3.0 AFFECTED ENVIRONMENT

3.1 LOCATION, SETTING AND HISTORICAL USE

The Huxtable Quarry Project Area (HQPA) is located at the northeast end of Sheep Mountain, approximately 6 miles southwest of Douglas in south-central Converse County, Wyoming (refer to Figure 2.1). Topography ranges from steep rugged rock outcrops to relatively gentle slopes toward the northeast. Elevations within the proposed HQPA range from approximately 5,200 to 5,400 feet above mean sea level (AMSL). The proposed quarry would be located several hundred feet below the crest of Sheep Mountain and would not be visible from the west side of Sheep Mountain, which reaches an elevation of 6,230 feet (+/-) approximately 1.25 miles south of the proposed project area.

The HQPA lies within the foothills transition area in the Wyoming Basin physiographic province along the northern flank of the Laramie Mountain range (Knight 1994). The proposed project area is located within the Platte River drainage system (Blackstone 1988).

Record high and low temperatures are approximately 105∀F and -32∀F, respectively. Summer temperatures range widely, typically with warm sunny days and cool nights. In and around Douglas, the mid-day summer temperatures reach 90∀F about 27 days each year. During winter nights, temperatures fall to 0∀F about 20 times per year. On average, there are approximately 100 to 120 frost-free days per year in the central part of Converse County. At the higher elevations in the Laramie Range, these figures drop to approximately 60 to 100 frost-free days per year. The proposed project area receives approximately 12 to 15 inches of precipitation per year and the prevailing winds are from the southwest (Martner 1986, Curtis and Grimes 2004).

The HQPA has historically been utilized for livestock grazing, wildlife habitat and recreation. This area provides limited summer and fall grazing for cattle, sheep and horses. However, stocking rates are low due to the rugged terrain and relatively sparse vegetation (SCS 1988).

3.2 CRITICAL ELEMENTS OF THE HUMAN ENVIRONMENT

Critical elements of the human environment as defined by the BLM (1988a), their status in the proposed project area, and their potential to be affected by the Proposed Action or alternatives are presented in Table 3.1. A review of the Proposed Action and possible alternatives has determined that nine of the 13 critical elements of the human environment are not present in the HQPA, are not affected by the Proposed Action or alternatives, and therefore are not discussed further. Four critical elements (air quality, cultural resources, threatened and endangered species, and water quality) are present in the proposed project area, may be affected by the Proposed Action or alternatives, and are discussed in detail in this EA.

Table 3.1 Critical Elements of the Human Environment [1]

Element	Status	Analyzed in Detail in This EA
Air quality	Potentially affected	Yes
Areas of critical environmental concern	Not present	No
Cultural resources	Potentially affected	Yes
Environmental justice related issues	Not present	No
Farmlands (prime or unique)	Not present	No
Floodplains	Not present	No
Invasive, nonnative species (noxious weeds)	Potentially affected	Yes
Native American religious concerns	Not present	No
Threatened and endangered species	Potentially affected	Yes
Wastes (hazardous and solid)	Potentially affected	Yes
Water quality	Potentially affected	Yes
Wetlands/riparian areas	Not present	No
Wild and scenic rivers	Not present	No
Wilderness (wilderness study areas and wilderness areas)	Not present	No

[1] From the BLM NEPA Handbook H-1790-1 (BLM 1988a, 1999a).

Based on comments received from the public during a BLM-sponsored open house for the proposed Huxtable Mineral Materials Project held in Douglas, Wyoming on April 20, 2004, and additional comments received on the project proposal, this EA will also analyze potential impacts of the Proposed Action and alternatives on mineral resources, noise, recreation, socioeconomics, soil resources, transportation, vegetation, visual resources and wildlife. A determination has been made that other resource values (e.g., water rights, wild horses, land ownership patterns, land status, etc.) will not be affected by the Proposed Action or alternatives. As a consequence, these resources will not be analyzed in detail in this EA.

3.3 ENVIRONMENTAL ELEMENTS CONSIDERED WITH MINOR EFFECTS

The following resources would not be adversely affected by implementation of the Proposed Action or alternatives. Consequently, these resources will also not be addressed in this chapter or in Chapter 4.0 (Environmental Consequences) to follow.

- Fisheries - there are no perennial streams in or directly adjacent to the HQPA; consequently, there are no fisheries that could/would be affected by the Proposed Action.

- Range Resources - the proposed HQPA is situated entirely upon private surface estate owned by the proponent, Mr. James Huxtable. As there are no federal lands in the general vicinity

of the HQPA, it would be difficult to provide accurate calculations regarding existing Animal Unit Months (AUMs) available in the project area for livestock grazing purposes and/or the loss thereof attributable to the proposed action. Considering that Mr. Huxtable owns the surface to be impacted by the proposed rock quarry, it is reasonable to assume that he is fully aware of any potential conflicts with his own ranching operation, including the potential loss of grazing and/or impacts to existing agricultural improvements such as fences. The quarry site itself is situated on a rocky ridge with little value for livestock grazing purposes and the majority of the access road has already been constructed. As indicated above, the proposed project area provides limited summer and fall grazing for cattle, sheep and horses; however, stocking rates are low due to the rugged terrain and relatively sparse vegetation. Consequently impacts to range resources within the HQPA will not be addressed further in this analysis document.

3.3.1 Issues Raised During Public Scoping

Of the nine primary issues raised by the public concerning the proposed Huxtable Quarry Mineral Materials Project (see Section 1.4), three issues were determined to have minor or unquantifiable effects as follows.

3.3.1.1 Potential Damage to Dwellings and Structures from Blasting Operations

During string blasting the detonation of the explosives will generate stress waves in the surrounding rock. Considering that the proposed quarry is situated on the toe of a rather large ridge extending to the west/southwest, most of the seismic ground waves will propagate into the mountain and away from the public to the northeast (it should be noted that the closest public dwellings are located on the north side of Bed Tick Creek with an intervening alluvial/colluvial valley between the dwellings and the proposed quarry). The distance of propagation and intensity of the seismic wave is dependent on the type of rock and any fractures in the rock mass. Assuming that the seismic waves have a direct media transport to the residence to the northeast and that the maximum explosive charge is one pound/cy^3 of material removed, then the peak particle velocity (how fast the ground moves) can be calculated as follows:

$$V = 160 (R \div W^{1/2})^{-1.6}$$

Where: V = peak particle velocity in inches per second (ips);
R = distance between explosion and recording sites in feet; and
W = maximum pounds-per-delay-period of eight milliseconds or more.

The amount of rock removed per individual blast is required to determine effects of blasting. As previously discussed, string blasting utilizes a series of several smaller blasts, which are timed and delayed to gain the same net results as one large blast. Of course, the amount of rock removed per string blast will vary with product demand. However, in order to meet the estimated annual maximum tonnage of rock (280,000 tons or 200,000 yd^3) while using only two string blasts per year, then 100,000 yd^3 will need to be produced per blast (which assumes that there is no swell factor as some of the rock removed will be waste material). Using a string

blasting pattern as depicted in Figure 2.3, 50 bores holes 10 feet apart and 20 feet in depth would be required to free 100,000 yd^3 of material, with each bore hole freeing approximately 2,000 yd^3 of material. Assuming there are 4 timed blasts per hole, each blast would result in the removal of 500 yd^3 of rock. If we assume a maximum explosive factor of one pound/yd^3 would be used for the proposed quarry, then the maximum pounds of explosive per delay period would be 500 pounds (lbs). A conservative estimate of the nearest residence to the project area is approximately 5,000 feet. Therefore, with R = 5,000 feet and W = 500 lbs/delay period, then V = 0.03 ips. The intensity of seismic motion that can be tolerated by various kinds of structures is presented in Table 3.2. By comparison, the perceptible motion level to humans is approximately 0.02 ips.

Table 3.2 Damage Levels as a Function of Peak Particle Velocity [1]

Peak Particle Velocity [2]	Nature of Damage
12.0	Fall of rock in unlined tunnels.
7.6	50% probability of major plaster damage.
5.4	50% probability of minor plaster damage.
2.8 - 3.3	Threshold of damage from close-in blasting.
2.0	Safe blasting criterion for residential structures recommended by U.S. Bureau of Mines. [3]

1 From duPont Blaster's Handbook (duPont 1997).

2 Peak Particle Velocity expressed in inches per second.

3 Perceptible motion level to humans is approximately bout 0.02 inches per second.

So, by using the calculated peak particle velocity of 0.03 ips, there would not be any damage to residential structures in the area - the blast may be a perceptible motion to people if there was a continuous media to propagate the seismic waves. In most cases the residential structures would be toward the free face of the blast and wave propagation due to ground movement would not occur in that direction. As a consequence, the potential impacts to local dwellings/structures from blasting operations in the proposed quarry will not be discussed further in this analysis document.

3.3.1.2 Potential Health and Safety Concerns from Exposure to Elevated Radon Levels

Radon is a colorless, odorless, tasteless and chemically inert radioactive gas that is formed by the natural radioactive decay of uranium (radium) in rock, soil and water. Naturally existing, low levels of uranium occur widely in the Earth's crust and can be found in all 50 states (NSC 2005). All rocks contain some uranium, although most contain just a small amount - between 1 and 3

parts per million (ppm) of uranium. In general, the uranium content of soil will be about the same as the uranium content of the parent material (rock) from which the soil was derived. Some types of rocks have higher than average uranium content including light-colored volcanic rocks, granites, dark shales, sedimentary rocks that contain phosphate, and metamorphic rocks derived from these rocks. These rocks and their soils may contain as much as 100 ppm uranium. The higher the uranium level is in an area, the greater are the chances that houses in the area have high levels of indoor radon (USGS 2005, NSC 2005).

Because radon is a gas, it has much greater mobility than uranium and radium, which are fixed in the solid matter in rocks and soils. As a consequence, radon can more easily leave the rocks and soils by escaping into fractures and openings in rocks and into the pore spaces between grains of soil. The ease and efficiency with which radon moves in the pore space or fractures effects how much radon enters a house. If radon is able to move easily in the pore space, then it can travel a great distance before it decays, and is more likely to collect in high concentrations inside a building. The method and speed of radon's movement through soils is controlled by the amount of water present in the pore space (the moisture content), the percentage of pore space in the soil (the porosity), and the "interconnectedness" of the pore spaces that determines the soil's ability to transmit water and air (called soil permeability). Radon moves more easily through permeable soils, such as coarse sand and gravel, than through impermeable soils such as clays. Fractures in any soil or rock allow radon to move more quickly. Radon moves slower in water than in air. The distance that radon moves before most of it decays is less than one inch in water-saturated rocks or soils, but it can be more than six feet, and sometimes tens of feet, through dry rocks or soils. For these reasons, homes in areas with drier, highly permeable soils and bedrock, such as hill slopes, mouths and bottoms of canyons, coarse glacial deposits, and fractured or cavernous bedrock, may have higher levels of indoor radon. Even if the radon content of the air in the soil or fracture is in the "normal" range (200-2,000 pCi/L), the permeability of these areas permits radon-bearing air to move greater distances before it decays, and thus contributes to high indoor levels of radon (USGS 2005). Radon moving through pore spaces and rock fractures near the surface of the earth usually escapes into the atmosphere. Where a house is present, however, soil air often flows toward its foundation for three reasons:

1) differences in air pressure between the soil and the house (house pressures are typically lower than soil or ambient air pressures),

2) the presence of openings in the foundation of the house, and

3) increases in permeability around the basement (if one is present) due to construction practices.

Most houses draw less than one percent of their indoor air from the soil; the remainder comes from outdoor air, which is generally quite low in radon. Houses with low indoor air pressures, poorly sealed foundations, and several entry points for soil air, however, may draw as much as 20 percent of their air from the soil. Even if the soil air has only moderate levels of radon, levels inside of the house may be very high (USGS 2005, NSC 2005).

Radon can also enter homes through their water systems. Water in rivers and reservoirs usually contain very little radon because it escapes into the air, so homes that rely on surface water

supplies usually do not have a radon problem with their water. In big cities, water processing in large municipal systems aerates the water, which allows radon to escape, and also delays use of the water until most of the remaining radon has decayed. However, in many areas of the country, ground water is the main water supply for homes and communities. These small public water works and private domestic wells often have closed systems and short transit times that do not remove radon from the water or permit it sufficient time to decay. This radon escapes from the water to the indoor air as people take showers, wash clothes and dishes, or otherwise use water indoors. The areas most likely to have problems with radon in ground water are areas that have high levels of uranium in the underlying rocks. For example, granites in various parts of the United States are sources of high levels of radon in ground water that is supplied to private water supplies (USGS 2005).

The radon zone designation assigned to most of Wyoming (including Converse County) by the Environmental Protection Agency (EPA) is Zone 1. Zone 1 counties have a predicted average indoor radon screening level of greater than 4 pCi/L (pico curies per liter), which represents the highest priority zone and reflects the average short-term radon measurement that can be expected to be measured in a building without the implementation of radon control methods (EPA 2005). However, it should be noted that this designation applies to expected indoor levels of radon. As discussed above, radon is primarily transmitted into buildings through direct contact with radon-bearing soils, with the gas being concentrated in enclosed areas lacking ventilation such as basements. In rural areas, indoor radon concentrations can be exacerbated though the use of "contaminated" water from local wells which results in the release of radon gas into the indoor air atmosphere. While outdoor air that is drawn into a building may contribute to the indoor radon level, average outdoor air radon levels are about 0.4 pCi/L, but may be higher in some areas (NSC 2005).

In this regard, the Huxtable Quarry Mineral Materials Project proposes to mine limestone and quartzite, which are sedimentary and metamorphic rocks (respectively) which do not and are not expected to contain high levels of uranium. Moreover, any radon that might be potentially released from mining activities associated with the subject quarry would be immediately dispersed to the atmosphere and literally scattered to the winds. Considering both the horizontal and vertical distances from the proposed quarry to existing residences within the general area, it is unlikely that there would be any measurable increase in indoor (or outdoor) radon levels due to the proposed mining activity. As a consequence, potential health and safety concerns from exposure to elevated radon levels emanating from the proposed quarry will not be discussed further in this analysis document.

3.3.1.3 Potential Impacts on Property Values

The Pennsylvania Bureau of Mining and Reclamation performed a study entitled "Effects of Longwall Mining on Real Property Value and the Tax Base of Greene and Washington Counties, Pennsylvania" (PDEP 2002). The study was designed to determine if underground longwall mining had an effect on residential property values, and the real estate tax bases of Greene and Washington Counties over a period of 10 years between 1993 and 2002.

The findings of this study reported the following:

> *While undoubtedly the real estate truism: " value is derived from three factors- location, location, location" is based in fact, in general, proximity to a longwall mine does not appear to be the major factor in determining "county value" and therefore assessed value. Other factors such as access to utilities (public sewer and water), proximity to major roads, density of residences, and the desirability of surrounding land uses appear more likely to influence the general taxable value (county value) of residential properties.*

The findings of this study also stated that

> *There was no correlation between location with respect to longwall mining and the ratio of sales price to county value.*

The above study refers to the coal mining industry in Pennsylvania, which has a much greater impact upon the local area than does the quarry as proposed herein. Nonetheless, this study does illustrate that property values in Green and Washington Counties, Pennsylvania did not appear to decrease solely due the presence of a sub-surface mining operation in the area (PDEP 2002).

Local realtors, as well as the Converse County Assessor's office, were contacted in an effort to obtain any relevant information on the potential effects of the proposed quarry on local property values. None of the people contacted were able to make any predictions as to the possible effect that such a project would have on local property values due to the many variables used to determine land value.

As indicated above, location seems to be the key factor in assessing property value. While aesthetic values may play a role in property sales between willing sellers and willing buyers, this is typically not the sole factor in determining property value and/or the salability of said property. Considering that there are no subdivisions or planned housing developments within the affected area and the dominant land use in the area is agricultural, it is unlikely that the proposed project would have a detrimental effect upon local property values as the value of the land for agricultural purposes will not be diminished by the establishment of the Huxtable quarry.

Should area land owners propose a residential subdivision at some point in the future, the development would occur pursuant to current county zoning in the area and subsequent to the commencement of mining operations. Prospective buyers would be aware from the outset of the visual intrusion resulting from the quarry and would make personal decisions on property purchases accordingly. As a consequence, the potential impacts to local property values will not be discussed further in this analysis document.

3.4 AIR QUALITY

No site-specific air quality data are available from the proposed project area; however, air quality in the area is generally good and is in compliance with state and national ambient air quality standards. The principal air-borne pollutant within the proposed project area is particulate matter in the form of fugitive dust (uncontrolled wind-carried particulates) generated from natural and

human sources. Current national and state air quality standards are presented in Table 3.3. Visibility in the region is typically very good (> 70 miles) and fine particulates are generally considered to be the main source of visibility degradation (BLM 1985a).

Table 3.3 Selected National and Wyoming Ambient Air Quality Standards

Air Pollutant	Averaging Time Period	NAAQS (Fg/m^3) [2]	WAAQS (Fg/m^3) [3]	Incremental Increase Above Legal Baseline	
				PSD Class I	PSD Class II
Particulate matter <10 microns in diameter (PM_{10})	24-hour	150	150	8	30
	AAM [4]	50	50	4	17
Particulate matter <2.5 microns in diameter ($PM_{2.5}$)	24-hour	65	65	ns [6]	ns
	AAM	15	15	ns	ns
Ozone	1-hour	235	235	ns	ns
	8-hour	157	ns	ns	ns
Nitrogen dioxide (NO_2)	AAM	100	100	2.5	25
Sulfur dioxide (SO_2)	3-hour	1,300 [7]	1,300	25	512
	24-hour	365	260	5	91
	AAM	80	60	2	20
Carbon monoxide (CO)	1-hour	40,000	40,000	ns	ns
	8-hour	10,000	10,000	ns	ns

[2] NAAQS = National Ambient Air Quality Standards (adapted from 40 CFR 50.5-50.12). Primary standard unless otherwise noted. National Primary Standards establish the level of air quality necessary to protect public health from any known or anticipated effects of a pollutant, allowing a margin of safety to protect sensitive members of the population.

[3] WAAQS = Wyoming Ambient Air Quality Standard (adapted from WDEQ/AQD [2000a]).

[4] AAM = annual arithmetic mean.

[5] nd = no data.

[6] ns = no standard.

[7] Secondary standard. National Secondary Standards establish the level of air quality to protect the public welfare by preventing injury to agricultural crops and livestock deterioration of materials and property and adverse impacts to the environment.

3.5 NOISE

No site-specific noise level data are available for the proposed project area; however, noise in the area is probably in the range reported for "Grand Canyon (North Rim)" (wilderness) and "Farm in Valley" sites (Wyle Laboratories 1971).

The A-weighted sound pressure level, or A-scale, is used extensively in the U.S. to measure community and transportation noise and is a measure of noise in A-weighted decibels (dBA), which is directly correlated with some commonly heard sounds. Table 3.4 presents a list of commonly heard sounds with the corresponding noise level (Rau and Wooten 1980). Median noise levels for the proposed project area likely ranges from 20 to 40 dBA in the morning and

evening and from 50 to 60 dBA in the afternoon when wind speeds are typically greatest. These levels correspond to noise levels of a soft whisper (30 dBA), a library (40 dBA), a quiet office (50dBA), a small town 40-50 dBA), and normal conversation (60 dBA). Traffic along an interstate typically averages noise levels > 70 dBA (Wyle Laboratories 1971).

Table 3.4 Comparison of Measured Noise Levels with Commonly Heard Sounds, Wills Quarry Project, 2001 [1]

Source	dBA	Description
Normal breathing	10	Barely audible
Rustling leaves	20	
Soft whisper (at 16 feet)	30	Very quiet
Library	40	
Quiet office	50	Quiet
Normal conversation (at 3 feet)	60	
Busy traffic	70	Noisy
Noisy office with machines; factory	80	
Heavy truck traffic (at 49 feet)	90	Constant exposure endangers hearing

[1] Source: Rau and Wooten (1980).

Typical ambient noise levels at an operating surface quarry are in the 40 to 60 dBA range for a 24-hour period, and within 50 ft of the operation the maximum noise level could reach or exceed 85 to 95 dBA (BLM 1997a). Traffic along Bed Tick Road, Wyoming Highway 91 (Cold Springs Road), livestock grazing operations and wind are presently the primary sources of noise in the proposed project area. Examples of noise-sensitive areas in Wyoming include private residences, occupied raptor nests and greater sage-grouse leks during the breeding and nesting season(s).

There are no occupied dwellings, homes, public buildings (i.e., schools, churches or institutional buildings), parks, cemeteries or community centers within 0.75 miles of the proposed quarry area that would be affected by noise associated with the Proposed Action or alternatives.

3.6 CULTURAL RESOURCES

Cultural resources are the non-renewable physical remains of past human activity and are protected under Section 106 of the *National Historic Preservation Act of 1966* (as amended) and the *Archaeological Resources Protection Action of 1979* (as amended). Archaeological investigations in the North Platte River Valley basin indicate that human activity has occurred across the landscape over the past 10,000 years, beginning during he Paleo-Indian period and continuing up to the present (Frison 1991).

A Class III cultural resource investigation was conducted on August 27, 2003 by Archaeological Energy Consulting of Casper, Wyoming. The investigation covered the proposed 10-acre quarry area and access (haul) road route. No significant cultural resources were identified and cultural resource clearance was subsequently recommended for the Proposed Action. An additional investigation was conducted by Archaeological Energy Consulting on July 3, 2004 covering an additional 30 acres of potential surface disturbance associated with the expanded quarry as proposed in Alternative A. No prehistoric cultural resources were identified during the course of the second investigation. A historical homestead was recorded and subsequently evaluated by Rosenburg Historical Consultants in conjunction with these inventories. The homestead was recommended as not eligible for nomination to the National Register of Historical Places (NRHP). While BLM Class I and III cultural surveys were not conducted outside of those areas to be potentially disturbed by the Proposed Action and alternatives, there are undoubtedly other cultural resources in the Sheep Mountain area.

Public scoping conducted on the proposed Huxtable Quarry Mineral Materials Project identified a potential impact to the Emigrant Trail, which is located approximately 7,500 feet (1.42 miles) northeast of the proposed quarry area in Section 33 (at it's closest point) and approximately 2,700 feet (0.51 miles) east/northeast of the junction of the proposed access (haul) road with Wyoming Highway 91 (see Figure 2.1). However, the setting and visual integrity of the Emigrant Trail has been compromised by pre-existing development (e.g., power line and pipeline right-of-ways, roads and trails, residences and associated outbuildings) within the general area (Arthur 2005).

3.7 MINERAL RESOURCES

Bedrock, rock outcrops, regolith, cobbles, gravels and coarse soils characterize much of the western portion of the proposed project area. A light gray silty clay loam formed from a residuum of sandstone, siltstone, and limestone occurs on the finger ridges, with sandy loams, sands, and poorly sorted gravels formed from alluvium along eastern portions of the ephemeral drainages (Lageson and Spearing 1988; Love and Christiansen 1985).

Exploratory drilling has not been conducted within the proposed quarry area because of the rugged terrain, the associated costs, and the potential surface disturbance that would occur in conjunction with the exploratory drilling operations. However, preliminary surface investigations indicate that the proposed quarry area contains various types of industrial non-metallic minerals including construction aggregates (e.g., sand and gravel, limestone, and quartzite) and decorative fieldstone (e.g., moss rock). The construction aggregates are suitable for road base construction, concrete, asphalt, and rip-rap for drainage control structures. The decorative fieldstone is rock covered with moss, algae, fungi, or lichen and is suitable for landscaping purposes.

The project proponent estimates that approximately 1.2 million tons of construction aggregates could be mined from the 10-acre quarry site over the LOP. An additional 4.5 million tons of mineral material could be mined from the 40-acre alternative (Alternative A) over the LOP. These tonnage estimates do not account for unmarketable (i.e., waste) materials that would be produced during the processing (i.e., crushing) phase of the operation and which would not meet

contract or market specifications. During the mining operation, the unmarketable materials would be returned to the quarry for backfilling and/or used for surfacing of the access (haul) road and selected work areas within said quarry. Depending on the type of material that is being mined and its intended uses, the amount of unmarketable materials may account for as much as 25% of the total tonnage mined.

3.8 RECREATION

Recreational opportunities within the general project area (southern Converse County) include hunting, hiking, camping, off-road vehicle (ORV) travel, wildlife viewing and rock hounding (BLM 1984) and are all controlled by the landowner and require his permission. According to the project proponent deer hunting and rock hounding are the only recreational activities that occur within the HQPA (Huxtable 2005).

3.9 SOCIOECONOMICS

Converse County's population increased from 11,128 in 1990 to an estimated 12,560 in 2000 - a 12.9% increase resulting from people moving into the county seeking employment in mining, petroleum, and related industries (USDC 1990, WDOE 2001). Total full-time and part-time employment in Converse County was 5,887 in 1990, which was composed of 5,418 non-farm workers and 469 farm workers. Total full-time and part-time employment increased in Converse County to 6,953 in 1998 - an 18.1% increase over 1990 employment levels. In 1998, service employment represented the single largest employment sector in Converse County, with approximately 1,200 workers, followed closely by 1,199 workers employed in retail trade, 977 workers employed by local governments, and 868 workers employed in the mining industry (WDOE 2001).

Annual per capita personal income in Converse County was $14,487 in 1990 compared to $19,977 in 1998 - 37.9% increase (WDOE 2001). The annual average unemployment rate in Converse County in 1999 was 5.2%, compared to 4.9% for Wyoming for the same time period (WDOE 2001). The cost of living index for Converse County was 93 during the fourth quarter of 1999 in Douglas, compared to a statewide average for Wyoming of 100 (WDOE 2001). According to the 1990 census, the percent of all persons living below the poverty level in Converse County was 11.9%, which was identical to the statewide average for Wyoming for the same period. There were 1,188 vacant housing units or a rate of 8.9% in Converse County in 1990, compared to the statewide average vacant housing rate of 3.9% during the same time period (USDC 1990).

3.10 SOIL RESOURCES

Soils in the project area are highly variable depending on landscape position and parent material. Preliminary Natural Resources Conservation Service (NRCS) soils mapping (Soil Survey of Converse County - South Half) and soil descriptions for the project area are included in Appendix A. Soil maps and descriptions are available at the NRCS office in Douglas. Soils

along the proposed access route are typically well drained loams and sandy loams on relatively gentle slopes with a moderate erosion hazard. Near the proposed quarry site slopes increase and the erosion hazard is moderate to severe. NRCS mapping identifies the soils at the proposed quarry site as Tyzak-Rock Outcrop Complex (Tyzak). The Tyzak soil covers approximately 50% of the mapping unit and is typically shallow to bedrock (less than 11 inches) with a high content of coarse fragments. Erosion hazard on the Tyzak soil is severe due to steep slopes and shallow, poorly developed soils. Reclamation potential is poor due to shallow, poorly developed soils and the large amount of coarse fragments present (NRCS 2003)

3.11 TRANSPORTATION

The primary safety risks for people living, working and traveling to/from the general project area are related to vehiclular traffic. These risks also include safety issues related to public school bus traffic along Wyoming State Highways 91 and 96. Surface transportation into and out of the proposed project area would be provided by a privately-owned access (haul) road, while access to the general project area from Douglas would be provided by two public highways including Wyoming State Highway 91 (Cold Springs Road) and Wyoming State Highway 96 (Chalk Buttes Road) - which represent the only readily accessible public roads into the proposed project area (see Figures 2.1 and 2.3). These public roads provide the principal roadway linking the proposed project area with the rest of central Wyoming and the national highway system. According to 1998 data from the Wyoming Department of Transportation (WDOT), average daily traffic (ADT) for Wyoming State Highway 91, on Mile Post 2.99 west of Douglas near the proposed project area, was recorded at 292 vehicles over a 24-hour period (WDOT 1999).

According to information provided by Converse County School District #1, two public school buses make morning and afternoon stops along the Cold Springs and Chalk Buttes Roads. When combined, there are two school buses scheduled to travel between Douglas and the Cold Springs Road on school days, with these buses traveling area roadways between the hours of 7:03 and 7:37 n the morning and between 3:05 and 4:30 n the afternoon.

Bus #22's route begins on Cold Springs Road and continues onto Chalk Buttes Road. According to the published school bus schedule for Bus #22, the stops occur between 7:03 and 7:35 in the morning and between 3:25 and 4:30 in the afternoon. Bus #6's route begins on the Easterbrook Road and continues to the Chalk Buttes Road. According to the published school bus schedule for Bus #6, stops occur between 7:08 and 7:37 in the morning and between 3:05 and 4:20 in the afternoon.

The proposed access (haul) road within the HQPA would be approximately 2 miles in length (including 1.2 miles of existing, flat-bladed road and 0.8 miles of existing two-track trail) and is currently being used by the project proponent for routine agricultural activities associated with his ranching operation. As previously indicated, the access (haul) road is located solely on private surface estate owned by the project proponent and access to these private lands (the project area) is strictly controlled. It is estimated that the existing road is currently being used by the project proponent as little as once per day and as much as four times per day.

3.12 VEGETATION

The Wyoming Gap Analysis project (Merrill et al. 1996) mapped landcover types in polygons throughout the state of Wyoming with each polygon assigned a primary cover type. Most polygons were also assigned a secondary cover type, both of which were generated from landsat imagery. The Wyoming Natural Diversity Database (WYNDD) was asked to provide the GAP landcover data for the HQPA. According to GAP, the primary cover-type within the W½ of Section 28 and the N½NW¼ of Section 33 is Basin Rock and Soil, with a Xeric Upland Shrub cover type identified within the S½NW¼ and much of the SW¼ of Section 33. The secondary cover type includes Wyoming Big Sagebrush and Black Sage Steppe respectively (WYNDD 2005). No riparian or wetland plant communities/habitat was observed in the HQPA in conjunction with the biological inventory conducted on February 24, 2005 (AEC 2005).

The proposed quarry area supports a mountain foothills shrub/juniper woodland habitat type (see Table 3.5) consisting of true mountain mahogany (*Cerocarpus montanus*), Antelope bitterbrush (*Purshia tridentate*), Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), silver sagebrush (*Artemisia filifolia*), skunkbush (*Rhus trilobata*), sumac (*Rhus coriaria*), common snowberry (*Symphoricarpos albus*), common serviceberry (*Amelanchier ainifolia*), rubber rabbitbrush (*Chrysothamnus nauseosus*) with interspersed juniper (*Juniperus chinensis*). The understory consists mostly of bluebunch wheatgrass (*Pseudoroegneria spicata*), Idaho fescue (*Festuca idahoensis*), needle-and-thread grass (*Stipa comata*), prairie junegrass (*Koeleria macrantha*), cheatgrass (*Bromus tectorum*) and numerous forb species.

The proposed access road route supports a predominately shrub steppe prairie habitat type with a small area of shortgrass prairie (see Table 3.5) along a short segment of the road route directly south of Bed Tick Creek. Dominant shrubs in the shrub-steppe habitat include Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), silver sagebrush (*Artemisia cana*), antelope bitterbrush (*Purshia tridentata*) and rubber rabbitbrush (*Chrysothamnus nauseosus*). Each of these species can be the only shrub or appear in complex seral conditions with other shrubs with a common shrub complex consisting of antelope bitterbrush and Wyoming big sagebrush. When this habitat is in good or better ecological condition a bunchgrass steppe layer is characteristic. Diagnostic native bunchgrasses that often dominate different shrub-steppe habitats include bluebunch wheatgrass (*Pseudoroegneria spicata*), Idaho fescue (*Festuca idahoensis*), bottlebrush squirreltail (*Elymus elymoides*), needle-and-thread grass (*Stipa comata*), threadleaf sedge (*Carex filifolia*) and Sandberg bluegrass (*Poa sandbergii*). Depending on site potential and disturbance history, the shrub-steppe habitat type can be rich in forbs or have little forb cover.

No site specific surveys have been conducted to determine the presence of invasive non-native species. However, it is possible that Canadian thistle (*Cirsium arvense*), musk thistle (*Carduus nutans*), cheatgrass (*Bromus tectorum*), Russian knapweed (*Acroptilon repens*), and halogeton (*Halogeton glomeratus*) occur on or adjacent to previously disturbed areas within the overall project area.

3.13 VISUAL RESOURCES

The project location lies within a Visual Resource Management (VRM) Class III area. Management objectives for this location are to partially retain the existing character of the landscape. Moderate levels of contrast are acceptable and new visual intrusions may draw the viewers' attention. However, new projects should not dominate the landscape. Best management practices for visual resources dictates that the basic elements which make up the existing landscape (i.e., line, form, color and texture) should be repeated whenever possible.

A key observation point (KOP) was selected from which to assess the existing visual environment within and adjacent to the HQPA. KOPs are chosen with the following criteria in mind: angle of observation, number of viewers, length of time project is in view, relative project size, season of use and lighting conditions. For this project a single KOP (located on County Road 8 and approximately midway between the base of the divide between Bed Tick and Little Bed Tick Creeks) was chosen as this was representative of the most significant view of the proposed quarry operation (see Figure #1 in Appendix B). The proposed Huxtable quarry is located roughly 1.3 miles southwest of the KOP. Two classes of viewers would be affected by changes in the project area. Transient viewers traveling on the county road will be able to see the proposed quarry for several minutes as they traverse the valley bottom. Moreover, entering the valley from the north would provide a direct, head-on view of the HQPA for a short time, at a distance of about 1.4 miles. Since these viewers are likely driving and focusing on the road ahead, their perception of the proposed quarry activity area would be limited. The second set of viewers are occupants of four of the five residences adjacent to and north of Bed Tick Creek. These individuals can view the proposed project area at distances varying from 0.8 miles and 1.75 miles, generally southwest of the dwellings. Indivisibility here is a larger issue in that the viewers have an opportunity to observe the project area on a daily basis and potentially for much longer periods of time.

Based on computer-generated viewshed analysis, the HQPA could also be seen from a distance along portions of Interstate 25 (I-25) south of Douglas, and possibly from upland locations within the Douglas environ (see Figure #'s 2 and 3 in Appendix B). These were not considered viable KOPs due to distance, length of time the project would be in view (particularly from I-25) and the screening effect of intervening landforms, vegetation and other developments.

In order to describe the characteristic landscape, visual resource management (VRM) techniques are used to portray the project area in objective terms of line, form, color, and texture. Another important factor in typifying a landscape is that of distance zones and the landscape components existing within them. Distance zones consist of the foreground, midground and background and are generally addressed as measured distances (foreground would be from KOP to three miles, midground from three to five miles, and background five miles and beyond). In constrained areas such as the Proposed Action, the foreground, midground and background are more readily defined by the landscape itself. In this case, the foreground extends from the KOP on the county road across the meadow/pasture area to the base of Sheep Mountain and surrounding foothills, a distance of about 1.4 miles. The midground, which contains the proposed quarry consists of the foothill zone itself, and the background the rising slopes of Sheep Mountain proper up to the skyline.

The foreground consists of flat to gently rolling hay meadows, ditches and several lines and clusters of trees. Gently rounded horizontal shapes dominate the view, echoed by the rounded shapes of the cottonwood groves. In contrast, the near foreground also contains several residential and agricultural structures, driveways, and fences. The midground, which contains the project area, is characterized by higher flat-topped benches rising a hundred feet or more above the foreground plain. These benches are dissected by drainages heading in the higher country to the west, forming a series of V-shaped valleys opening onto the lower flat and introducing a series of horizontal and diagonal lines. Darker vegetation serves to accentuate the difference in character between the lowlands and foothill benches. Rising behind these benches, Sheep Mountain forms a rounded backdrop with generally smooth curvilinear shapes against the skyline. Vegetation cover varies throughout this background exposing rock and mineral soil in some areas, and covering the surface in others.

Overall, the general project area is a typical valley floor/uplands interface with benches and steeper slopes climbing to the skyline. Essentially rural, there is only moderate development within the overall viewshed. Five residences line the county road with perhaps a quarter to half mile between them. Outbuildings and other structures are confined to the immediate vicinity of the dwellings, limiting the cultural component of the landscape to a narrow, discontinuous band along the road. There is a cylindrical water tank and a rectangular structure located at distance to the southwest on the bench in the midground, but they are quite small seen from any relevant point on the county road and are thus subordinate to the larger natural features. There is a two-track road visible leading generally into the project area, and another ascending the eastern slope of Sheep Mountain a short distance north of the proposed quarry. Both are visible only in the distance and are somewhat subdued. At the same time, however, they do introduce artificial linear shapes into an otherwise rounded natural view.

3.14 WATER RESOURCES

3.14.1 Surface Water Resources

The proposed project area lies entirely within the North Platte River drainage basin and is drained by an unnamed, well-defined, second-order ephemeral drainage that drains into Bed Tick Creek and eventually into the North Platte River approximately 5.5 miles east of the HQPA. Bed Tick Creek is the only intermittent stream within 2 miles of the proposed project area and is located approximately 0.5 miles north of the proposed quarry site.

Two small stock ponds are located approximately 400 feet and 700 feet, respectively, down stream of the proposed quarry site within the second-order ephemeral drainage referenced above. These stock ponds are currently dry but do retain water during heavy precipitation events. These ponds are fed by precipitation runoff from the general project area. There are no other reservoirs, ponds or pits within the HQPA.

There is no site-specific surface water quality data from the proposed project area; however, a comparison of water quality data from the general area with WDEQ/WQD Chapter 8 water class standards (WDEQ/WQD 2000) indicates that surface water quality would typically meet

livestock class of use (Class III) criteria (BLM 1998). Bed Tick Creek is an ephemeral stream that is classified by WDEQ (2001 stream classification list) as a Class 3B drainage, which indicates that it does not support fish habitat but does support other aquatic life. As a consequence, it is unlikely that Bed Tick Creek is able to support game fish populations due to a lack of nursery areas and/or food sources (WDEQ/WQD 1990). The project proponent confirms that the upper reaches of Bed Tick Creek within the HQPA does not flow except during periods of heavy spring runoff or intense local precipitation events (Huxtable 2005).

Neither Bed Tick Creek nor the segment of the North Platte River located immediately below the confluence of Bed Tick Creek and the North Platte River are included on the WDEQ/WQD 2000 305(b) list of water bodies with water quality impairments (WDEQ/WQD 2000). This list includes rivers, streams, creeks, or any bodies of water for which effluent limitations required by the federal *Clean Water Act*, as amended, are not stringent enough to implement any water quality standards applicable to such waters.

3.14.2 Ground Water Resources

No exploratory drilling has been conducted within the proposed project area, and there are no existing water wells within the actual project area. However, records maintained by the Wyoming State Engineer's Office indicate that there are a total of 157 ground water rights within a 3-miles radius of the proposed project area. There are 9 water wells within a one-mile radius of the quarry site (refer to Figure 3.1). Their static water depths and total well depths are tabulated in Table 3.5.

Table 3.5 Water Wells within a One Mile Radius of the Proposed Huxtable Quarry

Permit Number	Priority Date	Legal Description				Facility Name	Applicant	Well Depth	Static Depth
		Township	Range	Section	Qtr-Qtr				
P86479W	10/28/91	32N	72W	34	SWSW	Fritz #2	Lawrence Fritz	N/A	N/A
P97415W	04/17/90	32N	72W	33	NESE	Sheep Mtn. #1	City of Douglas	1165'	365'
P82387W	04/17/90	32N	72W	34	SWNW	Ridge Water-WWDC #1	WY Water Dev-elopment Comm.	N/A	N/A
P70305W	05/28/85	32N	72W	34	SWNW	ENL Gedney #3	Henry Gedney	120'	30'
P12073W	03/31/10	32N	72W	34	SWNW	Gedney #3	Henry Gedney	120'	30'
P80219W	07/14/89	32N	72W	33	NWNW	Huxtable #2	James Huxtable	160'	42'
P83411W	08/06/90	32N	72W	34	NENW	Bedtick I	Mary J. Smith	125'	25'
P83412W	08/06/90	32N	72W	34	NENW	Bedtick II (deepened)	Mary J. Smith	165'	25'
P11413P	09/30/06	31N	72W	05	NWNW	Whitaker	Wm. H. Cross & Sons	100'	40'

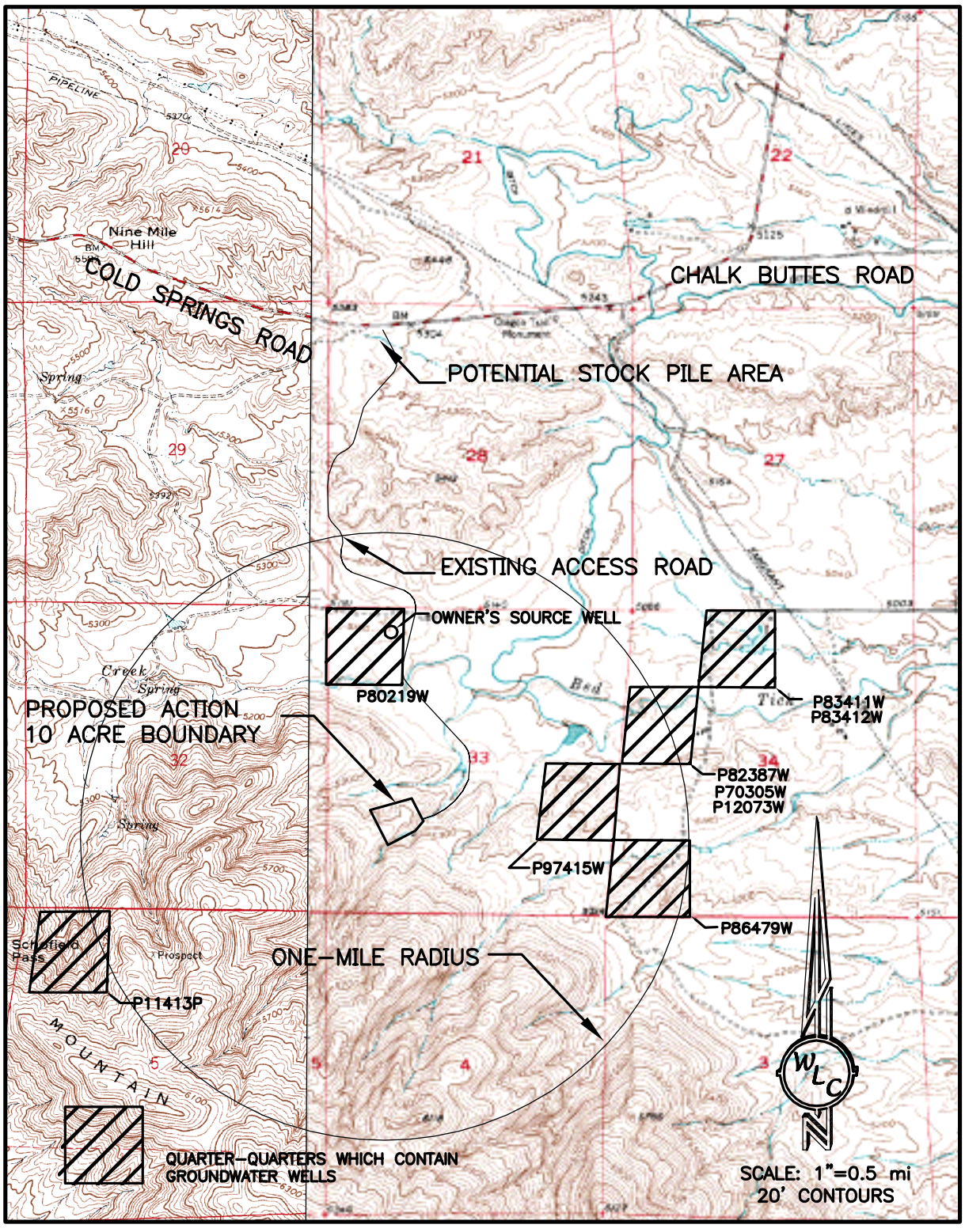

Figure 3.1 Water Wells within a One Mile Radius of the Project Area

Depths were not available for the Ridge Water-WWDC #1 and Fritz #2 wells. The City of Douglas owns the Sheep Mountain Well #1 located approximately 3,000 feet (+/-) east/northeast of the proposed quarry site.

There is no site-specific ground water quality data from the proposed project area; however, a comparison of water quality data from the general area to WDEQ/WQD water class standards (WDEQ/WQD 1993) indicates that ground water quality would typically meet livestock class of use (Class III) criteria (BLM 1998). Most likely the water quality in these wells is better than Class III, since some of the wells listed in Table 3.5 have been permitted as domestic wells.

3.15 WILDLIFE RESOURCES

Information concerning wildlife resources within the HQPA is presented below.

3.15.1 Big Game

Mule deer (*Odocoileus hemionus*) are the primary big game species found within the proposed HQPA with deer populations in this area classified within the South Converse Herd Unit (hunt area 65). The South Converse Herd Unit has a post-season population objective of 16,000 animals with a 2003 post-season estimate of 10,081 deer, 37% below population objectives. Drought continues to be one of the primary factors depressing mule deer populations in this herd unit. The proposed quarry is located within crucial winter/yearlong range for mule deer (WGFD 2003a).

Other big game species which may inhabit portions of the proposed HQPA include elk (*Cervus elaphus*), pronghorn antelope *(Antilocapra americana)*, Rocky Mountain bighorn sheep (*Ovis canadensis*), and white-tailed deer (*Odocoileus virginianus*). No crucial habitats for any of these species exist within the proposed project area.

3.15.2 Other Mammals

Other mammal species known to occur or to potentially occur in the HQPA include badger (*Taxidea taxus*), bobcat (*Lynx rufus*), black-tailed jackrabbit *(Lepus californicus*), coyote (*Canis latrans*), deer mouse (*Peromyscus maniculatus*), desert cottontail (*Sylvilagus auduboni*), least chipmunk (*Tamias minimus*), long-legged myotis (*Myotis volans*), mountain lion (*Felis concolor*), northern pocket gopher (*Thomomys talpoides*), striped skunk (*Mephitis mephitis*), thirteen-lined ground squirrel (*Spermophilus tridecemlineatus*), white-tailed jackrabbit (*Lepus townsendii*), and Wyoming ground squirrel (*Spermophilus elegans*) (WGFD 1999).

3.15.3 Raptors

The HQPA contains potential nesting habitat for a variety of raptor species including, but not limited to golden eagle (*Aquila chrysaetos*), ferruginous hawk (*Buteo regalis*), Swainson's hawk

(*Buteo swainsoni*), red-tailed hawk (*Buteo jamaicensis*), and prairie falcon (*Falco mexicanus*) (WGFD 1999).

An inventory of historic raptor nesting activity within the HQPA was conducted by Robert M. Anderson/Anderson Environmental Consulting (AEC) on February 24, 2005. No historic raptor nests were observed within the inventory area (AEC 2005).

3.15.4 Migratory and Non-Migratory Birds

Bird species distribution as reported in *The Atlas of Birds, Mammals, Reptiles and Amphibians in Wyoming* (WGFD 1999) includes a compilation of observations mapped by latitude and longitude, with the State of Wyoming divided into 28 regions. These regions are based upon a one degree separation of both latitude and longitude. The HQPA falls with Wyoming Distribution Area (latilongs) 20 as defined by the WGFD (1999). Avian distribution data for the Partners in Flight (PIF) priority species potentially occurring within the HQPA is included in Table 3.6. Only those birds that have been classified by WGFD (1999) as confirmed breeders (nest and/or young observed), with circumstantial evidence of breeding (nest and/or young not located), or that have been observed at any time (season) within the general area (but without any evidence of breeding) are included in the list. PIF priority species that have not been observed within Wyoming Distribution Area 20 are not included in Table 3.6.

Most of the birds listed in Table 3.6 typically nest either on the ground, in shrubs or in rock habitat (cliffs, ledges, crevices, etc.); therefore, activities associated with the Proposed Action have the potential to destroy individual nests, eggs, and/or young of some of these species. Projected losses are indeterminate as there are no Breeding Bird Survey (BBS) routes located within the immediate vicinity of the HQPA to provide information on breeding bird densities.

Concerns regarding the decline of both migratory and non-migratory bird populations both locally and on a continental scale have resulted in a nationwide bird conservation planning effort. Management goals and objectives for bird conservation are found in the Land Bird Strategic Plan, Presidential Executive Order (EO) 13186 dated January 17, 2001, and the Proposed Memorandum of Understanding associated with the above Presidential EO. Bird Conservation Plans prepared at the state and regional levels also include objectives for bird conservation. As evidenced by EO 13186, there has been national direction to implement actions that incorporate these goals.

3.15.5 Amphibians, Reptiles and Fish

Based on range and habitat preference, few if any amphibians or reptiles (herptiles) occur in the HQPA. Herptiles that may occur in the overall project area include Northern leopard frog (*Rana pipiens*), Northern many-lined skink (*Eumeces multivirgatus multivirgatus*), red-lipped prairie lizard (*Sceloporus undulatus erythrocheilus*), Northern prairie lizard (*Sceloporus undulatus garmani*), Western smooth green snake (*Liochlorophis vernalis blanchardi*) and milk snake (*Lampropeltis triangulatum*) (WYNDD 2005).

Table 3.6 List of Partners In Flight (PIF) Priority Bird Species Potentially Found within the Huxtable Quarry Project Area (Nicholoff 2003)

Common Name	Scientific Name	Habitat Type [1]	Distribution Area 20 [2]
Level I Species (Conservation Action)			
Ferruginous Hawk	*Buteo regalis*	SS/SGP	B
Greater Sage Grouse	*Centrocercus urophasianus*	SS	B
Mountain Plover	*Charadrius montanus*	SS/SGP	B
Upland Sandpiper	*Bartramia longicauda*	SGP	O
Long-billed Curlew	*Numenius americana*	SGP	O
Burrowing Owl	*Athene cunnicularia*	SGP	B
Short-eared Owl	*Asio flammeus*	SGP	O
Brewer's Sparrow	*Spizella breweri*	SS, MFS	B
McCown's Longspur	*Calcarius mccownii*	SS/SGP	B
Level II Species (Monitoring)			
White-throated swift	*Aeronautes saxatalis*	Spec.	O
Gray flycatcher	*Empidonax wrightii*	MFS	O
Dusky flycatcher	*Empidonax oberholseri*	MFS	B
Cassin's Kingbird	*Tyrannus vociferans*	JW	O
Loggerhead Shrike	*Lanius ludovicianus*	SS	B
Juniper Titmouse	*Baeolophus griseus*	JW	O
Western Bluebird	*Sialia mexicana*	JW	O
Townsend's Solitare	*Myadestes townsendii*	JW	B
Sage Thrasher	*Oreoscoptes montanus*	SS	B
Vesper Sparrow	*Pooecetes gramineus*	SS	B
Lark Sparrow	*Chondestes grammacus*	SS	B
Lark Bunting	*Calamospiza melanocorys*	SGP	B
Grasshopper Sparrow	*Ammodramus savannarum*	SGP	B
Chestnut-collared Longspur	*Calcarius omatusi*	SGP	O
Dickcissel	*Spiza Americana*	SGP	O
Bobolink	*Dolichonyx oryzivorus*	SGP	O
Level III Species (Local Interest)			
Golden eagle	*Aquila chrysaetos*	Spec.	B
Prairie Falcon	*Falco mexicanus*	Spec.	B
Common Poorwill	*Phalaenoptilus nuttallii*	SS	B
Say's Phoebe	*Sayornis saya*	SS	B
Rock Wren	*Salpinctes obsoletus*	Spec.	B
Bewick's Wren	*Thryomanes bewickii*	JW	O
Virginia's Warbler	*Vermivora virginiae*	JW	O

[1] Habitat Types: SS = Shrub-steppe
SGP = Shortgrass Prairie
JW = Juniper Woodland
MFS = Mountain-foothills Shrub
Spec. = Specialized (cliffs and canyons)

[2] B = Nest or young dependent upon parent birds observed.
b = Circumstantial evidence of breeding.
O = Species has been observed, but there was no evidence of nesting.

Due to the lack of permanent water bodies or perennial streams, the HQPA is not likely to support any fish populations (AEC 2005).

3.16 THREATENED, ENDANGERED AND BLM SENSITIVE SPECIES

The *Endangered Species Act* (ESA) (16 USC 1531-1543) protects listed threatened and endangered (T/E) plant and animal species and their critical habitats. A list of T/E species that potentially occur within the HQPA was provided by the Wyoming State Office of the USFWS. Endangered species are those species which are in danger of extinction throughout all or a significant portion of their range while threatened species are those species likely to become endangered in the foreseeable future throughout all or a significant portion of their range. Proposed species are those species for which the USFWS has published proposed rules in the *Federal Register* for listing of the species, but for which a final rule has not been adopted.

3.16.1 Federally Listed Animal and Plant Species

Federally listed species identified by the USFWS in their response to project scoping that may occur in the vicinity of the HQPA include the threatened bald eagle, the endangered black-footed ferret, the threatened Preble's meadow jumping mouse, the threatened Ute ladies'-tresses as well as five species found downstream in the North Platte River drainage that could be affected by water depletions as shown in Table 3.7. In 2003, the USFWS issued a decision that the mountain plover did not warrant protection under the ESA. Likewise, the USFWS recently issued a similar decision on greater sage grouse and elected not to list the species at this time. Therefore, neither of these species currently warrant protection under the ESA.

A discussion of those T/E species identified by the USFWS as potentially occurring within the HQPA follows.

Bald Eagle *(Haliaeetus leucocephalus)*. The bald eagle is a threatened species (down-listed from endangered and now proposed for removal from federal listing) that requires cliffs, large trees, or sheltered canyons associated with a concentrated food source (e.g., fish or waterfowl concentration areas) for nesting and/or roosting areas. Bald eagles forage over wide areas during the non-nesting season (i.e., fall and winter) and scavenge on animal carcasses such as pronghorn, deer, elk, sheep, and cattle (Edwards 1969; Snow 1973; Call 1978; Steenhof 1978; Peterson 1986).

Survey flights during the early 1980's suggested that more bald eagles were foraging in rangelands than along the rivers and other large water bodies. In this regard, open rangelands throughout east-central Wyoming are probably being used opportunistically by bald eagles for foraging (BLM 2005); however, the Wyoming Natural Diversity Database (WYNDD) contains no records of bald eagles within or adjacent to the proposed project area (WYNDD 2005) and BLM's GIS database also indicates that there are no documented bald eagle roost or nest locations within a one-mile radius of the HQPA.

Table 3.7 Federally Listed Threatened and Endangered Species and Their Potential Occurrence within the Huxtable Quarry Project Area

Common Name	Scientific Name	Federal Status [1]	Potential Occurrence Within the HQPA [2]
Mammals			
Black-footed ferret	*Mustela nigripes*	E	X
Preble's meadow jumping mouse	*Zapus hudsonius preblei*	T	R
Birds			
Bald eagle[3]	*Haliaeetus leucocephalus*	T	O
Interior least tern [4]	*Sterna antillarum*	E	X
Piping plover [4]	*Charadrium melodus*	T	X
Eskimo curlew [4]	*Numenius borealis*	E	X
Fish			
Pallid sturgeon [4]	*Scaphirhynchus albus*	E	X
Plants			
Ute ladies'-tresses	*Spiranthes diluvialis*	T	X
Western prairie fringed orchid [4]	*Plantanthera praeclara*	T	X

[1] Federal status: E = listed as federally endangered.
T = listed as federally threatened.

[2] Species occurrence:

O = occasional; this species may occur in the HQPA during specific times of the year and may be locally common when suitable food is available; generally not present for extended periods.
R = rare; species may occur in the HQPA for just a few days or hours (e.g., stopping over during migration), or the species has only occasionally or rarely been sighted in the HQPA. Encounters during the proposed action are very unlikely.
X = unlikely; there has been no recent historical record of the species' occurrence in the HQPA; probability of encountering the species during project-related activity is very unlikely.

[3] Proposed for removal from federal listing.

[4] North Platte River species.

Black-footed Ferret (*Mustela nigripes)*. The black-footed ferret, an endangered species, was once distributed throughout the high plains of the Rocky Mountain and western Great Plains regions (Clark and Stromberg 1987; Forrest et al. 1985). Prairie dogs *(Cynomys sp.)* are the primary food source for black-footed ferrets (Sheets et al. 1972), although historically a few black-footed ferrets have been collected away from prairie dog towns (Forrest et al. 1985).

As there are no prairie dog towns within the HQPA, impacts to black-footed ferrets will not occur; consequently, this species will not be addressed further in this analysis document (AEC 2005).

Preble's meadow jumping mouse *(Zapus hudsonius preblei)*. Preble's meadow jumping mouse, a threatened species, is a potential resident in riparian habitats east of the Laramie Mountains and south of the North Platte River drainages. All subspecies of *Zapus* in Wyoming are strongly associated with riparian areas, and are seldom found outside of heavy vegetation immediately adjacent to flowing streams. Preble's meadow jumping mouse is strongly associated with foothills and plains riparian areas. Heavy herbaceous cover is vital, and the highest densities of *Z. h. preblei* have been recorded in areas with some woody (e.g., cottonwood, willow) overstory. (Beauvais 2001; Keinath 2001; Keinath et al. 2003).

A single male *Z. h. preblei* was captured on Bed Tick Creek in June of 1999 approximately 1.5 miles east (downstream) of the proposed rock quarry access road crossing. The mouse was captured in conjunction with an inventory conducted for Wyoming Interstate Company's Medicine Bow Lateral natural gas pipeline. There are no other known occurrences of *Z .h. prebeli* recorded within or directly adjacent to the proposed project area (WYNDD 2005).

Ute ladies'-tresses *(Spiranthes diluvialis)*. Ute ladies'-tresses, a threatened species, is a perennial orchid that occurs primarily on moist, sub-irrigated or seasonally flooded soils in valley bottoms, gravel bars, old oxbows, or floodplains bordering springs, lakes, rivers, or perennial streams at elevations between 1,800 and 6,800 feet (Fertig 2000; Keinath et al. 2003; Spackman et al. 1997). Where Ute ladies'-tresses occur in ephemeral drainages, ground water is typically shallow (i.e., within approximately 18 inches of the ground surface) (BLM 2004, 2005). The plant has been found locally in the North Platte River drainage below Alcova Reservoir and in the drainages of the Cheyenne and Niobrara Rivers in southeastern Wyoming.

Four occurrences of the species have been recorded in Wyoming, with all discoveries made between 1993 and 1997. The closest recorded occurrence of Ute ladies'-tresses to the HQPA is in northwestern Converse County approximately 50 miles to the north/northwest, and there have been no occurrences recorded within the project area or elsewhere in southern Converse County (Fertig 2000; Keinath et al. 2003; WYNDD 2005). There are no perennial streams with associated riparian habitats as discussed above within the HQPA (AEC 2005) and there have been no occurrences of *S. diluvialis* recorded within the project area (WYNDD 2005). Consequently, this species is not discussed further in this EA.

North Platte River Species. In addition to the species listed above, the USFWS also identified five T/E species that may occur in the downstream riverine habitats of the North Platte River in Nebraska. These species include the endangered interior least tern *(Sterna antillarum)*, the threatened piping plover *(Charadrium melodus)*, the endangered pallid sturgeon *(Scaphirhynchus albus),* the endangered Eskimo curlew *(Numenius borealis)*, and the threatened Western prairie fringed orchid *(Platanthera praeclara)*. These species could be adversely affected by surface water depletions in the North Platte River system resulting from project-related activities.

3.16.2 BLM Sensitive Species

BLM sensitive species are those species that may warrant future designation as proposed T/E species, but available data are not currently sufficient for USFWS to make such a decision. Table 3.8 provides a listing of those BLM sensitive species that could potentially within the State of Wyoming.

BLM sensitive animal and plant species potentially occurring in the general vicinity of the HQPA include ferruginous hawk, American peregrine falcon, greater sage-grouse, mountain plover, burrowing owl, loggerhead shrike, sage thrasher, Brewer's sparrow, fringed myotis, Townsend's big-eared bat, swift fox, and northern leopard frog (WYNDD 2005). There may be some overlap of avian species between Table 3.6 and Table 3.8.

Of the BLM sensitive species identified in Table 3.7 that could potentially occur within the overall project area, three species are more likely to occur within the HQPA based upon a review of habitat types within the project area conducted by AEC on February 24, 2005 and include ferruginous hawk, greater sage-grouse and mountain plover.

Ferruginous hawk (*Buteo regalis*). No ferruginous hawk nests were identified within the HQPA in conjunction with a biological inventory conducted on February 24, 2005 (AEC 2005).

Greater sage-grouse (*Centrocercus urophasianus*). There are two (2) historic greater sage-grouse leks known to exist within this general area of southern Converse County including:

- Poison Lake Road lek: SW¼SW¼NE¼ of Section 36, T31N, R72W; and

- Faulkenberg lek: SW¼NE¼SW¼ of Section 25, T31N, R73W.

The Poison Lake Road lek was active in 1995 and inactive between 1997 and 2000. Strutting activity at the Poison Lake Road lek is not known for the years 1994, 1996 and 2001 through 2003. Strutting activity at the Faulkenberg lek is not known for the ten year period from 1994 through 2003 (WGFD 2003b). None of the above leks are within 5 miles of the HQPA and there are no other known greater sage-grouse leks within a 5 mile radius of the proposed project area. Potential sage grouse nesting and early brood-rearing habitat (based upon observations of shrub height and densities) is not known to exist within the HQPA with the exception of the potential stockpile location directly south of the Cold Springs Road (NE¼NW¼NW¼ of Section 28, T32N, R72W) (AEC 2005).

Mountain plover (*Charadrius montanus*). Mountain plover inhabit the high, dry short-grass plains east of the Rocky Mountains (Dinsmore 1983) as well as the sagebrush grasslands throughout Wyoming (WGFD 1999), and are documented to breed throughout Wyoming, especially in prairie dog colonies (WGFD 1999). Potential mountain plover habitat is not known to exist within the HQPA (AEC 2005).

Table 3.8 Wyoming BLM Sensitive Species and Their Habitat Preferences

Species		Habitat	Likely to Occur [1]
Common Name	**Scientific Name**		
Mammals			
Long-eared Myotis	*Myotis evotis*	Conifer and deciduous forests, caves and mines	N
Fringed Myotis	*Myotis thysanodes*	Conifer forests, woodland-chaparral, caves and mines	N
Spotted Bat	*Euderma maculatum*	Cliffs over perennial water, basin-prairie shrub	N
Townsend's Big-eared Bat	*Corynorhinus townsendii*	Forests, basin-prairie shrub, caves and mines	N
Pygmy Rabbit	*Brachylagus idahoensis*	Basin-prairie and riparian shrub	N
White-tailed Prairie Dog	*Cynomys leucurus*	Basin-prairie shrub, grasslands	N
Wyoming Pocket Gopher	*Thomomys clusius*	Meadows with loose soil	N
Idaho Pocket Gopher	*Thomomys idahoensis*	Shallow stony soils	N
Swift Fox	*Vulpes velox*	Grasslands	N
Birds			
White-faced Ibis	*Plegadis chihi*	Marshes, wet meadows	N
Trumpeter Swan	*Cygnus buccinator*	Lakes, ponds, rivers	N
Northern Goshawk	*Accipter gentilis*	Conifer and deciduous forests	N
Ferruginous Hawk	*Buteo regalis*	Basin-prairie shrub, grassland, rock outcrops	Y
Greater Sage-grouse	*Centrocercus urophasianus*	Basin-prairie shrub, mountain-foothill shrub	Y
Long-billed Curlew	*Numenius americanus*	Grasslands, plains, foothills, wet meadows	N
Yellow-billed Cuckoo	*Coccyzus americanus*	Open woodlands, streamside willow and alder groves	N
Burrowing Owl	*Athene cunicularia*	Grasslands, basin-prairie shrub	N
Sage Thrasher	*Oreoscoptes montanus*	Basin-prairie shrub, mountain-foothill shrub	Y
Loggerhead Shrike	*Lanius ludovicianus*	Basin-prairie shrub, mountain-foothill shrub	Y
Brewer’s Sparrow	*Spizella breweri*	Basin-prairie shrub	N
Mountain Plover	*Charadrius montanus*	Shortgrass, great basin-foothills grassland, and sagebrush-grasslands	N
Fish			
Roundtail Chub	*Gila robusta*	Colorado River drainage, mostly large rivers, also streams and lakes	N
Leatherside Chub	*Gila copei*	Bear, Snake and Green drainages, clear, cool streams and pools	N
Bluehead Sucker	*Catostomus discobolus*	Bear, Snake and Green drainages, all waters	N
Flannelmouth Sucker	*Catostomus latipinnis*	Colorado River drainage, large rivers, streams and lakes	N
Colorado River Cutthroat Trout	*Oncorhynchus clarki pleuriticus*	Colorado River drainage, clear mountain streams	N
Reptiles			
Midget Faded Rattlesnake	*Crotalus viridis concolor*	Mountain foothills shrub, rock outcrop	N

Table 3.8 Continued

Species		Habitat	Likely to Occur [1]
Common Name	**Scientific Name**		
Amphibians			
Boreal (Northern Rocky Mountain population) Toad	*Bufo boreas boreas*	Pond margins, wet meadows, riparian areas	N
Spotted Frog	*Ranus pretiosa (lutieventris)*	Ponds, sloughs, small streams	N
Plants			
Meadow Pussytoes	*Antennaria arcuata*	Moist, hummocky meadows, seeps or springs surrounded by sage/grasslands 4,950-7,900 ft	N
Small Rock Cress	*Arabis pusilla*	Cracks/crevices in sparsely vegetated granite and pegmatite outcrops within sage/grasslands 8,000-8,100 ft	N
Mystery Wormwood	*Artemisia biennis* var. *diffusa*	Clay flats and playas 6,500 ft	N
Nelson's Milkvetch	*Astragalus nelsonianus* or *Astragalus pectinatus* var. *platyphyllus*	Alkaline clay flats, shale bluffs and gullies, pebbly slopes, and volcanic cinders in sparsely vegetated sagebrush, juniper and cushion plant communities at 5,200-7,600 ft	N
Precocious Milkvetch	*Astragalus proimanthus*	Cushion plant communities on rocky, clay soils mixed with shale on summits and slopes of white shale hills 6,800-7,200 ft	N
Cedar Rim Thistle	*Cirsium aridum*	Barren, chalky hills, gravelly slopes, and fine textured, sandy-shaley draws 6,700-7,200 ft	N
Ownbey's Thistle	*Cirsium ownbeyi*	Sparsely vegetated shaley slopes in sage and juniper communities 6,440-8,400 ft	N
Wyoming Tansymustard	*Descurainia torulosa*	Sparsely vegetated sandy slopes at base of cliffs of volcanic breccia or sandstone 8,300-10,000 ft	N
Large-fruited Bladderpod	*Lesquerella macrocarpa*	Gypsum-clay hills and benches, clay flats, and barren hills 7,200-7,700 ft	N
Stemless Beardtongue	*Penstemon acaulis* var. *acaulis*	Cushion plant or Black sage grassland communities on semi-barren rocky ridges, knolls, and slopes at 5,900-8,200 ft	N
Beaver Rim Phlox	*Phlox pungens*	Sparsely vegetated slopes on sandstone, siltstone, or limestone substrates 6,000-7,400 ft	N
Tufted Twinpod	*Physaria condensata*	Sparsely vegetated shale slopes and ridges 6,500-7,000 ft	N
Green River Greenthread	*Thelesperma caespitosum*	White shale slopes and ridges of Green River Formation 6,300 ft	N
Uinta Greenthread	*Thelesperma pubescens*	Sparsely vegetated benches and ridges on coarse, cobbly soils of Bishop Conglomerate 8,200-8,900 ft	N
Cedar Mountain Easter Daisy	*Townsendia microcephala*	Rocky slopes of Bishop Conglomerate 8,500 ft	N

[1] Y = Likely to occur in or in the vicinity of the HQPA based on habitat and WYNDD data (2005).

N = Not likely to occur in or in the vicinity of the HQPA based on habitat and WYNDD data (2005).