U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
Washington, D.C. 20240

ENVIRONMENTAL ASSESSMENT

Test of 3-4 Year, Controlled-Release PZP Contraceptive for Wild Horses

Date of Preparation: January 11, 2005
EA #MT-010-05-12

TABLE OF CONTENTS

LIST OF APPENDICES

I. INTRODUCTION

With passage of the Wild Horse and Burro Act of 1971, Congress found that: "Wild horses are living symbols of the pioneer spirit of the West". In addition, the Secretary of the Interior was ordered to "manage wild free-roaming horses and burros in a manner that is designed to achieve and maintain a thriving natural ecological balance on the public lands". From the passage of the Act through present day, the Bureau of Land Management (BLM) has endeavored to meet the requirements of the Act. The procedures and policies implemented to accomplish this mandate have been constantly evolving over the years.

The BLM has recently determined research priorities for the Wild Horse and Burro Program. The result is the development of a document entitled the Strategic Research Plan for Wild Horse and Burro Management (SRP). Principal input has come from the USGS-BRD and APHIS on topics of contraception, aerial census, population modeling, genetics, as well as disease and animal health monitoring and surveillance. Advice and input has also come from the BLM managers and specialists assigned to the Wild Horse and Burro Program, the BLM WH&B Advisory Board, the BLM Wild Horse and Burro Washington Office staff, the BLM Director's Science Advisory Committee, and from seven topic-specific advisory panels that were convened by USGS-BRD. Direction for strategy development has come from the Wild Horse and Burro Act of 1971 and the National Strategic Plan for the Wild Horse and Burro Program, 1992.

Within the strategy, continuing research on fertility control has been identified as a high priority. BLM believes that fertility control can eventually reduce the total number of animals that need to be adopted, handled, or held in captive situations, as well as the frequency, size, and cost of gathers. To date, research has provided a 1-year and 22-month Porcine Zona Pellucida (PZP) vaccine that meets most of BLM's stated criteria for an ideal fertility control agent. In addition, extensive research has already been conducted on the safety, efficacy, and duration of PZP applications in both domestic and wild horses on eastern barrier islands and in several BLM-managed herds. Research trials, to determine the effects of fertility control in free roaming wild mares using PZP, began in 2000 under the direction of the Fertility Control Field Trial Plan (FCFTP). Two levels of investigation, individual animal based and population based trials, are being conducted. Individual animal based studies are designed to investigate the possible behavioral implications of PZP treatments on wild horses, population dynamics, efficacy of the vaccine, body condition, and foal health. The primary focus of population based studies is to determine affect on population dynamics (reproduction rates).

BLM has requested that the existing vaccine be further developed to provide 3-4 years of infertility in a single inoculation. The use of a multiple-year vaccine has the potential to help promote herd health and fitness as well as reduce the cost of wild horse management dramatically by: 1) reducing the need for removal of horses from the range and 2) matching availability of wild horses for adoption with demand, so that few horses must be maintained in long-term captivity. The research hypothesis is that an additional 1-2 years of infertility can be obtained from the present 2-year vaccine by modifications of the controlled-release pellet technology utilized in this vaccine. Based on data obtained from the 2-year vaccine, 3 years of contraception is projected in most mares with a 4th year in >50% of treated mares.

In addition, two additional trials are proposed with the intent of improving the cost effectiveness of the PZP application. These trials propose to 1) reduce the initial dose of PZP within the primer shot as well as 2) the elimination of the need for an adjuvant in the pellet component of the time-release technology.

This document outlines relevant information regarding the use of a developed 3-4 PZP vaccine, a reduced dose of PZP in the primer shot and no adjuvant in pellet formulations during pilot studies with captive mares that will have already been determined excess from the rangelands. These studies are proposed to take place at the Wild Horse Inmate Program, East Cañon Correctional Complex outside Cañon City, Colorado or another acceptable BLM holding facility.

II. BACKGROUND INFORMATION

A. PREFERRED FACILITY LOCATION:

Colorado

Cañon City Facility, Colorado Department of Corrections

Serves as a regional preparation center for wild horses and burros gathered from public lands in Colorado and a resting point for animals gathered in the far West for adoptions in the central and eastern portions of the United States. To schedule an appointment, please call (719) 269-8539.

Directions: Facility is located two miles east of Cañon City on Highway 50.

Animals are held in large dry-lot pens and often segregated by gender and age. Animal care is of a high standard, with consistent access to water and good quality hay. Health care and animal maintenance needs meet contract specifications and are provided as necessary. Mares being held for the proposed study have been isolated in a dry-lot pens and/or pastures at one end of the facility, where they will remain until completion of the trial.

B. SELECTED MARES FOR STUDY: Forty-nine, preferably barren wild mares, 4 to 18 years of age, will be selected for the proposed study. Mares will be selected from excess animals removed from various BLM HMAs and transported to the BLM contract holding facility. Removal of these mares from the rangelands will have already been covered under the appropriate Gather Plans and Environmental Assessments. These EAs may be made available by contacting the respective Field Offices. Cross-referencing mares to the appropriate Gather and Removal EAs can be done by tracking their unique freezemark. Due to their selection for the proposed trial, these mares will be held for a minimum period of three years, post study, prior to being available to the public.

III. PROPOSED ACTION:

Test of 3-4 Year, Controlled-Release PZP Contraceptive for Wild Horses

A. PURPOSE: The purpose of this research is the development of a longer duration (3-4 year)

PZP immunocontraceptive agent for wild mares, which will assist in reducing population growth rates of wild horses, is non-invasive in application and temporary in effect, and operates with controlled-release technology after a single injection. In addition, two additional trials are proposed with the intent of improving the cost effectiveness of the PZP application. These trials propose to 1) reduce the initial dose of PZP within the primer shot as well as 2) the elimination of the need for an adjuvant in the pellet component of the time-release technology.

B. NEED: Immunocontraception has been researched for many years. The Medical College of Ohio (MCO) has been involved in all of the research to date, and has worked in conjunction with the University of California at Davis, University of Iowa, Tufts University of Veterinary Medicine, the Humane Society of the US and the Science and Conservation Center, ZooMontana in Billings, Montana. BLM and USGS-Biological Resources Division (acting on behalf of BLM) have funded virtually all of the fertility control research on wild horses. The research thus far has produced a 2 year controlled-release PZP vaccine that will prevent contraception for up to 22 months. The BLM is in need of a longer duration (3-4 year) agent to help promote herd health and fitness and to reduce the costs associated with gathering excess animals for population control. The BLM is also interested in any technological advances which would help reduce costs associated with the implementation of PZP fertility control.

C. OBJECTIVES: The objectives of this proposed action are to:

1) implement (~February/March 2005) a controlled pilot study with captive wild horse mares, in an effort to evaluate antibody titer response and (subsequent fertility) to a newly-developed PZP vaccine having a 3-4 year efficacy as well as separate trials for reduced dose PZP primer shots and no adjuvant pellet boosters;

2) specifically provide a primer of PZP vaccine and Freunds Modified Adjuvant to nine (9) wild horse mares (Appendix 1); provide boosters of PZP vaccine and Freunds Incomplete Adjuvant at 1month, 1 year and 2 years to act as positive controls in the study;

3) specifically provide a dose of the newly-developed 3-4 year PZP vaccine (containing a 1-month, 3-month, 12-month and 20-month time release pellet) and Freunds Modified Adjuvant to twenty (20) wild horse mares (Appendix 1);

4) specifically provide a primer of reduced dose PZP vaccine and Freunds Modified Adjuvant to ten (10) wild mares; provide reduced-dose boosters of PZP vaccine and Freunds Incomplete Adjuvant 3-4 weeks later (Appendix 6);

5) specifically provide a dose of the newly-developed modified 3-4 year PZP vaccine (containing a 1-month, 3-month, 12-month and 20-month time release adjuvant-free pellet) to ten (10) wild mares (Appendix 7);

6) specifically draw post-treatment blood samples by jugular venipuncture from all 3-4 year PZP vaccine treated mares, sampling for anti-PZP titers, on the day of immunization and subsequent days 28, 56, 112, 168, 216, 300, 450, 510, 570, 630, and 720 (Appendix 1); reduced dose PZP vaccine and no adjuvant pellet treated mares will have blood drawn once a month for twelve (12) subsequent months; all serum harvested will be sent to the Science and Conservation Center, ZooMontana for anti-PZP antibody titer analysis;

7) perform a pasture-breeding study (Appendix 1) as a fertility test to all treated mares in the 3-4 year PZP vaccine study plus 9 untreated mares. The intent is to test the mares' response to a stallion or their ability to conceive and produce a foal. The latter mares are to be used as a negative control to demonstrate fertility. This fertility testing is scheduled for May-July 2007 with

subsequent pregnancy testing in November 2007 and 2008. This study will require the services of 4 domestic stallions of proven fertility.

8) adhere to all specifications, protocol and requirements for research as set forward in the Wild Horse and Burro Strategic Research Plan, the BLM National Wild Horse Fertility Control Field Trial program and the Assistance Agreement (FAA040011) between the Medical College of Ohio and the BLM for testing of the 3-4 year, controlled release PZP contraceptive for wild horses (Appendix 2).

PZP vaccines provided in February 2005 would provide 3 years of contraception in most mares with a 4th year of contraception at an expected level of >50% of treated mares. During the course of the study all mares will be kept isolated in a dry-lot pens and/or pastures at one end of the facility, where they will remain until completion of the trial. The titer response necessary to demonstrate successful infertility has been well established and documented for the PZP vaccine. These previously established titers levels will be used as reference points for this study. Subsequent fertility testing to validate efficacy of the vaccine is planned.

D. PROPOSED FERTILITY CONTROL AGENT: At this time, all published research indicates that the Immunocontraceptive Porcine Zona Pellucida (PZP) vaccine meets BLM requirements for an ideal contraceptive agent including criteria for safety and efficacy (see Appendix 3). Immunocontraception is a temporary means of fertility control preferred by humane groups to reduce the rate of growth in wild horse populations. Injections are minimally-intrusive and are considered a non-invasive technique. The drug under investigation is Porcine Zonae Pullicida (PZP), which acts as an antigen and produces an immune response within the mare. Developing antibodies cover the maturing egg in the mare's ovary and thereby prevent sperm penetration of the egg and conception. Research has shown that contracepted mares clearly show improvements in body condition and may actually live longer. From a mare physiological standpoint, PZP contraception appears to be completely reversible, does not appear to cause out-of-season births, and has no ill effects on ovarian function if contraception is not repeated for more than 5 consecutive years on a given mare.

E. VACCINE QUALITY AND STUDY PROTOCOL: All PZP vaccine used on mares within this study would be provided by the Science and Conservation Lab (SCC), ZooMontana and subjected to the appropriate quality control testing. Pellet production and formulation into the time-release product takes place at the Medical College of Ohio, Toledo, Ohio or with associated institutional partners. All participants in the proposed pilot study will document all aspects of PZP vaccine provision, mare selection, vaccine delivery, blood-draws, record keeping, veterinary emergencies, and media relations. Standards for these protocol shall serve as the Standard Operating Procedures (SOPs) for the Treatment of Wild Horses with a PZP Contraceptive Vaccine (see Appendix 4). Implementation of the SOPs would take into consideration all safety concerns including individual animal health and condition.

F. PERMISSION and PROTOCOL for VACCINE USE: The Humane Society of the United States (HSUS) has made the PZP vaccine available to the BLM under the Investigational New Animal Drug exemption (INAD #8857) filed with the federal Food and Drug Administration (FDA). The proposed study will adhere to all guidance and protocol set by the HSUS allowing research use of the vaccine.

G. ANIMAL USE AND CARE PROCEDURES: All handling activities would be conducted in accordance with the Standard BLM Operating Procedures for Wild Horse Capture, Removal, Handling, and Safety 2005 (Appendix 5). The MCO Investigational Animal Care and Use Committee has evaluated these care and use procedures for captive wild mares in support on this proposed captive mare study.

H. PROTOCOL FOR OPTIMUM PERFORMANCE OF THE TRIALS:

As part of Assistance Agreement #FAA040011, the BLM will be providing captive wild horses at the Canon City BLM facility for a 4-year test of a controlled-release PZP contraceptive vaccine of presumptive 3-4 year duration (3-4-yr vax). This study will require 38 wild mares and 4 stallions (domestic and of proven fertility). Mares will be immunized by hand or jabstick injection in early March 2005. Blood samples will be taken periodically to determine anti-PZP antibody titers, and the mares and stallions will be allowed to breed in the Spring of years 3 and 4 of the study. Pregnancy will be determined by fecal hormone analysis in November of years 3 and 4.

In addition to this study, 2 small add-on trials of 9-12 month duration will be performed (10 mares per study) to assess use of a reduced (50%) dose of PZP (see Appendix 6) and absence of controlled-release adjuvant (see Appendix 7) in PZP vaccine. Antibody titers will be monitored in these studies, but no breeding will occur.

The following list addresses some practical aspects of performing the study.

A. **AGE**
   1. Mares should be 4-18 years old, with 6-13 being ideal.

B. **NUMBERS**
   1. Needed horse numbers will be as follows:
      a. 3-4-yr vax study (a 4-year study)
         1) Year 1 = 29 (20 = 3-4 year vaccine; 9 = standard 2-injection vaccine)
         2) Year 2 = no horses added
         3) Year 3 = 9 untreated mares and 4 stallions added
         4) Year 4 = no horses added
      b. Add-on Trials #1 and #2 (simultaneous, 9-12 month duration)
         1) 20 mares (10 mares per study)
         2) No additional mares or years
   2. Each mare should be numbered (e.g., brand, ear tag, collar tag)

C. **TREATMENT TIMING**
   1. 3-4-yr vax study
      a. Immunizations in early March (or end of February) 2005
         i. 3-4-yr vax given single intramuscular injection (hip)
         ii. Standard PZP vax given (injection 1 and then 4 weeks later, injection 2). Also, an annual booster is given at end of years 1, 2, and 3.
   2. Add-on trials
      a. A single immunization in February/March 2005. No boosters thereafter.
   3. All injections by hand or jabstick, in stock chute.
   4. A staff veterinarian need not be present for treatment or blood sampling, but a veterinarian should be on call in the event of injuries associated with horse processing and handling.

D. **BLOOD SAMPLING**
   1. 3-4-yr vax study
      a. All mares sampled by 10 cc jugular venipuncture on the day of immunization and thereafter on days 28, 56, 112, 168, 216, 300, 450, 510, 570, 630, and 720.
      b. After day 150, sampling can be ± 7 days of the listed day. Each sample must be labeled

with a permanent marker, centrifuged, (to separate out the serum) and then frozen.

c. Ship frozen samples (for antibody titer testing) to:
Robin Lyda
Science and Conservation Center
2100 S. Shiloh Road
Billings, MT 59108

2. Add-on trials
a. Samples taken by method above
b. Sample days are day of treatment and monthly thereafter for nine to twelve months (Satellite study #2 may be extended to require samples every other month between 9 and 24 months).
c. Sample handling and shipping same as above

E. **PASTURING**

1. Except for the breeding portion, mares in all studies can be kept in whatever group arrangements are best for the convenience of the Canyon City facility.
2. Our suggestion is to keep mares in the 3-4-yr vax study separated from mares in the satellite studies.

F. **BREEDING** (3-4-yr vax study only)

1. During the winter before onset of the 3rd breeding season, the mares should be divided follows:

SET A	**SET B**
half of the mares in each treatment group, plus half the untreated mares	half of the mares in each treatment group, plus half the untreated mares

2. In early March, 4 stallions of proven fertility will be introduced into the pastures (2 into SET A, 2 into SET B). If only 1 stallion can be present in a single pasture, then SET A and SET B can be divided in half. The breeding ratio should not exceed 10 mares per stallion.
3. Horses will be observed daily after stallion introduction until all horses have accommodated to the circumstance.
4. During April and May, facility staff should record in a notebook when estrus and breeding are observed. Formal observation sessions are not necessary.

G. **PREGNANCY TESTING (3-4-yr vax study only)**

1. Between October 15 and November 15 of years 3 and 4, a single blood sample or fecal ball must be collected from each mare to permit pregnancy testing. All blood samples will be handled and shipped as described above. Fecal samples collected in place of blood samples, will be labeled, frozen and shipped in "cold-paks" to the address given above for blood samples.

IV. AUTHORITY for PROPOSED ACTION:

The Wild Free-Roaming Horse and Burro Act of 1971 (Public Law 92-195) as amended, Section 3(b)(1), states that the Secretaries of the Interior and Agriculture shall "determine appropriate management levels of wild free-roaming horses and burros on areas of public lands; and determine whether appropriate management levels should be achieved by the removal or destruction of excess animals, or other options (such as sterilization or natural controls on population levels)." The authority may also be found at Title 43 of the Code of Federal Regulations (CFR-4700, Protection, Management and Control of Wild and Free-Roaming Horses and Burros).

With implementation of the proposed study, 49 excess and captive wild horse mares would be contracepted in efforts to determine a more suitable long-term agent while BLM continues to evaluate fertility control as a population management tool. Protocol and guidance for research

efforts can be found in the Assistance Agreement between the Medical College of Ohio and the BLM (FAA040011), the Strategic Research Plan for Wild Horse and Burro Management and the Wild Horse Fertility Control Field Trial Plan.

V. ALTERNATIVE MANAGEMENT ACTIONS:

The following represents a reasonable range of alternatives based on the issues and goals identified during development of both the Strategic Research Plan for Wild Horse and Burro Management and the Wild Horse Fertility Control Field Trial Plan. This includes the results of 20 years of multi-agency, multi-institutional research efforts on wild horse fertility control.

A. Test of 3-4 Year, Controlled-Release PZP Contraceptive for Wild Horses using Domestic Horse Mares

Under this alternative, no wild mares being held at the Colorado Canon City Correctional Facility would be subjected to a newly-developed 3-4 year PZP vaccine. Domestic mares would be substituted. The use of domestic mares would require, at a minimum, contracting out the study, including the purchase and holding of domestic mares at a university facility. The expenses related to a study using domestic mares would preclude the study being initiated in FY2005. It is estimated that costs associated with holding domestic mares (conservative estimate of $12 per day per mare (49 total) over a 4 year period) would far exceed the governments' ability to fund and support this type of research to benefit the wild horse and burro program. As such, this approach could significantly delay the effort, to the extent that critical information needed in support of humane and cost-effective long-term management of wild horses and burros would not be available for several more years.

This alternative was considered but eliminated from further analysis because of the required delay in initiating the study. BLM has already invested significantly in the development of PZP vaccines for wild horse population control. Safety concerns have already been well established and researched for use of the PZP agent with wild mares. Studies are currently on-going in the field with the1-year conventional and 22-month time-release PZP agents. To date over 800 mares have been treated in individual and population-based studies, under the auspices of the Fertility Control Field Trial Program. Treatment of over 1000 additional mares is proposed for FY2005. The BLM is in need of a longer duration (3-4 year) agent to help promote herd health and fitness and to reduce the costs associated with gathering excess animals for population control. As a result, BLM feels a critical need to initiate trials with the 3-4 year agent on wild mares as soon as possible. Since the proposed study period consists of ~4 years, this already builds a significant time line before results are available that can be applied in field efforts.

B. No Action Alternative: No Test of 3-4 Year, Controlled-Release PZP Contraceptive for Wild Horses

Under this alternative, no wild mares being held at the Colorado Canon City Correctional Facility would be subjected to a newly-developed 3-4 year PZP vaccine.

This alternative was considered but eliminated from further analysis. The BLM currently employs a one-injection PZP contraceptive vaccine that provides one or 2 years of infertility, with a return

to fertility thereafter. Because wild horses are best accessible for injection when they are rounded up into a field corral system, BLM would like to increase the contraceptive duration to 3-4 years to more closely coincide with their present round-up/adoption program schedules. A 3-4 year vaccine will also broaden the options for fertility control in general as well as being significantly cost-effective for the program as a whole (Bartholow, 2004).

BLM has already invested several million dollars in the development of PZP vaccines for wild horse population control. Safety concerns have already been well established and researched for use of the PZP agent with wild mares. Studies are currently on-going in the field with the1-year conventional and 22-month time-release PZP agents. To date over 800 mares have been treated in individual and population-based studies, under the auspices of the Fertility Control Field Trial Program. Treatment of over 1000 additional mares is proposed for FY2005. The BLM is in need of a longer duration (3-4 year) agent to help promote herd health and fitness and to reduce the costs associated with gathering excess animals for population control. BLM feels a critical need to initiate trials with the 3-4 year agent on captive wild mares as soon as possible, in order to facilitate a shift to field trials at the earliest possible time.

VI. AFFECTED ENVIRONMENT, ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES:

A. AFFECTED ENVIRONMENT: The purpose of this section is to provide the reader and decision-makers with a listing of the resource values which are known to occur within the Colorado Canon City Correctional Facility.

Table 1. Summary of Critical Elements & Other Resources of Concern within The Human Environment.

Element	Present	Not Present	Element	Present	Not Present
Sensitive, Threatened or Endangered Plant Species		X	Range and Watershed Condition		X
Cultural and Paleontological Resources		X	Native American Religious Concerns		X
Wilderness Study Area		X	Sensitive, Threatened or Endangered Wildlife Species		X
Water Quality (surface or ground water)	X		Fisheries Habitat		X

Visual Resources Recreation, and Hunting		X	Areas of Critical Environmental Concern (ACECs)		X
Climate and Air Quality	X		Wetlands and Riparian Areas		X
Hazardous Waste	**X**		Livestock Grazing and Trailing		X
Wild Horse Mares	**X**		Vegetation		X
Soils	X		Terrestrial Wildlife		X
Social Economic Concerns	X		Forestry/Timber		X

The above listed (not-highlighted) resources of concern, although present, were determined not to be affected or impacted by the proposed action and will not be discussed further in this EA. The remaining resources (**in bold**) will be evaluated for potential impacts and mitigation measures.

B. ENVIRONMENTAL IMPACTS and MITIGATION MEASURES: Resources impacted by the proposed action will be evaluated for direct, indirect and cumulative consequences. Mitigation measures will be provided as needed. No irretrievable or irreversible impacts to any resource value are anticipated (with the exception of 49 wild mares which may be successfully contracepted for three to four years) with implementation of the proposed action.

a) Wild Horse Mares: Proposed actions incorporate proven Standard Operating Procedures (SOPs) which have been developed over time. All activity would be carried out according to current BLM, HSUS, Medical College of Ohio and ZooMontana policy with the intent of conducting as safe and humane an operation as possible. In addition, the proposed actions would also adhere to all guidance and research protocol set by the Assistance Agreement between the Medical College of Ohio and the BLM (FAA040011), and the National Wild Horse Fertility Control Field Trial program. Protocol have been specifically developed for delivery techniques of fertility control vaccine. These SOPs (Appendix 4) represent the "best methods" for ensuring quality results, minimizing risks and reducing impacts associated with this activity. SOPs have also been developed (Appendix 5) representing the "best methods" for reducing impacts associated with capturing and handling wild horses. If conditions warrant, and animal health or welfare is in jeopardy at any time, operations would be delayed or halted.

1) Fertility Control Impacts:

Impacts to the wild horses take the form of direct and indirect impacts and may occur on either the individual or the population as a whole. Direct individual impacts are those impacts which occur to individual horses and are immediately associated with implementation of the proposed action. In order to mitigate the impacts of the proposed fertility control, all vaccine would be controlled, handled and administered by a lead researcher in fertility control, Dr. John Turner, Jr., Medical College of Ohio, or a certified and experienced associate. Dr. Turner was responsible for the delivery of PZP vaccine for the 10-year study Nevada Wild Horse Fertility Control Project (USDI-BLM Assistance Agreement #1422F915A70001). In addition, knowlegeable and experienced BLM personnel would be on-site, during all phases of the operation. A contract veterinarian would be on-call, at all times during the operation. Possible veterinary emergencies have been dicussed in detail (Appendices 4 and 5).

Indirect individual impacts are those impacts which occur to individual horses after the initial stress event, and may develop as a result of the application of fertility control vaccine. Some of these impacts have yet to be noted and documented for wild horses in the scientific literature but may include increased social disorder among the horses and/or a prolonged foaling season. As the proposed wild mares have already been removed from a wildland setting, these impacts are deemed moot. Other potential physiological impacts of the PZP vaccine were discussed under the specifics of the proposed action. All mares subjected to fertility control would be monitored for aspects of body condition and health under the guidance and research protocol set by the the Assistance Agreement between the Medical College of Ohio and the BLM (FAA040011), and the BLM National Wild Horse Fertility Control Field Trial program.

2) Handling Impacts:

Direct individual impacts include handling stress associated with the capture, sorting, animal handling and preparation. The intensity of these impacts varies by individual, and is indicated by behaviors ranging from nervous agitation to physical distress. Mortality of individuals from these impacts is infrequent but may occur in one half to one percent of horses gathered in a given effort (national BLM statistics).

Protocols have been developed (Appendix 5) which would minimize impacts associated with handling stress. There are no indications that these direct impacts persist beyond a short time following the stress event. They would be expected to completely dissipate following release. Stress levels, and the potential for injury, are however, expected to be highest immediately following capture, and when animals are moved through the chutes in preparation for vaccination and blood draws. Mitigation measures would include well-constructed corrals at the corral facility, well-maintained equipment, and additional pens for animals determined best kept separate from other animals, in an effort to decrease stress and the potential for injury and illness. If necessary, the holding facility would be watered down regularly, to keep down the dust. Safety and performance records, and years of experience in handling wild horses weigh heavily in favor of using PVC and their experienced staff. Experienced BLM personnel would be on-site, during all phases of the operation. A contract veterinarian or APHIS veterinarian technician would either be on-site, or on-call, at all times during the operation. Observers would be asked to remain some

distance from the animals during preparation activities, in order to decrease additional stress due to surrounding levels of commotion and activity.

Indirect individual impacts are those impacts that occur to individual horses after the initial stress event, and may include spontaneous abortions in mares. These impacts, like direct individual impacts, are known to occur intermittently during wild horse handling operations. An example of an indirect individual impact would be the brief skirmish that occurs with older animals following sorting and release into containment pens. This generally lasts less than two minutes. With the proposed action, every effort would be made to minimize these types of impacts. Situations would be handled on a case-by-case basis.

Regardless of the sorting and handling process, traumatic injuries are usually rare, however, they do occur. These injuries typically involve a bite and/or kicking with bruises that don't break the skin. Like direct individual impacts, the frequency of occurrence of these impacts varies with the individual.

b) Waste, Hazardous or Solid: Syringes, darts, needles, vaccine containers, etc. used in the administration of the immunocontraceptive vaccine are considered regulated medical waste. Regulated medical waste must be placed in leak proof containers that are contained in a red plastic bag labelled medical waste. Medical waste must be handled and transported separately from other waste to an approved disposal facility. The amount of regulated waste that would be generated by the proposed action would be well-contained and not result in any threat to the environment.

VII. CONSULTATION AND COORDINATION:

The Strategic Research Plan for Wild Horse and Burro Management is a joint effort of the USGS-BRD, the BLM, and the APHIS. This plan was developed to provide the BLM with a research strategy to meet the needs for management and care of wild horses and burros. The plan was developed over a period of 2 years with the input of thirty-nine subject area experts from 11 universities, 3 federal agencies (BLM, USGS-BRD, APHIS), and two state wildlife agencies. USGS-BRD took the lead role in planning and coordinating meetings of the expert committees, and in drafting the strategic plan based on committee and agency inputs. Assisting in this effort was the BLM's wild horse and burro research coordinator, L. Coates-Markle, and equine health experts from the APHIS, L. Hatcher, and A. Kane. Within this plan, development of a 3-4 year fertility control agent is highly recommended as priority research.

A. List Of Preparers:

Linda Coates-Markle, Wild Horse and Burro Specialist, Montana/Dakotas
National Wild Horse and Burro Research Coordinator

B. Individuals, Groups and Agencies Consulted: Significant contributions to this EA were made by Dr. John Turner, Jr., Medical College of Ohio, Dr. Jay Kirkpatrick, Science and Conservation Center, ZooMontana, Billings, Mt, Dr. Al Kane, USDA-APHIS, Fort Collins, Co and Ron Hall, Wild Horse and Burro Management Specialist, BLM National Wild Horse and Burro Program Office, Reno, Nv.

VIII. FONSI: The environment assessment, analyzing the environmental effects of the proposed actions, has been reviewed. With the implementation of the attached mitigation measures, there is a finding of no significant impact on the human environment and an Environmental Impact Statement (EIS) is not required. Implementation of the Proposed Action will not result in unnecessary or undue degradation of the Public Lands. In addition, the Proposed Action is in conformance with the appropriate and approved management plans.