3.5 ECOLOGICAL RESOURCES

This section describes the terrestrial communities of the proposed Eagle Rock Enrichment Facility (EREF) and provides a baseline characterization of the proposed site's ecology prior to any disturbances associated with construction or operation of the proposed plant. Prior environmental disturbances (e.g., roads) not associated with the proposed plant are considered when describing the baseline condition.

The proposed site is within the Intermountain Semi-Desert Province (Bailey, 1995). The primary natural community is sagebrush steppe. The plant and animal species associated with this major community are identified and their distributions are discussed. Those species that are considered important to the ecology of the proposed site are described in detail. Once the important species are identified, their interrelationship with the environment is described. These descriptions include discussions of the species' habitat requirements, life history, and population dynamics. As part of the evaluation of important species at the proposed site, pre-existing environmental conditions that may have impacted the ecological integrity of the proposed site are considered. Unless otherwise indicated, the information provided in this section is based on surveys conducted by AREVA.

3.5.1 Maps

Ecological field surveys at the proposed site were conducted in May, June, and October 2008. Wildlife and vegetation transects were used to obtain information on vegetation cover, mammals, birds, reptiles, and amphibians occurring on the site. The locations of the transects and data collection points are shown in Figure 3.5-1, Vegetation and Animal Survey Transect Locations and Habitat Map.

3.5.2 General Ecological Conditions of the Site

Bonneville County is located in the eastern portion of the Snake River Plain geologic province. The Snake River Plain is a crescent shaped area of topographic depression that is bounded on three sides by mountain ranges and extends across much of the southern portion of Idaho, covering about 40,400 km^2 (15,600 mi^2). The geology of the Snake River Plain has experienced extensive volcanism that has deposited a thick sequence of rhyolitic and basaltic rocks, ranging up to 1,676 m (5,500 ft) thick. On-site soils are primarily of the Pancheri series. These soils consist of deep silt loams. On-site soils are common to areas used for crops, rangeland, and wildlife habitat. Refer to Section 3.3, Geology and Soils, for further discussion on the Snake River Plain.

The topography of the 1,700-ha (4,200-acre) proposed site has an average slope of about 1.4%. The elevation varies from about 1,556 m (5,106 ft) near U.S. Highway 20 to about 1,600 m (5,250 ft) in a small area at the eastern edge of the property. No major defined drainage features are evident on the proposed site. There is a minor drainage feature that runs from near the center of the proposed site toward the southwest portion of the site.

Soils in the Eastern Snake River Plain are variable, ranging from non-existent in areas of recent volcanism to tens of meters in thickness in areas of wind-blown loess derived from exposed lava flows, lacustrine deposits, and alluvial fill (Hughes, 1999) (Lindholm, 1996) (Whitehead, 1994a). The proposed site is located in an area dominated by Pancheri silt loams formed in loess covered lava plains (NRCS, 2008c). Pancheri silt loams are typically deep, well-drained soils although soil depths often vary depending upon the prevalence of basalt flows near the surface.

Soil depth on the proposed site ranges from 30 cm to 6.6 m (6 in to 21.5 ft). The vegetation in this area is dominated by Wyoming big sagebrush (*Artemisia tridentata wyomingensis*).

The sagebrush steppe vegetation community at the proposed site has been influenced by agricultural practices and grazing. The entire proposed site is grazed seasonally; and there is active irrigated farming on about 389 ha (962 acres), as well as approximately 882 ha (2,180 acres) that was dryland farmed as recently as four to five years ago. The sagebrush on portions of the proposed site has been cleared and the land seeded with perennial grasses to utilize as improved pasture for grazing. Existing vegetation on these areas is dominated by crested wheatgrass (*Agropyron cristatum*) and weedy annuals with limited sagebrush presence associated with basalt outcrops.

The composition of the wildlife community at the proposed site is dependent on habitat characteristics in and around the site. Based on initial field surveys of wildlife and with information on regional and local distribution of wildlife species and on species-specific habitat preferences, the wildlife species likely to occur at the proposed site can be identified. The mammals, birds, amphibians and reptiles known or expected to occur on the proposed site are discussed below.

Mammals typical of species that may occur in sagebrush habitats include: black-tailed jackrabbit (*Lepus californicus)*, mountain cottontail (*Sylvilagus nuttallii*), pygmy rabbit (*Brachylagus idahoensis*), Townsend's ground squirrel (*Spermophilus townsendii*), least chipmunk (*Eutamias minimus*), Ord's kangaroo rat (*Dipodomys ordii*), great basin pocket mouse (*Perognathus parvus*), western harvest mouse (*Reithrodontomys megalotis*), deer mouse *Peromyscus maniculatus*), badger (*Taxidea taxus*), coyote (*Canis latrans*), pronghorn (*Antilocapra americana*), and elk (*Cervus elaphus*) (Stoller, 2001). Refer to Table 3.5-1, Mammals Potentially Using the Proposed Eagle Rock Enrichment Facility Site, for a more complete list of mammals potentially using the proposed site. Table 3.5-1 also lists the general habitat requirements of each mammal species potentially occurring at the proposed site and its probable occurrence. The probable occurrence estimates are derived from knowledge of the species-specific habitat preferences and the current composition, structure, and extent of the vegetation communities at the proposed site. Vegetation in the sagebrush community is in an advanced seral stage. Therefore, changes are not anticipated in habitat or animal species. Similarly, the farmed areas are not expected to change. Vegetation on the 882 ha (2,180 acres) that has been dryland farmed is in a low seral stage with a substantial weed component. Seasonal grazing and limited rainfall will limit vegetation change in this area; therefore, changes in habitat or animal use will also be limited.

Field surveys to identify mammals at the proposed site were conducted in May, June, and October 2008. Incidental observations were made during reconnaissance surveys in May 2008 and wildlife transects were walked in June and October 2008. Small mammal capture and release was not conducted during the field survey.

Common game birds in the region include the mourning dove (*Zenaida macroura*) and greater sage grouse (*Centrocercus urophasianus*). Other birds common to the region include western meadowlark (*Sturnella neglecta)*, horned lark (*Eremophila alpestris*), kildeer (*Charadrius vociferous*), and the sage thrasher (*Oreoscoptes montanus*). Raptors include northern harrier (*Circus cyaneus*) and American kestrel (*Falco sparverius*) (Stoller, 2001). Table 3.5-2, Birds Potentially Using the Proposed Eagle Rock Enrichment Facility Site, lists the bird species that may occur on the proposed site along with their migratory and nesting status. All waterfowl and water birds have been excluded from this list due to the lack of suitable water-related habitat on the proposed site. The 62 species listed were identified as those likely to live in or visit the region. Of these, approximately 13 species are likely to be summer breeder residents, many of

which may nest on the proposed site. These species are denoted with the letter "C" under the column "Summer Breeder" in Table 3.5-2. Approximately two of the species are probable winter residents of the proposed site. A site-specific avian survey was conducted on the proposed site in June 2008 using wildlife transects and point count techniques.

Reptile species that may be present on the proposed site include the western rattlesnake (*Crotalus viridis*), gopher snake (*Pituophis catenifer*), short-horned lizard (*Phrynosoma douglassi*), and sagebrush lizard (*Sceloporus graciosus*) (Stoller, 2001). Amphibians and reptiles (herptiles) potentially occurring on the proposed site are listed in Table 3.5-3, Amphibians/Reptiles Potentially Using the Proposed Eagle Rock Enrichment Facility Site. Table 3.5-3 also lists the general habitat requirements for each amphibian or reptile species potentially occurring at the proposed site as well its probable occurrence. Because the occurrence of amphibian species is closely related to water and the proposed site contains no permanent water, there are very few associated amphibian species.

3.5.3 Description of Important Wildlife and Plant Species

Based on information from the Idaho Department of Fish and Game (IDFG), the U.S. Fish and Wildlife Service (USFWS), and the Bureau of Land Management - Upper Snake Field Office (BLM), the proposed site is located within the known range of four sensitive species: greater sage grouse (*Centrocercus urophasianus*) (IDFG, 2005), ferruginous hawk (*Buteo regalis*) (IDFG, 2005), pygmy rabbit (*Brachylagus idahoensis*) (IDFG, 2005), and Ute ladies'-tresses (*Spiranthes diluvialis*) (IDFG, 2005). The greater sage grouse is listed as a BLM sensitive species (Type 2 Rangewide/Globally Imperiled Species) (IDFG, 2005). The USFWS began a 12-month review in February 2008 to determine if listing of the greater sage grouse is appropriate (USFWS, 2008e) (USFWS, 2008f). However, IDFG maintained a hunting season for the species in 2007 and 2008. The nearest known breeding area or "lek" is located between 6.4 km and 8 km (4 mi and 5 mi) from the proposed site to the northwest. Field surveys of the proposed site in April 2008 did not locate any leks. Greater sage grouse use the sagebrush habitat on the proposed site and have been observed in large flocks moving west in the late fall. They likely use the proposed site throughout the year. The pygmy rabbit has been listed by the BLM as a species of concern and the USFWS initiated a status review in January 2008 to determine if the species should be listed as threatened or endangered. Field surveys of the proposed site in June and October 2008 did not record the presence of any pygmy rabbits or signs of their presence. In Idaho, pygmy rabbits are listed as a species of concern.

The sensitive species that may be present on the proposed site are discussed below in detail based on their special status and potential proximity to the proposed site. Other species are selected for discussion based on their importance for recreation or commercial value. The remaining species listed in Tables 3.5-1 through 3.5-3 are considered less important in terms of protected status, recreation, or commercial value. A complete list of sensitive species that potentially occur in the area surrounding the proposed site is presented in Table 3.5-4, Sensitive Species Potentially Present in the Area of the Proposed Eagle Rock Enrichment Facility Site.

GREATER SAGE GROUSE

Habitat Requirements. Greater sage grouse are closely allied with large, woody sagebrushes of western North America and depend on these for food and cover during all periods of the year. Due to greater sage grouse dependence on sagebrush habitats, they are considered a sagebrush obligate. Large, woody species of sagebrush, including big sagebrush (*Artemisia tridentata)*, silver sagebrush (*Artemisia cana*), and threetip sagebrush (*Artemisia tripartita*) are used by greater sage grouse throughout the year in all seasonal habitats. Other shrub species

such as rabbitbrush, antelope bitterbrush, and horsebrush have also been used for nesting and hiding cover by greater sage grouse (ISGAC, 2006).

Summer habitats used by greater sage grouse include riparian and upland meadows and sagebrush grasslands. Greater sage grouse breeding habitats are sagebrush-dominated rangelands, typically consisting of large, relatively contiguous sagebrush stands, and are critical for survival of greater sage grouse populations. Greater sage grouse nesting habitat is often a broad area within or adjacent to winter range or between winter and summer range. Productive nesting habitat includes sagebrush with horizontal and vertical structural diversity. The understory of productive nesting habitat should be composed of native grasses and forbs that provide a food source of insects, concealment of the nest and hen, and herbaceous forage for pre-laying and nesting hens (ISGAC, 2006) (Connelly, 2004). Adult males weigh 1.8-3.6 kg (4-8 pounds) and adult females 0.9-1.8 kg (2-4 pounds) (ISGAC, 2006). Sagebrush is a primary food item for adults throughout the year. However, greater sage grouse food habits are complex and forbs and insects are consumed at certain times of year. Insects are a key component of greater sage grouse early brood-rearing habitat. A high protein diet of insects is necessary for all young upland game birds during the first month of life.

Life History. The greater sage grouse is North America's largest grouse, and is long-lived for an upland game bird. During the spring (normally early March to mid-May), males gather on traditional breeding areas, called leks, for displaying and mating. Using elaborate plumage displays and inflatable air sacs that produce a loud "booming" sound, males attract females and protect their territory on the lek from other males (ISGAC, 2006). Females normally begin moving from winter to breeding areas from late February to early March, but actual lek attendance varies somewhat throughout the species range. After breeding, females move away from the lek to establish nests. In Idaho, hens nest an average of 3-5 km (2-3 mi) from their lek of capture but may move more than 18 km (11 mi) to nest (Connelly, 2004). The breeding and nesting season for greater sage grouse in Idaho extends from March 1 until July 15.

The greater sage grouse has one of the lowest reproductive rates of any North American game bird. Within 7 to 10 days after breeding, the hen builds a nest. The peak of egg-laying and incubation varies from late March through mid-June depending on weather, elevation, and plant phenology. Nest bowls may be scratched or dug immediately before the first egg is laid although relatively few specifics are known. In Idaho, clutch sizes for greater sage grouse average 6 to 7 eggs, relatively low for an upland game bird (ISGAC, 2006).

Population Dynamics. Three types of seasonal movement patterns have been described for greater sage grouse: (1) non-migratory; grouse do not make long distance movements (e.g., ≈10 km (6 mi) one way), (2) one-stage migratory; grouse move between two distinct seasonal ranges, and (3) two-stage migratory; grouse move among three distinct seasonal ranges (Connelly, 2004). Many greater sage grouse populations in Idaho are migratory. In the late summer and early fall, migratory greater sage grouse often congregate into flocks in preparation for movement to traditional wintering grounds. Migratory movements can be slow and meandering, or direct and rapid. Distances between seasonal use areas of migratory greater sage grouse have been reported to vary between 1 and 82 km (0.6 to 51 mi) although birds have moved up to 161 km (100 mi). These large movements result in highly variable home ranges that vary from 6 to 615 km^2 (2.3 to 237 mi^2). In some instances, migratory populations have been reported to use areas in excess of 2,700 km^2 (1042 mi^2). Despite large annual movements, greater sage grouse show high fidelity to seasonal ranges (Connelly, 2004).

Greater sage grouse have been monitored in Idaho since the 1950s, although in some areas, data are limited. Overall, from 1965-2003, Idaho's greater sage grouse population declined at an average rate of 1.5% per year (ISGAC, 2006). In general, Idaho greater sage grouse

numbers reached a low in the mid 1990s but have increased since that time (Connelly, 2004). Additional research data for southeast Idaho suggested that bird recruitment was poor in 2006 and 2007 (Connelly, 2007). Greater sage grouse populations in the general region of the proposed site show a long-term population decline (based on lek counts); however, these declines seem to be reversing in the past several years (IDFG, 2007). Similarly, the quantity and quality of greater sage grouse habitat has been declining due to agriculture encroachment, sagebrush manipulation, loss of moist areas, livestock grazing, wildfires, and prescribed burns (IDFG, 2007).

PYGMY RABBIT

Habitat Requirements. The pygmy rabbit is a sagebrush-obligate species that inhabits areas characterized by cold winters, warm summers, and low precipitation at elevations ranging from 900-2,380 m (2,800-7,800 ft). Habitat is generally characterized by dense, tall stands of big sagebrush growing on deep, friable soils that allow the rabbits to dig often extensive burrow systems (Ulmschneider, 2004). Landscape features common to pygmy rabbit habitat include alluvial fans and hillsides, swales within rolling topography, floodplains, brushy draws, riparian channels, edges of rock and lava outcroppings, and mima mounds (low, circular mounds of loose, unstratified soils that support distinctly taller patches of sagebrush). Pygmy rabbits are not randomly distributed within the sagebrush landscape; they are systematically distributed, because they choose particular soils and sagebrush habitats. They do not appear to be abundant in many situations (Ulmschneider, 2004).

Big sagebrush is the primary food item of pygmy rabbits and may comprise up to 99% of their winter diet (Green, 1980). Native forbs and grasses comprise a large proportion of the diet (30-40%) in the summer months (Green, 1980). Under deep snow conditions, dense and structurally diverse stands of big sagebrush facilitate subnivean burrowing, providing access to forage and protection from predators and thermal extremes (Katzner, 1997).

Life History. Pygmy rabbits are the smallest rabbits in North America. They weigh between 246 to 462 g (9-16 oz), averaging 398 to 436 g (14-15 oz). They are 23.5 to 29.5 cm (9.3-11.2 in) long, with a tail length of 15 to 24 mm (0.6-0.9 in) and hind foot length of 67 to 76 mm (2.6–3.0 in). The fur color varies from brown to dark grey with white around the margins of their short, round ears. The ears and feet are densely covered in hair, and they have a very short tail. Rabbits, in general, show some sexual size dimorphism, in that females are 1 to 10% larger than males.

The pygmy rabbit is the only native leporid that digs burrows. Juveniles use burrows more than other age groups. Burrows are usually located on slopes at the base of sagebrush plants, and face north to east (Tesky, 1994a).

Population Dynamics. Mating systems in pygmy rabbits are largely unknown. The breeding season of pygmy rabbits is very short - in Idaho it lasts from March through May. Gestation lasts about 27-30 days (Green, 1980). An average of six young are born per litter, and a maximum of three litters are produced per year (Green, 1980). In Idaho, the third litter is generally produced in June (Tesky, 1994a). Unlike many lagomorphs, pygmy rabbits do not appear to be able to produce extra litters in response to favorable environmental conditions (WDFW, 1995).

PRONGHORN

Habitat Requirements. Pronghorn are found from sea level in Mexico to alpine meadows reaching 3,353 m (11,000 ft) elevation in Oregon and Wyoming. Greatest densities in the Great Basin occur between 1,220-1,830 m (4,000 to 6,000 ft) elevation. Reaching top speeds of 80 km/hr (50 mph), pronghorn are North America's fastest mammal. Pronghorn rely on keen

eyesight, vigilant watch, and rapid flight to avoid predation. Pronghorn, therefore, require open cover, either grassland or grassland interspersed with low shrubs, which provides long-range visibility. Pronghorn typically occupy areas where vegetation is at a mean height of 37.5 cm (15 in), even if more suitable forage is available on sites with taller vegetation (Howard, 1995). Pronghorn primarily occur in grasslands and open shrub-grasslands and typically inhabit low, rolling, expansive lands with less than 30 percent slope.

Foods utilized by pronghorn vary seasonally depending upon availability, palatability, and succulence of vegetation. Over a year's time, pronghorn consume nearly all available plant species, with a preference for succulent forage. Forbs are preferentially selected when available. Pronghorn select the most succulent, high-protein browse or grasses available when forbs are scarce. In winter, shrubs are high in protein relative to other forage, and shrubs comprise the majority of the pronghorn diet (Howard, 1995).

Life History. The pronghorn's upper body and legs are tan to brown in color. The lower body, including the cheeks, chest, belly, and rump, are all lighter brown to white. This two-toned coloring is interrupted with a broad, black band down the snout, a black nose, and black neck patch. Pronghorn are the only species to annually shed their horn sheath and are also the only animal to have a forked horn design. Horns of the males are 30-48 cm (12-18 in) in length; the female's horns are much smaller, usually no longer than 15-18 cm (6-8 in). Shortly after mating season, the pronghorn sheds its horns and only the permanent core remains. Male pronghorns are slightly larger than the female species. Pronghorns usually stand about 1 m (3 ft) high at the shoulder and average between 1.0-1.5 m (3-5 ft) long (IDFG, 2008).

The pronghorn inhabits open plains and semi-deserts, living alone or in small bands in summer and forming large herds in winter. Being highly mobile, the pronghorn may cover a large area during the year. Pronghorns successfully survive both bitter cold temperatures and desert heat of up to 54 °C (130 °F). Because of their ability to adapt to various temperatures, pronghorn are abundant throughout various areas of the West and Southwest (IDFG, 2008).

Population Dynamics. Pronghorn breed from late summer to fall; rutting season lasts for 2 to 3 weeks. During this time, male pronghorns gather a harem of about 3 or 4 does. Females are pregnant for about 250 days. Fawning occurs from May to June; does deliver a single fawn at first birth and twins thereafter. Fawns are born weighing about 2.7 to 4.5 kg (6 to10 lb). At birth, fawns lack the spots that are characteristic of deer and elk fawns. Fawns walk within hours of birth but are generally inactive for the first few days of life; they run by their fifth day. Fawns under 3 weeks of age spend up to 90% of their time lying in seclusion; newborns are generally active only for a brief period when their mothers return to the fawning grounds to nurse them. Fawns graze by 3 weeks of age and are completely weaned by fall (IDFG, 2008) (Howard, 1995).

Pronghorn movement is usually in response to changing environmental conditions such as drought, blizzards, or new food sources. Some cold-climate populations migrate from one seasonal-use area to another, using the same routes each year. Migrating populations may travel up to 320 km (200 mi) or more to leave areas of deep snow. Pronghorn seldom live more than 9 years in the wild, but a few wild does have been aged at 16 years (Howard, 1995).

FERRUGINOUS HAWK

Habitat Requirements. Ferruginous hawks inhabit semi-arid to arid western plains and intermountain regions. They are typically found in open country with scattered trees, primarily prairies, plains, and badlands. The ferruginous hawk requires large tracts of relatively undisturbed areas (Clark, 1987). The conversion of extensive tracts of native vegetation into monotypic stands for grazing and agriculture may reduce ferruginous hawk densities and

reproductive success. The ferruginous hawk nesting habitat consists of communities with isolated trees, woodland edges, buttes, cliffs, and/or grassland with some relief. The majority of ferruginous hawks will preferentially construct their nests in trees. However, these hawks will use a wide variety of sites for nesting, including riverbed mounds, cut-banks, small hills, and small cliffs (Tesky, 1994b).

The ferruginous hawk generally forages in open habitats with short vegetation containing abundant prey. Food suitability for the ferruginous hawk is optimum when the vegetation occurs at a mix of heights and densities which optimizes prey abundance and minimizes hunting interference. The ferruginous hawk hunts mainly in early morning and late afternoon from low flights and perches (Clark, 1989). The ferruginous hawk feeds primarily on rabbits, ground squirrels, and prairie dogs but also takes mice, rats, gophers, birds, snakes, locusts, and crickets.

Life History. Ferruginous hawks are usually between 50-66 cm (20-26 in) in length, have an average wingspan of 134-152 cm (53-60 in) and weigh 980-2,030 g (2.2-4.5 lb). They are the largest hawks in North America, and are sexually dimorphic. The female hawk may be up to one-and-a half times larger than the male. Adults have a rusty color on their back and shoulders, which extends downward onto the legs (Rogers, 2002).

Ferruginous hawks commonly hunt by flying low to the ground over open fields at high speeds, soaring high above, hovering, or swooping down from perches. Hawks use their excellent eyesight to spot prey on the ground and then attack with talons (Rogers, 2002). When courting, ferruginous hawks will soar with wings held arched above their backs. The male then darts at the female, their talons clasp and the pair display an aerial cartwheel. A pair of hawks mate for life (Rogers, 2002).

Population Dynamics. The ferruginous hawk is an obligate grassland or desert-shrub nester (Tesky, 1994b). The ferruginous hawk generally returns to breeding grounds in late March or early April and begin nest construction in April (Clark, 1989). Breeding pairs aggressively defend their nesting territory. Nests are frequently reused by the same pair in subsequent years. The ferruginous hawk generally lays three to four eggs in April, but this number varies with fluctuating food supply. The eggs are incubated for 28 to 36 days (Clark, 1989). Male nestlings fledge at 38 to 40 days. The females, which are heavier and develop more slowly, fledge about 10 days later.

PLANT SPECIES

The vegetation community at the proposed site provides habitat for wildlife. Certain plant species that are better adapted to soil and climatic conditions of a given area occur at higher frequencies and define the vegetation community. The vegetation community that occupies the proposed site is generally classified as sagebrush steppe. The dominant shrub species associated with the sagebrush steppe community at the proposed site is Wyoming big sagebrush (*Artemisia tridentata* var. *wyomingensis*), with a lesser amount of dwarf goldenbush (*Ericameria nana*). The dominant perennial grass species at the proposed site is Sandberg bluegrass (*Poa secunda*). Significant amounts of cheatgrass (*Bromus tectorum*), foxtail barley *(Hordeum jubatum)* and crested wheatgrass (*Agropyron cristatum*) are also present. Numerous other herbaceous species are present in low densities. Table 3.5-5, Vegetation on the Proposed Eagle Rock Enrichment Facility Site, presents a list of plant species observed on the proposed site. The sagebrush-grass habitat provides nest, foraging, escape, and loafing cover for birds and small mammals. Similarly, this habitat provides foraging, escape, and loafing cover for big game, including pronghorn and elk. The relict sagebrush habitat from previous dryland farming and conversion to seeded pasture provides only limited foraging habitat for some songbirds and small mammals. Utes ladies'-tresses is the only sensitive plant that may

be present on the proposed site and is discussed in detail based on its special status and potential proximity to the proposed site. The other specie discussed, Wyoming big sagebrush, was selected based on its importance as wildlife habitat and for ecosystem function and recreation values.

UTE LADIES'-TRESSES

Species Description. The Ute ladies'-tresses orchid is a perennial, terrestrial orchid with erect, glandular-pubescent stems 12 to 60 cm (5 to 24 in) tall arising from tuberous-thickened roots. Its narrow leaves are about 28 cm (11 in) long at the base of the stem and become reduced in size going up the stem. This species flowers from late July to September. Plants do not flower every year and portions of a population remain dormant below ground each year. The flowers consist of small white to ivory colored flowers clustered into a 3 to 15 cm spike arrangement at the top of the stem. Whitish, stout, spirally arranged flowers characterize the species.

Habitat. When the Ute ladies'-tresses orchid was federally listed in 1992, it was known primarily from moist meadows associated with perennial stream terraces, floodplains, and oxbows at elevations between 1,310-2,090 m (4,300-6,850 ft) (USFWS, 1992) (Fertig, 2005). Most sites were reported from openings where vegetation cover was not overly dense or heavily grazed (USFWS, 1992). The Ute ladies'-tresses orchid is currently known to occur in western Nebraska, southeastern Wyoming, north-central Colorado, northeastern and southern Utah, east-central Idaho, southwestern Montana, and north-central Washington. The global population of Ute ladies'-tresses, based on survey and monitoring studies, may be over 83,000 individuals. Surveys since 1992 have expanded the number of vegetation and hydrology types occupied by Ute ladies'-tresses to include seasonally flooded river terraces, sub-irrigated or spring-fed abandoned stream channels and valleys, and lakeshores. In addition, 26 populations have been discovered along irrigation canals, berms, levees, irrigated meadows, excavated gravel pits, roadside barrow pits, reservoirs, and other human modified wetlands (Fertig, 2005).

Life History. Ute ladies'-tresses occurs primarily in areas where the vegetation is relatively open and not overly dense or overgrown and seems to require "permanent sub-irrigation," indicating a close affinity with floodplain areas where the water table is near the surface throughout the growing season and into the late summer or early autumn (USFWS, 1995). This plant typically blooms from late July through August, and in some cases through September. Blooms have been recorded in early July and in early October. The Ute ladies'-tresses' flower is required for identification. Reproduction is strictly sexual. Reproductively mature plants do not flower every year. These plants may take 5-10 years to reach reproductive maturity.

WYOMING BIG SAGEBRUSH

Species Description. Wyoming big sagebrush (*Artemisia tridentata* var. *wyomingensis*) is a native perennial shrub. Wyoming big sagebrush is the most xeric subspecies of big sagebrush. It generally occurs on shallow soil in areas receiving 200 to 300 mm (7.9 to 11.8 in) of annual precipitation (Cronquist, 1994) (Monsen, 2000). Wyoming big sagebrush plants exhibit a ragged, irregular growth form, and most plants grow to less than 1 meter (3.28 ft) in height. The main stem is often branched at or near ground level. Persistent leaves are narrowly cuneate to cuneate with the margins curved outward, and exhibit a strong, pungent odor when crushed. Wyoming big sagebrush is technically an evergreen but is semi-deciduous in habit. It develops 2 types of leaves: large ephemeral leaves and smaller, perennial leaves produced from ephemeral leaf axes. The inflorescence is an open, many-flowered spike. The fruit is a small, easily shattered cypsela. The plants flower from late July to September, and seed maturation occurs in October and November (Monsen, 2000).

Wyoming big sagebrush is the preferred browse for wild ungulates, and Wyoming big sagebrush communities are important winter ranges for big game (Howard, 1995). Pronghorn usually browse Wyoming big sagebrush heavily (Howard, 1999). Sagebrush also provides cover (nesting, resting, and escape) for a wide variety of game and non-game species.

Habitat. Of the three subspecies, Wyoming big sagebrush is most adapted to poor, infertile sites. Wyoming big sagebrush is intolerant of alkaline soils. In Idaho, it typically grows on dry, gravelly, shallow sites ranging from 700-1,980 m (2,500 to 6,500 ft) (Howard, 1999). Wyoming big sagebrush is most common on foothills, undulating terraces, slopes, and plateaus, but also occurs in basins and valley bottoms. Aspect varies, but shrubs are most common on south- to west-facing slopes.

Life History. Wyoming big sagebrush reproduces from seed; it does not sprout or layer (Howard, 1999). Twig elongation for Wyoming big sagebrush begins in mid-April and lasts until late June. Flowers of this species appear in late August, but flower bud development can last from mid-June until early September (Whitson, 2006). Wyoming big sagebrush forms and sheds seeds between October and December (Whitson, 2006). Seeds remain viable in the soil for one year (Whitson, 2006). Seeds may be transported by wind, water, or animals, but most seeds typically remain near parent plants.

3.5.4 Rare, Threatened or Endangered Species Known or Potentially Occuring in the Project Area

Based on field surveys and contacts with state and federal agency personnel, no currently listed rare, threatened, or endangered species have been found or are known to occur on the proposed site. However, USFWS initiated a status review in January 2008 for the pygmy rabbit (USFWS, 2008d) and in February 2008 for the greater sage grouse (USFWS, 2008e) (USFWS, 2008f) to determine if listing of either species is warranted. Life history and habitat requirements for both species are discussed in Section 3.5.3, Description of Important Wildlife and Plant Species.

Habitat is present on the proposed site for pygmy rabbits but is isolated to the western portion of the proposed site. However, no sign (e.g., pellets, burrows) of pygmy rabbits were observed during field surveys of the proposed site in June and October 2008. Pygmy rabbits have been found during surveys conducted by BLM in 2005 and 2006 on BLM lands (Crooked Creek and Medicine Creek) north of Market and Mudd lakes. No surveys have been conducted on BLM lands near the proposed site. Similarly, pygmy rabbits have also been found on the INL property during winter surveys conducted by DOE in 2006 and 2007. These surveys were conducted on the INL property at two locations within 3.2 km (2 mi) of the proposed site and at seven other locations within 8 km (5 mi) of the proposed site.

Habitat is present on the proposed site for greater sage grouse. Habitat is primarily isolated to the western portion of the proposed site. No birds were observed or heard during June 2-7, 2008 field surveys on the proposed site. However, greater sage grouse sign (e.g., feathers, and pellets) were observed during the June field surveys. One bird was observed about 1.6 km (1 mi) north of the proposed site and two birds were heard some distance from the proposed site during road point counts in May 2008. There are several leks within 16 km (10 mi) of the proposed site.

3.5.5 Major Vegetarian Characteristics

The general vegetation community that the proposed site is located in is classified as sagebrush steppe. However, present and historic land use at the site has also modified portions of this general vegetation community. As such, vegetation at the site has been stratified into three classes, which better represent current vegetation as influenced by recent and ongoing land uses. These three classes are: sagebrush, non-irrigated seeded pasture, and agriculture (center-pivot irrigation). As the agricultural land use class represents a complete modification of native vegetation, it will not be described further.

Cover data from the proposed site was collected during field studies on June 3-6, 2008. A total of 34 species were observed in cover transects in the sagebrush community, while 17 species were observed in sampling the non-irrigated seeded pasture. Species present in all cover transects consisted of the following life forms: 24 forb species, 8 grass species, 5 shrub species, and one species of cactus. See Figure 3.5-1, Vegetation Types and Survey Locations, for location of the transects and Table 3.5-6, Vegetation Cover on the Proposed Eagle Rock Enrichment Facility Site—Rangeland Type, and Table 3.5-7, Vegetation Cover on the Proposed Eagle Rock Enrichment Facility Site—Non-Irrigated Seeded Pasture Type, for a summary of the plant cover data. Shrub density data from the proposed site was collected during field studies on October 21 to 23, 2008. See Figure 3.5-1, Vegetation Types and Survey Locations, for location of the transects.

3.5.5.1 Sagebrush Community

The sagebrush community of the proposed site is characterized by the presence of significant amounts of the indicator species Wyoming big sagebrush (16% cover) and dwarf goldenbush (*Ericameria nana*) (17% cover) (Table 3.5-6). The community is further characterized by the presence of forbs, shrubs, and grasses that are adapted to the soils of the sagebrush steppe in southeastern Idaho. The sagebrush community type is typical for the region and the species encountered during the on-site survey are highly ubiquitous. The natural vegetation of the region typically consists of an overstory of shrubs and an understory of grasses and forbs. Wyoming big sagebrush and dwarf goldenbush are two of the most common shrubs but more than forty other species of shrubs have been recorded on adjacent lands. Perennial and annual grasses and forbs found on the site commonly occur in sagebrush dominated communities in the region (Anderson, 1996a).

Total vegetation cover represents the percentage of ground that has vegetation above it, as opposed to bare ground, rock, or litter. The total plant cover, excluding moss, for the undisturbed sagebrush type at the proposed site is approximately 60%. Grasses contribute approximately 20% ground cover and shrubs contribute approximately 34% ground cover. Forbs contribute approximately 6% cover.

The largest contributor to vegetation cover was dwarf goldenbush with approximately 17% cover, followed by Wyoming big sagebrush with approximately 16% cover. The next two largest contributors were Sandberg bluegrass (*Poa secunda*) with approximately 11% cover and cheatgrass (*Bromus tectorum*) with approximately 4% cover.

Relative cover is the fraction of total vegetation cover that is composed of a certain species or category of plants. Perennial grasses accounted for 33% of the relative cover, forbs accounted for 10% of the relative cover, and shrubs accounted for 57% of the relative cover.

Density board measurements were conducted to estimate the vertical cover and vegetation structure as an index of wildlife cover or concealment. Field survey results indicated that wildlife

cover in the sagebrush community decreased with increasing height. Maximum wildlife cover ranged from 91% at a height range of 0-0.1 m (0 – 3.9 in) to 3% at a height range of 0.7-0.8 m (27.5 – 31.5 in). The average maximum vegetation height in the sagebrush community was approximately 43 cm (17 in), with a standard deviation of 8.8 cm (3.5 in). Average shrub density in the sagebrush community including both size classes, is approximately 7,430 shrubs/ha (3,007 shrubs/ac). Wyoming big sagebrush is the tallest and largest shrub in this community and densities of this species are approximately 6,900 shrubs/ha (2,792 shrubs/ac) for the ≥40-cm size class, and 6,000 shrubs/ha (2,428 shrubs/acre) for the <40-cm size class. Dwarf goldenbush does not attain the stature of height of big sagebrush, and its growth habit is often classified as subshrub (a low-growing shrub usually under 0.5 m (1.5 feet) tall, never exceeding 1 meter (3 feet) tall at maturity) (USDA, 2008b). Dwarf goldenbush occurs at a relatively high density as a subshrub in this community, with a density of approximately 16,600 shrubs/ha (6,718 shrubs/ac) for the <40-cm size class. It does not often achieve a height of ≥40-cm in this community, and occurs at an approximate density of 300 shrubs/ha (121 shrubs/ac) for this class size.

3.5.5.2 Non-Irrigated Seeded Pasture Community

The non-irrigated seeded pasture community of the proposed site is characterized by the presence of significant amounts of the indicator species crested wheatgrass (34% cover) and cheatgrass (12% cover). The community is further characterized by the presence of forbs, shrubs, and other grasses that have colonized these mechanically disturbed sites. See Table 3.5-7, Vegetative Cover on the Proposed Eagle Rock Enrichment Facility Site – Non-irrigated Seeded Pasture Type, for a summary of the plant cover data.

The total plant cover for the non-irrigated seeded pasture community at the proposed site was approximately 55%. Grasses dominated this community and contributed approximately 47.5% ground cover. Shrubs contributed approximately 0.5% ground cover, and forbs contributed approximately 7% cover. The largest contributor to vegetation cover was crested wheatgrass with approximately 34% cover, followed by cheatgrass with approximately 12% cover. The next two largest contributors were bur buttercup (*Ranunculus testiculatus*) with approximately 5% cover and Sandberg bluegrass with approximately 2% cover.

Three shrub species were recorded on the non-irrigated seeded pasture community transects. Shrubs comprised only trace amounts of the total vegetation cover. Wyoming big sagebrush, rubber rabbitbrush (*Chrysothamnus nauseosa*), and dwarf goldenbush were all recorded in this community, each representing less than 0.5% cover.

With respect to relative cover, perennial grasses account for 87% of the relative cover, forbs accounted for 12% of the relative cover, and shrubs accounted for 1% of the relative cover.

Density board measurements were also conducted in the non-irrigated seeded pasture to estimate the vertical cover and vegetation structure as an index of wildlife cover or concealment. Field survey results indicate that wildlife cover in the non-irrigated seeded pasture community was very low above 0.2 m (8 in). Maximum wildlife cover ranged from 64% at a height range of 0-0.1 m (0–3.9 in) to 1% at a height range of 0.2-0.3 m (8–12 in). The average maximum vegetation height in the non-irrigated seeded pasture community was approximately 16.5 cm (6.5 in), with a standard deviation of 1.5 cm (0.6 in). While dominated by seeded and invasive grasses, small, isolated sections of the non-irrigated seeded pasture community have a shrub overstory. These areas occur in several locations where outcrops of basalt precluded full mechanical type conversion of this community from shrubland to grassland. Although these shrub-dominated outcrops are not representative of the grassland matrix in which they are found, targeted sampling of three outcrops was conducted in order to compare the shrub

densities of these small relict sagebrush stands with those of the adjacent sagebrush community. Average shrub density on the outcrops found in the seeded crested wheatgrass community, including both size classes, is approximately 1,310 shrubs/ha (526 shrubs/ac). Densities of Wyoming big sagebrush are approximately 2,100 shrubs/ha (850 shrubs/ac) for the ≥40-cm size class, and 1,800 shrubs/ha (728 shrubs/ac) for the <40-cm size class. Densities of dwarf goldenbush are approximately 100 shrubs/ha (40 shrubs/ac) for the ≥40-cm size, and 2,100 shrubs/ha (850 shrubs/ac) for the ≥40-cm size class. Densities of rubber rabbitbrush are approximately 500 shrubs/ha (243 shrubs/ac) for the ≥40-cm size class, and 1,100 shrubs/ha (445 shrubs/ac) for the <40-cm size class.

3.5.6 Wildlife Occurrence and Site Use

The importance of the habitat found on the proposed site for threatened, endangered, and other important species relative to the habitat of those species throughout their entire range is rather low. Most of these species have limited habitat on the proposed site, the habitats have been extensively grazed or converted to agriculture and habitats present on the proposed site are not rare or uncommon in the general area.

A field survey conducted in June 2008 revealed that the sagebrush community supports a diversity of bird and mammal species (Table 3.5-8a, Avian Transect Survey Data Summary for the Proposed Eagle Rock Enrichment Facility Site-Rangeland Area). During field reconnaissance in May 2008, several mobile mammal species were observed including a small herd of pronghorn, individual white-tailed deer, and numerous black-tailed jackrabbits. Pronghorn and black-tailed jackrabbits were observed incidentally during field surveys in June 2008. The most common species encountered in the sagebrush community during avian transect surveys in June 2008 included the horned lark (49.1% of the total number of birds observed), Brewer's sparrow (*Spizella breweri*) (15.4% of the total number of birds observed), and western meadowlark (13.6% of the total number of birds observed). Other birds commonly encountered included the sage thrasher, vesper sparrow (*Pooecetes gramineus*), mourning dove (*Zenaida macroura*), and northern harrier. A total of 17 bird species were positively identified in the sagebrush community in June 2008. The only commonly observed bird species encountered in the sagebrush community during the October 2008 surveys was the horned lark (79.9% of the total number of birds observed). A total of 7 bird species were positively identified in this community during the fall survey.

The most common species encountered in the non-irrigated seeded pasture community during the June 2008 avian transect surveys include the horned lark (68.2% of the total number of birds observed), Brewer's sparrow (12.9% of the total number of birds observed), and western meadowlark (9.4% of the total number of birds observed) (Table 3.5-8b, Avian Transect Survey Data Summary for the Proposed Eagle Rock Enrichment Facility Site-Non-Irrigated Seeded Pasture Area). The only other bird species commonly encountered was the vesper sparrow. A total of 9 bird species were positively identified in the non-irrigated seeded pasture community in June 2008. The only commonly observed bird species encountered in the non-irrigated seeded pasture community during the October 2008 surveys was the horned lark (74.4% of the total number of birds observed). A total of 5 bird species were positively identified in this community during the fall survey.

The most common species encountered in the agriculture (center-pivot) community during June 2008 avian point-count surveys include the horned lark (54.8% of the total number of birds observed), meadowlark (12.9% of the total number of birds observed), northern harrier (12.9% of the total number of birds observed), and long-billed curlew (*Numenius americanus*) (12.9% of the total number of birds observed) (Table 3.5-8c, Avian Transect Survey Data Summary for the

Proposed Eagle Rock Enrichment Facility Site-Crop Area). The only other bird species encountered was the mourning dove. A total of 5 bird species were positively identified in the non-irrigated seeded pasture community in the June 2008 survey. The only commonly observed bird species encountered in the agriculture community during the October 2008 surveys was the horned lark (82% of the total number of birds observed). A total of 5 bird species were positively identified in this community during the fall survey.

Mammalian species encountered via direct observation, sign, or vocalization on the site included coyote, pronghorn, badger, jackrabbit, and white-tailed deer (*Odocoileus virginianus*).

3.5.7 Location of Important Travel Corridors

The proposed site is within BLM-designated crucial winter-spring range of pronghorn. Pronghorn use the area through the spring and then move to summer range. Elk, white-tailed deer, and mule deer are known to be incidental visitors to the area. Elk have been observed by the current landowner in late fall and winter. Two deer were observed just north of the proposed site in May 2008.

Field surveys conducted on the site in May and June 2008 identified a limited number of migratory bird species present on the proposed site. The closest migratory bird route is located on the INL property approximately 24-32 km (15-20 mi) west of the site (Stoller, 2007). Studies conducted on the INL property indicate that migratory bird populations have increased along the Tractor Flats Route along the eastern portion of the sagebrush steppe. Although migratory birds utilize the property on a limited basis, the site has not been identified as an important travel corridor for migratory bird species.

The proposed site also provides limited habitat for the greater sage grouse. Field surveys for the greater sage grouse that were conducted in May and June 2008 indicated that the species may use the northwestern portion of the proposed site for roosting. No greater sage grouse were identified on the property during the field surveys; and, although the site has sagebrush densities that meet the requirements for greater sage grouse habitat, the site has not been identified as an important travel corridor for this species.

3.5.8 Important Ecological Systems

The proposed site contains fair to poor quality wildlife habitat. The sagebrush steppe vegetation community is an important ecological system in the region. On the proposed site and throughout the region, this community has been impacted by past land use practices. While it is susceptible to change, it is not especially vulnerable compared to other ecosystem types. General threats include conversion to other land uses and wildfire (ISGAC, 2006).

As discussed in Section 3.5.4, about one-third of the proposed EREF site is sagebrush steppe vegetation, while the remaining area is in crop land and seeded crested wheatgrass.

The proposed EREF site does not contain any breeding, nursery, feeding, or resting areas for any sensitive, rare, or protected species. The proposed site is within a general area considered crucial winter-spring pronghorn habitat by the BLM. While pronghorn use the site, pronghorn have not been observed and are not known to concentrate on the limited sagebrush steppe vegetation found on the proposed site.

Field observations indicate that greater sage grouse do use the sagebrush community on the proposed site as roosting habitat, but no leks were found on the site or known to exist on the site. The nearest known greater sage grouse lek is between 6.4 and 8 km (4 and 5 mi) to the

northwest of the proposed site on Idaho National Laboratory (INL) land. There are no reported observations of ferruginous hawks or pygmy rabbits occupying the proposed site.

3.5.9 Characterization of the Aquatic Environment

The proposed site contains no aquatic habitat. There are no features on the proposed site that support aquatic life, including rare, threatened, or endangered aquatic species. There are no intermittent or perennial waterbodies or jurisdictional wetlands on the proposed site. There is no hydrological/chemical monitoring station on site, and no data have been recorded in the past.

3.5.10 Location and Value of Commercial and Sport Fisheries

Due to the lack of aquatic habitat (no surface water), there are no commercial and/or sport fisheries located on the proposed site or in the local area. The closest fishery, the Snake River, is approximately 32 km (20 mi) east of the proposed site.

3.5.11 Key Aquatic Organism Indicators

Due to the lack of aquatic habitat on the proposed property, there are no key aquatic indicator species that would be used to gauge changes in the distribution and abundance of populations particularly vulnerable to impacts from the proposed action.

3.5.12 Important Aquatic Ecological Systems

There are no important aquatic ecological systems on the proposed site or in the local area that are especially vulnerable to change or that contain important species habitats, such as breeding areas, nursery areas, feeding areas, or other areas of seasonably high concentrations of individuals of important species.

3.5.13 Description of Conditions Indicative of Stress

Pre-existing environmental stresses on the plant and animal communities at the proposed site consist of road right-of-ways, agriculture, and grazing. The roads through the proposed site are dirt roads, limited to a main road into the site that is graded and a few un-maintained two-track roads scattered throughout the site that are used on a minimal basis. The disturbed areas immediately adjacent to the roads are being invaded by weedy species comprised mostly of cheatgrass. This pattern is expected to continue as long as the road is maintained.

The proposed site has intermittent stands of sagebrush indicative of grazing, agricultural use, and other environmental stressors. Areas that were dryland farmed have either been abandoned or seeded to crested wheatgrass, and portions of the sagebrush community have been treated to remove sagebrush and seeded to crested wheatgrass as improved pasture for grazing.

Other periodic environmental stresses are changes in local climatic and precipitation patterns. The proposed site is located in an area of southeastern Idaho that experiences shifts in precipitation amounts that can affect plant community diversity and production on a short-term seasonal basis and also on a long-term basis that may extend for several years. For these reasons, grazing, agricultural use, and drought represent the primary pre-existing environmental stress on the wildlife community of the proposed site.

3.5.14 Description of Ecological Succession

Long-term ecological studies on the proposed site are not available for analysis of ecological succession at this specific location. The proposed site is located in a sagebrush steppe vegetation community, which is a late-seral community that has been established in southeastern Idaho for an extended period. A large portion of the proposed site has been altered from a sagebrush community for purposes of agriculture. Portions of the site are grazed by cattle.

The sagebrush steppe landscape is a mosaic of shrub-dominated and herbaceous-dominated communities. Big sagebrush communities are critical habitat for greater sage grouse and other sagebrush obligate species. Historically, fire was the principal disturbance within this vegetation type; other disturbances included insects, periods of drought and wet cycles, and shifts in climate (return interval of 100 years). Intervals between natural wildfires varied between 25 years and 100+ years (West, 2000).

Wyoming big sagebrush is a mid- to late-seral species (Howard, 1999). Disturbed sagebrush communities are mostly populated with associated grasses. Wyoming big sagebrush may lose dominance in areas that have not experienced fire or other stand-replacing events for half a century or more (Howard, 1999).

3.5.15 Description of Ecological Studies

A vegetation survey of the proposed site was conducted in early June 2008. Plant cover by species on the proposed site was obtained through a series of 100-m (328-ft) transects. Twenty-one transects were located on a map of the property before the survey was conducted in the sagebrush community, and 11 transects were located in the non-irrigated seeded pasture community. The transects were then positioned on the ground (See Figure 3.5-1, Vegetation and Animal Survey Transect Locations and Habitat Map).

Sampling locations were determined by placing a grid over the site showing the communities to be sampled. Two 50-m (164-ft) tapes, one oriented south from the sampling point, the other oriented east from the sampling point, were then placed in the field. Point-intercept measurements were recorded at each 0.5-m (1.64-ft) interval of each transect, for a total of 100 samples points. The sampler traversed each transect, and at each 0.5-m (1.64-ft) interval, recorded the plant species found directly below the point on the transect. The sampler considered only those plants or seedlings touched by the line or lying under it. If a plant was not encountered at a sample point, either litter, bare ground, or rock was recorded.

This point-intercept survey method provides objective and accurate results. Sampling error is reduced since the survey results are based on actual measurements of the plants growing in randomly located and clearly defined sampling units. The survey method results are accurate in mixed plant communities and suited for measuring low vegetation. By direct measurement of small samples, the method allows estimates of known reliability to be obtained concerning the vegetation, its composition, and ecological structure.

Several sampling methods were used to identify animals using the proposed site. Incidental animal sitings were noted during field reconnaissance visits in May 2008. Wildlife transects and avian point survey techniques were used during June 2008 surveys. Linear transects parallel and immediately adjacent to the vegetation transects in the sagebrush community were walked in the mornings from about 30 minutes before sunrise to two hours after sunrise. Avian point surveys were also conducted during the mornings in the agricultural areas. Trapping or capture and release sampling was not conducted during the June 2008 survey

Many habitat studies have been conducted on the sagebrush steppe areas because of its association with greater sage grouse habitat. Supplemental studies specific to the proposed site were conducted by AREVA and are described elsewhere in Section 3.5. Ecological information of the sagebrush steppe is contained in regional studies by:

Long-term Vegetation Dynamics in Sagebrush Steppe at the Idaho National Laboratory, Environmental Science and Research Foundation (Anderson, 1999).

- This report describes the dynamics of vegetation over 35 years on a subset of permanent vegetation plots. The results suggest that shrub cover may fluctuate by as much as 100% and grass cover by as much as 500% within a decade. Changes in the cover of cheatgrass (*Bromus tectorum)* are also described.

The effects of precipitation timing on sagebrush steppe vegetation, Journal of Arid Environments, 64:670-697 (Bates, 2006).

- Results demonstrate that a shift to less winter and more summer precipitation would have negative consequences for sagebrush/bunchgrass communities. A shift to more winter and less spring/summer precipitation had minimal impact on the plant community. Species change is often used to evaluate rangeland health and response to management. Results show that changes in precipitation pattern can also have an impact on rangeland.

Sagebrush-Steppe Vegetation Dynamics and Restoration Potential in the Interior Columbia Basin, U.S.A. Conservation Biology 16(5):1243-1255 (Hemstrom, 2002).

- This report evaluated changes in the amount and quality of greater sage grouse habitat on 8.1 million ha (20,015,535 ac) of U.S. Forest Service and BLM land in the basin. Changes were estimated from historical to current conditions and from current conditions to those projected 100 years in the future under proposed management and under two restoration scenarios. Habitat quality under both scenarios was substantially improved compared with the current period and proposed management. Results suggest that aggressive restoration could slow the rate of sagebrush loss and improve the quality of remaining habitat.

Big Sagebrush: A Sea Fragmented into Lakes, Ponds, and Puddles, USDA Forest Service, Rocky Mountain Research Station General Technical Report RMRS-GTR-144 (Welch, 2005).

- This report indicates that approximately 50% of the historic sagebrush type has given way to agriculture, cities and towns, and other human developments. What remains is further fragmented by range management practices, creeping expansion of woodlands, alien weed species, and the historic view that big sagebrush is a worthless plant. Two ideas are promoted in this report: (1) big sagebrush is the home to a host of organisms that range from microscopic fungi to large mammals, and (2) many range management practices applied to big sagebrush ecosystems are not science based.

Management Considerations for Sagebrush (*Artemisia*) in the Western United States: a selective summary of current information about the ecology and biology of woody North American sagebrush taxa, U.S. Department of Interior, BLM, Washington, D.C., (BLM, 2002).

- This publication presents a selective summary of current information about the ecology and biology of woody North American sagebrush taxa and describes how sagebrush plant communities and certain species and sub-species respond to management treatments and disturbances, including fire, livestock grazing, and mechanized and chemical restoration practices.

Sage-grouse habitat restoration symposium proceedings; 2001 June 4-7, Boise, ID. Proc. RMRS-P-38. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station (Shaw, 2005).

- This series of 14 papers summarizes current knowledge and research gaps in sagebrush taxonomy and ecology, seasonal greater sage grouse habitat requirements, approaches to community and landscape restoration, and currently available plant materials and revegetation technology to provide a basis for designing and implementing effective management prescriptions.

3.5.16 Information on Rare, Threatened, and Endangered Sightings

A number of rare, threatened, or endangered species could potentially occur on the proposed site based on a literature review (Table 3.5-4). However, habitat types on the proposed site limit the number of these species that may occur. Based on field surveys, a review of habitat requirements, and contacts with state and federal agency personnel, only three sensitive species would likely use the proposed site. These species are the greater sage grouse, pygmy rabbit, and Townsend's big-eared bat (*Corynorhinus townsendii*). The USFWS initiated a status review in January 2008 for the pygmy rabbit (USFWS, 2008d) and in February 2008 for the greater sage grouse (USFWS, 2008e) (USFWS, 2008f) to determine if listing of either species is warranted. In addition, Townsend's big-eared bat was formerly a Candidate 2 (C2) species under the Endangered Species Act and is now considered a Species of Concern (non-statutory ranking) by the USFWS (Gruver, 2006).

Information from spring surveys conducted between March and May, 2008 by state and federal agencies indicates that the closest population of greater sage grouse has been sighted in an area approximately 8 km (5 mi) northwest of the proposed site. A field survey for the greater sage grouse that was conducted in May 2008 indicated that the species was not found on the proposed site. However, signs that greater sage grouse had roosting sites on the site were found, although no leks were located on the site.

Pygmy rabbit populations have been well documented by the INL (Wilde, 1978) and several dens have been identified throughout the INL property. Pygmy rabbits have also been documented by the Snake River BLM staff to the north at Mudd Lake. Wildlife surveys conducted in June and October of 2008 did not identify any pygmy rabbits on the proposed site, although other species of rabbits were observed. The closest known population of the pygmy rabbit is on the eastern area of the INL about 8.8 km (5.5 mi) west of the proposed site.

Townsend's big-eared bat caves are located south of the proposed site in the lava flow area. Habitat at the proposed facility is comprised of sagebrush, agriculture and non-irrigated seeded pasture and does not meet habitat requirements for the Townsend's big-eared bat.

3.5.17 Agency Consultation

Consultation was made with the USFWS and in a letter response dated June 30, 2008, the USFWS did not identify any issues that indicate that consultation under Section 7 of the Endangered Species Act of 1973, as amended, is needed for the proposed EREF. Refer to Appendix A, Consultation Documents, for a complete list of consultation documents.

3.5.18 Rare, Threatened and Endangered Effects by Other Federal Projects

There are no other federal projects within 16 km (10 mi) of the proposed EREF site.

TABLES

Table 3.5-1 Mammals Potentially Using the Proposed Eagle Rock Enrichment Facility Site
(Page 1 of 2)

Common Name	Scientific Name	Preferred Habit	Probable Occurrence at Areva Site
Little Brown Myotis	*Myotis lucifugus*	Coniferous forest, riparian areas in the mountains and lower valleys, woodlots, shelterbelts, and urban areas.	Unlikely to occur due to lack of suitable habitat.
Townsend's Big-eared Bat	*Plecotus townsendii*	Desert scrub, mixed conifer forest, and piñon-juniper habitat. Specifically associated with limestone caves, mines, lava tubes.	Unlikely to occur due to lack of suitable habitat.
White-tailed Jack Rabbit	*Lepus townsendii*	Found in open grasslands and montane shrublands generally above shrub steppe.	Probably occurs at site in limited numbers due to lack of habitat.
Black-tailed Jack Rabbit	*Lepus californicus*	A habitat generalist, primarily found in arid regions supporting shortgrass habitats.	Likely occurs at site.
Mountain Cottontail	*Sylvilagus nattallii*	Brushy, rocky areas in dense sagebrush, and streamside thickets and forest edges.	Likely occurs at site.
Yellow-bellied Marmot	*Marmota flaviventris*	Prefers montane meadows adjacent to talus slopes or rock outcrops; avoids tall vegetation.	Unlikely to occur due to lack of suitable habitat.
Pygmy Rabbit	*Brachylagus idahoensis*	Big sagebrush habitat and secondarily in communities dominated by rabbitbrush.	Potentially occurs at site.
Townsend's Ground Squirrel	*Spermophilus townsendii*	Arid environments with deep, friable, well-drained soils.	Likely occurs at site.
Least Chipmunk	*Eutamias minimus*	Sagebrush, bitterbrush, and other Great Basin shrub habitats.	Likely occurs at site.
Northern Pocket Gopher	*Thomomys talpoides*	Mountain meadows, tundra, grasslands, sagebrush steppe, and agricultural fields - habitats lacking canopy cover, but having abundant ground cover.	Probably occurs at site in limited numbers due to lack of habitat.
Great Basin Pocket Mouse	*Perognathus parvus*	Arid, sparsely vegetated plains and brushy areas.	Likely occurs at site.
Ord's Kangaroo Rat	*Dipodomys ordii*	Semiarid, open habitats. Big sagebrush/crested wheatgrass range; disturbed sites.	Likely occurs at site.

Table 3.5-1 Mammals Potentially Using the Proposed Eagle Rock Enrichment Facility Site
(Page 2 of 2)

Common Name	Scientific Name	Preferred Habit	Probable Occurrence at Areva Site
Beaver	*Castor canadensis*	stable aquatic habitats providing adequate water; channel gradient of less than 15 percent; and quality food species.	Unlikely to occur due to lack of suitable habitat.
Western Harvest Mouse	*Reithrodontomys megalotis*	Open areas, including grasslands, prairies, meadows, and arid areas including deserts, sand dunes, and shrublands.	Likely occurs at site.
Deer Mouse	*Peromyscus maniculatus*	Most common habitats are prairies, bushy areas, and woodlands.	Likely occurs at site.
Coyote	*Canis latrans*	Extremely adaptable; uses a wide range of habitats, including forests, grasslands, deserts.	Likely occurs at site.
Long-tailed Weasel	*Mustela frenata*	Upland brush, grasslands and woods to subalpine rock slides and semi-open forest areas.	Probably occurs at site in limited numbers due to lack of habitat.
Badger	*Taxidea taxus*	Occurs primarily in grasslands, shrublands, and other treeless areas with friable soil and a supply of rodent prey	Likely occurs at site.
Canada Lynx	*Lynx canadensis*	Canada lynxes require early, mid- and late-successional forests	Unlikely to occur due to lack of suitable habitat.
Bobcat	*Lynx rufus*	Adapted to a wide variety of habitats, including canyons, deserts, and mountain ranges. Bobcats are found in desert environments if shade is available.	Probably occurs at site in limited numbers due to lack of habitat.
Elk	*Cervus elaphus*	Found mostly in mountain or foothill areas; prefer alpine meadows in summer, and then move to lower, wooded slopes or sagebrush steppe in winter.	Likely occurs at site.
Mule Deer	*Odocoileus hemionus*	Coniferous forests, shrub steppe, chaparral, and grasslands; from dry, open country to dense forests. Prefer arid, open areas and rocky hillsides.	Probably occurs at site in limited numbers due to lack of habitat.
Pronghorn	*Antilocapra americana*	Open plains and semi-deserts; often found on low, rolling, expansive lands with less than 30 percent slope.	Likely occurs at site.

Table 3.5-2 Birds Potentially Using the Proposed Eagle Rock Enrichment Facility Site (Page 1 of 4)

Common Name	Scientific Name	Summer Breeder[1]	Wintering	Resident	Migrant
Turkey Vulture	*Cathartes aura*	U	U	--	A
Osprey	*Pandion haliaetus*	--	--	--	R
Bald Eagle	*Haliaeetus leucocephalus*	--	U	--	R
Northern Harrier	*Circus cyaneus*	--	--	C	--
Sharp-shinned Hawk	*Accipiter striatus*	R	R	--	R
Cooper's Hawk	*Accipiter cooperii*	U	R	--	R
Swainson's Hawk	*Buteo swainsoni*	U	R	--	U
Red-tailed Hawk	*Buteo jamaicensis*	U	R	--	R
Ferruginous Hawk	*Buteo regalis*	U	R	--	R
Rough-legged Hawk	*Buteo regalis*	C	A	--	C
Golden Eagle	*Aquila chrysaetos*	U	C	--	U
American Kestrel	*Falco sparverius*	C	U	--	C
Merlin	*Falco columbarius*	--	--	R	--
Peregrine Falcon	*Falco peregrinus*	--	--	R	--
Gyrfalcon	*Falco rusticolus*	--	--		A
Prairie Falcon	*Falco mexicanus*	--	--	U	--
Chukar	*Alectoris chukar*	--	--	U	--
Greater Sage Grouse	*Centrocercus urophasianus*	--	--	C	--
Kildeer	*Charadrius vociferus*	C	--	--	C
Long-billed Curlew	*Numenius americanus*	U	--	--	U
Franklin's Gull	*Larus pipixcan*	U	--	--	U
Ring-billed Gull	*Larus delawarensis*	U	--	--	U
California Gull	*Larus californicus*	R	--	--	U
Herring Gull	*Larus argentatus*	U	--	--	U
Mourning Dove	*Zenaida macroura*	C	R	--	C

Table 3.5-2 Birds Potentially Using the Proposed Eagle Rock Enrichment Facility Site (Page 2 of 4)

Common Name	Scientific Name	Summer Breeder[1]	Wintering	Resident	Migrant
Great Horned Owl	*Bubo virginianus*	--	--	U	
Burrowing Owl	*Athene cunicularia*	U	A	--	U
Short-eared Owl	*Asio flammeus*	U	--	--	U
Northern Saw-whet Owl	*Aegolius acadicus*	--	A	--	A
Common Nighthawk	*Chordeiles minor*	C	--	--	U
Horned Lark	*Eremophila alpestris*	C	C	--	C
Black-billed Magpie	*Pica pica*	--	--	C	--
American Crow	*Corvus brachyrhynchos*	--	--	U	--
Common Raven	*Corvus corax*	--	--	U	--
Rock Wren	*Salpinctes obsoletus*	U	--	--	U
Canyon Wren	*Catherpes mexicanus*	R	--	--	R
House Wren	*Troglodytes aedon*	U	U	--	U
Western Bluebird	*Sialia mexicana*	U	--	--	U
American Robin	*Turdus migratorius*	C	--	--	C
Sage Thrasher	*Oreoscoptes montanus*	C	--	--	C
Northern Shrike	*Lanius excubitor*	--	R	--	U
Loggerhead Shrike	*Lanius ludovicianus*	--	--	U	--
European Starling	*Sturnus vlugaris*	--	--	C	--
Black-headed Grosbeak	*Pheucticus melanocephalus*	R	--	--	R
Green-tailed Towhee	*Pipilo chlorurus*	U	--	--	U
Rufous-sided Towhee	*Pipilo erythrophthalmus*	U	--	--	U

Table 3.5-2 Birds Potentially Using the Proposed Eagle Rock Enrichment Facility Site (Page 3 of 4)

Common Name	Scientific Name	Summer Breeder	Wintering	Resident	Migrant
Brewer's Sparrow	*Spizella breweri*	C	--	--	C
Lark Sparrow	*Chondestes grammacus*	U	--	--	R
Black-throated Sparrow	*Amphispiza bilineata*	R	--	--	R
Sage Sparrow	*Amphispiza belli*	C	--	--	C
Lark Bunting	*Calamospiza melanocorys*	R	--	--	R
White-crowned Sparrow	*Zonotrichia leucophrys*	--	--	--	R
Vesper sparrow	*Pooecetes gramineus*	U	--	--	U
Chipping sparrow	*Spizella passerina*	--	--	--	R
Grasshopper sparrow	*Ammodramus savannarum*	U	--	--	U
Brown headed cowbird	*Molothrus ater*	--	--	--	U
Snow Bunting	*Plectrophenax nivalis*	--	R	--	R
Red-winged Blackbird	*Agelaius phoeniceus*	U	--	--	U
Western Meadowlark	*Sturnella neglecta*	C	U	--	C

Table 3.5-2 Birds Potentially Using the Proposed Eagle Rock Enrichment Facility Site (Page 4 of 4)

Common Name	Scientific Name	Summer Breeder	Wintering	Resident	Migrant
Brewer's Blackbird	*Euphagus cyanocephalus*	C	R	--	C
Rosy Finch	*Leucosticte arctoa*	--	R	--	R
House Sparrow	*Passer domesticus*	C	U	--	C

Note

[1]"U" – Species likely will be uncommon on-site if observed at all; "C" – Species likely will be common on-site; "R" – Species likely will be rare on-site if observed at all; "A" – Accidental occurrence; "—" – Not Applicable

Table 3.5-3 Amphibians/Reptiles Potentially Using the Proposed Eagle Rock Enrichment Facility Site
(Page 1 of 1)

Common Name	Scientific Name	Preferred Habitat	Probable Occurrence at Areva Site
Great Basin Spadefoot Toad	*Spea intermontana*	Sagebrush communities below 6,000 feet in elevation having loose soil in which to burrow. Breeding habitat is aquatic.	Unlikely occurs at site due to lack of aquatic habitat.
Long-nosed Leopard Lizard	*Gambelia wislizenii*	Arid and semi-arid plains with sagebrush, grass, and other low scattered vegetation. Prefers flat areas with open space for running, avoiding densely vegetated areas.	Probably occurs at site in limited numbers due to lack of habitat.
Short-horned Lizard	*Phrynosoma douglassi*	Open pine forests, pinion-juniper forests, shortgrass prairies and sagebrush desert .	Likely occurs at site.
Sagebrush Lizard	*Sceloporus graciosus*	Sagebrush and other types of shrublands, in open areas with scattered low bushes and lots of sun.	Likely occurs at site.
Western Skink	*Eumeces skiltonianus*	Piñon -juniper forests, grassy areas, desert shrub, talus slopes and canyon rims; often found in areas associated with water.	Unlikely to occur due to lack of suitable habitat.
Rubber Boa	*Charina bottae*	Desert shrub to open pine forest. Often, near water and near rocks, woody debris or leaf litter that are used for cover.	Unlikely to occur due to lack of suitable habitat.
Desert Striped Whipsnake	*Masticophis taeniatus*	Occurs in open brushy country - desert scrub, sagebrush flats, and mixed woodlands. Often found along the edges of rivers or ponds.	Probably occurs at site in limited numbers due to lack of habitat.
Gopher Snake	*Pituophis catenifer*	Grassland, sagebrush, agricultural lands, riparian areas, woodlands, desert.	Likely occurs at site.
Western Terrestrial Garter Snake	*Thamnophis elegans*	Found statewide in habitats ranging from desert riparian areas to mountain lakes and meadows.	Probably occurs at site in limited numbers due to lack of habitat.
Western Rattlesnake	*Crotalus viridis*	Drier regions with sparse vegetation, usually with a rocky component.	Likely occurs at site.

Table 3.5-4 Sensitive Species Potentially Present in the Area of the Proposed Eagle Rock Enrichment Facility Site
(Page 1 of 8)

Common Name	Scientific Name	Status[1]	Habitat Association	Probable Occurrence at EREF Site	Eliminated from Detailed Analysis	Reference
Insects						
St. Anthony Dune Tiger Beetle	*Cicindela arenicola*	BLM Type 2	This species is found on sand dunes. Larvae live in burrows located in flat, grassy areas where the sand is at least a meter thick, often on the windward side of sand dunes. Most adults remain in the immediate area of the dune system on which they developed.	None.	Yes. There is no suitable habitat present for this species within the proposed site.	IDFG, 2008; NatureServe, 2008.
Amphibians						
Northern Leopard Frog	*Rana pipiens*	BLM Type 2	This species is associated with permanent water sources during all life stages. Populations occur in a variety of wetland situations, including marshes, pond margins, and slow moving sections of streams and rivers.	None.	Yes. There is no suitable habitat present for this species within the proposed site.	IDFG, 2008; NatureServe, 2008.

Table 3.5-4 Sensitive Species Potentially Present in the Area of the Proposed Eagle Rock Enrichment Facility Site
(Page 2 of 8)

Common Name	Scientific Name	Status[1]	Habitat Association	Probable Occurrence at EREF Site	Eliminated from Detailed Analysis	Reference
Birds						
Trumpeter Swan	*Cygnus buccinator*	BLM Type 3; USFS R4 S	Trumpeter swans are predominantly herbivorous, eating submerged and emergent vegetation. Swans need slow, shallow water to effectively reach aquatic vegetation and sediment. Winter habitat must remain ice free and provide adequate forage. Swans nest on islands, muskrat or beaver houses, or exposed hummocks.	None.	Yes. There is no suitable habitat present for this species within the proposed site.	IDFG, 2008; NatureServe, 2008.
Harlequin Duck	*Histrionicus histrionicus*	BLM Type 4; USFS R1, R4 S	Harlequin ducks are sea ducks that migrate inland to breed. Breeding occurs along clear, swiftly flowing streams.	None.	Yes. There is no suitable habitat present for this species within the proposed site.	IDFG, 2005; NatureServe, 2008.

Table 3.5-4 Sensitive Species Potentially Present in the Area of the Proposed Eagle Rock Enrichment Facility Site
(Page 3 of 8)

Common Name	Scientific Name	Status[1]	Habitat Association	Probable Occurrence at EREF Site	Eliminated from Detailed Analysis	Reference
Greater Sage Grouse	*Centrocercus urophasianus*	BLM Type 2; USFS R4 S	This species is entirely dependent on sagebrush–dominated habitats. Breeding habitat is characterized by sagebrush canopy coverage of 15–25% with a healthy grass and forb understory. During summer, sage grouse may use a variety of habitats but are generally found in areas with succulent forbs and insects. Winter habitat consists of relatively large areas of sagebrush with 10–25% canopy cover.	Yes. This species is widely distributed throughout sagebrush–dominated habitats of southern Idaho. Sign of species observed on-site during June 2008 surveys.	No. Suitable habitat present within the proposed site. Surveys conducted and signs of species found	IDFG, 2005; NatureServe, 2008.
Columbian Sharp-tailed Grouse	*Tympanuchus phasianellus columbianus*	BLM Type 3; USFS R4 S	Columbian sharp–tailed grouse occupy a variety of habitats generally characterized by dense stands of herbaceous cover and a mixture of shrubs.	Low likelihood In southeastern Idaho, Columbian sharp–tailed grouse are reasonably widespread in shrub and grass habitats adjacent to or in mountainous foothills. Nearest mountain are over 80 km (50 mi)	Yes. There is no suitable habitat present for this species within the proposed site.	IDFG, 2005; NatureServe, 2008.
Ferruginous Hawk	*Buteo regalis*	BLM Type 3	This species inhabits flat and rolling terrain in grassland or shrub steppe regions, typically avoiding high elevation, forest interior, and narrow canyons. In Idaho, becomes locally abundant at the interface between piñon–juniper and shrubsteppe environments.	Yes.	No. Suitable habitat present within the proposed site. No animals observed during surveys.	IDFG, 2005; NatureServe, 2008.

Table 3.5-4 Sensitive Species Potentially Present in the Area of the Proposed Eagle Rock Enrichment Facility Site
(Page 4 of 8)

Common Name	Scientific Name	Status[1]	Habitat Association	Probable Occurrence at EREF Site	Eliminated from Detailed Analysis	Reference
Bald Eagle	*Haliaeetus leucocephalus*	IDFG threatened; BLM Type 1; USFS R4 T	Bald eagles are associated with aquatic ecosystems, including lakes, rivers, coastlines, marshes, and reservoirs. Eagles move to open water in fall and winter. They typically breed in forested areas adjacent to large bodies of water.	Low likelihood. Migrants may rarely be present.	Yes. There are no large water bodies, perch or nest sites on the EREF site or in the area.	IDFG, 2005; NatureServe, 2008.
Peregrine Falcon	*Falco peregrinus*	IDFG threatened; BLM Type 3; USFS R4 S	This species inhabits various landscapes, including mountains, river corridors, marshes, lakes, coastlines, and cities. In Idaho, peregrines are associated with mountains, major river corridors, reservoirs and lake basins. Migrants arrive in spring and depart by mid-October.	None.	Yes. There is no suitable habitat present for this species within the proposed site.	IDFG, 2005; NatureServe, 2008.
Mammals						
Yellow-billed Cuckoo	*Coccyzus americanus*	FC; IDFG protected nongame; BLM Type 1	In the western U.S., the yellow-billed cuckoo is a riparian obligate species. This species is usually found in large tracts of cottonwood and willow habitats with dense sub-canopies. In Idaho, they are reported to occur most frequently and consistently in cottonwood forests with thick understory.	None. In Idaho, the yellow-billed cuckoo is a rare visitor and local breeder that occurs in scattered drainages primarily in the southern portion of the state.	Yes. There is no suitable habitat present for this species within the proposed site.	IDFG, 2005; NatureServe, 2008.

Table 3.5-4 Sensitive Species Potentially Present in the Area of the Proposed Eagle Rock Enrichment Facility Site
(Page 5 of 8)

Common Name	Scientific Name	Status[1]	Habitat Association	Probable Occurrence at EREF Site	Eliminated from Detailed Analysis	Reference
Townsend's Big-eared Bat	*Corynorhinus townsendii*	BLM Type 3; USFS R4 S	Distribution and abundance is highly correlated with suitable cavity forming rock formations and historic mining districts. More than 90% of their diet consists of Lepidopterans.	Low likelihood. Only 2 maternity colonies have been confirmed in Idaho and both sites are found in the Craters of the Moon National Monument and in the BLM Hell's half Acre WSA south of the site. Numerous hibernacula in lava tube caves have been identified in south central and southeast Idaho.	No. Foraging may occur because colonies are known to exist within 8 km (5 mi) of the site.	IDFG, 2005; NatureServe, 2008.
Canada Lynx	*Lynx canadensis*	FT; BLM Type 1; USFS R4 S	In Idaho, the Canada lynx inhabits montane and subalpine coniferous forests typically above 1,200 m (4,000 ft). Habitat used during foraging is usually early successional forest. Dens are usually in mature forests. Individuals are wide-ranging and require large tracts of forest.	None.	Yes. There is no suitable habitat present for this species within the proposed site.	IDFG, 2005; NatureServe, 2008.
Pygmy Rabbit	*Brachylagus idahoensis*	BLM Type 2; USFS R4 S	This species is a sagebrush obligate. Habitat is dense, tall stands of big sagebrush growing on deep, friable soils that allow the rabbits to dig extensive burrow systems. Landscape features include alluvial fans and hillsides, swales within rolling topography, floodplains, brushy draws, riparian channels, edges of rock and lava outcroppings, and mima mounds.	Yes.	No. Suitable habitat present within the proposed site. No signs or animals observed during surveys.	IDFG, 2005; NatureServe, 2008.

Table 3.5-4 Sensitive Species Potentially Present in the Area of the Proposed Eagle Rock Enrichment Facility Site (Page 6 of 8)

Common Name	Scientific Name	Status[1]	Habitat Association	Probable Occurrence at EREF Site	Eliminated from Detailed Analysis	Reference
Plants						
Iodine Bush	*Allenrolfea occidentalis*	ID State 1	Native succulent halophyte found in the salt deserts of the Western U.S. Commonly occurs on alkaline soils, mostly on sandy hummocks in salt playas and mud flats; 1000-1700 m. Flowering: late summer.	None. Habitat is not present on site.	Yes. There is no suitable habitat present for this species within the proposed site.	Trent, 1997; FNA, 1993
Green Spleenwort	*Asplenium trichomanes-ramosum*	ID State 1	A fern found in moist crevices and concavities of calcareous rocks, cliffs, talus slopes, and other types of basic rock outcrops in locations that are usually partially or deeply shaded. Typically found at relatively high elevations (> 7,000 feet occurring within fir and spruce-fir forest types.	None.	Yes. There is no suitable habitat present for this species within the proposed site.	USFS, 2002; Pojar, 1994
Meadow Milkvetch	*Astragalus diversifolius*	ID GP2; BLM Type 3; USFS R4	Moist soils in alkaline meadows with flat or hummocky topography supporting graminoid or medium height shrub vegetation. Flowering: June-August, peaking in July.	None. Most Idaho populations are located in Custer and Lemhi counties. The meadow milkvetch population reported from the upper Snake River Plain, near Springfield, in Bingham County, has probably been extirpated.	Yes. There is no suitable habitat present for this species within the proposed site.	IDFG, 2008; Fertig, 1994.

Table 3.5-4 Sensitive Species Potentially Present in the Area of the Proposed Eagle Rock Enrichment Facility Site (Page 7 of 8)

Common Name	Scientific Name	Status[1]	Habitat Association	Probable Occurrence at EREF Site	Eliminated from Detailed Analysis	Reference
Plants (Cont'd)						
Payson's Milkvetch	*Astragalus paysonii*	ID-GP3; BLM Type 3; USFS R1, R4.	A regional endemic to Idaho and Wyoming, this species occurs primarily in disturbed areas such as recovering burns, clear cuts, road cuts, and blow downs. Usually found on sandy soils with low cover of forbs and grasses at 6,700-9,600 ft[See OI-ER 3.5-020]Flowering: June-August.	None.	Yes. There is no suitable habitat present for this species within the proposed site.	Fertig, 2000; Lorain, 1990.
Payson's Bladderpod	*Lesquerella paysonii*	ID-GP3; USFS R4.	In Idaho, this species mostly occurs on ridgelines and slopes in openings in sagebrush and forest stands. The substrate consists of carbonate parent material with gravelly, skeletal soils. Plant communities are open, with low cover of forbs, grasses, and an occasional shrub. 6,000 – 9,950 ft, [See OI-ER 3.5-020] with most populations occurring above 8,000 ft[See OI-ER 3.5-020]Flowering: early-mid July.	None. This species occurs on the ridges and high peaks of the Snake River Range.	Yes. There is no suitable habitat present for this species within the proposed site.	Mosely, 1996.

Table 3.5-4 Sensitive Species Potentially Present in the Area of the Proposed Eagle Rock Enrichment Facility Site (Page 8 of 8)

Common Name	Scientific Name	Status[1]	Habitat Association	Probable Occurrence at EREF Site	Eliminated from Detailed Analysis	Reference
Red Glasswort (Red Swampfire)	*Salicornia rubra*	ID-1; BLM Type 4.	Moist, saline or alkaline soil of flats, shores, seepage areas, and ditches. In Idaho, populations of Red glasswort are usually associated with low cover of other goosefoot family species. Flowering: late summer-early fall.	Low likelihood of presence. Habitat is not present on site.	No. Survey of drainages was conducted. No habitat or plants observed.	IDFG, 2005.
Gray Willow	*Salix glauca*	ID-2	In the Rocky Mountains, grayleaf willow is restricted to open, alpine and subalpine habitats that commonly have rocky, well-drained soils.	None.	Yes. There is no suitable habitat present for this species within the proposed site.	Uchytil, 1992; Dorn, 1977.
Ute Ladies'- Tresses	*Spiranthes diluvialis*	FT; ID-GP2; BLM Type 1.	Endemic to mesic or wet meadows and riparian/wetland habitats in relatively low elevations near springs, seeps, lakes, or perennial streams, generally; often found on silty-loam alluvial soils. Flowering: early-August through mid-September	Low likelihood of presence. In Idaho, Ute ladies'-tresses is known from the South Fork of the Snake River floodplain in Jefferson, Madison, and Bonneville counties. Populations are scattered along 49 river miles from near the confluence of Henry's Fork, upstream to Swan Valley, nine river miles below Palisades Dam.	No. Surveys were conducted; no habitat or plants were observed; habitat does not appear to be present at site.	Fertig, 2005; Murphy, 2002; Moseley, 1998.

Note:

[1]Status Definitions: BLM Type 1=Threatened, endangered, proposed and candidate; BLM Type 2=Rangewide/globally imperiled; BLM Type 3=Regional/state imperiled; BLM Type 4=Peripheral species to Idaho; USFS R1 S and USFS R4 S=USDA Forest Service Northern Region (R1) and Intermountain Region (R4) indicates species designated sensitive; USFS R4 T=Federally listed threatened species identified in Region 4 on the USFS; IDFG protected game=Animal species that is not threatened, endangered, or is a game species that is protected by the State of Idaho from intentional possession; IDFG threatened=Any native species likely to be classified as endangered within the foreseeable future; FC=Federal candidate; FT=Federal threatened; ID-1=Taxa in danger of becoming extinct in foreseeable future; ID-2=Taxa likely to be classified as Priority 1 within foreseeable future; ID-GP2=Global Priority 2—imperiled; ID-GP3=Global Priority 3—rare or uncommon but not imperiled.

Table 3.5-5 Vegetation on the Proposed Eagle Rock Enrichment Facility Site
(Page 1 of 1)

Scientific Name	Common Name
Shrubs	
Artemisia tridentata var. wyomingensis	Wyoming big sagebrush
Artemisia tripartite	Threetip sagebrush
Atriplex nuttallii	Nutall's saltbush
Chrysothamnus nauseosa	Rubber rabbitbrush
Ericameria nana	Dwarf goldenbush
Krascheninnikovia lanata	Winterfat
Grasses	
Agropyron cristatum	Crested wheatgrass
Bromus tectorum	Cheatgrass
Elymus elymoides	Squirreltail
Elymus lanceolatus	Thickspike wheatgrass
Hesperostipa comata	Needle and thread
Hordeum jubatum	Foxtail barley
Oryzopsis hymenoides	Indian ricegrass
Poa secunda	Sandberg bluegrass
Forbs	
Agoseris glauca	False dandelion
Allium textile	Textile onion
Arabis lignifera	Desert rockcress
Astragalus curvicarpus	Curvepod milkvetch
Castilleja sp.	Indian paintbrush
Chenopodium leptophyllum	Slimleaf goosefoot
Cirsium arvense	Canada thistle
Crepis accuminata	Hawksbeard
Cryptantha interrupta	Bristly cryptantha
Delphinium andersonii	Anderson's larkspur
Descurania Sophia	Tansymustard
Erigeron pumilus	Shaggy fleabane
Lappula occidentalis	Flatspine stickseed
Lepidium sp.	Pepperwort
Lomatium dissectum	Desert parsley
Oenethera caespitosa	Desert evening-primrose
Packera cana	Woolly groundsel
Phlox hoodii	Hood's phlox
Phlox longifolia	Longleaf phlox
Runnunculus testiculatus	Bur buttercup
Schoencrambe linifolia	Flaxleaf plainsmustard
Sphaeralcea munroana	Orange globemallow
Tragopogon dubius	Goat's beard
Cactus	
Opuntia polyacantha	Prickly pear

Table 3.5-6 Vegetative Cover on the Proposed Eagle Rock Enrichment Facility Site Rangeland Type

(Page 1 of 1)

Scientific Name	Common Name	Cover (%)
Ericameria nana	Dwarf goldenbush	17.00
Artemisia tridentata var. wyomingensis	Wyoming big sagebrush	16.00
Poa secunda	Sandberg bluegrass	11.00
Bromus tectorum	Cheatgrass	4.00
Hordeum jubatum	Foxtail barley	3.00
Phlox longifolia	Longleaf phlox	2.00
Descurania sophia	Tansymustard	1.00
Elymus lanceolatus	Thickspike wheatgrass	1.00
Phlox hoodii	Hood's phlox	0.60
Agropyron cristatum	Crested wheatgrass	0.60
Lappula occidentalis	Flatspine stickseed	0.50
Erigeron pumilus	Shaggy fleabane	0.40
Lomatium dissectum	Desert parsley	0.30
Schoencrambe linifolia	Flaxleaf plainsmustard	0.30
Artemisia tripartita	Threetip sagebrush	0.30
Arabis lignifera	Desert rockcress	0.20
Opuntia polyacantha	Prickly pear	0.20
Astragalus curvicarpus	Curvepod milkvetch	0.20
Cryptantha interrupta	Bristly cryptantha	0.10
Crepis accuminata	Hawksbeard	0.10
Allium textile	Textile onion	0.10
Atriplex nuttallii	Nutall's saltbush	0.10
Krascheninnikovia lanata	Winterfat	0.09
Elymus elymoides	Squirreltail	0.09
Lepidium sp.	Pepperwort	0.09
Castilleja sp.	Indian paintbrush	0.07
Chenopodium leptophyllum	Slimleaf goosefoot	0.04
Oryzopsis hymenoides	Indian ricegrass	0.04
Packera cana	Woolly groundsel	0.02
Delphinium andersonii	Anderson's larkspur	0.02
Oenethera caespitosa	Desert evening-primrose	0.02
Hesperostipa comata	Needle and thread	0.02
Sphaeralcea munroana	Orange globemallow	0.02
Rununculus testiculatus	Bur buttercup	0.02
OTHER		
Bare Ground		23.00
Rock		3.00
Litter		11.00
Moss		2.00
Total[1]		**98.54**

[1]Note: Total cover equals less than 100% due to rounding.

Table 3.5-7 Vegetative Cover on the Proposed Eagle Rock Enrichment Facility Site Non-irrigated Seeded Pasture Type

(Page 1 of 1)

Scientific Name	Common Name	Cover (%)
Agropyron cristatum	Crested wheatgrass	33.60
Bromus tectorum	Cheatgrass	11.90
Rununculus testiculatus	Bur buttercup	5.00
Poa secunda	Sandberg bluegrass	1.90
Agoseris glauca	False dandelion	0.80
Erigeron Pumilus	Shaggy flebane	0.41
Artemisia tridentata var. *wyomingensis*	Wyoming big sagebrush	0.18
Chrysothamnus nauseosa	Rubber rabbitbrush	0.18
Ericameria nana	Dwarf goldenbush	0.18
Medicago sativa	Alfalfa	0.14
Descurania sophia	Tansymustard	0.14
Tragopogon dubius	Goat's beard	0.09
Hordeum jubatum	Foxtail barley	0.05
Phlox hoodii	Hood's phlox	0.05
Lappula occidentalis	Flatspine stickseed	0.05
Packara cana	Woolley groundsel	0.05
Cirsium arvense	Canada thistle	0.05
OTHER		
Bare Ground		28.00
Litter		16.40
Rock		0.68
Moss		0.09
Total[1]		**99.94**

Note 1: Total cover equals less than 100% due to rounding.

Table 3.5-8a Avian Transect Survey Data Summary for the Proposed Eagle Rock Enrichment Facility Site - Rangeland Area
(Page 1 of 1)

Species		June 2008		October 2008	
		Total Number*	% of Total Number	Total Number*	% of Total Number
Horned Lark	*Eremophila alpestris*	137	49.1	111	79.9
Western Meadowlark	*Sturnella neglecta*	38	13.6	0	0.0
Sage Thrasher	*Oreoscoptes montanus*	18	6.5	0	0.0
Northern Harrier	*Circus cyaneus*	6	2.2	1	0.7
Brewer's Sparrow	*Spizella breweri*	43	15.4	16	11.5
Chipping Sparrow	*Spizella passerina*	0	0.0	0	0.0
Sage Sparrow	*Amphispiza belli*	3	1.1	2	1.1
Vesper Sparrow	*Pooecetes gramineus*	8	2.9	0	0.0
Grasshopper Sparrow	*Ammodramus savannarum*	5	1.8	0	0.0
Mourning Dove	*Zenaida macroura*	6	2.2	1	1.4
Kildeer	*Charadrius vociferus*	0	0.0	0	0.0
Brown-headed Cowbird	*Molothrus ater*	1	0.4	0	0.0
American Crow	*Corvus brachyrhynchos*	1	0.4	6	4.3
Short-earred Owl	*Asio flammeus*	1	0.4	0	0.0
Red-tailed Hawk	*Buteo jamaicensis*	0	0.0	0	0.0
Greater Sage Grouse	*Centrocercus urophasianus*	5	1.8	0	0.0
Long-billed Curlew	*Numenius americanus*	0	0.0	0	0.0
Black-billed Magpie	*Pica hudsonia*	0	0.0	2	1.1.
Unknown		7	2.5	0	0.0
Total Birds		**279**	**100**	**139**	**100**

*Note: Includes birds observed, heard, or sign observed (e.g., feathers, nests, roosts)

Table 3.5-8b Avian Transect Survey Data Summary for the Proposed Eagle Rock Enrichment Facility Site - Non-irrigated Seeded Pasture Area

(Page 1 of 1)

Species		June 2008		October 2008	
		Total Number*	% of Total Number	Total Number*	% of Total Number
Horned Lark	*Eremophila alpestris*	58	68.2	32	74.4
Western Meadowlark	*Sturnella neglecta*	8	9.4	0	0.0
Sage Thrasher	*Oreoscoptes montanus*	1	1.2	0	0.0
Northern Harrier	*Circus cyaneus*	1	1.2	1	2.3
Brewer's Sparrow	*Spizella breweri*	11	12.9	0	0.0
Chipping Sparrow	*Spizella passerina*	0	0.0	0	0.0
Sage Sparrow	*Amphispiza belli*	0	0.0	0	0.0
Vesper Sparrow	*Pooecetes gramineus*	3	3.5	0	0.0
Grasshopper Sparrow	*Ammodramus savannarum*	0	0.0	0	0.0
Mourning Dove	*Zenaida macroura*	0	0.0	4	9.3
Killdeer	*Charadrius vociferus*	1	1.2	0	0.0
Brown-headed Cowbird	*Molothrus ater*	1	1.2	0	0.0
American Crow	*Corvus brachyrhynchos*	1	1.2	4	9.3
Short-earred Owl	*Asio flammeus*	0	0.0	0	0.0
Red-tailed Hawk	*Buteo jamaicensis*	0	0.0	0	0.0
Greater Sage Grouse	*Centrocercus urophasianus*	0	0.0	0	0.0
Long-billed Curlew	*Numenius americanus*	0	0.0	0	0.0
Black-billed Magpie	*Pica hudsonia*	0	0.0	2	4.7
Unknown		0	0.0	0	0.0
Total Birds		**85**	**100**	**43**	**100**

*Note: Includes birds observed, heard, or sign observed (e.g., feathers, nests, roosts)

Table 3.5-8c Avian Point Survey Data Summary for the Proposed Eagle Rock Enrichment Facility Site- Crop Area
(Page 1 of 1)

Species		June 2008							October 2008						
		Total	% Observed	Pt 1	Pt 2	Pt 3	Pt 4	Pt 5	Total	% Observed	Pt 1	Pt 2	Pt 3	Pt 4	Pt 5
Horned Lark	*Eremophila alpestris*	17	54.8				10	7	50	82	14	10	9	10	7
Western Meadowlark	*Sturnella neglecta*	4	12.9				1	3	0	0.0					
Sage Thrasher	*Oreoscoptes montanus*	0	0.0						0	0.0					
Northern Harrier	*Circus cyaneus*	4	12.9	2	1			1	1	1.6					1
Brewer's Sparrow	*Spizella breweri*	0	0.0						0	0.0					
Chipping Sparrow	*Spizella passerine*	0	0.0						0	0.0					
Sage Sparrow	*Amphispiza belli*	0	0.0						0	0.0					
Vesper Sparrow	*Pooecetes gramineus*	0	0.0						0	0.0					
Grasshopper Sparrow	*Ammodramus savannarum*	0	0.0						0	0.0					
Mourning Dove	*Zenaida macroura*	2	6.5		2				4	6.6		2			2
Kildeer	*Charadrius vociferous*	0	0.0						0	0.0					
Brown-headed Cowbird	*Molothrus ater*	0	0.0						0	0.0					
American Crow	*Corvus brachyrhynchos*	0	0.0						5	8.2	1		1	3	
Short-earred Owl	*Asio flammeus*	0	0.0						0	0.0					
Red-tailed Hawk	*Buteo jamaicensis*	0	0.0						0	0.0					
Greater Sage Grouse	*Centrocercus urophasianus*	0	0.0						0	0.0					
Long-billed Curlew	*Numenius americanus*	4	12.9	2	1	1			0	0.0					
Black-billed magpie	*Pica hudsonia*	0	0.0						1	1.6	6				1
Unknown		0	0.0						0	0.0					
Total		**31**	**100**	**4**	**4**	**1**	**11**	**11**	**61**	**100**	**15**	**12**	**10**	**13**	**11**

FIGURES

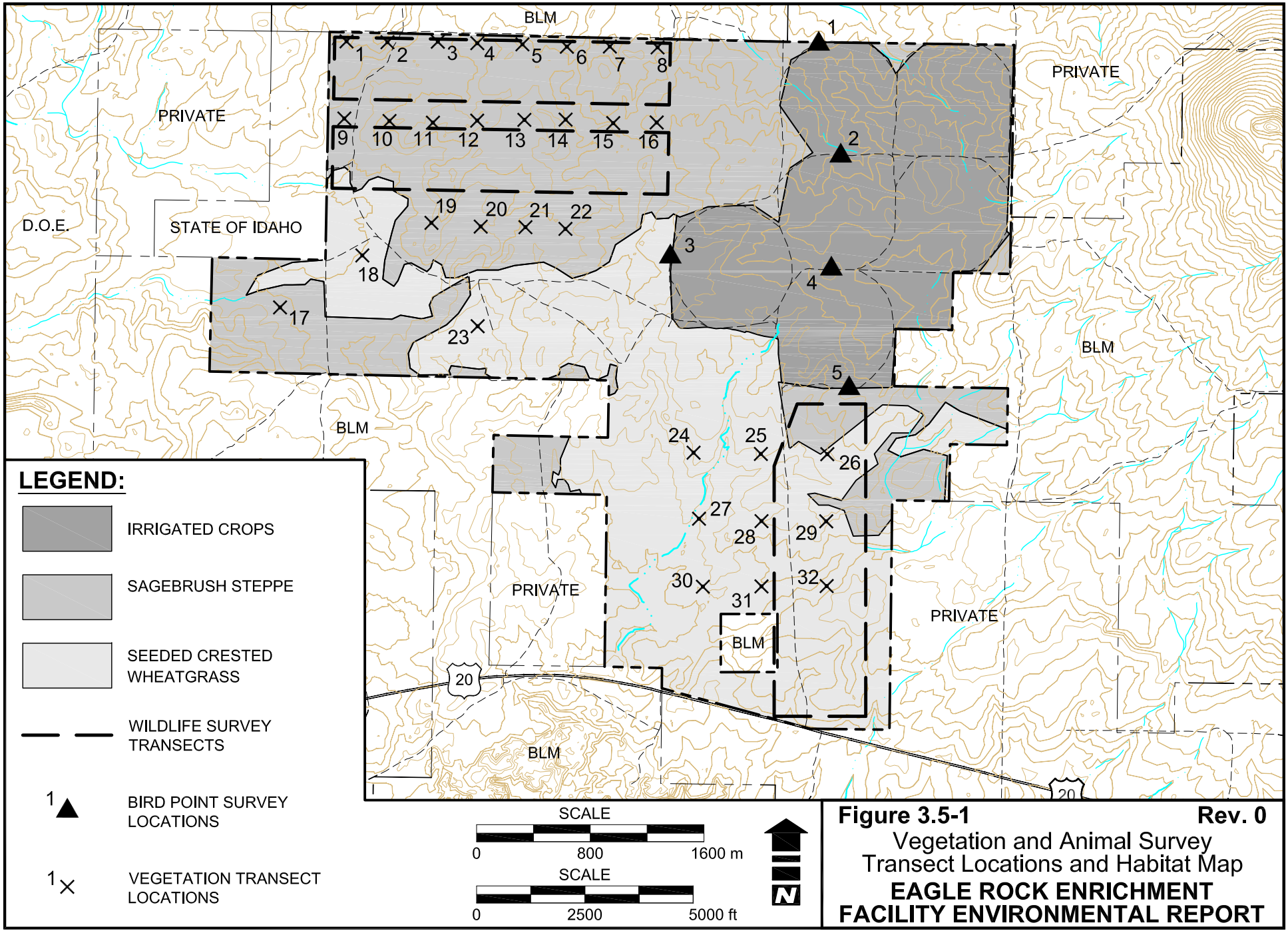


Figure 3.5-1 **Rev. 0**

Vegetation and Animal Survey Transect Locations and Habitat Map

EAGLE ROCK ENRICHMENT FACILITY ENVIRONMENTAL REPORT

3.6 CLIMATOLOGY, METEOROLOGY, AND AIR QUALITY

This section provides information on the general climate of the Eastern Snake River Plain (ESRP), a discussion of meteorological parameters representative of onsite conditions that influence atmospheric transport and diffusion processes, and a summary of regional air quality conditions and compliance with National Ambient Air Quality Standards (NAAQS).

The description of the general climate of the ESRP includes information on climatological averages of temperature, relative humidity, precipitation, wind speed and direction, and atmospheric stability. Information on measured extremes and diurnal ranges is also provided. The climatological discussion also includes information on special and severe meteorological phenomena such as tornadoes, thunderstorms, airborne dust and sand, dust devils, blowing snow, and lightning.

A climate "normal" is defined as the arithmetic mean of a climatological element computed over three consecutive decades. Such data were obtained from the National Climatic Data Center (NCDC) for two stations that bracket the location of the Eagle Rock Enrichment Facility (EREF). These stations are known as Idaho Falls 2 ESE, located approximately 35 km (22 mi) east-southeast of the site and Idaho Falls 46 W, located approximately 42 km (26 mi) west of the site. Both sites are located within the ESRP.

Hourly meteorological data have been obtained from the Idaho National Engineering Laboratory (INL). The Air Resources Laboratory Field Research Division (ARLFRD) of the National Oceanic and Atmospheric Administration (NOAA) furnishes forecast and emergency support to operations sponsored by the U.S. Department of Energy (DOE) at the INEL. ARLFRD also reports basic climatological data to NCDC. ARLFRD maintains a network of 33 meteorological observing stations on the property and in the vicinity of the INL (NOAA, 1989). All stations are equipped with meteorological towers with instrumentation to a height of 15 meters (49 feet). Three tall towers of differing heights (75, 61, and 45 m (246, 200, and 148 ft)) are located on the property of the INEL and are equipped with instrumentation at multiple levels. For the purposes of this section, hourly meteorological data was obtained from ARLFRD for a five-year period from two stations that best represent meteorological and atmospheric dispersion conditions at the EREF site. These stations are located at Kettle Butte (KET – 15-m (49-ft) tower), 10 km (6 mi) east-southeast of the EREF site and Argonne National Lab-West (EBR – 75-m (246-ft) tower), located 18 km (11 mi) west of the EREF site. Both sites are located within the ESRP. Figure 3.6-1, Location of Eagle Rock Enrichment Facility and Nearby Meteorological Monitoring Stations, shows the position of the four meteorological stations relative to the EREF site. The Station Identifier, Type of Station, and Station Coordinates for the four meteorological stations used as sources of meteorological information are as follows:

- ID2ESE (Idaho Falls 2 ESE), National Weather Service Cooperative Station, 43.4833 N and 112.0167 W;
- ID46W (Idaho Falls 46 W), National Weather Service Cooperative Station, 43.5333 N and 112.9500 W;
- KET (Kettle Butte), INL Meteorological Monitoring Network Station, 43.5476 N and 112.3263 W;
- EBR (Argonne National Lab-West) which is now identified as MFC (Materials and Fuels Complex), INL meteorological monitoring network station, 43.5941 N and 112.6517 W.

Regional air quality data and information on compliance with NAAQS were obtained from the Idaho Department of Environmental Quality (IDEQ) (IDEQ, 2006).

3.6.1 Climatology

The EREF site lies in the middle of the ESRP, which is a broad and basically flat 80-km (50-mi) wide valley with a southwest to northeast longitudinal axis. Both sides of the river plain are bordered by mountain ranges that rise to approximately 3,353 m (11,000 ft) above mean sea level (msl). The average elevation of the river plain is about 1,524 m (5,000 ft) msl. The orientation of the river plain and adjacent mountain ranges has a profound effect on wind flow patterns in the region.

Air masses that typically move from west to east across the inter-mountain region lose their moisture through condensation and precipitation over the mountains prior to reaching the ESRP. Annual rainfall in the region is quite light and results in the region being classified as semi-arid. Most air masses traversing the ESRP are of Pacific Ocean origin. The mountains to the east of the ESRP effectively block the intrusion of wintertime arctic outbreaks into the region. This results in a more moderate temperature regime than what is frequently encountered to the east of the Continental Divide. The absence of cloud cover and the presence of relatively dry air allows for intense solar radiation during daylight hours and effective radiational cooling at night, causing large diurnal ranges in temperature.

3.6.1.1 Temperature

Long-term temperature data representative of the EREF site conditions were obtained from NCDC for the following stations: Idaho Falls 2 ESE and Idaho Falls 46 W (NOAA, 2004a; NOAA, 2004b). Table 3.6-1, Eagle Rock Enrichment Facility Site Climate: Normal and Extreme Temperatures, presents normal and extreme temperature data for these stations.

Average monthly temperatures at Idaho Falls 2 ESE range from -6.1°C (21.1°F) in January to 20.4°C (68.7°F) in July. Average monthly temperatures at Idaho Falls 46 W range from a low of -8.8°C (16.2°F) in January to 19.8°C (67.6°F) in July. The average diurnal temperature ranges (the average differences between the daily maximum and minimum temperatures) at Idaho Falls 2 ESE are 9.5°C (17.2°F) in January and 20°C (35.9°F) in August. At Idaho Falls 46 W, the average diurnal temperature ranges are -13.0°C (23.4°F) and 21.6°C (39.0°F) in January and August, respectively. As can be seen, the smallest daily temperature range occurs in the winter, while the largest daily temperature range occurs in summer. Furthermore, the diurnal temperature ranges are larger at Idaho Falls 46 W than at Idaho Falls 2 ESE. The greater diurnal ranges in the summer are due to the intense solar radiation experienced during that time of year. The smaller diurnal temperature ranges experienced at Idaho Falls 2 ESE is likely caused by less efficient radiational cooling at night due to its urban location.

The highest and lowest temperatures recorded during a 50-year period of record at Idaho Falls 2 ESE are 38°C (100°F) and -37°C (-34°F), respectively. Comparable extreme temperatures recorded during the 48-year period of record at Idaho Falls 46 W are 38°C (101°F) and -44°C (-47°F).

Figure 3.6-2, Comparison of Monthly Mean Temperature in the Vicinity of the Eagle Rock Enrichment Facility Site, is a comparison of the monthly mean temperature values of the four meteorological stations in the vicinity of the EREF site. The temperature trends for the four stations over the course of a year compare favorably to each other with two exceptions. During the months of June through August, mean temperatures at KET and EBR are higher than those at Idaho Falls 46 W and Idaho Falls 2 ESE. Also monthly mean temperatures at Idaho Falls 46 W are always lower than the other meteorological stations.

3.6.1.2 Precipitation

Air masses approaching the ESRP and the EREF location must cross over significant mountain ranges prior to their arrival in southeastern Idaho. In doing so, the majority of the moisture contained in these air masses condenses and precipitates over the mountains. As the air masses descend from the mountains, they warm adiabatically and become relatively dry. As a result, annual precipitation in the ESRP is quite light. Table 3.6-2, Eagle Rock Enrichment Facility Site Climate: Normal and Extreme Precipitation, presents normal and extreme precipitation for Idaho Falls 2 ESE and Idaho Falls 46 W (NOAA, 2004a; NOAA, 2004b).

The type of precipitation in the ESRP varies with the seasons. Convective showers and thundershowers occur in the summer. Precipitation during the spring and fall can be characterized as showery or as a steadier rainfall. Winter precipitation is typically in the form of snow. Snow can occur anytime from September through May.

Annual average precipitation at Idaho Falls 2 ESE is 360.93 mm (14.21 in). This precipitation falls fairly evenly throughout the year with the exception of the month of May, which exhibits a significant spike in precipitation. The month with the highest recorded precipitation total is May 1993 with 115.82 mm (4.56 in). There have been several months in the 30-year period of record where no precipitation has fallen for the entire month.

Annual average precipitation at Idaho Falls 46 W is considerably less than what occurs at Idaho Falls 2 ESE and measures 224.03 mm (8.82 in). The precipitation pattern of these two locations is somewhat similar in that precipitation falls fairly evenly throughout the year with the exception of a precipitation maximum in May. The month with the highest recorded precipitation total at Idaho Falls 46 W is June 1995 with 117.86 mm (4.64 in). Over the 30-year period of record, precipitation has always fallen at some time during the months of January, May, June and August. Over the same period of record, there have been at least ten months when no precipitation has occurred for the entire month. The months of February and September have had multiple occurrences with no precipitation.

Figure 3.6-3, Comparison of the Monthly Mean Precipitation in the Vicinity of the Eagle Rock Enrichment Facility Site, is a comparison of the monthly mean precipitation values of the four meteorological stations in the vicinity of the EREF site. It is important to note that the INL data for EBR and KET are from the most recent five-year period available (2003-2007). That five-year period is not concurrent nor as lengthy as the 30-year period of record (1971-2000) that was used in the data obtained from the NCDC for Idaho Falls 46 W and Idaho Falls 2 ESE. The plot of monthly mean precipitation values indicates the following:

- All four stations experience an increase in precipitation in the spring (April-May).
- EBR and KET experience another increase in precipitation in October.
- The mean monthly precipitation at Idaho Falls 2 ESE is always greater than the other three stations. This is likely due to its close proximity to the mountains that border the ESRP to the east.

Table 3.6-3, Precipitation Distribution at KET and EBR (2003 - 2007), provides a distribution of hourly precipitation occurrences categorized by precipitation intensity for both KET and EBR for the period 2003 – 2007. The data indicates that precipitation occurs infrequently (less than 3% of the time) and that precipitation intensity is predominately less than 2.54 mm (0.1 in).

The annual average snowfall for Idaho Falls 2 ESE is 833.12 mm (32.8 in). The highest daily snowfall at this location is 254 mm (10 inches) and has occurred on at least two occasions. The

highest monthly snowfall is 571.5 mm (22.5 inches) occurring in December 1994. The highest daily snow depth is 660.4 mm (26 inches) occurring on January 13, 1993.

The annual average snowfall for Idaho Falls 46 W is 637.54 mm (25.1 in). The highest daily snowfall at this location is 218.44 mm (8.6 in), which occurred on March 22, 1973. The highest monthly snowfall is 566.42 mm (22.3 in) occurring in December 1971. The highest daily snow depth is 762 mm (30 in) occurring for several days from late February to early March 1993.

3.6.1.3 Relative Humidity

Relative humidity data were obtained from the ARLFRD for KET, the closest weather station to the EREF site, for the most recent available five-year period (2003 – 2007).

The monthly and annual relative humidity averages and extremes for KET are presented in Table 3.6-4, INL Monthly and Annual Mean Relative Humidity (%) at KET (2003 - 2007). Average relative humidity values are higher in winter and lower in summer. This seasonal dependence is due to the increased precipitation and the smaller daily temperature ranges observed in the winter compared to the summer. Absolute relative humidity values of 100% were observed on several occasions during the colder months of the year. The lowest relative humidity observed was 6.5% in August 2005. This is indicative of the very dry summers experienced across the entire ESRP.

The highest diurnal values usually occur near sunrise, while the lowest values occur during the mid-afternoon. The peaks and valleys in relative humidity values normally occur simultaneously with the minimum and maximum air temperatures, respectively.

Figure 3.6-4, INL Monthly Mean Relative Humidity (%) at KET (2003 - 2007), displays the monthly mean relative humidity values for KET. The figure clearly displays the pattern of higher relative humidity during the winter and lower relative humidity during the summer.

3.6.1.4 Wind

Both Idaho Falls 2 ESE and Idaho Falls 46 W are cooperative weather stations as opposed to first-order National Weather Service stations. As a result, wind data are not available for these locations from NCDC. However, Idaho Falls 46 W is located on the property of the INL, is operated by NOAA staff and is part of the 33-station meteorological network of the ARLFRD. Therefore, wind data is available from Idaho Falls 46 W (identified as CFA in ARLFRD reports) (NOAA, 1989). Five years (2003-2007) of recent wind data has also been obtained from ARLFRD for two additional stations located closer to the EREF site. These stations are identified as Argonne National Lab-West (EBR) and Kettle Butte (KET).

The EREF site is in a region of prevailing westerly winds that are normally channeled within the ESRP. This channeling usually produces a west-southwest or southwest wind. When these prevailing westerly winds become strong, the channeling effect within the ESRP enhances and strengthens the west-southwest to southwest flow. Some of the highest wind speeds within the ESRP are observed under these meteorological conditions.

Drainage winds (also referred to as mountain or gravity winds) also contribute to the wind flow pattern at the EREF site. On clear nights, the valley experiences rapid surface radiational cooling. The air near the surface of the mountain slopes cools, becomes more dense than the air further removed from the mountain slopes and sinks to the floor of the valley. The valley floor also has a slight tilt and the cooler air continues to flow towards lower elevations, in this case generally from the northeast to the southwest. This phenomenon is known as a down-slope valley wind.

During sunny daytime conditions an opposite flow develops as the mountain slopes and valley floor are rapidly heated and the air near the surface begins to rise to create an up-slope valley flow. The up-slope valley wind is usually weaker than the down-slope wind and is typically masked by the more dominant prevailing westerlies that are channeled through the valley from the southwest.

Figures 3.6-5, KET Wind Rose (15 Meters/49.2 Feet), and 3.6-6, EBR Wind Rose (10 Meters/32.8 Feet), present annual wind roses for KET and EBR, respectively. The wind roses clearly display the channeling effect of the mountains that border the ESRP. Figures 3.6-8 through 3.6-19 present monthly wind roses for EBR.

Table 3.6-5, Eagle Rock Enrichment Facility Site Climate: Average Monthly and Annual Wind Speeds for Idaho Falls 46 W, KET and EBR, provides the average monthly and annual wind speed based on data collected at Idaho Falls 46 W, KET and EBR. The comparison of wind speeds at these three locations is somewhat difficult because the measurements were taken at different heights above grade and, in the case of Idaho Falls 46 W, for a different period of record. The months with the highest monthly average wind speeds occur in the spring. The months with the lowest monthly average wind speeds occur in the winter. Table 3.6-6, Eagle Rock Enrichment Facility Site Climate: Highest Hourly Average Wind Speed and Concurrent Wind Direction for Idaho Falls 46 W, KET and EBR, displays the highest hourly average (peak) wind speeds and concurrent wind directions for each month and for the given periods of record. The month with the highest hourly average wind speed is March with peak winds ranging from 68 to 83 km/hr (43 to 51 mi/hr). The wind directions for all of the highest hourly average wind speeds are from the west-southwest.

Table 3.6-7, Number of Wind Direction Persistence Events ≥ 12 Hours – EBR (2003-2007), provides a listing of the number of times over the five-year period of record that the wind blew from the same wind direction for at least 12 consecutive hours at the EBR meteorological station. The wind direction persistence data clearly reflect the northeast-southwest orientation of the ESRP as these are the favored wind persistence directions.

Of the three sources of wind data discussed in this section (Idaho Falls 46 W, KET and EBR), 10-m (33-ft) wind data from EBR was selected for use in the χ/Q calculations discussed in Section 4.6.2.3. The reasons for this selection are as follows:

- Vertical temperature difference data are collected at EBR's 75-m (246-ft) tower. This information is used to calculate atmospheric stability. It is desirable to use atmospheric stability and wind data from the same location.
- EBR is closer to the EREF site than Idaho Falls 46 W.
- EBR generally experiences lower wind speeds than KET. Lower wind speeds typically give rise to conservative (higher) χ/Q values.
- Wind data from EBR are generally representative of conditions in the ESRP and at the EREF site.

Although wind data from the 75-m (246-ft) level at EBR are available, those data are not addressed here because it is assumed that any gaseous release from the EREF will occur at ground level.

3.6.1.5 Atmospheric Stability

The vertical thermal structure of the lower atmosphere is a key component in determining the efficiency of the dispersion of effluents into the atmosphere. The atmosphere is said to be

stable when warmer air overlies cooler air so that vertical motions are damped. During the day, rising currents of air heated at the surface mix vertically. It follows that the dispersion of an effluent will be most efficient within the thermally well-mixed portion of the atmosphere. This well-mixed portion of the atmosphere is known as the mixing depth and is defined as that portion of the atmosphere next to the surface through which airborne material can freely diffuse. The mixing depth is bounded above by an inversion layer where air temperature increases with height or where the rate of temperature decrease with height is less than in the air below. The depth of the mixed layer is determined by the heat energy exchange between the air and the ground, and is influenced by cloud cover, time of day, and season.

Seasonal average mixing depths, based on radiosonde data taken at selected airports throughout the contiguous United States, have been analyzed to determine the average mixing depths in the ESRP. The morning mixing height is calculated as the height above the ground at which the dry adiabatic extension of the morning minimum surface temperature plus 5°C (9°F) intersects the vertical temperature profile observed via radiosonde launched at 1200 Greenwich Mean Time (GMT). The afternoon mixing height is calculated in the same way except that the maximum surface temperature between noon and 4 PM local standard time is substituted for the minimum temperature plus 5°C (9°F).

The estimated seasonal and annual mixing depths for mornings and afternoons in the ESRP are shown in Table 3.6-8, Estimated Seasonal and Annual Mixing Depths for Mornings and Afternoons in
the ESRP, (NOAA, 1989). The data indicate that the mixing depth is the shallowest in the morning during the summer months, resulting in limited vertical dispersion. The mixing depth is greatest during summer afternoons, which enhances vertical dispersion during that portion of the day and year. The average annual mixing depth for the morning hours is 370 m (1,214 ft) and for the afternoon it is 2,090 m (6,857 ft).

Five years of meteorological data (2003-2007) from Argonne National Lab-West (EBR) were used to generate joint frequency distributions of wind speed and direction as a function of Pasquill stability class (A-G). Stability class was determined using the vertical temperature difference (ΔT) method as specified in Table 1 of Regulatory Guide 1.23, Revision 1 (NRC, 2007c). This method is preferred because it is an effective indicator for the worst-case stability conditions (e.g., Pasquill stability classes E, F and G). Furthermore, models endorsed by the NRC to predict radioactive release concentrations are based on field studies that used vertical temperature differences to classify atmospheric stability.

To prepare the joint frequency distributions, hourly atmospheric stability was determined from the hourly ΔT data from the 75-m (246-ft) meteorological tower at EBR. Temperature data from the 10-m (33-ft) level and the 75-m (246-ft) level were used to calculate ΔT and the stability class. The joint frequency distributions are presented in Table 3.6-9, EBR 10-m (33-ft) 2003-2007 Joint Frequency Distribution Tables.

Based on wind data from EBR at the 10-m (33-ft) level (Table 3.6-9, EBR 10-m (33-ft) 2003-2007 Joint Frequency Distribution Tables), the most stable classes, E, F and G, occur 21.5%, 17.6% and 18.8% of the time, respectively. The least stable class, A, occurs 5.1% of the time. Important conditions for atmospheric dispersion, stable conditions (stability class F and G) and low wind speeds of 0 to 1.0 m/s (0 to 3.3 ft/s), occur 3.4% of the time. The highest occurrence of Pasquill stability classes F and G and low wind speeds, 0 to 1.0 m/s (0 to 3.3 ft/s), with respect to wind direction is 0.4% with south winds.

Tables 3.6-10 through 3.6-14 provide yearly temperature inversion persistence summaries for the period 2003-2007 at EBR. Note: The EBR station is now identified as the Materials and Fuel Complex (MFC) station. For the purpose of this discussion, a temperature inversion

occurs when the temperature at 75 m (246 ft) is greater than the temperature at 10 m (33 ft). For the five-year period of record at EBR, the 50% percent probability level for inversion duration is between 10 and 11 hours. In other words, it is more likely than not that when an inversion occurs at EBR, it will last for at least 10 hours.

3.6.2 Extreme Weather

3.6.2.1 Thunderstorms

The NCDC Storm Event Database was queried to obtain information on thunderstorms in the vicinity of the EREF site (NOAA, 2008a). The period of record available for review was January 1, 1955 to April 30, 2008. The area of interest was a four-county area surrounding the EREF and included Bonneville, Bingham, Butte and Jefferson counties, an area of 18,871 km^2 (7,286 mi^2). The output from the query contained 228 thunderstorm days during the 53-year period of record or 4.3 thunderstorm days per year. Several individual thunderstorms may occur during each of the thunderstorm days. Thunderstorm days can occur during every month of the year; however, they are most prevalent during the months of March through October. The thunderstorms that occur over the ESRP tend to be less severe than those that are experienced east of the Rocky Mountains. This is due, in part, to high cloud-base altitudes that allow thunderstorm precipitation to evaporate prior to reaching the ground. If the thunderstorms are of sufficient strength, they may be accompanied by strong winds, hail and even tornadoes. Winds greater than 65 km/hr (35 knots) occurred with thunderstorms on 170 occasions during the 53-year period of record. Hail accompanied the thunderstorms on 89 occasions.

3.6.2.2 Tornadoes

A tornado is defined as a violent vortex in the atmosphere. When the vortex reaches the ground, it is classified as a tornado. If the vortex does not reach the ground, it is classified as a funnel cloud. Tornadoes and funnel clouds always occur in association with thunderstorms, especially those which produce hail.

Most of the tornado activity in the United States occurs east of the Rocky Mountains. The total number of tornadoes in the four-county region encompassing the EREF site for the 58-year (January 1, 1950 through April 30, 2008) period of record is 40. Most of the tornado activity (82.4% of occurrences) occurred from April through July. The annual frequency of occurrence of a tornado in the four-county region is 0.69 (40 tornadoes/58 years). The likelihood of a tornado occurring within any 1,000 square mile area in the vicinity of the EREF site is 0.09 (0.69/7.289) tornadoes per year per 1,000 square miles. The probability of a tornado developing at the EREF site is very small.

Tornadoes are commonly classified by their intensity. The F-Scale classification ranks tornadoes based on the level of observable damage, with F0 being the weakest and F5 the strongest. One F2 tornado was sighted in the four-county region during the 58-year period of record. That tornado occurred in Bonneville County on April 7, 1978, causing $2.5 million in damage and one injury. All other tornadoes were either F0 (20 occurrences) or F1 (19 occurrences).

In addition to the tornado activity described above, 12 funnel clouds were sighted during the 58-year period of record in the four-county region.

3.6.2.3 Airborne Dust and Sand

The EREF site is located in a semi-arid environment and, as a result, blowing dust and drifting sand can be a nuisance when the winds are strong in certain areas of the ESRP. Vehicular traffic and construction equipment are also significant contributors to high dust concentrations. These conditions may particularly affect the activities of construction personnel during the spring months after the winter thaw when strong frontal systems pass through the ESRP and during the summer months when thunderstorms are near. During the daylight hours under conditions of strong winds, the concentration of dust sharply decreases with height up to 21 m (70 ft) above grade level.

3.6.2.4 Dust Devils

A dust devil is a rotating updraft ranging from 0.5 m (1.6 ft) in diameter and a few meters tall to over 10 m (33 ft) wide and over 1,000 m (3,281 ft) tall. Dust devils form as an updraft under calm, sunny conditions and intense solar heating of the ground. Dust devils are common during the summer in the ESRP (NOAA, 1989). As the dust devil develops, the rising air within the rotating updraft picks up dust and pebbles and can move objects that are not properly secured. Due to their short duration and relatively weak wind speeds 48 to 80 lm/hr (30 to 50 mi/hr), dust devils very rarely cause damage to people or property.

3.6.2.5 Blowing Snow

Blowing snow occurs when snow is on the ground and high winds cause the snow to be entrained into the air near the surface. Blowing snow can become a hazard because it reduces visibility and causes the snow to accumulate into drifts on the leeward side of buildings, vehicles, fence posts and structures, in general. During blizzard conditions, visibility can be reduced to zero. The formation of drifts can make roads and parking lots impassable. The terrain in the vicinity of the EREF site is predominately flat. This type of terrain is not conducive to the formation of snowdrifts. Nevertheless, snowdrifts can form on the leeward side of structures and obstacles. With a recorded maximum daily snowfall of 254 mm (10 in) and a maximum snow depth of 762 mm (30 in) in the vicinity of the EREF site, however, heavy drifting of snow is not anticipated.

3.6.2.6 Lightning

The only lightning data contained in the NCDC Storm Event Database are lightning events that result in fatality, injury and/or property and crop damage. According to the Database (NOAA, 2008a), there were nine lightning strikes in the four-county region encompassing the EREF site that accounted for $517,000 in property damage between January 1, 1950 and May 31, 2008. There were no reported deaths, injury or crop damage caused by lightning. According to ARLFRD (NOAA, 1989), the INL is not frequently struck by lightning. The INL is located immediately west of the EREF site. Nevertheless, the lack of natural targets and the poor conductivity of the dry desert soil and underlying lava rock cause man-made structures in this region to be susceptible to lightning strikes.

J.L. Marshall (Marshall, 1973) presented a methodology for estimating lightning strike frequencies which includes consideration of the attractive area of structures. His method consists of determining the number of lightning flashes to earth per year per square kilometer and then defining an area over which the structure can be expected to attract a lightning strike. Assuming that there is one flash to earth per year per square kilometer (2.59 flashes to earth

per square mile) in the vicinity of the EREF (conservatively estimated using Figure 3.6-20, Average Lightning Flash Density, Average Lightning Flash Density, which is taken from the National Weather Service (NOAA, 2008b)). Marshall defines the total attractive area, A, of a structure with length, L, width W, and height H, for lightning flashes with a current magnitude of 50% of all lightning flashes as:

$A = LW + 4H (L + W) + 12.57 H^2$

The following building complex dimensions were used to estimate conservatively the attractive area of the EREF:

L = 633 m (2,078 ft) (Measured from northern edge of the Cylinder Receipt and Shipping Building to the southern edge of the Administration Building)

W = 311 m (1,020 ft) (Measured from the western edge of Cascade Halls 3 & 4 to the eastern edge of the Centrifuge Assembly Building)

H = 16 m (53 ft) (Maximum building height)

In addition, the area of the Cylinder Storage Pads was determined to be 139,838m^2 (1,505,208 ft^2). Adding the area of the Cylinder Storage Pads to the area of the building complex (196,863 m^2 (2,119,560 ft^2) results in a total area of 336,701 m^2 (3,624,768 ft^2). Assuming a square, the effective length and width would be the square root of the total area, or 580 m (1904 ft). Therefore:

$A = (580 m)(580 m) + 4(16 m)(580 m + 580 m) + 12.57(16 m)^2$

$= 13,857.92 m^2$

The total attractive area is therefore equal to 0.41 km^2 (0.16 mi^2). Consequently, the lightning strike frequency computed using Marshall's methodology is given as 0.41 flashes per year.

3.6.3 Air Quality

The federal Clean Air Act (CAA) requires the United States Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for pollutants considered to be harmful to public health and the environment (USC, 2008p). The standards are designed to primarily protect the general public, including sensitive populations such as asthmatics, children and the elderly. They are also intended to safeguard public welfare by reducing effects such as decreased visibility and damage to animals, crops, vegetation and buildings. EPA has established standards for six criteria pollutants, including two size ranges for particulate matter. The state of Idaho has adopted the federal NAAQS. Table 3.6-15, Ambient Air Quality Standards for Criteria Pollutants, lists the ambient air quality standards as administered by the Idaho Department of Environmental Quality (IDEQ).

The Air Quality Index (AQI) is a national index that categorizes air quality based on a 500-point scale for each of the criteria air pollutants. The categories and numeric values are as follows: Good (0-50); Moderate (51-100); Unhealthy for Sensitive Groups (101-150); Unhealthy (151-200); Very Unhealthy (201-300); and Hazardous (300-500). Idaho generally enjoys "good" air quality. The AQI for Bonneville County (the county in which the EREF will be located) in 2007 was classified as "good" 95.7% of the time and "moderate" 4.3% of the time (EPA, 2007).

Air quality data for the state of Idaho was obtained from the IDEQ 2006 Air Quality Monitoring Data Summary (IDEQ, 2006).

3.6.3.1 Ozone

Ozone is a summertime air pollution problem which primarily forms when photochemical pollutants from cars and industrial sources react with sunlight. These photochemical pollutants are called ozone precursors and include oxides of nitrogen (NO_x) and volatile organic compounds (VOC). Levels of ozone are usually highest in the afternoon because of the intense sunlight, warm temperatures and the time required for ozone to form. Based upon IDEQ monitoring data (IDEQ, 2006), ozone concentrations have remained below the ozone standard since monitoring began.

3.6.3.2 Particulate Matter (10 micrometers)

Particulate matter (PM) includes both solid matter and liquid droplets suspended in the air. Particles smaller than 2.5 micrometers in diameter are called "fine" particles, or $PM_{2.5}$. Particles between 2.5 and 10 micrometers in diameter are called "coarse" particles. PM_{10} includes both fine and coarse particles. In Idaho, coarse particles typically come from crushing or grinding operations and dust from roads. Idaho currently has two areas that had previously exceeded the PM_{10} standard and are designated as nonattainment areas. These PM_{10} nonattainment areas are in Sandpoint and Pinehurst (EPA, 2008c). These areas are in the northern reaches of Idaho, near the Canadian border, and are several hundred miles removed from the EREF site. Based upon IDEQ monitoring data (IDEQ, 2006), Idaho's airsheds have been in compliance with the PM_{10} standard from 1997 through 2006.

3.6.3.3 Particulate Matter (2.5 micrometers)

$PM_{2.5}$ generally comes from wood burning, agricultural burning and other area sources, as well as vehicle exhaust including cars, diesel trucks and buses. Fine particulate can also be formed secondarily in the atmosphere by chemical reactions of pollutant gases. All of Idaho was classified as attainment/unclassifiable for $PM_{2.5}$ in 2006. This designation is supported by IDEQ monitoring data (IDEQ, 2006), which show that $PM_{2.5}$ concentrations were all below the former $PM_{2.5}$ standard of 65 $\mu g/m^3$. The same IDEQ monitoring data, however, also show that the three-year average for $PM_{2.5}$ for Pinehurst exceeds the new $PM_{2.5}$ standard of 35 $\mu g/m^3$. The new $PM_{2.5}$ standard was made effective on December 17, 2006. Based upon only one year of data from Franklin County (near Logan, Utah and more than 161 km (100 mi) from the EREF site), $PM_{2.5}$ concentrations have exceeded the new standard at that location as well.

3.6.3.4 Carbon Monoxide

Carbon monoxide (CO) is an odorless, colorless gas that forms when the carbon in fuels does not burn completely. In Idaho, the majority of CO comes from vehicle exhaust. IDEQ CO monitoring data (IDEQ, 2006) confirm that CO concentrations have been steadily decreasing since the early 1990's. The maximum 8-hour concentration for CO in 2006 was 2.1 ppm, which is well below the 8-hour standard. Measured 1-hour CO concentrations in Idaho are historically much lower than the 35 ppm standard. The maximum and second-highest 1-hour CO concentrations in 2006 were 4.8 and 3.5 ppm, respectively.

3.6.3.5 Sulfur Dioxide

Sulfur dioxide (SO_2) is a colorless, reactive gas produced by burning fuels containing sulfur, such as coal and oil, and by industrial processes. Historically, the greatest sources of SO_2 were industrial facilities that derived their products from raw materials like metallic ore, coal and crude

oil, or that burned coal or oil to produce process heat (petroleum refineries, cement manufacturing and metal processing facilities). Currently, on-road vehicles, marine craft and diesel construction equipment also release significant SO_2 emissions to the air. IDEQ SO_2 monitoring data (IDEQ, 2006) shows that SO_2 concentrations are well below all SO_2 ambient air quality standards. The maximum 24-hour and 3-hour averages recorded in 2006 were 0.033 ppm and 0.107 ppm, respectively. The highest annual SO_2 concentration in 2006 was 0.005 ppm.

3.6.3.6 Lead

Lead is a highly toxic metal that was used for many years in household products, automobile fuel and industrial chemicals. Airborne lead was associated primarily with automobile exhaust and lead smelters. Lead has not been monitored in Idaho since 2002. With the phase-out of lead in fuel and the closure of the Bunker Hill lead smelter in Kellogg, airborne lead is no longer a public health concern in Idaho (IDEQ, 2006).

3.6.3.7 Nitrogen Dioxide

Nitrogen dioxide (NO_2) is a reddish brown, highly reactive gas that forms from the reaction of nitrogen oxide (NO) and oxygen in the atmosphere. The term "NO_x" refers to both NO and NO_2. NO_x and VOC are both photochemically reactive and can result in the formation of ozone. On-road vehicles are the major sources of NO_x. Industrial boilers and processes, home heaters and gas stoves can also produce NO_x. NO_x is not considered a significant pollution problem in Idaho. In 2006, IDEQ only maintained one monitoring site for NO_2 at the Lancaster site near Coeur d'Alene. The annual average has consistently been less than half of the NAAQS standard. The 2006 annual average concentration at this site was 0.006 ppm. NO_2 monitoring at this site was stopped on December 31, 2006 (IDEQ, 2006).

3.6.3.8 Nonattainment and PSD Class I Areas

There are currently two nonattainment areas in Idaho. Both nonattainment areas are for PM_{10}. The Shoshone County, Pinehurst, Idaho area was designated nonattainment for PM_{10} and classified as moderate upon enactment of the Clean Air Act Amendments of 1990 (EPA, 2008d). IDEQ submitted a PM_{10} attainment plan on April 14, 1992, and EPA approved the plan on August 25, 1994. On April 14, 1992, IDEQ also submitted a PM_{10} attainment plan revision for the portion of the Shoshone County, Idaho nonattainment area just outside of Pinehurst. This area was designated nonattainment in January 1994. EPA approved the plan revision on May 26, 1995. The plan relies on control strategies needed to assure attainment of the PM_{10} NAAQS. The strategy focuses on control of residential wood combustion.

The Sandpoint area in Bonner County, Idaho was designated as a nonattainment area for PM_{10} and classified as moderate upon enactment of the Clean Air Act Amendments of 1990. IDEQ submitted a PM_{10} attainment plan in May 1993. On August 16, 1996, IDEQ submitted a revised plan and EPA approved the plan on June 26, 2002. The control strategies that are contained in the plan and designed to achieve attainment are control of residential wood combustion, fugitive road dust and industrial processes.

Portions of Power and Bannock Counties (Portneuf Valley area including Pocatello), located approximately 56 km (35 mi) south of the EREF site, had been designated as a moderate nonattainment area for PM_{10} upon enactment of the Clean Air Act Amendments of 1990 (EPA, 2008d). On June 30, 2004, IDEQ submitted a plan to EPA that met nonattainment and maintenance plan obligations. As part of the plan, IDEQ requested redesignation of the

Portneuf Valley to attainment for PM_{10}. On May 20, 2005, EPA proposed in the Federal Register to approve the plan and grant the redesignation request. On July 13, 2006, EPA approved the plan and granted the redesignation request (71 FR 39574) (FR, 2006).

IDEQ has highlighted Franklin County as a $PM_{2.5}$ Area of Concern based upon exceedances recorded in 2006, the first year of $PM_{2.5}$ monitoring at that location. Depending on monitoring results from 2006-2008, portions of Franklin County may be redesignated as nonattainment for $PM_{2.5}$.

Prevention of Significant Deterioration (PSD) Class I areas are areas of special national or regional natural, scenic, recreational, or historic value for which the PSD regulations provide special protection. The following areas are the closest Class I areas to the EREF site:

- Craters of the Moon National Monument & Preserve – 75 km (47 mi) to the west
- Red Rock Lakes National Wildlife Refuge – 95 km (59 mi) to the north-northeast
- Yellowstone National Park – 105 km (65 mi) to the northeast
- Grand Teton National Park – 105 km (65 mi) to the east

Figure 3.6-7 is a map of Idaho's Air Quality Planning Areas highlighting nonattainment areas, maintenance areas, PSD Class I areas and areas of concern.

3.6.3.9 Regional Emissions

EPA's AirData website 2006 provides access to air pollution data for the entire United States. The National Emissions Inventory database provides estimates of annual emissions of criteria air pollutants from all types of sources. The database was queried to provide facility emissions data from the four-county area surrounding the EREF site (EPA, 1999a). The counties included in the search were Bingham, Bonneville, Butte and Jefferson. The requested pollutants were CO, NO_x, PM_{10}, $PM_{2.5}$, SO_2 and VOC. The most recent year for which data were available was 1999. The query resulted in a listing of 10 facilities located in Bingham and Butte Counties (EPA, 1999b). Eight of the ten facilities were emission sources associated with activities at the INEL. The other two facilities were owned by Basic American Foods, Inc., a producer of dehydrated fruits, vegetables and soups. Table 3.6-16, Facility Criteria Air Pollutant Emissions in the Four-County Region Surrounding the Eagle Rock Enrichment Facility Site, summarizes the annual emissions from these facilities as of 1999.

Since air quality in Bonneville County has not changed over the last decade and is categorized as "good," it can be assumed that the air emissions from these regional sources have remained fairly constant over the same period of time and/or the air emissions have minimal impact within the region. It is anticipated that air quality in the region will continue to be in attainment of the ambient air quality standards for the foreseeable future.

TABLES

Table 3.6-1 Eagle Rock Enrichment Facility Site Climate: Normal and Extreme Temperatures
(Page 1 of 1)

			Temperature (ºF/ºC)											
Station Name	**Temperature**	**POR[1]**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Ann**
	Extreme High	1952-2001	55.0	63.0	75.0	85.0	92.0	100.0	100.0	100.0	95.0	87.0	73.0	60.0	100.0
			12.8	17.2	23.9	29.4	33.3	37.8	37.8	37.8	35.0	30.6	22.8	15.6	37.8
	Normal[2] High	1971-2000	29.7	36.6	47.6	58.7	67.9	77.8	86.0	85.8	75.1	61.4	43.0	31.3	58.4
			-1.3	2.6	8.7	14.8	19.9	25.4	30.0	29.9	23.9	16.3	6.1	-0.4	14.7
Idaho Falls 2 ESE	Average	1971-2000	21.1	26.7	36.2	45.0	53.3	61.9	68.7	67.9	58.2	46.8	33.1	22.4	45.1
			-6.1	-2.9	2.3	7.2	11.8	16.6	20.4	19.9	14.6	8.2	0.6	-5.3	7.3
	Normal[2] Low	1971-2000	12.5	16.8	24.8	31.3	38.7	46.0	51.4	49.9	41.3	32.2	23.2	13.4	31.8
			-10.8	-8.4	-4.0	-0.4	3.7	7.8	10.8	9.9	5.2	0.1	-4.9	-10.3	-0.1
	Extreme Low	1952-2001	-29.0	-34.0	-15.0	9.0	20.0	28.0	34.0	31.0	18.0	7.0	-12.0	-29.0	-34.0
			-33.4	-36.7	-26.1	-12.8	-6.7	-2.2	1.1	-0.6	-7.8	-13.9	-24.4	-33.7	-36.7
	Extreme High	1954-2001	51.0	60.0	73.0	86.0	91.0	100.0	101.0	101.0	96.0	87.0	67.0	57.0	101.0
			10.6	15.6	22.8	30.0	32.8	37.8	38.3	38.3	35.6	30.6	19.4	13.9	38.3
	Normal[2] High	1971-2000	27.9	34.0	44.8	56.9	66.3	76.8	86.6	85.7	74.6	60.9	41.4	29.4	57.1
			-2.3	1.1	7.1	13.8	19.1	24.9	30.3	29.8	23.7	16.1	5.2	-1.4	13.9
Idaho Falls 46 W	Average	1971-2000	16.2	22.1	32.8	42.4	51.2	60.0	67.6	66.2	55.7	43.4	28.7	17.1	42.0
			-8.8	-5.5	0.4	5.8	10.7	15.6	19.8	19.0	13.2	6.3	-1.8	-8.3	5.6
	Normal[2] Low	1971-2000	4.5	10.2	20.7	27.9	36.1	43.2	48.5	46.7	36.8	25.9	15.9	4.8	26.8
			-15.3	-12.1	-6.3	-2.3	2.3	6.2	9.2	8.2	2.7	-3.4	-8.9	-15.1	-2.9
	Extreme Low	1954-2001	-40.0	-36.0	-28.0	6.0	13.0	23.0	28.0	24.0	12.0	1.0	-24.0	-47.0	-47.0
			-40.0	-37.8	-33.3	-14.4	-10.6	-5.0	-2.2	-4.4	-11.1	-17.2	-31.1	-43.9	-43.9

[1]POR - Period of Record

[2] A climate "normal" is defined as the arithmetic mean of a climatological element computed over three consecutive decades.

Table 3.6-2 Eagle Rock Enrichment Facility Site Climate: Normal and Extreme Precipitation
(Page 1 of 1)

			Precipitation (in/mm)												
Station Name	**Precipitation**	**POR[1]**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Ann**
	Extreme High[2]	1952-2001	2.38	3.13	4.30	2.82	4.56	3.16	2.13	2.66	2.81	2.49	3.20	3.18	
			60.45	79.50	109.22	71.63	115.82	80.26	54.10	67.56	71.37	63.25	81.28	80.77	
Idaho Falls 2 ESE	Average	1971-2000	1.25	1.01	1.33	1.27	2.01	1.18	0.74	0.93	0.94	1.12	1.17	1.26	14.21
			31.75	25.65	33.78	32.26	51.05	29.97	18.80	23.62	23.88	28.45	29.72	32.00	360.93
	Extreme Low[2]	1952-2001	0.22	0.00	0.04	0.20	0.33	0.15	0.00	0.07	0.00	0.00	0.00	0.00	
			5.59	0.00	1.02	5.08	8.38	3.81	0.00	1.78	0.00	0.00	0.00	0.00	
	Extreme High[2]	1954-2001	1.20	2.36	2.03	1.99	2.34	4.64	2.29	1.13	2.08	1.67	1.74	1.91	
			30.48	59.94	51.56	50.55	59.44	117.86	58.17	28.70	52.83	42.42	44.20	48.51	
Idaho Falls 46 W	Average	1971-2000	0.64	0.62	0.69	0.79	1.24	1.08	0.66	0.44	0.73	0.57	0.69	0.67	8.82
			16.26	15.75	17.53	20.07	31.50	27.43	16.76	11.18	18.54	14.48	17.53	17.02	224.03
	Extreme Low[2]	1954-2001	0.01	0.00	0.00	0.00	0.31	0.01	0.00	0.02	0.00	0.00	0.00	0.00	
			0.25	0.00	0.00	0.00	7.87	0.25	0.00	0.51	0.00	0.00	0.00	0.00	

[1]POR - Period of Record

[2]Precipitation extremes are provided in the NCDC Monthly Climate summaries for highest daily, highest monthly, and lowest monthly. Highest and lowest annuals are not provided.

Table 3.6-3 Precipitation Distribution at KET and EBR (2003 – 2007)
(Page 1 of 1)

KET			EBR		
Inches	**Millimeters**	**Number of Hours**	**Inches**	**Millimeters**	**Number of Hours**
0	0	40990	0	0	42322
0.0 - 0.1	0.00 - 2.54	1065	0.0 - 0.1	0.00 - 2.54	1172
0.1 - 0.2	2.54 - 5.08	48	0.1 - 0.2	2.54 - 5.08	36
0.2 - 0.3	5.08 - 7.62	5	0.2 - 0.3	5.08 - 7.62	7
0.3 - 0.4	7.62 - 10.16	2	0.3 - 0.4	7.62 - 10.16	5
0.4 - 0.5	10.16 - 12.70	0	0.4 - 0.5	10.16 - 12.70	1
0.5 - 0.6	12.70 - 15.24	0	0.5 - 0.6	12.70 - 15.24	0
0.6 - 0.7	15.24 - 17.78	0	0.6 - 0.7	15.24 - 17.78	0
0.7 – 0.8	17.78 - 20.32	0	0.7 – 0.8	17.78 - 20.32	0
0.8 - 0.9	20.32 - 22.86	0	0.8 - 0.9	20.32 - 22.86	0
0.9 - 1.0	22.86 - 25.40	0	0.9 - 1.0	22.86 - 25.40	1
1.0 - 2.0	25.40 - 50.80	0	1.0 - 2.0	25.40 - 50.80	0
2.0 - 3.0	50.80 - 76.20	0	2.0 - 3.0	50.80 - 76.20	0
3.0 - 4.0	76.20 - 101.60	0	3.0 - 4.0	76.20 - 101.60	0
4.0 - 5.0	101.60 - 127.00	0	4.0 - 5.0	101.60 - 127.00	0
5.0 - 10.0	127.00 - 254.00	0	5.0 - 10.0	127.00 - 254.00	0
Missing		1714	Missing		280

Table 3.6-4 INEL Monthly and Annual Mean Relative Humidity at KET (2003-2007)
(Page 1 of 1)

Month	Relative Humidity (%)
January	89.0
February	82.0
March	69.9
April	59.1
May	51.4
June	51.3
July	42.7
August	38.6
September	45.3
October	61.4
November	73.6
December	85.3
January-December	62.1

Table 3.6-5 Eagle Rock Enrichment Facility Site Climate: Average Monthly and Annual Wind Speeds for Idaho Falls 46 W, KET and EBR
(Page 1 of 1)

	Idaho Falls 46 W[1]		KET[2]		EBR[2]	
	6-m (20-ft) Level		15-m (49-ft) Level		10-m (33-ft) Level	
	(mph)	(m/s)	(mph)	(m/s)	(mph)	(m/s)
January	5.6	2.5	10.8	4.8	6.8	3.0
February	6.9	3.1	11.9	5.3	7.6	3.4
March	8.7	3.9	13.7	6.1	10.7	4.8
April	9.3	4.2	13.5	6.0	10.8	4.8
May	9.3	4.2	13.7	6.1	10.9	4.9
June	8.9	4.0	12.9	5.8	10.5	4.7
July	8.0	3.6	11.6	5.2	9.7	4.3
August	7.7	3.4	11.6	5.2	9.8	4.4
September	7.2	3.2	11.5	5.1	9.1	4.1
October	6.8	3.0	11.5	5.1	9.0	4.0
November	6.4	2.9	12.0	5.4	8.9	4.0
December	5.1	2.3	11.7	5.2	8.4	3.8
ANNUAL	7.5	3.4	12.2	5.5	9.3	4.2

[1] Data period of record: April 1950-October 1964

[2] Data period of record: January 1, 2003-December 31, 2007

Table 3.6-6 Eagle Rock Enrichment Facility Site Climate: Highest Hourly Average Wind Speed and Concurrent Wind Direction for Idaho Falls 46 W, KET and EBR

(Page 1 of 1)

	Idaho Falls 46 W[1]			KET[2]			EBR[2]		
	6-m (20-ft) Level			15-m (49-ft) Level			10-m (33-ft) Level		
	Speed		Direction	Speed		Direction	Speed		Direction
	(mph)	(m/s)		(mph)	(m/s)		(mph)	(m/s)	
January	48	21	WSW	42	19	SW	37	17	SSW
February	36	16	SW	39	17	WSW	36	16	SW
March	51	23	WSW	51	23	WSW	43	19	WSW
April	39	17	WSW	45	20	WSW	39	17	SW
May	41	18	SW	42	19	SW	37	17	SW
June	36	16	SW	37	17	WSW	35	16	SW
July	35	16	WSW	40	18	SW	38	17	WSW
August	40	18	WSW	39	17	WSW	36	16	WSW
September	42	19	WSW	42	19	WSW	36	16	WSW
October	44	20	WSW	48	21	SW	36	16	SSW
November	40	18	WSW	44	20	WSW	38	17	WSW
December	43	19	SW	41	18	SW	34	15	SSW
ANNUAL	51	23	WSW	51	23	WSW	43	19	WSW

Table 3.6-7 Number of Wind Direction Persistence Events ≥ 12 Hours – EBR (2003-2007)
(Page 1 of 1)

	10 m (33 ft)
N	4
NNE	11
NE	6
ENE	
E	
ESE	
SE	
SSE	
S	1
SSW	4
SW	23
WSW	1
W	
WNW	
NW	
NNW	

Table 3.6-8 Estimated Seasonal and Annual Mixing Depths for Mornings and Afternoons in the ESRP
(Page 1 of 1)

	Morning		Afternoon	
	Meters AGL[1]	**Feet AGL[1]**	**Meters AGL[1]**	**Feet AGL[1]**
Spring	480	1575	2330	7644
Summer	260	853	2900	9514
Autumn	330	1083	1550	5085
Winter	400	1312	730	2395
ANNUAL	370	1214	2090	6857

[1] AGL = Above Ground Level

Source: NOAA, 1989

Table 3.6-9 EBR 10-m (33-ft) 2003-2007 Joint Frequency Distribution Tables
(Page 1 of 16)

INEL EBR JAN03-DEC07 MET DATA JOINT FREQUENCY DISTRIBUTION (75-METER TOWER)

33.0 FT WIND DATA STABILITY CLASS A CLASS FREQUENCY (PERCENT) = 5.10

WIND DIRECTION FROM

SPEED mps (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL(3)	TOTAL
LT .3 (LT .7)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.3- .4 (.7-.9)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.5- 1.0 (1.0-2.2)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
(1)	.05	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.05
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
1.1- 1.5 (2.3-3.4)	7	0	3	1	2	0	0	0	0	0	0	0	1	4	4	2	0	24
(1)	.32	.00	.14	.05	.09	.00	.00	.00	.00	.00	.00	.00	.05	.18	.18	.09	.00	1.09
(2)	.02	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.01	.00	.00	.06
1.6- 2.0 (3.5-4.5)	24	24	13	7	6	1	0	1	1	1	6	5	6	5	18	17	0	135
(1)	1.09	1.09	.59	.32	.27	.05	.00	.05	.05	.05	.27	.23	.27	.23	.81	.77	.00	6.11
(2)	.06	.06	.03	.02	.01	.00	.00	.00	.00	.00	.01	.01	.01	.01	.04	.04	.00	.31
2.1- 3.0 (4.6-6.7)	40	64	73	45	28	17	14	16	4	11	14	15	25	13	12	15	0	406
(1)	1.81	2.89	3.30	2.04	1.27	.77	.63	.72	.18	.50	.63	.68	1.13	.59	.54	.68	.00	18.36
(2)	.09	.15	.17	.10	.06	.04	.03	.04	.01	.03	.03	.03	.06	.03	.03	.03	.00	.94
3.1- 4.0 (6.8-8.9)	17	47	80	32	12	8	5	17	12	16	27	16	15	8	9	6	0	327
(1)	.77	2.13	3.62	1.45	.54	.36	.23	.77	.54	.72	1.22	.72	.68	.36	.41	.27	.00	14.79
(2)	.04	.11	.18	.07	.03	.02	.01	.04	.03	.04	.06	.04	.03	.02	.02	.01	.00	.75

Table 3.6-9 EBR 10-m (33-ft) 2003-2007 Joint Frequency Distribution Tables
(Page 2 of 16)

4.1- 5.0 (9.0-11.2)	6	31	61	22	3	4	3	8	17	30	26	5	3	4	4	6	0	233
(1)	.27	1.40	2.76	1.00	.14	.18	.14	.36	.77	1.36	1.18	.23	.14	.18	.18	.27	.00	10.54
(2)	.01	.07	.14	.05	.01	.01	.01	.02	.04	.07	.06	.01	.01	.01	.01	.01	.00	.54
5.1- 6.0 (11.3-13.4)	6	26	44	8	1	0	2	3	26	48	18	3	1	1	0	0	0	187
(1)	.27	1.18	1.99	.36	.05	.00	.09	.14	1.18	2.17	.81	.14	.05	.05	.00	.00	.00	8.46
(2)	.01	.06	.10	.02	.00	.00	.00	.01	.06	.11	.04	.01	.00	.00	.00	.00	.00	.43
6.1- 8.0 (13.5-17.9)	5	28	44	8	1	0	3	9	48	113	78	17	1	3	4	2	0	364
(1)	.23	1.27	1.99	.36	.05	.00	.14	.41	2.17	5.11	3.53	.77	.05	.14	.18	.09	.00	16.46
(2)	.01	.06	.10	.02	.00	.00	.01	.02	.11	.26	.18	.04	.00	.01	.01	.00	.00	.84
8.1-10.0 (18.0-22.4)	6	19	8	2	2	0	0	2	31	64	162	25	4	4	3	2	0	334
(1)	.27	.86	.36	.09	.09	.00	.00	.09	1.40	2.89	7.33	1.13	.18	.18	.14	.09	.00	15.11
(2)	.01	.04	.02	.00	.00	.00	.00	.00	.07	.15	.37	.06	.01	.01	.01	.00	.00	.77
10.1-40.3 (22.5-90.1)	2	38	5	0	0	0	0	0	8	9	99	35	2	0	1	1	0	200
(1)	.09	1.72	.23	.00	.00	.00	.00	.00	.36	.41	4.48	1.58	.09	.00	.05	.05	.00	9.05
(2)	.00	.09	.01	.00	.00	.00	.00	.00	.02	.02	.23	.08	.00	.00	.00	.00	.00	.46
ALL SPEEDS	114	277	331	125	55	30	27	56	147	292	430	121	58	42	55	51	0	2211
(1)	5.16	12.53	14.97	5.65	2.49	1.36	1.22	2.53	6.65	13.21	19.45	5.47	2.62	1.90	2.49	2.31	.00	100.00
(2)	.26	.64	.76	.29	.13	.07	.06	.13	.34	.67	.99	.28	.13	.10	.13	.12	.00	5.10

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE
(2)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD
(3)=VARIABLE

Table 3.6-9 EBR 10-m (33-ft) 2003-2007 Joint Frequency Distribution Tables
(Page 3 of 16)

INEL EBR JAN03-DEC07 MET DATA JOINT FREQUENCY DISTRIBUTION (75-METER TOWER)

33.0 FT WIND DATA STABILITY CLASS B CLASS FREQUENCY (PERCENT) = 5.79

WIND DIRECTION FROM

SPEED mps (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL(3)	TOTAL
LT .3 (LT .7)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.3- .4 (.7-.9)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.5- 1.0 (1.0-2.2)	0	1	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	4
(1)	.00	.04	.00	.00	.00	.00	.00	.00	.00	.00	.00	.04	.08	.00	.00	.00	.00	.16
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01
1.1- 1.5 (2.3-3.4)	5	5	1	2	1	0	0	0	1	0	1	3	0	9	9	11	0	48
(1)	.20	.20	.04	.08	.04	.00	.00	.00	.04	.00	.04	.12	.00	.36	.36	.44	.00	1.91
(2)	.01	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.02	.02	.03	.00	.11
1.6- 2.0 (3.5-4.5)	21	19	16	3	2	3	0	4	2	3	8	6	12	18	27	16	0	160
(1)	.84	.76	.64	.12	.08	.12	.00	.16	.08	.12	.32	.24	.48	.72	1.08	.64	.00	6.38
(2)	.05	.04	.04	.01	.00	.01	.00	.01	.00	.01	.02	.01	.03	.04	.06	.04	.00	.37
2.1- 3.0 (4.6-6.7)	47	64	54	27	18	7	9	20	20	25	32	48	42	24	17	25	0	479
(1)	1.87	2.55	2.15	1.08	.72	.28	.36	.80	.80	1.00	1.28	1.91	1.67	.96	.68	1.00	.00	19.10
(2)	.11	.15	.12	.06	.04	.02	.02	.05	.05	.06	.07	.11	.10	.06	.04	.06	.00	1.11
3.1- 4.0 (6.8-8.9)	16	47	43	18	9	6	6	15	28	48	50	36	16	9	7	6	0	360
(1)	.64	1.87	1.71	.72	.36	.24	.24	.60	1.12	1.91	1.99	1.44	.64	.36	.28	.24	.00	14.35
(2)	.04	.11	.10	.04	.02	.01	.01	.03	.06	.11	.12	.08	.04	.02	.02	.01	.00	.83

Table 3.6-9 EBR 10-m (33-ft) 2003-2007 Joint Frequency Distribution Tables
(Page 4 of 16)

4.1- 5.0 (9.0-11.2)	9	21	44	7	1	2	2	7	26	78	55	27	11	4	4	1	0	299
(1)	.36	.84	1.75	.28	.04	.08	.08	.28	1.04	3.11	2.19	1.08	.44	.16	.16	.04	.00	11.92
(2)	.02	.05	.10	.02	.00	.00	.00	.02	.06	.18	.13	.06	.03	.01	.01	.00	.00	.69
5.1- 6.0 (11.3-13.4)	4	14	29	5	1	0	0	3	25	93	56	18	4	2	2	5	0	261
(1)	.16	.56	1.16	.20	.04	.00	.00	.12	1.00	3.71	2.23	.72	.16	.08	.08	.20	.00	10.41
(2)	.01	.03	.07	.01	.00	.00	.00	.01	.06	.21	.13	.04	.01	.00	.00	.01	.00	.60
6.1- 8.0 (13.5-17.9)	7	11	23	1	2	1	0	3	44	115	143	36	3	4	4	3	0	400
(1)	.28	.44	.92	.04	.08	.04	.00	.12	1.75	4.59	5.70	1.44	.12	.16	.16	.12	.00	15.95
(2)	.02	.03	.05	.00	.00	.00	.00	.01	.10	.27	.33	.08	.01	.01	.01	.01	.00	.92
8.1-10.0 (18.0-22.4)	5	11	7	1	2	1	0	0	19	49	163	40	1	1	2	0	0	302
(1)	.20	.44	.28	.04	.08	.04	.00	.00	.76	1.95	6.50	1.59	.04	.04	.08	.00	.00	12.04
(2)	.01	.03	.02	.00	.00	.00	.00	.00	.04	.11	.38	.09	.00	.00	.00	.00	.00	.70
10.1-40.3 (22.5-90.1)	6	5	3	0	0	0	0	0	4	12	120	43	1	0	1	0	0	195
(1)	.24	.20	.12	.00	.00	.00	.00	.00	.16	.48	4.78	1.71	.04	.00	.04	.00	.00	7.78
(2)	.01	.01	.01	.00	.00	.00	.00	.00	.01	.03	.28	.10	.00	.00	.00	.00	.00	.45
ALL SPEEDS	120	198	220	64	36	20	17	52	169	423	628	258	92	71	73	67	0	2508
(1)	4.78	7.89	8.77	2.55	1.44	.80	.68	2.07	6.74	16.87	25.04	10.29	3.67	2.83	2.91	2.67	.00	100.00
(2)	.28	.46	.51	.15	.08	.05	.04	.12	.39	.98	1.45	.60	.21	.16	.17	.15	.00	5.79

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE
(2)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD
(3)=VARIABLE

Table 3.6-9 EBR 10-m (33-ft) 2003-2007 Joint Frequency Distribution Tables
(Page 5 of 16)

INEL EBR JAN03-DEC07 MET DATA JOINT FREQUENCY DISTRIBUTION (75-METER TOWER)

33.0 FT WIND DATA STABILITY CLASS C CLASS FREQUENCY (PERCENT) = 7.09

WIND DIRECTION FROM

SPEED mps (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL(3)	TOTAL
LT .3 (LT .7)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.3- .4 (.7-.9)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.5- 1.0 (1.0-2.2)	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	0	4
(1)	.03	.00	.00	.00	.00	.00	.00	.00	.00	.03	.00	.00	.00	.00	.00	.07	.00	.13
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01
1.1- 1.5 (2.3-3.4)	19	8	9	4	2	2	0	1	2	1	0	6	13	25	27	12	0	131
(1)	.62	.26	.29	.13	.07	.07	.00	.03	.07	.03	.00	.20	.42	.81	.88	.39	.00	4.26
(2)	.04	.02	.02	.01	.00	.00	.00	.00	.00	.00	.00	.01	.03	.06	.06	.03	.00	.30
1.6- 2.0 (3.5-4.5)	38	29	25	10	4	7	2	2	2	5	10	23	17	21	21	41	0	257
(1)	1.24	.94	.81	.33	.13	.23	.07	.07	.07	.16	.33	.75	.55	.68	.68	1.33	.00	8.36
(2)	.09	.07	.06	.02	.01	.02	.00	.00	.00	.01	.02	.05	.04	.05	.05	.09	.00	.59
2.1- 3.0 (4.6-6.7)	45	94	64	27	15	4	14	18	28	38	59	56	42	18	16	45	0	583
(1)	1.46	3.06	2.08	.88	.49	.13	.46	.59	.91	1.24	1.92	1.82	1.37	.59	.52	1.46	.00	18.97
(2)	.10	.22	.15	.06	.03	.01	.03	.04	.06	.09	.14	.13	.10	.04	.04	.10	.00	1.34
3.1- 4.0 (6.8-8.9)	15	58	59	12	6	4	5	22	36	55	62	40	20	12	4	3	0	413
(1)	.49	1.89	1.92	.39	.20	.13	.16	.72	1.17	1.79	2.02	1.30	.65	.39	.13	.10	.00	13.44
(2)	.03	.13	.14	.03	.01	.01	.01	.05	.08	.13	.14	.09	.05	.03	.01	.01	.00	.95

Table 3.6-9 EBR 10-m (33-ft) 2003-2007 Joint Frequency Distribution Tables
(Page 6 of 16)

4.1- 5.0 (9.0-11.2)	9	33	31	5	1	1	0	11	35	70	96	34	4	6	9	1	0	346
(1)	.29	1.07	1.01	.16	.03	.03	.00	.36	1.14	2.28	3.12	1.11	.13	.20	.29	.03	.00	11.26
(2)	.02	.08	.07	.01	.00	.00	.00	.03	.08	.16	.22	.08	.01	.01	.02	.00	.00	.80
5.1- 6.0 (11.3-13.4)	8	16	27	3	1	1	0	9	44	69	76	14	9	6	6	4	0	293
(1)	.26	.52	.88	.10	.03	.03	.00	.29	1.43	2.25	2.47	.46	.29	.20	.20	.13	.00	9.53
(2)	.02	.04	.06	.01	.00	.00	.00	.02	.10	.16	.18	.03	.02	.01	.01	.01	.00	.68
6.1- 8.0 (13.5-17.9)	6	12	30	3	0	1	0	10	37	96	167	67	6	7	11	8	0	461
(1)	.20	.39	.98	.10	.00	.03	.00	.33	1.20	3.12	5.43	2.18	.20	.23	.36	.26	.00	15.00
(2)	.01	.03	.07	.01	.00	.00	.00	.02	.09	.22	.39	.15	.01	.02	.03	.02	.00	1.06
8.1-10.0 (18.0-22.4)	9	16	7	1	0	0	0	0	13	57	154	69	3	3	3	0	0	335
(1)	.29	.52	.23	.03	.00	.00	.00	.00	.42	1.85	5.01	2.25	.10	.10	.10	.00	.00	10.90
(2)	.02	.04	.02	.00	.00	.00	.00	.00	.03	.13	.36	.16	.01	.01	.01	.00	.00	.77
10.1-40.3 (22.5-90.1)	4	13	2	0	0	0	0	0	5	12	134	77	2	0	0	1	0	250
(1)	.13	.42	.07	.00	.00	.00	.00	.00	.16	.39	4.36	2.51	.07	.00	.00	.03	.00	8.14
(2)	.01	.03	.00	.00	.00	.00	.00	.00	.01	.03	.31	.18	.00	.00	.00	.00	.00	.58
ALL SPEEDS	154	279	254	65	29	20	21	73	202	404	758	386	116	98	97	117	0	3073
(1)	5.01	9.08	8.27	2.12	.94	.65	.68	2.38	6.57	13.15	24.67	12.56	3.77	3.19	3.16	3.81	.00	100.00
(2)	.36	.64	.59	.15	.07	.05	.05	.17	.47	.93	1.75	.89	.27	.23	.22	.27	.00	7.09

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE
(2)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD
(3)=VARIABLE

Table 3.6-9 EBR 10-m (33-ft) 2003-2007 Joint Frequency Distribution Tables
(Page 7 of 16)

INEL EBR JAN03-DEC07 MET DATA JOINT FREQUENCY DISTRIBUTION (75-METER TOWER)

33.0 FT WIND DATA STABILITY CLASS D CLASS FREQUENCY (PERCENT) = 24.20

WIND DIRECTION FROM

SPEED mps (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL(3)	TOTAL
LT .3 (LT .7)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.3- .4 (.7-.9)	1	0	1	0	0	0	0	0	0	0	0	0	1	1	0	1	0	5
(1)	.01	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.01	.00	.01	.00	.05
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01
.5- 1.0 (1.0-2.2)	17	27	10	8	10	6	5	3	2	9	13	13	14	17	19	25	0	198
(1)	.16	.26	.10	.08	.10	.06	.05	.03	.02	.09	.12	.12	.13	.16	.18	.24	.00	1.89
(2)	.04	.06	.02	.02	.02	.01	.01	.01	.00	.02	.03	.03	.03	.04	.04	.06	.00	.46
1.1- 1.5 (2.3-3.4)	64	64	55	26	25	21	14	14	16	26	32	36	45	42	66	77	0	623
(1)	.61	.61	.52	.25	.24	.20	.13	.13	.15	.25	.31	.34	.43	.40	.63	.73	.00	5.94
(2)	.15	.15	.13	.06	.06	.05	.03	.03	.04	.06	.07	.08	.10	.10	.15	.18	.00	1.44
1.6- 2.0 (3.5-4.5)	94	159	73	34	14	5	20	24	24	47	61	72	43	68	64	85	0	887
(1)	.90	1.52	.70	.32	.13	.05	.19	.23	.23	.45	.58	.69	.41	.65	.61	.81	.00	8.45
(2)	.22	.37	.17	.08	.03	.01	.05	.06	.06	.11	.14	.17	.10	.16	.15	.20	.00	2.05
2.1- 3.0 (4.6-6.7)	114	330	195	44	24	21	21	47	84	140	159	150	78	47	62	63	0	1579
(1)	1.09	3.15	1.86	.42	.23	.20	.20	.45	.80	1.33	1.52	1.43	.74	.45	.59	.60	.00	15.05
(2)	.26	.76	.45	.10	.06	.05	.05	.11	.19	.32	.37	.35	.18	.11	.14	.15	.00	3.64
3.1- 4.0 (6.8-8.9)	48	187	147	36	18	13	19	59	97	190	190	125	70	42	46	32	0	1319
(1)	.46	1.78	1.40	.34	.17	.12	.18	.56	.92	1.81	1.81	1.19	.67	.40	.44	.31	.00	12.57
(2)	.11	.43	.34	.08	.04	.03	.04	.14	.22	.44	.44	.29	.16	.10	.11	.07	.00	3.04

Table 3.6-9 EBR 10-m (33-ft) 2003-2007 Joint Frequency Distribution Tables
(Page 8 of 16)

4.1- 5.0 (9.0-11.2)	42	113	94	24	12	10	9	49	97	168	239	137	45	35	33	33	0	1140
(1)	.40	1.08	.90	.23	.11	.10	.09	.47	.92	1.60	2.28	1.31	.43	.33	.31	.31	.00	10.87
(2)	.10	.26	.22	.06	.03	.02	.02	.11	.22	.39	.55	.32	.10	.08	.08	.08	.00	2.63
5.1- 6.0 (11.3-13.4)	31	45	68	22	13	3	6	52	117	235	241	117	24	25	26	27	0	1052
(1)	.30	.43	.65	.21	.12	.03	.06	.50	1.12	2.24	2.30	1.12	.23	.24	.25	.26	.00	10.03
(2)	.07	.10	.16	.05	.03	.01	.01	.12	.27	.54	.56	.27	.06	.06	.06	.06	.00	2.43
6.1- 8.0 (13.5-17.9)	56	89	68	20	8	2	3	38	156	336	489	217	34	27	22	48	0	1613
(1)	.53	.85	.65	.19	.08	.02	.03	.36	1.49	3.20	4.66	2.07	.32	.26	.21	.46	.00	15.38
(2)	.13	.21	.16	.05	.02	.00	.01	.09	.36	.78	1.13	.50	.08	.06	.05	.11	.00	3.72
8.1-10.0 (18.0-22.4)	53	50	39	7	2	2	0	13	101	265	515	198	5	6	3	11	0	1270
(1)	.51	.48	.37	.07	.02	.02	.00	.12	.96	2.53	4.91	1.89	.05	.06	.03	.10	.00	12.11
(2)	.12	.12	.09	.02	.00	.00	.00	.03	.23	.61	1.19	.46	.01	.01	.01	.03	.00	2.93
10.1-40.3 (22.5-90.1)	34	42	7	5	1	0	0	2	39	123	370	174	6	0	0	2	0	805
(1)	.32	.40	.07	.05	.01	.00	.00	.02	.37	1.17	3.53	1.66	.06	.00	.00	.02	.00	7.67
(2)	.08	.10	.02	.01	.00	.00	.00	.00	.09	.28	.85	.40	.01	.00	.00	.00	.00	1.86
ALL SPEEDS	554	1106	757	226	127	83	97	301	733	1539	2309	1239	365	310	341	404	0	10491
(1)	5.28	10.54	7.22	2.15	1.21	.79	.92	2.87	6.99	14.67	22.01	11.81	3.48	2.95	3.25	3.85	.00	100.00
(2)	1.28	2.55	1.75	.52	.29	.19	.22	.69	1.69	3.55	5.33	2.86	.84	.72	.79	.93	.00	24.20

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE
(2)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD
(3)=VARIABLE

Table 3.6-9 EBR 10-m (33-ft) 2003-2007 Joint Frequency Distribution Tables
(Page 9 of 16)

INEL EBR JAN03-DEC07 MET DATA JOINT FREQUENCY DISTRIBUTION (75-METER TOWER)

33.0 FT WIND DATA STABILITY CLASS E CLASS FREQUENCY (PERCENT) = 21.50

WIND DIRECTION FROM

SPEED mps (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL(3)	TOTAL
LT .3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(LT .7)																		
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.3- .4	1	0	1	0	0	0	1	1	1	2	2	1	0	1	0	1	0	12
(.7-.9)																		
(1)	.01	.00	.01	.00	.00	.00	.01	.01	.01	.02	.02	.01	.00	.01	.00	.01	.00	.13
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.03
.5- 1.0	44	38	46	40	24	23	23	29	20	29	27	23	14	27	23	34	0	464
(1.0-2.2)																		
(1)	.47	.41	.49	.43	.26	.25	.25	.31	.21	.31	.29	.25	.15	.29	.25	.36	.00	4.98
(2)	.10	.09	.11	.09	.06	.05	.05	.07	.05	.07	.06	.05	.03	.06	.05	.08	.00	1.07
1.1- 1.5	88	108	87	64	36	26	23	31	43	50	38	62	34	26	54	62	0	832
(2.3-3.4)																		
(1)	.94	1.16	.93	.69	.39	.28	.25	.33	.46	.54	.41	.67	.36	.28	.58	.67	.00	8.93
(2)	.20	.25	.20	.15	.08	.06	.05	.07	.10	.12	.09	.14	.08	.06	.12	.14	.00	1.92
1.6- 2.0	102	140	133	60	25	19	21	33	58	61	44	54	38	34	33	50	0	905
(3.5-4.5)																		
(1)	1.09	1.50	1.43	.64	.27	.20	.23	.35	.62	.65	.47	.58	.41	.36	.35	.54	.00	9.71
(2)	.24	.32	.31	.14	.06	.04	.05	.08	.13	.14	.10	.12	.09	.08	.08	.12	.00	2.09
2.1- 3.0	97	261	219	80	29	23	34	67	103	125	121	104	58	51	54	53	0	1479
(4.6-6.7)																		
(1)	1.04	2.80	2.35	.86	.31	.25	.36	.72	1.11	1.34	1.30	1.12	.62	.55	.58	.57	.00	15.87
(2)	.22	.60	.51	.18	.07	.05	.08	.15	.24	.29	.28	.24	.13	.12	.12	.12	.00	3.41
3.1- 4.0	64	124	132	54	18	13	19	87	120	125	127	92	39	35	39	55	0	1143
(6.8-8.9)																		
(1)	.69	1.33	1.42	.58	.19	.14	.20	.93	1.29	1.34	1.36	.99	.42	.38	.42	.59	.00	12.27
(2)	.15	.29	.30	.12	.04	.03	.04	.20	.28	.29	.29	.21	.09	.08	.09	.13	.00	2.64

Table 3.6-9 EBR 10-m (33-ft) 2003-2007 Joint Frequency Distribution Tables
(Page 10 of 16)

4.1- 5.0 (9.0-11.2)	76	91	58	32	11	10	9	63	137	191	173	77	22	19	30	56	0	1055
(1)	.82	.98	.62	.34	.12	.11	.10	.68	1.47	2.05	1.86	.83	.24	.20	.32	.60	.00	11.32
(2)	.18	.21	.13	.07	.03	.02	.02	.15	.32	.44	.40	.18	.05	.04	.07	.13	.00	2.43
5.1- 6.0 (11.3-13.4)	40	55	66	32	7	3	8	53	119	204	222	69	11	16	15	37	0	957
(1)	.43	.59	.71	.34	.08	.03	.09	.57	1.28	2.19	2.38	.74	.12	.17	.16	.40	.00	10.27
(2)	.09	.13	.15	.07	.02	.01	.02	.12	.27	.47	.51	.16	.03	.04	.03	.09	.00	2.21
6.1- 8.0 (13.5-17.9)	69	89	94	14	1	2	2	31	166	387	386	100	7	9	8	33	0	1398
(1)	.74	.96	1.01	.15	.01	.02	.02	.33	1.78	4.15	4.14	1.07	.08	.10	.09	.35	.00	15.00
(2)	.16	.21	.22	.03	.00	.00	.00	.07	.38	.89	.89	.23	.02	.02	.02	.08	.00	3.23
8.1-10.0 (18.0-22.4)	34	39	23	7	1	0	3	4	54	229	211	49	1	3	1	6	0	665
(1)	.36	.42	.25	.08	.01	.00	.03	.04	.58	2.46	2.26	.53	.01	.03	.01	.06	.00	7.14
(2)	.08	.09	.05	.02	.00	.00	.01	.01	.12	.53	.49	.11	.00	.01	.00	.01	.00	1.53
10.1-40.3 (22.5-90.1)	11	7	0	0	0	0	0	2	39	130	170	47	1	1	0	0	0	408
(1)	.12	.08	.00	.00	.00	.00	.00	.02	.42	1.40	1.82	.50	.01	.01	.00	.00	.00	4.38
(2)	.03	.02	.00	.00	.00	.00	.00	.00	.09	.30	.39	.11	.00	.00	.00	.00	.00	.94
ALL SPEEDS	626	952	859	383	152	119	143	401	860	1533	1521	678	225	222	257	387	0	9318
(1)	6.72	10.22	9.22	4.11	1.63	1.28	1.53	4.30	9.23	16.45	16.32	7.28	2.41	2.38	2.76	4.15	.00	100.00
(2)	1.44	2.20	1.98	.88	.35	.27	.33	.93	1.98	3.54	3.51	1.56	.52	.51	.59	.89	.00	21.50

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE
(2)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD
(3)=VARIABLE

Table 3.6-9 EBR 10-m (33-ft) 2003-2007 Joint Frequency Distribution Tables
(Page 11 of 16)

INEL EBR JAN03-DEC07 MET DATA JOINT FREQUENCY DISTRIBUTION (75-METER TOWER)

33.0 FT WIND DATA STABILITY CLASS F CLASS FREQUENCY (PERCENT) = 17.57

WIND DIRECTION FROM

SPEED mps (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL(3)	TOTAL
LT .3 (LT .7)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.3- .4 (.7-.9)	0	0	2	0	1	1	0	1	2	0	0	0	0	0	1	1	0	9
(1)	.00	.00	.03	.00	.01	.01	.00	.01	.03	.00	.00	.00	.00	.00	.01	.01	.00	.12
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.02
.5- 1.0 (1.0-2.2)	40	48	54	66	43	48	39	58	79	56	38	21	21	19	21	30	0	681
(1)	.53	.63	.71	.87	.56	.63	.51	.76	1.04	.74	.50	.28	.28	.25	.28	.39	.00	8.94
(2)	.09	.11	.12	.15	.10	.11	.09	.13	.18	.13	.09	.05	.05	.04	.05	.07	.00	1.57
1.1- 1.5 (2.3-3.4)	72	76	113	104	83	39	56	103	138	101	74	38	30	49	33	48	0	1157
(1)	.95	1.00	1.48	1.37	1.09	.51	.74	1.35	1.81	1.33	.97	.50	.39	.64	.43	.63	.00	15.20
(2)	.17	.18	.26	.24	.19	.09	.13	.24	.32	.23	.17	.09	.07	.11	.08	.11	.00	2.67
1.6- 2.0 (3.5-4.5)	56	92	148	121	65	46	43	78	145	120	66	40	31	33	28	46	0	1158
(1)	.74	1.21	1.94	1.59	.85	.60	.56	1.02	1.90	1.58	.87	.53	.41	.43	.37	.60	.00	15.21
(2)	.13	.21	.34	.28	.15	.11	.10	.18	.33	.28	.15	.09	.07	.08	.06	.11	.00	2.67
2.1- 3.0 (4.6-6.7)	79	145	233	219	88	34	36	144	196	151	94	59	42	28	29	73	0	1650
(1)	1.04	1.90	3.06	2.88	1.16	.45	.47	1.89	2.57	1.98	1.23	.77	.55	.37	.38	.96	.00	21.67
(2)	.18	.33	.54	.51	.20	.08	.08	.33	.45	.35	.22	.14	.10	.06	.07	.17	.00	3.81
3.1- 4.0 (6.8-8.9)	54	97	129	143	45	23	36	172	142	145	123	50	21	10	23	35	0	1248
(1)	.71	1.27	1.69	1.88	.59	.30	.47	2.26	1.86	1.90	1.62	.66	.28	.13	.30	.46	.00	16.39
(2)	.12	.22	.30	.33	.10	.05	.08	.40	.33	.33	.28	.12	.05	.02	.05	.08	.00	2.88

Table 3.6-9 EBR 10-m (33-ft) 2003-2007 Joint Frequency Distribution Tables
(Page 12 of 16)

4.1- 5.0 (9.0-11.2)	46	74	73	69	21	8	16	128	105	162	116	28	4	4	8	20	0	882
(1)	.60	.97	.96	.91	.28	.11	.21	1.68	1.38	2.13	1.52	.37	.05	.05	.11	.26	.00	11.58
(2)	.11	.17	.17	.16	.05	.02	.04	.30	.24	.37	.27	.06	.01	.01	.02	.05	.00	2.03
5.1- 6.0 (11.3-13.4)	11	26	45	21	7	7	5	48	79	118	92	10	3	0	4	2	0	478
(1)	.14	.34	.59	.28	.09	.09	.07	.63	1.04	1.55	1.21	.13	.04	.00	.05	.03	.00	6.28
(2)	.03	.06	.10	.05	.02	.02	.01	.11	.18	.27	.21	.02	.01	.00	.01	.00	.00	1.10
6.1- 8.0 (13.5-17.9)	1	17	23	8	0	3	1	20	41	115	49	5	0	1	0	2	0	286
(1)	.01	.22	.30	.11	.00	.04	.01	.26	.54	1.51	.64	.07	.00	.01	.00	.03	.00	3.76
(2)	.00	.04	.05	.02	.00	.01	.00	.05	.09	.27	.11	.01	.00	.00	.00	.00	.00	.66
8.1-10.0 (18.0-22.4)	0	0	1	0	0	0	0	0	3	28	15	1	0	0	0	0	0	48
(1)	.00	.00	.01	.00	.00	.00	.00	.00	.04	.37	.20	.01	.00	.00	.00	.00	.00	.63
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.01	.06	.03	.00	.00	.00	.00	.00	.00	.11
10.1-40.3 (22.5-90.1)	0	0	0	0	0	0	0	0	5	7	5	0	0	0	0	0	0	17
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.07	.09	.07	.00	.00	.00	.00	.00	.00	.22
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.01	.02	.01	.00	.00	.00	.00	.00	.00	.04
ALL SPEEDS	359	575	821	751	353	209	232	752	935	1003	672	252	152	144	147	257	0	7614
(1)	4.71	7.55	10.78	9.86	4.64	2.74	3.05	9.88	12.28	13.17	8.83	3.31	2.00	1.89	1.93	3.38	.00	100.00
(2)	.83	1.33	1.89	1.73	.81	.48	.54	1.73	2.16	2.31	1.55	.58	.35	.33	.34	.59	.00	17.57

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE
(2)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD
(3)=VARIABLE

Table 3.6-9 EBR 10-m (33-ft) 2003-2007 Joint Frequency Distribution Tables
(Page 13 of 16)

INEL EBR JAN03-DEC07 MET DATA JOINT FREQUENCY DISTRIBUTION (75-METER TOWER)

33.0 FT WIND DATA STABILITY CLASS G CLASS FREQUENCY (PERCENT) = 18.76

WIND DIRECTION FROM

SPEED mps (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL(3)	TOTAL
LT .3 (LT .7)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.3- .4 (.7-.9)	1	2	4	1	0	2	2	0	2	0	0	0	1	1	2	0	0	18
(1)	.01	.02	.05	.01	.00	.02	.02	.00	.02	.00	.00	.00	.01	.01	.02	.00	.00	.22
(2)	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.04
.5- 1.0 (1.0-2.2)	27	43	59	96	112	65	63	74	83	46	25	23	10	13	12	26	0	777
(1)	.33	.53	.73	1.18	1.38	.80	.77	.91	1.02	.57	.31	.28	.12	.16	.15	.32	.00	9.56
(2)	.06	.10	.14	.22	.26	.15	.15	.17	.19	.11	.06	.05	.02	.03	.03	.06	.00	1.79
1.1- 1.5 (2.3-3.4)	50	79	124	176	161	76	60	113	142	88	53	39	23	14	21	26	0	1245
(1)	.61	.97	1.53	2.16	1.98	.93	.74	1.39	1.75	1.08	.65	.48	.28	.17	.26	.32	.00	15.31
(2)	.12	.18	.29	.41	.37	.18	.14	.26	.33	.20	.12	.09	.05	.03	.05	.06	.00	2.87
1.6- 2.0 (3.5-4.5)	44	73	148	206	119	45	35	89	152	121	62	27	8	10	15	22	0	1176
(1)	.54	.90	1.82	2.53	1.46	.55	.43	1.09	1.87	1.49	.76	.33	.10	.12	.18	.27	.00	14.46
(2)	.10	.17	.34	.48	.27	.10	.08	.21	.35	.28	.14	.06	.02	.02	.03	.05	.00	2.71
2.1- 3.0 (4.6-6.7)	39	91	274	346	153	36	35	150	286	247	123	41	10	7	6	18	0	1862
(1)	.48	1.12	3.37	4.26	1.88	.44	.43	1.84	3.52	3.04	1.51	.50	.12	.09	.07	.22	.00	22.90
(2)	.09	.21	.63	.80	.35	.08	.08	.35	.66	.57	.28	.09	.02	.02	.01	.04	.00	4.30
3.1- 4.0 (6.8-8.9)	16	41	115	244	90	17	57	234	303	183	90	11	2	2	3	3	0	1411
(1)	.20	.50	1.41	3.00	1.11	.21	.70	2.88	3.73	2.25	1.11	.14	.02	.02	.04	.04	.00	17.35
(2)	.04	.09	.27	.56	.21	.04	.13	.54	.70	.42	.21	.03	.00	.00	.01	.01	.00	3.26

Table 3.6-9 EBR 10-m (33-ft) 2003-2007 Joint Frequency Distribution Tables
(Page 14 of 16)

4.1- 5.0 (9.0-11.2)	3	7	50	124	79	20	41	479	128	147	84	14	0	0	1	0	0	1177
(1)	.04	.09	.61	1.53	.97	.25	.50	5.89	1.57	1.81	1.03	.17	.00	.00	.01	.00	.00	14.48
(2)	.01	.02	.12	.29	.18	.05	.09	1.11	.30	.34	.19	.03	.00	.00	.00	.00	.00	2.72
5.1- 6.0 (11.3-13.4)	0	4	16	29	9	3	12	197	40	46	35	1	0	0	0	0	0	392
(1)	.00	.05	.20	.36	.11	.04	.15	2.42	.49	.57	.43	.01	.00	.00	.00	.00	.00	4.82
(2)	.00	.01	.04	.07	.02	.01	.03	.45	.09	.11	.08	.00	.00	.00	.00	.00	.00	.90
6.1- 8.0 (13.5-17.9)	0	0	8	6	1	0	0	21	2	14	10	2	0	0	0	0	0	64
(1)	.00	.00	.10	.07	.01	.00	.00	.26	.02	.17	.12	.02	.00	.00	.00	.00	.00	.79
(2)	.00	.00	.02	.01	.00	.00	.00	.05	.00	.03	.02	.00	.00	.00	.00	.00	.00	.15
8.1-10.0 (18.0-22.4)	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	6
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.07	.00	.00	.00	.00	.00	.00	.00	.07
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.01
10.1-40.3 (22.5-90.1)	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	3
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.02	.01	.00	.00	.00	.00	.00	.00	.04
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01
ALL SPEEDS	180	340	798	1228	724	264	305	1357	1138	900	483	158	54	47	60	95	0	8131
(1)	2.21	4.18	9.81	15.10	8.90	3.25	3.75	16.69	14.00	11.07	5.94	1.94	.66	.58	.74	1.17	.00	100.00
(2)	.42	.78	1.84	2.83	1.67	.61	.70	3.13	2.63	2.08	1.11	.36	.12	.11	.14	.22	.00	18.76

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE
(2)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD
(3)=VARIABLE

Table 3.6-9 EBR 10-m (33-ft) 2003-2007 Joint Frequency Distribution Tables
(Page 15 of 16)

INEL EBR JAN03-DEC07 MET DATA JOINT FREQUENCY DISTRIBUTION (75-METER TOWER)

33.0 FT WIND DATA STABILITY CLASS ALL CLASS FREQUENCY (PERCENT) = 100.00

WIND DIRECTION FROM

SPEED mps (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL(3)	TOTAL
LT .3 (LT .7)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.3- .4 (.7-.9)	3	2	8	1	1	3	3	2	5	2	2	1	2	3	3	3	0	44
(1)	.01	.00	.02	.00	.00	.01	.01	.00	.01	.00	.00	.00	.00	.01	.01	.01	.00	.10
(2)	.01	.00	.02	.00	.00	.01	.01	.00	.01	.00	.00	.00	.00	.01	.01	.01	.00	.10
.5- 1.0 (1.0-2.2)	130	157	169	210	189	142	130	164	184	141	103	81	61	76	75	117	0	2129
(1)	.30	.36	.39	.48	.44	.33	.30	.38	.42	.33	.24	.19	.14	.18	.17	.27	.00	4.91
(2)	.30	.36	.39	.48	.44	.33	.30	.38	.42	.33	.24	.19	.14	.18	.17	.27	.00	4.91
1.1- 1.5 (2.3-3.4)	305	340	392	377	310	164	153	262	342	266	198	184	146	169	214	238	0	4060
(1)	.70	.78	.90	.87	.72	.38	.35	.60	.79	.61	.46	.42	.34	.39	.49	.55	.00	9.37
(2)	.70	.78	.90	.87	.72	.38	.35	.60	.79	.61	.46	.42	.34	.39	.49	.55	.00	9.37
1.6- 2.0 (3.5-4.5)	379	536	556	441	235	126	121	231	384	358	257	227	155	189	206	277	0	4678
(1)	.87	1.24	1.28	1.02	.54	.29	.28	.53	.89	.83	.59	.52	.36	.44	.48	.64	.00	10.79
(2)	.87	1.24	1.28	1.02	.54	.29	.28	.53	.89	.83	.59	.52	.36	.44	.48	.64	.00	10.79
2.1- 3.0 (4.6-6.7)	461	1049	1112	788	355	142	163	462	721	737	602	473	297	188	196	292	0	8038
(1)	1.06	2.42	2.57	1.82	.82	.33	.38	1.07	1.66	1.70	1.39	1.09	.69	.43	.45	.67	.00	18.54
(2)	1.06	2.42	2.57	1.82	.82	.33	.38	1.07	1.66	1.70	1.39	1.09	.69	.43	.45	.67	.00	18.54
3.1- 4.0 (6.8-8.9)	230	601	705	539	198	84	147	606	738	762	669	370	183	118	131	140	0	6221
(1)	.53	1.39	1.63	1.24	.46	.19	.34	1.40	1.70	1.76	1.54	.85	.42	.27	.30	.32	.00	14.35
(2)	.53	1.39	1.63	1.24	.46	.19	.34	1.40	1.70	1.76	1.54	.85	.42	.27	.30	.32	.00	14.35

Table 3.6-9 EBR 10-m (33-ft) 2003-2007 Joint Frequency Distribution Tables
(Page 16 of 16)

4.1- 5.0 (9.0-11.2)	191	370	411	283	128	55	80	745	545	846	789	322	89	72	89	117	0	5132
(1)	.44	.85	.95	.65	.30	.13	.18	1.72	1.26	1.95	1.82	.74	.21	.17	.21	.27	.00	11.84
(2)	.44	.85	.95	.65	.30	.13	.18	1.72	1.26	1.95	1.82	.74	.21	.17	.21	.27	.00	11.84
5.1- 6.0 (11.3-13.4)	100	186	295	120	39	17	33	365	450	813	740	232	52	50	53	75	0	3620
(1)	.23	.43	.68	.28	.09	.04	.08	.84	1.04	1.88	1.71	.54	.12	.12	.12	.17	.00	8.35
(2)	.23	.43	.68	.28	.09	.04	.08	.84	1.04	1.88	1.71	.54	.12	.12	.12	.17	.00	8.35
6.1- 8.0 (13.5-17.9)	144	246	290	60	13	9	9	132	494	1176	1322	444	51	51	49	96	0	4586
(1)	.33	.57	.67	.14	.03	.02	.02	.30	1.14	2.71	3.05	1.02	.12	.12	.11	.22	.00	10.58
(2)	.33	.57	.67	.14	.03	.02	.02	.30	1.14	2.71	3.05	1.02	.12	.12	.11	.22	.00	10.58
8.1-10.0 (18.0-22.4)	107	135	85	18	7	3	3	19	221	698	1220	382	14	17	12	19	0	2960
(1)	.25	.31	.20	.04	.02	.01	.01	.04	.51	1.61	2.81	.88	.03	.04	.03	.04	.00	6.83
(2)	.25	.31	.20	.04	.02	.01	.01	.04	.51	1.61	2.81	.88	.03	.04	.03	.04	.00	6.83
10.1-40.3 (22.5-90.1)	57	105	17	5	1	0	0	4	100	295	899	376	12	1	2	4	0	1878
(1)	.13	.24	.04	.01	.00	.00	.00	.01	.23	.68	2.07	.87	.03	.00	.00	.01	.00	4.33
(2)	.13	.24	.04	.01	.00	.00	.00	.01	.23	.68	2.07	.87	.03	.00	.00	.01	.00	4.33
ALL SPEEDS	2107	3727	4040	2842	1476	745	842	2992	4184	6094	6801	3092	1062	934	1030	1378	0	43346
(1)	4.86	8.60	9.32	6.56	3.41	1.72	1.94	6.90	9.65	14.06	15.69	7.13	2.45	2.15	2.38	3.18	.00	100.00
(2)	4.86	8.60	9.32	6.56	3.41	1.72	1.94	6.90	9.65	14.06	15.69	7.13	2.45	2.15	2.38	3.18	.00	100.00

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE
(2)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD
(3)=VARIABLE

Table 3.6-10 MFC/EBR Temperature Inversion Persistence Summary for 2003

(Page 1 of 1)

DURATION (HOURS)	NUMBER OF OBSERVATIONS	PERCENT PROBABILITY
1	57	12.67
2	24	18.00
3	17	21.78
4	17	25.56
5	14	28.67
6	12	31.33
7	12	34.00
8	10	36.22
9	11	38.67
10	31	45.56
11	44	55.33
12	55	67.56
13	36	75.56
14	33	82.89
15	20	87.33
16	28	93.56
17	16	97.11
18	6	98.44
19	4	99.33
20	3	100.00

THE LONGEST INVERSION LASTED 20 HOURS

OF THE LONGEST INVERSIONS
NUMBER 1 STARTED 15 HOURS INTO DAY 3
NUMBER 2 STARTED 17 HOURS INTO DAY 353
NUMBER 3 STARTED 17 HOURS INTO DAY 354

THIRD COLUMN DEFINES THE PERCENT PROBABILITY
THAT IF AN INVERSION OCCURS, ITS DURATION
WILL BE LESS THAN THE NUMBER OF HOURS SPECIFIED

Table 3.6-11 MFC/EBR Temperature Inversion Persistence Summary for 2004
(Page 1 of 3)

DURATION (HOURS)	NUMBER OF OBSERVATIONS	PERCENT PROBABILITY
1	60	12.85
2	33	19.91
3	28	25.91
4	18	29.76
5	13	32.55
6	12	35.12
7	13	37.90
8	17	41.54
9	11	43.90
10	27	49.68
11	31	56.32
12	51	67.24
13	29	73.45
14	33	80.51
15	19	84.58
16	28	90.58
17	17	94.22
18	6	95.50
19	7	97.00
20	4	97.86
21	2	98.29
22	1	98.50
23	1	98.72
24	1	98.93
25	0	98.93
26	0	98.93
27	0	98.93
28	0	98.93
29	0	98.93
30	0	98.93
31	0	98.93

Table 3.6-11 MFC/EBR Temperature Inversion Persistence Summary for 2004
(Page 2 of 3)

DURATION (HOURS)	NUMBER OF OBSERVATIONS	PERCENT PROBABILITY
32	0	98.93
33	0	98.93
34	0	98.93
35	0	98.93
36	0	98.93
37	0	98.93
38	0	98.93
39	1	99.14
40	0	99.14
41	0	99.14
42	0	99.14
43	0	99.14
44	1	99.36
45	0	99.36
46	0	99.36
47	0	99.36
48	1	99.57
49	0	99.57
50	0	99.57
51	0	99.57
52	0	99.57
53	0	99.57
54	0	99.57
55	0	99.57
56	0	99.57
57	0	99.57
58	0	99.57
59	0	99.57
60	0	99.57
61	0	99.57
62	0	99.57
63	1	99.79

Table 3.6-11 MFC/EBR Temperature Inversion Persistence Summary for 2004
(Page 3 of 3)

DURATION (HOURS)	NUMBER OF OBSERVATIONS	PERCENT PROBABILITY
64	0	99.79
65	0	99.79
66	0	99.79
67	0	99.79
68	0	99.79
69	0	99.79
70	1	100.00

THE LONGEST INVERSION LASTED 70 HOURS

OF THE LONGEST INVERSIONS
NUMBER 1 STARTED 15 HOURS INTO DAY 13

THIRD COLUMN DEFINES THE PERCENT PROBABILITY
THAT IF AN INVERSION OCCURS, ITS DURATION
WILL BE LESS THAN THE NUMBER OF HOURS SPECIFIED

Table 3.6-12 MFC/EBR Temperature Inversion Persistence Summary for 2005
(Page 1 of 5)

DURATION (HOURS)	NUMBER OF OBSERVATIONS	PERCENT PROBABILITY
1	56	12.96
2	33	20.60
3	20	25.23
4	15	28.70
5	15	32.18
6	11	34.72
7	8	36.57
8	12	39.35
9	9	41.44
10	15	44.91
11	46	55.56
12	50	67.13
13	29	73.84
14	23	79.17
15	10	81.48
16	26	87.50
17	17	91.44
18	12	94.21
19	7	95.83
20	4	96.76
21	4	97.69
22	1	97.92
23	0	97.92
24	1	98.15
25	0	98.15
26	1	98.38
27	0	98.38
28	0	98.38
29	0	98.38
30	0	98.38
31	0	98.38

Table 3.6-12 MFC/EBR Temperature Inversion Persistence Summary for 2005
(Page 2 of 5)

DURATION (HOURS)	NUMBER OF OBSERVATIONS	PERCENT PROBABILITY
32	0	98.38
33	0	98.38
34	1	98.61
35	1	98.84
36	0	98.84
37	0	98.84
38	0	98.84
39	1	99.07
40	0	99.07
41	0	99.07
42	1	99.31
43	0	99.31
44	0	99.31
45	0	99.31
46	0	99.31
47	0	99.31
48	0	99.31
49	0	99.31
50	0	99.31
51	0	99.31
52	0	99.31
53	0	99.31
54	0	99.31
55	0	99.31
56	0	99.31
57	0	99.31
58	0	99.31
59	0	99.31
60	0	99.31
61	0	99.31

Table 3.6-12 MFC/EBR Temperature Inversion Persistence Summary for 2005
(Page 3 of 5)

DURATION (HOURS)	NUMBER OF OBSERVATIONS	PERCENT PROBABILITY
62	0	99.31
63	0	99.31
64	0	99.31
65	0	99.31
66	0	99.31
67	1	99.54
68	0	99.54
69	0	99.54
70	0	99.54
71	0	99.54
72	0	99.54
73	0	99.54
74	1	99.77
75	0	99.77
76	0	99.77
77	0	99.77
78	0	99.77
79	0	99.77
80	0	99.77
81	0	99.77
82	0	99.77
83	0	99.77
84	0	99.77
85	0	99.77
86	0	99.77
87	0	99.77
88	0	99.77
89	0	99.77
90	0	99.77
91	0	99.77

Table 3.6-12 MFC/EBR Temperature Inversion Persistence Summary for 2005
(Page 4 of 5)

DURATION (HOURS)	NUMBER OF OBSERVATIONS	PERCENT PROBABILITY
92	0	99.77
93	0	99.77
94	0	99.77
95	0	99.77
96	0	99.77
97	0	99.77
98	0	99.77
99	0	99.77
100	0	99.77
101	0	99.77
102	0	99.77
103	0	99.77
104	0	99.77
105	0	99.77
106	0	99.77
107	0	99.77
108	0	99.77
109	0	99.77
110	0	99.77
111	0	99.77
112	0	99.77
113	0	99.77
114	0	99.77
115	0	99.77
116	0	99.77
117	0	99.77
118	0	99.77
119	0	99.77
120	0	99.77
121	0	99.77

Table 3.6-12 MFC/EBR Temperature Inversion Persistence Summary for 2005
(Page 5 of 5)

DURATION (HOURS)	NUMBER OF OBSERVATIONS	PERCENT PROBABILITY
122	0	99.77
123	0	99.77
124	0	99.77
125	0	99.77
126	0	99.77
127	0	99.77
128	0	99.77
129	0	99.77
130	0	99.77
131	0	99.77
132	0	99.77
133	0	99.77
134	0	99.77
135	0	99.77
136	0	99.77
137	0	99.77
138	0	99.77
139	1	100.00

THE LONGEST INVERSION LASTED 139 HOURS

OF THE LONGEST INVERSIONS
NUMBER 1 STARTED 6 HOURS INTO DAY 22

THIRD COLUMN DEFINES THE PERCENT PROBABILITY
THAT IF AN INVERSION OCCURS, ITS DURATION
WILL BE LESS THAN THE NUMBER OF HOURS SPECIFIED

Table 3.6-13 MFC/EBR Temperature Inversion Persistence Summary for 2006
(Page 1 of 2)

DURATION (HOURS)	NUMBER OF OBSERVATIONS	PERCENT PROBABILITY
1	51	11.33
2	35	19.11
3	26	24.89
4	14	28.00
5	17	31.78
6	12	34.44
7	12	37.11
8	10	39.33
9	14	42.44
10	21	47.11
11	38	55.56
12	62	69.33
13	27	75.33
14	26	81.11
15	17	84.89
16	19	89.11
17	22	94.00
18	5	95.11
19	6	96.44
20	5	97.56
21	1	97.78
22	2	98.22
23	2	98.67
24	0	98.67
25	2	99.11
26	0	99.11
27	0	99.11
28	0	99.11
29	1	99.33
30	0	99.33
31	0	99.33

Table 3.6-13 MFC/EBR Temperature Inversion Persistence Summary for 2006
(Page 2 of 2)

DURATION (HOURS)	NUMBER OF OBSERVATIONS	PERCENT PROBABILITY
32	0	99.33
33	0	99.33
34	0	99.33
35	0	99.33
36	0	99.33
37	0	99.33
38	0	99.33
39	0	99.33
40	0	99.33
41	0	99.33
42	1	99.56
43	0	99.56
44	0	99.56
45	0	99.56
46	0	99.56
47	0	99.56
48	1	99.78
49	0	99.78
50	1	100.00

THE LONGEST INVERSION LASTED 50 HOURS

OF THE LONGEST INVERSIONS
NUMBER 1 STARTED 16 HOURS INTO DAY 5

THIRD COLUMN DEFINES THE PERCENT PROBABILITY
THAT IF AN INVERSION OCCURS, ITS DURATION
WILL BE LESS THAN THE NUMBER OF HOURS SPECIFIED

Table 3.6-14 MFC/EBR Temperature Inversion Persistence Summary for 2007
(Page 1 of 1)

DURATION (HOURS)	NUMBER OF OBSERVATIONS	PERCENT PROBABILITY
1	63	14.19
2	31	21.17
3	18	25.23
4	11	27.70
5	8	29.50
6	9	31.53
7	14	34.68
8	9	36.71
9	13	39.64
10	34	47.30
11	40	56.31
12	59	69.59
13	25	75.23
14	25	80.86
15	22	85.81
16	34	93.47
17	18	97.52
18	6	98.87
19	4	99.77
20	1	100.00

THE LONGEST INVERSION LASTED 20 HOURS

OF THE LONGEST INVERSIONS
NUMBER 1 STARTED 17 HOURS INTO DAY 360

THIRD COLUMN DEFINES THE PERCENT PROBABILITY
THAT IF AN INVERSION OCCURS, ITS DURATION
WILL BE LESS THAN THE NUMBER OF HOURS SPECIFIED

Table 3.6-15 Ambient Air Quality Standards for Criteria Pollutants
(Page 1 of 1)

Pollutant	Standard	Level
Ozone	The 3-year average of the 4th highest daily maximum 8-hour average concentration cannot exceed the level measured at each monitor within an area over each year.	0.075 ppm
Particulate Matter (10 micrometers)	The 24-hour average cannot exceed the level more than once per year on average over three years.	150 $\mu g/m^3$
Particulate Matter (2.5 micrometers)	The 3-year annual average of the weighted annual mean concentration cannot exceed the level.	15.0 $\mu g/m^3$
	The 3-year average of the 98th percentile (based on the number of samples taken) of the daily concentrations must not exceed the level.	35 $\mu g/m^3$
Carbon Monoxide	The 1-hour average cannot exceed the level more than once per year.	35 ppm
	The 8-hour average cannot exceed the level more than once per year.	9 ppm
Sulfur Dioxide	Annual arithmetic mean of 1-hour averages cannot exceed the level.	0.03 ppm
	The 24-hour average cannot exceed the level more than once per year.	0.14 ppm
	The 3-hour average cannot exceed the level more than once per year.	0.5 ppm
Lead	The quarterly average (by calendar) cannot exceed the level.	1.5 $\mu g/m^3$
Nitrogen Dioxide	The annual mean of 1-hour averages cannot exceed the level.	0.053 ppm

Note: Daily concentration is the 24-hour average, measured from midnight to midnight.

Source: IDEQ, 2006

Table 3.6-16 Facility Criteria Air Pollutant Emissions in the Four-County Region Surrounding the Eagle Rock Enrichment Facility Site

(Page 1 of 1)

	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC
Tons per Year	431	624	641	417	38.3	35.7
Kilograms per Year	390,997	566,083	581,505	378,296	34,745	32,386

FIGURES

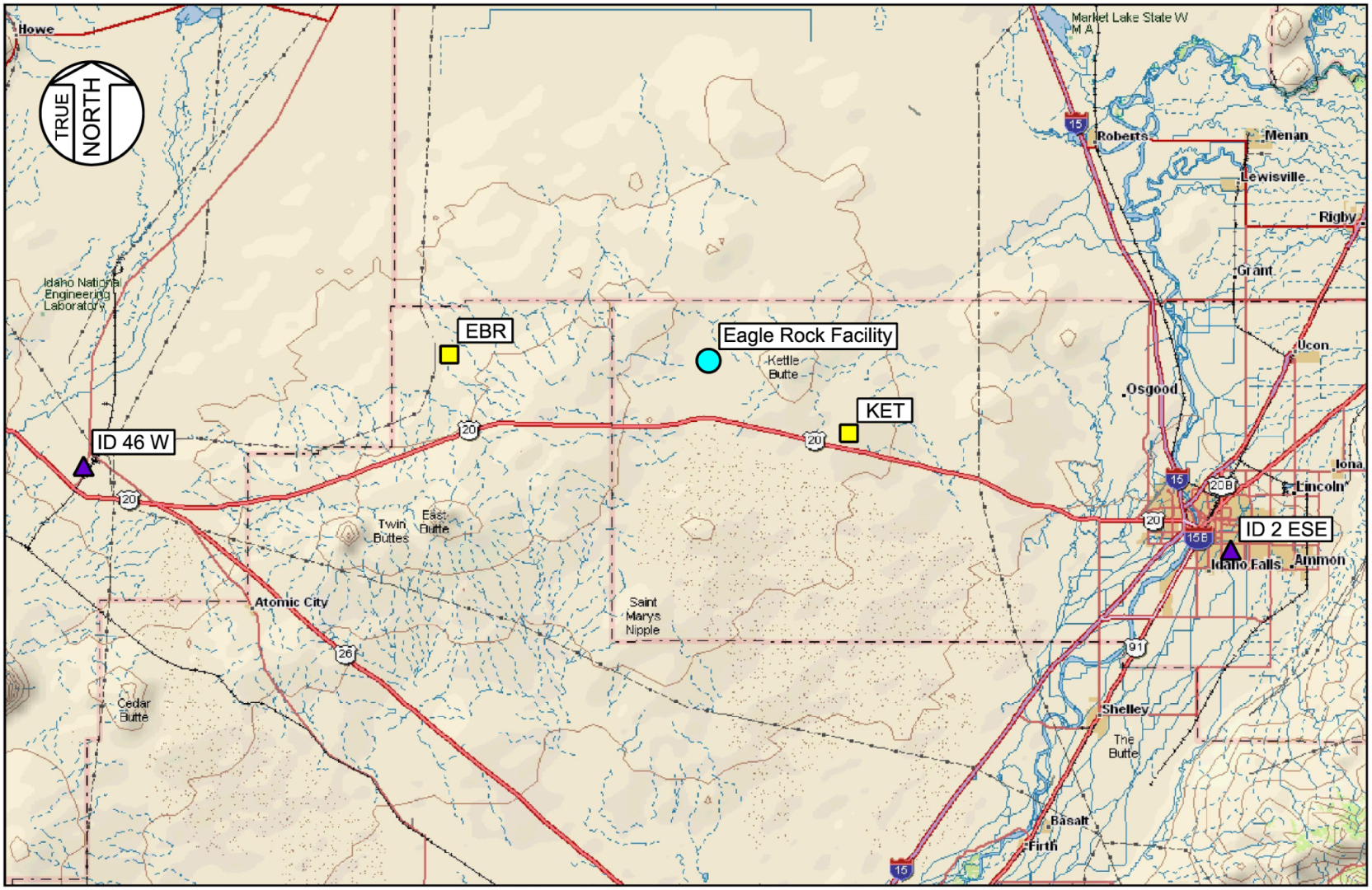


FIGURE 3.6-1 **Rev. 0**

Location of Eagle Rock Enrichment Facility and Nearby Meterological Monitoring Stations

EAGLE ROCK ENRICHMENT FACILITY ENVIRONMENTAL REPORT

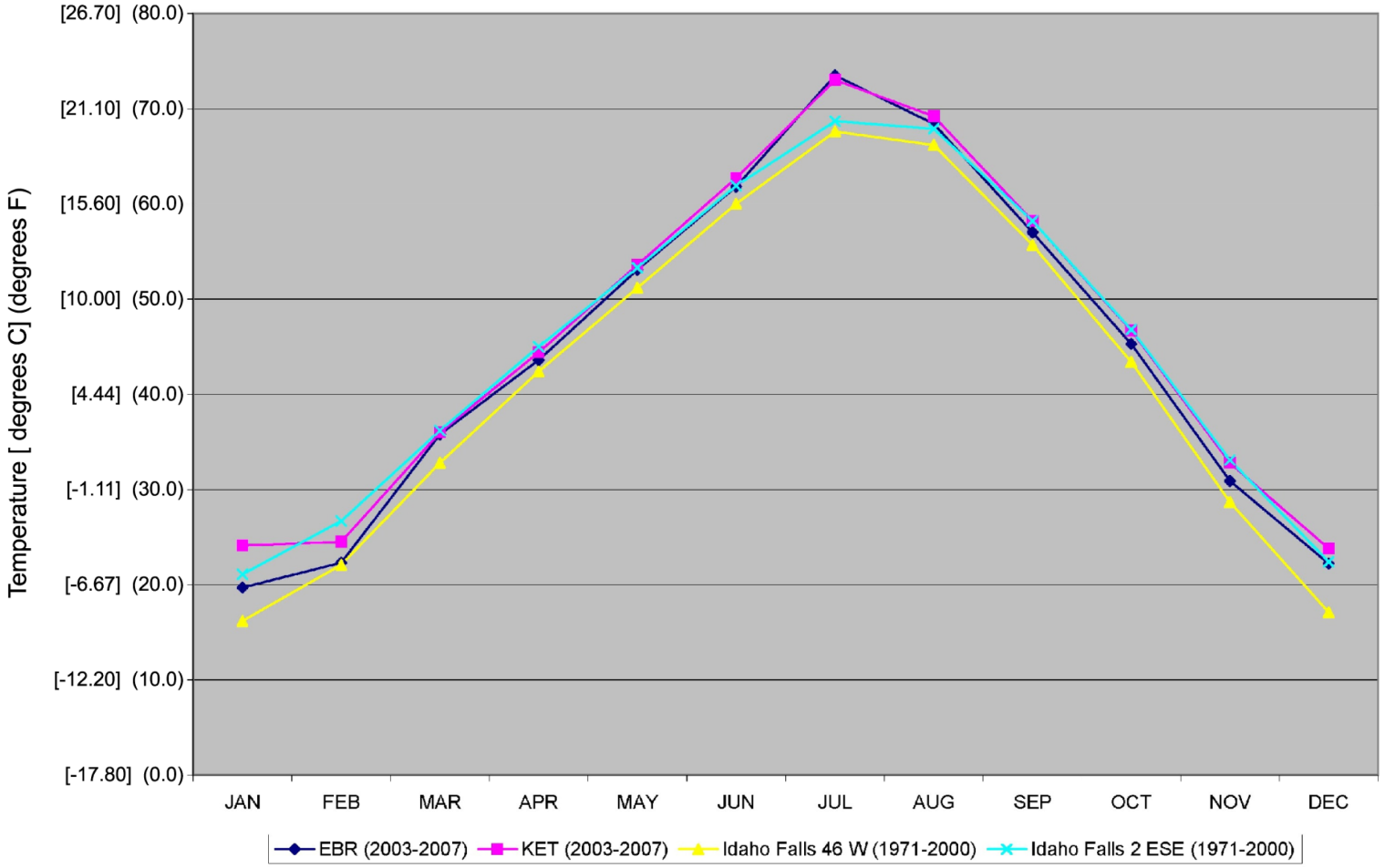


FIGURE 3.6-2 **Rev. 0**

Comparison of Monthly Mean Temperature in the Vicinity of Eagle Rock Enrichment Facility Site

EAGLE ROCK ENRICHMENT FACILITY ENVIRONMENTAL REPORT

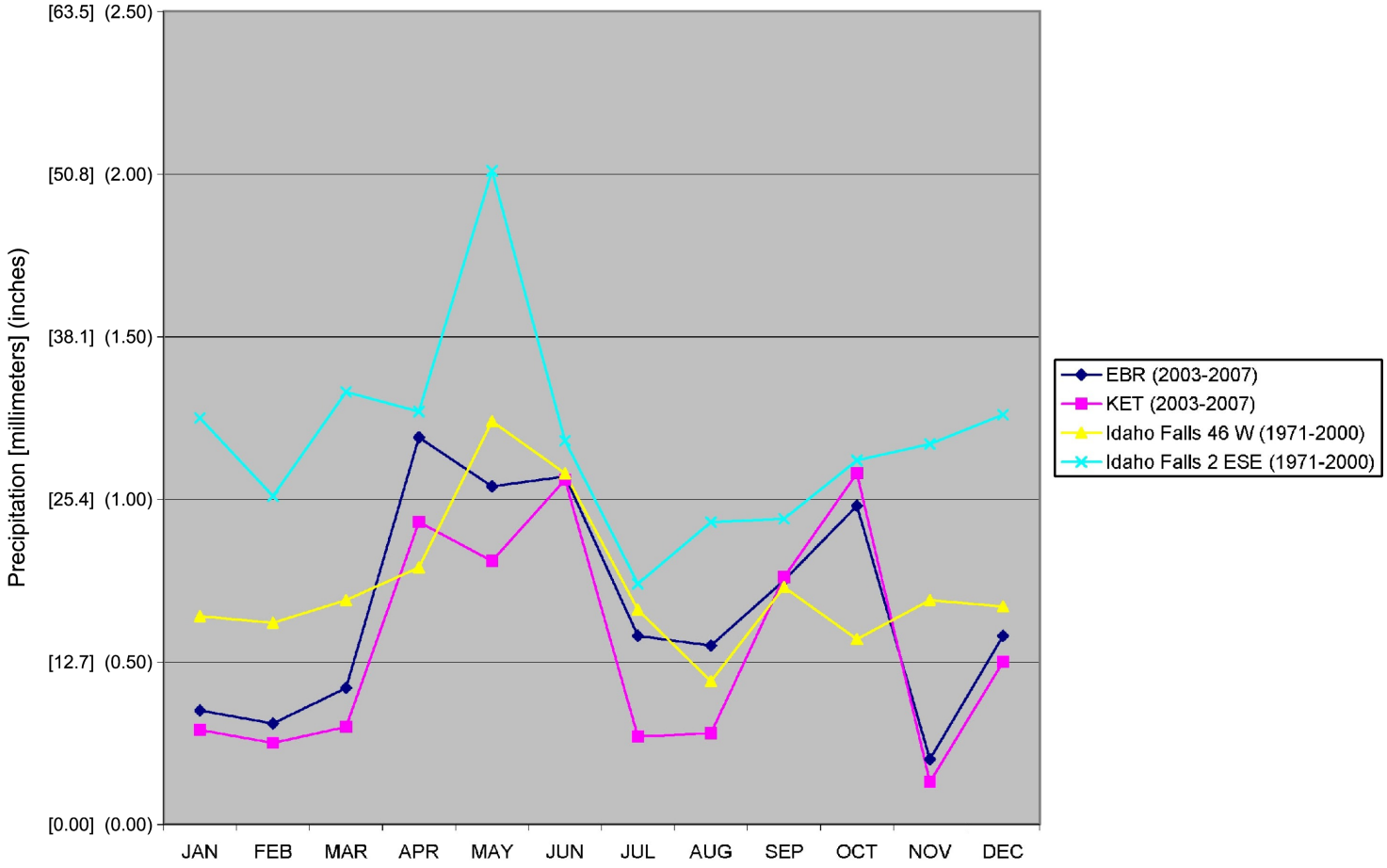


FIGURE 3.6-3 **Rev. 0**

Comparison of the Monthly Mean Precipitation in the Vicinity of Eagle Rock Enrichment Facility Site

EAGLE ROCK ENRICHMENT FACILITY ENVIRONMENTAL REPORT

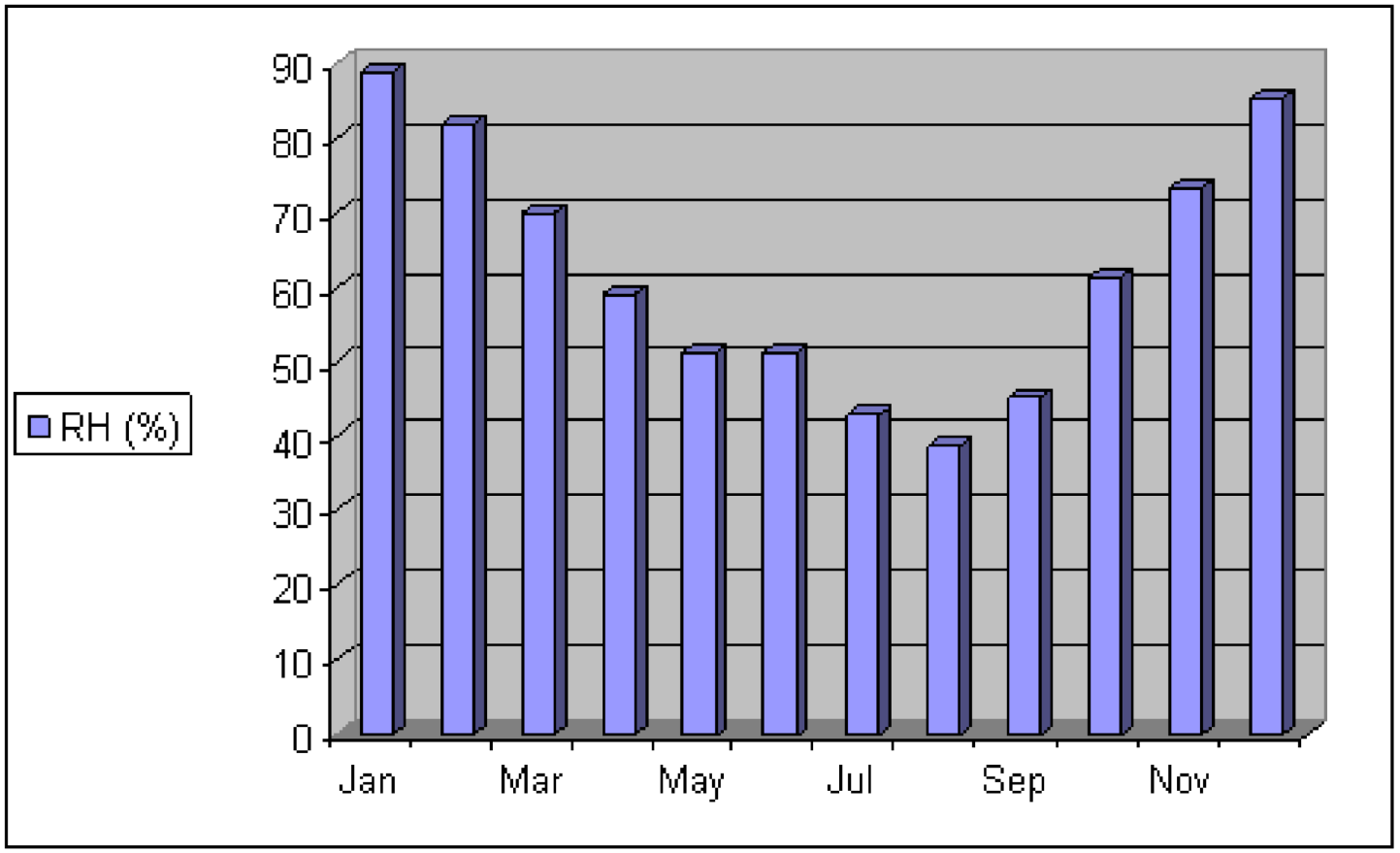


FIGURE 3.6-4 **Rev. 0**

INL Monthly Mean Relative Humidity (%) at KET (2003-2007)

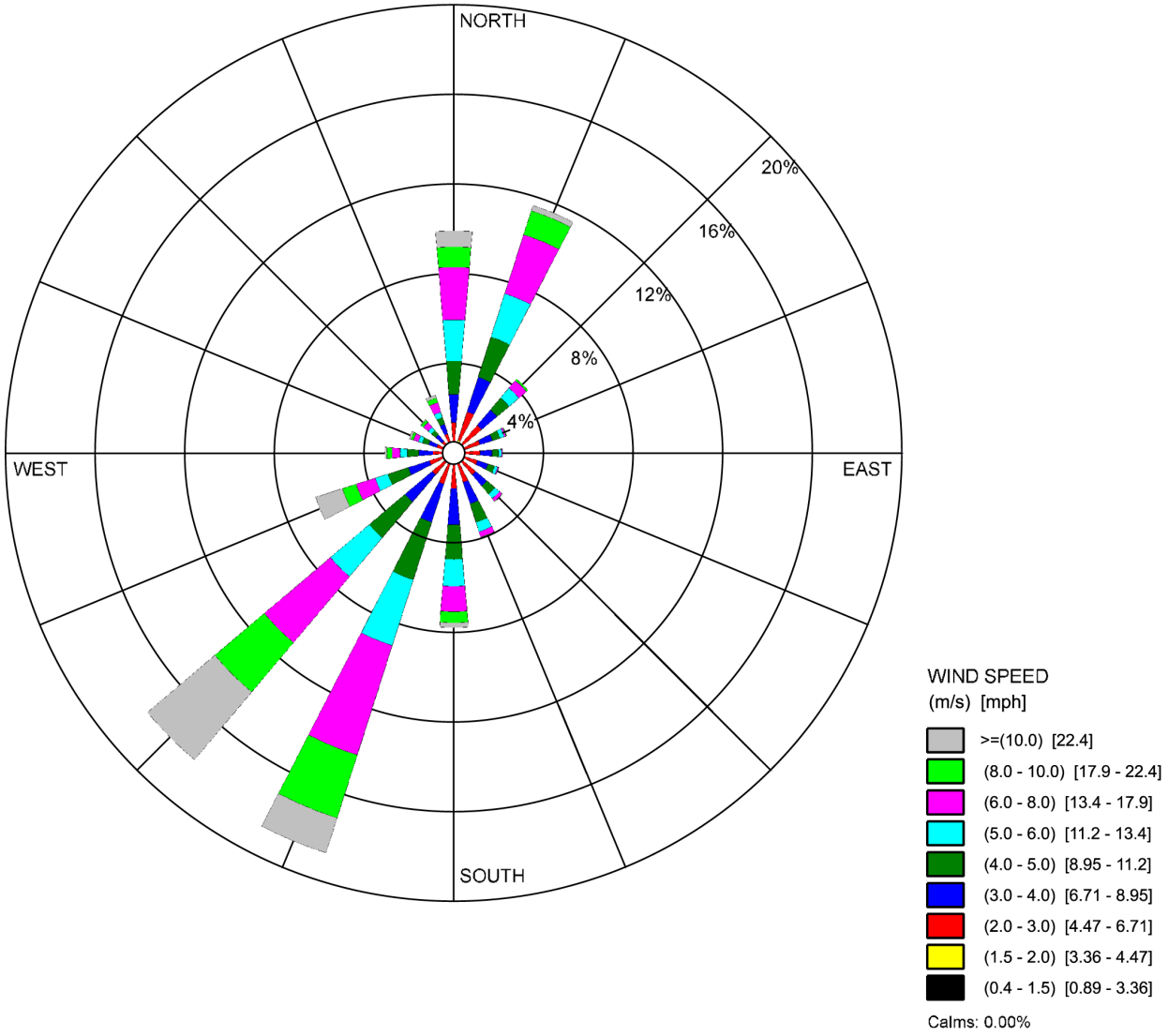
EAGLE ROCK ENRICHMENT FACILITY ENVIRONMENTAL REPORT

WIND ROSE PLOT:

Station #KetBt

DISPLAY:

Wind Speed Direction
(blowing from)



DATA PERIOD:

2003, 2004, 2005, 2006, 2007
Jan 1 - Dec 31 (00:00-23:00)

CALM WINDS: 0.00 %	AVG. WIND SPEED: (5.45 m/s) [12.2 mph]
TOTAL COUNT: 43211 hrs	DATE: 7/17/2008

FIGURE 3.6-5 **Rev. 0**

KET Wind Rose (15 Meters / 49.2 Feet)

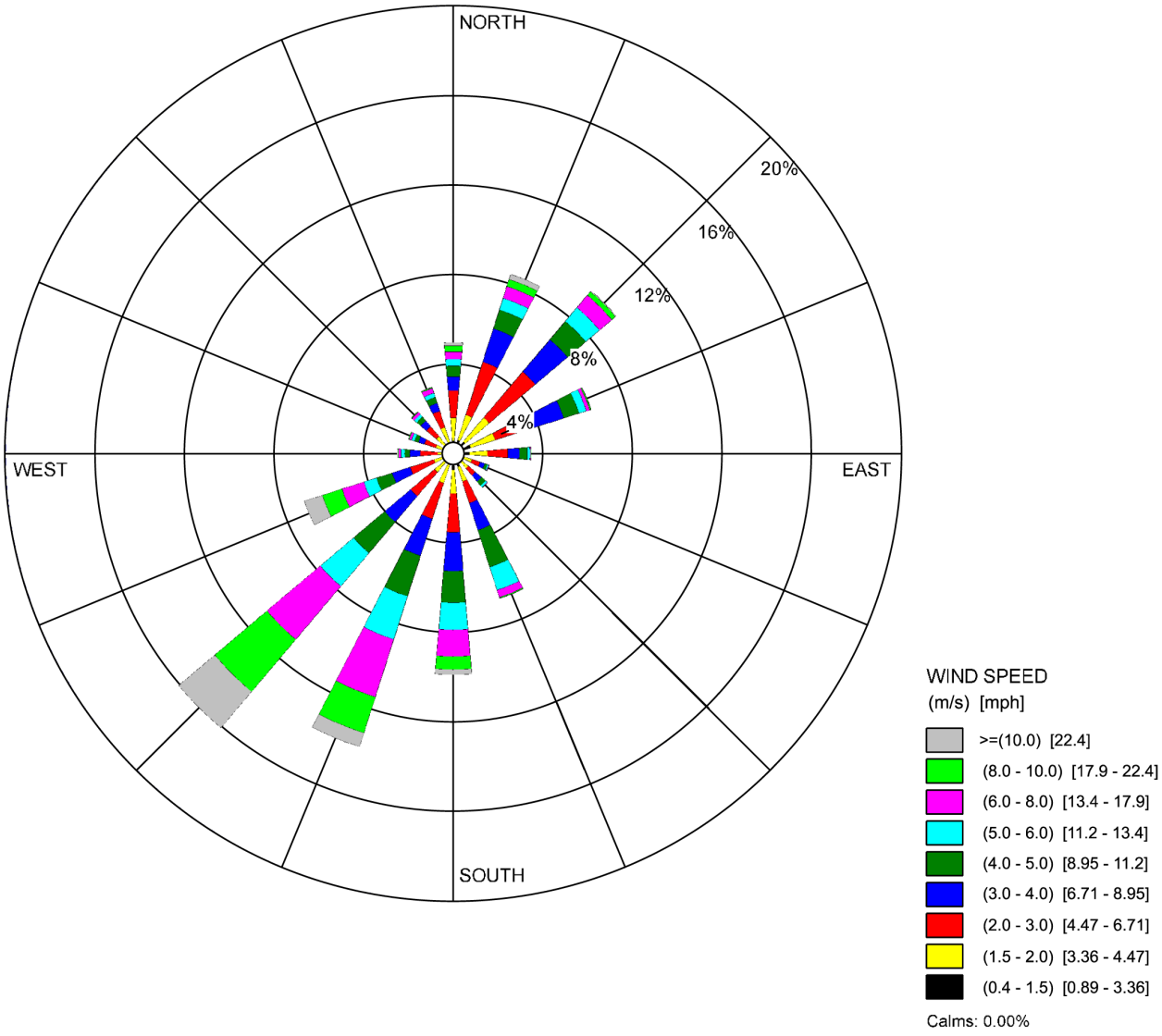
EAGLE ROCK ENRICHMENT FACILITY
ENVIRONMENTAL REPORT

WIND ROSE PLOT:

Station #EBRID

DISPLAY:

Wind Speed Direction
(blowing from)



DATA PERIOD:

2003, 2004, 2005, 2006, 2007
Jan 1 - Dec 31 (00:00-23:00)

CALM WINDS: 0.00 %	AVG. WIND SPEED: (4.18 m/s) [9.35 mph]
TOTAL COUNT: 43211 hrs	DATE: 7/15/2008

FIGURE 3.6-6 **Rev. 0**

EBR Wind Rose (10 Meters/32.8 Feet)

EAGLE ROCK ENRICHMENT FACILITY
ENVIRONMENTAL REPORT

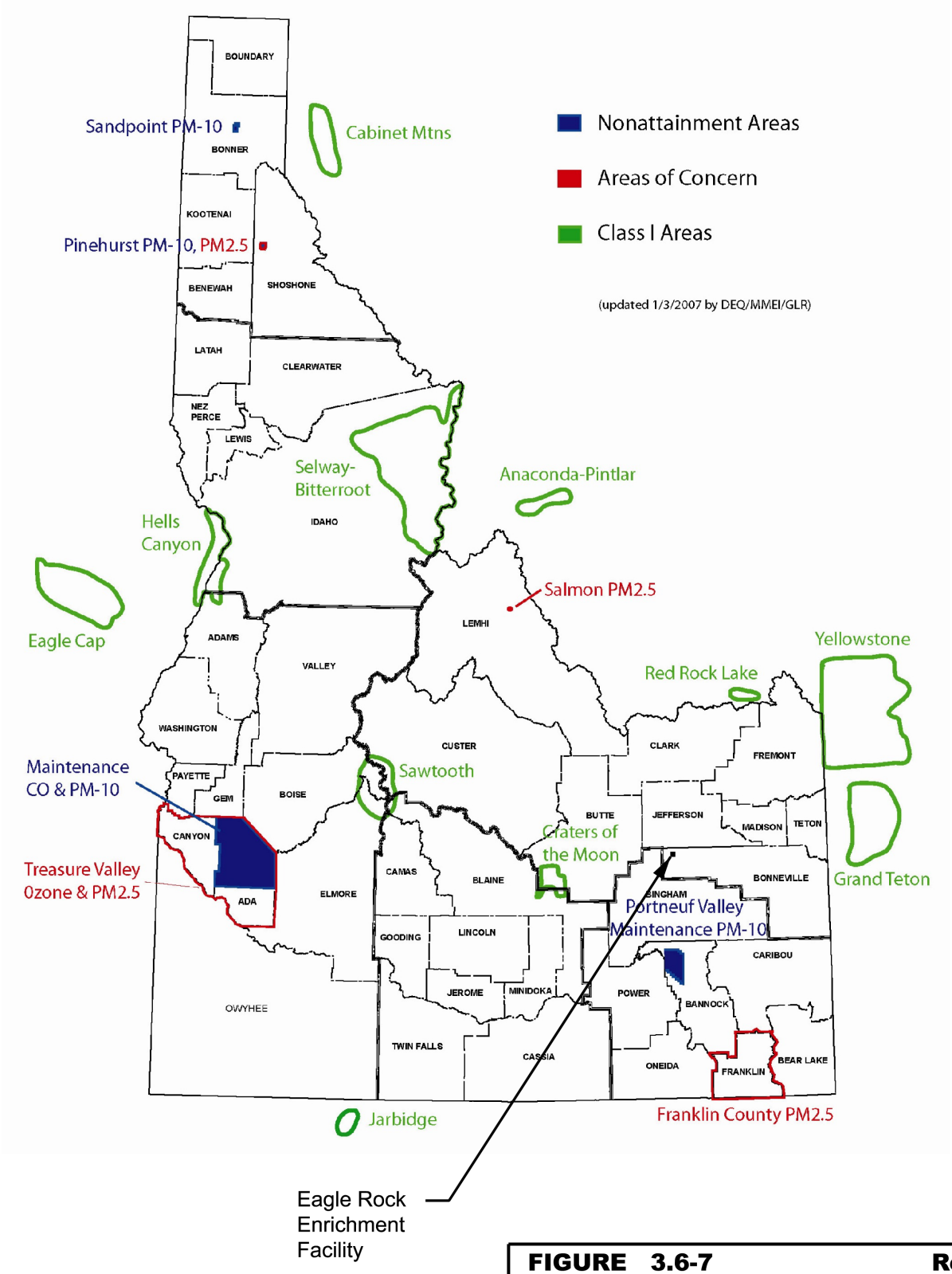


FIGURE 3.6-7 **Rev. 0**

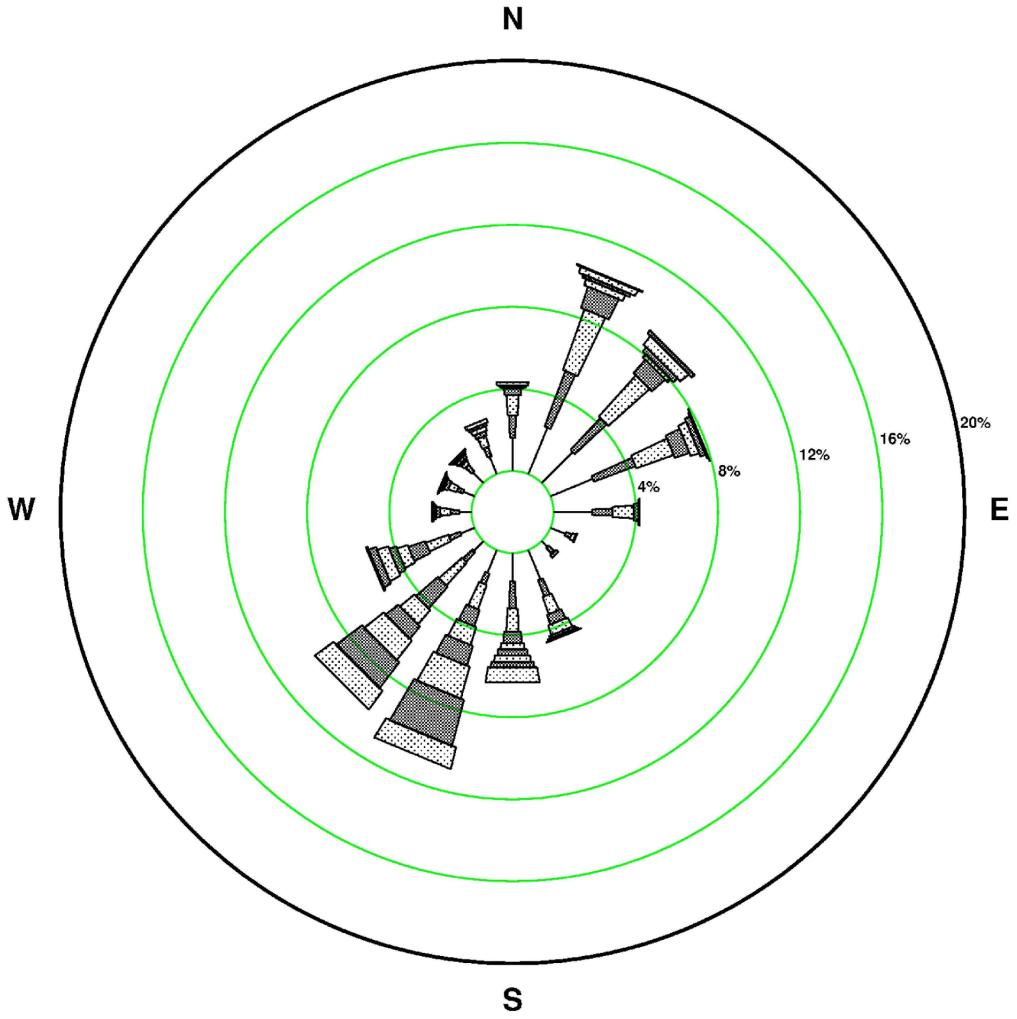
Map of Idaho Highlighting Nonattainment and Maintenance Areas, Areas of Concern and PSD Class I Areas

EAGLE ROCK ENRICHMENT FACILITY ENVIRONMENTAL REPORT

Source: IDEQ, 2007

EBR JAN 2003 – 2007

10-METER/33-FEET WIND DATA



STABILITY CLASS ALL

CALM WINDS 15.52%

NOTE: Frequencies indicate direction from which the wind is blowing.

WIND SPEED (MPS) [MPH-Approximate]

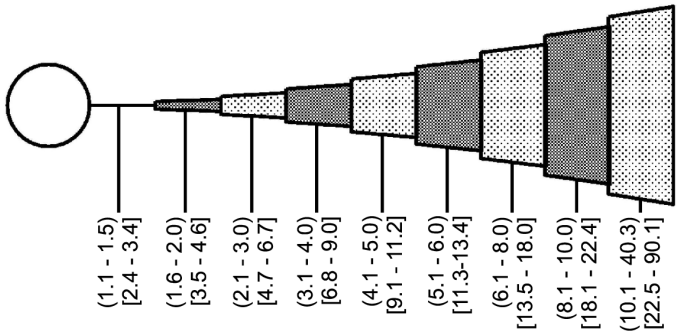


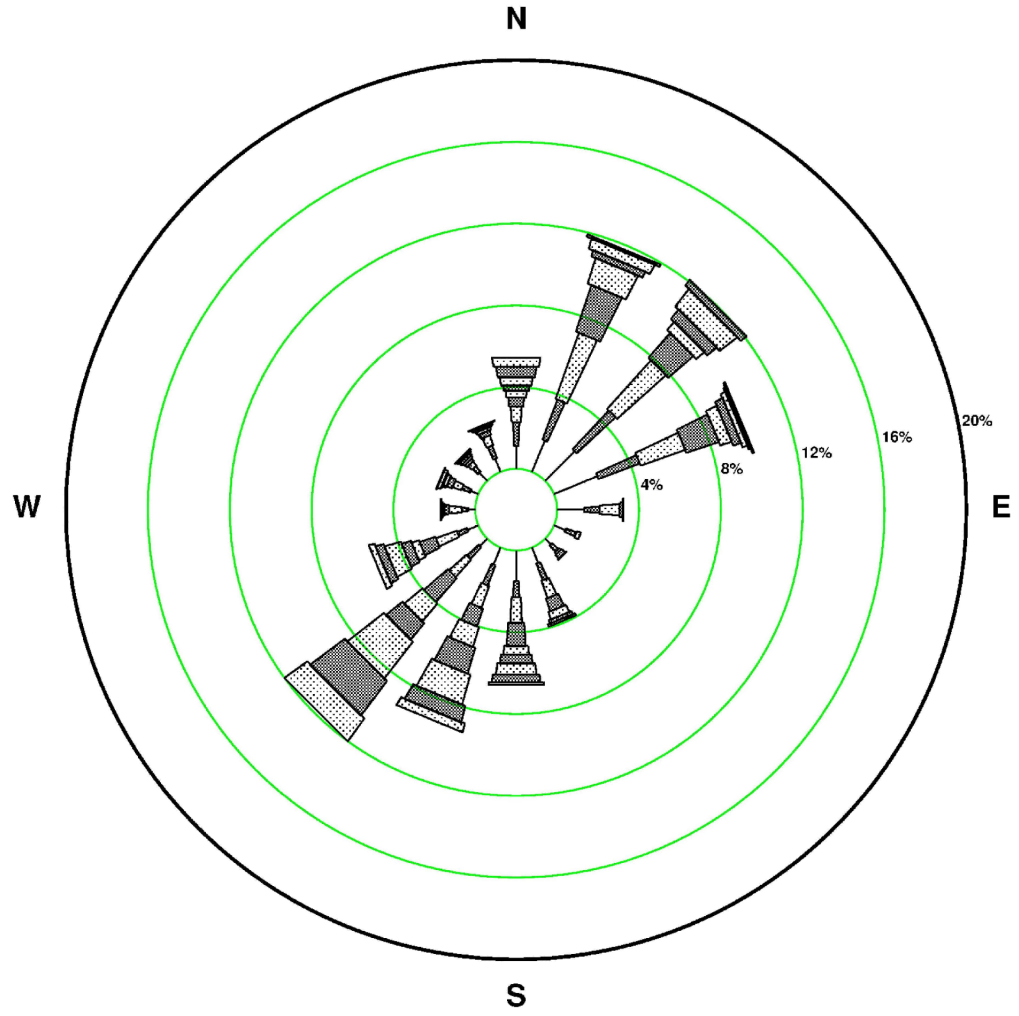
FIGURE 3.6-8 **Rev. 0**

EBR January Wind Rose (10 Meters/33 Feet)

EAGLE ROCK ENRICHMENT FACILITY ENVIRONMENTAL REPORT

EBR FEB 2003 – 2007

10-METER/33-FEET WIND DATA



STABILITY CLASS ALL

CALM WINDS 9.21%

NOTE: Frequencies indicate direction from which the wind is blowing.

WIND SPEED (MPS) [MPH-Approximate]

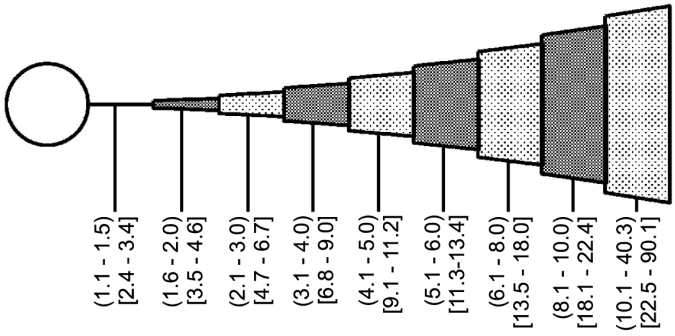


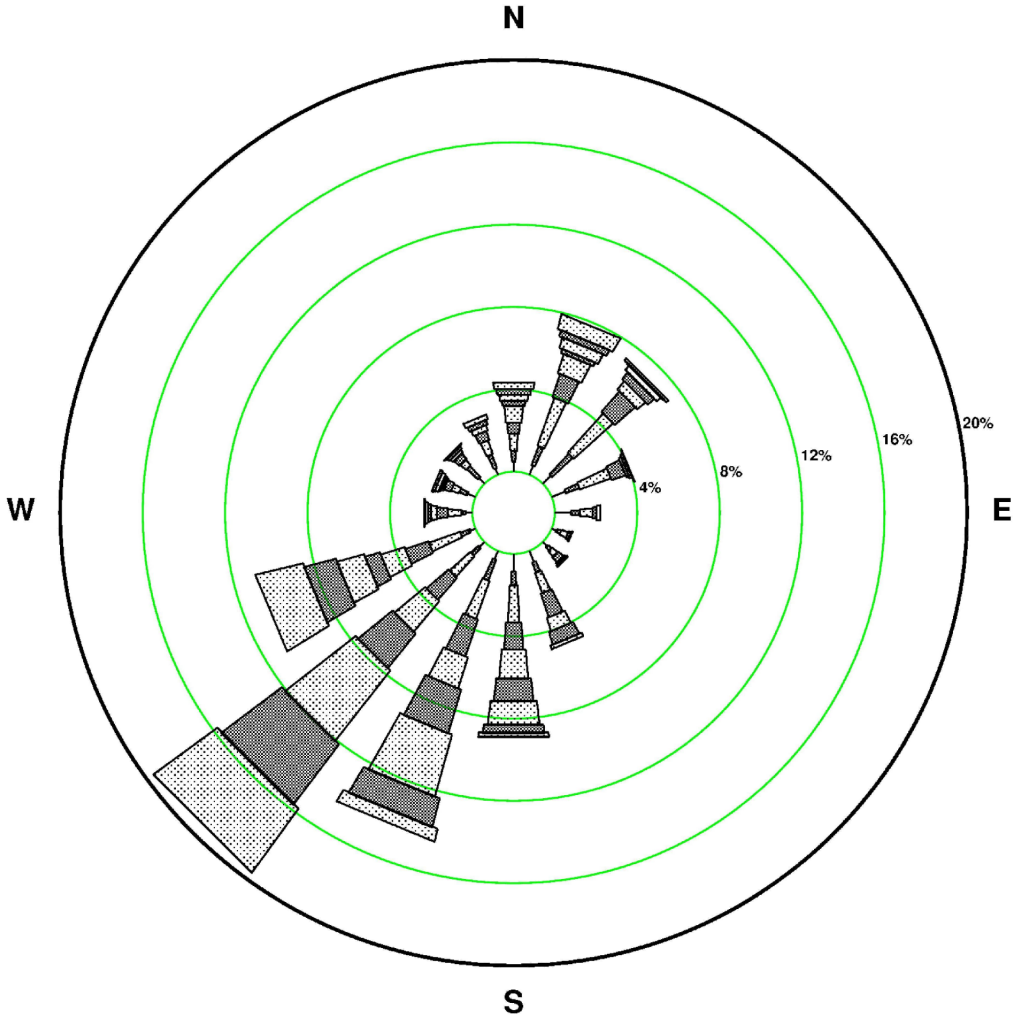
FIGURE 3.6-9 **Rev. 0**

EBR February Wind Rose (10 Meters/33 Feet)

EAGLE ROCK ENRICHMENT FACILITY ENVIRONMENTAL REPORT

EBR MAR 2003 – 2007

10-METER/33-FEET WIND DATA



STABILITY CLASS ALL

CALM WINDS 3.17%

NOTE: Frequencies indicate direction from which the wind is blowing.

WIND SPEED (MPS) [MPH-Approximate]

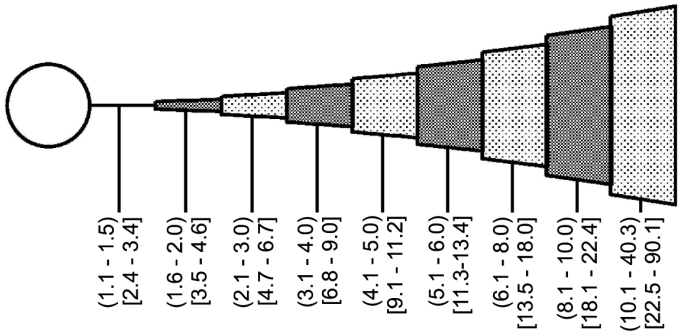


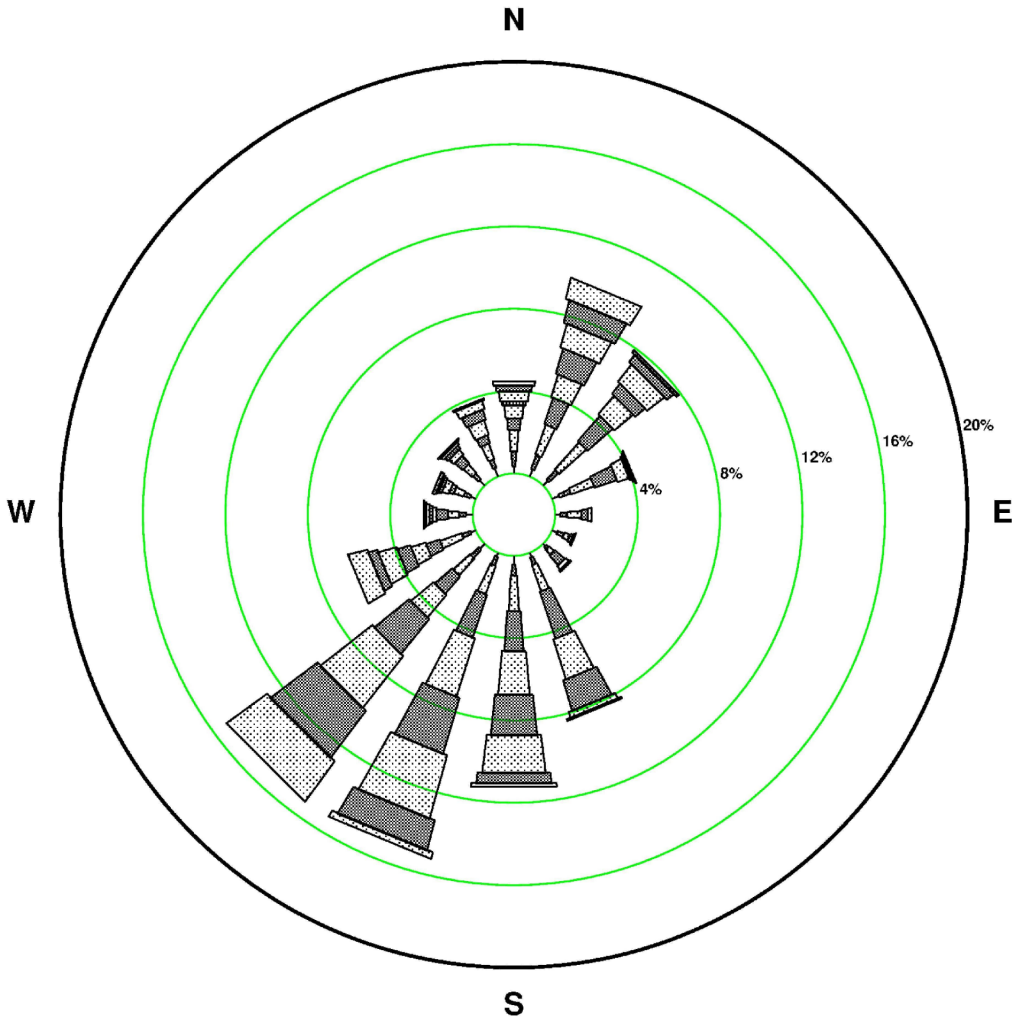
FIGURE 3.6-10 **Rev. 0**

EBR March Wind Rose (10 Meters/33 Feet)

EAGLE ROCK ENRICHMENT FACILITY ENVIRONMENTAL REPORT

EBR APR 2003 – 2007

10-METER/33-FEET WIND DATA



STABILITY CLASS ALL

CALM WINDS 1.64%

NOTE: Frequencies indicate direction from which the wind is blowing.

WIND SPEED (MPS) [MPH-Approximate]

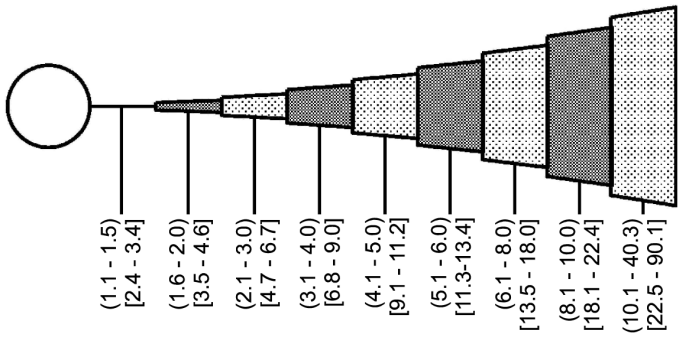


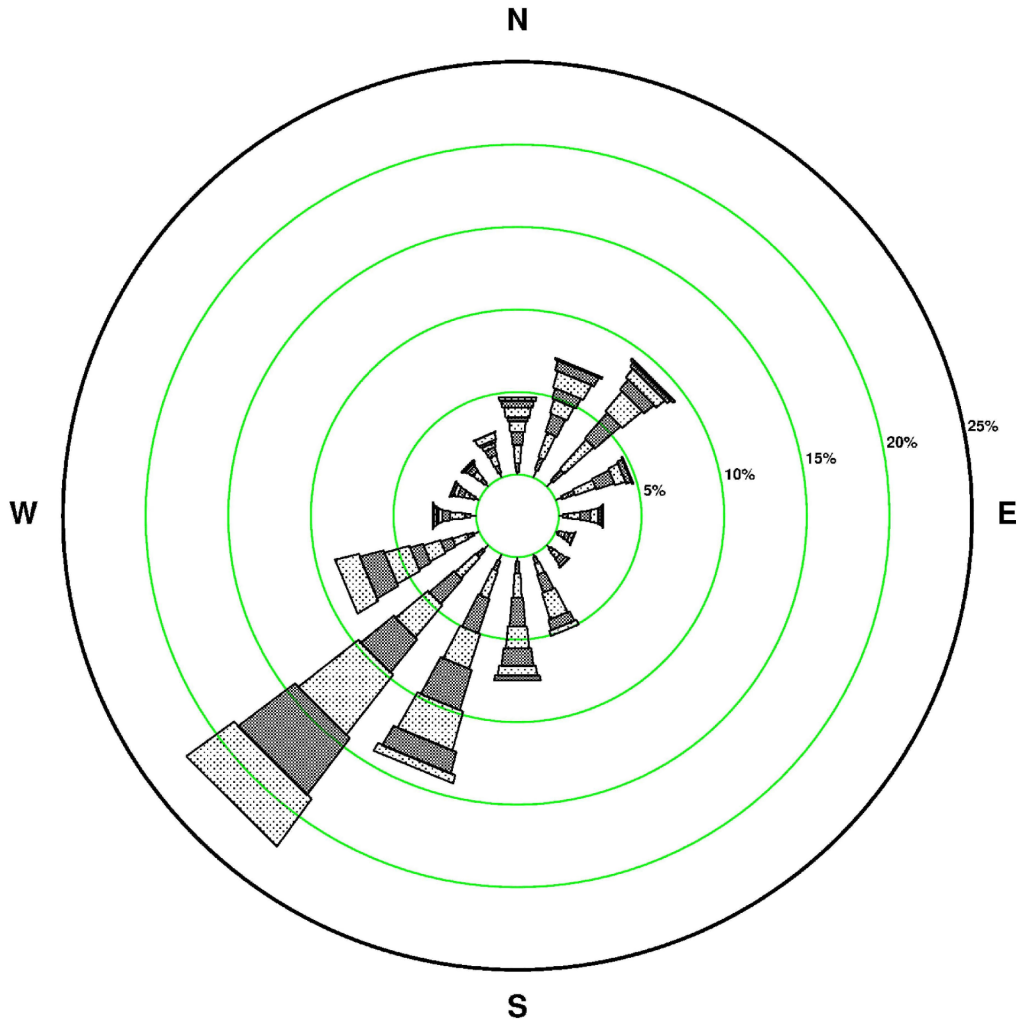
FIGURE 3.6-11 **Rev. 0**

EBR April Wind Rose (10 Meters/33 Feet)

EAGLE ROCK ENRICHMENT FACILITY ENVIRONMENTAL REPORT

EBR MAY 2003 – 2007

10-METER/33-FEET WIND DATA



STABILITY CLASS ALL

CALM WINDS 1.43%

NOTE: Frequencies indicate direction from which the wind is blowing.

WIND SPEED (MPS) [MPH-Approximate]

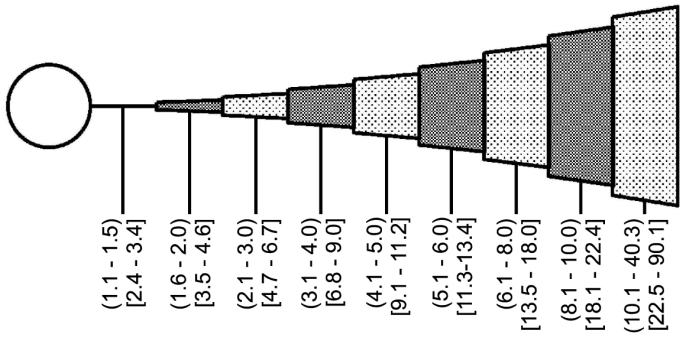


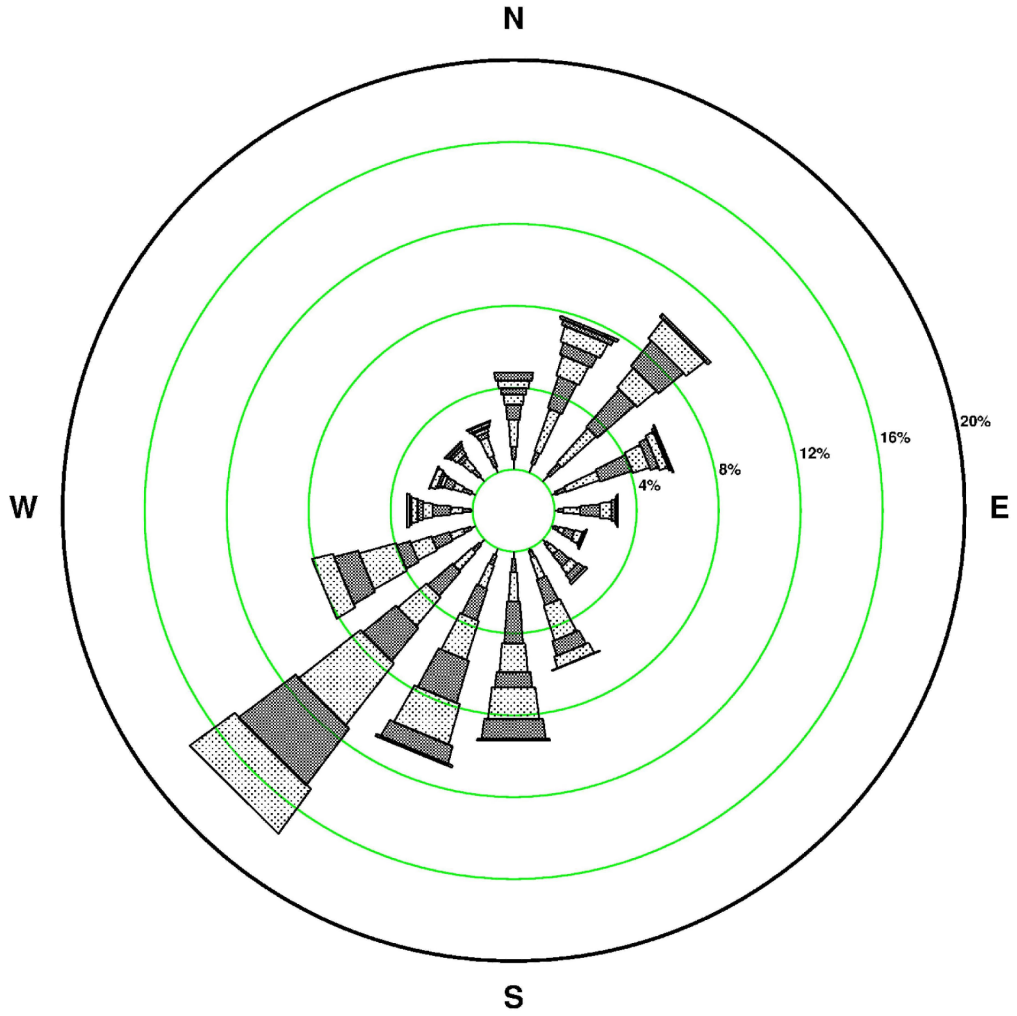
FIGURE 3.6-12 **Rev. 0**

EBR May Wind Rose (10 Meters/33 Feet)

EAGLE ROCK ENRICHMENT FACILITY ENVIRONMENTAL REPORT

EBR JUN 2003 – 2007

10-METER/33-FEET WIND DATA



STABILITY CLASS ALL

CALM WINDS 1.65%

NOTE: Frequencies indicate direction from which the wind is blowing.

WIND SPEED (MPS) [MPH-Approximate]

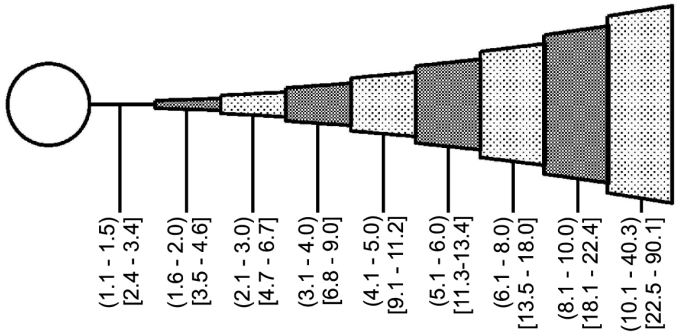


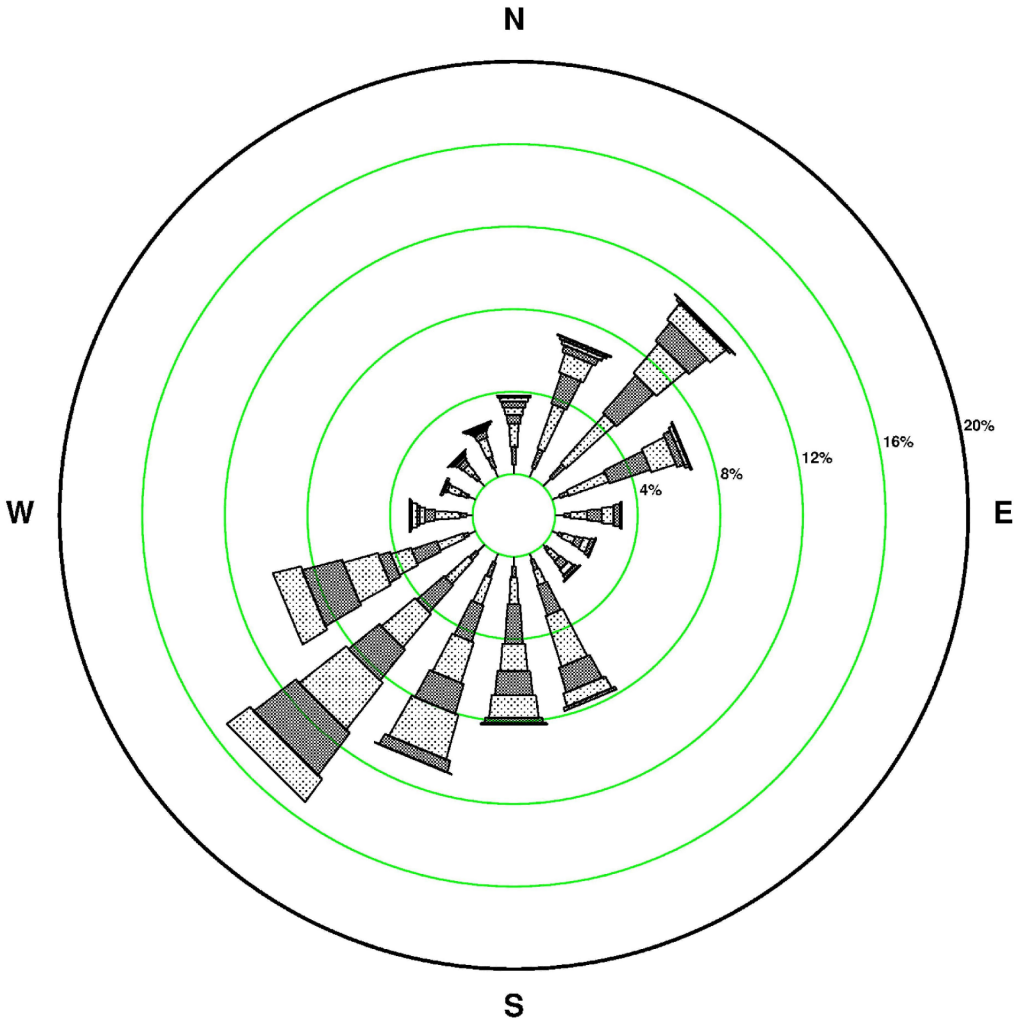
FIGURE 3.6-13 **Rev. 0**

EBR June Wind Rose (10 Meters/33 Feet)

EAGLE ROCK ENRICHMENT FACILITY ENVIRONMENTAL REPORT

EBR JUL 2003 – 2007

10-METER/33-FEET WIND DATA



STABILITY CLASS ALL

CALM WINDS 1.83%

NOTE: Frequencies indicate direction from which the wind is blowing.

WIND SPEED (MPS) [MPH-Approximate]

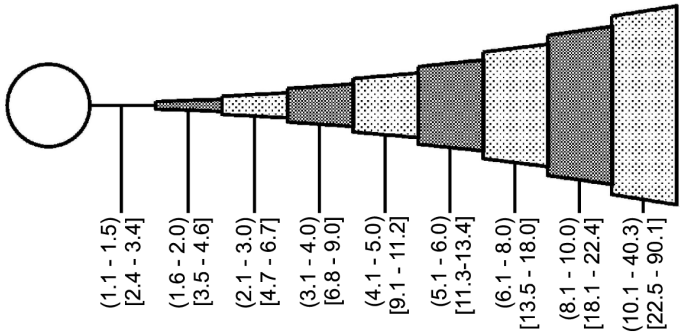


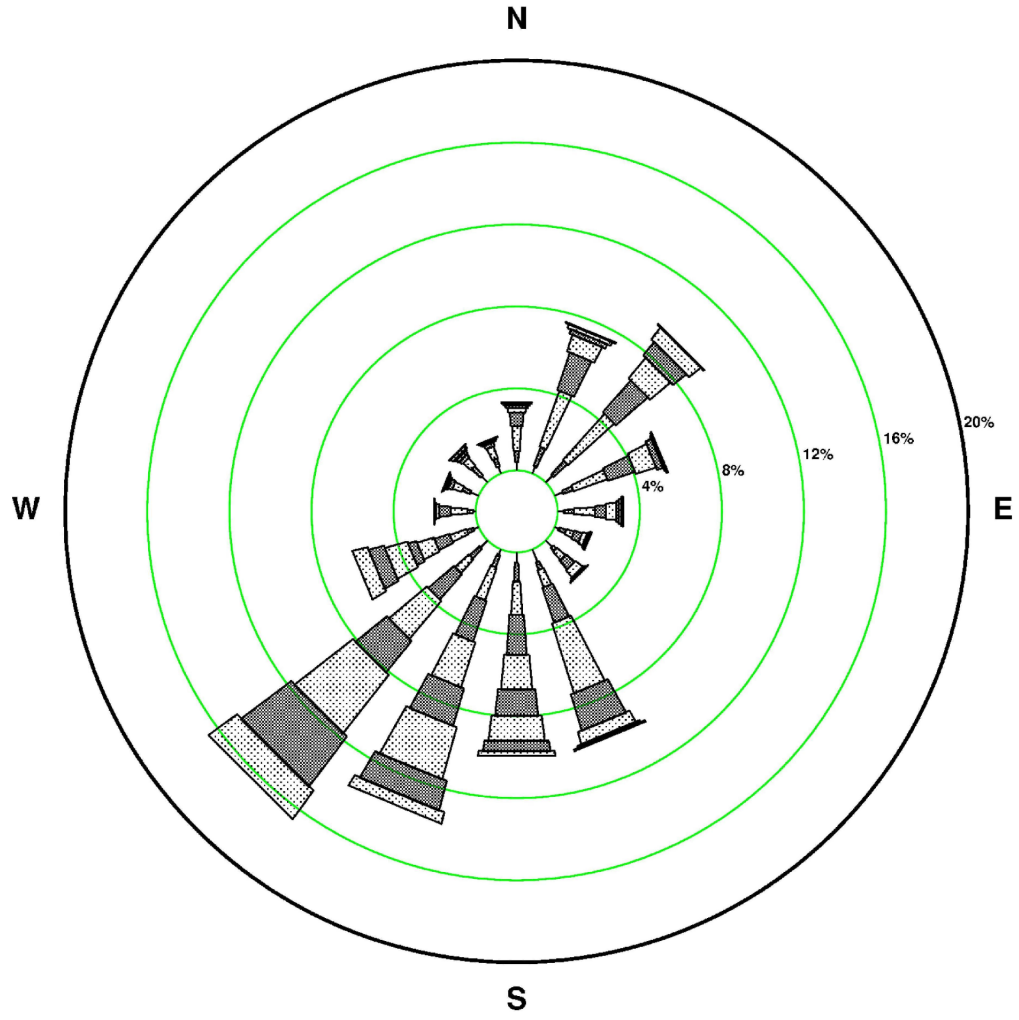
FIGURE 3.6-14 **Rev. 0**

EBR July Wind Rose (10 Meters/33 Feet)

EAGLE ROCK ENRICHMENT FACILITY ENVIRONMENTAL REPORT

EBR AUG 2003 – 2007

10-METER/33-FEET WIND DATA



STABILITY CLASS ALL

CALM WINDS 2.28%

NOTE: Frequencies indicate direction from which the wind is blowing.

WIND SPEED (MPS) [MPH-Approximate]

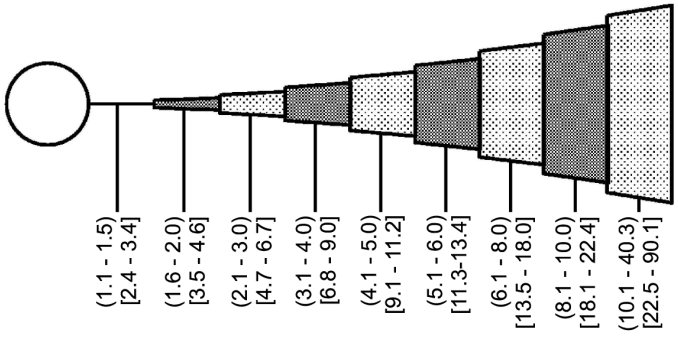


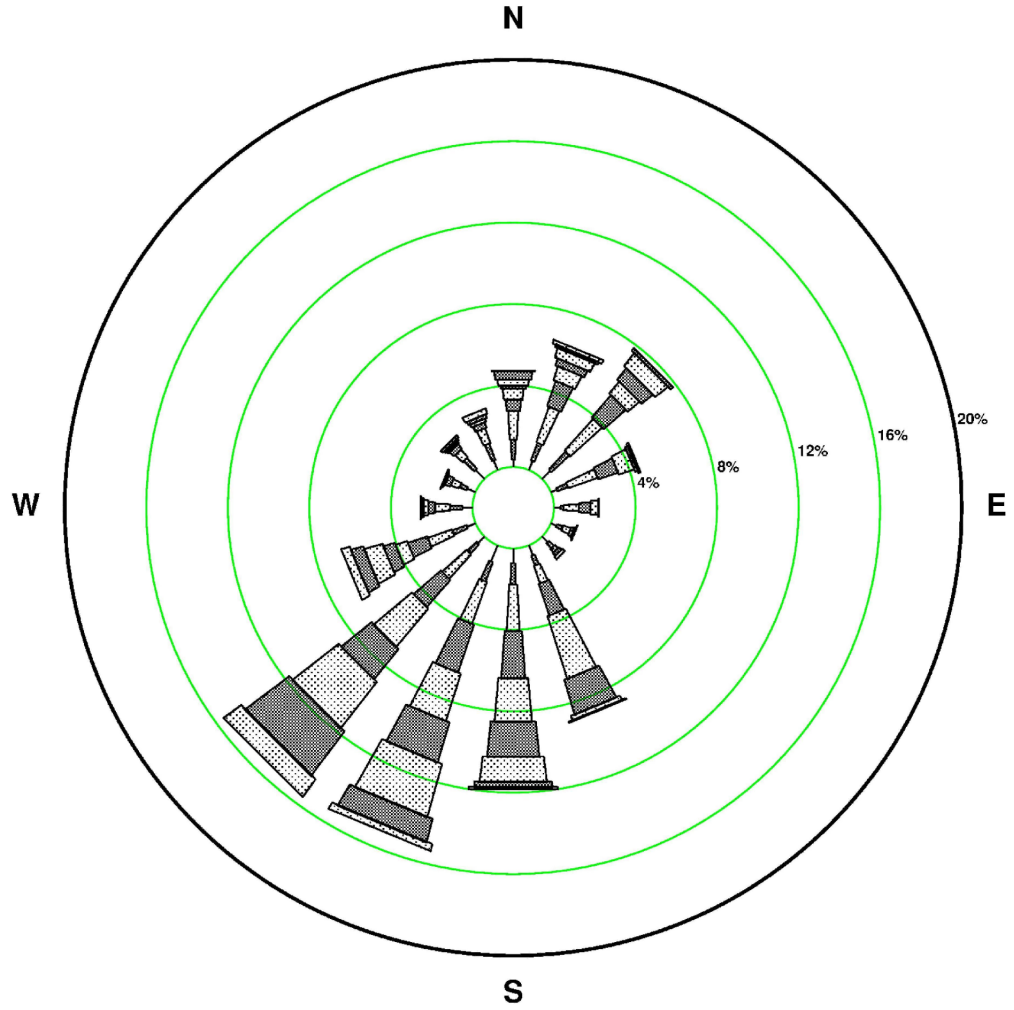
FIGURE 3.6-15 **Rev. 0**

EBR August Wind Rose (10 Meters/33 Feet)

EAGLE ROCK ENRICHMENT FACILITY ENVIRONMENTAL REPORT

EBR SEP 2003 – 2007

10-METER/33-FEET WIND DATA



STABILITY CLASS ALL

CALM WINDS 3.18%

NOTE: Frequencies indicate direction from which the wind is blowing.

WIND SPEED (MPS) [MPH-Approximate]

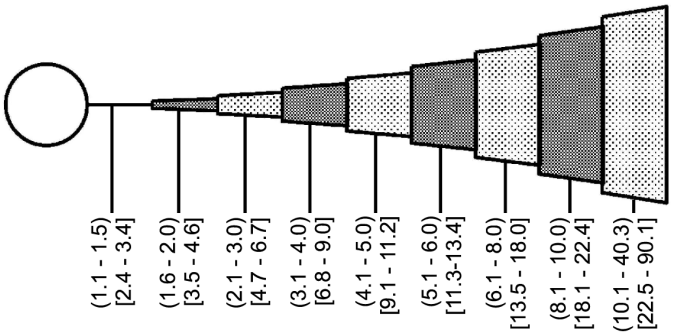


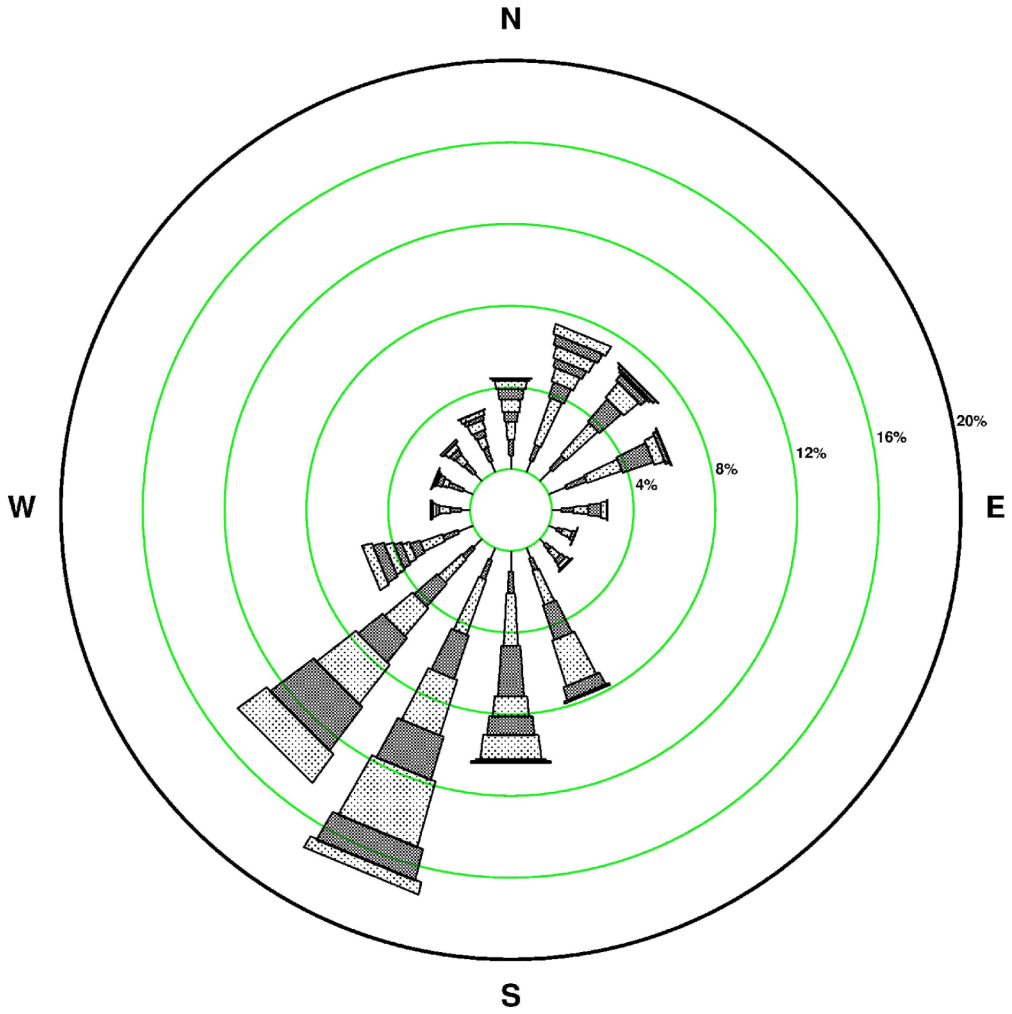
FIGURE 3.6-16 **Rev. 0**

EBR September Wind Rose (10 Meters/33 Feet)

EAGLE ROCK ENRICHMENT FACILITY ENVIRONMENTAL REPORT

EBR OCT 2003 – 2007

10-METER/33-FEET WIND DATA



STABILITY CLASS ALL

CALM WINDS 3.88%

NOTE: Frequencies indicate direction from which the wind is blowing.

WIND SPEED (MPS) [MPH-Approximate]

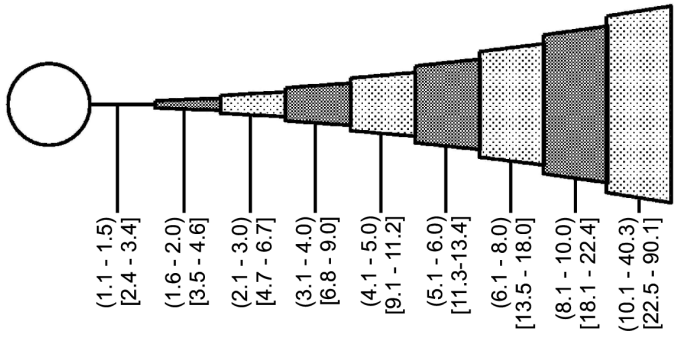


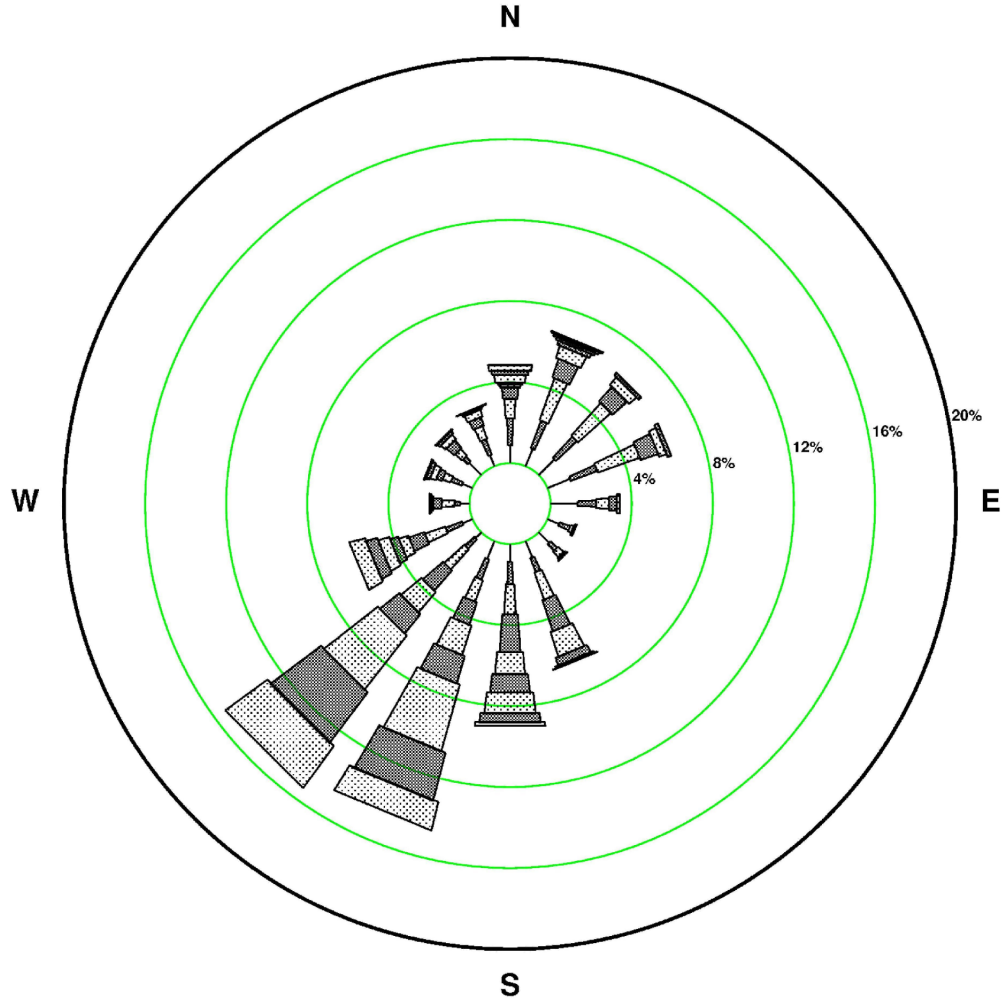
FIGURE 3.6-17 **Rev. 0**

EBR October Wind Rose (10 Meters/33 Feet)

EAGLE ROCK ENRICHMENT FACILITY ENVIRONMENTAL REPORT

EBR NOV 2003 – 2007

10-METER/33-FEET WIND DATA



STABILITY CLASS ALL

CALM WINDS 7.11%

NOTE: Frequencies indicate direction from which the wind is blowing.

WIND SPEED (MPS) [MPH-Approximate]

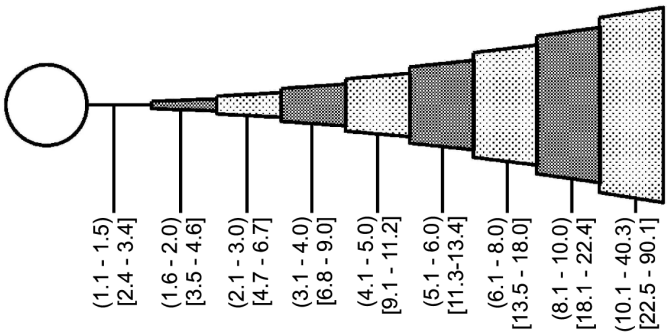


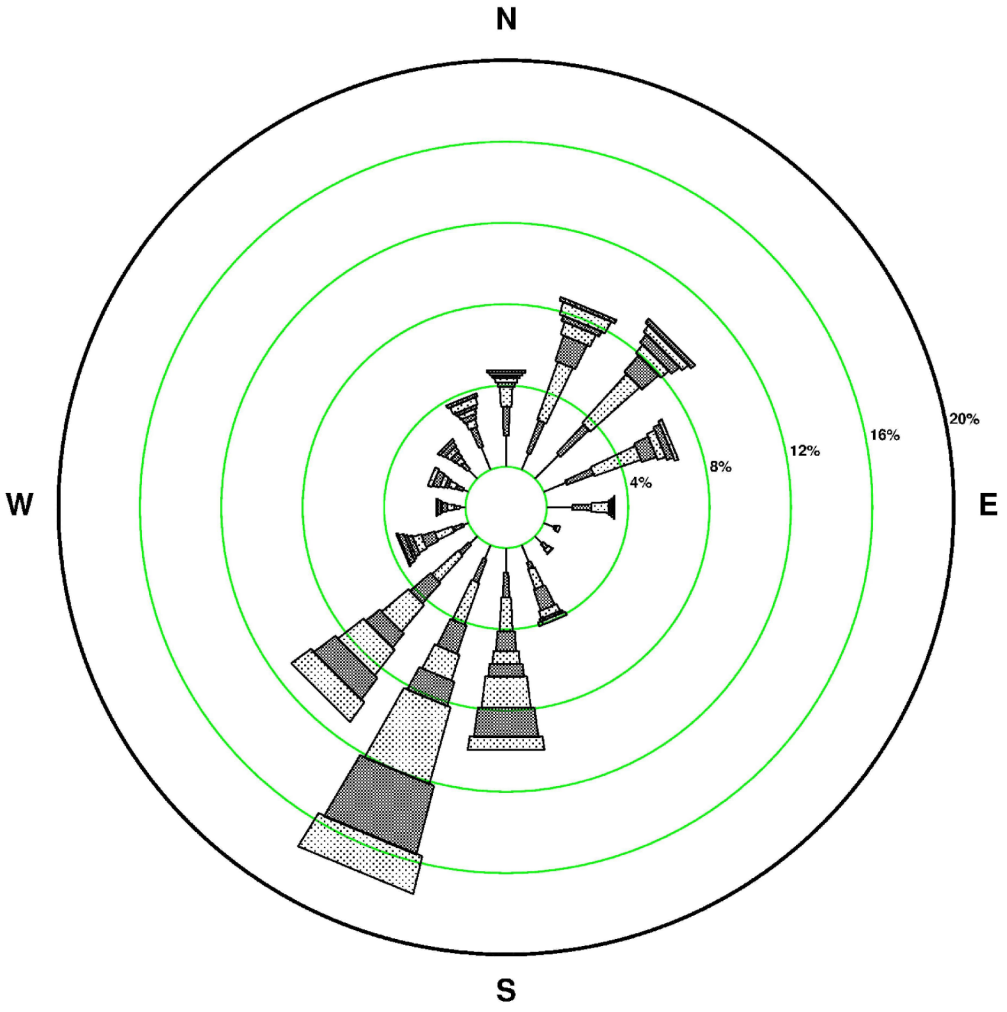
FIGURE 3.6-18 **Rev. 0**

EBR November Wind Rose (10 Meters/33 Feet)

EAGLE ROCK ENRICHMENT FACILITY ENVIRONMENTAL REPORT

EBR DEC 2003 – 2007

10-METER/33-FEET WIND DATA



STABILITY CLASS ALL

CALM WINDS 8.73%

NOTE: Frequencies indicate direction from which the wind is blowing.

WIND SPEED (MPS) [MPH-Approximate]

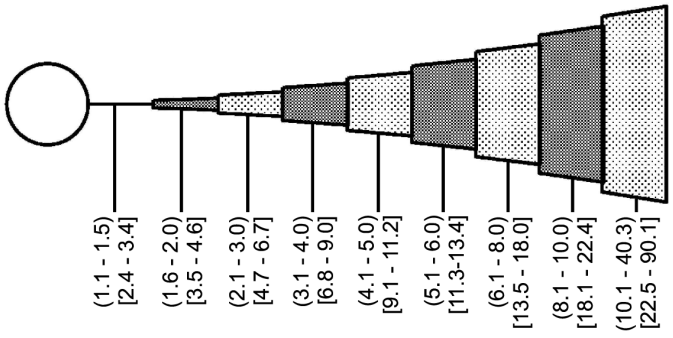


FIGURE 3.6-19 **Rev. 0**

EBR December Wind Rose (10 Meters/33 Feet)

EAGLE ROCK ENRICHMENT FACILITY ENVIRONMENTAL REPORT

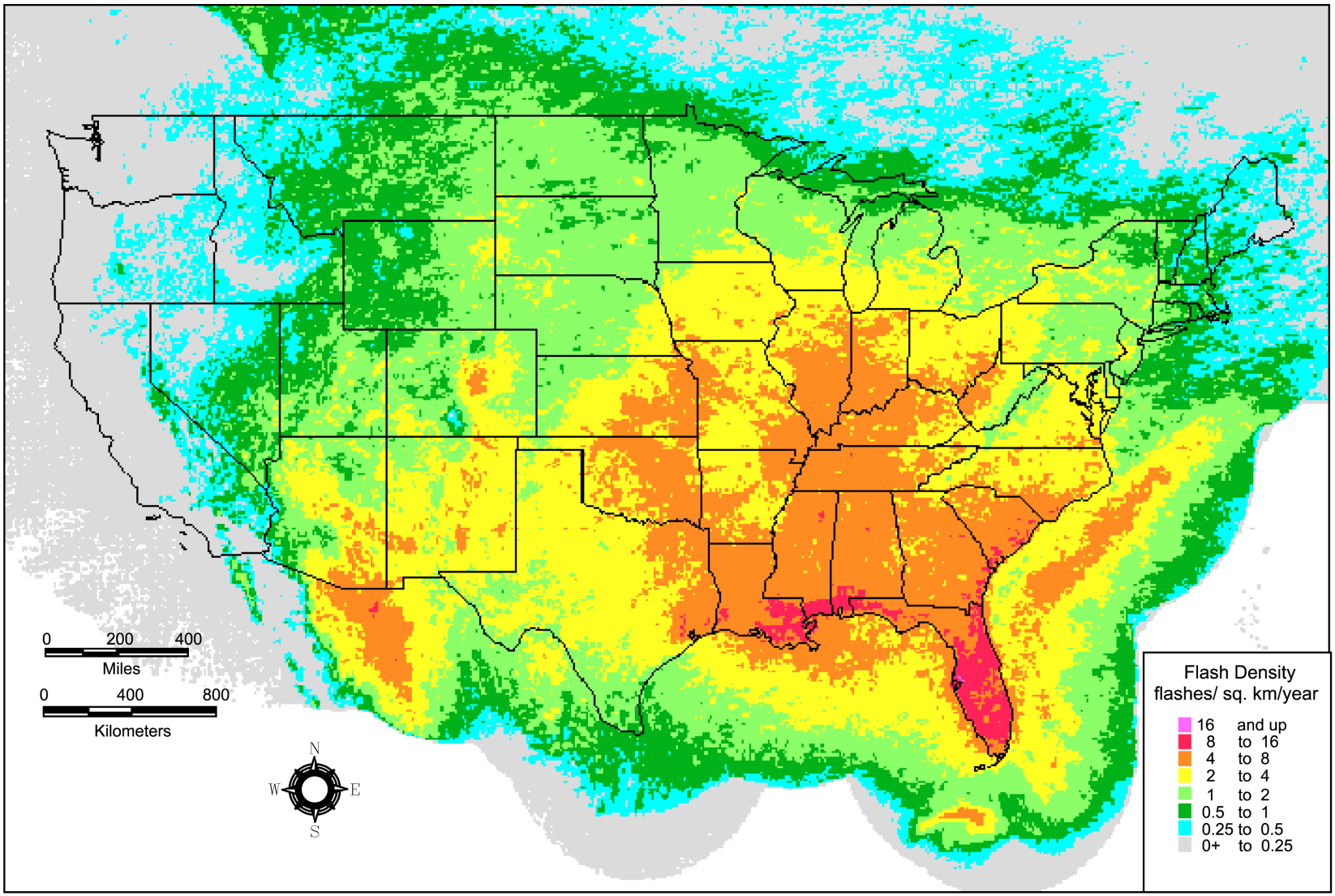


FIGURE 3.6-20 **Rev. 0**

Five-Year Lightning Flash Density Map

EAGLE ROCK ENRICHMENT FACILITY ENVIRONMENTAL REPORT