enclosure, image taken June 1, 2009;

ii. Lucy in barn, image taken June 1, 2009; and

iii. Lucy outside barn in snow, image taken March 16, 2009;

iv. Lucy walking on snow and ice, image taken March 16, 2009;

v. Outdoor elephant enclosure yard, image taken April 26, 2007;

vi. Lucy in barn, image taken May 2, 2005;

(f) A drawing of Lucy's indoor barn measurements, dated 10/30/09, a copy of which is attached as **Exhibit H**;

(g) A drawing of Lucy's outdoor enclosure measurements, dated 10/30/09, a copy of which is attached as **Exhibit I**;

(h) A video of Lucy in her indoor enclosure, taken by Ms. Woodyer on April 25, 2007, a copy of which is attached as **Exhibit J**;

(i) A video of Lucy in her indoor enclosure, taken by Ms. Woodyer on March

16, 2009, a copy of which is attached as **Exhibit K**;

(j) Elephant Consultation Report for Female Asian Elephant "Skanik" (aka "Lucy"), dated 10 September 09, by Dr. Oosterhuis, a copy of which is attached as **Exhibit L**; and

(k) Lucy's Treatment Program, Edmonton Valley Zoo's plan to implement expert recommendations November 13, 2009, a copy of which is attached as **Exhibit M**.

17. I believe these records, documents, photographs and video recordings provided by Ms. Woodyer to be true and accurate. I understand that the drawings are not expected to be fully accurate.

18. Furthermore, I have reviewed section 2(2) of the *Animal Protection Act*, which provides a legal definition of "distress" as well as Government of Alberta Standards for Zoos in Alberta (the "GASZA Standards") and the Association of Zoos and Aquariums' Standards for Elephant Management and Care (the "AZA Standards").

Summary Conclusion

19. Based on my academic and professional experiences, as well as my review of the attached exhibits I conclude that Lucy is in distress, as that term is defined in section 2(2) of the *Animal Protection Act*. Specifically, I conclude that Lucy is in distress (Suffering or Privation) as a result of her medical conditions in the circumstances in which she is kept and her lack of an elephant companion(s).

Lucy's Medical Problems According to the Valley Zoo's Records

20. Lucy is currently suffering from a number of chronic medical problems: respiratory, arthritis, foot problems, obesity, sleep disorder, and bed sores. In addition to the medical problems listed above, Lucy has also suffered from oral/dental problems.

21. Below I have listed each of these problems and noted references to these problems as they are documented in the Valley Zoo's records for Lucy. In the next section I discuss the relationship between these problems and Lucy's living conditions and standard of care at the Valley Zoo.

(a) Respiratory Illness

22. The first notation of a respiratory problem in Lucy was documented in her veterinary medical records on October 4, 1994, when she was approximately 19 years of age. The October 4, 1994 notation stated: "Blowing white discharge from trunk a large amount daily - sample sent for C & S."

23. Lucy's respiratory problems reappeared briefly in 2000 and became a chronic condition by 2004. For her respiratory problems Lucy is treated almost daily according to her Daily Log with Sputolysin™, (expectorant powder), and a decongestant medication (generic or trade name not identified in the Daily Log). The Daily Log indicates additional medicinal treatments given to Lucy on a near daily basis to include Buzone™ (non-steroidal anti-inflammatory drug), UBAVET™ (liquid glucosamine HCL) or Corta-Rx™ (joint supplement) both joint nutraceutical products.

24. This chronic respiratory problem continues to exist today, as Lucy's veterinary medical records reflect:

Date	**Notation**
October 4, 1994	Blowing white discharge from trunk a large amount daily - sample sent for C & S.
February 9, 2000	Has had thick mucous discharge from nose on & off for past 3 weeks. Not vocalizing and heard rumbling sounds like congestion from sinuses.
March 29, 2000	Yesterday lethargic, some pussy discharge from trunk. Didn't eat well the night before. Day before outside rolling in cold mud. Kept inside yesterday, seemed a bit better last night. She should be given a choice to go outside or stay inside. She needs outside exercise and being on the sand is better for her than being on concrete. No treatments.
June 23, 2004	Since Monday snuffling and gurgling in trunk age 3. Some occasional discharge. Possible allergies.
August 25, 2004	Trunk gurgling a bit. Hay is very dusty. Wet hay down prior to feeding.

October 6, 2004	Recheck, still wheezing. Use dilute salt water solution (5%) as a salt water trunk wash.
October 13, 2004	Recheck, wheezing in trunk is worse. Open mouth breathing a few times today. Possible sinus infection.
November 3, 2004	Keepers have observed that when she is laying on left side she has more laboured breathing. Trunk some pussy discharge yesterday. Open mouth breathing continues.
November 10, 2004	Passing out large mucous masses at times from trunk.
November 24, 2004	Still bringing mucous discharge up through trunk.
December 12, 2004	Sedated. Fiber optic exam with endoscope of both nostrils and mouth. Neither nostril red or inflamed, left nostril slightly cleaner than right. Scope has 110 cm reach- used all of it.
December 13, 2004	Breathing worse today.
December 22, 2004	Treat upper respiratory inflammation. Treat diphenhydramine hydrochloride for 10 days.
February 2, 2005	Still has occasional mouth breathing when out for walks.
February 23, 2005	Open mouth breathing increased
June 14, 2005	Treat upper respiratory condition diphenhydramine hydrochloride orally for one dose
June 22, 2005	Sounds like a lot of mucous in trunk continue benadryl.
June 29, 2005	Lots of open mouth breathing. Harder breathing out when laying down. Today some gurgling noises.
July 6, 2005	Trunk right side more congested than left side.
July 13, 2005	Trunk lots of clear mucous discharge still mouth breathing.
July 20, 2005	Treat upper respiratory congestion diphenhydramine hydrochloride for 377 days. Breath has a bit of odour, most likely due to mouth breathing.
August 3, 2005	Trunk lots of white discharge. One nostril appears to have a

	blockage.
November 11, 2005	Heavy open mouth breathing.
November 23, 2005	Lots of heavy breathing. She is very congested.
December 1, 2005	Trunk still seems to be congested. Breath smells very bad. Currently try to get a consult on scoping the trunk.
December 29, 2005	Trunk scope- no visible cause of respiratory problems noted. Right nostril slightly thicker than left nostril. Left nostril scope in approx 2.0-2.2 meters, small growth/plaque approximately 6" from trunk end. Right nostril scope in approx 2.0-2.2 meters. Some puss seen in at approx 2.0 meters.
February 15, 2006	Breathing: still open mouth breathing every 3-4 minutes.
March 8, 2006	Trunk has been bringing up more white discharge from the trunk over the last couple of days.
May 17, 2006	Keeper reports decreased nasal discharge with doors left open due to warmer temperatures and fans on.
May 25, 2006	Sounds very gurgly in trunk. Lots of white discharge from trunk.
June 21, 2006	On Monday difficulty breathing in and out of trunk. Lots of head resting. Not laying down to sleep-tired. Will go down on command will not stay down. Right nostril plugged somewhat. Mouth breathing when laying on right side
July 27, 2006	Treat: Possible pneumonia treat Novo-trimel orally 5 days.
August 2, 2006	Taken off meds July 31, 2006 due to lack of appetite.
August 16, 2006	Breathing a bit worse.
August 19, 2006	Breathing appears more labored. Lethargic, yellow discharge noted.
October 18, 2006	Keeper report she is quite congested.
March 28, 2007	Trunk discharge somewhat like cottage cheese.
April 25, 2007	White nasal discharge continues.
November 7, 2007	Lots of thick white mucous from trunk, some whistling during

	breathing.
December 3, 2007	Breathing no change, continuing to mouth breath lots of foamy discharge.
December 18, 2007	Continued mouth breathing. Bringing up thick white discharge, still mouth breathing.
January 14, 2008	Nasal discharge with some greenish tint, lots of necrotic material around tooth.
May 27, 2009	IDEXX Laboratory Report Comment Attn: Dr. Harr. Routine Panel. Has had chronic respiratory problems related to impacted upper molar mouth breathes, eats well, slightly overweight, nasal discharge, some arthritis. Please add serum electrophoresis.
June 12, 2009	IDEXX Laboratory Report **Added by Kendal Harr DVM MS DACVP on 6/18/2009 2:17:47 PM GMT** A:G ratio is 0.5 indicating an active systemic inflammatory process is present. Beta peak (fibrinogen and other acute phase proteins) indicates acute phase response activation and systemic inflammation.
June 15, 2009	Low resting cortisol. A/G ratio is 0:5 indicating active inflammatory process is present. This is due to chronic sinusitis. Dr. K. Harr rec. fibrinogen as well. Will use this as a monitor for her sinusitis

25. In addition to Lucy's veterinary medical records, her 2008 Walk Log includes documentation relating to Lucy's respiratory problems, as noted below:

Date	**Notation**
May, 2008	- mouth breathing today, sour trunk
June, 2008	- lost [lots?] of mouth breathing
June, 2008	-Skin still cold- Milt gave Banamine (60ml) 1 PM- no Buzone until Sunday- breath is worse tonight- never been this bad- end of day hot outside but her skin is still cold
July, 2008	Physiotherapy sessions (gasping)
August, 2008	- tooth (top left) starting to separate

	-she was very tired this morning, did not really want to walk. She is having hard time breathing, tried to have her sleep but she cannot seem to breath lying down.

26. The Daily Logs dated between January 1, 2008 and July 14, 2009 have also included notations relating to Lucy's respiratory problems:

Date	**Notation**
May 19, 2008	fell asleep during demo (can't breathe on L side)
May 26, 2008	has hard time breathing on L (for demo)
June 2, 2008	hard time breathing
June 14, 2008	gasping for to breathe
July 8, 2008	Bit of gasping
July 10, 2008	gasping
July 22, 2008	Low level gasping

27. Dr. Oosterhuis' Elephant Consultation Report dated September 10, 2009 includes a number of comments about Lucy's respiratory illness. According to the Elephant Consultation Report, Dr. Oosterhuis had the opportunity to examine Lucy. An endoscope procedure was performed in order to examine each nostril. Dr. Oosterhuis' report states that, "On closer inspection, however it is noted that she has a white nasal discharge and when she walks too fast she has to periodically open mouth breathe during the walk and will even stop and take every breath through her mouth in order to get enough air into her lungs."

28. In addition Dr. Oosterhuis' report states that:

> At the extent of the scope, the nasal passages narrowed to slits and there was a considerable amount of white exudate —the same material that she discharges from the end of her trunk. With each respiration, it was noted that the air was forced through the area, bubbling through the exudates. This area was thought to be just above the soft palate. No obvious reason could be seen that would account for the constriction. No polyps or tumors were seen. Also, both sides appeared the same, so the association with the deformed, recently shed, right upper molar could not be directly correlated to her problem.

(b) Arthritis

29. The first notation and diagnosis of arthritis in Lucy's veterinary medical records as a problem dates to October 1, 1991, when Lucy was approximately 14 years of age. The notation for that date states: "Problem: Arthritis, treatment phenylbutazone orally for three days." As noted previously the Daily Logs indicate medicinal treatments given to Lucy on a near daily basis to include Buzone™ a non-steroidal anti-inflammatory drug, and UBAVET™ liquid glucosamine HCL or Corta-Rx™ both joint nutraceutical products. Lucy's veterinary medical records document Lucy's arthritis history to include references to stiffness, swelling, soreness, lameness and pain:

Date	**Notation**
October 1, 1991	Problem: Arthritis, treatment phenylbutazone orally for three days.
October 15, 1991	Problem: Arthritic, treatment Buzone™ once daily for five days.
June 11, 1997	Appears possibly sore on right rear leg, does not want to go down.
December 28, 1997	Problem: Treat stiffness, Ibuprofen™ through December 31, 1997.
January 7, 1998	Treat stiffness, Ibuprofen™ 14 days twice daily.
January 21, 1998	Treat stiffness, Ibuprofen™ once a day for seven days.
January 28, 1998	Treat soreness, Ibuprofen™ seven days.
February 4, 1998	Treat soreness, Ibuprofen™ seven days. Today very stiff getting up.
February 11, 1998	Treat soreness, Ibuprofen™ orally once daily for seven days. Blood drawn to Vpl. Previous results show possible arthritis.
February 18, 1998	Treat soreness, Tylocin™ IM once daily for 7 days.
February 20, 1998	Treat pain and swelling, Ibuprofen™ twice daily for five days.
February 25, 1998	Treat arthritis, Ibuprofen™ for seven days. Still stiff and sore in back.
March 24, 1999	sore right hip, slow to come down and get up from a come down on that side.
April 29, 2000	Treat swollen leg, Ibuprofen™ three days, possible sprain.

May 1, 2000	Treat swollen leg, Ibuprofen™ two days twice a day.
May 3, 2000	Moving better, bending knee reduce Ibuprofen™ to once daily
May 4, 2000	Treat stiff leg, Ibuprofen™ once daily for three days
May 10, 2000	Leg still a bit stiff
June 21, 2000	She is arthritic and that rock is too high. May precipitate another arthritic event. Should not encourage her or make her get on the rock. Limit all her movements to only what she needs to be done to work around her.
July 26, 2000	Due to her arthritis she should be asked to do only the basics to get her cleaning/training done. When she is on her own she will limit her own movements/exercise. Short walks on flat level surfaces would be good for her. If she is having an arthritic event, limit her to what she chooses to do.
September 6, 2000	Very sore, doesn't even want to stretch out, getting better on own.
September 14, 2000	Treat arthritis Ibuprofen™ five days
September 20, 2000	Soreness right rear leg, had a "hot" sensitive spot on it, treated with Ibuprofen™
June 28, 2001	Treat arthritis Ibuprofen™ six days, very stiff right rear
July 4, 2001	Treat arthritis Ibuprofen™ for 5 days. Stiff right rear leg. Since June 28/01. Somewhat improved since then, just started stretching again on July 2. Still has a hard time getting up.
July 11, 2001	Still favoring right hind leg a bit. (Relieves weight on it when standing).
September 12, 2001	Has been stiff again. Back right leg sore again. Hot over hip area. Look into possibility of acupuncture.
September 24, 2001	Acupuncture treatment by Dr. Ung.
November 1, 2001	Treat arthritis Ibuprofen™ once daily past four days. Sore lately, locked in because of fencing, very stiff on back left. Trouble stretching and getting up, Ibuprofen™ four days.
November 4, 2001	Treat arthritis two days

November 8, 2001	Still very stiff
November 14, 2001	Still very stiff
November 24, 2001	Dr. Ung gave her acupuncture treatment.
January 10, 2002	Doesn't appear to be laying down to sleep. Won't stretch out or come down. Treat arthritis Ibuprofen ™ for 4 days
January 2, 2002	Sore not laying down. Right rear leg appears swollen between ankle and knee, but not warm to touch. Interacting with other elephant and still playful at times.
February 12, 2002	Right front foot has been sore, favoring it. Right knee appears swollen measurement indicates is a bit larger.
February 10, 2002	Does not appear to be laying down to sleep. swollen. Left front foot has a sore.
February 20, 2002	Radiograph of right knee.
February 21, 2002	Treat arthritis two days with Ibuprofen™
February 28, 2002	One readable X-ray showed spurs in the knee joint.
March 6, 2002	Severe arthritis (degeneration) of right carpus on radiograph. Continue palliative therapy (Ketoprofen™), behavior modification and continue acupuncture treatment., Chinese herbal medication on a trial basis two to three months.
March 12, 2002	Ketoprofen ™ prohibitively expensive prophylactically. Use Ibuprofen™ as needed.
March 20, 2002	Right front leg stiff at carpus. Bottom of feet need to be trimmed as they are badly overgrown
April 16, 2002	Treat arthritis twice daily for 15 days phenylbutazone.
June 19, 2002	Treat arthritis once daily for 43 days, phenylbutazone.
July 31, 2002	Stiff on left hip after walks. Treat arthritis once daily for 145 days, phenylbutazone. Bed sore on right hip and right elbow, both hot to touch. Lifting right front leg well, can flex it well, but possibly holding it up/favoring it at times. Swelling on front right leg subsided somewhat. Did not walk as long today due to cold and

	rain. Continue normal exercise in all weather.
October 10, 2002	Treat arthritis, polysulfated glycoaminoglycan IM as needed. Adequan™ IM repeat weekly for 7 more injections then reassess whether to continue injections or go to oral.
December 11, 2002	Treat arthritis once daily, phenylbutazone for 7 days. Seems a little more stiff and slow.
December 12, 2002	Treat arthritis for 56 days, phenylbutazone.
December 31, 2002	Very sore before Christmas. Front feet very sore, changing feet to relieve pressure, slower moving, less puss from hip abscess. Butone (Buzone™) increased.
May 7, 2003	Buzone™ increased on Sunday due to severe stiffness.
May 8, 2003	Treat arthritis phenylbutazone twice daily for 7 days.
August 3, 2003	Treat arthritis phenylbutazone 9 days.
August 13, 2003	Treat arthritis.
September 17, 2003	Treat arthritis phenylbutazone for 196 days. Friday ran out of Buzone™ so put on Ibuprofen™. Right knee swollen and sore 90 degree flexion.
November 12, 2003	Treat arthritis polysulfated glycoaminoglycan IM as needed.
April 1, 2004	Treat arthritis phenylbutazone orally twice daily for 91 days.
June 7, 2006	Stiff right front yesterday. (Stepping heavily) shoulder or elbow appears sore. Treat arthritis phenylbuzone once daily 55 days
June 15, 2004	Keepers report that when standing and walking left leg seems to rotate out a little.
June 30, 2004	Front right knee swollen for 4-5 days, using trunk to assist walking. Hot for two days, still hot to touch. Treat phenylbutazone twice daily for seven days.
July 7, 2004	Treat arthritis. Treat phenylbutazone twice daily for 157 days.
August 25, 2004	Favoring right front foot a bit.
September 29, 2004	Back left hip a bit sore.
December 14, 2004	Treat arthritis phenylbutazone for 30 days.

January 12, 2005	Treat arthritis phenylbutazone for 14 days.
January 26, 2005	Treat arthritis phenylbutazone twice daily for 12 days.
February 9, 2005	Treat arthritis phenylbutazone for 44 days.
March 21, 2005	Treat arthritis phenylbutazone for 70 days.
December 21, 2005	Treat arthritis phenylbutazone once daily for 124 days. Continue Buzone™ until further notice.
June 7, 2006	Stiff right front yesterday. (Stepping heavily) shoulder or elbow appears sore. Not sleeping since sand moved out from inside. Treat arthritis phenylbutazone once daily 55 days
February 14, 2007	Front left knee swollen and appears sore. Treat arthritis phenylbutazone for seven days.
March 14, 2007	Treat soreness from arthritis, phenylbutazone for seven days.
April 28 2007	Treat pain from arthritis phenybutazone three days.
July 4, 2007	Treat pain from arthritis phenylbutazone seven days. Yesterday limping on front foot. Moving very slow. Today very congested, does not want to lay down.
July 11, 2007	back left leg very stiff this a.m. Continue Buzone™. Keep on lowest dose possible but adjust as needed.
August 5, 2007	Keeper Report still very stiff and somewhat slow lifting front right leg very little while out on walks. Right front knee quite swollen.
August 9, 2007	Treat arthritis phenylbutazone
August 13, 2007	Treat arthritis. Bending right knee at first then stiff after walk.
October 31, 2007	Stiff right front knee- started October 25 swinging leg, very stiff on 26th & 27th. A bit better on 28th. On 30th seems to be stiff in shoulder, but have better flex in knee.
November 15, 2007	Stiffened up overnight. Front right knee no flexibility at all, not bending, to start Buzone™ again. Monitor stiffness and adjust Buzone™ as needed.
November 16, 2007	Treat arthritis phenylbutazone orally twice daily for 13 days. Still very stiff, Ok to increase Buzone™ to 2 scoops (6 gms) twice a

	day. If still stiff tomorrow, may increase to 3 scoops (9 gms) twice a day, to reduce as much as possible.
March 12, 2008	Sore and swollen left front over radius.
March 20, 2008	Treat arthritis phenylbutazone once daily 26 days.
April 26, 2008	Treat arthritis phenylbutazone 37 days.
August 30, 2008	Treat arthritis phenylbutazone 13 days.
September 16, 2008	Treat arthritis phenylbutazone 14 days.
September 30 2008	Treat arthritis & ache from malpositioned tooth. Arthritis in front left leg is more noticeable today.
October 2, 2008	Treat arthritis phenylbutazone 13 days.
November 4, 2008	Treat arthritis phenylbutazone for 7 days twice daily. Sore right hind, will warm out of soreness. Decreased stride length. increase bute to twice daily for one week than return to initial dose.
November 14, 2008	Treat arthritis phenylbutazone 20 days.
December 10, 2008	Treat arthritis phenylbutazone 27 days.
March 25, 2009	Treat arthritis phenylbutazone 64 days.
May 27, 2009	Treat arthritis phenylbutazone once daily until further notice.

30. Lucy's 2008 Walk Log also includes a number of entries for arthritis, stiffness, swelling, soreness, lameness and pain:

Date	**Notation**
January, 2008	-stiff shoulder and knee -Did not lay down last night, scrapes on Right eye, forehead leaning on wall, not hungry. Lucy experiencing anxiety near end of day.
February, 2008	-stiff in back legs
April, 2008	-No well, vet getting new pain killers.
July, 2008	-Extremely tired, somewhat sore on LF. End of day rubbing RF leg.
September, 2008	-Very tired this AM- layed down to sleep inside but couldn't get

	comfortable, favouring and resting her left front leg -Dr. Ness looked at her. Still very sore today left front leg/ Swinging leg. Difficulty bending knee.
October, 2008	-a little stiff downhill, swinging right leg out coming down -right hip stiff going down slopes -very stiff again today going down hills
November, 2008	-she is extremely slow today, not walking the greatest. Slow in PM as well -right front leg by pits - muscle pulled? Swelling there. -doing commands right front leg bit stiff. Didn't lay down to sleep last night. Slept on sand pile last night -left front very stiff to lift for PC

31. Lastly, Lucy's Daily Logs for January 1, 2008 - July 14, 2009 reveal additional documentation related to her arthritis:

Date	**Notation**
June 7, 2008	-On walk up in the back she was very slow bringing LF over a log as she was grazing.
June 8, 2008	-Stepping very heavy on right.
October 28, 2008	-stiff on right side
October 21, 2008	-a little stiff downhill, swinging right leg out coming down
May 7, 2009	-she was a bit stiff getting up from her left side- possibly due to long walks
July 12, 2009	-reluctant to do behaviours for demo. a bit lethargic.

32. The Elephant Consultation Report September 10, 2009 by Dr. Oosterhuis, states: "Also, recent radiographs of her front feet show some arthritis;" "Also, she has some stiffness in her left elbow;" and "Skanik is currently on oral phenylbutazone due to the arthritis in her lower legs and feet."

(c) Foot Problems

33. Lucy has a long history of problems with her feet, including split or cracked toenails, nail bed or toe and foot abscesses and infections. The first notation relating to foot problems is dated September 22, 1989, when Lucy was approximately 14 years of age. Lucy's veterinary medical records document her foot problems:

Date	**Notation**
September 22, 1989	"Left front foot abscess. Rx: GENTOCIN/DMSO SPRAY topically BID for 5886 days. Refer to monthly data reports for more information. Originally prescribed until further notice. Discontinued on 2 Nov.2005"
February 18, 1992	Split right front nail. Topical treatment.
March 3, 1992	Split toe nail, topical 7days.
January 12, 1993	Cracked toe, cuticle and skin Rx ABSORBINE
July 4, 1995	Split rear nail continue to observe.
August 1, 1995	Check toe, groove out nail on toe.
November 28, 1995	Dry nails, ok to use Hooflex™ once a day.
January 24, 1996	Soft sole, spray twice a day with tincture of benzoin.
February 21, 1996	Hooflex™ used daily on cuticles, treat HoofPro™ in feed daily.
April 28, 1998	Excessive cracks in nails.
May 13, 1998	Smallest nail on front left foot very soft, if breaks will treat by soaking with Epsom salts and iodine hole.
May 27, 1998	Recheck: toe left front. Lesion broke & cavity present clean daily, iodine every other day.
June 3, 1998	Recheck toe: Cuticle peeling off.
July 2, 1998	Recheck toe: looking better starting to grow out.
March 17, 1999	Check right front foot pad soft, will contact other facilities regarding heated floors and see if this could be a possibility and has happened anywhere else.
April 14, 1999	Feet appear to be getting worse, soft on bottom. Try to get the

	proceedings from the recent foot symposium. Try to get her outside walking on the sand more. See if that improves pad condition.
March 27, 2002	Possible left front foot abscess. Front right foot not as sore today, flexing better. Soft spot 3cm x 3cm on bottom inside near second inside toe on front left foot. Treatment soaks.
March 31, 2002	Front right foot pad very soft, possibly ruptured abscess. Foot soaks.
April 3, 2002	Right front foot pad- soft spot- softness had increased. Foot soaks.
April 10, 2002	Foot soaks.
April 17, 2002	Front right foot inside toe, on top of cuticle, pus, broken toe abscess.
April 18, 2002	Treat cuticle abscess right front foot.
May 1, 2002	Abscess broke through bottom of foot last night.
May 10, 2002	Treat arthritis Ibuprofen™ three days. Continue abscess treatment.
June 7, 2002	Right front outside toe nail 75% detached from nail base.
June 8, 2002	Outside nail fell off.
June 10, 2002	Still very sore. Sleeping a lot. Not eating or drinking much. Some diarrhea. Inside toe nail 75% off. Start Ketoprofen™ treatment for soreness.
June 11, 2002	Moving better today. Stools looking normal. Can stand and walk to the pad, still appears very weak in hind quarters. Inside toe fell off.
June 18, 2002	Sores on right side of face. Right front foot swollen. Appears to be cracking behind all toe nails. Left front foot- one of outside toes cracking at base.
September 11, 2002	Right front, toe nail #4 has soft spot on outside of toe nail. Trim feet per Dr. Oosterhuis instructions.
December 4, 2002	Right front foot abscess blew out top of toe nail #5. Right front

	toe nail #2 pus observed underneath. Treat arthritis phenylbutazone 3 days.
December 11, 2002	Right front toe nail #5, nail base splitting out, soft spot under toe. Seems a bit more stiff and slow. Try taping a piece of duck tape to bottom of foot before walks to keep out stones. Possible try a silicone sock next week.
February 5, 2003	Split right foot toe nail #5, nail bed swollen.
September 3, 2003	Treat foot abscess after flushing. Rx Ketanserin tartrate % topically BID for 792 days. Discontinued on 2Nov05.
March 17, 2004	New abscess erupted front left toe #4 on top of nail but below cuticle. Right front toe #5 cracked through. Hole in pad very sensitive.
April 7, 2004	Recheck: Front feet have been sore. Buzone™ increased for a few days has now been reduced.
May 5, 2004	Front left toe #4- small amount of pus coming from hole.
May 12, 2004	Right front foot-hole in pad now extends approx 1.5-2 inches into foot pad. He has been full of sand and dirt. Smells. Front left foot cracked toe is still bulging, occasionally oozing from toe- sometimes pus, sometimes blood or fluid.
June 23, 2004	Right front foot toe #4 hole under pad just inside of nail is now deeper.
November 24, 2004	Front left foot outside left toe pus discharge since Sunday during foot trim. Second outside toe pus discharge from toe, culture.
December 8, 2004	Front left foot outside second toe abscess ruptured on the weekend tracting down behind the toe.
December 13, 2004	Abscesses on cuticles on one nail on each front foot.
February 16, 2005	Right front foot- top of nail inside toe looking better, holes on bottom looking good., no smell. Cracked toe 5 inches W, 1 inch H. Will see about potentially plating the toe to keep the crack from spreading. Tail- pus on the weekend, better last couple days.

March 15, 2006	Thermography done today. Recommend sending Dr. Oosterhuis an update to on the feet with pictures, asking for his recommendations.
June 28, 2006	Abscess front left second outside toe draining underneath.
September 27, 2006	Front right foot healing slowly.
November 29, 2006	Front left foot- second outside toe, smelly bottom needs to be cleaned out, leave bridge in toenail for support.
January 17, 2007	Recheck. Front left foot outside second toe, no discharge of pus, starting to heal and grow in.
April 18, 2007	Front left foot bottom pad almost healed, still one channel, keep open and clean.
September 12, 2007	Not laying down to sleep. Can put leg in leg stand for footwork for no more than 5 minutes at a time. Do not take on long walks.
September 24, 2007	Cultured abscess right front toe #5. Questions from EMC: Can Skanik's Buzone be increased over the three scoop BID limit for the cold winter months? No, 10 gm BID maximum daily dose, above that is toxic to the liver so the dose should not exceed more than 3 LEVEL scoops twice each day. Is it possible to provide a buffer for her stomach along with the increase in Buzone (ie Bicarb)? No. It doesn't work that way. Would need losec/cimetadine etc. Is it possible to phone Dr. Oosterhuis to discuss long term effects of increase in Buzone? We have already done that. Regarding the open hole on her toe- can this be cultured? Anything can be cultured. Regarding her hip abscess- right now it is hard to get the catheter in to flush, is it ok to go to a smaller size catheter? Note smaller size provided on Tuesday Sept 23/03 Fr. #10 Yes. Regarding her hip abscess- is it ok to let the hole close? Yes, but it is best not to, as the pus will again build up and could tract to a different area.

	On the skin below the area of the hip abscess there is a small crack. Keepers have been applying Vaseline to keep it soft. Should anything else be used on this? Vitamin E cream.
January 28, 2008	Abscess above cuticle on front left foot outside second toe. Keeper expressed. Soaking all feet in epsom salts and apple cider vinegar.

34. Lucy's 2008 Walk Log also documents her foot problems:

Date	**Notation**
January	- left front foot abscess -foot stinking -Fitting for boot
February	-More x-rays- left front toes - split nail
May	-Ness checked out her feet
July	-Extremely tired, somewhat sore on left front. -Pooped by 2:30, dragging front feet.

35. Lucy's Daily Logs from January 1, 2008 - July 14, 2009, document near daily foot treatments consisting of Epsom or vinegar foot soaks, Kopertox™, Hooflex™, Iodine, or Honey Poultice (beginning March 2009). The Daily Logs reveal additional documentation of foot problems:

Date	**Notation**
January 16, 2008	LF pretty stinking
January 27, 2008	Pad thin, took nails to pink
February 22, 2008	Center toe RF has a sharp edge to it like she has been rubbing on something. Her cuticles are pushed up in some spots on both front feet
February 29, 2008	outer nail split – smoothed it so it does not catch

March 5, 2008	Extra hard scrub of toes to remove Hooflex build up
March 6, 2008	Hose- off YES, feet-to clean & remove road salt after walk
March 20, 2008	Bath YES Soap YES, extra hard scrub around toes to remove old Hooflex!
March 24, 2008	Bath YES Soap YES, extra scrub to remove Hooflex build up around & between nails
March 25, 2008	Bath YES Soap YES, extra scrub of toes, cuticles, etc. to remove Hooflex
April 11, 2008	File Nails YES LF outside nail splitting clean it up
April 13, 2008	Both center back nails have horizontal ...?... in them???
May 14, 2008	Trim Feet RF LF RR lots flaps but pads thin underneath File Nails YES, RF LF inside nails v thin
May 31, 2008	Foot Treatments AM Kopertox YES + Hooflex esp r.f center cuticle separation
September 19, 2008	Rocks getting stuck in back feet pretty good.
October 5, 2008	Recent nail crack on R rear
October 31, 2008	Hard to get rocks out of back feet
December 1, 2008	File nails RR removed outer corner-lowered to prevent more nail splitting on cent. Nail
December 13, 2008	Trim Feet YES RF LF pads looking good- cracks growing out. No stones beneath.
April 9, 2009	Extra scrub to remove hooflex buildup on cuticles.
April 18, 2009	The epsom salt soak seemed to bother her today.
June 17, 2009	EMC Meeting Minutes June 17, 2009 Standing Item 4. Health- Foot trims have not been carried out consistently. This needs to be done. Suggested to pick a day to do foot work.

36. In the Elephant Consultation Report September 10, 2009, Dr. Oosterhuis references two visits to see "Skanik" in 2002 and again in 2007. There are no consultation reports from these visits in Lucy's medical records; however, Dr Oosterhuis'

2009 report states, "[i]n 2007 when I saw her she had foot problems that were solved by adjusting her husbandry program, increasing her exercise schedule and reducing her weight." The 2009 report now indicates that, "[s]he has a pad defect on her right front foot and a bad nail on her left front foot. Also, recent radiographs of her front feet show some arthritis." "However, due to the previously mentioned conditions, she has developed a pad defect at the pad/nail junction of the #2 nail on her right front foot. Instructions were given to the keepers on how to handle this defect. The #4 nail on her left front foot is undermined, so most of the nail wall has been removed and the keepers were instructed on how to deal with this problem, also."

37. A review of the critical veterinary literature pertaining to elephants provides an important understanding and background as to the causes and impact of foot problems in captive elephants. In the first edition (1978) of the veterinary textbook series, *Zoo and Wild Animal Medicine* edited by Fowler, in the chapter on elephants, author Michael Schmidt discusses restraint and handling, diseases of the feet such as split nails, abscesses of the foot, and musculoskeletal diseases such as degenerative joint disease (Schmidt, 1978):

> Split nails are most often caused be inadequate wear or trimming, combined with moist conditions. Moist conditions soften the nail and inadequate wear or trimming puts unusual pressure on the softened nail causing it to split. If the split is caught early – before the deep sensitive laminae are exposed—the nail should be trimmed to eliminate pressure and the feet kept dry, which should prevent deepening on the crack.
>
> [...]
>
> Abscessation of the foot is a common sequel to injury or poor foot care. Due to the thickness and toughness of normal or overgrown sole, many abscesses of the foot are readily observable externally as a fluctuant swelling.
>
> [...]
>
> Degenerative joint disease is apparently more common in captive than wild elephants. Debate concerning cause of degenerative joint disease in captive elephants has centered around husbandry. Some researchers believe that elephants forced to live out their lives on hard surfaces such as bare concrete, which produces a damp, cold, environment, most often develop degenerative joint disease. Another view is that the uniform surface of hard, cold floors and the fact that many elephants are chained for the major part of the day in positions that restrict movement are responsible for the degenerative joint lesions seen in captive

elephants.

[...]

Captive elephants can develop loss of joint function after even minor injury if they are not required to move that joint after injury. It may be that the artificially induced, reduced joint use caused by chaining could contribute over the years to degenerative joint disease. Faulty conformation on individual elephants undoubtedly will predispose some elephants to develop more degenerative joint problems than elephants with normal conformation.

[...]

Actions that might be taken to prevent degenerative joint disease in elephants include providing a dirt exercise yard, providing concrete floors with a warm heat system built into them, padding the concrete surfaces on which the elephants are housed with artificial turf, foregoing chaining of elephants unless necessary as a temporary means of restraint, or combination of the above."

38. In the book *Wild Elephants in Captivity*, concerning the subject conditions of elephants' feet and limbs from standing on hard surfaces, the author makes several observations (Adams, 1981):

Elephants in captivity are frequently afflicted with arthritic and rheumatoid disorders which affect the bones and joints of the extremities. These are attributed to confinement in damp and cold concrete floors, poorly ventilated housing facilities, and insufficient opportunity to walk for extended distances. These diseases are rarely reported in wild elephants who generally walk a lot.

[...]

Wild elephants seldom have foot problems because they usually walk long distances, they are careful where they step, they use their feet to dig in the soil, and they bathe regularly.

[...]

Split sole or heel and overgrown sole are additional pathological conditions resulting when elephants remain standing in water or in their own excrement for long periods of time.

[...]

The constant moisture causes the sole to soften, and since the foot expands as the elephant places its weight on it, the usually tough sole splits and the break in the tissues becomes infected causing the symptoms described.

[...]

As mentioned for split sole and heel, standing in water or in its own excrement for a long period of time tends to soften the soles of elephants' feet. If the elephants are then made to walk long distances over coarse surfaces, the soles tend to wear more than usual and become tender. The result is lameness.

[...]

Elephants' toe nails also need attention. If unable to walk daily or dig in the dirt, elephants develop overgrown toenails. The nails extend beyond the sole of the feet, resulting in unusual shape and sometimes cracking. A contributing factor to the cracking of nails is excessive moisture to the feet.

[...]

This disease (degenerative joint disease) will have to be diagnosed by an experienced veterinarian and treated systematically. This disease is not common among captive elephants living in wild animal parks where they have large areas in which they can walk on soil.

39. In the fourth edition (1999) of the veterinary textbook series, *Zoo and Wild Animal Medicine* edited by Fowler and Miller, in the chapter on radiographic techniques of the elephant foot and carpus, author Laurie Gage comments on foot disorders (Gage, 1999):

> An extensive review of the medical management of elephants indicated that foot disorders are one of the most common ailments observed in captive elephants. Cracks in the nail or cuticle and abscesses in the sole are common and may lead to deeper infections. Severe infections in the soft tissues and nails may spread to the adjacent bones and joints of the foot, causing osteomyelitis and suppurative arthritis.

40. In the introduction to the veterinary text, *The Elephant's Foot* (2001, Cusuti, B. et. al., eds.), which is based upon information presented at The First North American Conference on Elephant Foot Care and Pathology held in March 1998, it is stated that:

> Foot problems are seen in 50% of captive Asian and African elephants at some time in their lives.
>
> [...]
>
> There is a consensus that lack of exercise, long hours standing on hard substrates, and contamination resulting from standing in their own excreta are major contributors to elephant foot problems.

41. It appears the Valley Zoo veterinary staff was aware of the Conference on Elephant Foot Care and Pathology as there is reference to this meeting in Lucy's medical records, on April 14, 1999: "Feet appear to be getting worse, soft on bottom. Try to get the proceedings from the recent foot symposium."

42. In the *Elephant's Foot* text's first chapter, An Overview of Foot Conditions in Asian and African Elephants, Fowler indicates (Fowler, 2001):

> The following are suggestions of predisposing factors leading to foot problems based on the author's experience:
>
> 1. Lack of exercise.
> 2. Overgrowth of nail and/or sole.
> 3. Improper enclosure surface.
> 4. Excessive moisture.
> 5. Insufficient foot grooming.
> 6. Insanitary enclosures.
> 7. Inherited poor foot structure.
> 8. Malnutrition.
> 9. Skeletal disorders (arthritis).

43. In the text's fifth chapter, Foot Care For Captive Elephants, authors Roocroft and Oosterhuis state (Roocroft and Oosterhuis, 2001):

> We believe that no matter how good a foot care program is, eventually foot problems will be seen because they are the result of keeping elephant in captivity.
>
> [...]
>
> Healthy feet require exercise of all joints, and ligaments. Anything less predisposes an elephant to foot problems, especially later in an elephant's life.
>
> [...]
>
> In captivity, elephants' feet are constantly exposed to their own feces and urine, which results from long hours of confinement in their stalls, up to 16 hours a day in some situations.
>
> [...]

Unfortunately, most captive elephants spend the majority of their time standing on concrete or asphalt floors. Elephants should be housed for the majority of the day on resilient, interactive, yielding surfaces. Substrates allowing an elephant to dig will exercise and strengthen leg and foot muscles, tendons and joints. This exercise and activity directly supports healthy feet throughout the elephant' life.

[...]

An elephant in the wild traverses many different types of substrates and terrain. Most often the Asian elephant walks on soft, yielding surfaces like the leafy jungle floor, while the African elephant walks on the grass and sand of the savannah and the hard dry surfaces of semiarid deserts."

[...]

The wild elephant, unlike its captive counterpart, can walk away from its own feces and urine. In most management situations, the captive elephant is housed on concrete or asphalt floor in an indoor facility for up to 60 percent of its time. Inevitably it must stand and walk in its own feces and urine, which collects in the cracks of the pads and between the nails. Urine is corrosive and feces contain numerous organisms that may cause infection if the feet are not washed daily.

[...]

Abscesses are commonly seen in many captive elephants, and their causes are usually not obvious. It is our opinion that they are rarely the result of a puncture or some other outside insult to the foot. Rather they are caused by internal blood supply disruption, which is a sign or symptom of the multitude of problems associated with keeping elephants in captivity. We feel that the elephant is not genetically programmed to withstand the constant gravitational pressure of living on hard surfaces and carrying the excessive weight typical of most captive elephants. Elephants certainly didn't evolve to stand motionless for long periods of time.

[...]

The inactive, overfed, overweight, out of shape, captive elephant, which may or may not have some abnormal behavioral activities, is predisposed to foot problems like abscesses and cracks. We feel that the lack of exercise decreases the overall vitality of the structure of the captive elephant's foot. This lack of vitality is further exacerbated by the added weight most elephants carry and by the fact that the majority of their time is spent on hard unyielding surfaces.

[...]

It is our opinion that when these factors are combined with abnormal behavioral movement, poor conformation, or previous injuries, the foot is destined to develop abscesses. Any abnormal pressure on the nails is seen on the lateral nails of the

stereotypical 'rocking' elephant, will result in a disruption of the blood supply to the sensitive tissue behind the nail. When this tissue is subject to constant or intermittent or abnormal pressure, it will bruise and then form a sterile nail abscess. This abscess then follows the path of least resistance as the body tries to get rid of it. It usually ruptures toward the surface at the cuticle line or at the interface between the bottom of the nail and the pad. As soon as it ruptures it becomes an infected abscess.

The bottom line is that abscess prevention is the best course of action. Prevention of abscesses requires: 1) exercise to strengthen foot structures and maintain good blood flow to the foot; 2) reduction in weight to reduce pressure on the foot; 3) allowing the elephant to live on soft, yielding surfaces; 4) elimination of behavioral motions that cause abnormal stress on the foot; 5) attention to good hygiene practices to minimize surface contamination; and 6) regular, complete, and correct pedicures.

44. The authors further discuss the occurrence of nail cracks indicating:

Cracks are normal in the pads of an elephant's foot, but not in their nails. When cracks occur in the nails, they demand attention to prevent the development of serious problems. And even though cracks are normal in the pad without proper care these too can lead to problems.

[...]

Nail cracks are usually the result of a repetitive movement that puts abnormal pressure on the nail. The environment of the elephant's enclosure can exacerbate this pressure. An example is the stereotypical 'rocking' elephant, where an elephant stands in one place on a hard surface and rocks back and forth. This puts abnormal pressure on the lateral toes of the front feet, eventually leading to nail cracks. This problem will be compounded in an extremely arid climate, which will dry out the nails so they become hard and lose their flexibility.

[...]

45. Finally, authors Roocroft and Oosterhuis identify the conditions that can lead to foot problems (Roocroft and Oosterhuis, 2001):

Conformation- Elephants with poor leg conformation will walk with an abnormal gait. This will then lead to the foot touching the ground in an abnormal manner and will result in an excess of pressure being exerted on the toes. This excess pressure will result in increased wear and possible cracks and abscesses.

[...]

Abnormal behaviors- Repetitive or 'stereotypical' behaviors can have the same effect as poor conformation on an elephant's feet.

[...]

Trauma- When an elephant injures a leg, it will refuse to flex the joints and walk with a stiff leg. The end result in many cases is a permanently stiff leg, regardless of the original problem. When the elephant walks on this leg, it will cause abnormal wear on the medial edge of the pad of that foot.

[...]

Arthritis- Another condition that can lead to foot problems is arthritis. The soreness in an elephant's joints will result in decreased joint flexibility. This will lead to an altering of the elephant's gait and, as mentioned before, abnormal pressure on the nails and pads.

[...]

Environment- Environmental conditions are so important to the health of an elephant's feet that we are mentioning them again. When comparing the conditions of a captive elephant's environment to its counterpart in the wild, it is easy to see the multitude of insults we impose on their feet. Some conditions can cause problems rather quickly, like sharp metal objects that an elephant accidentally hits with its feet. Others, including lack of movement, can take years of accumulation to manifest into problems.

46. In the final chapter of the text, *The Elephant's Foot*, there was a general consensus of the conference attendees on six items, one being that "Each elephant facility should minimize the amount of time elephants spend on hard, unyielding surfaces."

47. In the recent veterinary text, *Biology, Medicine, and Surgery of Elephants*, (Fowler and Mikota, eds., 2006), in the introduction to the chapter on foot disorders, Fowler indicates that "Elephants' foot health would be enhanced if they lived in a natural habitat which is defined as a large space with diverse topography and natural substrate."

48. G. West notes in the same text, in his chapter on the musculoskeletal system, regarding degenerative joint disease/osteoarthritis (West, 2006):

> Degenerative joint disease (DJD) is one of the most common musculoskeletal diseases in captive elephants. There is no single cause for the development of DJD. DJD may result from an imbalance of the integrity of the joint and the extrinsic forces placed upon it. Typically, there are mechanical insults that contribute to the development of joint disease, but biological factors may play a role. Mechanical trauma due to repetitive loading stress on hard surfaces is probably a major factor in the development of joint disease. Lack of sufficient exercise, excessive body weight, and poor conformation are other potential underlying factors. Conformation may concentrate stress and mechanical failure may result in the joint.

49. Regarding treatment with non-steriodal anti-inflammatory (NSAIDS) drugs, G. West notes (West, 2006):

> Non-steroidal anti-inflammatory (NSAIDS) drugs are widely used to treat joint inflammation. These drugs interrupt the synthesis of prostaglandins. Prostaglandins are important mediators of inflammation and pain. Chronic use of NSAIDS may, however, suppress proteoglycan synthesis, which is an important constituent of cartilage. Therefore, NSAIDS are useful in acute inflammation but chronic use could contribute to cartilage loss. Corticosteroids are potent anti-inflammatory drugs but can have detrimental effects. They would be contraindicated in reactive or infectious arthritis or in an elephant with unknown tuberculosis status. Also, corticosteroids may inhibit chrondrocyte development and the release of hyuronan by the synovial membrane.

50. In the fifth edition of the veterinary textbook series *Zoo and Wild Animal Medicine* edited by Fowler and Miller, in the chapter Proboscidea (Elephants), author Dennis L. Schmitt indicates in the chapter discussing noninfectious diseases (Schmitt, 2003):

> Foot problems compromise the most common ailment in the care of captive elephants and are seen in 50% of the elephants at some point in their lifetime.
>
> [...]
>
> Major contributors to foot problems in elephants are lack of exercise, standing on hard substrates, and contamination resulting from standing in their own excrement. Prevention of foot problems by changing the environment of the elephant to reduce contributing factors and daily foot care are essential for captive elephant husbandry.

51. In a section discussing special housing requirements, Schmitt indicates that "Elephants should be allowed to get off hard surfaces for as many hours each day as weather and husbandry permit."

(d) Obesity

52. Dr. Oosterhuis' Elephant Consultation Report of September 10, 2009, states the following:

(a) She has lost weight and is on a scheduled exercise program.

(b) Her weight is now at 4,230 kg (9,300 lbs), which, as requested, is down from my previous visit. A weight reduction program should continue, however.

(c) Skanik is still overweight. The goal should be for her to lose 450 kg

(~1,000 lbs) over the next 12 months.

53. After viewing two video segments documenting Lucy (Exhibits J and K), I concur with Dr. Oosterhuis' assessment that Lucy is obese as judged in particular by her rounded body contours and lack of muscle definition. It is difficult to assess degree of obesity merely by body weight alone. In my opinion an elephant can lose or gain 200-250 lbs in a 24 hour period depending on how much the elephant has eaten or the amount of solid and liquid waste an elephant has eliminated. In my experience most Asian elephants in captivity are overweight and no standards for optimum weights are available. Each elephant has to be assessed on an individual basis. In my opinion, based upon Lucy's videos, if she were to lose 450 kg (1,000 lbs) in the next 12 months she would still be considered overweight.

(e) Sleep Disorder

54. According to Michelle Miller in her chapter on the nervous system in the veterinary text *Biology, Medicine, and Surgery of Elephants*, she describes the unique sleep physiology of elephants (Miller, 2006):

> Both African and Asian elephants are diurnal. Although elephants can sleep standing, most studies indicate that animals sleep in lateral recumbency, if undisturbed. Similar sleep patterns have been observed in free-ranging African and captive African and Asian elephants, with sleep periods lasting 3.1-6.9 hours, 1-4.5 hours in recumbency between 11 p.m. and 7 a.m.. During the night, animals will often get up to feed and then lay back down to sleep again.

55. In the third edition of the veterinary textbook series, *Zoo and Wild Animal Medicine*, edited by Fowler, in the chapter, Veterinary Care of Performing elephants, author Richard Houck states (Houck, 1993):

> Elephants experiencing arthritic pain are reluctant to lie down to sleep and rest, but continuous standing only enhances the arthritic process. Once analgesia has been attained, a performing elephant may be commanded to lie down in a comfortable area away from the threats of other elephants, thus providing needed relief and even re-establish sleep patterns.

56. Lucy's veterinary medical records document problems in sleeping regularly:

Date	**Notation**
September16, 1998	Since elephants are outside during construction and now that the

	weather is getting colder what type of nutrition should the elephants be getting. Can use straw bedding when cold but only if necessary. Possibly start playing a radio in the evenings so that when the heater noise starts, the noise won't be as obtrusive.
January 2, 2002	Sore, not laying down, diet? Right leg appears swollen between ankle and knee, but not warm to touch. Interacting with other elephant and still playful at times.
January 10, 2002	Does not appear to be laying down to sleep. Treat arthritis Ibuprofen™
March 5, 2003	Not laying down to sleep. Consider changing sleeping arrangements.
April 5, 2004	Leave outside all night when weather allows adequate sleeping time off her feet.
May 12, 2004	Sleeping- should be sleeping 4-5 hours per day but currently sleeping only 1.5 hours per day. Bring in a load of peet moss for bed.
June 7, 2006	Stiff on right front yesterday (stepping heavily), shoulder or elbow appears sore. Left front seems sore. Not sleeping since sand moved from inside. Treat arthritis, phenylbutazone once daily for 55 days.
June 21, 2006	On Monday difficulty breathing in and out of trunk. Lots of head resting. Not laying down to sleep-tired. Will go down on command will not stay down. Right nostril plugged somewhat. Mouth breathing when laying on right side.
August 9, 2006	Not sleeping on the sand pile.
April 25, 2007	Sleeping well at this time, does lie down to sleep.
July 4, 2007	Treat pain from arthritis phenylbutazone once daily for 7 days. Yesterday limping on front foot. Moving very slow. Today very congested, Does not want to lay down.
September 12, 2007	Not laying down to sleep. Can put leg in leg stand for footwork for no more than 5 minutes at a time. Do not take on long walks.

57. Lucy's 2008 Walk Log also documents difficulty in sleeping:

Date	Notation
February 2008	Sleepy- did not lay down last night, abrasions on right side of head from wall leaning
July 2008	went straight to sand pile and laid down (stayed there for 10 minutes), then turned on her left side an tried to go to sleep, took about 20 minutes before she woke up and we then continued the demo. Not enough sand for her to get comfy
August 2008	she is having a hard time breathing, tried to have her sleep but she cannot seem to breath lying down. -she hadn't slept well the night before and was very tired...
September 2008	very tired this AM – laid down to sleep inside but couldn't get comfortable, favouring and resting her left leg
November 2008	didn't lay down to sleep last night

(f) Bed sores

58. Bedsores are discussed by Susan Mikota in her chapter on the integument system in the text *Biology, Medicine, and Surgery of Elephants* (Mikota, 2006):

> Pressure sores may occur on the hips, elbows, or other pressure sensitive areas with prolonged contact on inappropriate surfaces. Pressure may compromise circulation, causing tissue damage, deep ulceration, and open wounds. Lesions may be dry and painful or swollen and irritated. Treatment should be aimed at identifying and correcting any underlying etiology. Elephants may lie down for long periods due to pain, foot problems, or other ailments. Exposure to rough, cold, or unhygienic substrates may be causative or may aggravate an underlying problem.

59. In The Elephant Consultation Report September 10, 2009, Dr. Oosterhuis states, "Examining her body revealed no problems other than a healed pressure sore on her right hip and a small wear spot on the right side of her face."

60. Lucy suffers from bed sores, or decubital ulcers (pressure sores), documented below in her veterinary medical records beginning on June 18, 2002:

June 18, 2002	Sores on sides of face. Right front foot swollen
July 3, 2002	Bed sores on sides of face and hips.

July 31, 2002	Stiff on left hip after walks, bed sore on right hip and right elbow, both hot to touch.
October 23, 2002	Bedsores right hip and right front elbow.
November 5, 2002	Abscess right hip came to head last night. Bottom opened slightly, come draining of a clear fluid and small amount of blood. Smaller in size now but protruding from hip more (apple size).
January 29, 2003	Staff massaging hip, some pus.
February 13, 2003	Sore on top of mouth. Hip abscess draining.
March 5, 2003	4X10 cm flesh removed from hip abscess, a lot of fluid released, swelling on hip reduced.
March 12, 2003	Hip flush- fluid that is pit in does not always come out- remedy is exercise.
March 19, 2003	Hip abscess very swollen, will possibly break open again, was hot is now cool to the touch.
March 26, 2003	Right hip abscess started draining Sat. Hip area still swollen
August 27, 2003	Hip abscess flared up again.
April 2, 2003	Hip abscess- lots of solid necrotic tissue from hip during cleaning this am (approx. 3 pieces), lots of cottage cheese consistency pus from it as well.
April 14, 2003	Recheck. Removed large piece of attached dead tissue from hip abscess that was blocking drainage.
August 27, 2003	Hip abscess flared up again. Right front foot has been very sensitive this last week.
April 16, 2009	Treat wound on right flank/hip topical treatment.
April 23, 2009	Treat wound on flank. Topical treatment twice daily 36 days.
June 24, 2009	Check abscess on side. Nitro Ointment same as B4. Try furacin twice daily for 14 days.

61. Lucy's Daily Logs from 2008-2009 also document bed sores:

Date	Notation
March 15, 2009	2 sores on right hip-scrubbed and put iodine and Panalog™ on them
April 14, 2009	Dr. Ness checked sore on hip. Will get in medication for treatments.
May 10, 2009	another small sore on right hip
June 23, 2009	sore on left hip has pus-flushed/cleaned with iodine

(g) Oral/Dental Problems

62. The normal process of teeth shedding in elephants is explained by Genevieve A. Dumonceaux in her chapter on the digestive system in *Biology, Medicine, and Surgery of Elephants* (Dumonceaux, 2006):

> Molar teeth are worn down and shed in sections, and they are replaced by the next tooth pushing forward from behind. This drifting of teeth provides continuous contact. Each new tooth is larger than the preceding one. Each adult molar tooth may weigh over 5 kilograms. Discarded tooth fragments may be found as they fall out of the mouth or may be found in the feces after being swallowed. In many instances the fragments are not found.

63. It cannot be determined from reviewing Lucy's veterinary medical records why she has experienced several episodes where she has had difficulty in shedding molar tooth fragments.

64. Lucy's veterinary medical record on May 27, 2009 notes, "Has had chronic respiratory problems related to impacted upper molar mouth breathes, eats well, slightly overweight, nasal discharge, some arthritis." This impacted molar did shed according to Dr. Oosterhuis' Elephant Consultation Report September 10, 2009 which states, "The recently shed, deformed right upper molar was examined and the site in her mouth was visualized and found to be filled with a normal blood clot. I expect it to heal without complications."

65. In the veterinary literature there are documented at least two cases similar to that of Lucy's described by Ramiro Isaza in his chapter on the respiratory system in the text

Biology, Medicine, and Surgery of Elephants. In these cases he reports (Isaza, 2006):

> The nasopharynx is the narrowest portion of the upper respiratory tract and is therefore subject to pathologic stricture. A progressive left-sided nasal occlusion caused by a benign osteoma in the paranasal area of the skull has been seen in an adult Asian elephant (personal communication, Drs. G. Kollias, Ithaca, N.Y. and C. Wallace-Switalski, Pittsburgh, PA, 2005). Similarly, a unilateral partial obstruction of the right nostril was noted in another Asian elephant caused by an impacted upper molar that pushed medially into the nasopharynx (personal communication, Dr. S Terrell, Orlando, FL, 2005).

66. Lucy's veterinary medical records document a history of oral/dental problems, beginning on November 26, 1996 and noted below. By 2008, complications from a molar became a chronic condition:

Date	**Notation**
November 20, 1996	New tooth coming in- monitor.
November 26, 1997	Large piece of tooth fell out. Came from upper right jaw.
February 13, 2003	Sore on tip of mouth. Hip abscess draining. Treat sores on mouth with Vaseline & vitamin E.
December 7, 2005	Breath smells of rotten tooth. Upper right old tooth toonie size ulcerated area on old tooth at base.
February 9, 2008	Keeper observation that she is not eating hay and is lethargic with very little water consumption. Loose cap felt in anterior of mouth. Tentative diagnosis sore mouth secondary to loss of anterior molar. Treat phenylbutazone three days.
February 13, 2008	Impacted molar.
February 20, 2008	Tooth is elevated more.
March 12, 2008	Bottom right jaw warm to touch.
April 18, 2008	Treat impacted tooth. Flunixin meglumine orally as needed.
April 24, 2008	Impacted tooth looser. Tooth on other side loosening up.
July 25, 2008	Treat malpositioned tooth.
August 13, 2008	Treat malpositioned toth.
September 12, 2008	Treat ache from a malpositioned tooth. Treat flunixin meglumine orally as needed

September 30, 2008	Treat arthritis & ache from malpositioned tooth.
January 14, 2009	Lots of necrotic material around tooth.

67. Lucy's 2008 Walk Logs also document oral/dental problems:

Date	**Notation**
January, 2008	- lost big piece of tooth in past week
February, 2008	- tooth loosening - tooth loosening deeper under gums
March, 2008	- tooth closer to coming out
May, 2008	- upper left tooth separated
November, 2008	- tooth bothering her

68. Lucy's Daily Logs also document oral/dental problems:

Date	**Notation**
August 9, 2008	Tooth - top left starting to separate
May 26, 2009	access out all night. Lost part of upper left tooth.
July 12, 2009	chewing on logs (teeth bothering her) lethargic in am and not eating in - perked up in pm and was eating

The Conditions and Standard of Care at the Valley Zoo are Causing Lucy Physical Illnesses, and Distress

69. The impact of conditions and the standard of care at the Valley Zoo have caused unnecessary distress, (suffering or privation) for Asian elephant Lucy.

70. The most serious of Lucy's medical issues are her respiratory problems, arthritis, foot disorders, and obesity. It is difficult based on the information available for me to conclude what is causing Lucy's respiratory illness for which there is no current diagnosis in her medical records. While I have not seen respiratory signs in an Asian elephant similar to what Lucy exhibits, it is reasonable to assume that the freezing cold temperatures in Edmonton during winter further aggravates this condition. There is

documentation in Lucy's Daily Logs (January 1, 2008 - July 14, 2009) that reveals the cold weather conditions to be a factor which limits Lucy's exercise activity and exposes her to the cold:

Date	**Notation**
January 7, 2008	- temp dropped quickly brought her back- ears cold
January 22, 2008	- Walk yes, v cold wind
January 24, 2008	- Walk yes, cold wind, ears cold
February 6, 2008	- started out- wind very cold- went back inside
February 9, 2008	- sick- skin very cold all day
February 10, 2008	- body still cold
February 16, 2008	- Walk yes, icy spots!
February 17, 2008	- Walk yes, very icy!
February 18, 2008	- Walk yes, very icy slipped on R rear & a bit on left
February 19, 2008	-Walk yes, cold wind- bit icy
February 29, 2008	- outer nail split- smoothed it so it does not catch
March 2, 2008	- too darn cold!
March 3, 2008	- walk no, v icy
March 13, 2008	- Buzone PM had to fight to get her to take it
April 11, 2008	- outside nail splitting clean it up
April 21, 2008	- end of day bitchy
April 25, 2008	-Walk yes, v cold wind in back area
May 19, 2008	- fell asleep during demo (can't breathe on L side)
May 22, 2008	- Bath-yes PM to warm her up

May 26, 2008	- has hard time breathing on L (for demo)
June 2, 2008	- hard time breathing
June 14, 2008	- gasping for to breathe
July 10, 2008	- gasping
July 22, 2008	- low level- gasping
August 9, 2008	- Tooth - top left starting to separate
September 19, 2008	- Rocks getting stuck in back feet pretty good
September 22, 2008	- Walk yes. AM 1¼ hr in rain-cold
October 5, 2008	- cent nail crack on R rear
October 14, 2008	- Walk yes, v cold wind
October 29, 2008	- stiff on right side
October 31, 2008	- a little stiff downhill, swinging right leg out coming down, cold, hard to get rocks out of back feet
December 6, 2008	- Walk no, extremely icy
December 8, 2008	- Walk yes. -10 –wind icy
December 9, 2008	- Walk yes, -15+ wind chill
December 10, 2008	- Walk yes, in for 5 min to warm feet
December13, 2008	- Walk no, -25
December 14, 2008	- Walk no, -27 + wind chill -30
December 16, 2008	- Walk yes, -14
December 18, 2008	- Walk no, -21
December 23, 2008	- Walk no, -24 too cold
December 30, 2008	- Walk no, too cold

71. In addition Lucy's 2008 Walk Log illustrates how the cold frigid weather impacts the ability for Lucy to leave her indoor enclosure and receive exercise:

Date	**Notation**
February, 2008	- icy spots on walk - very icy on walk – not eating shifting uncomfortably - very icy, slopped (slipped?) on right rear & a bit on left - cold wind and icy- lethargic, eat nothing all day - split nail -stiff in back legs
June, 2008	-lethargic- skin cold to touch even when out in sun on her walk - skin still cold, breath is worse tonight – never been this bad – end of day hot outside but her skin is still cold
December, 2008	- no walk due to wind chill - no walk extremely icy - no walks, extremely icy roads - no walks due to wind chill - No walks due to cold - no walks too cold

72. Finally, Lucy's Walking Log from March-July 2009 indicates time walked and the temperature on each day. "Cold" weather with freezing or below freezing temperatures is recorded from March 1, 2009 thru April 4, 2009 with no temperatures recorded after April 4, 2009. Walk times are recorded thru to August 1, 2009.

73. From reviewing the Daily Logs and Lucy's Walking Log from March-July 2009 it appears that Lucy is routinely kept indoors for prolonged periods of time in the winter due to Edmonton's frigid weather. It is noted in Lucy's veterinary medical records for May 17, 2006 "Keeper reports decreased nasal discharge with doors being left open due to warmer temperatures and fans on." In my opinion it would be important to learn the temperature of Lucy's indoor enclosure prior to her exiting into colder outdoor temperatures. It is reasonable to assume the rapid change in temperature extremes can be

stressful on an elephant having respiratory system problems.

74. The causes of Lucy's remaining serious, chronic illnesses – arthritis, foot disorders, and obesity are co-related and are the result of a combination of the restricted space in her indoor enclosure, the hard, unyielding surfaces in both her indoor and outdoor enclosures, and the lack of exercise she receives in Edmonton's freezing cold winter temperatures.

75. Based upon the two sketch maps (Exhibits H and I) of Lucy's outdoor and indoor enclosures these spaces satisfy the minimum standards recommended by the AZA Standards for elephant management and care. Adopted 21 March 2001, Updated 5 May 2003 and the 2004 Elephant Husbandry Resource Guide by Olson.

76. Lucy's outdoor enclosure has a dirt substrate and her indoor enclosure has a concrete substrate (Elephant Consultation Report 10 September 2009).

77. The AZA Standards include the minimum guidelines regarding the dimensions for indoor and outdoor enclosures. The AZA Standards state for indoor and outdoor enclosure sizes:

> Indoor space must provide room for animals to move about and lie down without restriction. A minimum of 400 sq. ft (37.2 sq.m) is required for a single animal, approximately 800 sq. ft (74.3 sq. m) for two animals, and so on. Because of their size and space requirements, bulls or cows with calves must have a minimum of at least 600 sq. ft (55.7sq. m). Outdoor yards must have at least 1,800 sq. ft (167.2 sq. m) for a single adult individual and an additional animal. If this space is the only location for exercise, then it is recommended that the space per elephant should be even greater.

78. The AZA Standards also state:

> Elephants must be kept outside on natural substrates as much as possible. Institutions should consider designing exhibits that allow elephants outdoor access twenty-four hours a day – weather, health, and safety permitting.

79. Lucy's lack of exercise, which is exacerbated by being kept indoors for most of the year due to wintery conditions, is also a major cause and enhancing factor of her chronic arthritis (Fowler, 2006; West, 2006; Adams, 1981). Elephants, who have the opportunity to walk a lot, particularly wild elephants and elephants living in wild animal parks, rarely suffer from arthritis (Adams, 1981). Lucy is not getting the opportunity to use her muscles and joints regularly and is forced to stand for much of her day, especially in the winter, for which elephants did not evolve (Roocroft & Oosterhuis, 2001).

80. Lucy's concrete floors are also a contributing cause of her arthritis. Concrete, due to its hard, unyielding quality (Fowler, 1978; Cusuti et al. eds., 2001) does not provide the cushion or shock absorption that she would normally find in nature.

81. Lucy's foot problems are caused by the same factors as those which are causing her arthritis.

82. Foot problems are one of the most common ailments observed in captive elephants (Gage, 1999). Some experts estimate that fifty percent of captive elephants develop foot disorders (Cusuti, B. et. al. eds., 2001; Schmitt, 2003). These foot problems present as split nails or split toes, split soles, abscesses and infections – all of which are problems Lucy has suffered since 1992.

83. The central cause for these problems is that captive elephants are forced to stand in their own feces and urine as a result of many hours of confinement on unyielding surfaces (Adams, 1981; Cusuti, B. et. al., eds. 2001; Fowler, 2001; Roocroft and Oosterhuis, 2001; Schmitt, 2003). Under these conditions urine and feces inevitably collect in the cracks of an elephant's foot; the urine is corrosive and the feces contain bacteria that can cause infections in the feet (Roocroft and Oosterhuis, 2001).

84. The issue of packed dirt in Lucy's outdoor enclosure should be considered. Natural substrates, while desirable, require maintenance that prevents them from becoming packed down and unyielding. Simply because a substrate is natural does not mean that it does not require maintenance or cannot become unyielding.

85. As stated above, Lucy's outdoor enclosure has a dirt substrate. Given the amount that elephants walk and their weight, the dirt in a relatively small enclosure can easily become packed down to the point of becoming hard and unyielding. It is reasonable to assume that this dirt becomes even harder in cold temperatures as the ground freezes. The physical effect of hard packed dirt on an elephant's health is not very different than the physical effect of an unnatural substrate such as concrete.

86. Therefore, the time Lucy spends in her outdoor exhibit (when the weather permits) may contributing as well to her arthritis and foot problems.

87. Being forced to stand for long periods of time on hard substrates, especially concrete is a central cause of elephant foot disorders (Cusuti, B. et. al., eds., 2001; Fowler, 2001; Schmitt, 2003). Asian elephants are adapted to soft, yielding surfaces such

as a leafy jungle floor (Fowler, 2001 in Cusuti, B. et. al., eds., 2001). On a hard substrate an elephant is unable to engage in its normal digging, which exercises and strengthens the leg and foot muscles, tendons and joints, which form an important part in encouraging healthy feet in elephants (Roocroft and Oosterhuis, 2001) and also keeps nails trim and less susceptible to cracking (Adams, 1981).

88. Trim nails are important because as they grow and extend beyond the sole of the foot they can easily split with pressure of the elephant's weight on it (Adams, 1981), especially under moist conditions (Schmidt, M, 1978). Split nails also occur in captive elephants as a result of repetitive "rocking" – a stereotypical movement that Lucy has exhibited (see Exhibits 9 & 10). Such rocking places abnormal pressure on the nail and eventually leads to nail cracks (Roocroft and Oosterhuis, 2001).

89. Lack of exercise, arthritis and obesity – which are related to one another – are also contributing causes of Lucy's foot problems (Fowler, 2001; Roocroft and Oosterhuis, 2001; Schmitt, 2003). Lack of exercise, prolonged standing, and stereotypic behavior, on unyielding surfaces can cause arthritis and obesity which may cause an elephant like Lucy to develop an abnormal gait, adding abnormal pressure on the nails and pads of the feet, making her toes more susceptible to cracks that can then become infected.

90. Finally, poor conformation, can contribute to foot problems, again due to unusual pressures on the foot (Fowler, 2006; Roocroft and Oosterhuis, 2001) and also to arthritis, or injury (West, 2006). It should be noted that Dr. Oosterhuis, in his Elephant Consultation Report, stated that Lucy exhibited signs of poor conformation:

> As noted in 2002, she has some conformational defects that include both front legs being bow legged and pigeon toed and the rear feet being somewhat pigeon toed.

91. However, it is my opinion that conformation is not the sole cause of Lucy's foot disorders and arthritis, given the number of risk factors present in Lucy's case.

92. Lucy also suffers from chronic bed sores or pressure sores as well as oral/dental problems.

93. In summary the conditions and standard of care for Lucy at the Valley Zoo have caused and will continue to enhance ongoing health problems to include arthritis, pressure sores, obesity, irregular sleep, and foot problems.

The Lack of an Elephant Companion is Causing Lucy Suffering

94. Lucy is held alone at the Valley Zoo without an elephant companion(s).

95. It is important to point out that both the GASZA and AZA Standards respectively recognize the need for elephants to be maintained in appropriate numbers. The GASZA Standards state that "[a]ll animals must be maintained in numbers sufficient to meet their social and behavioural needs (unless a single specimen is biologically correct for that animal)." The AZA Standards state that "[z]oos should make every effort to maintain elephants in social groupings. It is inappropriate to keep highly social female elephants singly. Institutions should strive to hold no less than three female elephants whenever possible. All new exhibits and major renovations must have the capacity to hold three or more female elephants."

96. Notably, the AZA Standards also state that "socially aberrant adult females [...] can be managed singly if the institution has made every effort to introduce them to a social group and the SSP [referring to the AZA Elephant Species Survival Plan] agrees that the anti-social behaviour is not correctable."

97. The GASZA and AZA Standards on the issue of group size for female elephants in captivity are consistent with another leading standard – the *Elephant Husbandry Resource Guide* (Olson, D. ed. 2004). The *Elephant Husbandry Resource Guide* states:

> Due to the social nature and behavior of elephants, it is recommended that elephant holding facilities maintain a minimum of three same-species females, and all facilities establishing new groups of elephants should strive for groups of the same species. It is acceptable for elephants to be managed as individuals if they have been raised alone and will not socialize with other elephants or in the case of working elephants that are temporarily required to be removed from the herd in order to perform their work.

98. Elephants are social animals. Wild elephants live in complex social family groups (Moss, 2000; Owens et al., 1992; Owens et al. 2006, Poole, 1997). Female elephants particularly form close-knit groups of relatives; they communicate vocally using rumbles, trumpets, screams, through odors secreted from their temporal glands and through touch (Owens et al., 1992). A group of female elephants will stay in close physical proximity – usually within thirty yards of one another and often close enough to "reach out their trunks to stroke, caress, or sniff their kin mate" (Owens et al., 1992).

99. It is inappropriate in the field of care and management of captive elephants to

keep a female elephant alone. They are by their nature social animals.

100. Based on my review of the records and documents attached as exhibits to this affidavit, I have found no evidence that the Valley Zoo has made any attempt to introduce Lucy to a social group of any size.

Lucy Suffers Physical and Emotional Pain

101. Based on the entries in Lucy's veterinary medical records and Daily Logs, and because Lucy receives NSAIDS daily which acts to relieve pain and provide analgesia, in my opinion Lucy is in chronic physical pain.

102. In the paper Understanding Pain and Its Relevance to Animals the author discusses issues in defining pain (Church, 2000):

> The standard definition of pain, as developed by the International Association for the Study of Pain is as follows: 'An unpleasant sensory and emotional experience normally associated with tissue damage or described in terms of such damage.'
>
> [...]
>
> Many hold the anachronistic overly simple idea that pain is merely an aversive sensation. The normal therapeutic solution to an aversive sensation is to turn it off in one of the following ways: remove the origin of the noxious signaling, gait signal transmission from the peripheral tissues with opiod or other drugs, prevent such transmission with temporary nerve blocks, or introduce destructive lesions within the nervous system that prevent such transmission. This conception, while not completely inaccurate, is clearly incorrect. Pain can exist without evidence of tissue trauma and can be notoriously unresponsive to therapies that target its putative cause, and can interfere with normal living, functional capacity and sleep. Chapman and Stillman defined pathological pain as 'severe persisting pain or moderate pain of long duration that disrupts sleep and normal living, ceases to serve a protective function, and instead degrades health and functional capability.'

103. With regards to acute vs. chronic pain:

> Pain is considered acute when it accompanies tissue injury or pathology. The pain associated with athletic injury, pain following surgery, or headaches are all examples of acute pain. Medically acute pain can have a diagnostic value because it can help identify a pathological condition. Chronic pain typically lasts beyond time required for healing following tissue trauma and is often associated with a pathological condition that does not heal. Examples of chronic pain include low back pain, phantom limb pain, fibromyalgia syndrome, and arthritis.

104. Regarding considerations for pain relief:

> Aside from measures directed towards alleviating or preventing pain, it is important

to consider the overall care of the animal in the prevention of distress and suffering. Distress and suffering are used in this context to describe conditions which are not themselves painful, but which are unpleasant and which many animals would chose to avoid. For example, recovering from anesthesia on wet, uncomfortable bedding in a cold environment may be distressful to animals. Good husbandry and housing which strives to meet the animals' behavioral needs, careful and gentle handling, competence in carrying out surgical and non surgical procedures, and the alleviation of negative side-effects, are all of paramount importance in reducing animal pain, distress and suffering.

105. In a 2003 issue of the Journal of the American Veterinary Medical Association (JAVMA) a commentary was published by veterinarian F.D. McMillan on the topic of pain, and emotional pain (McMillan, 2003):

> The approach to pain has recently undergone revolutionary changes in human and veterinary medicine. In what could be regarded as a period of enlightenment, the past two decades have seen a rapid increase in awareness of and intensified efforts to treat pain. After decades of being undervalued, undertreated, and in many ways ignored, pain is now regarded as a critically important factor in the quality of life of humans and other animals. Articles on pain management are commonplace in veterinary journals and textbooks, and pain management has become a popular continuing education topic. National veterinary organizations, such as the AVMA and the American College of Veterinary Anesthesiologists, have recently developed formal position statements on pain and its importance to well-being. The American Animal Hospital Association is proposing the inclusion of pain management requirements within its hospital accreditation standards, a step similar to that taken recently in human medicine, when the Joint Commission on Accreditation of Healthcare Organizations mandated that human hospitals measure pain in their patients and take steps to manage it. The Twelfth Annual Animal Welfare Forum was devoted exclusively to pain management, and the proceedings from that meeting were published in the July 15, 2003 JAVMA.
>
> The discomfort of unpleasant emotional states has been regarded as a form of pain in standard and medical dictionaries. Pain has been defined as physical or mental suffering caused by injury, disease, grief, anxiety, and an awareness of acute or of chronic discomfort occurring in varying degrees of severity and resulting from injury, disease, or emotional distress, as evidenced by biological or behavioral changes or both. The various physical and emotional pains have the capacity to induce suffering in animals.
>
> Contrary to the prevailing view, there is evidence that emotional pain may induce greater suffering than physical pain. Studies have shown that emotional factors weigh more strongly in animals' behavioral choices than physical pain.
>
> Experimentally and anecdotally, it is clear that some emotional distresses outweigh the suffering of physical pain.

> Because some emotional pains may induce more suffering than physical pain, the veterinary profession should stop viewing emotional pain as less important and less worthy of diligent treatment efforts. Animals with unalleviated fear, anxiety, isolation, distress, and boredom should be regarded as inadequately treated as we now view animals with inadequately treated physical pain.

106. In a 2007 issue of the Journal of the American Veterinary Medical Association, the American Veterinary Medical Association's AVMA Animal Welfare Principles, which I accept and apply as minimum standards, were published:

> The AVMA, as a medical authority for the health and welfare of animals, offers the following eight integrated principles for developing and evaluating animal welfare policies, resolutions, and actions.
>
> - The responsible use of animals for human purposes, such as companionship, food, fiber, recreation, exhibition, and research conducted for the benefit of both humans and animals, is consistent with the Veterinarian's Oath.
> - Decisions regarding animal care, use, and welfare shall be made by balancing scientific knowledge and professional judgment with consideration of ethical and societal values.
> - Animals must be provided water, food, proper handling, health care, and an environment appropriate to their care and use, with their species-typical biology and behavior.
> - Animals should be cared for in ways that minimize fear, pain, stress, and suffering.
> - Procedures related to animal housing, management, care, and use should be continuously evaluated, and when indicated, refined or replaced.
> - Conservation and management of animal populations should be humane, socially responsible, and scientifically prudent.
> - Animals shall be treated with respect and dignity throughout their lives and, when necessary, provided a humane death.
> - The veterinary profession shall continually strive to improve animal health and welfare through scientific research, education, collaboration, advocacy, and the development of legislation and regulations.

107. It is my opinion that veterinarians have a professional obligation to be responsible advocates for improved care of elephants, and to be aware that both physical and

emotional pain has the ability to cause suffering in animals.

108. In my opinion Lucy's arthritis causes her to suffer unnecessary chronic physical pain. It is reasonably to assume that her chronic foot and toe abscesses cause her discomfort and pain. It is difficult to provide an opinion on whether Lucy's respiratory problem is causing her pain as there is no diagnosis of what is causing this problem.

109. In my opinion Lucy's isolation from other elephants causes her to suffer unnecessary emotional pain. The species-typical biology of the elephant is that they are social animals, and wild elephants live in complex social family groups. In Lucy's 2008 Walk Log, a notation in January 2008 states, "Lucy experiencing anxiety near end of day." In my opinion Lucy demonstrates stereotypic behavior in the video clips, Exhibits J and K. Treating both physical and emotional pain is difficult. However, it requires those charged with the care an animal to consider that animal's overall care and how to prevent pain or distress (Church, 2000).

110. In Lucy's case, she has been treated near daily with nonsteroidal anti-inflammatory drugs such as Buzone, or phenylbutazone, Ibuprofen, and Ketprofen. on a near-daily basis over a period of years. The purpose of NSAIDs is to reduce inflammation and control pain and provide analgesia. These medications, while providing relief for pain, also serve to mask the pain. The aim of any therapy should be to remove the inciting cause of the pain, not simply to mask it. For example there is the notation such as in April, 2008 on Lucy's 2008 Walk Log stating "No well, vet getting new pain killers." And then, a few days later there is the notation "Very lethargic, would not eat until drugs kicked in."

111. Lucy's historic and current treatment strategy, which relies primarily on the use of NSAIDs, does not address the basic underlying causes for her foot and musculoskeletal problems that have been present for two decades. As noted previously NSAIDS are potent anti-inflammatory drugs but can have detrimental effects (West, 2006).

The Valley Zoo's Treatment Program Will Not End Lucy's Distress

112. Two months following Dr. Oosterhuis' Elephant Consultation Report 10 September 2009, the Edmonton's Valley Valley Zoo released Lucy's Treatment Program

on November 13, 2009. This plan has four parts.

113. Part One is the Medical Treatment Program. This program provides a course of treatment with an antibiotic (enrofloxicin) and an anti-inflammatory (flunixin meglumine).

114. Enrofloxicin is a broad spectrum bactericidal antibiotic. Flunixin megumine is a non-steroidal anti-inflammatory drug. It is a potent non-narcotic, analgesic agent, with fever-reducing activity. Flunixin is recommended for the alleviation of inflammation and pain associated with musculoskeletal disorders in the horse. It is also recommended for the alleviation of visceral pain associated with colic in the horse.

115. In addition, under Part One, Dr. Reid will develop a treatment plan, and an exercise and weight reduction program. Lastly there will be a follow-up endoscope exam and potential biopsy in four to six weeks.

116. Part Two is an Exercise and Weight Reduction Program. Part Three is entitled Facilities Modification. Part Four is entitled Implementing Foot Care and Husbandry Recommendations.

117. In my opinion the Medical Treatment Program is, on the surface, well thought out; however, it overlooks two important facts. First, Lucy's enclosure and substrate modifications need to change immediately, beyond what is proposed in Part Three of the Treatment Program described below. Second, the frigid cold regional weather will continue to impact Lucy's husbandry program regardless of what changes or modifications are made to her enclosures.

The Proposal to Add Sand to One Part of Lucy's Indoor Enclosure and to Lay Rubber Matting in Lucy's Indoor Enclosure

118. In laymen's terms these modifications, in my opinion, are "too little too late." Sand placed in an indoor enclosure will become contaminated with urine and fecal matter, and will become compacted down to the bare concrete. Rubber matting, or sand, will not provide the level of comfort required for an elephant such as Lucy who has had arthritis and foot problems for twenty years and has been documented in her medical records as having degenerative joint changes.

119. The GASZA Standards state:

Exhibit enclosures must be of sufficient size to provide for the physical well being

of the animal. All animal exhibits must be of a size and complexity sufficient to provide for the animal's physical and social needs and species typical behaviours and movements (Part III.B.1.).

120. Lucy's enclosures will not meet this standard even if they are modified as proposed.

121. The AZA Standards state that "[e]lephants must be kept outside on natural substrates as much as possible" (section 1.1.1). Implicit in this particular standard is the recognition that elephants should not be held exclusively on unyielding and unnatural substrates.

Weight Loss Regime

122. In my opinion, given Lucy's arthritis, foot and respiratory problems, enclosure restrictions, and the regional weather conditions, she will not exercise daily in a manner that will allow her to strengthen her limbs, improve muscle tone, increase range of motion in her joints, and extend her activity throughout the day, and thus reduce weight.

123. Diet alone will not improve Lucy's health. Diet and weight loss alone do not address the other problems with Lucy's enclosures and the cold regional temperatures.

The Treatment Program Does Not Address Lucy's Isolation

124. In my opinion, it is vital that Lucy be given the opportunity to develop socially with other elephants of her species. The treatment program does not recognize the importance of the species-typical biology and behavior of Asian elephants.

The Projected Effect on Lucy's Health if She is Moved to a Sanctuary

125. I have no first hand information on the two recognized elephant sanctuaries in the United States. What information I do know however, is that elephants at these facilities are maintained on pasture. They are located in warmer to temperate climates. Elephants are permitted and encouraged to socialize with other elephants. In this environment and under these conditions, I would expect Lucy to no longer to be confined in restricted spaces, standing for prolonged periods on concrete or compacted enclosure substrate surfaces which are the major inciting causes, and enhancing factors of her arthritis. Lucy would be free to move about on natural surfaces, in effect a pasture

environment, 24 hours a day. Lucy would then require less and perhaps no NSAIDS medications. Lucy will gradually demonstrate increased activity on natural surfaces that will result in an increased range of motion in her joints. As Lucy increases her activity on a pasture environment, her soft tissue, muscle, joint and tendon tone will improve and strengthen as she forages for food throughout the day. As Lucy's activity increases and muscle tone improves she will lose weight and lessen stress to her limbs. Having natural surfaces available would be conducive to Lucy being able to lie down and acquire restful sleep. A warmer climate will allow Lucy the ability to exercise year around. A warmer climate will be less stressful to her respiratory system problems. In a pasture environment Lucy will experience much less exposure of her feet to urine and fecal matter. Finally, Lucy would not live in social isolation from other elephants. She would have an opportunity to engage in more elephant species-typical behavior.

Conclusion

126. It is my opinion that the conditions and standard of care at the Valley Zoo are causing Lucy unnecessary distress and that these conditions are not in conformity with the GASZA and AZA Standards. It is further my opinion that the Valley Zoo's Treatment Plan, if fully implemented, will not bring its conditions and standard of care up to conformity with the GASZA or AZA Standards, and specifically will not provide even the physical relief Lucy now requires and would receive were she to be transferred to one of the proposed elephant sanctuaries.

127. I swear this affidavit in support of this application for declaratory judgment and for no other or improper purpose.

AFFIRMED BEFORE ME in the City of San Diego, this 19th of January, 2010.

Philip K. Ensley

Commissioner ~~for~~ Taking Affidavits

K. HEINTZ
Commission # 1773252
Notary Public - California
San Diego County
My Comm. Expires Oct 14, 2011