

FINAL  
ENVIRONMENTAL ASSESSMENT  
FOR AMENDMENT TO SOURCE MATERIALS LICENSE SUA-1310  
GROUND WATER ALTERNATE CONCENTRATION LIMITS

ANADARKO PETROLEUM CORPORATION  
BEAR CREEK URANIUM MILL SITE  
CONVERSE COUNTY, WYOMING

February 2013

Source Materials License SUA-1310  
Docket No. 40-8452

PREPARED BY

U.S. NUCLEAR REGULATORY COMMISSION  
OFFICE OF FEDERAL AND STATE MATERIALS  
AND ENVIRONMENTAL MANAGEMENT PROGRAMS  
DIVISION OF WASTE MANAGEMENT AND ENVIRONMENTAL PROTECTION

Enclosure 2

GRCC-007

## TABLE OF CONTENTS

1.0	INTRODUCTION
1.1	Background
1.2	Need for the Proposed Action
1.3	The Proposed Action
1.4	Regulatory Environment
1.4.1	Federal and State Authorities
1.4.2	Basis of NRC Review
2.0	ALTERNATIVES TO PROPOSED ACTION
2.1	No-Action Alternative
3.0	AFFECTED ENVIRONMENT
3.1	Land use
3.2	Geology and Topography
3.3	Water Resources
3.3.1	Surface Water
3.3.2	Ground Water
3.4	Ecology
3.5	Meteorology, Climatology, and Air Quality
3.6	Socioeconomic Conditions
3.7	Historical and Cultural Resources
3.8	Transportation
4.0	ENVIRONMENTAL IMPACTS
4.1	Land Use
4.2	Surface Water
4.3	Ground Water
4.4	Ecological Impacts
4.5	Meteorology, Climatology, and Air Quality
4.6	Socioeconomic Impacts
4.7	Historical and Cultural Resources
4.8	Transportation
5.0	MONITORING
6.0	AGENCIES CONSULTED
7.0	CONCLUSIONS
8.0	LIST OF PREPARERS
9.0	LIST OF REFERENCES

ENVIRONMENTAL ASSESSMENT  
FOR GROUND WATER ALTERNATE CONCENTRATION LIMITS  
ANADARKO PETROLEUM CORPORATION  
BEAR CREEK URANIUM COMPANY MILL SITE  
CONVERSE COUNTY, WYOMING

## 1.0 INTRODUCTION

The U.S. Nuclear Regulatory Commission (NRC) has received, by letter dated November 28, 2011, a license amendment application from Anadarko Petroleum Corporation (APC or the Licensee) for its Bear Creek Uranium Company (BCUC) site, requesting to amend the basis for its existing Alternate Concentration Limits (ACLs), to delete License Condition (LC) No. 47, and to proceed with termination of the license and transfer of the site to the U.S. Department of Energy (DOE). License No. SUA-1310 authorizes the Licensee to possess byproduct material resulting from past operations of its Bear Creek facility until site reclamation is sufficient for transfer of the BCUC site to DOE. The proposed change to the existing ACLs is to move the previously designated Points of Exposure (POE) to wells located at the northern property boundary. The elimination of LC No. 47 would mean that the Licensee would no longer be required to sample its wells and report the results to the NRC.

### 1.1 Background

The BCUC site is located in rural Converse County, Wyoming, approximately 45 miles northeast of Casper, Wyoming and about 37 miles north-northwest of Douglas, Wyoming. During operation, approximately 4.7 million tons of tailings were produced and discharged as a slurry into an above-grade tailings basin. Reclamation of the BCUC mill consisted of demolishing site structures and consolidating contaminated materials in the mill tailings impoundment according to a reclamation plan accepted by NRC in 1991. The NRC concurred that site reclamation was complete in 2001. The grass-covered disposal cell occupies 101 acres of the 1,000 acre site. Seepage through the tailings embankment into the underlying ground water during operations resulted in ground water contamination that was impracticable to remediate through corrective action. Therefore, BCUC proposed ACLs which NRC accepted in 1997. The 1997 ACL application contained predictive modeling results that indicated that the maximum concentration of nickel, radium, and uranium, at the Point of Compliance (POC) locations (wells MW-12 and MW-74) would be 3.8 mg/L, 46 pCi/L, and 2,038 pCi/L, respectively. Similarly, maximum concentrations of nickel, radium, and uranium at the POE locations (wells MW-14 and MW-43) were predicted to be 0.55 mg/L, 13 pCi/L, and 45 pCi/L, respectively.

In preparation for the transfer of the BCUC site to DOE for Long-Term Care, the NRC staff tabulated the ground water data from the date of the 1997 ACL application until 2010. Evaluation of the data indicated that the uranium concentration in POE well MW-14 exceeded the predicted concentration of 45 pCi/L on several occasions and reached 520 pCi/L in 2008, more than 10 times the predicted value. This indicated that the assumptions used in the original 1997 predictive model to calculate the ACLs were not valid. As a result, the NRC staff requested that a new risk-based ACL application be submitted incorporating the ground water

data collected over the 14 years since the original ACL application. This Environmental Assessment (EA) is for the current 2011 ACL application.

The NRC staff recognizes that the BCUC site boundary has been extended to the north and that four new wells have been installed to monitor the potential flow of contaminants from the tailings pond. POE wells were installed at the boundary property and intersection of the two plumes of seepage along the Lang Draw (MW-109) and Northern flow path (MW-111). MW-12 is the POC well for the Lang Draw path and MW-74 is the POC well for the Northern flow path. The Licensee has proposed ACLs at the POC wells (which are the same as the 1997 ACLs) that it considers will not pose a substantial present or potential hazard to human health or the environment and that are ALARA based on ground water flow modeling, fate and transport modeling, and exposure and risk assessments.

## 1.2 Need for the Proposed Action

A revised ACL application is required to correct errors found in the 1997 ACL application which underestimated the uranium concentration at the 1997 POE wells. Also, new POE wells needed to be established at the new northern boundary of the BCUC property. The proposed ACLs for nickel, radium, and uranium in the POC wells have not been changed from the values established in 1997. The new POE wells are much further north than the 1997 POE wells and the new model and risk calculations indicate that contaminate concentrations at this boundary will not pose a substantial present or potential hazard to human health or the environment. The Licensee has requested the elimination of LC No. 47, which requires the annual sampling of wells, to facilitate the transfer of the site to DOE.

## 1.3 The Proposed Action

The proposed action is to eliminate LC No. 47 which requires the Licensee to sample wells annually and report the results to NRC. LC No. 47 states:

The Licensee shall implement a groundwater compliance monitoring program containing the following:

- A. Sample Well Nos. MW-9, MW-12, MW-14, MW-43, and MW-74 on an annual frequency for nickel, combined radium-226 and -228, selenium, thorium-230, and uranium. Sample Well Nos. MW-12 and MW-74 on an annual frequency for beryllium, cadmium, chromium, and molybdenum. Sample Well Nos. MW-108, MW-109, MW-110, and MW-111 on an annual frequency for nickel, combined radium- 226 and -228, thorium-230, uranium, chloride, and sulfate.
- B. Comply with the following groundwater protection standards at point of compliance Well Nos. MW-12 and MW-74, with background water quality established in Well No. MW-9: beryllium = 0.01 mg/L, cadmium = 0.01 mg/L, chromium = 0.05 mg/L, molybdenum = 0.02 mg/L, selenium = 0.025 mg/L, thorium-230 = 2.6 pCi/L, nickel = 3.8 mg/L, combined radium-226 and -228 = 46 pCi/L, and uranium = 2038 pCi/L.
- C. In the event the limits for the constituents in Subsection (B) are exceeded, the Licensee will propose a new corrective action program with the objective of returning concentrations of those constituents to the concentration limits specified in Subsection (B).

Another proposed action is the establishment of new POE wells and the retention of the 1997 ACLs for nickel, radium-226 and -228, and uranium at the original two POC wells. The Licensee will also set up Institutional Controls (ICs) restricting domestic, livestock, and agricultural ground water use within the Long-Term Surveillance Boundary (LTSB).

The estimated level of risk using projected concentrations of uranium, combined radium, and nickel at the POE well MW-109 is on the order of  $10^{-4}$ , similar to the background risk for the site, and is acceptable under NUREG-1620, Rev.1. NRC staff has determined that the proposed ACLs for the site meet Criterion 5B(6) of 10 CFR Part 40 Appendix A.

## 1.4 Regulatory Environment

### 1.4.1 Federal and State Authorities

NRC source material licenses are issued under Title 10 of the *Code of Federal Regulations* (10 CFR), Part 40. In addition, the Uranium Mill Tailings Radiation Control Act of 1978, as amended (UMTRCA), requires persons who conduct uranium source material operations to obtain a byproduct material license to own, use, or possess tailings and wastes generated by the operations.

This EA has been prepared in accordance with 10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," which implements NRC's environmental protection program under the National Environmental Policy Act of 1969, as amended (NEPA). In accordance with 10 CFR Part 51, an EA serves the following purposes: (a) briefly provides sufficient evidence and analysis for determining whether to prepare an environmental impact statement (EIS) or a finding of no significant impact (FONSI); (b) facilitates preparation of an EIS when one is necessary; and (c) demonstrates the NRC's compliance with NEPA when an EIS is not necessary. Evidence presented herein includes a detailed description of the proposed action, impacts of the proposed action, and impacts of the alternative to the proposed action. In undertaking this project, the Licensee committed to complying with all applicable Federal and State regulations.

Under 10 CFR Part 40, Appendix A, Criterion 5B, NRC can grant ACLs for ground water at uranium mill tailings sites provided that the new limits will not pose a substantial present or potential hazard to human health or the environment. ACLs must also meet the as low as reasonably achievable (ALARA) criterion found in Criterion 5B(6).

### 1.4.2 Basis of NRC Review

The NRC staff has assessed the potential environmental impacts associated with this request for a license amendment for the proposed ACLs at the POC wells and the designation of new POE wells at the LTSB, and has documented the results of the assessment in this EA. NRC staff performed this assessment in accordance with the requirements of 10 CFR Part 51.

In conducting the assessment, the staff considered the following:

- information in the ACL amendment application and supporting documentation,
- information in modeling reports and NRC staff review reports,

- information in land use and environmental monitoring reports,
- personal communications with BCUC staff, the State of Wyoming, and Federal agencies,
- information from NRC staff site visits and inspections,
- 10 CFR Part 51, 10 CFR Part 40, Appendix A; NUREG-1620, Rev. 1 (NRC, 2003a); and NUREG-1748 (NRC, 2003b).

## 2.0 ALTERNATIVES TO PROPOSED ACTION

### 2.1 No-Action Alternative

As an alternative to the proposed action, the staff considered denial of the proposed action (i.e., the "no-action alternative"). Denial of the proposed license amendment would result in no land transfer to DOE and the retention of POE wells that are not at the boundary of the property.

## 3.0 AFFECTED ENVIRONMENT

### 3.1 Land Use

The physical setting of the former mill site and the reclaimed tailings is a remote semi-arid section of central Wyoming. Annual precipitation measured over twenty years on site averaged 10 inches. The land use, prior to uranium production, was limited to open range for grazing cattle and sheep. The ranches that surround the BCUC site are each generally thousands of acres or more in size and have been in existence for almost a hundred years. They are now in their third and fourth generation of family operation with no change in the land use scenario. The nearest ranch headquarters is located 4 miles from the project. When homesteads were claimed, the ranch house was normally built close to an artesian spring with good water quality as most "streams," i.e., forks of Bear Creek and the Dry Fork of the Cheyenne River, in the region are intermittent. The towns and cities throughout Wyoming are typically found along the major water ways which are located nearly 50 miles away from the Bear Creek site in any direction.

The ranchers are adamantly opposed to man camps and people living on site within their property boundaries. There is no reason to believe that this land use will change in the near future.

### 3.2 Geology and Topography

The tailings basin is underlain by sandstone, shales, and lignites of the Wasatch Formation. The uppermost sandstones have been named the K and N sands. The depositional environment appears to have been one of rivers carrying fine- to coarse-grained materials in a coastal or deltaic plain setting. The numerous shale deposits indicate that the river gradient was low. The massive thickness of the K sand suggests that it may have been deposited by a meandering river of moderate size. The underlying N sand is less consistent and of variable thickness. Borehole information shows that it changes from a small channel sand into several sands splaying out into an overbank environment. Laterally continuous lignites and coals are present, and further suggest a meandering river through a low gradient wet overbank environment.

The K and N sands crop out within and underlie the tailings basin. The K sand is the upper sandstone and is exposed at the surface and on the sides of Lang Draw. In some places, the K sand has been eroded away. Within Lang Draw, the K sand has been eroded and replaced by up to 20 to 40 feet of alluvial sand, silt, and clay deposits. The K sand is separated from the N sand by a claystone that varies in thickness between 5 and 50 feet. The N sand tends to be thicker to the northeast near the unnamed draw than toward Lang Draw (APC, 2011) and dips to the east north east. The N sand outcrops in Lang Draw north of MW-108, and in the unnamed draw about 500 feet northwest of MW-111.

### 3.3 Water Resources

#### 3.3.1 Surface Water

Information regarding surface water is presented in the final environmental statement for the site (NRC, 1977). Most of the BCUC site is drained by tributaries of South Fork Creek. The extreme northern part of the site drains to Bear Creek, and the southeastern part to Dry Fork Cheyenne River. Bear Creek and Dry Fork Cheyenne River flow northeasterly into Antelope Creek and then easterly into the Cheyenne River.

Bear Creek and Dry Fork are interrupted streams—streams that include short perennial reaches and intervening intermittent reaches. The intermittent reaches are dry except for periods when rainfall or snowmelt runoff occurs.

There is no pit mine water at the site as the open pit mines were filled in.

#### 3.3.2 Ground Water

The uppermost saturated zone is found within 40 feet of the original ground surface and is referred to as the N-sand. The flow direction in the N-sand is in a north to northeast direction. As a result, the low pH tailings solution that has seeped from the tailings impoundment into the N-sand has migrated in a north to northeast direction. There is no history of this upper saturated zone of the Wasatch formation being used for a domestic or livestock water supply in this region of the Powder River Basin in Wyoming. The estimated well yield for N-sand monitor wells MW-108 and MW-109 are <0.01 gallons per minute.

There are several existing stock water wells completed to 430 to 515 foot depths, in which the water bearing formations are separated from the N-sand by hundreds of feet of claystone (i.e., aquitard), located within a mile or less of the proposed POE locations on Lang Draw and the Northern flow path. These wells provide water at 2-3 gallons per minute and the water is utilized for livestock. All three are windmill driven and have been sampled in the past for groundwater parameters. The wells GW-8, GW-10 and GW- 15 are located <1/2 mile south-west of the proposed new POE on Lang Draw, <1 mile north of both Lang Draw and the Northern flow path, and 1 mile north-west of the Lang Draw flow path proposed new POE, respectively. Water samples were collected from these wells and reported to the Wyoming Department of Environmental Quality in required annual reports during operation of the mine. These wells do not appear to have been impacted from the former uranium mill operations.

The surficial deposits, alluvium and the N-sand of concern are discontinuous in nature and partially eroded. The quantity of ground water in these deposits varies spatially, and is further dependent upon the saturated thickness. The alluvium and N-sand contain “pockets” of water; however, these units are not capable of yielding to wells with a sustainable quantity of water in the downgradient areas along Lang Draw and the Northern Flow Path beyond the proposed long-term surveillance boundaries. Boreholes (T18 - T23) completed in the vicinity of the property boundary along the Lang Draw indicate the alluvium and N-Sand are less than 10 feet thick, and only a minor amount of groundwater was observed (Stoller, 1997). The alluvium and N-sand does not produce a significant amount of water to be classified as an aquifer. It is therefore not expected that water supplies for any use (e.g., domestic, livestock, etc.) will be installed in the downgradient vicinity of the site along the Lang Draw and the North Flow Path.

NRC’s definition of an “aquifer” is: A geologic formation, group of formations, or part of a formation capable of yielding a significant amount of ground water to wells or springs. Any saturated zone created by uranium or thorium recovery operations would not be considered an aquifer unless the zone is or potentially is (1) hydraulically interconnected to a natural aquifer, (2) capable of discharge to surface water, or (3) reasonably accessible because of migration beyond the vertical projection of the boundary of the land transferred for long-term government ownership and care in accordance with Criterion 11 of Appendix A to 10 CFR Part 40. NRC’s definition of “ground water” is: water below the land surface in a zone of saturation. For purposes of Appendix A to 10 CFR Part 40, ground water is the water contained within an aquifer as defined above.

### 3.4 Ecology

Information regarding terrestrial ecology is presented in the final environmental statement for the site (NRC, 1977). Prior to the start of the BCUC project, the vegetation cover was typical of the midgrass prairie with 58% sagebrush, 36% grassland, and 6% meadow. There were no known threatened or endangered plant species within the area (NRC, 1977).

Fifty-five terrestrial vertebrate species have been observed on or adjacent to the BCUC site. Birds were the most diverse (33 species), followed by mammals (12 species), and amphibians and reptiles (5 species). The area is a yearlong habitat for pronghorn antelope which subsist primarily on the sagebrush vegetation type. Mule deer have also been observed. Rodents known to occur in the area include the 13-lined squirrel, deer mouse, prairie vole, desert cottontail, black- and white-tailed jackrabbits, and prairie dogs. Predatory species are the red fox, bobcat, badger, striped skunk and coyote. Various bird species utilize the project area for a seasonal or permanent residence, or as a resting place during migration. Sage grouse and mourning dove occur in the area but not in significant numbers. Bald eagles have been observed along the Cheyenne River but no nesting sites are known to occur within or adjacent to the site. Amphibians are relatively uncommon in the area because of the scarcity of aquatic habitat. Reptiles occurring on the site are primarily western rattlesnakes.



### 3.5 Meteorology, Climatology, and Air Quality

Climate data was obtained from the Western Regional Climate Center from the Douglas Aviation station (WRRC, 2012), located about 40 miles from the site. Information was collected from a 1981 to 2010 monthly climate summary. The annual average maximum temperature (°F) was 60.7, the average minimum temperature (°F) was 31.1 and the average total precipitation (inches) was 13.17. The following table is a summary of the site climate data.

Site Climatic Data

<b>Month</b>	<b>Average Max Temp (°F)</b>	<b>Average Min Temp (°F)</b>	<b>Precipitation (Inches)</b>
January	37.8	10.1	0.34
February	42.2	14.6	0.60
March	50.0	23.0	0.98
April	59.3	29.9	1.32
May	68.6	39.8	2.43
June	79.0	48.1	1.81
July	86.0	53.6	1.69
August	85.1	51.8	1.06
September	75.0	41.2	0.87
October	60.6	29.7	0.81
November	46.0	19.4	0.76
December	37.0	10.3	0.50

### 3.6 Socioeconomic Conditions

The area surrounding the BCUC site is sparsely populated. There are no current plans that would indicate a population increase in the near future. The largest population center within 50 miles is Douglas, Wyoming, about 40 miles southwest with a 2010 population of 6,120 (Census Bureau, 2010).

### 3.7 Historical and Cultural Resources

Information regarding historical and cultural resources is presented in the final environmental statement for the site (NRC, 1977). No known historical properties or values exist at the BCUC site. An occasional flake (stone chip associated with primitive tool making) has been found in the area, indicating limited presence of man sometime in the prehistoric past. No archeological sites or other cultural materials have been found. Assurance of archeological clearance for the BCUC project was indicated in correspondence jointly authored by the Assistant State Archeologist and the State Historic Preservation Officer (NRC, 1977).

### 3.8 Transportation

The area of east-central Wyoming in Converse country where the BCUC site is located is accessed by Interstate 25 from Casper to State Highway 95 north through the town of Rolling Hills and to the intersection with State Highway 93. Turn left on to County Road 31 and proceed

north for about 15 miles to the entrance of the Hornbuckle Ranch, on the right side of the road. Turn on to the Hornbuckle Ranch road, and proceed about 6.6 miles to its junction with another gravel road. Turn north on this gravel road and travel 3.5 miles, passing the Spook Title I site on the right at about 2.5 miles, to the BCUC site.

#### 4.0 ENVIRONMENTAL IMPACTS

##### 4.1 Land Use

Implementing the proposed action would not change the land use within the LTSB. Under both the proposed action and the no-action alternative, the land within the LTSB will ultimately be owned by the United States or the State which will preserve its isolation.

##### 4.2 Surface Water

There is no surface water at the site. There is no water flow in Bear Creek located outside the LTSB. If an extreme rainfall event occurred, any flow of water in Bear Creek would be temporary and would not impact the area within the LTSB.

##### 4.3 Ground Water

Implementing the proposed action would have no impact on the ground water as there is no viable aquifer at the site. The reassignment of the POE wells to the BCUC northern boundary simply provides a greater distance of contaminant migration prior to monitoring, thereby allowing for more attenuation of contaminants from the tailings impoundment. As a result, the reassignment of the POE wells should enable the BCUC site to stay in compliance with the ACLs.

##### 4.4 Ecological Impacts

Neither the proposed action nor the alternative action will have an impact on any plants or animals because the proposed action only involves the reassignment of the POE wells and the elimination of an annual sampling requirement and the alternative action involves no action.

##### 4.5 Meteorology, Climatology, and Air Quality

Meteorology, climatology, and air quality are not expected to be impacted by the implementation of the proposed action or alternative action.

##### 4.6 Socioeconomic Impacts

One potential impact of the proposed action is positive in that the land inside the LTSB can be used for grazing by livestock. This is a routine practice by DOE when there is no surface contamination in the soil or forage grass.

#### 4.7 Historical and Cultural Resources

No adverse impacts to historic and cultural resources are expected because the proposed action and alternative action do not involve any surface disturbance.

#### 4.8 Transportation

No adverse impacts due to transportation are expected from the proposed actions. Future inspections of the site will be on an annual or less frequent basis.

### 5.0 MONITORING

Given the predictive uncertainty related to the revised ACL model, NRC staff believes it prudent to continue a focused ground water monitoring program along the Lang Draw. Consequently, the NRC recommends that DOE sample the POC and POE wells along the Lang Draw for selected parameters of nickel, radium-226 and radium-228, uranium, chloride, sulfate, pH, conductivity, and water level, initially after transfer of the site, then once every 3 years for a 30-year period. The NRC staff believes that ground water quality monitoring along the Lang Draw will provide verification of the predictive accuracy of the revised ACL model over the entire recommended sampling period. Since the concentrations of the selected parameters are much lower in the Northern Flow Path, the NRC staff does not believe verification of these ACL modeling results is necessary. The predicted breakthrough values and current actual concentration values for the selected sampling parameters are presented in the Safety Evaluation Report and DOE should compare the measurements from its focused sampling regime to these values.

NRC and the DOE have considered the inclusion of beryllium, cadmium, chromium, molybdenum, and selenium in the current sampling suite. By letter dated August 12, 2009, DOE submitted a draft final Long-Term Surveillance Plan (LTSP) for the Bear Creek UMTRCA Title II disposal site for NRC staff review. The NRC's review focused on the ground water monitoring aspects of the draft final LTSP. DOE requested the elimination of the analytes beryllium, cadmium, chromium, molybdenum, and selenium from the long-term monitoring requirements for both POC and POE wells. The NRC staff agreed with this proposal because the concentration of these analytes has been at or below their respective detection limits for the past eight years in the tailings-impacted monitoring wells (NRC, 2009). NRC has also added chloride and sulfate to the analytes to be sampled at the POC and POE wells.

The constructed fate and transport model has captured essential features of the site, including subsurface geology and geochemical processes. As with any model it has its limitations. The model results have been hindered by the extreme complexities associated with spatial variability. The model results at the proposed POE well MW-109 indicate that uranium concentrations are overestimated with a peak of 460 pCi/L. NRC asked the licensee to review the modeled value for POE well MW-109 and submit revised model results that more accurately reflect the measured values. In September 2012, the licensee, through its contractor Tetra Tech Geo, submitted revised predictions of uranium concentrations along Lang Draw which show a much better fit for POE well MW-109 when compared to measured values (Tetra Tech Geo, 2012).

The measured values of uranium in well MW-109 from 2002 to 2012 are listed below.

<b>Year</b>	<b>Uranium Concentration (pCi/L)</b>
2002	39.3
2003	31.8
2004	27.0
2005	31.6
2006	32.9
2007	41.0
2008	41.4
2009	59.5
2010	64.0
2011	61.0
2012	52.2

The background water quality for uranium was established in well MW-9 to be 98.7 pCi/L (NRC, 1996). In order to demonstrate that the selection of well MW-9 as a background well was valid, the Licensee determined the variation trends for “mobile species” through the time period from 1988 to 1995. The “mobile species” are pH, conductivity, total dissolved solids, chloride, and sulfate. In March 1993, total dissolved solids, chloride, and sulfate increased while prior to this date the “mobile species” were stable. Consequently, the licensee excluded data collected after March 1992 and established background for hazardous constituent concentrations as the mean plus two standard deviations. The NRC reviewer also noted that the ground water in the N-sands is naturally brackish and would be restricted to raising livestock.

The estimated level of risk using the overestimated concentrations at the POE well MW-109 is on the order of  $10^{-4}$ , similar to the background risk for the site, and is acceptable under NUREG-1620, Rev.1 (NRC, 2003a). Under 10 CFR Part 40, Appendix A, Criterion 5B(6), the NRC will establish site specific alternate concentration limits if it finds that the limits proposed by the licensee are as low as reasonably achievable and that there is not a substantial present or potential hazard to human health or the environment as long as the alternate concentration limits are not exceeded. The NRC is not required to compare contaminant values at a POE well to Federal or State ground water quality standards when making determinations under Criterion 5B(6).

## 6.0 AGENCIES CONSULTED

The Wyoming Department of Environmental Quality (WDEQ) has been consulted on this proposed action. A draft Environmental Assessment was sent to WDEQ and they responded with comments. A letter was sent to WDEQ explaining that NRC has exclusive jurisdiction over both the radiological and non-radiological hazards of byproduct material and responses to the WDEQ comments were enclosed (NRC, 2012). Letters were also sent to the Wyoming Fish and Wildlife service for information about threatened or endangered species and to the State Historical Protection Office for information on historical and cultural resources.

## 7.0 CONCLUSIONS

Based on the information presented above describing the proposed action, the need for the proposed action, the alternative to the proposed action, the environmental impacts of the proposed action and alternative, and the agencies consulted, NRC staff has determined that the proposed action will not have a significant effect on the quality of the human environment and does not warrant the preparation of an Environmental Impact Statement. Accordingly, the NRC has determined that a finding of no significant impact (FONSI) is appropriate.

This finding and any related environmental documents are available for public inspection through the NRC's Agencywide Document Access and Management System (ADAMS) that may be accessed from the NRC's Electronic Reading Room at <http://www.nrc.gov/reading-rm/adams.html>.

## 8.0 LIST OF PREPARERS

Thomas McLaughlin, Ph.D., Project Manager, Materials Decommissioning Branch, Decommissioning and Uranium Recover Licensing Directorate, Division of Waste Management and Environmental Protection, Office of Federal and State Materials and Environmental Management Programs.

Lifeng Guo, Ph.D., Hydrologist, Materials Decommissioning Branch, Decommissioning and Uranium Recover Licensing Directorate, Division of Waste Management and Environmental Protection, Office of Federal and State Materials and Environmental Management Programs.

## 9.0 LIST OF REFERENCES

Census Bureau, 2010. "American FactFinder 2010 Census Data." 2012.

APC, 2011. Anadarko Petroleum Corporation Alternate Concentration Limit License Amendment Application, November 28, 2011. ADAMS Accession Nos. ML12046A858, ML12046A857, ML12046A856, and ML12046A854.

State of Wyoming, 2012. On line search of State of Wyoming, State Engineer's Office, Water Rights Data Base, Search by Well Location, ground water information only. April 2012.

Stoller, 1997. *Delineation of N-Sand and Lang Draw Alluvium, Bear Creek Uranium Tailings Area*, S.M. Stoller Corporation, 1997. ADAMS Accession No. ML12181A053.

Tetra Tech Geo, 2012. "Revised Predictions of Uranium Concentrations along Lang Draw," September, 2012. ADAMS Accession No. ML12270A289.

U.S. Nuclear Regulatory Commission, 1977. Final Environmental Statement for Bear Creek Uranium Company.

U.S. Nuclear Regulatory Commission, 1996. Technical Evaluation Report Establishing Background Levels of Constituents at MW-9 for the Bear Creek Uranium Mill Facility. ADAMS Accession No. ML12270A290.

U.S. Nuclear Regulatory Commission, 2003a. NUREG-1620, Rev. 1, Standard Review Plan for the Review of a Reclamation Plan for Mill Tailings Sites Under Title II of the Uranium Mill Tailings Radiation Control Act of 1978, June 2003.

U.S. Nuclear Regulatory Commission, 2003b. NUREG-1748, Environmental Review Guidance for Licensing Actions Associated with NMSS Programs, August 2003.

U.S. Nuclear Regulatory Commission, 2012. Letter to Steve Ingle, Land Quality Division, Wyoming Department of Environmental Quality, December, 2012. ADAMS Accession No. ML12193A056.

U.S. Nuclear Regulatory Commission, 2009. Technical Evaluation Report, Bear Creek UMTRCA Title II Disposal Site Long-Term Surveillance Plan Ground Water Monitoring Program Review, Converse County, Wyoming. ADAMS Accession No. ML093010213.

U.S. Nuclear Regulatory Commission, 2012. Response to Comments on the Draft Environmental Assessment Related to the Issuance of a License Amendment to the Anadarko Petroleum Corporation Bear Creek Uranium Company Mill Site, December, 2012. ADAMS Accession Nos. ML12193A056 and ML12193A070.

U.S. Nuclear Regulatory Commission, 10 CFR Part 40, Appendix A, Appendix A, Criterion 5B(6).

U.S. Nuclear Regulatory Commission, 10 CFR Part 51, Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions.

Uranium Mill Tailings Radiation Control Act of 1978, as amended (UMTRCA).

WRCC, 2012. Western Regional Climate Center. April 2012.