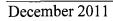


ADDENDUM 3.5-J

LUDEMAN WETLAND DATA FORMS - GREAT PLAINS REGION



. سەن

• –	Ludeman License Area						Sampling Date:	6/5/2008
Applicant/Owner:	Uranium One						City/County:	Converse County
	K. LaClair, W. Stansbu					4, T34N, R74W		(0/)
Landform (hillslope	, terrace, etc.): Depre	ession in	drainage	Local relief	(concave, c	convex, none)	concave Slope	e (%) <u><2%</u>
Subregion (LRR): LRR H Lat: -105.708 Long: 42.920 Datum: NAD-83 Soil Map Unit Name: 164-Haverdad Loam, 187-Kishona-Cambria Ioams, 189-Kishona-Cambria-Theedle Ioams								
					NWI classif	fication	na San	npling Point_WL-1
	gic conditions on the s	site typic	al for this ti	me of year? Y	es_X_No	o (If no, ex	plain in Remarks.)	
Are "Normal Circun	nstances" present?			Y	'es <u>X</u> No	lo		
Are Vegetation	, Soil, or Hydo	logy	significar	atly disturbed?			Yes	No <u>X</u>
	, Soil, or Hydr						Yes	No <u>X</u>
(If needed, explain	any answers in Remai	rks.)		,				
SUMMARY OF F	INDINGS – Attach	site ma	ap showin	g sampling	point loca	ations, transec	ts, important fea	atures, etc.
Hydrophytic Vegeta			No	<u> </u>	•	•		
Hydric Soil Present	t? Yes_	<u> </u>	No	lst	the Sampled	d Area		
Wetland Hydrology	Present? Yes	<u>_x_</u> I	No	wit	hin a Wetla	and? Yes <u>X</u>	No	
Remarks:								
	termittent wetlands (17 v	vetlands,	WL-1a thro	ough WL-1q) th	at are discon	nnected depressions	s along the same dra	inage. They range in
size from 0.003 acre						-		
	Use scientific nam			1		Dominance T	est Worksheet:	
Tree Stratum	(Plot size:)		Absolute	Dominate	Indicator Status	Number of De	minant Species	
1			%Cover	Species?	Status		, FACW, or FAC	
						(excluding FA		1 (A)
2							· .	(/
3						Total Number		
4						Species Acros	s All Strata:	<u> </u>
				=Total Cover		Percent of Do	minant Species	
Sapling/Shrub	Stratum (Plot size:						,FACW, or FAC:	100 (A/B)
1						Prevalence in	ndex Worksheet:	· · · · · · · · · · · · · · · · · · ·
2							ver of:	Multiple by:
							x 1 =	
3					-	FACW species	sx2=	
4						FAC species	x 3 =	
5						FACU species	s x 4 = x 5 =	
				=Total Cover		il	A)	
Herb Stratum	(Plot size: 20sf	[isA)	(B)
1 Eleocharis palusti	ris		40	Y	OBL	Prevalence Ir	ndex = B/A =	
2								
3							Vegetation Indica	tors:
4							ance Test is $>50\%$ nce Index is $\leq 3.0^{\circ}$	l
5							logical Adaptations	
6						supporting dat	ta in Remarks or or	n a separate sheet)
7						Problem	natic Hydrophytic V	egetation ¹ (Explain)
8								land hudeals
9					·		nless disturbed or p	tland hydrology must
10						·	·	
			40%	=Total Cover			egetation Present?	
	tratum (Plot size:)				Yes <u>X</u>	N0	
1				<u> </u>		-		
2				-Tel-10		-		
0/ Data Crawali 1				=Total Cover		1		
% Bare Ground in I	Herb Stratum <u>60%</u>							
}					•			
	· ·							
Remarks:								

SOIL Profile Description: (Describe to the Depth Matrix		ocument the edox Feature		or or co	onfirm the absence of	Sampling Point of indicators.)	
(inches) Color (moist) %	Color (moist)			.oc ²	<u> Texture</u>		
<u>0-4" 10YR 3 /1</u>	7.5YR 4/6	<2%	_ <u>C</u> _	M	_Loam w/organics	Mottles: Fine, few,	, prominen
<u>4-10"</u> 2.5YR 5/1	7.5YR 4/6		<u> </u>	M	Clay loam Mottles:	Fine to medium, mar	ıy, prominent
						· · · · · · · · · · · · · · · · · · ·	
	·	<u></u>					
¹ Type: C=Concentration, D=Depletion,	RM=Reduced Matrix	, CS=Covere	ed or Co	ated Sa	nd Grains. ² Loca	tion: PL=Pore Lining	, M=Matrix.
Hydric Soil Indicators: (Applicab Histosol (A1) Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4)	le to all LRRs, unl Sandy Gley Sandy Red Striped Mat X_Loamy Mu	ess otherw ed Matrix (S4 ox (S5) rix (S6) cky Mineral (vise no ' 4) (F1)		Indicators for Pro 1 cm Muck (A Coast Prairie Dark Surface	oblematic Hydric	Soils ³ :
Stratified Layers (A5) (LRR F) 1 cm Muck (A9) (LRR F, G, H) Depleted Below Dark Surface (A12)	Depleted M Redox Dark	< Surface (F6	5)		Reduced Vert Red Parent M	aterial (TF2)	
 Thick Dark Surface (A12) Sandy Mucky Mineral (S1) 2.5 Mucky Peat or Peat (S2) (LRR 5 cm Mucky Peat or Peat (S3) (LRI 	Redox Dep G,H)High Plains	eark Surface ressions (F8 Depressions & 73 of LRR) s (F16)		wetland hydro	In Remarks) Irophytic vegetation a blogy must be preser bed or problematic	and nt,
Restrictive Layer (if present): Type: Depth (inches) :			Hydric S	Soil Pres	sent? Yes <u>X</u>	No	
Remarks:							
HYDROLOGY							
Wetland Hydrology Indicators:							
Primary Indicators (minimum of one require Surface Water (A1) Saturation (A3)	d; check all that apply) Salt Crust (B11 X Hydrogen Sulf			Se	condary Indicators (min Sparsely Vegetated Drainage Patterns	Concave Surface (B8)	
Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3)	Dry Season Wa Oxidized Rhizo (where not tille	ater Table (C2) spheres on Lived)	ving Root	s (C3)	Oxidized Rhizospher (where tilled) Crayfish Burrows (C	ès on Living Roots (C3 8))
Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B Water-Stained Leave (B9)	Presence of Re Thin Muck Surf Other (Explain	ace (C7)	4)	-	Saturation Visible of Geomorphic Position FAC-Neutral Test (I Frost-Heave Humm	n (D2) 05)	
Field Observations:				Wetlan	d Hydrology Present?]	
	<pre>Depth (inches) Depth (inches) </pre> Depth (inches)				<u>X</u> No		
Describe Recorded Data (stream gaug previous inspections), if available:	e, monitoring well, ae	erial photos,					
Remarks:							۰

,

Project/Site: Ludeman License Area				Sampling Date: 6/6/2008
Applicant/Owner: Uranium One				City/County: Converse County
Investigator(s): K. LaClair				4, T34N, R74W State: WY
Landform (hillslope, terrace, etc.):Depression	in drainage	Local relief	(concave, c	convex, none) <u>concave</u> Slope (%) <2%
Subregion (LRR): LRR H	Lat:_	105.699 	LOP LOP	ng: <u>42.917</u> Datum: <u>NAD-83</u>
Are climate/bydrologic conditions on the site tyr	<u>nis</u> pical for this t	ime of year? Y	ίassiiication ίας Χ Ν	o (If no, explain in Remarks.)
Are "Normal Circumstances" present?		γear γ	'es <u>X</u> N	
Are Vegetation, Soil, or Hydology_	significa	ntly disturbed?)	Yes No <u>X</u>
Are Vegetation, Soil, or Hydology_ Are Vegetation, Soil, or Hydrology_	natural	ly problematic	?	Yes No_X_
(If needed, explain any answers in Remarks.)				
SUMMARY OF FINDINGS – Attach site r	nap showir	ng sampling	point loca	ations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes X	No			
Hydric Soil Present? Yes X	No	ls	the Sample	d Area
Wetland Hydrology Present? Yes X	_ No	wi	thin a Wetla	ind? YesXNo
Remarks:	, i			
This is a depression in a drainage.				
VEGETATION – Use scientific names of	plants.	•		Dominance Test Worksheet:
Tree Stratum (Plot size:)	Absolute	Dominate	Indicator	- ·
	%Cover	Species?	Status	Number of Dominant Species
1				That Are OBL, FACW, or FAC
2				(excluding FAC-):2(A)
3				Total Number of Dominant
				Species Across All Strata: <u>2</u> (B)
4				
		=Total Cover		Percent of Dominant Species
Sapling/Shrub Stratum (Plot size:)				That are OBL, FACW, or FAC: 100% (A/B)
	· · · · ·			Prevalence Index Worksheet:
2				<u>Total % Cover of:</u> <u>Multiple by:</u>
				OBL species x 1 =
3			-	FACW species x 2 =
4				_ FACW species x 2 = FAC species x 3 =
5				FACU species x 4 = UPL species x 5 =
		=Total Cover		
Herb Stratum (Plot size: 20sf)				- Column Totals:A)(B)
1 Juncus balticus	20	Y	OBL	
2 Carex aquatilis	20	Y	OBL	_ Prevalence Index = B/A =
3 Poa sp.	20	N N		Hydrophytic Vegetation Indicators:
4	2	1		X_Dominance Test is >50%
5				Prevalence Index is $\leq 3.0^{1}$
				Morphological Adaptations ¹ (Provide
6				 supporting data in Remarks or on a separate sheet)
7	_			Problematic Hydrophytic Vegetation ¹ (Explain)
8		•		¹ Indicators of hydric soil and wetland hydrology must
9				be present, unless disturbed or problematic.
10				
	42	=Total Cover		Hydrophytic Vegetation Present?
Woody Vine Stratum (Plot size:)				Yes <u>X</u> No
1				4
2				1
	1	=Total Cover		
% Bare Ground in Herb Stratum58				
Remarks:				

Soil Sampling Point_WL-2 Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Depth Matrix Redox Features
(inches) Color (moist) % Color (moist) % Type ¹ Loc ² Texture
0-4" 5Y 4/2 7.5YR 4/4 25 % C M Clay loam Mottles: Fine, many, distinct
4-10" 2.5Y 4/2 7.5YR 5/8 25% C M Clay loam Mottles: Fine to medium, many, prominent
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ² Location: PL=Pore Lining, M=Matrix.
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils ³ :
Histosol (A1) Sandy Gleyed Matrix (S4) 1 cm Muck (A9) (LRR I, J) Histic Epipedon (A2) Sandy Redox (S5) Coast Prairie Redox (A16) (LRR F, G, H)
Black Histic (A3) Striped Matrix (S6) Dark Surface (S7) (LRR G)
Hydrogen Sulfide (A4) _X_Loamy Mucky Mineral (F1) High Plains Depressions (F16) Stratified Layers (A5) (LRR F) Loamy Gleyed Matrix (F2) (LRR H outside of MLRA 72 & 73)
1 cm Muck (A9) (LRR F, G, H)Depleted Matrix (F3)Reduced Vertic (F18)Reduced Vertic (F18)Red Parent Material (TF2)
Thick Dark Surface (A12) Depleted Dark Surface (F7) Other (Explain in Remarks)
Sandy Mucky Mineral (S1) Redox Depressions (F8) Indicators of hydrophytic vegetation and wetland hydrology must be present,
5 cm Mucky Peat or Peat (\$3) (LRR F) (MLRA 72 & 73 of LRR H) unless disturbed or problematic
Restrictive Layer (if present):
Type: Hydric Soil Present? Yes X No Depth (inches) :
Remarks:
HYDROLOGY
Wetland Hydrology Indicators:
Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required)
X_Surface Water (A1) Salt Crust (B11) Sparsely Vegetated Concave Surface (B8) X_Saturation (A3) Hydrogen Sulfide Odor (C1) Drainage Patterns (B10)
Drift Deposits (B3) (where not tilled)Crayfish Burrows (C8)
Algal Mat or Crust (B4) Presence of Reduced Iron (C4) Saturation Visible of Aerial Imagery (C9) Iron Deposits (B5) Thin Muck Surface (C7) Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7)Other (Explain in Remarks)FAC-Neutral Test (D5)Water-Stained Leave (B9)Frost-Heave Hummocks (D7) (LRR F)
Field Observations:
Surface Water Present? Yes X No Depth (inches) 6 inches
Water Table Present? Yes No X Depth (inches) Yes X No
Saturation Present? Yes_X_No Depth (inches)* (includes capillary fringe)
* Saturated to the surface.
Describe Recorded Data (stream gauge, monitoring well, aerial photos,
previous inspections), if available:
Pomorko
Remarks:

..

Project/Site: Lud	leman License Area				Sampling Date: 8/9/08
Applicant/Owner:	Uranium One				City/County: Converse County
Investigator(s): W.					2, T34N, R74W State: WY
				(concave, c	convex, none) <u>concave</u> Slope (%) <2%
Subregion (LRR): LR	<u>(R H</u> 164 Haverdad Joam '	Lat:	<u>-105.715</u>	Lon	g: <u>42.903</u> Datum: <u>NAD-83</u> 1-Theedle-Kishona-Shingle loams
Son wap onit Name		230-Shingle-Dau	and-Samuay (NWI class	sification_PEMC Sampling Point_WL-3
Are climate/hydrologic	conditions on the site	e tvoical for this ti	me of vear? Y		o(If no, explain in Remarks.)
Are "Normal Circumsta				es X N	
Ann Manadallan	O all and budala		a Alice a di a Alice da Carla da Carla		Mar Ala M
Are Vegetation,					Yes No_X Yes No_X
Are Vegetation, (If needed, explain any	answers in Remarks	ogynaturan	y problematic	r	
		•	a compling	noint loor	ational transacta important factures, etc.
			iy sampiny	point loca	ations, transects, important features, etc.
Hydrophytic Vegetation Hydric Soil Present?		XNo XNo	le f	the Sampled	t Area
Wetland Hydrology Pre	esent? Yes	XNo		hin a Wetla	
Remarks:		<u> </u>			
	nittent wetlands (WL-3	a through WL-3c)	that are discont	nected depres	ssions along Little Sand Creek. They range in size from
1.96 acres to 4.97 acres.		5 ,		1	
VEGETATION - Us	e scientific names	s of plants.			Dominance Test Worksheet:
Tree Stratum (Plo		Absolute	Dominate	Indicator	
	-	%Cover	Species?	Status	Number of Dominant Species
1					That Are OBL, FACW, or FAC
2					(excluding FAC-):1(A)
3				<u> </u>	Total Number of Dominant
					Species Across All Strata:1_(B)
4					
			=Total Cover		Percent of Dominant Species
Sapling/Shrub St	ratum (Plot size:				That are OBL,FACW, or FAC: 100 (A/B)
1					Prevalence Index Worksheet:
2					Total % Cover of: Multiple by:
3					
4				·····	FACW species x 2 = FAC species x 3 =
5					FACU species x 4 =
0			=Total Cover		UPL species x 5 =
Horb Stratum (Di	ot size: 20sf	<u></u>			- Column Totals:A)(B)
Herb Stratum (Plo	01 5120. 2051	61	Y	OBL	
1 Carex nebrascensis 2 Hordeum jubatum		5	N	FACW	Prevalence Index = B/A =
3 Juncus effusus		5	N	OBL	Hydrophytic Vegetation Indicators:
4 Calamagrostis neglect	ta	4	N	OBL	XDominance Test is >50%
5	iu			ODL	Prevalence Index is $\leq 3.0^1$
6	· · ·				Morphological Adaptations ¹ (Provide
7					supporting data in Remarks or on a separate sheet)
8	·····		-		Problematic Hydrophytic Vegetation ¹ (Explain)
9					¹ Indicators of hydric soil and wetland hydrology must
10					be present, unless disturbed or problematic.
		75%	=Total Cover		Hydrophytic Vegetation Present?
Woody Vine Strat	um (Plot size)	1		Yes X_No
1	<u></u>	<u> </u>			
2					1
			=Total Cover		1
% Bare Ground in Her	b Stratum 25%	<u></u>			
Remarks:					

					dicato	r or confirm	Sampling PointWL-3 the absence of indicators.)
Depth (inches)	Matrix Color (moist) %	Color (moist)	Redox Fea %	atures Type	1 Lo	oc ² Textur	e
<u>0-3"</u>	10YR 4/2	7.5YR 5/6	<2%	<u> </u>	M	Silty clay	Mottles: fine, few, prominent
<u>3-12"</u>	2.5Y 5/1	7.5YR 5/8	25%	<u> </u>	<u>M</u>	<u>Clay</u>	Mottles: medium, many, prominent oxidized root channels in 3-12"
			·				
·						······	
¹ Type: C=(Concentration, D=Depletior	, RM=Reduced Mat	rix, CS=Co	overed c	or Coat	ted Sand Gr	ains. ² Location: PL=Pore Lining, M=Matrix.
Hydric So	oil Indicators: (Applica	ble to all LRRs, u	nless otl	herwise			cators for Problematic Hydric Soils ³ :
Histos Histic E	ol (A1) Epipedon (A2)	Sandy Gl Sandy Re	eyed Matri edox (S5)	ix (S4)			_1 cm Muck (A9) (LRR I, J) _Coast Prairie Redox (A16) (LRR F, G, H)
Black H	Histic (A3)	Striped M	atrix (S6)				Dark Surface (S7) (LRR G)
	gen Sulfide (A4) ed Layers (A5) (LRR F)	<u>X</u> Loamy N	lucky Mine leyed Matr			_	High Plains Depressions (F16) (LRR H outside of MLRA 72 & 73)
	luck (A9) (LRR F, G, H)		Matrix (F3				_Reduced Vertic (F18).
	ed Below Dark Surface (A1	2)Redox Da	ark Surfac Dark Surf	e (F6)	、	_	_Red Parent Material (TF2) Other (Explain in Remarks)
	Dark Surface (A12) Mucky Mineral (S1)		epressions)	³ ti	ndicators of hydrophytic vegetation and
2.5 Mu	cky Peat or Peat (S2) (LRF	R G,H)High Plai	ns Depres	sions (F	16)		wetland hydrology must be present,
5 cm N	lucky Peat or Peat (S3) (Ll	RRF) (MLRA /	'2 & 73 of	LRR H)			unless disturbed or problematic
	e Layer (if present):						
Type:	nches) :			Hy	dric Sc	oil Present?	Yes <u>X</u> No
Remark							
	ydrology Indicators:						
						0	n la l'activitation de la companya d
Surface	icators (minimum of one requi Water (A1)	<u>Salt Crust (B</u>					ry Indicators (minimum of two required) arsely Vegetated Concave Surface (B8)
Saturati		Hydrogen Si					rainage Patterns (B10)
	larks (B1) nt Deposits (B2)	Dry Season ^v X_Oxidized RI			a Roots		dized Rhizospheres on Living Roots (C3) (where tilled)
Drift De	posits (B3)	(where not t	illed)		3	Cra	ayfish Burrows (C8)
	at or Crust (B4) posits (B5)	Presence of I		on (C4)			turation Visible of Aerial Imagery (C9) omorphic Position (D2)
	ion Visible on Aerial Imagery (rks)		<u>_X</u> _F	AC-Neutral Test (D5)
vvater-S	Stained Leave (B9)					Fro	ost-Heave Hummocks (D7) (LRR F)
Field Obse	ervations:						
Surface Wat	ter Present? Yes No 2	L Depth (inches)			\	Netland Hydr	ology Present?
Water Table	Present? YesNo	K Depth (inches)			· · ·	Yes <u>X</u> No	<u></u>
Saturation P	Present? YesNo_2 pillary fringe)	C Depth (inches)				·	
	pinary mingoy						
	Recorded Data (stream gau spections), if available:	ge, monitoring well,	aerial phot	tos,			
	,						
Remarks:							

Project/Site:	Ludeman License Area				Sampling Date: 8/5/08					
Applicant/Owner:	Uranium One				City/County: Converse County					
	W. Stansbury				3, T34N, R73W State: WY					
Landform (hillslope	e, terrace, etc.): Depres	sion in drainage	Local relief	(concave, c	convex, none) <u>concave</u> Slope (%) <2%					
Subregion (LRR): LRR H Lat: -105.614 Long: 42.903 Datum: NAD-83 Soil Map Unit Name: 187-Kishona-Cambria loams NVI classification PEMC Sampling Point WL-4										
Soil Map Unit Nam	Soil Map Unit Name: <u>187-Kishona-Cambria loams</u> NWI classification <u>PEMC</u> Sampling Point <u>WL-4</u> Are climate/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)									
	Are climate/hydrologic conditions on the site typical for this time of year? Yes \underline{x} No (if no, explain in Remarks.) Are "Normal Circumstances" present? Yes \underline{x} Yes \underline{x} No									
Are Normal Circui	mstances present?		ĭ	es <u>x</u> N	0					
Are Vegetation	, Soil , or Hydold	ogy significar	ntly disturbed?	>	Yes NoX					
Are Vegetation	, Soil, or Hydolo , Soil, or Hydrol	logynaturall	y problematic	?	Yes No_X Yes No_X					
	any answers in Remark									
SUMMARY OF I	FINDINGS – Attach s	ite map showin	g sampling	point loca	ations, transects, important features, etc.					
	ation Present? Yes_			-						
Hydric Soil Presen	t? Yes_	X No	ls	the Sample	d Area					
Wetland Hydrology	y Present? Yes_	<u>X</u> No	wi	thin a Wetla	nd? Yes <u>X</u> No					
Remarks:										
This is wetland wh	nich has formed on the dow	nstream side of a c	liked waterbod	у.						
VEGETATION -	Use scientific name	s of plants.			Dominance Test Worksheet:					
Tree Stratum	(Plot size:)	Absolute	Dominate	Indicator	1					
	<u></u>	%Cover	Species?	Status	Number of Dominant Species					
1					That Are OBL, FACW, or FAC					
2					(excluding FAC-):2(A)					
3					Total Number of Dominant					
					Species Across All Strata:2(B)					
4										
			=Total Cover		Percent of Dominant Species					
Sapling/Shru	b Stratum (Plot size:)			That are OBL, FACW, or FAC: 100 (A/B)					
1					Prevalence Index Worksheet:					
2					<u>Total % Cover of:</u> Multiple by:					
					OBL species x 1 =					
3					FACW species x 2 =					
4					FAC species x 3 =					
5					FACU species x 4 =					
			=Total Cover		UPL species x 5 =					
Herb Stratum	(Plot size: 20sf	1			Column Totals:A)(B)					
1 Hordeum Jubatu		20	Y	FACW	Prevalence Index = B/A =					
2 Scirpus american		20	Y	OBL						
3 Rumex stenophyu		5	N	FACW+	Hydrophytic Vegetation Indicators:					
4 Agropyron spicati		2	N	FACU-	XDominance Test is >50%					
5 Cirsium arvense		2	N	FACU	Prevalence Index is $\leq 3.0^1$					
6 Other		1	N	na	Morphological Adaptations ¹ (Provide					
7		· · · · · · · · · · · · · · · · · · ·		ia	supporting data in Remarks or on a separate sheet)					
					Problematic Hydrophytic Vegetation ¹ (Explain)					
8					¹ Indicators of hydric soil and wetland hydrology must					
10					be present, unless disturbed or problematic.					
			=Total Cover							
		50%	- Total Cover		Hydrophytic Vegetation Present?					
	Stratum (Plot size:	<u> </u>			Yes <u>X</u> No					
1					4					
2			T .(10		1					
			=Total Cover		l					
% Bare Ground in	Herb Stratum <u>50%</u>									

Remarks:

~

SOIL Profile Description: (Describe to the d Depth <u>Matrix</u>	Re	cument the in dox Features		_	Sampling Point <u>WL-4</u> he absence of indicators.)
(inches) Color (moist) %	Color (moist)	<u>% Туре</u>	e ¹ Loc ²	Texture	
$\frac{0-9"}{0-9"} \frac{2.5Y}{5Y} \frac{5/2}{2.5/1} \frac{60}{40}$	7.5YR 4/6	<u>20%</u> C	<u>M</u>	Silty loam	Mottles: medium to coarse, common, promit Blended matrix with fine texture
9-14" 2.5Y 5/2 60	7.5YR 4/6	20% C		Silty loam	Mottles: medium to coarse, common, prominent
<u>9-14"</u> <u>5Y 2.5/1</u> <u>40</u>					Blended matrix with medium texture
			_		
1					2
¹ Type: C=Concentration, D=Depletion, F					
Hydric Soil Indicators: (Applicable Histosol (A1)		ess otnerwis ed Matrix (S4)	e notea		tors for Problematic Hydric Soils ³ : cm Muck (A9) (LRR I, J)
Histic Epipedon (A2)	Sandy Redo	ox (S5)			Coast Prairie Redox (A16) (LRR F, G, H)
Black Histic (A3)	Striped Matr	ix (S6)	、		Dark Surface (S7) (LRR G)
Hydrogen Sulfide (A4) Stratified Layers (A5) (LRR F)		cky Mineral (F1 ed Matrix (F2)			High Plains Depressions (F16) LRR H outside of MLRA 72 & 73)
1 cm Muck (A9) (LRR F, G, H)	Depleted Ma	atrix (F3)		È	Reduced Vertic (F18)
Depleted Below Dark Surface (A12)		Surface (F6)		F	Red Parent Material (TF2)
Thick Dark Surface (A12) Sandy Mucky Mineral (S1)		ark Surface (F7 ressions (F8))	<u>(</u>	Other (Explain in Remarks) icators of hydrophytic vegetation and
2.5 Mucky Peat or Peat (S2) (LRR G		Depressions (10)	-16)	110	wetland hydrology must be present,
5 cm Mucky Peat or Peat (S3) (LRR	F) (MLRA 72 a	& 73 of LRR H)			unless disturbed or problematic
Restrictive Layer (if present):					
Туре:		Ну	dric Soil	Present?	YesX No
Depth (inches) :					
Remarks:					
HYDROLOGY					
······					
Wetland Hydrology Indicators:					
Primary Indicators (minimum of one required		<u>,</u>			Indicators (minimum of two required)
X_Surface Water (A1) X_Saturation (A3)	Salt Crust (B11 Hydrogen Sulfic	,			sely Vegetated Concave Surface (B8) age Patterns (B10)
Water Marks (B1)	Dry Season Wa	ter Table (C2)		Oxidiz	zed Rhizospheres on Living Roots (C3)
Sediment Deposits (B2) Drift Deposits (B3)	Oxidized Rhizos (where not tille	spheres on Living	Roots (C		re tilled) ish Burrows (C8)
Algal Mat or Crust (B4)	Presence of Red				ation Visible of Aerial Imagery (C9)
Iron Deposits (B5)	Thin Muck Surfa				norphic Position (D2)
Inundation Visible on Aerial Imagery (B7) Water-Stained Leave (B9)	Other (Explain i	in Remarks)			Neutral Test (D5) Heave Hummocks (D7) (LRR F)
Field Observations:					
Surface Water Present? Yes X No	Depth (inches) 6 in	nches	We	etland Hydrold	ogy Present?
	Depth (inches)		Ye	s <u>X</u> No	
Saturation Present? Yes X No	Depth (inches) *				
(includes capillary fringe) * Saturated to the surface.			•		
Caturated to the surrace.					
Describe Recorded Data (stream gauge	, monitoring well, ae	rial photos,	1		
previous inspections), if available:					
Remarks:					· · · · · · · · · · · · · · · · · · ·
					_

6-

Project/Site:	Ludeman License	Area				Sampling Date:	6/9/2008
Applicant/Owner:						City/County:	
						5, T34N, R73W State: WY	
Landform (hillslope	i, terrace, etc.):	_Depression i	n range land	Loc	al relief (cor	ncave, convex, none) <u>concave</u>	Slope (%)_ <u>NA</u>
Soil Map Unit Nam	ie: 187-Kishona-	Cambria loa	Lai <u>.</u>	-105.592	NWI class	ng: <u>42.875</u> Datum: <u>N</u> ificationPEMA Sampling	a Point WL-5
Are climate/hydrol	ogic conditions or	n the site typ	ical for this t	ime of year? Y	'es_ <u>X_</u> N	o (If no, explain in Remarks.)	
Are "Normal Circu	mstances" preser	nt?		Y	'es <u>X</u> N	o	
Are Vegetation	, Soil, o	r Hydology_	significa	ntly disturbed?	,	Yes Yes	No <u>X</u>
Are Vegetation	, Soil, oi	r Hydrology_	natural	ly problematic	?	Yes	No <u>X</u>
(If needed, explain	•	•					
				ng sampling	point loca	ations, transects, important fe	atures, etc.
Hydrophytic Veget Hydric Soil Preser		Yes <u>X</u> Yes <u>X</u>	No	le	the Sample	d Area	
Wetland Hydrolog	v Present?	Yes X	No		thin a Wetla		
Remarks:	,						· · · · ·
	depression in rolli	ng rangeland.					
VEGETATION –	Use scientific	names of	plants.			Dominance Test Worksheet:	
Tree Stratum	(Plot size:		Absolute	Dominate	Indicator	Number of Deminent Creation	
1			%Cover	Species?	Status	Number of Dominant Species That Are OBL, FACW, or FAC	
			·			(excluding FAC-):	(A)
2							
3						Total Number of Dominant Species Across All Strata:	1 (B)
4							(D)
				=Total Cover		Percent of Dominant Species	
Sapling/Shru	<u>b Stratum (Plot si</u>	ze:)				That are OBL, FACW, or FAC:	100 (A/B)
1						Prevalence Index Worksheet:	
2						Total % Cover of:	Multiple by:
3						OBL species x 1 =	
4						_ FACW species x 2 = FAC species x 3 =	·
5						FACU species x 4 =	
				=Total Cover		UPL species x 5 =	
Herb Stratum	(Plot size: 20s	sf)				Column Totals:A)	(B)
1 Eleocharis palus			50	Y	OBL	Prevalence Index = B/A =	
2 Agropyron smith	ii		10	N	FACU		
3						Hydrophytic Vegetation Indica	
4						$\underbrace{X}_{\text{Dominance Test is >50\%}}_{\text{Prevalence Index is } \leq 3.0}$	
5						Morphological Adaptation	s ¹ (Provide
6 7						supporting data in Remarks or o	n a separate sheet)
8						Problematic Hydrophytic	/egetation' (Explain)
<u> </u>						¹ Indicators of hydric soil and we	tland hydrology must
10						be present, unless disturbed or	
-			60%	=Total Cover		Hydrophytic Vegetation Present	 >
Woody Vine S	Stratum (Plot size	:)				Yes <u>X</u> No	
1							
2						1	
				=Total Cover			
% Bare Ground in	Herb Stratum	_40%	_				
						· · · · · · · · · · · · · · · · · · ·	
Damasta							
Remarks:							

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) DepthMatrixRedox Features
(inches) Color (moist) % Color (moist) % Type ¹ Loc ² Texture
0-6" 2.5Y 4/1 NA Silty loam Oxidized root channels
6-13" 2.5Y 5/2 2.5Y 5/6 15% C M Sandy silt loam Mottles: Fine to medium, common, distinct
· · · ·
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ² Location: PL=Pore Lining, M=Matrix. Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils ³ :
Histic Epipedon (A2)Sandy Redox (S5)Coast Prairie Redox (A16) (LRR F, G, H)
Black Histic (A3) Striped Matrix (S6) Dark Surface (S7) (LRR G) Hydrogen Sulfide (A4) X_Loamy Mucky Mineral (F1) High Plains Depressions (F16)
1 cm Muck (A9) (LRR F, G, H)Depleted Matrix (F3)Reduced Vertic (F18)
Depleted Below Dark Surface (A12)Redox Dark Surface (F6)Red Parent Material (TF2)Thick Dark Surface (A12)Depleted Dark Surface (F7)Other (Explain in Remarks)
Sandy Mucky Mineral (S1) Redox Depressions (F8) ³ Indicators of hydrophytic vegetation and
2.5 Mucky Peat or Peat (S2) (LRR G,H)High Plains Depressions (F16) wetland hydrology must be present, 5 cm Mucky Peat or Peat (S3) (LRR F) (MLRA 72 & 73 of LRR H) unless disturbed or problematic
Restrictive Layer (if present): Type: Hydric Soil Present? YesX No
Depth (inches) :
Remarks:
HYDROLOGY
Wetland Hydrology Indicators:
Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required)
Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) X_Surface Water (A1) Salt Crust (B11) Sparsely Vegetated Concave Surface (B8)
Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) X_Surface Water (A1) Salt Crust (B11) Sparsely Vegetated Concave Surface (B8) X_Saturation (A3) Hydrogen Sulfide Odor (C1) Drainage Patterns (B10) Water Marks (B1) Dry Season Water Table (C2) Oxidized Rhizospheres on Living Roots (C3)
Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) X_Surface Water (A1) Salt Crust (B11) Sparsely Vegetated Concave Surface (B8) X_Saturation (A3) Hydrogen Sulfide Odor (C1) Drainage Patterns (B10) Water Marks (B1) Dry Season Water Table (C2) Oxidized Rhizospheres on Living Roots (C3) Sediment Deposits (B2) X_Oxidized Rhizospheres on Living Roots (C3) (where tilled)
Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) X_Surface Water (A1) Salt Crust (B11) Sparsely Vegetated Concave Surface (B8) X_Saturation (A3) Hydrogen Sulfide Odor (C1) Drainage Patterns (B10) Water Marks (B1) Dry Season Water Table (C2) Oxidized Rhizospheres on Living Roots (C3) Sediment Deposits (B2) XOxidized Rhizospheres on Living Roots (C3) (where not tilled) Crayfish Burrows (C8) Algal Mat or Crust (B4) Presence of Reduced Iron (C4) Saturation Visible of Aerial Imagery (C9)
Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) X_Surface Water (A1) Salt Crust (B11) Sparsely Vegetated Concave Surface (B8) X_Saturation (A3) Hydrogen Sulfide Odor (C1) Drainage Patterns (B10) Water Marks (B1) Dry Season Water Table (C2) Oxidized Rhizospheres on Living Roots (C3) Sediment Deposits (B2) XOxidized Rhizospheres on Living Roots (C3) Ortif Deposits (B3) Drift Deposits (B3) Where not tilled) Crayfish Burrows (C8) Ion Deposits (B5) Thin Muck Surface (C7) Geomorphic Position (D2)
Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) X_Surface Water (A1) Salt Crust (B11) Sparsely Vegetated Concave Surface (B8) X_Saturation (A3) Hydrogen Sulfide Odor (C1) Drainage Patterns (B10) Water Marks (B1) Dry Season Water Table (C2) Oxidized Rhizospheres on Living Roots (C3) Sediment Deposits (B2) XOxidized Rhizospheres on Living Roots (C3) (where not tilled) Crayfish Burrows (C8) Algal Mat or Crust (B4) Presence of Reduced Iron (C4) Saturation Visible of Aerial Imagery (C9)
Wetland Hydrology Indicators: Secondary Indicators (minimum of two required) Y Surface Water (A1) Salt Crust (B11) Sparsely Vegetated Concave Surface (B8) X_Saturation (A3) Hydrogen Sulfide Odor (C1) Drainage Patterns (B10) Water Marks (B1) Dry Season Water Table (C2) Oxidized Rhizospheres on Living Roots (C3) Sediment Deposits (B2) XOxidized Rhizospheres on Living Roots (C3) (where not tilled) Drift Deposits (B3) Presence of Reduced Iron (C4) Caryfish Burrows (C8) Inon Deposits (B5) Thin Muck Surface (C7) Geomorphic Position (D2) Inundation Visible on Aerial Imagery (B7) Other (Explain in Remarks) FAC-Neutral Test (D5)
Wetland Hydrology Indicators: Secondary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) X_Surface Water (A1) Salt Crust (B11) Sparsely Vegetated Concave Surface (B8) X_Saturation (A3) Hydrogen Sulfide Odor (C1) Drainage Patterns (B10) Water Marks (B1) Dry Season Water Table (C2) Oxidized Rhizospheres on Living Roots (C3) Sediment Deposits (B2) XOxidized Rhizospheres on Living Roots (C3) (where not tilled) Drift Deposits (B3) Presence of Reduced Iron (C4) Saturation Visible of Aerial Imagery (C9) Iron Deposits (B5) Thin Muck Surface (C7) Geomorphic Position (D2) Inundation Visible on Aerial Imagery (B7) Other (Explain in Remarks) FAC-Neutral Test (D5)
Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) X_Surface Water (A1)
Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) X_Surface Water (A1)
Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) X_Surface Water (A1)
Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) X_Surface Water (A1)
Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) X_Surface Water (A1) Salt Crust (B11) Sparsely Vegetated Concave Surface (B8) X_Surface Water (A3) Hydrogen Sulfide Odor (C1) Drainage Patterns (B10) Water Marks (B1) Dry Season Water Table (C2) Oxidized Rhizospheres on Living Roots (C3) Sediment Deposits (B2)
Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) X_Sufrace Water (A1)
Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) X_Surface Water (A1) Salt Crust (B11) Sparsely Vegetated Concave Surface (B8) X_Saturation (A3) Hydrogen Sulfide Odor (C1) Drainage Patterns (B10) Water Marks (B1) Dry Season Water Table (C2) Oxidized Rhizospheres on Living Roots (C3) Sediment Deposits (B2) X_Oxidized Rhizospheres on Living Roots (C3) (where tilled) Drift Deposits (B3) (where not tilled) Crayfish Burrows (C8) Hord Deposits (B5) Thin Muck Surface (C7) Geomorphic Position (D2) Iron Deposits (B5) Thin Muck Surface (C7) Geomorphic Position (D2) Iron Deposits (B5) Thin Muck Surface (C7) Geomorphic Position (D2) Iron Deposits (B5) Thin Muck Surface (C7) Geomorphic Position (D2) Iron Deposits (B6) Dotter (Explain in Remarks) Frost-Heave Hummocks (D7) (LRR F) Water Table Present? Yes X_NoDepth (inches) Yes_X_No Saturation Present? Yes X_NoDepth (inches) Yes_X_No Saturated to the surface. Saturated to the surface.
Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) X_Sufrace Water (A1)
Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) X_Sufrace Water (A1)
Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) X_Surface Water (A1)

Applicant/Owner Ciratian Ose City/County: Curverse County Inadiom (hillslops, forrace, etc.) Dick durinage Local relief (concave, convex, none) Solo May Soli Map Unit Name 244.265 Datum: NAD-83 Ace 'Insamption of the site byokal for this time of year? Yes No	Project/Site:	Ludeman License Area					Sampling Date:	8/6/08
Partorm (hillstope, terrose, etc.). Dited drainage. Local relief (concese, convex, none)concaveSlope(%) = 2% Soli Map Unit Name: _244_Taluce_Turnercoset.Keeline fine same loarns NW classification na Sampling Point_WT-6				· · · · · · · · · · · · · · · · · · ·				Converse County
Subregion (LRR) LRR H Lst.::-105.591 Long::4.2866 Sampling Point, WL-6								
Soil Map Unit Name. 244-1 atuce Turnerrost-Keeline fine and loams NVM classificationm								
Are cimate/hydrologic conditions on the site typical for this time of year? Yees	Soil Map Unit Nam	<u></u> ne [:] 244-Taluce-Turnercrest-K	Lal eeline fine s:	- 105.591	Lor NWI clas	sification na	Datum. <u>N</u> Sampling F	<u>AD-03</u> Point WL-6
Are "Normal Circumstances" present? Yes _ No	Are climate/hydrol	ogic conditions on the site typ	ical for this ti	me of year? Y	es X N	lo (If no, e	xplain in Remarks.)	
Are Vegstationonl, or Hydrologynaturally problematic? YesNoNo	Are "Normal Circu	mstances" present?					, ,	
Are Vegstationonl, or Hydrologynaturally problematic? YesNoNo								
Are Vegstationonl, or Hydrologynaturally problematic? YesNoNo	Are Vegetation		significar	atly disturbed?	,		Ves	No X
(If needed, explain any answers in Remarks.) SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc. Hydrophytic Vegetation Present? Yes_X_No							Yes	
Hydrophytic Vegetation Present? Yes_X_No				j problomatio	•			<u> </u>
Hydrophytic Vegetation Present? Yes_X_No	SUMMARY OF	FINDINGS – Attach site m	ap showir	ng sampling	point loc	ations, transe	cts, important fe	atures, etc.
Hydric Soli Present? Yes_X No				3 - 1 - 3				,
Remarks: This is a wetland which has formed behind a dike in a drainage. VEGETATION - Use scientific names of plants. Absolute 1 Absolute 2 Absolute 3 Absolute 4 Contrast Species? 5 Free Stratum (Plot size: 1	Hydric Soil Preser	nt? Yes <u>X</u>	No	ls	the Sample	d Area		
This is a wetland which has formed behind a dike in a drainage. VEGETATION - Use scientific names of plants. Image: Tree Stratum (Plot size:		y Present? Yes <u>X</u>	No	wit	thi <mark>n a Wet</mark> la	and? Yes	<u>XNo</u>	
VEGETATION – Use scientific names of plants. Image: Instruct Tree Stratum (Plot size:								
Tree Stratum (Plot size: Absolute %Cover Dominate Species? Indicator Status 1	This is a wetland	which has formed behind a dike	in a drainage.					
Tree Stratum (Plot size: Absolute %Cover Dominate Species? Indicator Status 1						- r		
1 %Cover Species? Status Number of Dominant Species 1 1 1 A 1 (A) 3 1 1 (A) Total Number of Dominant Species 4 1 1 (B) Percent of Dominant Species 5 1 1 (B) Percent of Dominant Species 1 1 1 (B) Percent of Dominant Species 2 1 1 (B) Percent of Dominant Species 1 1 1 (B) Percent of Dominant Species 1 1 1 (B) Percent of Dominant Species 1 1 1 (B) Percent of Dominant Species 2 1 1 (B) Percent of Dominant Species 3				1		Dominance	Test Worksheet:	
1 Image: Construction of the stratum of the stratu	Tree Stratum	(Plot size:)				Number of D	ominant Species	
2	1		%Cover	Species?	Status			
3								(A)
4								
4 =Total Cover Percent of Dominant Species 1 Prevalence Index Worksheet: Total % Cover of: 100 (A/B) 2 Data are OBL,FACW, or FAC: 100 (A/B) 3 Prevalence Index Worksheet: Total % Cover of: Multiple by: 3 Prevalence Index Worksheet: Total % Cover of: Multiple by: 4 Prevalence Index Worksheet: Total % Cover of: Multiple by: 5 FAC Species x 2 = FAC Species x 2 = Herb Stratum (Plot size: 20sf FAC U Species x 4 = UPL Species x 5 = Browus britighomis 1 N OBL Prevalence Index is 2.0* Column Totals: A) (B) 3 Browus britighomis 1 N NL Hydrophytic Vegetation Indicators: X Dominance Test is >50% S.0* Prevalence Index is 3.0* Prevalence Index is 3.0* Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation '(Explain) 'Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. 8 S0% =Total Cover Hydrophytic Vegetation Present? Yes X No Yes X No Yes X	3							1 (P)
Sapling/Shrub Stratum (Plot size:) That are OBL_FACW, or FAC:100 (A/B) 1 Prevalence Index Worksheet: 2 OBL_FACW, or FAC:100 (A/B) 3 FAC species 4 FAC species 5 FAC species Herb Stratum (Plot size: FAC species Herb Stratum (Plot size:) FACW 1 N 2 Column Totals:A) 1 N 2 Column Totals:A) 2 Column Totals:A) 3 1 3 N 4 OBL FACW species 5	4					Species Acit	SS All Stidta.	<u>i</u> (D)
Prevalence Index Worksheet: 1 Total % Cover of: Multiple by: 0 OBL species x 1 = 4 FAC species x 3 = 5 FAC species x 3 = 6 FAC species x 4 = 1 N OBL 1 Hordeum jubatum 47 Y 2 Eleocharis palustris 1 N 1 N OBL Prevalence Index is >50% 2 Eleocharis palustris 1 N 3 1 N NL 4 Grindelia squarrosa 1 N 5 Prevalence Index is >50% 5 Prevalence Index is > 50% 6 Problematic Hydrophytic Vegetations (Explain) 8 Problematic Hydrophytic Vegetations (Explain) 9 Problematic Hydrophytic Vegetation '(Explain) 10 12		· · · · · · · · · · · · · · · · · · ·		=Total Cover				
Image: state stat	Sapling/Shru	b Stratum (Plot size:)				That are OB	L,FACW, or FAC:	100 (A/B)
3 OBL species X 1 =	1					Prevalence	Index Worksheet:	
G	2			· · · · · ·		Total % Co	over of:	Multiple by:
4	3				· · · · · · · · · · · · · · · · · · ·	OBL species	x 1 =	
5								
Herb Stratum (Plot size: 20sf)						FAC species	$x_3 = x_4 =$	
Herb Stratum (Plot size: 20sf)	5					UPL species	x5=	
Herb Stratum (Plot size:) 47 Y FACW Prevalence Index = B/A = 2 Eleocharis palustris 1 N OBL Hydrophytic Vegetation Indicators: 3 Bromus briziformis 1 N NL								
2 Eleocharis palustris 1 N OBL 3 Bromus briziformis 1 N NL 4 Grindelia squarrosa 1 N UPL 5 - - - 6 - - - 7 - - - 8 - - - 9 - - - 10 - - - 50% =Total Cover - Hydrophytic Vegetation Present? Woody Vine Stratum (Plot size: - - - 1 - - - - % Bare Ground in Herb Stratum50% - - -			47	N7	EACU	_		
3 Bromus briziformis 1 N NL 4 Grindelia squarrosa 1 N UPL 5 1 N UPL 6						Prevalence	Index = B/A =	· · · · · · · · · · · · · · · · · · ·
4 Grindelia squarrosa 1 N UPL						Hydrophytic	Vegetation Indica	tore
1 1			_					1015.
6 Morphological Adaptations' (Provide supporting data in Remarks or on a separate sheet) 7	-	754	-			Preval	ence Index is ≤ 3.0	
7						Morph	ological Adaptations	¹ (Provide
8 9 1 Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. 10 50% =Total Cover Hydrophytic Vegetation Present? Woody Vine Stratum (Plot size:) 1 Hydrophytic Vegetation Present? 1 =Total Cover YesNo % Bare Ground in Herb Stratum50% 50%								
9 1	8						matic Hydrophytic v	egetation (Explain)
10 be present, unless disturbed or problematic. 50% =Total Cover Woody Vine Stratum (Plot size:) Hydrophytic Vegetation Present? 1 YesXNo 2 =Total Cover % Bare Ground in Herb Stratum								
Woody Vine Stratum (Plot size:) Yes 1 2 *Total Cover *Total Cover			1	1				
Woody Vine Stratum (Plot size:) Yes 1 2 # =Total Cover % Bare Ground in Herb Stratum			50%	=Total Cover		Hydrophytic Y	Vegetation Present?	
1	Woody Vine S	Stratum (Plot size:)			I			
% Bare Ground in Herb Stratum	1							
% Bare Ground in Herb Stratum <u>50%</u>	2							
				=Total Cover				
Remarks:	% Bare Ground in	Herb Stratum 50%	_					
Remarks:								
Remarks:								
	Remarks:							

 \cdot

SOIL Profile De Depth	escription: (Describ Matrix	e to the d		ocument edox Fea		icator	or confirm (Sampling Point the absence of indicators.)	WL-6
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Lo	c ² Texture		
<u>0-4"</u>	10YR 4/2		7.5YR 5/8	2%	<u> </u>	<u>M</u>	Silty loam	Mottles: fine, few, prominent oxidized root channels in 0-4	
0-9"	10YR 4/2		7.5YR 5/8	30%	C	M	Silty loam	Mottles: fine, many, prominen	—
		·							
						- <u>-</u>			
Hydric S Histos Histic Black Hydroo Stratifi 1 cm M Deplet Thick Sandy 2.5 Mu	Concentration, D=De oil Indicators: (Ap sol (A1) Epipedon (A2) Histic (A3) gen Sulfide (A4) ed Layers (A5) (LRR Muck (A9) (LRR F, G ted Below Dark Surfa Dark Surface (A12) Mucky Mineral (S1) Jucky Peat or Peat (S2)	2) (LRR 0	e to all LRRs, un Sandy Gley Sandy Rec Striped Ma Loamy Mu Loamy Gle Depleted M Redox Dar Redox Dep Redox Depleted I Redox Depleted I	less oth yed Matrix lox (S5) trix (S6) ucky Mine yed Matrix latrix (F3) k Surface Dark Surface Dark Surface pressions s Depress	erwise (S4) ral (F1) x (F2) (F6) ace (F7) (F8) sions (F ⁻)	note	rd.) Indica 	ins. ² Location: PL=Pore Lin ators for Problematic Hyd 1 cm Muck (A9) (LRR I, J) Coast Prairie Redox (A16) (LR Dark Surface (S7) (LRR G) _High Plains Depressions (F16 (LRR H outside of MLRA 72 & Reduced Vertic (F18) Red Parent Material (TF2) Other (Explain in Remarks) dicators of hydrophytic vegetati wetland hydrology must be pre- unless disturbed or problemat	ric Soils ³ : RR F, G, H)) 73) on and esent,
Restrictiv	e Layer (if present)	:			Hyd	Iric So	il Present?	Yes <u>X</u> No	
Depth (Remar HYDRO									
Wetland H	ydrology Indicators:								
Primary Inc Surface Saturat Water I Sedime Drift De Algal M Iron De Inunda	Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) Surface Water (A1) Salt Crust (B11) Sparsely Vegetated Concave Surface (B8) Saturation (A3) Hydrogen Sulfide Odor (C1) X_Drainage Patterns (B10) Water Marks (B1) Dry Season Water Table (C2) Oxidized Rhizospheres on Living Roots (C3) Sediment Deposits (B2) X Oxidized Rhizospheres on Living Roots (C3) (where not tilled) Algal Mat or Crust (B4) Presence of Reduced Iron (C4) Saturation Visible of Aerial Imagery (C9) Iron Deposits (B5) Thin Muck Surface (C7) Geomorphic Position (D2) Inundation Visible on Aerial Imagery (B7) _Other (Explain in Remarks) X FAC-Neutral Test (D5) Water-Stained Leave (B9) Totst_Heave Hummocks (D7) (LRR F)								
	ervations: ater Present? Yes	No X	Depth (inches)				Vetland Hydrol	logy Present?	
Water Table Saturation I	e Present? Yes	NoX	_ Depth (inches) _ Depth (inches) _ Depth (inches)				/esXNo_		
	Recorded Data (streanspections), if availal		, monitoring well, a	erial photo	os,				
Remarks:									۲
		a ma					· · · · · · · · · · · · · · · · · · ·		

Project/Site: Ludeman License Area				Sampling Date: 8/7/2008
Applicant/Owner: Uranium One				City/County: Converse County
Investigator(s): <u>W. Stansbury</u> Landform (hillslope, terrace, etc.): <u>Depressi</u>				T34NR73W State: WY
Subregion (LRR): <u>LRR H</u>	<u>on</u> Lat: <u>-1</u>	a reliei (coi 05.641	ncave, conv Lo	vex, none) <u>concave</u> Slope (%) <u><2%</u> ong: <u>42.953</u> Datum: <u>NAD-83</u>
Soil Map Unit Name: 175-Hiland-Bowbac c	omplex	1	WI classifi	cation_PEMA/PUSC Sampling Point_WL-7
Are climate/hydrologic conditions on the site	typical for this time	e of year? Y	′es <u>X</u> N	lo (If no, explain in Remarks.)
Are "Normal Circumstances" present?		Y	′es <u>X</u> N	lo
Are Vegetation, Soil, or Hydolog				Yes No <u>_X</u>
Are Vegetation, Soil, or Hydrolo		problematic	?	Yes No <u>_X_</u>
(If needed, explain any answers in Remarks				
		sampling	point loc	ations, transects, important features, etc.
	<pre>{ No</pre>	le	the Sample	d Area
Hydric Soil Present? Yes_2 Wetland Hydrology Present? Yes_2	<u>XNO</u> XNO			and? Yes <u>X</u> No
Remarks:				
This is an isolated depression in rolling rangelar	nd with some areas	of shallow op	oen water.	
VEGETATION – Use scientific names	of plants.			Dominance Test Worksheet:
Tree Stratum (Plot size:)		Dominate	Indicator	
	%Cover	Species?	Status	Number of Dominant Species
1				That Are OBL, FACW, or FAC (excluding FAC-):1_(A)
2				
3				Total Number of Dominant
4				Species Across All Strata:1_(B)
		=Total Cover		Percent of Dominant Species
Sapling/Shrub Stratum (Plot size:	7			That are OBL, FACW, or FAC: 100 % (A/B)
1				Prevalence Index Worksheet:
2				Total % Cover of: Multiple by:
3				OBL species x 1 = FACW species x 2 =
4				FAC species x 3 =
5				FACU species x 4 = UPL species x 5 =
		=Total Cover		
Herb Stratum (Plot size: 20sf	<u>)</u>			Column Totals:A)(B)
1 Eleocharis palustris	23	Y	OBL	Prevalence Index = B/A =
2 Hordeum jubatum	1	N	FACW	
3 Ambrosia tomentosa	1	<u>N</u>	NL	Hydrophytic Vegetation Indicators:
4				$\frac{1}{2} - \frac{X}{2} \text{ Dominance Test is } >50\%$ Prevalence Index is $\leq 3.0^1$
5				Morphological Adaptations ¹ (Provide
6 7				supporting data in Remarks or on a separate sheet)
8				Problematic Hydrophytic Vegetation ¹ (Explain)
9				⁻¹ Indicators of hydric soil and wetland hydrology must
10				be present, unless disturbed or problematic.
	25%	=Total Cover		Hydrophytic Vegetation Present?
Woody Vine Stratum (Plot size:				Yes <u>X</u> No
1				-
2		Tatal O-		4
% Bare Ground in Herb Stratum75%		=Total Cover		
Remarks:				

SOIL Sampling PointWL-7 Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Sampling PointWL-7 Depth Matrix Redox Features
(inches) Color (moist) % Color (moist) % Type ¹ Loc ² Texture
0-16" 10YR 5/1 NA Silty clay loam Oydized root channels present. More roots in 0-10"
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ² Location: PL=Pore Lining, M=Matrix.
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils ³ : Histosol (A1) Sandy Gleyed Matrix (S4) 1 cm Muck (A9) (LRR I, J) Histic Epipedon (A2) Sandy Redox (S5) Coast Prairie Redox (A16) (LRR F, G, H) Black Histic (A3) Striped Matrix (S6) Dark Surface (S7) (LRR G) Hydrogen Sulfide (A4) _X_Loamy Mucky Mineral (F1) High Plains Depressions (F6) Stratified Layers (A5) (LRR F, G, H) Depleted Matrix (F3) High Plains Depressions (F8) Depleted Below Dark Surface (A12) Redox Depressions (F8) Redox Depressions (F16) Thick Dark Surface (A12) Depleted Dark Surface (F7) Other (Explain in Remarks) Sandy Mucky Peat or Peat (S2) (LRR G, H) High Plains Depressions (F16) 3'Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic
Restrictive Layer (if present):
Type: Hydric Soil Present? YesX No Depth (inches) :
Remarks:
HYDROLOGY
Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) X_Surface Water (A1) Salt Crust (B11) Sparsely Vegetated Concave Surface (B8) X_Saturation (A3) Hydrogen Sulfide Odor (C1) Drainage Patterns (B10) Water Marks (B1) Dry Season Water Table (C2) Oxidized Rhizospheres on Living Roots (C3) Sediment Deposits (B2) _X_Oxidized Rhizospheres on Living Roots (C3) (where not tilled) Drift Deposits (B3) Presence of Reduced Iron (C4) Saturation Visible of Aerial Imagery (C9) Iron Deposits (B5) Thin Muck Surface (C7) Geomorphic Position (D2) Inundation Visible on Aerial Imagery (B7) Other (Explain in Remarks) FAC-Neutral Test (D5) Water-Stained Leave (B9) Frost-Heave Hummocks (D7) (LRR F)
Field Observations: Wetland Hydrology Present? Surface Water Present? YesNoX_ Depth (inches) Water Table Present? YesNoX_ Depth (inches)
Saturation Present? Yes No X Depth (inches) * (includes capillary fringe) * Soil moist at depth of 10 inches.
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
Remarks:

-	udeman License Area				Sampling Date: 8/7/2008
Applicant/Owner:					City/County: Converse County
nvestigator(s): W	. Stansbury				T34NR73W State: WY
Subregion (LRR):	terrace, etc.): <u>Depression</u> _RR H	Lot	ocal reliet (cor		ex, none) <u>concave</u> Slope (%) <u><2%</u>
Soil Map Unit Name	141-Dwyer-Orpha loamy s	Lat	105.045	10	ng: <u>42.953</u> Datum: <u>NAD-83</u> WI classification <u>na</u> Sampling Point_ WL-8
			me of year? Y	es X N	o (If no, explain in Remarks.)
Are "Normal Circums				'es <u>X</u> N	
Are Vegetation	, Soil, or Hydology	eignificar	thy disturbed?		Yes NoX
	_, Soil, or Hydrology _, Soil, or Hydrology				Yes No_X Yes No_X
	ny answers in Remarks.)	nataran	y problemate.		
	•	an showin	a samplina	point loca	ations, transects, important features, etc.
Hydrophytic Vegetati			33		
	V T	No	ls	the Sample	d Area
Wetland Hydrology P	Present? Yes_X_	No		hin a Wetla	
Remarks:					
This is an isolated depr	ression in rolling rangeland.				
	se scientific names of	plants.			Dominance Test Worksheet:
Tree Stratum (P	Plot size:)	Absolute	Dominate	Indicator	Number of Deminent Openies
		%Cover	Species?	Status	Number of Dominant Species That Are OBL, FACW, or FAC
1					(excluding FAC-):1(A)
2					(.)
3					Total Number of Dominant
4					Species Across All Strata:1(B)
			=Total Cover		
					Percent of Dominant Species That are OBL,FACW, or FAC: 100 % (A/B)
Sapling/Shrub S	Stratum (Plot size:)				
1					Prevalence Index Worksheet: <u>Total % Cover of:</u> Multiple by:
2					
3					OBL species x 1 = FACW species x 2 =
4					FAC species x 3 =
5					FACU species x 4 =
			=Total Cover		UPL species x 5 =
Herb Stratum (F	Plot size: 20sf)				- Column Totals:A)(B)
		36	Y	OBL	
1 Eleocharis palustris 2 Agropyron smithii	<u>i</u>	2	N I	UPL	Prevalence Index = B/A =
3 Hordeum jubatum		1	N	FACW	Hydrophytic Vegetation Indicators:
4 Ambrosia tomentosa	<i>a</i>	1	N	NL	XDominance Test is >50%
5	<u>+</u>				Prevalence Index is $\leq 3.0^1$
6					Morphological Adaptations ¹ (Provide
7	wa				supporting data in Remarks or on a separate sheet)
8					Problematic Hydrophytic Vegetation ¹ (Explain)
9		· · · ·			¹ Indicators of hydric soil and wetland hydrology must
10					be present, unless disturbed or problematic.
		40%	=Total Cover		
Moody Mine Office	otum (Dist sinc)	HU 70			Hydrophytic Vegetation Present? Yes <u>X</u> No
Woody Vine Stra					
2			<u> </u>		4
<u>د</u>			=Total Cover		4
% Bare Ground in He	erb Stratum 60%				· · · · ·
	510 Ottatum00 %				
Bomerica	· · · · · · · · · · · · · · · · · · ·				
Remarks:					

Soll Sampling Point WL-8 Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Depth Matrix Redox Features
(inches) Color (moist) % Color (moist) % Type ¹ Loc ² Texture
0-16" 2.5Y 5/2 7.5YR 4/4 <2% Silty clay loam Oxidized root channels present. More
roots in 0-8"
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ² Location: PL=Pore Lining, M=Matrix.
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils ³ : Histosol (A1) Sandy Gleyed Matrix (S4) 1 cm Muck (A9) (LRR I, J) Histic Epipedon (A2) Sandy Redox (S5) Coast Prairie Redox (A16) (LRR F, G, H) Hydrogen Sulfide (A4) X_Loamy Mucky Mineral (F1) Coast Quere (S7) (LRR G) High Plains Depressions (F16) Loamy Gleyed Matrix (F2) High Plains Depressions (F16) Torm Muck (A9) (LRR F, G, H) Depleted Matrix (F3) Redox Dark Surface (F6) Redox Dark Surface (F7) Thick Dark Surface (A12) Redox Depressions (F8) Other (Explain in Remarks)
Restrictive Layer (if present):
Type: Hydric Soil Present? Yes X No Depth (inches) :
Remarks:
HYDROLOGY
Wetland Hydrology Indicators:
Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required)
Field Observations: Wetland Hydrology Present?
Surface Water Present? YesNoXDepth (inches) Water Table Present? YesNoXDepth (inches) Saturation Present? YesNoXDepth (inches) (includes capillary fringe) YesNo
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
Remarks:

Project/Site: Ludeman License Area				Sampling Date: 8/7&9/2008
Applicant/Owner: Uranium One		•		City/County: Converse County
Investigator(s): K. LaClair & W. Stansbury				6, T34NR73W State: WY
Landform (hillslope, terrace, etc.): <u>Depression</u> Subregion (LRR): <u>LRR H</u>				rex, none) <u>concave</u> Slope (%) <u><2%</u> png: <u>42.950</u> Datum: <u>NAD-83</u>
Subregion (LRR): <u>LRR H</u> Soil Map Unit Name: <u>141-Dwyer-Orpha loamy</u>	Lat sands, 175-ł	liland-Bowbac	complex. 2	258-UIm-Forkwood loams
			NWI	classification_PEMA Sampling Point_WL-9
Are climate/hydrologic conditions on the site typ	ical for this ti	me of year? Ye	es_ <u>X</u> _N	o (If no, explain in Remarks.)
Are "Normal Circumstances" present?		Y	es <u>X</u> N	0
Are Vegetation, Soil, or Hydology	significar	ntly disturbed?		Yes NoX
Are Vegetation, Soil, or Hydrology_				Yes NoX_
(If needed, explain any answers in Remarks.)				
SUMMARY OF FINDINGS – Attach site m	nap showin	g sampling	point loca	ations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes_X_				
Hydric Soil Present? Yes X			he Sample	
	No	wit	hin a Wetla	nd? Yes <u>X</u> No
Remarks: This is a string of intermittent wetlands (8 wetlands)	WI - Qa throu	ah WI -Oh) tha	t are disconr	pacted depressions within the same drainage area
They range in size from 0.003 acres to 1.016 acres.		igii wil-9ii) illa	t are discont	lected depressions within the same dramage area.
VEGETATION – Use scientific names of				Dominance Test Worksheet:
Tree Stratum (Plot size:)	Absolute	Dominate	Indicator	
	%Cover	Species?	Status	Number of Dominant Species
1				That Are OBL, FACW, or FAC
2			.	(excluding FAC-): <u>1</u> (A)
3				Total Number of Dominant
				Species Across All Strata:1_(B)
4		=Total Cover		
				Percent of Dominant Species That are OBL,FACW, or FAC: 100 % (A/B)
Sapling/Shrub Stratum (Plot size:)				
1				Prevalence Index Worksheet: <u>Total % Cover of:</u> Multiple by:
2				OBL species x 1 =
3				FACW species x 2 =
4				FAC species x 3 =
5				FACU species x 4 = UPL species x 5 =
		=Total Cover		Column Totals:A)(B)
Herb Stratum (Plot_size:20sf)				
1 Eleocharis palustris	49	Y	OBL	Prevalence Index = B/A =
2 Agropyron smithii	5	N	UPL	
3 Hordeum jubatum	5	N	FACW	Hydrophytic Vegetation Indicators: X Dominance Test is >50%
4 Ambrosia tomentosa	1	N	NL	$\frac{x}{2} = \frac{1}{2} = \frac{1}$
5				Morphological Adaptations ¹ (Provide
6 7				supporting data in Remarks or on a separate sheet)
				Problematic Hydrophytic Vegetation ¹ (Explain)
8 9				¹ Indicators of hydric soil and wetland hydrology must
10				be present, unless disturbed or problematic.
	60%	=Total Cover		Hydrophytic Vogetation Propert?
Woody Vine Stratum (Plot size:)	0070			Hydrophytic Vegetation Present? Yes <u>X</u> No
1				
2				7
		=Total Cover		
% Bare Ground in Herb Stratum <u>40%</u>	_			
P				
Remarks:				

SOIL Profile Depth	escription: (Desc Matrix	ribe to the	depth needed to	document the i Redox Features		confirm the		ampling Point_ indicators.)	WL-9
(inches)	Color (moist)	%	Color (moist)	% Ty		Texture			
<u>0-8"</u>	2.5Y 3/1 10YR 5/2	<u>50%</u> 50%	7.5YR 5/6	<u><2%</u>		Loamy sand		e, few, prominen rix. More roots	
				· ·					
Hydric S	Soil Indicators: (sol (A1)			nless otherwi eyed Matrix (S4)	se noted.) Indicato	o rs for Prob m Muck (A9)		ic Soils ³ :
Black Hydro Stratif 1 cm Deple Thick X Sandy 2.5 M 5 cm	Epipedon (A2) Histic (A3) ogen Sulfide (A4) ied Layers (A5) (L Muck (A9) (LRR F ted Below Dark Su Dark Surface (A12 Mucky Mineral (S ucky Peat or Peat Mucky Peat or Peat	, G, H) urface (A12) 2) 1) (S2) (LRR (at (S3) (LRF	Striped M Loamy G Depleted Redox Da Depleted CRedox Da CREdox Da G,H) High Plai	edox (S5) latrix (S6) Mucky Mineral (F leyed Matrix (F2) Matrix (F3) ark Surface (F6) Dark Surface (F epressions (F8) ns Depressions 22 & 73 of LRR F	2) =7) (F16)	Da Hi (LR Rec Rec Ott ³ Indica we	ark Surface (S igh Plains De RR H outside duced Vertic d Parent Mate her (Explain in tors of hydrolo ttland hydrolo	pressions (F16) of MLRA 72 & 7 (F18) erial (TF2)	n and sent,
Type:_ Depth(ve Layer (if prese (inches) :	nt):		ŀ	lydric Soil F	Present? Ye	es <u>X</u> _	No	
Remai									
HYDRC					<u> </u>				
Primary In Surfac Satural Water Sedim Drift D Algal M Iron Do Inunda	Hydrology Indicator e Water (A1) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Mat or Crust (B4) eposits (B5) tition Visible on Aeria Stained Leave (B9)	f one require	Dry Season Oxidized RI (where not t Presence of Thin Muck S	11) ulfide Odor (C1) Water Table (C2) hizospheres on Liv illed) Reduced Iron (C4)	•	Sparsel X_Drainag Oxidized 3) (where Crayfish Saturati Geomor X_FAC-N	y Vegetated Co ge Patterns (B1 I Rhizospheres e tilled) Burrows (C8)	on Living Roots (erial Imagery (C9) D2) 5)	(C3)
Surface W Water Tab Saturation	servations: ater Present? Yes_ le Present? Yes_ Present? Yes_ apillary fringe)	NoX	_ Depth (inches) Depth (inches) Depth (inches)			land Hydrology <u>X_</u> No	/ Present?		
	Recorded Data (st nspections), if ava		e, monitoring well,	aerial photos,					
Remarks:									
							-	a	

Project/Site: Ludeman License Area				Sampling Date: 8/7/2008
Applicant/Owner: Uranium One				City/County: Converse County
(nvestigator(s): W. Stansbury Se	ction,Towns			NR73W State: WY
Landform (hillslope, terrace, etc.): Depression	L	ocal relief (cor		/ex, none) <u>concave</u> Slope (%) <2%
Subregion (LRR): LRR H	Lat:	-105.627		ong: <u>42.948</u> Classification_PEMA Sampling Point_WL-10
Soil Map Unit Name: 257-Ulm-Bidman complex	<u>(</u> Iool for this ti	ma af year? V	NVVI (classification_PEMA Sampling Point_wL-10
Are climate/hydrologic conditions on the site type Are "Normal Circumstances" present?	cal for this ti		es <u> </u>	
Are Normal Circumstances present?		ř	es <u> </u>	l0
Are Vegetation, Soil, or Hydology	significar	ntly disturbed?		Yes No_X
Are Vegetation, Soil, or Hydrology_				Yes No_X
(If needed, explain any answers in Remarks.)				
SUMMARY OF FINDINGS – Attach site m	ap showin	a sampling	point loc	ations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes_X_	-	0.0	•	
		ls t	the Sample	d Area
Hydric Soil Present? Yes_X Wetland Hydrology Present? Yes_X	No	wit	hin a Wetla	
Remarks:			-	
This is an isolated depression adjacent to a drainage				
VEGETATION – Use scientific names of	nlants.			Dominance Test Worksheet:
Tree Stratum (Plot size:)	Absolute	Dominate	Indicator	
	%Cover	Species?	Status	Number of Dominant Species
1	///////////////////////////////////////			That Are OBL, FACW, or FAC
2		· · · · · · · · · · · · · · · · · · ·		(excluding FAC-):1(A)
3				Total Number of Dominant
4				Species Across All Strata:1_(B)
		=Total Cover		Percent of Dominant Species
Sapling (Shruh Stratum (Blat aiza)				That are OBL, FACW, or FAC: 100 % (A/B)
Sapling/Shrub Stratum (Plot size:)				
<u>/1</u>			· · ·	Prevalence Index Worksheet: Total % Cover of: Multiple by:
2				
3				OBL species x 1 = FACW species x 2 =
4				FAC species x 2 =
5				FACU species x 4 =
		=Total Cover		UPL species x 5 =
				- Column Totals:A)(B)
Herb Stratum (Plot_size: 20sf)				
1 Eleocharis palustris	37	Y	OBL	Prevalence Index = B/A =
2 Agropyron smithii	1	N	UPL	
3 Hordeum jubatum	1	N	FACW	Hydrophytic Vegetation Indicators: X_Dominance Test is >50%
4 Ambrosia tomentosa	1	N	NL	Prevalence Index is $\leq 3.0^{1}$
5				Morphological Adaptations ¹ (Provide
6				supporting data in Remarks or on a separate sheet)
7				Problematic Hydrophytic Vegetation ¹ (Explain)
8				
9				¹ Indicators of hydric soil and wetland hydrology must
10				be present, unless disturbed or problematic.
	40%	=Total Cover		Hydrophytic Vegetation Present?
Woody Vine Stratum (Plot size:)				Yes <u>X</u> No
1				
2				
		=Total Cover		1
% Bare Ground in Herb Stratum 60%	1	· ·		<u>1</u>
	_			
L				
Pemarke:				
Remarks:				

SOIL Profile Description: (Describe to the depth needed to document the indicate DepthMatrix Redox Features	Sampling Point <u>WL-10</u> or or confirm the absence of indicators.)
(inches) Color (moist) % Color (moist) % Type ¹ L	.oc ² Texture
<u>0-8"</u> <u>10YR 6/1</u> <u>7.5YR 5/6 <2%</u>	Silty loam Mottles: fine, few, prominent oxidized root channels in 0-4"
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Co Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise no	
Histosol (A1) Sandy Gleyed Matrix (S4) Histic Epipedon (A2) Sandy Redox (S5) Black Histic (A3) Striped Matrix (S6) Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) Stratified Layers (A5) (LRR F) Loamy Gleyed Matrix (F2) 1 cm Muck (A9) (LRR F, G, H) Depleted Matrix (F3) Depleted Below Dark Surface (A12) Redox Dark Surface (F6) Thick Dark Surface (A12) Depleted Dark Surface (F7) Sandy Mucky Mineral (S1) Redox Depressions (F8) S tm Mucky Peat or Peat (S2) (LRR G, H) High Plains Depressions (F16) S tm Mucky Peat or Peat (S3) (LRR F) High Plains Depressions (F16)	 1 cm Muck (A9) (LRR I, J) Coast Prairie Redox (A16) (LRR F, G, H) Dark Surface (S7) (LRR G) High Plains Depressions (F16) (LRR H outside of MLRA 72 & 73) Reduced Vertic (F18) Red Parent Material (TF2) Other (Explain in Remarks) ³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic
Depth (inches) :	Soil Present? Yes <u>X</u> No
Remarks:	
HYDROLOGY	
Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (minimum of two required) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) ots (C3) (where tilled) Crayfish Burrows (C8) Saturation Visible of Aerial Imagery (C9) Geomorphic Position (D2) FAC-Neutral Test (D5) Frost-Heave Hummocks (D7) (LRR F)
Field Observations: Surface Water Present? YesNoX_ Depth (inches) Water Table Present? YesNoX_ Depth (inches) Saturation Present? YesNoX_ Depth (inches) (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos,	Wetland Hydrology Present? YesX_No
previous inspections), if available:	
Remarks:	

١

Project/Site:	Ludeman License Area				Sampling Date: 8/7/2008
Applicant/Owner:					City/County: Converse County
Investigator(s):			hip,Range:		
Subregion (LRR):_ Soil Map Unit Nam Are climate/hydrole	LRR H ne: <u>187-Kishona-Cambria loan</u> ogic conditions on the site typ	Lat: ns, 269-Wor	<u>-105.616</u> f-Shingle-Talu me of year? Y	Lo <u>ce complex</u> 'esX N	ave, convex, none) <u>concave</u> Slope (%) <2% ong: <u>42.943</u> Datum: <u>NAD-83</u> NWI classification <u>na</u> Sampling Point <u>WL-11</u> o (If no, explain in Remarks.)
Are Vegetation Are Vegetation (If needed, explain SUMMARY OF Hydrophytic Veget Hydric Soil Presen Wetland Hydrology Remarks: This is a series of tw 0.011 acres.	tation Present? Yes X tt? Yes X y Present? Yes X wo wetlands (WL-11a and b) that - Use scientific names of	natural nap showir No No No	ntly disturbed? ly problematic [*] ng sampling is wit	? point loca the Sample thin a Wetla	Yes No X Yes No X ations, transects, important features, etc. d Area ind? Yes X same drainage. They range in size from 0.002 acres to Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC
2					(excluding FAC-):(A)
3					Total Number of Dominant
4					Species Across All Strata: <u>1</u> (B)
			=Total Cover		Percent of Dominant Species
Sapling/Shru	b Stratum (Plot size:)				That are OBL FACW, or FAC: 100 % (A/B)
1					Prevalence Index Worksheet: <u>Total % Cover of:</u> <u>Multiple by:</u>
3					OBL species x 1 =
4					FACW species x 2 = FAC species x 3 =
5					FACU species x 4 =
			=Total Cover		UPL species x 5 =
Herb Stratum	(Plot size: 20sf)	1			Column Totals:A)(B)
1 Eleocharis palus 2	tris	15	Y	OBL	Prevalence Index = B/A =
3	······································	-			Hydrophytic Vegetation Indicators:
4					XDominance Test is >50%
5					Prevalence Index is $\leq 3.0^1$ Morphological Adaptations ¹ (Provide
6					supporting data in Remarks or on a separate sheet)
7	· · · · · · · · · · · · · · · · · · ·				Problematic Hydrophytic Vegetation ¹ (Explain)
8 9					¹ Indicators of hydric soil and wetland hydrology must
10	· · · · · · · · · · · · · · · · · · ·				be present, unless disturbed or problematic.
		40%	=Total Cover	1	Hydrophytic Vegetation Present?
Woody Vine S	Stratum (Plot size:)				Yes X_ No
1					
2					
			=Total Cover		
% Bare Ground in	Herb Stratum60%				
L					
Demontrat A 1					
Remarks: Area f	nas been heavily grazed.				

SoiL Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Depth Matrix Redox Features
Depth Matrix Redox Features (inches) Color (moist) % Type ¹ Loc ² Texture
0-8" 2.5Y 5/1 7.5YR 5/6 <2% Silty loam Mottles: fine, few, prominent
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ² Location: PL=Pore Lining, M=Matrix.
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils ³ :
Restrictive Layer (if present): Type: Depth (inches) :
Remarks:
HYDROLOGY
Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) Surface Water (A1) Salt Crust (B11) Sparsely Vegetated Concave Surface (B8) Saturation (A3) Hydrogen Sulfide Odor (C1) Drainage Patterns (B10) Water Marks (B1) Dry Season Water Table (C2) Oxidized Rhizospheres on Living Roots (C3) Sediment Deposits (B2) X_Oxidized Rhizospheres on Living Roots (C3) (where not tilled) Drift Deposits (B3) (where not tilled) Crayfish Burrows (C8) Algal Mat or Crust (B4) Presence of Reduced Iron (C4) Saturation Visible of Aerial Imagery (C9) Iron Deposits (B5) Thin Muck Surface (C7) Geomorphic Position (D2)
Field Observations: Wetland Hydrology Present?
Surface Water Present? YesNoXDepth (inches) Water Table Present? YesNoXDepth (inches) Saturation Present? YesNoXDepth (inches) (includes capillary fringe) YesNo
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
Remarks:

Applicant/Owner: nvestigator(s):	Uranium C					City/County:	Converse County
	W. Stansbury	<u>yne</u>	Sect	ion,Township,	Range:	Sec 3, T34N, State: WY	Converse county
	R73W						
andform (hillslope	e, terrace, etc.):_	Depression	in drainage	Loc	al relief (co	oncave, convex, none) <u>concave</u>	Slope (%) <u>NA</u>
oil Map Unit Nam	e 175-Hiland	-Bowbac con	Lat	-105.011	NWI c	hong: <u>42.950</u> Datum: <u>N</u> lassification <u>PABFh</u> Sampling No (If no, explain in Remarks.)	Point WL-12
re climate/hydrol	ogic conditions o	on the site typ	oical for this ti	me of year? Y	'es X	No (If no, explain in Remarks.)	
re "Normal Circur	mstances" prese	ent?		Ý	es X_	No	
re Vegetation	, Soil, o	or Hydology_	significal	ntly disturbed?	,	Yes Yes	No <u>X</u> No <u>X</u>
re Vegetation f needed, explain	, Soli, (Pemarks)	natural	y problematic	(1es	NO <u>X</u>
		781	non ohoudr	a compline	naint la	actions transacts important fo	aturea ata
				ig sampling	point io	cations, transects, important fe	atures, etc.
lydrophytic Veget	ation Present?	Yes <u>X</u>	No	la	the Compl	lad Area	
ydric Soil Presen Vetland Hydrology	V Present?	Ves X	_ No		the Sampl thin a Wet		
emarks:	y riesent?	163_7_		VVI			
This is a depressio	n in a drainage						
ins is a depressio	in in a arannage.						
EGETATION -	l lee scientifi	names of	Inlante			Dominance Test Worksheet:	
	(Plot size:	and the state of t	Absolute	Dominate	Indicator	Dominance rest worksheet.	
The otratum	(1 101 3126.		%Cover	Species?	Status	Number of Dominant Species	
					5 ⁹⁷	That Are OBL, FACW, or FAC	
						(excluding FAC-):	1(A)
						Total Number of Dominant	
· · ·						— Species Across All Strata:	1 (B)
							(-/
				=Total Cover		Percent of Dominant Species	
Sapling/Shrul	b Stratum (Plot s	size:)				That are OBL, FACW, or FAC:	100 (A/B)
						Prevalence Index Worksheet:	
						Total % Cover of:	
11						OBL speciesx 1 =	
	а. в 2 ⁸			-		FACW species x 2 =	
						FAC species x 3 = FACU species x 4 =	•
				=Total Cover		Column Totals:A)	
	(Plot size: 20	<u>)sf)</u>					(0)
Eleocharis palus	tris		40	Y	OBL	Prevalence Index = B/A =	
							na an a
		. [. [Hydrophytic Vegetation Indica X Dominance Test is >50%	
						$\frac{X}{2} Dominance Test is >50\%$ Prevalence Index is ≤ 3.0	
						Morphological Adaptation	
						supporting data in Remarks or c	n a separate sheet)
						Problematic Hydrophytic	Vegetation ¹ (Explain)
						¹ Indicators of hydric soil and we	tland hydrology mus
			-			be present, unless disturbed or	
0							
			40%	=Total Cover		Hydrophytic Vegetation Present	?
	Stratum (Plot size	e:)				Yes <u>X</u> No	
	а <u>на 1865 година и на село</u> дина на селодина и на селодина и на селодина и на селодина и						
				=Total Cover			i i i i i i i i i i i i i i i i i i i
Bare Ground in							

Soil Sampling Point WL-12 Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Depth Matrix Redox Features
(inches) Color (moist) % Color (moist) % Type ¹ Loc ² Texture
0-4" 10YR.3/2 7.5YR 5/8 <2% C M silty loam w/organics Mottles: Fine, few,
4-12" 10YR 4/1 7.5YR 4/6 15% C M silty loam Mottles: Medium, common, prominent
¹ <u>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.</u> ² Location: PL=Pore Lining, M=Matrix, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils ³ : Histosol (A1) Sandy Gleyed Matrix (S4) 1 cm Muck (A9) (LRR I, J) Histic Epipedon (A2) Sandy Redox (S5) Coast Prairie Redox (A16) (LRR F, G, H) Hydrogen Sulfide (A4) X_Loamy Mucky Mineral (F1) Dark Surface (S7) (LRR G) Hydrogen Sulfide (A4) X_Loamy Mucky Mineral (F1) High Plains Depressions (F16) Stratified Layers (A5) (LRR F) Loamy Gleyed Matrix (F2) (LRR H outside of MLRA 72 & 73) 1 cm Muck (A9) (LRR F, G, H) Depleted Matrix (F3) Reduced Vertic (F18) Depleted Below Dark Surface (A12) Redox Dark Surface (F6) Red Parent Material (TF2) Thick Dark Surface (A12) Depleted Dark Surface (F7) Other (Explain in Remarks) Sandy Mucky Mineral (S1) Redox Depressions (F8) ³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic S 5 cm Mucky Peat or Peat (S2) (LRR F) (MLRA 72 & 73 of LRR H) unless disturbed or problematic
Restrictive Layer (if present):
Type: Hydric Soil Present? YesX No
Depth (inches) : Remarks:
HYDROLOGY
Wetland Hydrology Indicators:
Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) Surface Water (A1) Salt Crust (B11) X_Sparsely Vegetated Concave Surface (B8) Saturation (A3) Hydrogen Sulfide Odor (C1) X Drainage Patterns (B10)
Water Marks (B1) Dry Season Water Table (C2) Oxidized Rhizospheres on Living Roots (C3) Sediment Deposits (B2) X_Oxidized Rhizospheres on Living Roots (C3) (where tilled) Drift Deposits (B3) (where not tilled) Crayfish Burrows (C8) Algal Mat or Crust (B4) Presence of Reduced Iron (C4) Saturation Visible of Aerial Imagery (C9) Iron Deposits (B5) Thin Muck Surface (C7) Geomorphic Position (D2) Inundation Visible on Aerial Imagery (B7) Other (Explain in Remarks) X_FAC-Neutral Test (D5) Water-Stained Leave (B9) Frost-Heave Hummocks (D7) (LRR F)
Field Observations: Wetland Hydrology Present?
Surface Water Present? YesNo_XDepth (inches) Water Table Present? YesNo_XDepth (inches) Saturation Present? YesNo_XDepth (inches) (includes capillary fringe) YesNo
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
Remarks:

	Ludeman License Area				Sampling Date: 6/10/2008
Applicant/Owner:	Uranium One				City/County: Converse County
Investigator(s):	W. Stansbury R73W	Sec	tion, Township	,Range:	Sec 3, T34N, State: WY
Landform (hillslope	e, terrace, etc.):depression		Local relief (co	oncave, con	vex, none) <u>concave</u> Slope (%) NA
Subregion (LRR):_	LRR H	Lat:	105.611	Lo	ong: <u>42.950</u> Datum: <u>NAD-83</u>
Soil Map Unit Nam	ne: <u>175-Hiland-Bowbac com</u>	plex		NWI class	sification_na Sampling Point_WL-13
		cal for this ti			o (If no, explain in Remarks.)
Are "Normal Circu	mstances" present?		Y	′es <u>X</u> N	0
Are Vegetation	, Soil, or Hydology	significar	ntly disturbed?	I.	Yes NoX
Are Vegetation	, Soil, or Hydrology_	naturall	y problematic'	?	Yes No <u>_X_</u>
(If needed, explain	any answers in Remarks.)				
SUMMARY OF I	FINDINGS – Attach site m	i <mark>ap showi</mark> n	g sampling	point loca	ations, transects, important features, etc.
Hydrophytic Veget	tation Present? Yes X	No	_		
Hydric Soil Presen	t? Yes \overline{X}	No		the Sample	
Wetland Hydrology	y Present? Yes_X_	No	Wit	thin a Wetla	nd? Yes <u>X</u> No
Remarks:					
This is an excavate	ed depression adjacent to a wind	mill.			
VEGETATION -	- Use scientific names of	nlante			Dominance Test Worksheet:
	(Plot size:)	Absolute	Dominate	Indicator	
	(PIOL SIZE.)	%Cover	Species?	Status	Number of Dominant Species
1	· · · · ·	7600461	Opecies:		That Are OBL, FACW, or FAC
					(excluding FAC-): <u>2</u> (A)
2					
3					Total Number of Dominant
4	· · · · · · · · · · · · · · · · · · ·				Species Across All Strata: <u>2</u> (B)
· · · · · · · · · · · · · · · · · · ·			=Total Cover		Percent of Dominant Species
Carling/Ohru	h Chrotum (Dist sing)				That are OBL, FACW, or FAC: 100 (A/B)
	b Stratum (Plot size:)				
1					Prevalence Index Worksheet: <u>Total % Cover of:</u> <u>Multiply by:</u>
2					
3					- OBL species x 1 = FACW species x 2 =
4	· · · · ·				FAC species x 3 =
5					FACU species x 4 =
5			=Total Cover		- UPL species x 5 =
					- Column Totals:A)(B)
Herb Stratum					,, ,, , ,
1 Scirpus validus		35	Y	OBL ,	Prevalence Index = B/A =
2 Eleocharis palus		20	Y	OBL	
3 Typhus angustifo	olia	5	N	OBL	Hydrophytic Vegetation Indicators:
4					XDominance Test is >50% Prevalence Index is ≤ 3.0 ¹
5					- Morphological Adaptations1 (Provide)
6					 supporting data in Remarks or on a separate sheet)
7					Problematic Hydrophytic Vegetation ¹ (Explain)
8					
9			1		¹ Indicators of hydric soil and wetland hydrology must
10					be present, unless disturbed or problematic.
		60%	=Total Cover		Hydrophytic Vegetation Present?
Woody Vine S	Stratum (Plot size:)				Yes X_ No
2					1
-			=Total Cover		1
% Bare Ground in	Herb Stratum 40%	L	I		•
		_			
Remarks:					

December 2009

SOIL Profile Description: (Describe to the second s	ne depth needed to de	ocument the i	ndicator or	confirm the absen	Sampling Point <u>WL-13</u> ice of indicators.)
Depth <u>Matrix</u> (inches) Color (moist) %		edox Features % Tyr		Texture	,
0-6" 7.5YR 4/1	10 YR 2/1	<2%	C N		ome sand Mottles: Medium, few,
distinct	10YR 4/6	<2%	C PL		Oxidized root channels in 0-6"
6-12" 10YR 4/3 50	$\frac{101R4/0}{NA}$	<u> </u>		sandy/silty loam	Blended matrix.
10YR 4/2 50	%				
• • •					
				2	
¹ Type: C=Concentration, D=Depletio Hydric Soil Indicators: (Applica	ble to all LRRs, un	less otherwi	se noted.)	Indicators for	<u>location: PL=Pore Lining, M=Matrix.</u> Problematic Hydric Soils ³ :
Histosol (A1) Histic Epipedon (A2)	Sandy Gley	/ed Matrix (S4) lox (S5))		(A9) (LRR I, J) irie Redox (A16) (LRR F, G, H)
Black Histic (A3) Hydrogen Sulfide (A4)	Striped Ma		:1)	Dark Surf	ace (S7) (LRR G) ns Depressions (F16)
Stratified Layers (A5) (LRR F)	Loamy Gle	yed Matrix (F2		(LRR H ou	utside of MLRA 72 & 73)
1 cm Muck (A9) (LRR F, G, H) Depleted Below Dark Surface (A		k Surface (F6)		Red Parer	Vertic (F18) ht Material (TF2)
Thick Dark Surface (A12) Sandy Mucky Mineral (S1)	Redox Dep	Dark Surface (F pressions (F8)			plain in Remarks) hydrophytic vegetation and
2.5 Mucky Peat or Peat (S2) (LR 5 cm Mucky Peat or Peat (S3) (L		s Depressions			ydrology must be present, sturbed or problematic
Restrictive Layer (if present):	· · ·				· · · · · · · · · · · · · · · · · · ·
Type: Depth (inches) :		H	lydric Soil P	resent? Yes <u>X</u>	No
Remarks:					
HYDROLOGY					
Wetland Hydrology Indicators:					
Primary Indicators (minimum of one requ Surface Water (A1)	ired; check all that apply) Salt Crust (B1*				(minimum of two required) ated Concave Surface (B8)
X_Saturation (A3) Water Marks (B1)	Hydrogen Sult			Drainage Patter	
Sediment Deposits (B2) Drift Deposits (B3)	Dry Could the 	ospheres on Livi	ing Roots (C3		
Algal Mat or Crust (B4)		educed Iron (C4)			le of Aerial Imagery (C9)
Inundation Visible on Aerial Imagery				FAC-Neutral Te	
Field Observations:					
Surface Water Present? Yes No	X Depth (inches)		Wetl	and Hydrology Presen	t?
Water Table Present? YesNo	X Depth (inches)		Yes_	_ <u>X_</u> No	
Saturation Present? Yes X No (includes capillary fringe)	Depth (inches)*		L		
Saturated to the surface.					
Describe Recorded Data (stream gau previous inspections), if available:	uge, monitoring well, a	erial photos,			
Remarks:					
					-
Remarks:					

_	Ludeman License Area				Sampling Date:	8/9/08
Applicant/Owner:	Uranium One	<u>Os etie</u>	- Teurschie Des		City/County:	Converse County
Investigator(s):	e, terrace, etc.): Depre		n,Township,Ran			(%)<2%
Subregion (LRR):					onvex, none) <u>concave</u> Slope g: 42.953 Datum: <u>NA</u>	
Soil Map Unit Nan	ne: 129-Clarkelen-Have	erdad-Bigwinder	complex, 246-T	assel-Tullock	<	<u>5 00</u>
		_	NV	VI classificati	ionnaSampling	Point <u>WL-14</u>
		ite typical for th	is time of year? Y	/esXNo	o (If no, explain in Remarks.)	
Are "Normal Circu	mstances" present?		١	res X_ No	0	
Are Vegetation	, Soil, or Hydo	loav sianif	cantly disturbed?	2	Yes	NoX
	, Soil, or Hydro				Yes	No <u>X</u>
(If needed, explain	n any answers in Remar	rks.)				
SUMMARY OF	FINDINGS – Attach	site map show	wing sampling	point loca	ations, transects, important feat	ures, etc.
Hydrophytic Vege		_X_ No			· · · · · · · · · · · · · · · · · · ·	
Hydric Soil Preser		_X No	ls	the Sampleo	d Area	
Wetland Hydrolog	y Present? Yes_	<u>X</u> No	wi	thin a Wetla	nd? Yes <u>X</u> No	
Remarks:						
	on within Sage Creek.					
	sted as a Hydric soil by th					
VEGETATION -	 Use scientific name 	es of plants.			Dominance Test Worksheet:	
Tree Stratum	n (Plot size:)	Absolut	e Dominate	Indicator	1	
		%Cove	r Species?	Status	Number of Dominant Species	
1					That Are OBL, FACW, or FAC (excluding FAC-):	<u>2 (</u> A)
2						<u> </u>
3					Total Number of Dominant	
4					Species Across All Strata:	<u> 2 (</u> B)
			=Total Cover			
				<u></u>	Percent of Dominant Species That are OBL,FACW, or FAC:	100 (A/B)
Sapling/Shru	b Stratum (Plot size:					100 (A/B)
1					Prevalence Index Worksheet:	
2					Total % Cover of:	Multiple by:
3					OBL species x 1 =	
4					FACW species x 2 = FAC species x 3 =	
5					FACU species x 4 =	
5			=Total Cover		UPL species x 5 =	
			-10(2) 00001		Column Totals:A)	(B)
Herb Stratum						
1 Hordeum Jubatu		40	<u>Y</u>	FACW	Prevalence Index = B/A =	
2 Eleocharis palust	ris	32	Y	OBL	Hydrophytic Vegetation Indicate	
3 Scirpus validus			<u>N</u>	OBL FACW	X Dominance Test is >50%	//3.
4 Spartina gracillis 5 Polypogon monsp		1	<u>N</u>	OBL	Prevalence Index is $\leq 3.0^{1}$	
6 Rumex stenophyl		1	N	FACW+	Morphological Adaptations ¹	
7	жо 				supporting data in Remarks or on	a separate sheet)
					Problematic Hydrophytic Ve	getation' (Explain)
8					¹ Indicators of hydric soil and wetla	and bydrology must
10					be present, unless disturbed or pre-	oblematic.
	<u></u>	80	% =Total Cover			
144 1 14		<u> </u>			Hydrophytic Vegetation Present?	
Woody Vine S	Stratum (Plot size:)			Yes <u>X</u> No	
2					4	
<u> </u>	<u></u>	·	=Total Cover		4	
% Bare Ground in	Herb Stratum20%_	l	1010 00101			
	1010 Otratum2070					
						· · · · · ·
F						

Remarks:

Sampling Point WL-14 Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Depth Matrix Redox Features
(inches) Color (moist) % Color (moist) % Type ¹ Loc ² Texture
0-8" 5Y 5/1 7.5YR 4/4 15% C M Silty loam Mottles: medium to coarse, common, promin
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ² Location: PL=Pore Lining, M=Matrix,
Histosol (A1) Sandy Gleyed Matrix (S4) 1 cm Muck (A9) (LRR I, J) Histic Epipedon (A2) Sandy Redox (S5) Coast Prairie Redox (A16) (LRR F, G, H) Black Histic (A3) Striped Matrix (S6) Dark Surface (S7) (LRR G) Hydrogen Sulfide (A4) _X_Loamy Mucky Mineral (F1) High Plains Depressions (F16) Stratified Layers (A5) (LRR F) Loamy Gleyed Matrix (F2) (LRR H outside of MLRA 72 & 73) 1 cm Muck (A9) (LRR F, G, H) Depleted Matrix (F3) Reduced Vertic (F18) Depleted Below Dark Surface (A12) Depleted Dark Surface (F6) Red Parent Material (TF2) Thick Dark Surface (A12) Depleted Dark Surface (F7) Other (Explain in Remarks) Sandy Mucky Mineral (S1) Redox Depressions (F8) 3 ¹ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic S cm Mucky Peat or Peat (S2) (LRR F, (MLRA 72 & 73 of LRR H) unless disturbed or problematic
Restrictive Layer (if present): Type: Type: Hydric Soil Present? Yes_XNo Depth (inches): Remarks:
HYDROLOGY
Wetland Hydrology Indicators:
Primary Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) X_Surface Water (A1) Salt Crust (B11) Sparsely Vegetated Concave Surface (B8) X_Saturation (A3) Hydrogen Sulfide Odor (C1) Drainage Patterns (B10) Water Marks (B1) Dry Season Water Table (C2) Oxidized Rhizospheres on Living Roots (C3) Sediment Deposits (B2) X_Oxidized Rhizospheres on Living Roots (C3) (where tilled) Drift Deposits (B3) (where not tilled) Crayfish Burrows (C8) Algal Mat or Crust (B4) Presence of Reduced Iron (C4) Saturation Visible of Aerial Imagery (C9) Iron Deposits (B5) Thin Muck Surface (C7) Geomorphic Position (D2) Inundation Visible on Aerial Imagery (B7) Other (Explain in Remarks) FAC-Neutral Test (D5) Water-Stained Leave (B9) Frost-Heave Hummocks (D7) (LRR F)
Field Observations:
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
Remarks:

	Ludeman License Area					Sampling Date:	6/8/2008
Applicant/Owner: Investigator(s):	Uranium One	Section To	washin Danga	. Coo Q Q	2 9, T34NR73W	City/County:	Converse County
	k. LaClair e, terrace, etc.): Depression i						e (%)<2%
Subregion (LRR):_			-105.638		ong: 42.937		
Soil Map Unit Nan	ne: 187-Kishona-Cambria loa	ms. 189-Kis	hona-Cambria	-Theedle lo	ams. 263-Ustic	Torriorthents, aullied	<u>1.</u>
					fication_na		ing Point_WL-15
Are climate/hydrol	ogic conditions on the site typ	ical for this ti	me of year? Ye	esXN	o(If no, e	xplain in Remarks.)	•
	mstances" present?			'es <u>X</u> N			
				-			
		-116					NI. 77
	, Soil, or Hydology Soil or Hydrology_					Yes Yes	No <u>X</u> No <u>X</u>
	, Soil, or Hydrology_ a any answers in Remarks.)	naturali	y problematic	r		165	NO <u>X</u>
							-4
	FINDINGS – Attach site n		ig sampling	point loca	ations, transe	cts, important fe	atures, etc.
Hydrophytic Vege		No	1	he Cemele	d Area		
Hydric Soil Preser Wetland Hydrolog				the Sample hin a Wetla		XNo	
Remarks:	ntermittent wetlands (18 wetland	e WI-15a the	rough WI 15a	that are dis	connected depress	tions along the same	hannel They range in
	es to 0.014 acres. Soil unit 263				connected depress	nons along the same t	mainter. They fallge in
	- Use scientific names of				Dominana	Test Worksheet:	
	(Plot size:)	Absolute	Dominate	Indicator		rest worksneet:	
		%Cover	Species?	Status	Number of D	ominant Species	
1		7000401	Opeoles :			L, FACW, or FAC	
					 (excluding FA 	AC-):	(A)
2							
3						r of Dominant	2 (D)
4						oss All Strata:	<u> 2 (</u> B)
			=Total Cover		Percent of Do	ominant Species	
Sapling/Shru	b Stratum (Plot size:)					L,FACW, or FAC:	100 % (A/B)
					Bravalanaa		
1						Index Worksheet: over of:	Multiple by:
2							
3					FACW species	x1= x2=	*
4						x3=	
5					FACU specie	es x 4 =	
<u> </u>			=Total Cover		UPL species	x 5 =	
Lingto Otrastan					- Column Tota	als:A)	(B)
Herb Stratum		20	×7	0.01	_		· ·
1 Eleocharis palus	tris	30	Y	OBL	Prevalence I	Index = B/A =	
2 Carex aquatilis	· · · · · · · · · · · · · · · · · · ·	10	Y	OBL			4
3 Agropyron reper		5	N	FAC		• Vegetation Indica nance Test is >50%	lors:
4 Taraxacum offic	inaie	1	N	FACU		ence Index is ≤ 3.0	1
5	do					ological Adaptations	
6					supporting da	ata in Remarks or o	n a separate sheet)
7					Proble	matic Hydrophytic V	/egetation ¹ (Explain)
8					1	6 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.	u
9					Indicators o	of hydric soil and we Inless disturbed or p	tland hydrology must
10					be present, u	amess disturbed of p	noblematic.
		46%	=Total Cover			Vegetation Present?)
Woody Vine S	Stratum (Plot size:)				Yes <u>X</u>	_No	
1					_		
2							
			=Total Cover				
% Bare Ground in	Herb Stratum <u>54%</u>						
Remarks:							
1							

SOIL Profile Description: (Describe to the Depth Matrix		locument Redox Fea		cator	Sampling Point <u>WL-15</u> or confirm the absence of indicators.)
(inches) Color (moist) %	Color (moist)	%	Type ¹	Loc	² Texture
0-4" 10YR 4/2	7.5YR 5/8	25%	<u>C</u>	<u>M</u>	Sandy silt loam Mottles: Fine to large, many,
4-7" 10YR 4/2	7.5YR 4/6	25%	$\frac{C}{C}$	M	Sandy loam Mottles: Fine to medium, many, prominent
7 14" 10VD 4/2	$\frac{10 \text{YR } 2/1}{7.5 \text{YR } 4/6}$	25%	$\frac{C}{C}$	<u>M</u>	Organic mottles: Fine to medium, many, prominent
7-14" 10YR 4/3		<u>25%</u>	<u> </u>	 	Loamy sand Mottles: Fine, many, prominent
¹ Type: C=Concentration, D=Depletion,					
Hydric Soil Indicators: (Applicab Histosol (A1) Histic Epipedon (A2)	e to all LRRs, ur Sandy Gle Sandy Re	yed Matri		notec	I.) Indicators for Problematic Hydric Soils ³ : 1 cm Muck (A9) (LRR I, J) Coast Prairie Redox (A16) (LRR F, G, H)
Black Histic (A3)	Striped Ma	atrix (S6)			Dark Surface (S7) (LRR G)
Hydrogen Sulfide (A4) Stratified Layers (A5) (LRR F)	<u>X</u> Loamy M Loamy Gle				High Plains Depressions (F16) (LRR H outside of MLRA 72 & 73)
1 cm Muck (A9) (LRR F, G, H)	Depleted N	Matrix (F3)		Reduced Vertic (F18)
Depleted Below Dark Surface (A12) Thick Dark Surface (A12))Redox Da Depleted				Red Parent Material (TF2) Other (Explain in Remarks)
Sandy Mucky Mineral (S1)	Redox De	pressions	s (F8)		³ Indicators of hydrophytic vegetation and
2.5 Mucky Peat or Peat (S2) (LRR _5 cm Mucky Peat or Peat (S3) (LRR				6)	wetland hydrology must be present, unless disturbed or problematic
Restrictive Layer (if present):	, .				
Туре:			Hyd	ric Soil	Present? Yes_X No
Depth (inches) : Remarks:					
HYDROLOGY Wetland Hydrology Indicators:					
Primary Indicators (minimum of one require X_Surface Water (A1)	<u>salt Crust (B'</u>				Secondary Indicators (minimum of two required)Sparsely Vegetated Concave Surface (B8)
X_Saturation (A3) Water Marks (B1)	Hydrogen Su				Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3)
Sediment Deposits (B2)	Dry Season V X_Oxidized Rh			Roots (C3) (where tilled)
Drift Deposits (B3) Algal Mat or Crust (B4)	(where not til Presence of R		n (C4)		Crayfish Burrows (C8) Saturation Visible of Aerial Imagery (C9)
Iron Deposits (B5)	Thin Muck Su	rface (C7)			Geomorphic Position (D2) FAC-Neutral Test (D5)
Water-Stained Leave (B9))Other (Explain	n in Remar	KS)		Frost-Heave Hummocks (D7) (LRR F)
Field Observations:					
Surface Water Present? Yes X No	_ Depth (inches) <u>6 ir</u> (Depth (inches)	nches			etland Hydrology Present?
Saturation Present? Yes X No	Depth (inches) Depth (inches)*			^{Ye}	esXNo
(includes capillary fringe) * Saturated to the surface.					
Describe Recorded Data (stream gauge previous inspections), if available:	e, monitoring well, a	aerial phot	os,		
Remarks:					

	Ludeman License Area				Sampling Date:	6/9/2008
Applicant/Owner:	Uranium One W. Stansbury	Section To	washin Bongo		City/County: 34NR73W State: WY	Converse County
andform (hillslon	w. statisoury	5ection, 10			'34NR73W State: WY vex, none) concaveSlope (%) <2%
Subregion (LRR):	LRR H	Lat:	-105.638	Lon	ng: 42.937 Datum: N	IAD-83
oil Map Unit Nan	ne: 187-Kishona-Cambria lo	oams	NWI	classification	n PUSC/PEMA Samplir	g Point WL-16
re climate/hydrol	ogic conditions on the site t	ypical for this t	ime of year? Y	es <u>X</u> N	o (If no, explain in Remarks.)	
Are Normal Circu	mstances" present?			/es <u>X</u> N		
	, Soil, or Hydology				Yes	No <u>X</u>
	, Soil, or Hydrolog any answers in Remarks.)		ly problematic	?	Yes	No <u>X</u>
				noint look	ations, transects, important fe	
	tation Present? Yes_X		ig sampling	point ioca	ations, transects, important le	atures, etc.
Ivdric Soil Preser	12 12 12 12 12 12 12 12	No	ls	the Sample	d Area	
Vetland Hydrolog	nt? Yes <u>X</u> y Present? Yes <u>X</u>	No	wi	thin a Wetla	nd? Yes <u>X</u> No	
Remarks:						
This is an isolated	depression in rolling rangelar	nd.				
NOT THE OWNER OF A DESCRIPTION OF A DESC	Use scientific names of				Dominance Test Worksheet:	
Tree Stratum	(Plot size:)	Absolute %Cover	Dominate Species?	Indicator Status	Number of Dominant Species	
		%Cover	Speciesr	Oluluo	That Are OBL, FACW, or FAC	
					(excluding FAC-):	(A)
					 Total Number of Dominant	
					- Species Across All Strata:	1 (B)
		national second	=Total Cover		Percent of Dominant Species That are OBL, FACW, or FAC:	100 (A/B)
Sapling/Shru	b Stratum (Plot size:)					
r . Se i de la se a	^{on} (1915), and 1915) Alternation of Constant Alternation				Prevalence Index Worksheet:	
2:::::::::::::::::::::::::::::::::::::					Total % Cover of:	
3					OBL species x 1 = FACW species x 2 =	
k					FAC species x 3 =	
5					FACU species x 4 = UPL species x 5 =	
			=Total Cover		Column Totals:A)	
Herb Stratum	(Plot size: 20sf)			1 ¹		(D)
Eleocharis palus	tris	50	Y	OBL	Prevalence Index = B/A =	
						·
					Hydrophytic Vegetation Indica X Dominance Test is >50%	itors:
5					Prevalence Index is ≤ 3.0	1
<u>}</u>					 Morphological Adaptation 	
					 supporting data in Remarks or c Problematic Hydrophytic 	n a separate sheet)
3						
)					¹ Indicators of hydric soil and we	
10	annan na shi wa sa na sa			la companya di seconda di se	be present, unless disturbed or	problematic.
		50%	=Total Cover		Hydrophytic Vegetation Present	}
	Stratum (Plot size:	ונ			Yes <u>X</u> No	
2			=Total Cover			
Pore Crewed !-	Harb Stratum 50.0		= I otal Cover			
bare Ground in	Herb Stratum50%					

SOIL Profile Description: (Describe to the dep Depth Matrix	th needed to document the indic Redox Features	ator or confirm the abse	Sampling Point <u>WL-16</u> nce of indicators.)
(inches) Color (moist) %	Color (moist) % Type ¹	Loc ² Texture	
<u>0-12"</u> <u>2.5Y 5/2</u>	7.5YR 5/6 <u>2% C</u>	<u>M</u> Silty loam with Oxidi	h clay Mottles: Fine, few, promined zed root channels
¹ Type: C=Concentration, D=Depletion, RM: Hydric Soil Indicators: (Applicable to Histosol (A1) Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4) Stratified Layers (A5) (LRR F) 1 cm Muck (A9) (LRR F, G, H) Depleted Below Dark Surface (A12) Thick Dark Surface (A12) Sandy Mucky Mineral (S1) 2.5 Mucky Peat or Peat (S2) (LRR G,H) 5 cm Mucky Peat or Peat (S3) (LRR F)	all LRRs, unless otherwise Sandy Gleyed Matrix (S4) Sandy Redox (S5) Striped Matrix (S6) X Loamy Mucky Mineral (F1) Loamy Gleyed Matrix (F2) Depleted Matrix (F3) Redox Dark Surface (F6) Depleted Dark Surface (F7) Redox Depressions (F8) High Plains Depressions (F1)	noted.) Indicators fo 1 cm Muc Coast Pr Dark Su High Pla (LRR H c Reduced Red Pare Other (E ³ Indicators c 6) wetland	² Location: PL=Pore Lining, M=Matrix. pr Problematic Hydric Soils ³ : ck (A9) (LRR I, J) rairie Redox (A16) (LRR F, G, H) rface (S7) (LRR G) ains Depressions (F16) putside of MLRA 72 & 73) I Vertic (F18) ent Material (TF2) xplain in Remarks) of hydrophytic vegetation and hydrology must be present, disturbed or problematic
Restrictive Layer (if present): Type: Depth (inches) : Remarks:	Hydr	c Soil Present? Yes	<u>x</u> No
HYDROLOGY			
Wetland Hydrology Indicators: Primary Indicators (minimum of one required; ch X_Surface Water (A1) X_Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Water-Stained Leave (B9)	Salt Crust (B11) Hydrogen Sulfide Odor (C1) Dry Season Water Table (C2) XOxidized Rhizospheres on Living R (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7) Other (Explain in Remarks)	Sparsely Vege Drainage Patte Oxidized Rhizo oots (C3) (where tilled) Crayfish Burro Geomorphic P FAC-Neutral 1	ospheres on Living Roots (C3) ws (C8) ible of Aerial Imagery (C9) osition (D2)
	Depth (inches) <u>4 "</u> Depth (inches) <u>*</u> Depth (inches) <u>*</u>	Wetland Hydrology Prese YesXNo	ent?
Describe Recorded Data (stream gauge, m previous inspections), if available:	onitoring well, aerial photos,		,
Remarks:	· ·		

.

Project/Site: L	udeman License Area				Sampling Date: 6/9/2008
Applicant/Owner:					City/County: Converse County
					T34NR73W State: WY
Landform (hillslope, t	terrace, etc.):depression		Local relief (co	oncave, con	vex, none) <u>concave</u> Slope (%) <2%
Subregion (LRR):	LRR H	Lat:_	<u>-105.638</u>	Lor	ng: 42.937 Datum: NAD-83
Soli Map Unit Name:	187-Kisnona-Cambria in	ical for this ti	ma of year? V		sification <u>na</u> Sampling Point <u>WL-17</u> lo (If no, explain in Remarks.)
Are "Normal Circums				'esX_ N	
			•	00 <u> </u>	···
	_, Soil, or Hydology				Yes No_X Yes No_X
	, Soil, or Hydrology	natural	ly problematic'	?	Yes No <u>X</u>
	ny answers in Remarks.)				
			ng sampling	point loca	ations, transects, important features, etc.
Hydrophytic Vegetati					
Hydric Soil Present?		No		the Sample	
Wetland Hydrology F	Present? Yes_X_	NO	Wil	thin a Wetla	and? Yes_ <u>X_</u> No
Remarks:					
This is a depression i	in a drainage.				
	lse scientific names of	nlanta			
	·····	Absolute	Dominate	Indicator	Dominance Test Worksheet:
<u>Tree Stratum (</u> F	<u>riot size:)</u>	%Cover	Species?	Status	Number of Dominant Species
1		700000	Opecies :		That Are OBL, FACW, or FAC
2					(excluding FAC-): <u>1</u> (A)
3					Total Number of Dominant Species Across All Strata: 1 (B)
4					Species Across All Strata:1(B)
			=Total Cover		Percent of Dominant Species
Sapling/Shrub S	Stratum (Plot size:)				That are OBL, FACW, or FAC: 100 (A/B)
1					Prevalence Index Worksheet:
2					Total % Cover of: Multiply by:
					OBL species x 1 =
3					FACW species x 2 =
4					FAC species x 3 =
5					FACU species x 4 =
			=Total Cover		UPL species x 5 =
Herb Stratum (F	Plot size: 20sf)				Column Totals:A)(B)
1 Juncus balticus		70	Y	OBL	Prevalence Index = B/A =
2 Taraxacum officina	ale	5	N	FACU	
3 Equisetum laevigati		5	N	FAC	Hydrophytic Vegetation Indicators:
4 Poa sp.		5	N		X_Dominance Test is >50%
5					Prevalence Index is $\leq 3.0^1$
6	<u></u>				Morphological Adaptations ¹ (Provide
7		1			supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain)
8				· · ·	
9		· · · · · · · · · · · · · · · · · · ·			¹ Indicators of hydric soil and wetland hydrology must
10		1			be present, unless disturbed or problematic.
		85%	=Total Cover		Hydrophytic Vegetation Present?
Woody Vine Stra	atum (Plot size:		1	L	Yes X_ No
1					
2	· · · · ·				1
			=Total Cover		1
% Bare Ground in H	erb Stratum 15%		<u> </u>		L
	<u></u>	_			
Remarks:					

Remarks:

SOIL Profile D Depth	escription: (Describ Matrix	e to the d		ocument edox Feat		ator or	confirm the a	Sampling PointWL-17 absence of indicators.)
(inches)	Color (moist)	[′] %	Color (moist)	%	Type ¹	Loc ²	Texture	
<u>0-4"</u>	<u>10 YR 4/1</u> 10 YR 2/1	<u> 50 %</u> 50 %	NA	······			sandy lo	am Blended matrix
4-12"	<u>10 YR 5/1</u>		10 YR 6/8	<2%	C	M	sandy clay	Mottles: Coarse, few, prominent
			2.5 Y 2.5/1	15%	<u> </u>	Μ		Mottles: Medium, common, prominent
								Oxidized root channels in 4-12"
				·				
		·····						
	Concentration, D=De							² Location: PL=Pore Lining, M=Matrix.
	Soil Indicators: (A sol (A1)	ррисаріе	Sandy Gle			10tea.)		rs for Problematic Hydric Soils ³ : n Muck (A9) (LRR I, J)
	Epipedon (A2) Histic (A3)		Sandy Rec Striped Ma	lox (S5)	. ,		Coa	st Prairie Redox (A16) (LRR F, G, H)
	ogen Sulfide (A4)		Stiped Ma		ral (F1)			'k Surface (S7) (LRR G) h Plains Depressions (F16)
	fied Layers (A5) (LRF Muck (A9) (LRR F, G		Loamy Gle Depleted M					R H outside of MLRA 72 & 73) uced Vertic (F18)
Deple	ted Below Dark Surfa		Redox Dar	k Surface	(F6)		Red	Parent Material (TF2)
	Dark Surface (A12) y Mucky Mineral (S1)		Depleted I Redox Dep					er (Explain in Remarks) ors of hydrophytic vegetation and
2.5 M	ucky Peat or Peat (S	2) (LRR G	,H)High Plain	s Depress	ions (F16	5)	wet	land hydrology must be present,
5 cm	Mucky Peat or Peat ((S3) (LRR	F) (MLRA 72	2 & 73 of L	RR H)		unl	ess disturbed or problematic
Restrictiv Type:_	ve Layer (if present)):			Hydri	c Soil Pr	rocont? Vo	s X No
	(inches) :				Hyun	C 3011 F1	esent? rea	s <u>X</u> No
Rema	rks:							
HYDRO	DLOGY							
Wetland I	Hydrology Indicators:							
Primary In	dicators (minimum of or	ne required;	check all that apply)				Secondary Indi	cators (minimum of two required)
	e Water (A1) ation (A3)		Salt Crust (B1 Hydrogen Su		(C1)			Vegetated Concave Surface (B8) e Patterns (B10)
Water	Marks (B1)		Dry Season W	ater Table	(C2)		Oxidized	Rhizospheres on Living Roots (C3)
	ent Deposits (B2) eposits (B3)		X_Oxidized Rhiz (where not till		n Living R	oots (C3)		illed) Burrows (C8)
Algal M	Mat or Crust (B4) eposits (B5)		Presence of Ro	educed Iror	n (C4)		Saturatio	n Visible of Aerial Imagery (C9) hic Position (D2)
Inunda	ation Visible on Aerial In	nagery (B7)	Other (Explain		s)		FAC-Neu	utral Test (D5)
	-Stained Leave (B9)						Frost-nea	ve Hummocks (D7) (LRR F)
	servations:					Wet	and Hydrology	Present?
	ater Present? Yes		_ Depth (inches)					
Saturation	le Present? Yes Present? Yes_X		_ Depth (inches) Depth (inches)*			Yes_	_ <u>X_</u> No	-
	apillary fringe)		· · · · ·			h		
Jaturate		. <u></u>						
Describe	Recorded Data (streatinspections), if availal	am gauge, ble:	monitoring well, a	erial photo	os,			
Remarks:	··· · · · · · · · · · · · · · · · · ·	· · ·						

Project/Site:	Ludeman License Ar	ea				Sampling Date: 6/8/2008
Applicant/Owner:						City/County: Converse County
	K. LaClair, W. Stans					
Landform (hillslop	e, terrace, etc.): <u>De</u>	pression in	n channel	Local	relief (conca	ave, convex, none) <u>concave</u> Slope (%) <2% Long: <u>42.909</u> Datum: <u>NAD-83</u>
Subregion (LRR):	<u>LRR H</u>	mbria loa	Lat:	<u>-105.631</u>	LL	.ong: <u>42.909</u> Datum: <u>NAD-83</u> ams, 251-Theedle-Kishona-Shingle loams
Son Map Onit Nan	ne. <u>107-Rishona-Ca</u>		1115, 103-1115	nona-cambria		ssificationna Sampling PointWL-18
Are climate/hydrol	logic conditions on th	e site typi	cal for this ti	me of year? Y		o (If no, explain in Remarks.)
Are "Normal Circu	mstances" present?			Y	′es <u>X</u> N	o
Are Vegetation	, Soil, or Hy	/doloav	significar	ntly disturbed?)	Yes No <u>X_</u>
Are Vegetation	, Soil , or Hy	/drology				Yes NoX
(If needed, explain	n any answers in Ren	narks.)				
SUMMARY OF	FINDINGS – Attac			ig sampling	point loca	ations, transects, important features, etc.
Hydrophytic Vege		es <u>X</u>	No			
Hydric Soil Preser	nt? Ye	es <u>X</u>	No		the Sample	
Wetland Hydrolog	y Present? Y	es_ <u>X</u>	NO	Wi	thin a Wetla	nd? Yes <u>X</u> No
Remarks:	ntermittent wetlands (?	0 wetland	WI-18a th	rough WI -18t)	that are disc	ontinuous depressions along the same channel. They range in
size from 0.001 acr		o wenanu	, ₩12-10a liii	(ougii WL-101)	mat all uist	onemuous depressions along the same chaliner. They fallge in
	- Use scientific na	mes of	nlants			Dominance Test Worksheet:
	(Plot size:)		Absolute	Dominate	Indicator	
<u>Thee officiality</u>	<u>[[</u>		%Cover	Species?	Status	Number of Dominant Species
1						That Are OBL, FACW, or FAC
2	·					(excluding FAC-):1(A)
3						Total Number of Dominant
4						- Species Across All Strata: <u>1</u> (B)
				=Total Cover		
Capling/Chau						Percent of Dominant Species That are OBL,FACW, or FAC: 100 (A/B)
	b Stratum (Plot size:					
1					· ···	Prevalence Index Worksheet: Total % Cover of: Multiple by:
2						OBL species x 1 =
3						FACW species x 2 =
4						FAC species x 3 =
5						FACU species x 4 = UPL species x 5 =
				=Total Cover		Column Totals:A)(B)
	n (Plot_size: 20sf)				
1 Carex aquatilis			65	Y	OBL	Prevalence Index = B/A =
2 Carex praegraci	lis		5	N	FACW	
3 Juncus balticus			5	N	OBL	Hydrophytic Vegetation Indicators: X Dominance Test is >50%
4 Equisetum arven			1	N N	FAC FACU	Prevalence Index is $\leq 3.0^{1}$
5 Taraxacum offic	inale			19	FACU	Morphological Adaptations ¹ (Provide
6 7	<u>, , , , , , , , , , , , , , , , , </u>					- supporting data in Remarks or on a separate sheet)
8						Problematic Hydrophytic Vegetation ¹ (Explain)
9			· ·· ··			¹ Indicators of hydric soil and wetland hydrology must
10						be present, unless disturbed or problematic.
			77%	=Total Cover		Hydrophytic Vegetation Present?
Woody Vine S	Stratum (Plot size:)				Yes <u>X</u> No
1		<i>1</i>				
2						
				=Total Cover		
% Bare Ground in	Herb Stratum <u>23</u>	%	-			
						

Remarks:

SOIL Profile Description: (Describe to the c Depth Matrix		ocument th edox Featu		ator or	Sampling PointWL-18 confirm the absence of indicators.)
(inches) Color (moist) %	Color (moist)		Type ¹	Loc ²	Texture
0-4" 2.5Y 2.5/1	NA				Sandy silt loam w/ decomposing organics (black)
4-8" 2.5Y 4/1	NA				Sandy silt loam w/ decomposing organics (black)
8-16" 2.5Y 4/1	2.5Y 5/4	<2%	С	M	sandy loam Mottles: Fine, few, distinct
	7.5YR 4/6	<2%	<u>C</u>	Μ	Mottles: Fine, few, prominent
		<u> </u>			
¹ Type: C=Concentration, D=Depletion, F	M=Reduced Matri	x CS=Cove	ered or (Coated S	Sand Grains. ² Location: PL=Pore Lining, M=Matrix.
Hydric Soil Indicators: (Applicable					
Histosol (A1)	Sandy Gle	yed Matrix (•	1 cm Muck (A9) (LRR I, J)
Histic Epipedon (A2) Black Histic (A3)	Sandy Rec Striped Ma				Coast Prairie Redox (A16) (LRR F, G, H) Dark Surface (S7) (LRR G)
Hydrogen Sulfide (A4)	_X_Loamy M	ucky Minera			High Plains Depressions (F16)
Stratified Layers (A5) (LRR F) 1 cm Muck (A9) (LRR F, G, H)	Loamy Gle Depleted M	yed Matrix Aatrix (F3)	(F2)		(LRR H outside of MLRA 72 & 73) Reduced Vertic (F18)
Depleted Below Dark Surface (A12)	Redox Dar	rk Surface (Red Parent Material (TF2)
Thick Dark Surface (A12) Sandy Mucky Mineral (S1)		Dark Surfac pressions (I			Other (Explain in Remarks) ³ Indicators of hydrophytic vegetation and
2.5 Mucky Peat or Peat (S2) (LRR G	i,H)High Plain	s Depressio	ons (F16	6)	wetland hydrology must be present,
5 cm Mucky Peat or Peat (S3) (LRR	F) (MLRA 72	2 & 73 of LR	RR H)		unless disturbed or problematic
Restrictive Layer (if present):			11	- 0-2 F	
Type: Depth (inches) :			Hyari	c Soil Pr	resent? YesX No
Remarks:					
HYDROLOGY		1 18 3 1 1 0			
Wetland Hydrology Indicators:					
Primary Indicators (minimum of one required	; check all that apply)				Secondary Indicators (minimum of two required)
X_Surface Water (A1) X_Saturation (A3)	Salt Crust (B1 Hydrogen Sul	,	4)		Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10)
Water Marks (B1)	Dry Season W	/ater Table (0	C2)		Oxidized Rhizospheres on Living Roots (C3)
Sediment Deposits (B2) Drift Deposits (B3)	Oxidized Rhize (where not till		Living Ro	oots (C3)	(where tilled) Crayfish Burrows (C8)
Algal Mat or Crust (B4)	Presence of R	edúced Iron ((C4)		Saturation Visible of Aerial Imagery (C9)
Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7)	Thin Muck Sur Other (Explain	· · ·)		Geomorphic Position (D2) FAC-Neutral Test (D5)
Water-Stained Leave (B9)		,			Frost-Heave Hummocks (D7) (LRR F)
Field Observations:					
Surface Water Present? Yes X No	Depth (inches)	<1"		Wetla	and Hydrology Present?
Water Table Present? Yes X No	Depth (inches)	14"		Yes_	_XNo
Saturation Present? Yes_X_No (includes capillary fringe)	Depth (inches) *				
* Saturated to the surface.					
Describe Recorded Data (stream gauge	monitoring well a	erial nhotos			
previous inspections), if available:	, morntoring weit, a		· ,		
Remarks:	······				

Project/Site:	Ludeman License Area					Sampling Date:	6/7/2008
Applicant/Owner:						City/County:	Converse County
Investigator(s):	K. LaClair, W. Stansbury R74W	Section,	Township,Ran	nge: Sec 1	2, T34N,	State: WY	
Landform (hillslop	e, terrace, etc.): Depression		_ocal relief (co	ncave, conv	vex, none) c	oncaveSlope (%) 2%
Subregion (LRR):	LRR H	Lat:	-105.64	Lon	g: 42.935	Datum: N	IAD-83
Soil Map Unit Nan	ne: 189-Kishona-Cambria-	Theedle loam	S	NWI	classification_	na Samp	ling Point_WL-19
	ogic conditions on the site ty	pical for this ti	ime of year? Y	′es <u>X</u> N	o (If no,	explain in Remarks.)	
Are "Normal Circu	mstances" present?		۲	/es <u>X</u> N	o		
Are Vegetation	, Soil, or Hydology_	significa	ntly disturbed?	>		Yes	No <u>X</u>
Are Vegetation	, Soil, or Hydrology	natural	y problematic	?		Yes	No_X_
(If needed, explain	n any answers in Remarks.)						
SUMMARY OF	FINDINGS – Attach site i	map showir	ng sampling	point loca	ations, trans	ects, important fe	atures, etc.
Hydrophytic Vege	tation Present? Yes_X_	No		-		-	
Hydric Soil Preser	nt? Yes <u>X</u>	_ No		the Sampleo			
Wetland Hydrolog	y Present? Yes_X_	_ No	wi	thin a Wetla	nd? Yes_	_XNo	
Remarks:							
to 0.07 acres.	wo wetlands (WL-19a and b) th	at are disconti	nuous depressio	ons upgradien	it of a diked wa	iter body. They range	in size from 0.03 acres
	11	· · · · ·			-		
	- Use scientific names of				Dominanc	e Test Worksheet:	
Tree Stratum	(Plot size:)	Absolute	Dominate	Indicator Status	Number of	Dominant Species	
1		%Cover	Species?	Status		DBL, FACW, or FAC	
		_			(excluding		(A)
2		_					
3						per of Dominant	
4					Species Ac	cross All Strata:	(B)
			=Total Cover		Percent of	Dominant Species	
Sapling/Shru	b Stratum (Plot size:)				That are C	BL,FACW, or FAC:	100 (A/B)
1	<u>, , , , , , , , , , , , , , , , , , , </u>				Prevalence	e Index Worksheet:	
2	· · · · · · · · · · · · · · · · · · ·					Cover of:	Multiple by:
3					OBL specie	esx1=	
					📙 FACW spe	cies x 2 =	=
4		_			FAC specie	esx 3 =	
5						cies x 4 = es x 5 =	<u></u>
			=Total Cover			otals:A)	
	n (Plot_size: 20sf)						(0)
1 Eleocharis palus	stris	15	Y	OBL	Prevalence	e Index = B/A =	
2					<u> </u>		
3						tic Vegetation Indica ninance Test is >50%	
4		_				alence Index is ≤ 3.0	
5					Morp	phological Adaptation	s ¹ (Provide
6	· · · · · · · · · · · · · · · · · · ·				supporting	data in Remarks or o	on a separate sheet)
7					_ Prob	lematic Hydrophytic	Vegetation' (Explain)
8					¹ Indicators	s of hydric soil and we	etland hydrology must
9						, unless disturbed or	
		1501	=Total Cover				
		15%		ļ		c Vegetation Present	ť
Woody Vine S	Stratum (Plot size:)					No	
2					-		
<u> </u>			=Total Cover		-		
% Bare Ground in	Herb Stratum 85%	_1	1	I			
	<u></u>	_					
•						· · · · · · · · · · · · · · · · · · ·	
Remarks:						· ·	

SOIL Profile Description: (Describ	e to the de	pth needed to do	cument the	indicato	or or co	onfirm the absend	Sampling PointWL-19 e of indicators.)	1
Depth <u>Matrix</u> (inches) Color (moist)			dox Features	S		<u>Texture</u>	,	
<u>0-2"</u> 2.5Y 3/2		7.5 YR 3/4	25%	<u>C</u>	M	sandy/silty loam		
2-8" 5Y 2.5/1	50%	7.5YR 5/8	2%	<u> </u>	<u>M</u>	sandy/silty loam	Oxidized root channels in 0-2" Mottles: Fine, few, prominent	
<u>2.5Y 3/2</u>	50%						atrixOxidized root channels in 2-8"	
$\frac{8-16"}{2.5Y} \frac{2.5Y}{2.5Y} \frac{2.5/1}{4/1}$	<u>50%</u> 50%	10YR 4/6	15%	<u> </u>	M	<u>sandy/silty loam</u> Blended ma	Mottles: Fine, common, prominent	
¹ Type: C=Concentration, D=De							ocation: PL=Pore Lining, M=Matrix.	
Hydric Soil Indicators: (A) Histosol (A1) Histic Epipedon (A2)	pplicable	to all LRRs, unle Sandy Gleye Sandy Redo	ed Matrix (S4		ed.)	1 cm Muck	Problematic Hydric Soils ³ : (A9) (LRR I, J) ie Redox (A16) (LRR F, G, H)	
Black Histic (A3) Hydrogen Sulfide (A4)		Striped Matr X_Loamy Muc	ix (S6)	F1)		Dark Surfa	ice (S7) (LRR G) s Depressions (F16)	
Stratified Layers (A5) (LRF 1 cm Muck (A9) (LRR F, G		Loamy Gleye	ed Matrix (F				side of MLRA 72 & 73)	
Depleted Below Dark Surfa Thick Dark Surface (A12)		Redox Dark				Red Parent	ain in Remarks)	
Sandy Mucky Mineral (S1) 2.5 Mucky Peat or Peat (S		Redox Depr	essions (F8) Depressions			³ Indicators of I	hydrophytic vegetation and drology must be present,	
5 cm Mucky Peat or Peat (& 73 of LRR				turbed or problematic	
Restrictive Layer (if present) Type:	:			Hydric S	oil Pro	sent? Yes X	No	1
Depth (inches) :						50nti 100 <u>7</u>		┦
Remarks:								
HYDROLOGY								
Wetland Hydrology Indicators:								
Primary Indicators (minimum of or Surface Water (A1)	ne required;	Salt Crust (B11)			Se	Sparsely Vegetat	<u>minimum of two required</u>) red Concave Surface (B8)	
X_Saturation (A3) Water Marks (B1)		Hydrogen Sulfic Dry Season Wa	ter Table (C2)			Drainage Pattern Oxidized Rhizosp	s (B10) heres on Living Roots (C3)	ŀ
Sediment Deposits (B2) Drift Deposits (B3)		X_Oxidized Rhizo	d)	-	s (C3)	(where tilled) Crayfish Burrows		
Algal Mat or Crust (B4) Iron Deposits (B5)		Presence of Rec Thin Muck Surfa	ice (C7)	4)		Geomorphic Posi		1
Inundation Visible on Aerial In Water-Stained Leave (B9)	agery (B7)	Other (Explain i	n Remarks)		-	FAC-Neutral Tes Frost-Heave Hum	t (D5) mocks (D7) (LRR F)	
Field Observations:								
Surface Water Present? Yes	No V	Donth (inchor)			Wetlan	d Hydrology Present	?	
Water Table Present? Yes	_No_X_	Depth (inches)	. <u> </u>		Yes	<u>X</u> No		
(includes capillary fringe)	No1	Depth (inches) *]	
* Saturated to the surface.								
Describe Recorded Data (strea previous inspections), if availa		monitoring well, aei	rial photos,					
Remarks:								
							· · · · · · · · · · · · · · · · · · ·	

Project/Site:	Ludeman License						Sampling Date:	6/8/2008
Applicant/Owner:			Castian	Townshin Don		0 TO 4NI	City/County:	Converse County
Investigator(s):	K. LaClair, W. S R74W	-		Township,Ran	-	2, T34N,	State: WY	•
Landform (hillslop	e, terrace, etc.):_	_depression	· · · · · ·	Local relief (co	oncave, conv	vex, none)	concave Slope ((%) <u>NA</u>
Subregion (LRR):	LRR H		Lat:	-105.708	Lon	g: <u>42.935</u>	Datum: <u>N</u> Samplii , explain in Remarks.)	<u>IAD-83</u>
Soil Map Unit Nan	ne: <u>189-Kishor</u>	na-Cambria-T	heedle loam	s	NWI c	classification_	<u>na</u> Samplir	ng Point_ <u>WL-20</u>
Are climate/hydro	logic conditions o	n the site typi	ical for this ti	me of year? Y	'es <u>X</u> No	o (lf no	, explain in Remarks.)	1
Are "Normal Circu	umstances" prese	nt?		Y	′es <u>X</u> No	o		
Are Vegetation	Soil		cignificor	thy disturbed?			Voc	No V
Are Vegetation							Yes Yes	No <u>X</u> No <u>X</u>
(If needed, explain	, 3011, 0 n any answers in	Remarks)	naturan	y problematic	r		163	NU <u>X</u>
•	•			a compline		tions trong	nanta lunnautant fa	aturaa ata
				ig sampling	point loca	tions, trans	sects, important fe	atures, etc.
Hydrophytic Vege		Yes <u>X</u>	No					
Hydric Soil Preser Wetland Hydrolog	nt?	Yes <u>X</u>	No		the Sampleo		37 N	
	ly Present?	Yes <u>X</u>	No	Wi	thin a Wetlar	nd? Yes_	_ <u>X</u> No	
Remarks:								
This is an isolated	l, excavated depres	ssion adjacent i	to a windmill.					
						-1		
VEGETATION -	 Use scientific 	names of	plants.			Dominanc	e Test Worksheet:	
Tree Stratum	n (Plot size:)	Absolute	Dominate	Indicator			
· · · · · · · · · · · · · · · · · · ·	·		%Cover	Species?	Status		Dominant Species	
1							OBL, FACW, or FAC	
2						(excluding	FAC-):	(A)
3						Total Num	ber of Dominant	
· · · · · · · · · · · · · · · · · · ·							cross All Strata:	<u>2</u> (B)
4					1			
				=Total Cover		Percent of	Dominant Species	
Sapling/Shru	b Stratum (Plot s	ize:)	:			That are (DBL,FACW, or FAC:	100 (A/B)
1		11				Prevalenc	e Index Worksheet:	
	· · ·						Cover of:	Multiply by:
2								
3						EACW she	es x 1 = ecies x 2 =	
4						FAC speci	es x 3 =	
5						FACU spe	cies x 4 =	
				=Total Cover		UPL speci	esx5=	:
						Column T	otals:A)	(B)
	n (Plot size: 20	<u>st)</u>				_		, , ,
1 Typhus angustife			50	Y	OBL	Prevalence	e index = B/A =	
2 Scirpus validus			20	Y	OBL	_		
3 Eleocharis palus			3	N	OBL		tic Vegetation Indica	
4 Alopecurus prat	ensis	1.14	2	N	FACW		ninance Test is >50%	
5							valence Index is ≤ 3.0 phological Adaptation	
6							data in Remarks or c	
7						Prof	plematic Hydrophytic '	Vegetation ¹ (Explain)
8						1		
9				 				etland hydrology must
10	· · · · · · · · · · · · · · · · · · ·					be presen	t, unless disturbed or	problematic.
			75%	=Total Cover			ic Vegetation Present	Ω
Mandul Vin - 1	Checkum /Dist at-		1370	1	l		<pre>C Vegetation Present C No</pre>	ŗ
1 <u>VVoody Vines</u>	<u>Stratum (Plot size</u>)				' ^{cs}	<u> </u>	
						1		
2				=Total Cover		-		
0/ Dara Oranati		25.07						
% Bare Ground in	i Herb Stratum _	_23%						

SOIL Profile Description: (Describe to the d Depth <u>Matrix</u>		ent the indicato		ng Point <u>WL-20</u> I tors.)
(inches) Color (moist) %	Color (moist) %	Type ¹ L	oc ² Texture	
0-4" 2.5Y 4 /1	_10YR 4/629	<u>% C M</u>	sandy/silty loam w/organics Mott Oxidized root chan	
4-8" 10YR 3 /2	7.5YR 4/6 209	76 <u>C</u> 1		nedium, many, prominent
8-16" 2.5Y 4 /2	10YR 4/6 20%			nedium, many, prominent
			······	
¹ Type: C=Concentration, D=Depletion, R				Pore Lining, M=Matrix.
Hydric Soil Indicators: (Applicable Histosol (A1)	Sandy Gleyed Ma	atrix (S4)	1 cm Muck (A9) (LRR	, J)
Histic Epipedon (A2) Black Histic (A3)	Sandy Redox (S Striped Matrix (S		Coast Prairie Redox (A Dark Surface (S7) (LF	
Hydrogen Sulfide (A4)	X_Loamy Mucky N	lineral (F1)	High Plains Depressi	ons (F16)
Stratified Layers (A5) (LRR F) 1 cm Muck (A9) (LRR F, G, H)	Loamy Gleyed M Depleted Matrix ((LRR H outside of MLF Reduced Vertic (F18)	RA (2 & (3)
Depleted Below Dark Surface (A12)	Redox Dark Surf	ace (F6)	Red Parent Material (1	
Thick Dark Surface (A12) Sandy Mucky Mineral (S1)	Depleted Dark S Redox Depression		Other (Explain in Rem ³ Indicators of hydrophytic	arks) vegetation and
2.5 Mucky Peat or Peat (S2) (LRR G 5 cm Mucky Peat or Peat (S3) (LRR	H)High Plains Dep	ressions (F16)	wetland hydrology mu unless disturbed or p	st be present,
	F) (IVILKA 72 & 73		unless disturbed of pl	obiematic
Restrictive Layer (if present): Type:		Hydric S	oil Present? Yes <u>X</u> No	
Depth (inches) :				
Remarks:				
HYDROLOGY				
Wetland Hydrology Indicators:				
Primary Indicators (minimum of one required;	check all that apply)		Secondary Indicators (minimum of t	wo required)
Surface Water (A1) Saturation (A3)	Salt Crust (B11) Hydrogen Sulfide Oo	lor (C1)	Sparsely Vegetated Concave Drainage Patterns (B10)	Surface (B8)
Water Marks (B1)	Dry Season Water Ta	able (C2)	Oxidized Rhizospheres on Liv	ing Roots (C3)
Sediment Deposits (B2) Drift Deposits (B3)	X_Oxidized Rhizospher (where not tilled)	es on Living Root	s (C3) (where tilled) Crayfish Burrows (C8)	
Algal Mat or Crust (B4)	Presence of Reduced Thin Muck Surface (C		Saturation Visible of Aerial Im Geomorphic Position (D2)	agery (C9)
Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7)	Other (Explain in Rer		FAC-Neutral Test (D5)	
Water-Stained Leave (B9)			Frost-Heave Hummocks (D7) (LRR F)
Field Observations:				
Surface Water Present? Yes X No	Depth (inches) <u>4"</u>		Wetland Hydrology Present?	
	Depth (inches)		Wetland Hydrology Present? YesX_No	
Water Table Present? Yes No X		- -	,	
Water Table Present? YesNo Saturation Present? Yes_XNo	Depth (inches)	-	,	
Water Table Present? YesNoX Saturation Present? Yes_X_No (includes capillary fringe)	_ Depth (inches) Depth (inches)*	- L	,	
Water Table Present? YesNoX Saturation Present? Yes_X_No (includes capillary fringe) Saturated to the surface.	_ Depth (inches) Depth (inches)*	- L	,	
Water Table Present? YesNoX Saturation Present? Yes_X_No (includes capillary fringe) Saturated to the surface. Describe Recorded Data (stream gauge, previous inspections), if available:	_ Depth (inches) Depth (inches)*	- L	,	
Water Table Present? YesNoX_ Saturation Present? Yes_X_No (includes capillary fringe) Saturated to the surface. Describe Recorded Data (stream gauge,	_ Depth (inches) Depth (inches)*	- L	,	
Water Table Present? YesNoX Saturation Present? Yes_X_No (includes capillary fringe) Saturated to the surface. Describe Recorded Data (stream gauge, previous inspections), if available:	_ Depth (inches) Depth (inches)*	- L	,	

Project/Site:	Ludeman License Ar	ea				Sampling Date: 6/7/2008
Applicant/Owner:						City/County: Converse County
Investigator(s):						T34N, R73W State: WY
Subregion (LRR): Soil Map Unit Name	LRR H e: <u>189-Kishona-C</u> gic conditions on th	ambria-Ti e site typi	Lat: needle loam	<u>-105.665</u> s NW me of year? Y	Lon Lon/I classificat	convex, none) <u>concave</u> Slope (%) <u><2%</u> g: <u>42.929</u> Datum: <u>NAD-83</u> ion <u>na</u> Sampling Point <u>WL-21</u> o (If no, explain in Remarks.) o
Are Vegetation Are Vegetation (If needed, explain SUMMARY OF F	, Soil, or Hy any answers in Rer	ydrology_ narks.)	naturall	y problematic?	?	Yes NoX Yes NoX ations, transects, important features, etc.
Hydrophytic Vegeta Hydric Soil Present Wetland Hydrology	ation Present? Y ? Y	es_X_	No No	lst	the Sample thin a Wetla	d Area
Remarks:	termittent wetlands (1			·		ontinuous depressions along the same channel. They range in
VEGETATION -	Use scientific na	mes of i	olants.			Dominance Test Worksheet:
Tree Stratum			Absolute %Cover	Dominate Species?	Indicator Status	Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-):1_(A)
2 3 4						Total Number of Dominant Species Across All Strata:1(B)
Sapling/Shrub	Stratum (Plot size:)		=Total Cover		Percent of Dominant Species That are OBL,FACW, or FAC: 100 % (A/B)
2						Prevalence Index Worksheet: <u>Total % Cover of:</u> Multiple by:
3						
4						FACW species x 2 = FAC species x 3 =
5						FACU species x 4 =
	1			=Total Cover		UPL species x 5 =
Herb Stratum	(Plot size: 20sf)				Column Totals:A)(B)
1 Eleocharis palust	ris		30	Y	OBL	Prevalence Index = B/A =
2 Agropyron smithi	i		10	N	FACU	
3 Mustard sp.			10	N		Hydrophytic Vegetation Indicators: XDominance Test is >50%
4 Unknown			2	N N	NL	$\frac{X}{2} = 200 \text{ Prevalence Index is } \leq 3.0^{1}$
5 Thermopsis monte	ana		1	IN	INL	Morphological Adaptations ¹ (Provide
<u>6</u> 7						supporting data in Remarks or on a separate sheet)
8						Problematic Hydrophytic Vegetation ¹ (Explain)
9						¹ Indicators of hydric soil and wetland hydrology must
10						be present, unless disturbed or problematic.
			53%	=Total Cover		Hydrophytic Vegetation Present?
Woody Vine S	tratum (Plot size:)				Yes X No
2]
				=Total Cover		
% Bare Ground in	Herb Stratum <u>47</u>	%	-			
Remarks:						

SOIL Profile Description: (Describe to the de Depth Matrix		cument the in dox Features		confirm the a		Sampling Point <u>WL-21</u> f indicators.)	-
(inches) Color (moist) %	Color (moist)	% Тур	e ¹ Loc ²	Texture			
0-4" 2.5Y 4/1	7.5YR 4/6		<u>C_M</u>	Sandy loam	Mottles:	Fine, few, prominent	
4-10" 10YR 4/2	7.5YR 4/6	25%	C M	Sandy loam	Mottles:	Fine to medium, many, pron	ninent
10+" 10YR 4/3	7.5YR 4/6	25%	C M	Sandy loam	Mottles:	Fine to medium, many, pron	ninent
¹ Type: C=Concentration, D=Depletion, R						tion: PL=Pore Lining, M=Ma	
Hydric Soil Indicators: (Applicable Histosol (A1)		ess otnerwis ed Matrix (S4)	se notea.)			blematic Hydric Soils ³ :) (LRR I, J)	
Histic Epipedon (A2)	Sandy Redo	x (S5)		Coas	st Prairie F	Redox (A16) (LRR F, G, H)	
Black Histic (A3)	Striped Matr					(S7) (LRR G)	
Hydrogen Sulfide (A4) Stratified Layers (A5) (LRR F)	X Loamy Muc	ed Matrix (F2)				epressions (F16) e of MLRA 72 & 73)	
1 cm Muck (A9) (LRR F, G, H)	Depleted Ma	itrix (F3)	/	Redu	uced Verti	c (F18)	
Depleted Below Dark Surface (A12)		Surface (F6)				aterial (TF2)	
Thick Dark Surface (A12) Sandy Mucky Mineral (S1)		ark Surface (F essions (F8)	()	³ Indicate	ors of hvdi	in Remarks) rophytic vegetation and	
2.5 Mucky Peat or Peat (S2) (LRR G	H)High Plains	Depressions (wetl	and hydro	logy must be present,	
5 cm Mucky Peat or Peat (S3) (LRR	F) (MLRA 72 8	& 73 of LRR H)	unie	ess disturb	ed or problematic	
Restrictive Layer (if present):							
Type: Depth (inches) :		H	ydric Soil P	resent? Yes	<u> X </u>	_ No	
Remarks:							
HYDROLOGY							
Wetland Hydrology Indicators:							
Primary Indicators (minimum of one required;	check all that apply)			Secondary India	cators (mini	mum of two required)	
X_Surface Water (A1)	Salt Crust (B11)			Sparsely	Vegetated	Concave Surface (B8)	
X_Saturation (A3) Water Marks (B1)	Hydrogen Sulfic Dry Season Wa				Patterns (E	310) es on Living Roots (C3)	F
Sediment Deposits (B2)	Oxidized Rhizos	pheres on Livin	g Roots (C3)	(where til	led)		
Drift Deposits (B3) Algal Mat or Crust (B4)	(where not tilled Presence of Red				Burrows (C8 N Visible of	3) Aerial Imagery (C9)	
Iron Deposits (B5)	Thin Muck Surfa	ice (C7)		Geomorpl	hic Position	(D2)	
Inundation Visible on Aerial Imagery (B7) Water-Stained Leave (B9)	Other (Explain i	n Remarks)			tral Test (D /e Hummoo	5) ks (D7) (LRR F)	
Field Observations:]	
Surface Water Present? Yes X No	Depth (inches) 4 inch	ies	Wet	and Hydrology F	resent?		
Water Table Present? Yes No X	_ Depth (inches)		Yes_	<u>X</u> _No	-		
· · · · · · · · · · · · · · · · · · ·							
Saturation Present? Yes X No	Depth (inches) *			••••		1	
· · · · · · · · · · · · · · · · · · ·	Depth (inches)*		[1	
Saturation Present? Yes_X_No (includes capillary fringe) * Saturated to the surface.			L			1	
Saturation Present? Yes X_No (includes capillary fringe)		rial photos,]	
Saturation Present? Yes_X_No (includes capillary fringe) * Saturated to the surface. Describe Recorded Data (stream gauge,		rial photos,				J	
Saturation Present? Yes_X_No (includes capillary fringe) * Saturated to the surface. Describe Recorded Data (stream gauge, previous inspections), if available:		rial photos,				J	

Project/Site:	Ludeman License Area				Sampling Date: 8/7/2008
Applicant/Owner:					City/County: Converse County
Investigator(s):					7, T34N R73W State: WY
Subregion (LRR): Soil Map Unit Nam Are climate/hydrol	<u>LRR H</u> ne: <u>189-Kishona-Cambria-T</u>	Lat: Theedle_loam	<u>-105.650</u> <u>s</u> NV\ me of year? Y	Lon Lon/I classificati	, none) <u>concave</u> Slope (%) <u><2%</u> g: <u>42.922</u> Datum: <u>NAD-83</u> ion <u>PEMAh</u> Sampling Point <u>WL-22</u> o (If no, explain in Remarks.) o
(If needed, explain	, Soil, or Hydology_ , Soil, or Hydrology_ any answers in Remarks.) FINDINGS – Attach site n				YesNoX_ YesNoX_ ations, transects, important features, etc.
Hydrophytic Veget Hydric Soil Preser Wetland Hydrolog Remarks:	tation Present? Yes_X_ ht? Yes_X_ y Present? Yes_X_	No		the Sampleo hin a Wetla	
	at has formed behind a dike in a	drainage.			
VEGETATION -	Use scientific names of	plants.			Dominance Test Worksheet:
Tree Stratum	(Plot size:)	Absolute %Cover	Dominate Species?	Indicator Status	Number of Dominant Species
1					That Are OBL, FACW, or FAC (excluding FAC-):1(A)
3					Total Number of Dominant
4					Species Across All Strata: <u>1</u> (B)
			=Total Cover		Percent of Dominant Species
Sapling/Shru	b Stratum (Plot size:)	×			That are OBL,FACW, or FAC: 100 % (A/B)
1					Prevalence Index Worksheet: <u>Total % Cover of:</u> <u>Multiple by:</u>
2					OBL species x 1 =
4					FACW species x 2 =
5					FAC species x 3 = FACU species x 4 =
5			=Total Cover		UPL species x 5 =
Herb Stratum	(Plot size: 20sf)				Column Totals:A)(B)
1 Hordeum jubatu		40	Y	FACW	- Prevalence Index = B/A =
2					
3					Hydrophytic Vegetation Indicators: X Dominance Test is >50%
4					$\frac{x}{100000000000000000000000000000000000$
5			<u> </u>		Morphological Adaptations ¹ (Provide
7			<u> </u>		 supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation¹ (Explain)
8	· · · · · · · · · · · · · · · · · · ·	<u>+</u>			
9	······································				¹ Indicators of hydric soil and wetland hydrology must
10					be present, unless disturbed or problematic.
		40%	=Total Cover		Hydrophytic Vegetation Present?
Woody Vine S	Stratum (Plot size:)				Yes <u>X</u> No
2]
			=Total Cover		
% Bare Ground in	Herb Stratum <u>60%</u>				
L					

Soil Sampling Point WL-22 Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Depth Matrix Redox Features
(inches) Color (moist) % Color (moist) % Type ¹ Loc ² Texture
0-4" 10YR 4/2 Silty loam Oxidized root channels present
4-8" 10YR 4/2 7.5YR 4/4 5% C M Silty loam Mottles: medium to coarse, common, distinct
·
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ² Location: PL=Pore Lining, M=Matrix.
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils ³ : Histosol (A1) Sandy Gleyed Matrix (S4) 1 cm Muck (A9) (LRR I, J)
Histic Epipedon (A2) Sandy Redox (S5) Coast Prairie Redox (A16) (LRR F, G, H)
Black Histic (A3) Striped Matrix (S6) Dark Surface (S7) (LRR G) Hydrogen Sulfide (A4) X_Loamy Mucky Mineral (F1) High Plains Depressions (F16)
Stratified Layers (A5) (LRR F)Loamy Gleyed Matrix (F2) (LRR H outside of MLRA 72 & 73)
1 cm Muck (A9) (LRR F, G, H)Depleted Matrix (F3)Reduced Vertic (F18) Depleted Below Dark Surface (A12)Redox Dark Surface (F6)Red Parent Material (TF2)
Thick Dark Surface (A12)Depleted Dark Surface (F7)Other (Explain in Remarks)
Sandy Mucky Mineral (S1)Redox Depressions (F8) ³ Indicators of hydrophytic vegetation and 2.5 Mucky Peat or Peat (S2) (LRR G,H)High Plains Depressions (F16) wetland hydrology must be present,
5 cm Mucky Peat or Peat (S3) (LRR F) (MLRA 72 & 73 of LRR H) unless disturbed or problematic
Restrictive Layer (if present):
Type: Hydric Soil Present? YesX No Depth (inches) :
Remarks:
HYDROLOGY
Wetland Hydrology Indicators:
Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) Surface Water (A1) Salt Crust (B11) Sparsely Vegetated Concave Surface (B8)
Saturation (A3)Hydrogen Sulfide Odor (C1)Drainage Patterns (B10)
Water Marks (B1) Dry Season Water Table (C2) Oxidized Rhizospheres on Living Roots (C3) Sediment Deposits (B2) X Oxidized Rhizospheres on Living Roots (C3) (where tilled)
Drift Deposits (B3)(where not tilled)Crayfish Burrows (C8)
Iron Deposits (B5)Thin Muck Surface (C7)Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7)Other (Explain in Remarks)FAC-Neutral Test (D5)Frost-Heave Hummocks (D7) (LRR F)
Field Observations: Wetland Hydrology Present?
Surface Water Present? Yes <u>No X</u> Depth (inches)
Water Table Present? YesNoX_ Depth (inches) YesX_No Saturation Present? YesNoX_ Depth (inches) YesX_No
(includes capillary fringe)
Describe Recorded Data (stream gauge, monitoring well, aerial photos,
previous inspections), if available:
Remarks:

-	Ludeman License Area				Sampling Date: 6/9/2008
Applicant/Owner:		0 + T -		0.17.7	City/County: Converse County
Investigator(s):			wnship,Range		
Subregion (LRR):_ Soil Map Unit Nam Are climate/hydrolo	<u>LRR H</u> e: <u>189-Kishona-Cambria-T</u>	Lat: heedle loam	<u>-105.642</u> <u>s</u> me of year? Y	LonLon	ne) <u>concave</u> Slope (%) <u><2%</u> g: <u>42.921</u> Datum: <u>NAD-83</u> sification <u>na</u> Sampling Point <u>WL-23</u> o(If no, explain in Remarks.) o
Are Vegetation (If needed, explain SUMMARY OF F		naturall	y problematic	?	YesNo_X YesNo_X ations, transects, important features, etc.
Hydrophytic Vegeta Hydric Soil Presen Wetland Hydrology	t? Yes <u>X</u>	No		the Sampleo thin a Wetla	
Remarks:	100 <u>A</u>		4410		
	t has formed behind a dike in a	drainage.			
VEGETATION –	Use scientific names of	plants.			Dominance Test Worksheet:
Tree Stratum	(Plot size:)	Absolute %Cover	Dominate Species?	Indicator Status	Number of Dominant Species
1					That Are OBL, FACW, or FAC (excluding FAC-):2(A)
3					Total Number of Dominant
4					Species Across All Strata:2_(B)
Sapling/Shrut	Stratum (Plot size:)		=Total Cover		Percent of Dominant Species That are OBL,FACW, or FAC: 100 % (A/B)
					Prevalence Index Worksheet:
2					Total % Cover of: Multiple by:
3					OBL species x 1 =
4					FACW species x 2 =
					FAC species x 3 =
5					FACU species x 4 = UPL species x 5 =
Llorb Stratum	(Dist size: 20sf)		=Total Cover		Column Totals:A)(B)
	(Plot_size: 20sf)	30	Y	OBL	
1 Eleocharis palust 2 Carex praegracili		10	Y	FACW	Prevalence Index = B/A =
3 Rotala ramosior	.u	5	N	NI	Hydrophytic Vegetation Indicators:
4 Poa sp.		5	N		X_Dominance Test is >50%
5				1	Prevalence Index is $\leq 3.0^1$
6		1			Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
7					Problematic Hydrophytic Vegetation ¹ (Explain)
8					¹ Indicators of hydric soil and wetland hydrology must
9					be present, unless disturbed or problematic.
10	······································	50%	=Total Cover		Hydrophytic Vegetation Present?
Woody Vine S	tratum (Plot size:)				Yes <u>X</u> No
2					
			=Total Cover		1
% Bare Ground in	Herb Stratum <u>50%</u>	-			

SOIL Profile Description: (Describe to the Depth Matrix		locument the Redox Feature		or or confirm the	Sampling Point <u>WL-23</u>
(inches) Color (moist) %	Color (moist)			oc ² Texture	
<u>0-5" 10YR 4/1</u>	7.5YR 5/8	25%	C M	Sandy Silt lo	am Mottles: fine, many, prominent Oxidized root channels present 0-5"
5-14" 10YR 4/2	7.5YR 5/8	<2%	C M	Sandy loam	Mottles: fine, few, prominent
					Decomposed organic matter throughout profile
· ·					
¹ Type: C=Concentration, D=Depletion,	RM=Reduced Matr	ix. CS=Cover	ed or Coa	ated Sand Grains	a. ² Location: PL=Pore Lining, M=Matrix.
Hydric Soil Indicators: (Application, D-Depletion, Histosol (A1) Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4) Stratified Layers (A5) (LRR F) 1 cm Muck (A9) (LRR F, G, H) Depleted Below Dark Surface (A12) Thick Dark Surface (A12) Sandy Mucky Mineral (S1) 2.5 Mucky Peat or Peat (S2) (LRR 5 cm Mucky Peat or Peat (S3) (LR	ele to all LRRs, un Sandy Gle Sandy Re Striped Ma Loamy M Depleted I Pepleted I Redox Da Redox Da G,H) High Plain	n less othen eyed Matrix (S dox (S5)	wise not (F1) (F2) (F7) 8) (F7) 8) (F16)	ed.) Indicat 1 c C D H (Li R R R 3 Indic W	ors for Problematic Hydric Soils ³ : cm Muck (A9) (LRR I, J) bast Prairie Redox (A16) (LRR F, G, H) ark Surface (S7) (LRR G) ligh Plains Depressions (F16) RR H outside of MLRA 72 & 73) beduced Vertic (F18) ad Parent Material (TF2) ther (Explain in Remarks) ators of hydrophytic vegetation and etland hydrology must be present, nless disturbed or problematic
Restrictive Layer (if present): Type: Depth (inches) : Remarks:			Hydric S	oil Present? Y	/esX No
HYDROLOGY				<u> </u>	
Wetland Hydrology Indicators: Primary Indicators (minimum of one require Surface Water (A1) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Algal Mat or Crust (B4) Iron Deposits (B5) Mundation Visible on Aerial Imagery (B Water-Stained Leave (B9)	Salt Crust (B' Hydrogen SL Dry Season V Oxidized Rr (where not ti Presence of F Thin Muck Su	11) Ilfide Odor (C1) Vater Table (C2 iizospheres on Iled) Reduced Iron (C	2) Living Roo	Sparse Draina Oxidize ts (C3) (when Crayfis Satura Geomo FAC-N	dicators (minimum of two required) ly Vegetated Concave Surface (B8) ge Patterns (B10) d Rhizospheres on Living Roots (C3) re tilled) h Burrows (C8) lion Visible of Aerial Imagery (C9) rphic Position (D2) eutral Test (D5) eave Hummocks (D7) (LRR F)
	_ Depth (inches) <u>1 i</u> X_ Depth (inches) Depth (inches)			Wetland Hydrolog Yes_ <u>X</u> _No	
Describe Recorded Data (stream gaug previous inspections), if available:	je, monitoring well, a	aerial photos,			
Remarks:					

.

Project/Site: Ludeman License	Area			Sampling Date: 6/8/2008
Applicant/Owner: Uranium Or				City/County: Converse County
nvestigator(s): <u>K. LaClair</u>				, T34N, R73W State: WY
Landform (hillslope, terrace, etc.):	Depression in drainage	Local relief	(concave,	convex, none) <u>concave</u> Slope (%) <u>2%</u>
Subregion (LRR): LRR H	Lat:	-105.644		ong: 42.931 Datum: NAD-83
Are elimete/bydrologie conditions or	- Taluce-Badiand Compl	<u>ex</u> N time of voor? N	IVVI CIASSIIIO	cation <u>na</u> Sampling Point_ <u>WL-24</u> lo (If no, explain in Remarks.)
Are "Normal Circumstances" preser		une or year i	es / /esX_ N	
Are Normal Oreanistances preser			00 <u></u> _	·····
Are Vegetation, Soil, or	r Hydology significa	antly disturbed?)	Yes No_X Yes No_X
Are Vegetation, Soil, or		Illy problematic	?	Yes No <u>_X_</u>
(If needed, explain any answers in I	•			
	-	ng sampling	point loc	ations, transects, important features, etc.
Hydrophytic Vegetation Present?				
Hydric Soil Present?	Yes <u>X</u> No		the Sample	
Wetland Hydrology Present?	Yes_X_ No	WI	thin a Wetla	and? Yes <u>X</u> No
Remarks:				
This is a depression in a drainage.				
	nomes of plants			
VEGETATION – Use scientific				_ Dominance Test Worksheet:
Tree Stratum (Plot size:	_) Absolute %Cover	Dominate Species?	Indicator Status	Number of Dominant Species
1	7000VEI			That Are OBL, FACW, or FAC
2				- (excluding FAC-):(A)
3				Total Number of Dominant – Species Across All Strata: <u>1</u> (B)
4				Species Across All Strata:1_(B)
		=Total Cover		Percent of Dominant Species
Sapling/Shrub Stratum (Plot si	ze:)			That are OBL, FACW, or FAC: 100 % (A/B)
1	<u> </u>			Prevalence Index Worksheet:
2				Total % Cover of: Multiple by:
3				OBL species x 1 =
				FACW species x 2 =
4				FAC species x 3 =
5				FACU species x 4 = UPL species x 5 =
		=Total Cover		Column Totals:A)(B)
Herb Stratum (Plot size: 20s	<u>sf)</u>			
1 Carex praegracilis	50	Y	OBL	Prevalence Index = B/A =
2 Poa sp-1	15	N		
3 Rosa woodsii	10	N	FACU	Hydrophytic Vegetation Indicators:
4 Thermopsis montana	5	N	NL	XDominance Test is >50% Prevalence Index is ≤ 3.0 ¹
5 Poa sp-2	1	N		- Morphological Adaptations1 (Provide)
6			ļ	violphological Adaptations (Provide violphological Adaptations (Provide
7				Problematic Hydrophytic Vegetation ¹ (Explain)
8				
9				¹ Indicators of hydric soil and wetland hydrology must
10				be present, unless disturbed or problematic.
	81%	=Total Cover		Hydrophytic Vegetation Present?
Woody Vine Stratum (Plot size	:)			Yes X_ No
1				_
2				_
		=Total Cover	L	
% Bare Ground in Herb Stratum	<u>_19%</u>			
Remarks:				

SOIL Profile Description: (Describe to the de			Sampling Point <u>WL-24</u> r confirm the absence of indicators.)
Depth <u>Matrix</u> (inches) Color (moist) %	Redox Features Color (moist) % Ty		Texture
0-3" 10YR 4/2	5YR 4/6 <2% C	М	Sandy silt loam Mottles: Fine, few, prominent
3-7" 2.5Y 4+/2	7.5YR 5/8 <2% C	M	Sandy silt loam w/ organics _ Mottles: Fine, few, prominent
			Oxidized root channels
<u>7-14" 5Y 5/2</u>	7.5YR 5/8 < 2% C	<u>M_</u>	Sandy silt loam with minor organics.
	<u></u>		Mottles: Fine, few, prominent
¹ Type: C=Concentration, D=Depletion, R		d or Contor	Sand Grains. ² Location: PL=Pore Lining, M=Matrix.
Hydric Soil Indicators: (Applicable			
Histosol (A1) Histic Epipedon (A2)	Sandy Gleyed Matrix (S4) Sandy Redox (S5))	1 cm Muck (A9) (LRR I, J) Coast Prairie Redox (A16) (LRR F, G, H)
Black Histic (A3)	Striped Matrix (S6)		Dark Surface (S7) (LRR G)
Hydrogen Sulfide (A4) Stratified Layers (A5) (LRR F)	_X_Loamy Mucky Mineral (F Loamy Gleyed Matrix (F2)		Ligh Plains Depressions (F16) (LRR H outside of MLRA 72 & 73)
1 cm Muck (A9) (LRR F, G, H)	Depleted Matrix (F3)	,	Reduced Vertic (F18)
Depleted Below Dark Surface (A12) Thick Dark Surface (A12)	Redox Dark Surface (F6) Depleted Dark Surface (F		Red Parent Material (TF2) Other (Explain in Remarks)
Sandy Mucky Mineral (S1) 2.5 Mucky Peat or Peat (S2) (LRR G,	Redox Depressions (F8) H) High Plains Depressions		³ Indicators of hydrophytic vegetation and wetland hydrology must be present,
5 cm Mucky Peat or Peat (S2) (LRR G,			unless disturbed or problematic
Restrictive Layer (if present):			
Type: Depth (inches) :	ŀ	lydric Soil I	Present? Yes <u>X</u> No
Remarks:			
L HYDROLOGY			
Wetland Hydrology Indicators:			
Primary Indicators (minimum of one required;	check all that apply)		Secondary Indicators (minimum of two required)
Surface Water (A1) Saturation (A3)	Salt Crust (B11) Hydrogen Sulfide Odor (C1)		Sparsely Vegetated Concave Surface (B8)
Water Marks (B1)	Dry Season Water Table (C2)		Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3)
Sediment Deposits (B2) Drift Deposits (B3)	<u>X</u> Oxidized Rhizospheres on Liv (where not tilled)		C3) (where tilled) Crayfish Burrows (C8)
Algal Mat or Crust (B4) Iron Deposits (B5)	Presence of Reduced Iron (C4) Thin Muck Surface (C7))	Saturation Visible of Aerial Imagery (C9) Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7) Water-Stained Leave (B9)	Other (Explain in Remarks)		FAC-Neutral Test (D5) Frost-Heave Hummocks (D7) (LRR F)
	· · · ·		
Field Observations:		We	tland Hydrology Present?
Surface Water Present? Yes <u>No X</u> Water Table Present? Yes No X	Depth (inches) Depth (inches)		
Saturation Present? YesNoX	_ Depth (inches) _ Depth (inches)*		sXNo
(includes capillary fringe)			
* Soil was moist to the surface.			
Describe Recorded Data (stream gauge, previous inspections), if available:	monitoring well, aerial photos,		
Remarks:			

Project/Site: Ludeman License Area Applicant/Owner: Uranium One				Sampling Date: 6/11/08 City/County: Converse County
	Section Tow	nship Range:	Sec 20, 7	T34N R73W State: WY
Landform (hillslope, terrace, etc.): Depression in	1 drainage	Local relief	(concave. (convex, none) <u>concave</u> Slope (%) <2%
Subregion (LRR): LRR H	Lat:	-105.648	Lor	ng: <u>42.906</u> Datum: <u>NAD-83</u>
Subregion (LRR): <u>LRR H</u> Soil Map Unit Name: <u>263-Ustic Torriorthents, g</u>	ullied		NWI cla	assification na Sampling Point WL-25
Are climate/hydrologic conditions on the site typi	cal for this ti	me of year? Y	es <u>X</u> N	lo (If no, explain in Remarks.)
Are "Normal Circumstances" present?		Ý	′es <u>X</u> N	ło
And Manadatian Oall and Indeterm	- 1 1 6	- 41		· Maria Ni Tr
Are Vegetation, Soil, or Hydology				Yes No_X Yes No_X
Are Vegetation, Soil, or Hydrology	naturall	y problematic:	1	Yes NoX
(If needed, explain any answers in Remarks.)	an showin	a samnlina	noint loc:	ations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes_X_		ig cumping	pointie	
		lst	the Sample	ed Area
Hydric Soil Present? Yes_X_ Wetland Hydrology Present? Yes_X_	No	wit	thin a Wetla	and? Yes_ <u>X</u> _No
Remarks:				
	a and b) that	are disconnecte	ed depression	ns along the same drainage. They range in size from 0.002 acres
to 0.012 acres. Soil Unit 263 is listed as hydric by			u uopiossioi	no along the bank dramage. They range in the riom 0.002 acres
VEGETATION – Use scientific names of				Dominance Test Worksheet:
Tree Stratum (Plot size:)	Absolute	Dominate	Indicator	
<u></u>	%Cover	Species?	Status	Number of Dominant Species
1				That Are OBL, FACW, or FAC
2				(excluding FAC-):1(A)
3				Total Number of Dominant
4				Species Across All Strata:1(B)
		=Total Cover		Percent of Dominant Species
Sapling/Shrub Stratum (Plot size:)				That are OBL, FACW, or FAC: 100 (A/B)
<u>Saping/Shrub Stratum (Plot size.</u>)				
1				Prevalence Index Worksheet: Total % Cover of: Multiple by:
2				
3				OBL species x 1 = FACW species x 2 =
4				FAC species x 2 = FAC species x 3 =
5				FACU species x 4 =
5		-Total Osuan		UPL species x 5 =
		=Total Cover		Column Totals:A)(B)
Herb Stratum (Plot size: 20sf)				
1 Juncus balticus	60	Y	OBL	Prevalence Index = B/A =
2 Typha angustifolia	5	N	OBL	
3 Melilotus sp.	5	N	FACU-	Hydrophytic Vegetation Indicators:
4 Poa compressa	5	N	OBL	X_Dominance Test is >50%
5 Carex praegracilis	2	N	FACW	Prevalence Index is $\leq 3.0^1$
6 Bromus inermis	2	N	NL	Morphological Adaptations ¹ (Provide
7 Unknown	1	N		 supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation¹ (Explain)
8				
9		i		¹ Indicators of hydric soil and wetland hydrology must
10				be present, unless disturbed or problematic.
	80%	=Total Cover		
	00%	10121 00961	L	Hydrophytic Vegetation Present?
Woody Vine Stratum (Plot size:)				Yes <u>X</u> No
1				-
2				_
		=Total Cover		
% Bare Ground in Herb Stratum	_			
				
				· · · · · · · · · · · · · · · · · · ·
Remarks				

arks:

SOIL Sampling Point WL-25 Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Depth Matrix Redox Features Redox Features
(inches) Color (moist) % Color (moist) % Type ¹ Loc ² Texture
0-3" 5Y 5/2 80% Mucky mineral/sand
0-3" Gley 1 2.5/5GY 20% Blended matrix with very black organics
<u>3-6" 5Y 5/2 7.5YR 6/8 <2% C M Sand Mottles: few, fine, prominent</u>
·
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ² Location: PL=Pore Lining, M=Matrix,
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils ³ :
Histosol (A1)Sandy Gleyed Matrix (S4)1 cm Muck (A9) (LRR I, J)
Histic Epipedon (A2) Sandy Redox (S5) Coast Prairie Redox (A16) (LRR F, G, H) Black Histic (A3) Striped Matrix (S6) Dark Surface (S7) (LRR G)
Hydrogen Sulfide (A4)Loamy Mucky Mineral (F1)High Plains Depressions (F16)
Stratified Layers (A5) (LRR F) Loamy Gleyed Matrix (F2) (LRR H outside of MLRA 72 & 73) 1 cm Muck (A9) (LRR F, G, H) Depleted Matrix (F3) Reduced Vertic (F18)
Depleted Below Dark Surface (A12) Redox Dark Surface (F6) Red Parent Material (TF2)
Thick Dark Surface (A12) Depleted Dark Surface (F7) Other (Explain in Remarks) X_Sandy Mucky Mineral (S1) Redox Depressions (F8) 3 Indicators of hydrophytic vegetation and
2.5 Mucky Peat or Peat (S2) (LRR G,H)High Plains Depressions (F16) wetland hydrology must be present,
5 cm Mucky Peat or Peat (S3) (LRR F) (MLRA 72 & 73 of LRR H) unless disturbed or problematic
Restrictive Layer (if present):
Type: Hydric Soil Present? Yes_X No Depth (inches) :
Remarks:
HYDROLOGY
Wetland Hydrology Indicators:
Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required)
X_Surface Water (A1)Salt Crust (B11)Sparsely Vegetated Concave Surface (B8)
Saturation (A3) Hydrogen Sulfide Odor (C1) Drainage Patterns (B10) Water Marks (B1) Dry Season Water Table (C2) Oxidized Rhizospheres on Living Roots (C3)
Sediment Deposits (B2)Oxidized Rhizospheres on Living Roots (C3) (where tilled) Cravfish Burrows (C8)
Algal Mat or Crust (B4)Presence of Reduced Iron (C4)Saturation Visible of Aerial Imagery (C9)
Iron Deposits (B5)Thin Muck Surface (C7)Geomorphic Position (D2) Inundation Visible on Aerial Imagery (B7) Other (Explain in Remarks) FAC-Neutral Test (D5)
Water-Stained Leave (B9)
Field Observations:
Surface Water Present? Yes_X*_No Depth (inches) Wetland Hydrology Present?
Water Table Present? YesNo Depth (inches) Water Table Present? YesNoX Depth (inches)
Saturation Present? Yes No X Depth (inches)
(includes capillary fringe) *Ponded water at mid-point of wetland
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
Remarks:

	Ludeman License Area				Sampling Date: 6/11/2008
Applicant/Owner:	Uranium One				City/County: Converse County
Investigator(s):					1, T34NR73W State: WY
	e, terrace, etc.): <u>Diked draina</u>	ige l	Local relief (co	ncave, con	vex, none) <u>concave</u> Slope (%) <2%
Subregion (LRR):	LRR H ne:189-Kishona-Cambria-Th	Lat:	-105.623	Lor	ng: <u>42.905</u> Datum: <u>NAD-83</u>
Soli Map Unit Nan	re:189-Kisnona-Campria-Tr	eedle loams	<u>, 230-Sningle-i</u> Ni	Badiand-Sa	ation_PUSAh Sampling Point_WL-26
Are climate/bydrol	ogic conditions on the site two	ical for this ti			lo (If no, explain in Remarks.)
	mstances" present?			es <u>X</u> N esX N	
			•	00 <u> </u>	
Are Vegetation	, Soil, or Hydology	significar	ntly disturbed?		Yes NoX
Are Vegetation	, Soil, or Hydrology_	naturall	y problematic?	?	Yes NoX
(If needed, explair	any answers in Remarks.)				
SUMMARY OF	FINDINGS – Attach site m	nap showin	ig sampling	point loca	ations, transects, important features, etc.
Hydrophytic Veget		No		-	· · · · · · · · · · · · · · · · · · ·
Hydric Soil Preser			ls t	the Sample	d Area
Wetland Hydrolog				hin a Wetla	
Remarks:					
This is a string of d	isconnected wetlands along the s	ame diked dr	ainage (9 wetlar	nds, WL-26a	a through WL-26i). They range in size from 0.002 acres
to 0.487 acres.					
VEGETATION -	- Use scientific names of	plants.			Dominance Test Worksheet:
Tree Stratum		Absolute	Dominate	Indicator	
1100 011444	<u></u>	%Cover	Species?	Status	Number of Dominant Species
1					That Are OBL, FACW, or FAC
2					- (excluding FAC-):1(A)
3					Total Number of Dominant Species Across All Strata: <u>1</u> (B)
4					
			=Total Cover		Percent of Dominant Species
Sapling/Shru	b Stratum (Plot size:)				That are OBL FACW, or FAC: 100 (A/B)
		· · · · ·			Prevalence Index Worksheet:
1					Total % Cover of: Multiple by:
2					OBL species x 1 =
3					FACW species x 2 =
4	· · · · · · · · · · · · · · · · · · ·				FAC species $x 3 =$
5					FAC species x 3 = FACU species x 4 =
	·		=Total Cover		UPL species x 5 =
					- Column Totals:A)(B)
Herb Stratum		40		0.01	-
1 Eleocharis palus		49	Y	OBL	Prevalence Index = B/A =
2 Lappula redowsk	<i>kii</i>	10	N	NL	
3 Poa sp.		1	N		Hydrophytic Vegetation Indicators: X Dominance Test is >50%
4	· · · · · · · · · · · · · · · · · · ·				$\frac{1}{2} = \frac{1}{2} \text{ Dominance rest is } > 50\%$
5					Morphological Adaptations ¹ (Provide
6					supporting data in Remarks or on a separate sheet)
7					Problematic Hydrophytic Vegetation ¹ (Explain)
8					1
9					¹ Indicators of hydric soil and wetland hydrology must
10					be present, unless disturbed or problematic.
		60%	=Total Cover		Hydrophytic Vegetation Present?
Woody Vine S	Stratum (Plot size:)	1			Yes <u>X</u> No
1					
2					
			=Total Cover		
% Bare Ground in	Herb Stratum 40%		·		-
			-,		
Remarks:					
i tomano.					

Sampling Point <u>WL-26</u> Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Depth Matrix Redox Features
(inches) Color (moist) % Color (moist) % Type ¹ Loc ² Texture
0-2" 7.5YR 4/1 7.5YR 4/6 < 2% C M silty loam Mottles: Fine, few, prominent Oxidized root channels in 0-2"
2-8" 7.5YR 4/1 7.5YR 4/6 15% C M silty clay loam Mottles: Medium, common, prominent Oxidized root channels in 2-8"
8-14" 7.5YR 4/1 7.5YR 4/6 25% C M silty clay loam Mottles: Medium to coarse, many, prominent
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ² Location: PL=Pore Lining, M=Matrix. Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils ³ : Histosol (A1) Sandy Gleyed Matrix (S4) Indicators for Problematic Hydric Soils ³ :
Histic Epipedon (A2) Sandy Redox (S5) Coast Prairie Redox (A16) (LRR F, G, H) Black Histic (A3) Striped Matrix (S6) Dark Surface (S7) (LRR G) Hydrogen Sulfide (A4) X_Loamy Mucky Mineral (F1) High Plains Depressions (F16)
Stratified Layers (A5) (LRR F) Loamy Gleyed Matrix (F2) (LRR H outside of MLRA 72 & 73) 1 cm Muck (A9) (LRR F, G, H) Depleted Matrix (F3) Reduced Vertic (F18) Depleted Below Dark Surface (A12) Redox Dark Surface (F6) Red Parent Material (TF2)
Thick Dark Surface (A12) Depleted Dark Surface (F7) Other (Explain in Remarks) Sandy Mucky Mineral (S1) Redox Depressions (F8) Indicators of hydrophytic vegetation and
2.5 Mucky Peat or Peat (\$2) (LRR G,H) High Plains Depressions (F16) wetland hydrology must be present, unless disturbed or problematic 5 cm Mucky Peat or Peat (\$3) (LRR F) (MLRA 72 & 73 of LRR H) unless disturbed or problematic
Restrictive Layer (if present): Hydric Soil Present? Yes_X No Depth (inches) :
Remarks:
HYDROLOGY Wetland Hydrology Indicators:
Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) Surface Water (A1) Salt Crust (B11)
X_Saturation (A3) Hydrogen Sulfide Odor (C1) Drainage Patterns (B10) Water Marks (B1) Dry Season Water Table (C2) Oxidized Rhizospheres on Living Roots (C3)
Sediment Deposits (B2) Oxidized Rhizospheres on Living Roots (C3) (where tilled) Drift Deposits (B3) (where not tilled) Crayfish Burrows (C8) Algal Mat or Crust (B4) Presence of Reduced Iron (C4) Saturation Visible of Aerial Imagery (C9)
Iron Deposits (B5) Thin Muck Surface (C7) Geomorphic Position (D2) Inundation Visible on Aerial Imagery (B7) Other (Explain in Remarks) FAC-Neutral Test (D5) Water-Stained Leave (B9) Frost-Heave Hummocks (D7) (LRR F)
Field Observations:
Surface Water Present? Yes NoX_Depth (inches) Wetland Hydrology Present? Water Table Present? Yes NoX_Depth (inches) Yes X No
Saturation Present? Yes_X_NoDepth (inches)*(includes capillary fringe)
* Saturated to the surface. Describe Recorded Data (stream gauge, monitoring well, aerial photos,
previous inspections), if available:
Remarks:

Project/Site:	Ludeman License Area					Sampling Date:	6/11/2008
Applicant/Owner:						City/County:	Converse County
Investigator(s):	W. Stansbury	Section,T			, T34NR73W	State: WY	
Landform (hillslop Subregion (LRR)	e, terrace, etc.): Depression	Lat	Local relief (c 105.616	concave, coi L	nvex, none) <u>cc</u> Long: <u>42.907</u>	oncave Slope Datum	(%) <u>NA</u> ∶ <u>NAD-83</u>
Soil Map Unit Nan	LRR H ne: 189-Kishona-Cambria-T	heedle loam	s	NV	VI classification	na Samp	ing Point WL-27
Are climate/hydrol	logic conditions on the site typ	ical for this ti	me of year? Y	es_X_No	o (If no, ex	plain in Remarks.)	·
Are "Normal Circu	imstances" present?		Y	′es <u>X</u> No	o		
Are Vegetation	Soil or Hydology	significar	ntly disturbed?			Yes	No <u>X</u>
Are Vegetation	, Soil, or Hydology_ , Soil, or Hydrology_	naturall	v problematic'	?		Yes	No_X
(If needed, explain	n any answers in Remarks.)		,				
SUMMARY OF	FINDINGS – Attach site m	nap showin	g sampling	point loca	ations, transed	ts, important fe	atures, etc.
	tation Present? Yes X		<u> </u>	•	•	••••••••••••••••••••••••••••••••••••••	
Hydric Soil Preser	nt? Yes_X_	No	ls ⁻	the Sampled	d Area		
Wetland Hydrolog	y Present? Yes X	No	wit	thin a Wetla	nd? Yes <u>X</u>	No	
Remarks:							
	two intermittent wetlands (WL-2	27a and WL-2	7b) that are dis	continuous d	lepressions along t	he same channel. Th	ey range in size from
0.034 acres to 0.0	159 acres.						
VEGETATION	- Use scientific names of	nlants			Dominance T	est Worksheet:	
	(Plot size:)	Absolute	Dominate	Indicator	 Number of De	minant Spanica	
<u>Thee Stratum</u>		%Cover	Species?	Status		minant Species ., FACW, or FAC	
1					(excluding FA		(A)
2					- (- /	()
3					- Total Number		
					Species Acros	ss All Strata:	(B)
4					Percent of Do	minant Species	
			=Total Cover			"FACW, or FAC:	100 (A/B)
Sapling/Shru	b Stratum (Plot size:)						
11						ndex Worksheet:	
2						/er of:	
3					OBL species	x 1 =	
4					FACW specie	sx2=	
-					FAC species	s x 3 =	
5						x 5 =	
		ļ	=Total Cover			ls: A)	
Herb Stratun	n (Plot_size: 20sf)				_		(-/
1 Eleocharis palus	stris	40	Y	OBL	Prevalence li	ndex = B/A =	
2							• • • • •
3						Vegetation Indica ance Test is >50%	tors:
4						ence Index is ≤ 3.0	1
5					- Morpho	logical Adaptations	¹ (Provide
6							n a separate sheet)
7					Probler	natic Hydrophytic \	/egetation ¹ (Explain)
8					¹ Indicators of	f hydric soil and we	tland hydrology must
9						nless disturbed or p	
10		40.07	=Total Cover		`		
		40%				egetation Present?	,
	Stratum (Plot size:)				Yes <u>X</u>	NU	
2					-		
4			=Total Cover		-		
% Baro Ground in	h Herb Stratum60%			L <u>.</u>	1		
	1160 Statum _00%	_					
Remarks:	<u></u> .				•		
rtemarks.							

Sampling PointWL-27 Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) DepthMatrixRedox Features
(inches) Color (moist) % Color (moist) % Type ¹ Loc ² Texture
0-2" 5Y 5/1 NA Silty clay loam
2-14" 2.5Y 5/2 5Y 4/1 2% C M Silty clay loam Mottles: Fine, few, faint
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ² Location: PL=Pore Lining, M=Matrix.
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils ³ : Histosol (A1)Sandy Gleyed Matrix (S4)1 cm Muck (A9) (LRR I, J)
Histic Epipedon (A2) Sandy Redox (S5) Coast Prairie Redox (A16) (LRR F, G, H)
Black Histic (A3) Striped Matrix (S6) Dark Surface (S7) (LRR G) Hydrogen Sulfide (A4) _X_Loamy Mucky Mineral (F1) High Plains Depressions (F16)
Stratified Layers (A5) (LRR F) Loamy Gleyed Matrix (F2) (LRR H outside of MLRA 72 & 73) 1 cm Muck (A9) (LRR F, G, H) Depleted Matrix (F3) Reduced Vertic (F18)
Depleted Below Dark Surface (A12) Redox Dark Surface (F6) Red Parent Material (TF2)
Thick Dark Surface (A12)Depleted Dark Surface (F7)Other (Explain in Remarks)Other (Explain in Remarks) 3 Indicators of hydrophytic vegetation and
2.5 Mucky Peat or Peat (S2) (LRR G,H) High Plains Depressions (F16) wetland hydrology must be present, 5 cm Mucky Peat or Peat (S3) (LRR F) (MLRA 72 & 73 of LRR H) unless disturbed or problematic
Restrictive Layer (if present):
Type: Hydric Soil Present? Yes_X No Depth (inches) :
Remarks:
HYDROLOGY
Wetland Hydrology Indicators:
Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required)
Surface Water (A1) Salt Crust (B11) Sparsely Vegetated Concave Surface (B8) X_Saturation (A3) Hydrogen Sulfide Odor (C1) Drainage Patterns (B10)
Water-Stained Leave (B9)
Field Observations:
Surface Water Present? Yes NoX Depth (inches) Wetland Hydrology Present?
Water Table Present? Yes No_X_ Depth (inches) Saturation Present? Yes_X_No Depth (inches)
(includes capillary fringe) * Saturated to the surface.
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
Remarks:

Project/Site:	Ludeman License Area				Sampling Date:	6/10/2008
Applicant/Owner:					City/County:	Converse County
Investigator(s):					5, T34N R73W State: WY	
	e, terrace, etc.): <u>Depression i</u>	n drainage	Local relief	(concave, c	onvex, none) <u>concave</u> Slop	e (%) <u>2%</u>
Subregion (LRR):_ Soil Man Unit Nam					ng: <u>42.924</u> Datum: <u> </u>	
Are climate/hvdrol	paic conditions on the site typ	ical for this ti	me of year? Y	es X No	o (If no, explain in Remarks.)	(
	mstances" present?			'es X_ N		
Are Vegetation	Soil or Hydology	eignificar	atly disturbed?	1	Ves	No X
Are Vegetation	, Soil, or Hydology , Soil, or Hydrology_	naturall	v problematic	7	Yes Yes	No <u>X</u> No <u>X</u>
(If needed, explain	any answers in Remarks.)		y problomato	•		<u></u>
	•	nap showin	ig sampling	point loca	ations, transects, important fea	atures, etc.
	tation Present? Yes X					
Hydric Soil Presen				the Sampled		
Wetland Hydrology	y Present? Yes_X_	No	Wit	thin a Wetla	nd? Yes <u>X</u> No	
Remarks:	on in a drainage. Soil Unit 263 i	s listed as hy	tric by the NR(75		
This is a depressio	in in a dramage. Son Onit 205 i	is instead as hyv	and by the DRK			
VEGETATION -	Use scientific names of	plants.			Dominance Test Worksheet:	
Tree Stratum	······································	Absolute	Dominate	Indicator		
	<u> </u>	%Cover	Species?	Status	Number of Dominant Species	
1					That Are OBL, FACW, or FAC	4 (A)
2					(excluding FAC-):	1(A)
3					Total Number of Dominant	
4					Species Across All Strata:	(B)
			=Total Cover			
					Percent of Dominant Species That are OBL,FACW, or FAC:	100 % (A/B)
Sapling/Shrul	b Stratum (Plot size:)					
1					Prevalence Index Worksheet: Total % Cover of:	Multiple by:
2					OBL species x 1 =	•
3					FACW species x 2 =	
4					FACW species x 2 = FAC species x 3 =	
5					FACU species x 4 =	
			=Total Cover		UPL species x 5 =	
Herb Stratum	(Plot size: 20sf)				Column Totals:A)	(B)
1 Eleocharis palus	tris	30	Y	OBL	Prevalence Index = B/A =	
2 Agropyron smith	ii	8	N	FACU		
3 Poa sp.		2	N		Hydrophytic Vegetation Indica	tors:
4					<u>X</u> _Dominance Test is >50%	1
5					Prevalence Index is ≤ 3.0 Morphological Adaptations	
6					supporting data in Remarks or o	
7		ļ			Problematic Hydrophytic V	
8					¹ Indicators of hydric soil and we	land bydrology
9					be present, unless disturbed or p	
10		10.07	Total Cause		· · · · · · · · · · · · · · · · · · ·	
		40%	=Total Cover		Hydrophytic Vegetation Present?	
Woody Vine S	Stratum (Plot size:)				Yes <u>X</u> No	
					-	
2			=Total Cover		-	
% Bare Ground in	Herb Stratum 60%	I			1	
		_				

Soil Sampling Point_WL-28 Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Depth Matrix Redox Features
(inches) Color (moist) % Color (moist) % Type ¹ Loc ² Texture
0-4"10YR 4/210YR 5/8<2%CMSandy loamMottles: Fine, few, prominent3-14"10YR 4/27.5YR 5/8<2%
Oxidized root channels 0-14"
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ² Location: PL=Pore Lining, M=Matrix. Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils ³ :
Histosol (A1) Sandy Gleyed Matrix (S4) 1 cm Muck (A9) (LRR I, J) Histic Epipedon (A2) Sandy Redox (S5) Coast Prairie Redox (A16) (LRR F, G, H) Black Histic (A3) Striped Matrix (S6) Dark Surface (S7) (LRR G) Hydrogen Sulfide (A4) X_Loamy Mucky Mineral (F1) High Plains Depressions (F16)
Stratified Layers (A5) (LRR F) Loamy Gleyed Matrix (F2) (LRR H outside of MLRA 72 & 73) 1 cm Muck (A9) (LRR F, G, H) Depleted Matrix (F3) Reduced Vertic (F18) Depleted Below Dark Surface (A12) Redox Dark Surface (F6) Red Parent Material (TF2)
Thick Dark Surface (A12) Depleted Dark Surface (F7) Other (Explain in Remarks) Sandy Mucky Mineral (S1) Redox Depressions (F8) 3 Indicators of hydrophytic vegetation and 2.5 Mucky Peat or Peat (S2) (LRR G,H) High Plains Depressions (F16) wetland hydrology must be present, 5 cm Mucky Peat or Peat (S3) (LRR F) (MLRA 72 & 73 of LRR H) unless disturbed or problematic
Restrictive Layer (if present): Type: Depth (inches) :
Remarks:
HYDROLOGY
Wetland Hydrology Indicators:
Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) Surface Water (A1) Salt Crust (B11) Sparsely Vegetated Concave Surface (B8) Saturation (A3) Hydrogen Sulfide Odor (C1) Drainage Patterns (B10)
Water Marks (B1) Dry Season Water Table (C2) Oxidized Rhizospheres on Living Roots (C3) Sediment Deposits (B2) X_Oxidized Rhizospheres on Living Roots (C3) (where tilled) Drift Deposits (B3) (where not tilled) Crayfish Burrows (C8)
Algal Mat or Crust (B4) Presence of Reduced Iron (C4) Saturation Visible of Aerial Imagery (C9) Iron Deposits (B5) Thin Muck Surface (C7) Geomorphic Position (D2) Inundation Visible on Aerial Imagery (B7) Other (Explain in Remarks) FAC-Neutral Test (D5) Water-Stained Leave (B9) Other (Explain in Remarks) Frost-Heave Hummocks (D7) (LRR F)
Field Observations:
Surface Water Present? YesNo_X_ Depth (inches) Wetland Hydrology Present? Water Table Present? YesNo_X_ Depth (inches) YesXNo Saturation Present? YesNo_X_ Depth (inches) YesXNo
(includes capillary fringe) * Soil was moist at 14".
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
Remarks:

.

Project/Site: Applicant/Owner:	Ludeman License Area Uranium One		v		Sampling Date: 6/12/2008 City/County: Converse Co	
Investigator(s):		Section		ngo: Sec	22, T34NR73W State: WY	Junty
	e, terrace, etc.):Depression i					
Subregion (LRR):		l at	-105 599	1000vc, con	ong: 42.904 Datum: NAD-83	-
Soil Map Unit Nan	ne: 152-Forkwood-Cambria	loams, 187-	Kishona-Camb	pria loams.	189-Kishona-Cambria-Theedle loams,	
		1001110, 101			fication_PUSAh Sampling Point_WL-	-29
Are climate/hvdrol	loaic conditions on the site typ	ical for this ti			lo (If no, explain in Remarks.)	
	imstances" present?			'es <u>X</u> N		
			·		λ.	
				:	ł	
Are Vegetation	, Soil, or Hydology	significar	ntly disturbed?		Yes NoX	
	, Soil, or Hydrology_				Yes No_X	
(If needed, explain	n any answers in Remarks.)		,			
		an chowir	a samplina	noint loc	ations, transects, important features, etc.	
		-	ig sampling		ations, transects, important leatures, etc.	
	tation Present? Yes X	No				
Hydric Soil Preser		No		the Sample hin a Wetla		
Wetland Hydrolog	y Present? Yes_X_		WIT	nin a vvetia	and? Yes <u>X</u> No	
Remarks:						
		s, WL-29a th	rough WL-29dd	l) that are di	scontinuous depressions along the same channel. The	y range in
size from 0.001acre	es to 0.127 acres.			,		
VEGETATION -	- Use scientific names of	plants.			Dominance Test Worksheet:	
Tree Stratum		Absolute	Dominate	Indicator		
<u>-1100 Ollutani</u>		%Cover	Species?	Status	Number of Dominant Species	
1		7000101			That Are OBL, FACW, or FAC	
						_(A)
2						
3					Total Number of Dominant	
4					Species Across All Strata: 1	<u>(</u> B)
4						
			=Total Cover		Percent of Dominant Species	
Sapling/Shru	b Stratum (Plot size:)				That are OBL,FACW, or FAC: 100	(A/B)
1					Prevalence Index Worksheet:	
2	1				Total % Cover of: Multiple by:	
				A	OBL species x 1 =	•
3					FACW species x 2 =	
4					FAC species $x_3 =$	<u> </u>
5					FAC species x 3 = FACU species x 4 =	
5					UPL species x 5 =	
			=Total Cover		Column Totals:A)	
Herb Stratum	n (Plot_size: 20sf)					(0)
1 Eleocharis palus	stris	40	Y	OBL	Prevalence Index = B/A =	
2						
3		1			Hydrophytic Vegetation Indicators:	
4		1	<u> </u>		XDominance Test is >50%	
5					Prevalence Index is $\leq 3.0^1$	
					Morphological Adaptations ¹ (Provide	
6		<u> </u>	Į		 supporting data in Remarks or on a separate s 	
7					Problematic Hydrophytic Vegetation ¹ (E)	
8						
9					Indicators of hydric soil and wetland hydrolog	ly must
10					be present, unless disturbed or problematic.	
		40%	=Total Cover		Hudronbutio Venetation Dresento	
		+0 %			Hydrophytic Vegetation Present?	
	Stratum (Plot size:)				Yes <u>X</u> No	
1					-1	
2					_	
			=Total Cover			
% Bare Ground in	Herb Stratum60%					
		_				
Remarks:						
remarks:						

SOIL						Complian D	aint W/L 20
Profile Description: (Describe to the	denth needed to	document	the indi	cator o	or confirm the al	Sampling Po	
Depth Matrix		Redox Fea				bsence of mulcators	••)
(inches) Color (moist) %	Color (moist)		Type ¹	Loc ²	Texture		
0-14" 2.5Y 5/1	7.5YR 5/6	15%	C	м	Cilm, .1	Manilar Pina ann	
<u>0-14</u> <u>2.31 3/1</u>	7.31K 3/0	_13 %_	<u> </u>	_ <u>M_</u>	Silty clay loam	Mottles: Fine, comm	ion, prominent
	<u> </u>		<u> </u>	<u></u>			
				0		2	
¹ Type: C=Concentration, D=Depletion, Hydric Soil Indicators: (Applicat						s for Problematic H	e Lining, M=Matrix.
Histosol (A1)		leyed Matri		notea		Muck (A9) (LRR I, J)	iyaric Solis :
Histic Epipedon (A2)		edox (S5)				t Prairie Redox (A16)	(LRR F, G. H)
Black Histic (A3)	Striped N	latrix (S6)			Dark	Surface (S7) (LRR G)
Hydrogen Sulfide (A4)	<u>X</u> Loamy					Plains Depressions (
Stratified Layers (A5) (LRR F)		leyed Matr Matrix (F3				H outside of MLRA 7 ced Vertic (F18)	2 & 73)
1 cm Muck (A9) (LRR F, G, H) Depleted Below Dark Surface (A12		ark Surface				Parent Material (TF2)	
Thick Dark Surface (A12)		Dark Surf				r (Explain in Remarks)
Sandy Mucky Mineral (S1)	Redox D	epressions	s (F8)		³ Indicato	rs of hydrophytic veg	etation and
2.5 Mucky Peat or Peat (S2) (LRR		ins Depres		6)		and hydrology must be	
5 cm Mucky Peat or Peat (S3) (LR	RF) (MLRA	72 & 73 of I	LKK H)		unie	ss disturbed or proble	matic
Restrictive Layer (if present):							
Туре:			Hydr	ic Soil	Present? Yes	<u>X</u> No	_
Depth (inches) :							
Remarks:							
					•		
HYDROLOGY							•••
HIDROLOGI							
Wetland Hydrology Indicators:							
Primary Indicators (minimum of one require	ad: check all that ann	λ.)			Secondary India	ators (minimum of two re	autired)
X Surface Water (A1)	Salt Crust (I					Vegetated Concave Surf	
X_Saturation (A3)		ulfide Odor	(C1)		<u> </u>	Patterns (B10)	(,
Water Marks (B1)	Dry Season	Water Table	e (C2)		Oxidized R	hizospheres on Living R	oots (C3)
Sediment Deposits (B2) Drift Deposits (B3)	Oxidized Rh (where not	•	on Living H	(oots (C		ea) urrows (C8)	
Algal Mat or Crust (B4)	Presence of	Reduced Iro	on (C4)			Visible of Aerial Imagen	/ (C9)
Iron Deposits (B5)	Thin Muck S		ا م ا			ic Position (D2)	
Inundation Visible on Aerial Imagery (B Water-Stained Leave (B9)	7)Other (Expla	am in Remar	KS)			ral Test (D5) e Hummocks (D7) (LRR	F)
Field Observations:							
				We	etland Hydrology P	resent?	
Surface Water Present? Yes X No Water Table Present? Yes No X	Depth (inches) [Depth (inches)	<u>6 inches</u>					
Saturation Present? Yes_ X_No		*		re	s_X_No		
(includes capillary fringe)	Depth (inches)						
* Saturated to the surface.							
Describe Recorded Data (stream gaug	ge, monitoring well,	aerial phot	tos,				
previous inspections), if available:							
Remarks:			· .				

				Sampling Date: 6/11/2008
Applicant/Owner: Uranium One				City/County: Converse County
	on,Township,Ran			
Landform (hillslope, terrace, etc.): <u>Depress</u> Subregion (LRR): <u>_LRR H</u> Soil Map Unit Name: <u>152-Forkwood-Camb</u> Are climate/hydrologic conditions on the site Are "Normal Circumstances" present?	Lat: ria loams	<u>-105.601</u> NWI me of year? Y	Lon classificatio	g: <u>42.900</u> Datum: <u>NAD-83</u> n Sampling Point_ <u>WL-30</u> D (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydolo Are Vegetation, Soil, or Hydrol (If needed, explain any answers in Remarks SUMMARY OF FINDINGS – Attach si	s.)			YesNoX YesNoX Itions, transects, important features, etc.
Hydrophytic Vegetation Present? Yes_ Hydric Soil Present? Yes_ Wetland Hydrology Present? Yes_	<u>XNo</u>		the Sampled	
Remarks: This is a string of intermittent wetlands (4 wetl size from 0.002 acres to 0.007 acres.	ands, WL-30a thro	ough WL-30d) t	hat are disco	nnected depressions along the same drainage. They range in
VEGETATION – Use scientific names	s of plants.			Dominance Test Worksheet:
Tree Stratum (Plot size:)	Absolute	Dominate	Indicator	
2	%Cover	Species?	Status	Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-):
3				Total Number of Dominant Species Across All Strata:1(B)
Conline/Charle Statum (Distaire)	<u>,</u>	=Total Cover		Percent of Dominant Species That are OBL,FACW, or FAC: 100 (A/B)
Sapling/Shrub Stratum (Plot size:				Prevalence Index Worksheet:
2				<u>Total % Cover of:</u> <u>Multiple by:</u>
3				OBL species x 1 =
4				FACW species x 2 =
				FAC species x 3 = FACU species x 4 =
5		=Total Cover		UPL species x 5 =
Harb Stratum (Diat aire) 20of	<u> </u>			Column Totals:A)(B)
Herb Stratum (Plot size: 20sf 1 Eleocharis palustris	40	Y	OBL	
2	10	-	UDD	Prevalence Index = B/A =
3				Hydrophytic Vegetation Indicators:
4				X_Dominance Test is >50%
5				Prevalence Index is ≤ 3.0 ¹ Morphological Adaptations ¹ (Provide
6				supporting data in Remarks or on a separate sheet)
7				Problematic Hydrophytic Vegetation ¹ (Explain)
8				¹ Indicators of hydric soil and wetland hydrology must
<u>9</u> 10				be present, unless disturbed or problematic.
	40%	=Total Cover		· · · · · · · · · · · · · · · · · · ·
Woody Vine Stratum (Plot size:1)			Hydrophytic Vegetation Present? Yes <u>X</u> No
2]
		=Total Cover		
% Bare Ground in Herb Stratum 60%				
				· · · · · · · · · · · · · · · · · · ·

Soil Sampling Point WL-30 Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Depth Matrix Redox Features
(inches) Color (moist) % Color (moist) % Type ¹ Loc ² Texture
0-4" 2.5Y 4/2 10YR 4/6 < 2% C M Loam Mottles: Medium, few, prominent 4-14" 2.5Y 4/2 Sandy silt loam Sandy silt loam </td
4-14" 2.5Y 4/2 Sandy silt loam
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ² Location: PL=Pore Lining, M=Matrix. Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils ³ :
Histosol (A1)Sandy Gleyed Matrix (S4)1 cm Muck (A9) (LRR I, J)
Histic Epipedon (A2) Sandy Redox (S5) Coast Prairie Redox (A16) (LRR F, G, H) Black Histic (A3) Striped Matrix (S6) Coast Prairie Redox (A16) (LRR F, G, H)
Hydrogen Sulfide (A4) X_Loamy Mucky Mineral (F1) High Plains Depressions (F16) Stratified Layers (A5) (LRR F) Loamy Gleyed Matrix (F2) (LRR H outside of MLRA 72 & 73)
1 cm Muck (A9) (LRR F, G, H)Depleted Matrix (F3)Reduced Vertic (F18)
Depleted Below Dark Surface (A12) Redox Dark Surface (F6) Red Parent Material (TF2) Thick Dark Surface (A12) Depleted Dark Surface (F7) Other (Explain in Remarks)
Sandy Mucky Mineral (S1) Redox Depressions (F8) Indicators of hydrophytic vegetation and 2.5 Mucky Peat or Peat (S2) (LRR G,H) High Plains Depressions (F16) wetland hydrology must be present,
5 cm Mucky Peat or Peat (S3) (LRR F) (MLRA 72 & 73 of LRR H) unless disturbed or problematic
Restrictive Layer (if present):
Type: Hydric Soil Present? YesX No Depth (inches) :
Remarks:
HYDROLOGY
Wetland Hydrology Indicators:
Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required)Surface Water (A1)Salt Crust (B11)Sparsely Vegetated Concave Surface (B8)
Saturation (A3)Hydrogen Sulfide Odor (C1)X Drainage Patterns (B10)
Water Marks (B1) Dry Season Water Table (C2) Oxidized Rhizospheres on Living Roots (C3) Sediment Deposits (B2) Oxidized Rhizospheres on Living Roots (C3) (where tilled) Dry Season Water Table (C2) Oxidized Rhizospheres on Living Roots (C3) (where tilled)
Drift Deposits (B3) (where not tilled) Crayfish Burrows (C8) Algal Mat or Crust (B4) Presence of Reduced Iron (C4) Saturation Visible of Aerial Imagery (C9)
Iron Deposits (B5) Thin Muck Surface (C7) Geomorphic Position (D2) Inundation Visible on Aerial Imagery (B7) Other (Explain in Remarks) X_FAC-Neutral Test (D5)
Water-Stained Leave (B9)Frost-Heave Hummocks (D7) (LRR F)
Field Observations:
Surface Water Present? Yes No X Depth (inches) Wetland Hydrology Present?
Water Table Present? YesNoXDepth (inches) YesNo Saturation Present? YesNoXDepth (inches) YesNo
(includes capillary fringe)
Describe Recorded Data (stream gauge, monitoring well, corial photos
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
Remarks:

Project/Site:	Ludeman License Area				Sampling Date: 6/11/2008
Applicant/Owner:					City/County: Converse County
Investigator(s):					2, T34NR73W State: WY
	e, terrace, etc.): Depression i		ocal relief (co	ncave, conv	ex, none) <u>concave</u> Slope (%) <u><2%</u>
Subregion (LRR):	LRR H		-105.595 Kishona-Camb		g: <u>42.901</u> Datum: <u>NAD-83</u> b loams, <u>251-Theedle-Kishona-Shingle loams</u>
Son Map Onit Nan	ne <u>152-i orwood-Cambria</u>	Ioams, 109-			cation_PEMA Sampling Point_WL-31
Are climate/hydrol	logic conditions on the site typ	ical for this ti	me of year? Y	es <u>X</u> No	o(If no, explain in Remarks.)
Are "Normal Circu	umstances" present?		Ŷ	′es <u>X</u> N	o
Are Vegetation	, Soil, or Hydology	significar	ntly disturbed?	•	Yes No_X
	, Soil, or Hydrology_				Yes No_X
(If needed, explain	n any answers in Remarks.)		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
SUMMARY OF	FINDINGS – Attach site m	nap showir	g sampling	point loca	ations, transects, important features, etc.
Hydrophytic Vege		No		-	
Hydric Soil Preser	nt? Yes <u>X</u>	No	· Is	the Sampled	
Wetland Hydrolog	y Present? Yes <u>X</u>	No	wit	thin a Wetla	nd? Yes_XNo
Remarks:					
This is a string of in size from 0.001acre		s, WL-31a th	rough WL-31y)	that are disc	continuous depressions along the same channel. They range in
	- Use scientific names of		Densingto	Indicator	Dominance Test Worksheet:
Tree Stratum	n (Plot size:)	Absolute %Cover	Dominate Species?	Status	Number of Dominant Species
1		7000461	Opecies:		That Are OBL, FACW, or FAC
2					(excluding FAC-):(A)
					Total Number of Dominant
3					Species Across All Strata:1(B)
4					
			=Total Cover		Percent of Dominant Species
Sapling/Shru	ub Stratum (Plot size:)				That are OBL, FACW, or FAC: 100 (A/B)
1					Prevalence Index Worksheet:
2					Total % Cover of: Multiple by:
3					OBL species x 1 =
4					FACW species x 2 = FAC species x 3 =
5					FACU species x 4 =
5			=Total Cover		UPL species x 5 =
Lieste Obreture					Column Totals:A)(B)
	n (Plot_size:20sf)	40	Y	OBL	
1 Eleocharis palus 2	siris	40	I	UBL	Prevalence Index = B/A =
3					Hydrophytic Vegetation Indicators:
4					X_Dominance Test is >50%
5					Prevalence Index is $\leq 3.0^{1}$
6					Morphological Adaptations ¹ (Provide
7	<u> </u>				 supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation¹ (Explain)
8					
9		1	<u> </u>		¹ Indicators of hydric soil and wetland hydrology must
10			1		be present, unless disturbed or problematic.
		40%	=Total Cover		Hydrophytic Vegetation Present?
Woodv Vine S	Stratum (Plot size:)			L	Yes <u>X</u> No
1					
2					
			=Total Cover		
% Bare Ground in	n Herb Stratum <u>60%</u>	_			
					
F					· · · · · · · · · · · · · · · · · · ·
Remarks:					

SOIL Profile Description: (Describe to the d	epth needed to do	ocument the indi	cator or	confirm the a	Sampling Point	WL-31			
Depth <u>Matrix</u> (inches) Color (moist) %		edox Features % Type ¹	Loc ²	Texture	,				
0-4" 2.5Y 4/1	2.5Y 5/3	<2% C	M	Sandy loam	Mottles: Fine, few, distinct				
4-14" 2.5Y 5/2	7.5YR 5/6	<2% C	M	Sandy loam	Mottles: Fine, few, prominer	ıt			
				<u> </u>					
		<u></u>							
<u> </u>									
		<u></u>							
¹ Type: C=Concentration, D=Depletion, R					² Location: PL=Pore Lining				
Hydric Soil Indicators: (Applicable Histosol (A1)	Sandy Gley	/ed Matrix (S4)	notea.)	1 cm	Muck (A9) (LRR I, J)				
Histic Epipedon (A2) Black Histic (A3)	Sandy Red Striped Mat	trix (S6)		Dar	st Prairie Redox (A16) (LRR F k Surface (S7) (LRR G)	, G, H)			
Hydrogen Sulfide (A4) Stratified Layers (A5) (LRR F)		icky Mineral (F1) yed Matrix (F2)			h Plains Depressions (F16) R H outside of MLRA 72 & 73)				
1 cm Muck (A9) (LRR F, G, H) Depleted Below Dark Surface (A12)	Depleted M Redox Dar	atrix (F3) k Surface (F6)			uced Vertic (F18) Parent Material (TF2)				
Thick Dark Surface (A12) Sandy Mucky Mineral (S1)	Depleted E	Dark Surface (F7) pressions (F8)		Othe	er (Explain in Remarks) ors of hydrophytic vegetation a	and			
2.5 Mucky Peat or Peat (S2) (LRR G 5 cm Mucky Peat or Peat (S3) (LRR	H)High Plains	s Depressions (F & 73 of LRR H)	6)	wetl	and hydrology must be preser				
Restrictive Layer (if present):				unie					
Туре:		Hyd	ric Soil P	resent? Yes	s <u>X</u> No				
Depth (inches) : Remarks:									
		· .		2 -					
HYDROLOGY	· · · · · · · · · · · · · · · · · · ·								
Wetland Hydrology Indicators:									
Primary Indicators (minimum of one required;		A)			cators (minimum of two required)				
X_Surface Water (A1) X_Saturation (A3)	Salt Crust (B1 Hydrogen Sulf	ide Odor (C1)		Drainage	Vegetated Concave Surface (B8) Patterns (B10)				
Water Marks (B1) Sediment Deposits (B2)	Oxidized Rhizo	ater Table (C2) ospheres on Living I	Roots (C3)	where til)			
Drift Deposits (B3) Algal Mat or Crust (B4)		educed Iron (C4)		Saturatio	Burrows (C8) n Visible of Aerial Imagery (C9)				
Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Water-Stained Leave (B9)	Thin Muck Sur Other (Explain			FAC-Neu	hic Position (D2) itral Test (D5) /e Hummocks (D7) (LRR F)				
Field Observations:]				
	Depth (inches) 4 i	inches	Wetl	and Hydrology I	Present?				
Water Table Present? Yes No X	Depth (inches)		Yes_	_X_No					
Saturation Present? Yes_X_No (includes capillary fringe)	Depth (inches) *								
* Saturated to the surface.									
Describe Recorded Data (stream gauge, previous inspections), if available:	monitoring well, a	erial photos,							
Remarks:									

Project/Site:	Ludeman License	Area				Sampling Date:	5/12/2008
Applicant/Owner:							Converse County
						3, T34N R73W State: WY	
Subregion (LRR): Soil Map Unit Nam	LRR H ne: 251-Theedle ogic conditions on	e-Kishona-Sh the site typi	Lat: hingle loams	- <u>105.594</u> me of year? Y	Lon NWI clas	g: <u>42.902</u> Datum: <u>NAC</u> ssification <u>na</u> Sampling Po o (If no, explain in Remarks.)	%)2% <u>0-83</u> intWL-32
	, Soil, or any answers in F FINDINGS – Att	Hydrology_ Remarks.) t ach site m	naturall	y problematic?	?	Yes Yes ations, transects, important featu	No <u>X</u> No <u>X</u> ures, etc.
Hydrophytic Veget Hydric Soil Preser Wetland Hydrolog Remarks:	nt?	Yes <u>X</u>			the Sampleo hin a Wetla		
acres to 0.053 acres	5.			d) that are disco	ontinuous dep	pressions along the same channel. They n	range in size from 0.002
VEGETATION -	- Use scientific	names of	plants.			Dominance Test Worksheet:	
Tree Stratum	I (Plot size:		Absolute %Cover	Dominate Species?	Indicator Status	Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-):	<u>1 (</u> A)
2							<u> </u>
3						Total Number of Dominant	4 (D)
4						Species Across All Strata:	(B)
· · · · · ·				=Total Cover		Percent of Dominant Species	
Sapling/Shru	b Stratum (Plot si:	<u>ze:)</u>				That are OBL, FACW, or FAC:	100 (A/B)
P1						Prevalence Index Worksheet:	
2							<u>Multiple by:</u>
3						OBL species x 1 = FACW species x 2 =	
4						FAC species x 3 =	
5		· · ·				FACU species x 4 =	
				=Total Cover		UPL species x 5 =	
Herb Stratum	n (Plot size: 20s	if)				Column Totals:A)	(B)
1 Eleocharis palus	stris		40	Y	OBL	Prevalence Index = B/A =	
2 3						Hydrophytic Vegetation Indicato	rs:
4						X_Dominance Test is >50%	
5						Prevalence Index is $\leq 3.0^{1}$	Drovida
6						Morphological Adaptations ¹ (supporting data in Remarks or on a	
7						Problematic Hydrophytic Veg	jetation ¹ (Explain)
8							ad bydrology myst
9						¹ Indicators of hydric soil and wetla be present, unless disturbed or pro	
10			10.00	Total Cover			
			40%	=Total Cover		Hydrophytic Vegetation Present?	
	Stratum (Plot size:)				Yes <u>X</u> No	
2						4	
<u> </u>				=Total Cover		· · ·	
% Bare Ground in	Herb Stratum	60%	_				

Soil Sampling Point WL-32 Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Depth Matrix Redox Features Matrix Redox Features
(inches) Color (moist) % Color (moist) % Type ¹ Loc ² Texture
0-1" 2.5Y 6/1 10YR 5/4 <2% C M Silty loam Mottles: Medium, few, prominent
1-6" 2.5Y 6/1 10YR 5/4 15% C M Silty clay loam w/sand Mottles: Medium, common, prominent
6-14" 2.5Y 5/1 50% 10YR 5/4 <2% C M Silty loam w/sand Mottles: Medium, few, faint
2.5Y 5/2 50% Blended Matrix
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ² Location: PL=Pore Lining, M=Matrix.
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils ³ :
Histosol (A1)Sandy Gleyed Matrix (S4)1 cm Muck (A9) (LRR I, J)
Histic Epipedon (A2) Sandy Redox (S5) Coast Prairie Redox (A16) (LRR F, G, H) Black Histic (A3) Striped Matrix (S6) Dark Surface (S7) (LRR G)
Hydrogen Sulfide (A4)Loamy Mucky Mineral (F1)High Plains Depressions (F16)
Stratified Layers (A5) (LRR F) Loamy Gleyed Matrix (F2) (LRR H outside of MLRA 72 & 73) 1 cm Muck (A9) (LRR F, G, H) Depleted Matrix (F3) Reduced Vertic (F18)
Depleted Below Dark Surface (A12) Redox Dark Surface (F6) Red Parent Material (TF2)
Thick Dark Surface (A12)Depleted Dark Surface (F7)Other (Explain in Remarks)Other (Explain in Remarks) ³ Indicators of hydrophytic vegetation and
2.5 Mucky Peat or Peat (S2) (LRR G,H)High Plains Depressions (F16) wetland hydrology must be present,
5 cm Mucky Peat or Peat (S3) (LRR F) (MLRA 72 & 73 of LRR H) unless disturbed or problematic
Restrictive Layer (if present):
Type: Hydric Soil Present? Yes No Depth (inches) :
Remarks:
HYDROLOGY
Wetland Hydrology Indicators:
Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required)
X_Surface Water (A1) Salt Crust (B11) Sparsely Vegetated Concave Surface (B8) X_Saturation (A3) Hydrogen Sulfide Odor (C1) Drainage Patterns (B10)
Water Marks (B1)Dry Season Water Table (C2)Oxidized Rhizospheres on Living Roots (C3)
Sediment Deposits (B2) Oxidized Rhizospheres on Living Roots (C3) (where tilled) Drift Deposits (B3) (where not tilled) Crayfish Burrows (C8)
Algal Mat or Crust (B4) Presence of Reduced Iron (C4) Saturation Visible of Aerial Imagery (C9) Iron Deposits (B5) Thin Muck Surface (C7) Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7)Other (Explain in Remarks)FAC-Neutral Test (D5)
Water-Stained Leave (B9)Frost-Heave Hummocks (D7) (LRR F)
Field Observations:
Surface Water Present? Yes X No Depth (inches) 6 inches
Water Table Present? Yes No X Depth (inches) Yes X No
Saturation Present? Yes_X_No Depth (inches)* (includes capillary fringe)
* Saturated to the surface.
Describe Recorded Data (stream gauge, monitoring well, aerial photos,
previous inspections), if available:
Remarks:

· · · ·

· · _	Ludeman License Area				Sampling Date: 8/8/2008
Applicant/Owner:					City/County: Converse County
nvestigator(s):			wnship,Range		
	, terrace, etc.): <u>Depressio</u> LRR H				convex, none) <u>concave</u> Slope (%) <u><2%</u> g: 42.902 Datum: NAD-83
Subregion (LRR):	152-Forkwood-Cambi	ria loams 189-	Kishona-Camb	 oria-Theedle	loams, 251-Theedle-Kishona-Shingle loams
	<u></u>				sification <u>na</u> Sampling Point_WL-33
		ypical for this ti	me of year? Y	'es <u>X</u> N	o (if no, explain in Remarks.)
re "Normal Circun	nstances" present?		Y	′es <u>X</u> N	o
				: -	
Are Vegetation	_, Soil, or Hydology	v significar	ntly disturbed?	÷ ۱	Yes No_X
	_, Soil, or Hydrolog				Yes NoX
	any answers in Remarks.)			٠	
SUMMARY OF F	INDINGS – Attach site	map showir	ng sampling	point loca	ations, transects, important features, etc.
Hydrophytic Vegeta		-		•	· · · · ·
lydric Soil Present	? Yes <u>X</u>	No		the Sample	
Vetland Hydrology	Present? Yes_X	No	wit	thin a Wetla	nd? YesX No
Remarks:				· · ·	2011 1911 - Anna Anna Anna Anna Anna Anna Anna An
This is a string of int size from 0.002 acre		ids, WL-33a thro	ough WL-33e) t	that are disco	nnected depressions along the same drainage. They range in
					-
	Use scientific names of				Dominance Test Worksheet:
Tree Stratum	(Plot size:)	Absolute %Cover	Dominate	Indicator Status	Number of Dominant Species
<u> </u>		%Cover	Species?	010103	That Are OBL, FACW, or FAC
·					(excluding FAC-): <u>3</u> (A)
2	1. * 17				
3					Total Number of Dominant
4		4			Species Across All Strata:3_(B)
			=Total Cover	i i i	Percent of Dominant Species
Sapling/Shrub	Stratum (Plot size:)				That are OBL FACW, or FAC: 100 % (A/B)
1		L			Prevalence Index Worksheet:
2			· · · · · · · · · · · · · · · · · · ·		Total % Cover of: Multiple by:
					OBL species x 1 =
3					FACW species x 2 =
4					FAC species x 3 =
5					FACU species x 4 =
			=Total Cover		- UPL species x 5 =
Herb Stratum	(Plot size: 20sf)				Column Totals:A)(B
1 Juncus effusus	· · · · · · · · · · · · · · · · · · ·	20	Y	OBL	Prevalence Index = B/A =
2 Carex praegracili	S	20	Y	FACW	
B Distichlis stricta	'syn. D. spicata)*	20	Y	FAC+	Hydrophytic Vegetation Indicators:
4 Hordeum jubatum		5	N	FACW	$\underbrace{X}_{\text{Dominance Test is } > 50\%}$
5 Poa sp.		5	N		Prevalence Index is $\leq 3.0^1$ Morphological Adaptations ¹ (Provide
5 Triglochin concinr		1	N	OBL	supporting data in Remarks or on a separate sheet)
7 Equisetum laeviga		1	N	FAC	Problematic Hydrophytic Vegetation ¹ (Explain)
B Sporobolis airoid		1	N	FAC	
9 Plantago maritim		1	N	NL	¹ Indicators of hydric soil and wetland hydrology mus
10 Muhlenbergia a	sperifolia	1	N	FACW	be present, unless disturbed or problematic.
		75%	=Total Cover		
Woody Vine S	tratum (Plot size:				Hydrophytic Vegetatio
					Present ? Yes
1			1		
			=Total Cover		

Remarks * Distich		tor status of	NI in Region 4	therefore th	he indic	ator sta	tus of FAC+ in	n adjacent Region 9 was used.		
(inches)	Color (moist)	%	Color (moist)	%	Tyr	be' L	.oc' Texture			
<u>0-4"</u>	Gley 1 2.5/10Y		5Y4/4	<2%	<u> </u>	M	Loam with i	inclusions of black organic matter, peat, sand,		
							& small calc	areous concretions inconsistently within 0-4".		
<u>4-8"</u>	2.5Y 3/2		5YR 4/6	5%	<u> </u>	<u>M</u>	Silt loam	Mottles: fine, common, prominent		
			5YR 4/8	5%	<u>C</u>	<u>M</u>		Mottles: fine, common, prominent		
0.10"			5VD 0/4	5%	C	<u>M</u>		fine calcium concretions		
<u>8-12"</u>	$\frac{2.5Y}{Clay} \frac{5/2}{1.6/10V}$		5YR 3/4	$\frac{<2\%}{2\%}$	$\frac{C}{D}$	M	Sandy loam	Mottles: coarse, few, distinct		
	<u>Gley 1 6/10Y</u> Gley 1 5/10Y			$\frac{2\%}{2\%}$	<u>D</u> D	_ <u>M</u>				
	$\frac{\text{Glev} 1.25/\text{N}}{\text{Glev} 1.25/\text{N}}$			$-\frac{270}{2\%}$		M	<u></u>	large manganese constations		
¹ Type: C	=Concentration, D=De	pletion, RI	M=Reduced Mat	trix, CS=C	overed	l or Co				
Histo Histic Black Hydru Strati Deple Strati	Soil Indicators: (Ap sol (A1) Epipedon (A2) Histic (A3) ogen Sulfide (A4) fied Layers (A5) (LRR Muck (A9) (LRR F, G, eted Below Dark Surfa Dark Surface (A12) y Mucky Mineral (S1) lucky Peat or Peat (S2 Mucky Peat or Peat (S2	F) H) ce (A12)	Sandy Gi Sandy Ri Striped M Loamy M Loamy G Depleted Redox D Redox D Redox D H)High Pla	leyed Mat edox (S5) latrix (S6) /lucky Min leyed Mat Matrix (F ark Surfac	rix (S4) heral (F trix (F2 3) ce (F6) hrface (F hs (F8) ssions	1) 2) =7) (F16)	·	ators for Problematic Hydric Soils ³ : 1 cm Muck (A9) (LRR I, J) Coast Prairie Redox (A16) (LRR F, G, H) _Dark Surface (S7) (LRR G) _High Plains Depressions (F16) (LRR H outside of MLRA 72 & 73) _Reduced Vertic (F18) _Red Parent Material (TF2) _Other (Explain in Remarks) dicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic		
Depth Rema	Restrictive Layer (if present): Type: Type: Hydric Soil Present? YesX No Depth (inches) :									
	DLOGY									
Primary Ir Surfac Satura Water Drift D Algal I Inunda	Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) Surface Water (A1) Salt Crust (B11) Sparsely Vegetated Concave Surface (B8) Saturation (A3) Hydrogen Sulfide Odor (C1) Drainage Patterns (B10) Water Marks (B1) Dry Season Water Table (C2) Oxidized Rhizospheres on Living Roots (C3) Sediment Deposits (B2) _X_Oxidized Rhizospheres on Living Roots (C3) (where not tilled) Drift Deposits (B3) Where not tilled) Crayfish Burrows (C8) Algal Mat or Crust (B4) Presence of Reduced Iron (C4) Saturation Visible on Aerial Imagery (B7) Inundation Visible on Aerial Imagery (B7) Other (Explain in Remarks) FAC-Neutral Test (D5) Water-Stained Leave (B9) Frost-Heave Hummocks (D7) (LRR F)									
Surface W Water Tab Saturation	servations: /ater Present? Yes ble Present? Yes Present? Yes capillary fringe)	_No_X_	epth (inches) Depth (inches) epth (inches)				Wetland Hydro Yes <u>X</u> No			
	Recorded Data (strea inspections), if availab		monitoring well,	aerial pho	otos,	1				
Remarks										

Project/Site: Applicant/Owner:	Ludeman License Area Uranium One				Sampling Date: 8/8/2008 City/County: Converse County
Investigator(s):		Townshin P	ange: Sec 22	3 T3/N D7	
	e, terrace, etc.):Depression i				
Subregion (LRR):	LRR H	Lat:	-105.578	Lon	g: 42.898 Datum: NAD-83
Soil Map Unit Nan	ne:_251-Theedle-Kishona-Sh	ingle loams,	263-Ustic Tor	riorthents, g	
				NWI classif	
Are climate/hydro	logic conditions on the site typ	ical for this ti			p (If no, explain in Remarks.)
Are "Normal Circu	imstances" present?		Ŷ	'es <u>X</u> N	<u>).</u>
Are Vegetation	, Soil, or Hydology	significar	ntly disturbed?		Yes No <u>X_</u>
	, Soil, or Hydrology_				Yes NoX
(If needed, explain	n any answers in Remarks.)				
SUMMARY OF	FINDINGS – Attach site m	nap showin	ig sampling	point loca	tions, transects, important features, etc.
Hydrophytic Vege		No			·
Hydric Soil Preser				the Sampleo	
Wetland Hydrolog	y Present? Yes_X_	No	wit	thin a Wetla	nd? Yes_XNo
Remarks:					
					ressions along the same drainage. They range in
	res to 0.612 acres. Soil Unit 263		yaric by the NE	KLS	
	- Use scientific names of	•			Dominance Test Worksheet:
Tree Stratum	n (Plot size:)	Absolute	Dominate	Indicator	Number of Dominant Species
		%Cover	Species?	Status	Number of Dominant Species That Are OBL, FACW, or FAC
1					(excluding FAC-):1(A)
2					
3					Total Number of Dominant
4		1			Species Across All Strata:1_(B)
			=Total Cover		Percent of Dominant Species
Sanling/Shru	ib Stratum (Plot size:)	 			That are OBL, FACW, or FAC: 100 (A/B)
				1	
1					Prevalence index Worksheet: <u>Total % Cover of:</u> Multiple by:
2					OBL species x 1 =
3					FACW species x 2 =
4					FAC species x 3 =
5					FACU species x 4 =
	·		=Total Cover		UPL species x 5 =
Herb Stratun	n (Plot size: 20sf)				Column Totals:A)(B)
1 Scirpus america		40	Y	OBL	Prevalence Index = B/A =
2 Hordeum jubatur		5	N	FACW	
3 Carex nebrascen		5	N	OBL	Hydrophytic Vegetation Indicators:
4					<u>X</u> Dominance Test is >50%
5					Prevalence Index is $\leq 3.0^1$
6				· · · · ·	Morphological Adaptations ¹ (Provide
7					supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain)
8					
9					¹ Indicators of hydric soil and wetland hydrology must
10					be present, unless disturbed or problematic.
		50%	=Total Cover		Hydrophytic Vegetation Present?
Woody Vine	Stratum (Plot size:)		<u> </u>	1	Yes <u>X</u> No
1					
2					
			=Total Cover		1 .
% Bare Ground in	Herb Stratum50%	_	· · · · · ·		
					· · · · · · · · · · · · · · · · · · ·
Remarks:					

. .

SOIL Profile Description: (Describe to the d DepthMatrix		locument Redox Fea			confirm the	Sampling PointWL-34 absence of indicators.)
(inches) Color (moist) %	Color (moist)	%	Type ¹	Loc ²	Texture	
0-4" 10YR 5/1					Sand	Many roots
4-12" 10YR 4/1	7.5Y 5/6	15%	C	М	Sandy loam	Mottles: medium, common, prominent
						Oxidized root channels in 4-12"
	<u></u>					Black organic material streaked through 4-12"
					<u> </u>	
				·		
		<u> </u>		·	·	
					. <u> </u>	
¹ Type: C=Concentration, D=Depletion, F	M=Reduced Matr	ix CS=Cc	vered or	Coated	Sand Grains	2Location: PL=Pore Lining, M=Matrix.
Hydric Soil Indicators: (Applicable Histosol (A1) Histic Epipedon (A2)	e to all LRRs, un Sandy Gle Sandy Re	n less oth eyed Matri dox (S5)	nerwise		Indicato	o rs for Problematic Hydric Soils³: m Muck (A9) (LRR I, J) ast Prairie Redox (A16) (LRR F, G, H)
Black Histic (A3) _Hydrogen Sulfide (A4)	Striped Ma _X_Loamy M		aral (E1)			ark Surface (S7) (LRR G) igh Plains Depressions (F16)
Stratified Layers (A5) (LRR F)	Loamy Gle	eyed Matri	ix (F2)		(LF	RR H outside of MLRA 72 & 73)
1 cm Muck (A9) (LRR F, G, H) Depleted Below Dark Surface (A12)	Depleted I Redox Da					duced Vertic (F18) d Parent Material (TF2)
Depleted below Dark Sufface (A12) Thick Dark Sufface (A12)	Redox Da				Ot	her (Explain in Remarks)
Sandy Mucky Mineral (S1)	Redox De			6)		ators of hydrophytic vegetation and
2.5 Mucky Peat or Peat (S2) (LRR G 5 cm Mucky Peat or Peat (S3) (LRR		2 & 73 of l		0)		etland hydrology must be present, nless disturbed or problematic
Restrictive Layer (if present):						
Туре:			Hydr	ic Soil P	resent? Y	es <u>X</u> No
Depth (inches) : Remarks:						
HYDROLOGY						
Wetland Hydrology Indicators:						
Primary Indicators (minimum of one required						dicators (minimum of two required)
Surface Water (A1) Saturation (A3)	Salt Crust (B1 Hydrogen Su		(C1)		Sparsel Drainag	y Vegetated Concave Surface (B8) ge Patterns (B10)
Water Marks (B1) Sediment Deposits (B2)	Dry Season V			Deete (C	Oxidized	d Rhizospheres on Living Roots (C3)
Drift Deposits (B3)	(where not ti	lled)	Ū	ROOIS (C	Crayfish	e tilled) n Burrows (C8)
Algal Mat or Crust (B4) Iron Deposits (B5)	Presence of F Thin Muck Su		on (C4)			ion Visible of Aerial Imagery (C9) rphic Position (D2)
Inundation Visible on Aerial Imagery (B7)			ks)		FAC-N	eutral Test (D5)
Water-Stained Leave (B9)					Frost-H	eave Hummocks (D7) (LRR F)
Field Observations:						
Surface Water Present? Yes _ No X	Depth (inches)			Wet	land Hydrology	y Present?
Water Table Present? YesNoX	Depth (inches)			Yes	<u>X</u> No	_
Saturation Present? Yes NoX (includes capillary fringe)	Depth (inches)			L		
Describe Recorded Data (stream gauge, previous inspections), if available:	, monitoring well, a	aerial phot	os,			
Remarks:						
	•					

Project/Site: Ludeman License Area				Sampling Date: 6/4/2008
Applicant/Owner: Uranium One	Cention 7			City/County: Converse County 4, T34NR73W State: WY
Investigator(s): K. LaClair, W. Stansbury				convex, none) <u>concave</u> Slope (%) 5%
Subregion (LRR): <u>LRR H</u>	Lat:	-105.579	Lon	g: 42.923 Datum: NAD-83
Soil Map Unit Name: 187-Kishona-Cambria lo	ams			NWI classification_na Sampling Point_WL-35
Are climate/hydrologic conditions on the site typ	ical for this ti	me of year? Y	es <u>X</u> No	o (If no, explain in Remarks.)
Are "Normal Circumstances" present?		Y	'es <u>X</u> No	0 <u></u>
				ζώ 4
Are Vegetation, Soil, or Hydology	significai	ntly disturbed?		Yes No_X
Are Vegetation, Soil, or Hydrology_	natural	y problematic'	?	Yes No_X
(If needed, explain any answers in Remarks.)				
	No	ig sampling	point loca	ations, transects, important features, etc.
Hydric Soil Present? Yes_X_		ls ⁻	the Sampled	d'Area
Wetland Hydrology Present? Yes_X_	No		thin a Wetla	
Remarks:				
This is a string of intermittent wetlands (5 wetland in size from 0.001 acres to 0.042 acres.	s, WL-35a th	rough WL-35e)) that are disc	continuous depressions along the same channel. They range
VEGETATION – Use scientific names of	plants.			Dominance Test Worksheet:
Tree Stratum (Plot size:)	Absolute	Dominate	Indicator	Number of Deminent Species
· · · · · · · · · · · · · · · · · · ·	%Cover	Species?	Status	Number of Dominant Species That Are OBL, FACW, or FAC
1				(excluding FAC-):1 (A)
2				
3				Total Number of Dominant
4				Species Across All Strata:1_(B)
		=Total Cover		Percent of Dominant Species
Sapling/Shrub Stratum (Plot size:)				That are OBL,FACW, or FAC: 100 (A/B)
			n	Prevalence Index Worksheet:
2				Total % Cover of: Multiple by:
3				OBL speciesx 1 =
4				FACW species x 2 = FAC species x 3 =
5				FACU speciesx 4 =
5		=Total Cover		UPL species x 5 =
Herb Stratum (Plot_size: 20sf)				- Column Totals:A)(B)
1 Eleocharis palustris	10	Y	OBL	
2 Lappula redowskii	5	Y	NL	Prevalence Index = B/A =
3				Hydrophytic Vegetation Indicators:
4				X_Dominance Test is >50%
5				Prevalence Index is $\leq 3.0^{1}$
6				Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
7				Problematic Hydrophytic Vegetation ¹ (Explain)
8				
9				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
10				
	15%	=Total Cover		Hydrophytic Vegetation Present?
Woody Vine Stratum (Plot size:)				Yes <u>X</u> No
1				1
2		=Total Cover	· · · ·	-
% Bare Ground in Herb Stratum 85%	L			I

SOIL Profile Description: (Describe Depth Matrix		locument the inc Redox Features	licator or	confirm the	Sampling Point absence of indicators.)	WL-35			
(inches) Color (moist)	<u> </u>	% Type	¹ Loc ²	Texture					
<u>0-12" 10YR 4 /2</u>	5YR 4/4	<u>2%</u> C	<u>M</u>	Sandy clay	Mottles: Fine, few, prominen				
				·					
		· ·	- <u></u>	- <u> </u>					
¹ Type: C=Concentration, D=Dep Hydric Soil Indicators: (Ap Histosol (A1) Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4) Stratified Layers (A5) (LRR 1 cm Muck (A9) (LRR F, G, Depleted Below Dark Surfac Thick Dark Surface (A12) Sandy Mucky Mineral (S1) 25 Mucky Peat or Peat (S2) 5 cm Mucky Peat or Peat (S2)	plicable to all LRRs, un Sandy Gle Sandy Re Striped Ma Loamy M F)Loamy Gle H)Depleted f ce (A12)Redox Da Depleted Redox De (LRR G,H)High Plair G3) (LRR F) (MLRA 72	nless otherwise eyed Matrix (S4) edox (S5)	e noted.)	Indicato	² Location: PL=Pore Linin brs for Problematic Hydric m Muck (A9) (LRR I, J) ast Prairie Redox (A16) (LRR ark Surface (S7) (LRR G) igh Plains Depressions (F16) RR H outside of MLRA 72 & 73 duced Vertic (F18) d Parent Material (TF2) her (Explain in Remarks) ators of hydrophytic vegetation stland hydrology must be presen hess disturbed or problematic	: Soils³: F, G, H)) and			
Restrictive Layer (if present): Type: Depth (inches) :		Hyo	dric Soil P	resent? Ye	es <u>X</u> No				
Remarks:									
HYDROLOGY									
Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) X_Surface Water (A1) Salt Crust (B11) Sparsely Vegetated Concave Surface (B8) X_Saturation (A3) Hydrogen Sulfide Odor (C1) Drainage Patterns (B10) Water Marks (B1) Dry Season Water Table (C2) Oxidized Rhizospheres on Living Roots (C3) Sediment Deposits (B2) Oxidized Rhizospheres on Living Roots (C3) (where not tilled) Drift Deposits (B3) (where not tilled) Crayfish Burrows (C8) Iron Deposits (B5) Thin Muck Surface (C7) Geomorphic Position (D2) Inundation Visible on Aerial Imagery (B7) Other (Explain in Remarks) FAC-Neutral Test (D5) Water-Stained Leave (B9) Frost-Heave Hummocks (D7) (LRR F)									
	No Depth (inches) NoX_ Depth (inches) NoX_ Depth (inches)	8		and Hydrology X_No					
Describe Recorded Data (strear previous inspections), if availabl	n gauge, monitoring well, a le:	aerial photos,	1						
Remarks:					,				

Project/Site: I	Ludeman License Area				Sampling Date:	6/10/2008
Applicant/Owner:					City/County:	Converse County
Investigator(s):		Township R	ange: Sec 1	4. T34N R7		converse county
					vex, none) <u>concave</u> Slope (%	%) NA
Subregion (LRR):		Lat:	-105.584	Lo	ng: <u>42.912</u> Datum:	NAD-83
Soil Map Unit Name	263-Ustic Torriorthents, g	ullied		NWI cla	ng: <u>42.912</u> Datum:_ assification <u>na</u> Sampling	Point_WL-36
Are climate/hydrolog	gic conditions on the site typ	ical for this ti	me of year? Ye	es_X_N	lo (If no, explain in Remarks.)	
Are "Normal Circum	stances" present?		Y	es <u>X</u> N	lo	
Are Vegetation	Soil or Hydology	significar	thy disturbed?	· •	Vec	No X
Are Vegetation	_, Soil, or Hydology_ _, Soil, or Hydrology_	naturall	v problematic?)	Yes Yes	No <u>X</u> No <u>X</u>
	any answers in Remarks.)		y problemato:			
•	•	nan showin	a samplina	noint loc	ations, transects, important fe	atures etc
	tion Present? Yes_X_		ig sampling	point loc	ations, transcots, important to	
Hydric Soil Present	$\gamma = 1000000000000000000000000000000000000$	No	ls t	he Sample	d'Area	
Wetland Hydrology	Present? Yes X	No	wit		and? Yes <u>X</u> No	
Remarks:					<u> </u>	
	vo intermittent wetlands (WL-	36a and WL-3	(6b) that are dis	continuous	depressions along the same channel. T	hev range
	res to 0.005 acres. Soil Unit					nej range
	Use scientific names of				Dominance Test Worksheet:	
Tree Stratum (Absolute	Dominate	Indicator		
Thee Stratum (Flot size.	%Cover	Species?	Status	Number of Dominant Species	
1		7000101	Opecies:		That Are OBL, FACW, or FAC	
2					(excluding FAC-):	1(A)
3					Total Number of Dominant	4 (D)
4					Species Across All Strata:	(B)
			=Total Cover		Percent of Dominant Species	
Sonling/Shrub	Stratum (Blat aiza)		<u> </u>		That are OBL, FACW, or FAC:	100 (A/B)
Sapling/Shrub	Stratum (Plot size:)			<u>.</u>		
4					Prevalence Index Worksheet: Total % Cover of:	Multiple by:
2						
3					OBL species x 1 =	
4					_ FACW species x 2 = FAC species x 3 =	
5	- · · · ·				FACU species x 4 =	
•			=Total Cover		- UPL species x 5 =	
					Column Totals:A)	(B)
	Plot size: 20sf)					
1 Eleocharis palustri	is	25	Y	OBL	_ Prevalence index = B/A =	
2						
3	······				Hydrophytic Vegetation Indica X Dominance Test is >50%	
4					$\frac{X}{2} \text{Dominance rest is > 50\%}$ $Prevalence Index is \le 3.0\%$	
5					Morphological Adaptation	
6					supporting data in Remarks or c	n a separate sheet)
7					Problematic Hydrophytic	
8						
9					¹ Indicators of hydric soil and we	
10					be present, unless disturbed or	problematic.
<u></u>		25%	=Total Cover		Hydrophytic Vegetation Present	?
Woody Vine St	ratum (Plot size:)				Yes <u>X</u> No	
1						
2					1	
		1	=Total Cover			
% Bare Ground in F	lerb Stratum75%		· 4		•	
Remarks:		1				
tomano.						

Depth Matrx Redox Peatures (0-12" 2.5Y 5/2 7.5YR 5/6 25% C M sitry loam Motiles: Fins, many, prominent (0-12" 2.5Y 5/2 7.5YR 5/6 25% C M sitry loam Motiles: Fins, many, prominent (0-12" 2.5Y 5/2 7.5YR 5/6 25% C M Motiles: Medium, few, prominent (0-12" 2.5Y 5/2 7.5YR 5/6 22% C M Motiles: Medium, few, prominent (0-12" 2.5Y 5/2 7.5YR 5/6 22% C M Motiles: Medium, few, prominent (0-12" 2.5Y 5/2 7.5YR 5/6 22% C M Motiles: Medium, few, prominent (0-12" 2.5Y 5/2 7.5YR 5/6 25% C M Motiles: Medium, few, prominent (0-12" 1.5YR 5/6 2.5% C Motiles: Medium, few, prominent Motiles: Medium, few, prominent (1.5% 50H faw) Sandy Redox (28) 1.5% 1.5% 1.5% 1.5% 1.5% (1.5% 50H faw) Sandy Redox (28) 1.5% 1.5% 1.5% 1.5% 1.5% 1.5%	Sampling Point <u>WL-36</u> Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)
0-12" 2.SY 5/2 7.SYR 5/6 25% C M sitty loam Mottles: Fine, many, prominent 10YR 2/1 <2%	Depth <u>Matrix</u> <u>Redox Features</u> (inches) Color (moist) % Color (moist) % Type ¹ Loc ² Texture
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils ² :	0-12" 2.5Y 5/2 7.5YR 5/6 25% C M silty loam Mottles: Fine, many, prominent
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils ² :	
Type: Hydric Soil Present? Yes X No_ Depth (inches) : Remarks: Remarks: Primarks: Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) X Surface Water (A1)	Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils ³ :
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) X_Surface Water (A1)	Type: Hydric Soil Present? Yes_X No Depth (inches) :
Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) X Surface Water (A1)	Remarks:
Primary Indicators (minimum of one required): check all that apply) Secondary Indicators (minimum of two required) X Surface Water (A1)	
Surface Water Present? Yes X No_ Depth (inches) <1 inch	Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) X Surface Water (A1) Salt Crust (B11) Sparsely Vegetated Concave Surface (B8) X Saturation (A3) Hydrogen Sulfide Odor (C1) Drainage Patterns (B10) Water Marks (B1) Oxidized Rhizospheres on Living Roots (C3) Oxidized Rhizospheres on Living Roots (C3) Sediment Deposits (B2) Oxidized Rhizospheres on Living Roots (C3) (where not tilled) Drift Deposits (B3) (where not tilled) Crayfish Burrows (C8) Algal Mat or Crust (B4) Presence of Reduced Iron (C4) Saturation Visible of Aerial Imagery (C9) Iron Deposits (B5) Thin Muck Surface (C7) Geomorphic Position (D2) Inundation Visible on Aerial Imagery (B7) Other (Explain in Remarks) FAC-Neutral Test (D5)
previous inspections), if available:	Surface Water Present? Yes _X_ No Depth (inches) <1 inch
Remarks:	
	Remarks:

•	Ludeman License					Sampling Date: 8/7/2008
Applicant/Owner:				- <u> </u>	2 25 26 26	City/County: Converse County
	W. Stansbury					, T34N, R73W State: WY
Subregion (LRR): Soil Map Unit Nan	LRR H ne: 127-Clarkeler	n-Draknab co	Lat: mplex, 129-	<u>-105.579</u> Clarkelen-Ha loams, 251-T	Lon verdad-Bigw heedle-Kish	onvex, none) <u>concave</u> Slope (%) <u><2%</u> g: <u>42.911</u> Datum: <u>NAD-83</u> rinder complex, <u>172-Hiland-Bowbac fine sandy loams</u> , <u>nona-Shingle loams</u> , <u>263-Ustic Torriorthents</u> , <u>gullied</u> cation <u>PEMF/PEMC</u> Sampling Point_WL-37_
Are climate/hydrol Are "Normal Circu			cal for this ti	me of year? Y		(If no, explain in Remarks.)
Are Vegetation Are Vegetation (If needed, explain	, Soil, o	r Hydrology_	significar naturall	ntly disturbed? y problematic	, ?	Yes No_X Yes No_X
SUMMARY OF	FINDINGS - At	ttach site m	ap showin	g sampling	point loca	tions, transects, important features, etc.
Hydrophytic Vege				_		
Hydric Soil Preser Wetland Hydrolog		Yes <u>X</u> Yes <u>X</u>	No		the Sampleo thin a Wetlar	
Remarks:	ly Present?	res_A_		. wi	unin a vveuai	nd? Yes <u>X</u> No
						connected depressions along Sage Creek. They range in CS.
VEGETATION -	- Use scientific	names of	plants.			Dominance Test Worksheet:
Tree Stratum	n (Plot size:)	Absolute	Dominate	Indicator	
			%Cover	Species?	Status	Number of Dominant Species That Are OBL, FACW, or FAC
1						(excluding FAC-): <u>1</u> (A)
2						
3			•			Total Number of Dominant
4					- · · · .	Species Across All Strata:1(B)
				=Total Cover		Percent of Dominant Species
Sanling/Shru	ıb Stratum (Plot s	ize:)				That are OBL, FACW, or FAC: 100 (A/B)
		<u> </u>				Prevalence Index Worksheet:
2						Total % Cover of: Multiple by:
						OBL species x 1 =
3						FACW species x 2 =
4						FAC species x 3 =
5						FACU species x 4 = UPL species x 5 =
				=Total Cover		Column Totals:A)(B)
Herb Stratun		<u>sf)</u>				
1 Hordeum jubatu			19	Y	FACW	Prevalence Index = B/A =
2 Scirpus american		·····	2	N	OBL	
3 Eleocharis palus			2	N N	OBL FACW	Hydrophytic Vegetation Indicators: X Dominance Test is >50%
4 Muhlenbergia as 5 Taraxacum offici			1	N N	FACW	Prevalence Index is $\leq 3.0^{1}$
	nuie		1	19	IACO	Morphological Adaptations ¹ (Provide
6 7	· · · · · · · · · · · · · · · · · · ·					supporting data in Remarks or on a separate sheet)
8	····· • · · · ·					Problematic Hydrophytic Vegetation ¹ (Explain)
9						¹ Indicators of hydric soil and wetland hydrology must
10						be present, unless disturbed or problematic.
			25%	=Total Cover	1	Hydrophytic Vegetation Present?
Woody Vine :	Stratum (Plot size	<u>)</u>			l	Yes X No
2						· ·
	·····			=Total Cover		· · · · · · · · · · · · · · · · · · ·
% Bare Ground in	Herb Stratum	_75%				
F				• • •		
Remarks:						· · · · · · · · · · · · · · · · · · ·

مر

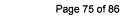
SOIL Profile Description: (Describe to the Depth Matrix		document Redox Fea		cator or	confirm the	Sampling Point absence of indicators.)	<u>WL-37</u>
(inches) Color (moist) %	Color (moist)	%	Type ¹	Loc ²	Texture		
$\frac{0-4"}{0-4"} \frac{10 \text{YR } 2/1}{5 \text{Y } 5/1} \frac{70\%}{30\%}$	7.5YR 5/6	<2%	<u> </u>	M	Silty clay	Mottles: fine, few, prominent	<u>"</u>
$\frac{34}{4-16^{"}} = \frac{513/1}{5Y4/1} = \frac{30/2}{100}$	7.5YR 5/8	15%	<u> </u>	Μ		Mottles: coarse, common, prom	-
					- <u> </u>	Oxidized root channels in 4-12" Black steaks of organics in 4-12"	
¹ Type: C=Concentration, D=Depletion Hydric Soil Indicators: (Applical Histosol (A1) Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4) Stratified Layers (A5) (LRR F) 1 cm Muck (A9) (LRR F, G, H) Depleted Below Dark Surface (A1 Thick Dark Surface (A12) Sandy Mucky Mineral (S1) 2.5 Mucky Peat or Peat (S2) (LRR	Die to all LRRs, u Sandy Gla Sandy Re Striped M. X. Loamy M Depleted 2) Redox Da Depleted C,H) High Plain	nless oth eyed Matrix dox (S5) atrix (S6) lucky Mine eyed Matri Matrix (F3) ark Surface Dark Surface pressions ns Depress	eral (F1) x (S4) x (F2)) e (F6) ace (F7) (F8) sions (F1)	noted.) Indicato 1 c Co Da H (LF Re Re Ottl ³ Indica we	ors for Problematic Hydric S m Muck (A9) (LRR I, J) ast Prairie Redox (A16) (LRR F ark Surface (S7) (LRR G) igh Plains Depressions (F16) RR H outside of MLRA 72 & 73) duced Vertic (F18) d Parent Material (TF2) ner (Explain in Remarks) ators of hydrophytic vegetation a etland hydrology must be presen	Soils ³ : , G, H) ind
5 cm Mucky Peat or Peat (S3) (LF Restrictive Layer (if present):	RF) (MLRA 7	2 & 73 of L	_RR H)		ur	nless disturbed or problematic	
Type: Depth (inches) :			Hydr	ic Soil F	Present? Ye	esX No	
Remarks:							
		,			•		
HYDROLOGY							
Wetland Hydrology Indicators: Primary Indicators (minimum of one requir Surface Water (A1) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B Water-Stained Leave (B9)	Salt Crust (B Dry Season \ Dry Season \ Oxidized Rr Oxidized Rr Presence of F Thin Muck Su	11) ulfide Odor (Water Table nizospheres illed) Reduced Iron urface (C7)	(C2) on Living n (C4)	Roots (C	Sparsel Drainag Oxidizec 3) (where Crayfish Saturati Geomol FAC-Ne	dicators (minimum of two required) y Vegetated Concave Surface (B8) ge Patterns (B10) d Rhizospheres on Living Roots (C3) e tilled) n Burrows (C8) on Visible of Aerial Imagery (C9) rphic Position (D2) eutral Test (D5) eave Hummocks (D7) (LRR F)	
Field Observations:				Wet	land Hydrology	/ Present?	
Water Table Present? YesNo	X Depth (inches) X Depth (inches) X Depth (inches)				XNo		
Describe Recorded Data (stream gau previous inspections), if available:	ge, monitoring well, a	aerial photo	OS,	•			
Remarks:							۲

:

1

Project/Site:	Ludeman License Area					Sampling Date:	6/3/2008
	Uranium One					City/County:	Converse County
Investigator(s):	K. LaClair, W. Stansbury	Section, To			, T34N R73W		
Subregion (LRR):	e, terrace, etc.): <u>Hillslope</u> LRR H	Lat:	Local relie -105.562	Loncave,	a: 42.876	Siop Datum: N	AD-83
Soil Map Unit Nan	ne: 127-Clarkelen-Draknab co	omplex	NWI	classification	on PEMC	Sampling	Point_WL-38
Are climate/hydrol	ogic conditions on the site typ	ical for this ti	me of year? Y	es_ <u>X</u> _N	o (If no, ex	xplain in Remarks.)	
Are "Normal Circu	mstances" present?		Y	'es <u>X</u> N	°		
					:		
Are Vegetation	, Soil, or Hydology_	significar	ntly disturbed?			Yes Yes	NoX
	, Soil, or Hydrology_	naturall	y problematic?	?		Yes	No <u>X</u>
	n any answers in Remarks.) FINDINGS – Attach site n	aan chowin	a complina	noint loss	ations transp	oto important fo	turos oto
	tation Present? Yes X		ig sampling		allons, transe		alures, etc.
Hydric Soil Preser		No	ls	the Sample	d Area		
Wetland Hydrolog	y Present? Yes X	No		hin a Wetla		<u>KNo</u>	
Remarks:							
This is a slope we	tland with a depressional compo	nent.					
VEGETATION -	- Use scientific names of	plants			Dominanco	Test Worksheet:	
Tree Stratum		Absolute	Dominate	Indicator	Dominance	lest worksheet.	
		%Cover	Species?	Status		ominant Species	
1						L, FACW, or FAC	2 (A)
2	•,				 (excluding FA 	40-):	2(A)
3					Total Number	r of Dominant	
4					 Species Acro 	ss All Strata:	<u> 2 (</u> B)
•			=Total Cover		- Percent of Dr	ominant Species	
Sapling/Shru	h Stratum (Plat aiza:		_		That are OB	L,FACW, or FAC:	100 (A/B)
	b Stratum (Plot size:)				_ <u>}</u>	ndex Worksheet:	
2						ver of:	Multiple by:
						x 1 =	
3					📙 FACW specie	∋sx2 =	
4		ļ			FAC species	x 3 =	
5			THEO			x 4 =x 5 =	
			=Total Cover		1	als:A)	
	n (Plot_size: 20sf)			0.57	4		
1 Carex aquatilis		45 20	Y Y	OBL OBL	Prevalence I	ndex = B/A =	
2 Eleocharis palus		20	Y N	FAC	Hydrophytic	Vegetation Indica	lore.
3 Equisetum arven 4 Potentilla anseri		4	N N	OBL		ance Test is >50%	
5 Mentha arvensis		2	N	FACW	Prevale	ence Index is $\leq 3.0^{2}$	
6 Scirpus america		1	N	OBL		ological Adaptations	
7	·	1				ata in Remarks or or matic Hydrophytic V	n a separate sheet) (egetation ¹ (Explain)
8		· · · · · · · · · · · · · · · · · · ·					•
9							land hydrology must
10					be present, u	inless disturbed or p	roplematic.
		76%	=Total Cover			/egetation Present?	
	Stratum (Plot size:)				Yes <u>X</u>	No	
1					4		
2			-Tatal Origina		-		
N/ Data Crownel in	Lieve Christian 040		=Total Cover				
% Bare Ground in	Herb Stratum <u>24%</u>	_					
4							

Remarks:



SOIL Sampling Point WL-38 Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Depth Matrix
(inches) Color (moist) % Color (moist) % Type ¹ Loc ² Texture
0-5" 10YR 2 /1 5YR 4/6 < 2% C M Mucky Peat Mottles: Fine to medium, few, promin
<u>5-13" 2.5YR 4/1 NA Mucky Sand</u>
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ² Location: PL=Pore Lining, M=Matrix
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils ³ :
Histic Epipedon (A2) Sandy Redox (S5) Coast Prairie Redox (A16) (LRR F, G, H)
Black Histic (A3) Striped Matrix (s6) Dark Surface (S7) (LRR G) X_Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) High Plains Depressions (F16)
Stratified Layers (A5) (LRR F) Loamy Gleyed Matrix (F2) (LRR H outside of MLRA 72 & 73)
1 cm Muck (A9) (LRR F, G, H)Depleted Matrix (F3)Reduced Vertic (F18)Reduced Vertic (F18)Red Parent Material (TF2)
Thick Dark Surface (A12) Depleted Dark Surface (F7) Other (Explain in Remarks) Sandy Mucky Mineral (S1) Redox Depressions (F8) 3 Indicators of hydrophytic vegetation and
2.5 Mucky Peat or Peat (S2) (LRR G,H)High Plains Depressions (F16) wetland hydrology must be present,
X_5 cm Mucky Peat or Peat (S3) (LRR F) (MLRA 72 & 73 of LRR H) unless disturbed or problematic
Restrictive Layer (if present):
Type: Hydric Soil Present? YesX No Depth (inches) :
Remarks:
HYDROLOGY
Wetland Hydrology Indicators:
Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) X _Surface Water (A1) Salt Crust (B11) Sparsely Vegetated Concave Surface (B8)
X_Saturation (A3) X_Hydrogen Sulfide Odor (C1) Drainage Patterns (B10)
Water Marks (B1)Dry Season Water Table (C2)Oxidized Rhizospheres on Living Roots (C3) Oxidized Rhizospheres on Living Roots (C3) (where tilled)
Drift Deposits (B3) (where not tilled) Crayfish Burrows (C8) Algal Mat or Crust (B4) Presence of Reduced Iron (C4) Saturation Visible of Aerial Imagery (C9)
Iron Deposits (B5)Thin Muck Surface (C7)Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7)Other (Explain in Remarks)FAC-Neutral Test (D5)Frost-Heave Hummocks (D7) (LRR F)
Field Observations:
Surface Water Present? Yes_X_ No Depth (inches)_ <1"
Water Table Present? Yes_X_No Depth (inches)_13" Yes_X_No
Saturation Present? Yes_X_No Depth (inches)*
* Saturated to the surface with some areas of surface water. Standing water in
pit at depth of 13". Describe Recorded Data (stream gauge, monitoring well, aerial photos,
previous inspections), if available:
Remarks:

	Ludeman License Area				Sampling Date: 6/3/2008
Applicant/Owner:	Uranium One				City/County: Converse County
	K. LaClair, W. Stansbury				, T34N R73W State: WY
	e, terrace, etc.): <u>Hillslope</u>	1 - 4	Local relief (c	concave, cor	nvex, none) <u>concave</u> Slope (%) <u>17%</u>
Subregion (LRR):	<u>LRR H</u> ne: <u>127-Clarkelen Draknab</u>	Lat:	-105.563	Long	g: <u>42.876</u> Datum: <u>NAD-83</u>
Soli Map Unit Nan	ne: <u>127-Clarkelen Draknab</u>	complex, 2:	51-Theedie-Ki	Shona-Shing NM/L classifi	cation_na Sampling Point_WL-39
Are climate/bydrol	logic conditions on the site typi	cal for this ti	me of vear? V	as V No	(If no, explain in Remarks.)
Are "Normal Circu	imstances" present?		V v	'es <u>X</u> No	
	instances presenti			<u> </u>	S
Are Vegetation	, Soil, or Hydology	significar	ntly disturbed?	l.	Yes No <u>_X</u>
Are Vegetation	, Soil, or Hydrology	naturall	y problematic?	?	Yes NoX
(If needed, explair	n any answers in Remarks.)				
SUMMARY OF	FINDINGS – Attach site m	ap showin	ig sampling	point loca	itions, transects, important features, etc.
Hydrophytic Vege		No			
Hydric Soil Preser		No		the Sampled	
Wetland Hydrolog	y Present? Yes_X_	No	wit	thin a Wetlar	nd? Yes_ <u>X_</u> No
Remarks:					
This is a slope we	tland with a depressional compo	nent.			
VEGETATION -	 Use scientific names of 	plants.			Dominance Test Worksheet:
Tree Stratum) (Plot size:)	Absolute	Dominate	Indicator	
		%Cover	Species?	Status	Number of Dominant Species
1					That Are OBL, FACW, or FAC
2					(excluding FAC-):2_(A)
3				 	Total Number of Dominant
					Species Across All Strata:2 (B)
4					(-)
			=Total Cover		Percent of Dominant Species
Sapling/Shru	b Stratum (Plot size:)				That are OBL FACW, or FAC: 100 (A/B)
1	· · · · · · · · · · · · · · · · · · ·				Prevalence Index Worksheet:
2					Total % Cover of: Multiple by:
					OBL species x 1 =
3					FACW species x 2 =
4					FAC species x 3 =
5					FACU species x 4 =
			=Total Cover		UPL species x 5 =
Herb Stratum	n (Plot size: 20sf)				Column Totals:A)(B)
1 Scirpus validus	<u>11101 3126. 2031 1</u>	40	Y	OBL	\mathbf{D} as unlarged in day = \mathbf{D}/\mathbf{A} =
2 Eleocharis palus	stric	40	Y	OBL	Prevalence Index = B/A =
3 Carex lanuginos		5	N	OBL	Hydrophytic Vegetation Indicators:
4 Potentilla anseri		3	N	OBL	X_Dominance Test is >50%
5 Carex acuatilis	inu	1	N	OBL	Prevalence Index is $\leq 3.0^1$
		1			Morphological Adaptations ¹ (Provide
6 Mentha arvensis		1	N	FACW	supporting data in Remarks or on a separate sheet)
7					Problematic Hydrophytic Vegetation ¹ (Explain)
8					¹ Indicators of hydric soil and wetland hydrology must
9					be present, unless disturbed or problematic.
10					
		90%	=Total Cover		Hydrophytic Vegetation Present?
	Stratum (Plot size:)				YesXNo
1					4
2					1
			=Total Cover		
% Bare Ground in	Herb Stratum10%				
					······································

Remarks:

		t the indicator or confirm the absence of indicators.)	<u>VL-39</u>
Depth <u>Matrix</u> inches) Color (moist)	Redox Fea	atures Type ¹ Loc ² Texture	
0-6" 10YR 2 /1	NA	Peat	-
$\frac{1011(2/1)}{5-20"}$ 2.5Y 3/2	<u>NA</u>	Mucky Peat	
$\frac{1}{20+}$ " $\frac{1}{2.5Y}$ $\frac{4}{2}$	<u>NA</u>	Peaty clay	
		2	
	<u>Depletion, RM=Reduced Matrix, CS=Co</u> Applicable to all LRRs, unless oth		
X_Histosol (A1)	Sandy Gleyed Matri	rix (S4)1 cm Muck (A9) (LRR I, J)	
Histic Epipedon (A2) Black Histic (A3)	Sandy Redox (S5) Striped Matrix (s6)	Coast Prairie Redox (A16) (LRR F, G Dark Surface (S7) (LRR G)	S, H)
Hydrogen Sulfide (A4)	Loamy Mucky Miner	ral (F1)High Plains Depressions (F16)	
Stratified Layers (A5) (LR		rix (F2) (LRR H outside of MLRA 72 & 73)	
1 cm Muck (A9) (LRR F, (Depleted Below Dark Suri			
Thick Dark Surface (A12)	Depleted Dark Surfa	face (F7) Other (Explain in Remarks)	
Sandy Mucky Mineral (S1 2.5 Mucky Peat or Peat (S			
5 cm Mucky Peat or Peat			
estrictive Layer (if present	t)·		
Туре:		Hydric Soil Present? Yes <u>X</u> No	
Depth (inches) : Remarks:			
Remarks:	· · · · ·	ч.	
			1
IYDROLOGY			
Vetland Hydrology Indicators:			
Primary Indicators (minimum of c	one required; check all that apply)	Secondary Indicators (minimum of two required)	
X_Surface Water (A1)	Salt Crust (B11)	Sparsely Vegetated Concave Surface (B8)	
		(C1)Drainage Patterns (B10)	
X_Saturation (A3)	Hydrogen Sulfide Odor (0		
	Hydrogen Sulfide Odor ((Dry Season Water Table Oxidized Rhizospheres o	e (C2)Oxidized Rhizospheres on Living Roots (C3)	
X_Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3)	Dry Season Water Table Oxidized Rhizospheres o (where not tilled)	e (C2)Oxidized Rhizospheres on Living Roots (C3) on Living Roots (C3)Orayfish Burrows (C8)	
X_Saturation (A3) _Water Marks (B1) _Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) _Iron Deposits (B5)	Dry Season Water Table Oxidized Rhizospheres o (where not tilled) Presence of Reduced Iron Thin Muck Surface (C7)	e (C2)Oxidized Rhizospheres on Living Roots (C3)Oxidized Rhizospheres on Living Roots (C4)Oxidized Rhizospheres on Living Roots (C4)	
K_Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial II	Dry Season Water Table Oxidized Rhizospheres o (where not tilled) Presence of Reduced Iron Thin Muck Surface (C7)	e (C2)Oxidized Rhizospheres on Living Roots (C3)Oxidized Rhizospheres on Living Roots (C4)Oxidized Rhizospheres on Li	
X_Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5)	Dry Season Water Table Oxidized Rhizospheres o (where not tilled) Presence of Reduced Iron Thin Muck Surface (C7)	e (C2)Oxidized Rhizospheres on Living Roots (C3)Oxidized Rhizospheres on Living Roots (C4)Oxidized Rhizospheres on Living Roots (C4)	
X Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial II Water-Stained Leave (B9)	Dry Season Water Table Oxidized Rhizospheres o (where not tilled) Presence of Reduced Iron Thin Muck Surface (C7)	e (C2)Oxidized Rhizospheres on Living Roots (C3)Oxidized Rhizospheres on Living Roots (C4)Oxidized Rhizospheres on Li	
X Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial II Water-Stained Leave (B9)	Dry Season Water Table Oxidized Rhizospheres o (where not tilled) Presence of Reduced Iron Thin Muck Surface (C7)	e (C2)Oxidized Rhizospheres on Living Roots (C3)Oxidized Rhizospheres on Living Roots (C5)Oxidized Rhizospheres on Living Roots (C3)Oxidized R	
X_Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial In Water-Stained Leave (B9) ield Observations: urface Water Present? Yes_X	Dry Season Water Table Oxidized Rhizospheres o (where not tilled) Presence of Reduced Iron Thin Muck Surface (C7) magery (B7)Other (Explain in Remark	e (C2)Oxidized Rhizospheres on Living Roots (C3)Oxidized Rhizospheres on Living Roots (C4)Oxidized Rhizospheres on Li	
X_Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial In Water-Stained Leave (B9) ield Observations: urface Water Present? Yes_X /ater Table Present? Yes_X	Dry Season Water Table Oxidized Rhizospheres o (where not tilled) Presence of Reduced Irou Thin Muck Surface (C7) magery (B7)Other (Explain in Remark Other (Explain in Remark	e (C2)Oxidized Rhizospheres on Living Roots (C3)Oxidized Rhizospheres on Living Roots (C5)Oxidized Rhizospheres on Living Roots (C3)Oxidized R	
X Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial In Water-Stained Leave (B9) Field Observations: Surface Water Present? Yes_X Vater Table Present? Yes_X	Dry Season Water Table Oxidized Rhizospheres o (where not tilled) Presence of Reduced Iron Thin Muck Surface (C7) magery (B7)Other (Explain in Remark	e (C2)Oxidized Rhizospheres on Living Roots (C3)Oxidized Rhizospheres on Living Roots (C3)	
X Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial In Water-Stained Leave (B9) Iteld Observations: Surface Water Present? Yes_X Vater Table Present? Yes_X aturation Present? Yes_X Saturated to the surface with surface wit	Dry Season Water Table Oxidized Rhizospheres o (where not tilled) Presence of Reduced Irou Thin Muck Surface (C7) magery (B7)Other (Explain in Remark Other (Explain in Remark	e (C2)Oxidized Rhizospheres on Living Roots (C3)Oxidized Rhizospheres on Living Root	
X_Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial In Water-Stained Leave (B9) ield Observations: iurface Water Present? Yes_X Vater Table Present? Yes_X iaturation Present? Yes_X includes capillary fringe) Saturated to the surface with so it at depth of 8".	Dry Season Water TableOxidized Rhizospheres o (where not tilled)Presence of Reduced IronThin Muck Surface (C7) magery (B7)Other (Explain in Remark	e (C2)Oxidized Rhizospheres on Living Roots (C3)Oxidized Rhizospheres (C9)Oxidized Rhizospheres (C9)Geomorphic Position (D2)FAC-Neutral Test (D5)FAC-Neutral Test (D5)Frost-Heave Hummocks (D7) (LRR F)Ves_X_NoYes_X_No	
X_Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial In Water-Stained Leave (B9) ield Observations: urface Water Present? Yes_X /ater Table Present? Yes_X aturation Present? Yes_X aturation Present? Yes_X includes capillary fringe) Saturated to the surface with so it at depth of 8".	Dry Season Water TableOxidized Rhizospheres o (where not tilled)Presence of Reduced IronThin Muck Surface (C7) magery (B7)Other (Explain in Remark	e (C2)Oxidized Rhizospheres on Living Roots (C3)Oxidized Rhizospheres (C9)Oxidized Rhizospheres (C9)Geomorphic Position (D2)FAC-Neutral Test (D5)FAC-Neutral Test (D5)Frost-Heave Hummocks (D7) (LRR F)Ves_X_NoYes_X_No	
X_Saturation (A3) 	Dry Season Water TableOxidized Rhizospheres o (where not tilled)Presence of Reduced IronThin Muck Surface (C7) magery (B7)Other (Explain in Remark	e (C2)Oxidized Rhizospheres on Living Roots (C3)Oxidized Rhizospheres (C9)Oxidized Rhizospheres (C9)Geomorphic Position (D2)FAC-Neutral Test (D5)FAC-Neutral Test (D5)Frost-Heave Hummocks (D7) (LRR F)Ves_X_NoYes_X_No	
X_Saturation (A3) 	Dry Season Water TableOxidized Rhizospheres o (where not tilled)Presence of Reduced IronThin Muck Surface (C7) magery (B7)Other (Explain in Remark	e (C2)Oxidized Rhizospheres on Living Roots (C3)Oxidized Rhizospheres (C9)Oxidized Rhizospheres (C9)Geomorphic Position (D2)FAC-Neutral Test (D5)FAC-Neutral Test (D5)Frost-Heave Hummocks (D7) (LRR F)Ves_X_NoYes_X_No	

Project/Site:	Ludeman License Area					Sampling Date:	6/3/2008
Applicant/Owner:						City/County:	Converse County
Investigator(s):	K. LaClair, W. Stansbury	Section,	Township,Ran	ige: Sec 36	5, T34N R73W	State: WY	-
Landform (hillslope	, terrace, etc.):Hillslop	<u>be</u>	Local relie	f (concave,	convex, none) _	concave Slo	pe (%) <u>17%</u>
Subregion (LRR):_	LRR H	Lat:	-105.561	Lon	g: <u>42.873</u>	Datum:	<u>NAD-83</u>
Soil Map Unit Nam	e: <u>127-Clarkelen Dra</u>	knab complex	NWI c	lassification	PEMF	Sampling P	oint <u>WL-40</u>
Are climate/hydroid	gic conditions on the sit nstances" present?	e typical for this ti	me of year? Y	es <u>x</u> N /es_X_N	o (If no, e	xplain in Remarks.)	
Are Normal Circun	nstances present?		T	es <u> </u>	0		
					· . ·		
Are Vegetation	, Soil, or Hydold	ogy significar	ntly disturbed?	>		Yes	NoX
Are Vegetation	, Soil, or Hydrol	ogynaturall	y problematic	?		Yes	No <u>X</u>
(If needed, explain	any answers in Remark	s.)					
	INDINGS – Attach s		ig sampling	point loca	ations, transe	cts, important fe	atures, etc.
Hydrophytic Vegeta		<u>XNo</u>					
Hydric Soil Present		X No		the Sampled		V Na	
Wetland Hydrology	Present? Yes_	<u>XNo</u>	Wi	thin a Wetla	na? res	XNo	
Remarks:	nd with a dominant	monont					
i nis is a slope wetla	nd with a depressional cor	nponent.					
VEGETATION	Use scientific name	e of planta			D a !	T	
		Absolute	Dominate	Indicator	Uominance	Test Worksheet:	
Tree Stratum		%Cover	Species?	Status	Number of D	ominant Species	
1		700000	Opecies !			L, FACW, or FAC	
					(excluding F/		<u> </u>
2							
3						r of Dominant	0 (D)
4					- Species Acro	oss All Strata:	<u> 2 (</u> B)
			=Total Cover		Percent of D	ominant Species	
Sapling/Shruh	Stratum (Plot size:	<u> </u>			That are OB	L,FACW, or FAC:	100 (A/B)
	Stratum (Fiot Size.	┙					,
1						Index Worksheet:	Multiple by:
2					R		
3					EACW species	es x 1 =	
4					FAC species	x 3 =	
5					FACU specie	es x 4 =	
			=Total Cover		UPL species	x 5 =	
Herb Stratum	(Plot size: 20sf	\			Column Tota	als:A)	(B)
1 Potentilla anserin			Y	OBL			
2 Carex aquatilis	u	40 40	Y Y	OBL	Prevalence	Index = B/A =	
3 Eleocharis palust	ric	5	N N	OBL	Hydrophytic	Vegetation Indica	tors:
4 Scirpus american		1	N N	OBL		ance Test is >50%	
5 Equisetum laevig		1	N	FAC		ence Index is ≤ 3.0	1
	******		<u> </u>		–Morph	ological Adaptations	s ¹ (Provide
6					supporting d	ata in Remarks or o	n a separate sheet)
					Proble	matic Hydrophytic \	/egetation ¹ (Explain)
8						of hydric soil and we	tland hydrology must
9 10				ļ,		inless disturbed or p	
10			=Total Cover		<u>}</u>		
	· · · · · · · · · · · · · · · · · · ·	87%	- Total Cover	ļ		Vegetation Present?	2
	tratum (Plot size:	<u> </u>			^{Yes} <u>X</u>	_ No	
1					-		
2			Tatal Carro		-		
04 Dans Carried	Line Otratura to m		=Total Cover		L		
% Bare Ground In	Herb Stratum <u>13%</u>	<u> </u>					
L							

Remarks: Typhus angustifolia is present in adjacent ponded area.

SOIL Profile Description: (Describe to the	depth needed to a	document	the indic	ator o	Sampling PointWL-40 or confirm the absence of indicators.)					
Depth <u>Matrix</u> (inches) Color (moist) %		Redox Fea %		Loc ²						
0-2" 7.5YR 2.5/1	7.5YR 4/6	<2%	<u>C</u>	M						
$\frac{2-10"}{2-10"} \frac{7.5 \text{YR } 3/1}{} \dots$	2 5VD 1/6	1007	<u> </u>		Silt Loam with decomposing organics					
$\frac{2-10}{10+"}$ <u>5Y 5/1</u>	2.5YR 4/6 7.5YR 4/6	$\frac{10\%}{10\%}$	<u>C</u>	<u>M</u> M	Mottles: fine to med., common & prominent Sand Mottles: fine to med., common & prominent					
		<u></u>								
¹ Type: C=Concentration, D=Depletion,	RM=Reduced Matr	rix, CS=Co	overed or (Coated	Sand Grains. ² Location: PL=Pore Lining, M=Matrix.					
Histosol (A1) Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4) Stratified Layers (A5) (LRR F) 1 cm Muck (A9) (LRR F, G, H) Depleted Below Dark Surface (A12) Thick Dark Surface (A12) Sandy Mucky Mineral (S1)	Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils ³ :									
Restrictive Layer (if present): Type:			Hydri	c Soil E	Present? YesXNo					
Depth (inches) : Remarks:			riyun		Hesent: Tes <u>A</u> NO					
Remarks.										
HYDROLOGY										
Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one required</u> <u>X</u> Surface Water (A1) <u>X</u> Saturation (A3) <u>Water Marks (B1)</u> <u>Sediment Deposits (B2)</u> <u>Drift Deposits (B3)</u> <u>Algal Mat or Crust (B4)</u> <u>Iron Deposits (B5)</u> <u>Inundation Visible on Aerial Imagery (B7</u> <u>Water-Stained Leave (B9)</u>	Salt Crust (B' Hydrogen Su Dry Season V Oxidized Rhiz (where not ti Presence of F Thin Muck Su	11) Ilfide Odor (Nater Table zospheres d Iled) Reduced Iro urface (C7)	e (C2) on Living Ro n (C4)	oots (C3	Secondary Indicators (minimum of two required) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) 3) (where tilled) Crayfish Burrows (C8) Saturation Visible of Aerial Imagery (C9) Geomorphic Position (D2) FAC-Neutral Test (D5) Frost-Heave Hummocks (D7) (LRR F)					
Field Observations: Surface Water Present? Yes_X_ No Water Table Present? Yes_ X_ No	_ Depth (inches)< _ Depth (inches)1				tland Hydrology Present? sX_No					
Saturation Present? Yes X No (includes capillary fringe) * Saturated to the surface with some areas pit at depth of 10".	_ Depth (inches)	anding wat								
Describe Recorded Data (stream gauge previous inspections), if available:	e, monitoring well, a	aerial phot	:OS,							
Remarks:										

	Ludeman License Area				Sampling Date: 8/6/2008
Applicant/Owner:		n Townshin F	Concos Con 10	0 8 20 724	City/County: Converse County N, R72W State: WY
					N, R72W State: WY none)
	LRR H				ng: 42.895 Datum: <u>NAD-83</u>
	ne: 172-Hiland-Bowbac fine				
·				NWI classi	fication L2ABFh Sampling Point WL-41
		pical for this t	me of year? Y	'es_ <u>X</u> _N	lo (If no, explain in Remarks.)
Are "Normal Circu	Imstances" present?		Y	′es <u>X</u> N	lo
Are Vegetation	, Soil, or Hydology_	significa	ntly disturbed?	,	Yes NoX
Are Vegetation	, Soil, or Hydrology_ , Soil, or Hydrology	signincal natural	ly problematic	2	Yes No_X
(If needed, explain	n any answers in Remarks.)		ly problematic	I	
• • •	•	man showir	na samnlina	noint loc	ations, transects, important features, etc.
Hydrophytic Vege			ig sampling	point loc	ations, transects, important reatures, etc.
Hydric Soil Prese		_ No	lst	the Sample	d Area
Wetland Hydrolog	v Present? Yes X	No		thin a Wetla	
Remarks:					
	ntermittent wetlands (WL-41a t	hrough WL-41	f) that are disco	onnected dep	pressions along the same drainage that lead to Gilbert Lake (WL-
	is a diked drainage. They range				
VEGETATION -	- Use scientific names of	f plants.			Dominance Test Worksheet:
	n (Plot size:)	Absolute	Dominate	Indicator	
<u>nee olidian</u>	<u>(11013)20.</u> /	%Cover	Species?	Status	Number of Dominant Species
1					That Are OBL, FACW, or FAC
2	· · · · · · · · · · · · · · · · · · ·	-			(excluding FAC-):1(A)
3					 Total Number of Dominant
3					Species Across All Strata:1(B)
4					
			=Total Cover		Percent of Dominant Species
Sapling/Shru	ib Stratum (Plot size:)				That are OBL, FACW, or FAC: 100 (A/B)
1	······································				Prevalence Index Worksheet:
2		· · · · · · · · · · · · · · · · · · ·			<u>Total % Cover of:</u> Multiple by:
					OBL species x 1 =
3					FACW species x 2 =
4					FAC species x 3 =
5					FACU species x 4 =
			=Total Cover		- UPL species x 5 =
Herb Stratun	n (Plot size: 20sf)				Column Totals:A)(B)
1 Eleocharis palu		44	Y	OBL	Prevalence Index = B/A =
2 Lappula redowsk		5	N	NL	
3 Hordeum jubatur		1	N	FACW	Hydrophytic Vegetation Indicators:
4					X_Dominance Test is >50%
5					Prevalence Index is $\leq 3.0^1$
6					Morphological Adaptations ¹ (Provide
7					_ supporting data in Remarks or on a separate sheet) _ Problematic Hydrophytic Vegetation ¹ (Explain)
8					
9	•				¹ Indicators of hydric soil and wetland hydrology must
10		-			be present, unless disturbed or problematic.
		40%	=Total Cover		Hydrophytic Vegetation Present?
Woody Vine	Stratum (Plot size:)		1	l	YesX No
1					
2					
			=Total Cover		
% Bare Ground in	Herb Stratum60%		- I		•
				· · · •	
Remarks:					

3

SOIL Profile Description: (Describe to the Depth Matrix		l ocument Redox Fea		cator or	[,] confirm the	Sampling PointWL-41 absence of indicators.)			
(inches) Color (moist) %	Color (moist)	%	Type ¹	Loc ²	Texture				
0-5" 2.5Y 5/1 5-12" 2.5Y 5/2	7.5YR 5/8 7.5YR 5/8	<u>2%</u> 40%	<u>C</u>	<u>M</u> M	Sandy loam Sandy loam	<u>Mottles: fine, common, prominent</u> <u>Mottles: medium to coarse, many, prominent</u> Oxidized root channels in 0-5"			
¹ Type: C=Concentration, D=Depletion,									
Hydric Soil Indicators: (Applicab Histosol (A1) Black Histic (A3) Hydrogen Sulfide (A4) Stratified Layers (A5) (LRR F) 1 cm Muck (A9) (LRR F, G, H) Depleted Below Dark Surface (A12) Thick Dark Surface (A12) Sandy Mucky Mineral (S1) Som Mucky Peat or Peat (S2) (LRR 5 cm Mucky Peat or Peat (S3) (LR)	Sandy Gle Sandy Re Striped Ma Loamy Mi Loamy Gle Depleted M Depleted Redox De Redox De G,H) High Plair	yed Matrix dox (S5) atrix (S6) ucky Mine eyed Matri Matrix (F3) rk Surface Dark Surface pressions	x (S4) ral (F1) x (F2)) e (F6) ace (F7) s (F8) sions (F1		1 ci Co Da Hii Re Re Re Ott ³ Indici we	ors for Problematic Hydric Soils ³ : m Muck (A9) (LRR I, J) ast Prairie Redox (A16) (LRR F, G, H) ark Surface (S7) (LRR G) gh Plains Depressions (F16) RR H outside of MLRA 72 & 73) duced Vertic (F18) d Parent Material (TF2) her (Explain in Remarks) ators of hydrophytic vegetation and titand hydrology must be present, alless disturbed or problematic			
Restrictive Layer (if present): Type: Depth (inches) : Remarks: HYDROLOGY			Hydi	ric Soil F	Present? Ye	es <u>X</u> No			
Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required)									
Field Observations: Surface Water Present? Yes X No Water Table Present? Yes No Saturation Present? Yes Includes capillary fringe) No	Depth (inches)4 { Depth (inches) { Depth (inches)				land Hydrology				
Describe Recorded Data (stream gaug previous inspections), if available:	e, monitoring well, a	erial phot	os,						
Remarks:									

Application Charlow one Charlow one Charlow one Charlow one Converse County Investigation3 With Name 28.20 Converse County State WY Sold Map Unit Name 28.20 Determining Converse County State WY An of Intermity County State W State W State W State W Are Intermity fordig conditions on the side byEach for his time of year? Yes No No No Are Vegetation Soll or Hydologysignificantly disturbed? Yes No No Are Vegetation Soll or Hydologysignificantly disturbed? Yes No No Are Vegetation Plance Soll or Hydologysignificantly disturbed? Yes No No Are Vegetation Plance Soll or Hydologysignificantly disturbed? Yes No No Sold Map Urbit Soll Plance Yes No Intermity Problemate? No Sold Map Urbit Soll Plance Yes No	•	Ludeman License Area			10-1	Samplin		8/6/2008
Landform (hillslope, farrace, etc.) Depression Local relief (concave, convex, none) cd.2899 Datum: NAD-33 Soli Map Unit Name cd.2899 Datum: NAD-33 Sampling Point_WL+d2 Are Vagetation sol								Converse County
Subregion (LRR)_LR2H Lat105.55 Long42.890 Data Data Are dimatchydrologic conditions on the site typical for this time of yea?? Yes No(fine, explain in Remarks.) Sampling Point_W1_42 Are Normal Circumstances' present? Yes No No Are VegetationSoll or Hydrologynaturally problematic? Yes No No YesNO Yes No No No SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc. Hydrophylic Vegetation Present? No SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc. Hydrophylic Vegetation Present? No Submark YesNO								<i>nt</i>
Soil May Unit Name252-Ulint-Forkwood loams NW classification _PUSC	Landform (hillslope, Subregion (LPP):	, terrace, etc.): <u>Depression</u>	Local re	lief (concave, 4	convex, nor	e) <u>concave</u> Slope		
Are dimeterhydrologic conditions on the site typical for this time of year? Yes	Soil Map Unit Name	258-Ulm-Forkwood loams	Lai	105.555	L0/ N/	VI classification PUSC	Sar	mpling Point WL-42
Are 'Normal Circumstances' present? Yes No				me of vear? Y				npinig i ont <u>_112 42</u>
Are Vegetation Soil or Hydrology significantly disturbed? Yes No_X Are Vegetation Soil or Hydrology neturally problematic? Yes No_X (ff needed, explain any answers in Remarks.) SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc. Hydrolytic Vegetation Present? Yes_X No_X Metiand Hydrology Present? Yes_X No_ within a Welland? Yes_X No_ The Stratum (Plot size. Absolute Dominate Indicator No_Dit FACV, or FAC (A) 3 Absolute Dominate Species? Status No (A) (A) 4 Absolute Dominate Species? No (A) (A) (A) 4 Accover Species? Status No (A) (A) (A) 4 Accover Species Status No (A) (A) (A) 5 Ascover of Species No (A) (A) (A) (A) 2 Ascover of Status (A) (A) (A) (A) 4 Ascover							,	
Are VegetationSoll or Hydrologynaturally problematic? Yes No Yes No No SUMMARY OF FINDINGS - Attach sits map showing sampling point locations, transects, important features, etc. Hydrophylic Vegetation Present? Yes No Interview Yes No Wetland Hydrology Present? Yes No Yes Absolute Dominant Species 1 Species Arces All Strata: 1						· · ·		
Are VegetationSoll or Hydrologynaturally problematic? Yes No Yes No No SUMMARY OF FINDINGS - Attach sits map showing sampling point locations, transects, important features, etc. Hydrophylic Vegetation Present? Yes No Interview Yes No Wetland Hydrology Present? Yes No Yes Absolute Dominant Species 1 Species Arces All Strata: 1	A			the distant sile		Mari		NI T T
(ff needed, explain any answers in Remarks.) SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc. Hydrophytic Vegetation Present? Yes_X Yes No						Yes		No <u>X</u>
SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc. Hydrophytic Vegetation Present? Yes_X_No	(If needed, evolution	_, Soli, of Hydrology_		y problematic	ſ	165		NO <u>X</u>
hydrophytic Vegetation Present? Yes_X_No			on chowin	a complina	noint loo	tiono tronocoto imp	artant fa	sturse sta
Hydric Soli Present? Yes_X No				iy sampiny	point loca	alons, transects, impo	Sriant le	atures, etc.
Wetland Hydrology Present? Yes_X_No_ within a Wetland? Yes_X_No_ Remarks: This is an isolated depression in rolling rangeland. Dominance Test Worksheet: Number of Dominant Species 1 Kover Species? Status 2 Absolute Species? Number of Dominant Species 2 Image: Species? Status Number of Dominant Species 3 Image: Species? Total Number of Dominant Species Image: Species? 4 Image: Species? Image: Species? Image: Species? Image: Species? 4 Image: Species? Image: Species? Image: Species? Image: Species? 3 Image: Species? Image: Species? Image: Species? Image: Species? 4 Image: Species? Image: Species? Image: Species? Image: Species? 2 Image: Species? Image: Species? Image: Species? Image: Species? 3 Image: Species? Image: Species? Image: Species? Image: Species? 3 Image: Species? Image: Species? Image: Species? Image: Species? Image: Species? 4 Ima	Hydric Soil Present		No	le '	tha Sampla			
Remarks: This is an isolated depression in rolling rangeland. VEGETATION - Use scientific names of plants. 1 Absolute 2 Absolute 3 Absolute 4 Species? 5 Frotal Cover 5 Frotal Cover 4 Frotal Cover 9 Species? 1 Frotal Cover Provalence Index Worksheet: 100 (A/B) Prevalence Index Worksheet: 100 (A/B) 1 Frotal Cover 1 Exclusion Inductors: 2 Saphing/Shrub Stratum (Plot size: 20sf) 4 Frotal Cover 1 Nordeaun publicity 1 Nordeaun publicity 2 Saphing/Shrub Stratum (Plot size: 20sf) 4 Frotal Cover 1 Nordeaun publicity 1 Nordeaun publicity 2 Saphing/Shr	Wetland Hydrology	Present? Yes X	No					
This is an isolated depression in rolling rangeland. VEGETATION - Use scientific names of plants. Iee Stratum (Plot size: Absolute Version Species? Status Status Iee Stratum (Plot size: Absolute Septing/Shrub Stratum (Plot size: Iee Stratum (Plot size: Iee Stratum (Plot size: Iee Stratum (Plot size: Septing/Shrub Stratum (Plot size: Iee Stratum (Plot size: Iee Stratum (Plot size: Iee Stratum (Plot size:			···•					
Tree Stratum (Plot size: Absolute %Cover Dominate Status Indicator Status 1		pression in rolling rangeland.						
Tree Stratum (Plot size: Absolute %Cover Dominate Status Indicator Status 1								
Tree Stratum (Plot size: Absolute %Cover Dominate Status Indicator Status 1	VEGETATION -	Use scientific names of	olants.			Dominance Test Wor	ksheet:	
1 %Cover Species? Status Number of Dominant Species 1 1 1 A 1 1 (a) 3 1 1 A 1 (b) (c)				Dominate	Indicator	1		
2		<u></u>			Status		•	
2	1						or FAC	· · · ·
3	2					(excluding FAC-):		1(A)
4						Total Number of Domin	nant	
4 =Total Cover Percent of Dominant Species 1 =Total Cover That are OBL_FACW, or FAC: 100 (A/B) 2 1 Intervention 3 1 Intervention 4 1 FACU species x 1 =						1		1 (B)
Sapling/Shrub Stratum (Plot size: Image: Stratum (Plot s	4					┨. '		、 /
Applind Shado Shadon (Prof Size.) Image: Constraint of the second se				=Total Cover				
2 Image: Second sec	Sapling/Shrub	Stratum (Plot size:)				That are OBL, FACW,	or FAC:	100 (A/B)
2	1							
3	2							
4	3					OBL species	x1=	
5	4	· · · · · · · · · · · · · · · · · · ·					X2=	
Image: statum (Plot size: 20sf) Image: statum (Plot size: 20sf) <td< td=""><td></td><td></td><td></td><td></td><td></td><td>FACU species</td><td>x4=</td><td></td></td<>						FACU species	x4=	
Herb Stratum (Plot size: 20sf) Column Totals:A)(B) 1 Eleocharis palustris 34 Y OBL 2 Ambrosia tomentosa 5 N NL 3 Hordeum jubatum 1 N FACW 4	5			=Total Cover		UPL species	x 5 =	
Itero Stratum (Plot size:) 34 Y OBL 1 1 N FACW Prevalence Index = B/A = 2 Ambrosia tomentosa 5 N NL 3 Hordeum jubatum 1 N FACW 4						Column Totals:	A)	(B)
2 Ambrosia tomentosa 5 N NL Intervalence index = D/A =			24		0.01			
3 Hordeum jubatum 1 N FACW 4				_		Prevalence Index = B/	'A =	
4		ia						
5			1	ÎN	FACW			tors:
3								1
7								
8						supporting data in Ren	harks or o	n a separate sheet)
9 1						Problematic Hyd	Irophytic V	egetation' (Explain)
10 be present, unless disturbed or problematic. 40% =Total Cover Woody Vine Stratum (Plot size:)						¹ Indicators of hydric se	oil and we	land hydrology must
ID ID 40% =Total Cover Woody Vine Stratum (Plot size:) Hydrophytic Vegetation Present? 1 YesX_No 2 Image: Stratum (Stratum						be present, unless dist	urbed or p	problematic.
Woody Vine Stratum (Plot size:) Yes 1 2 8 Bare Ground in Herb Stratum			10.07	=Total Cover		ļ	•	
1	101		40%					
2 =Total Cover 9% Bare Ground in Herb Stratum60%		ratum (Plot size:)				1 es <u>X</u> NO		
% Bare Ground in Herb Stratum60%						-		
% Bare Ground in Herb Stratum60%	L			=Total Cover		4		
	% Bare Ground in F	Herh Stratum 60%				I		
Remarks:			-			1		
Remarks:		<u> </u>			á á			
	Bomarka				<u>.</u> .			

SOIL Profile Description: (Describe to the depth needed to document the indica	Sampling Point <u>WL-42</u> ator or confirm the absence of indicators.)
Depth Matrix Redox Features (inches) Color (moist) % Color (moist) % Type ¹	Loc ² Texture
<u>0-8"</u> <u>2.5Y 5/1</u>	Clay loam
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Co	
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise not strip of the strip of	 1 cm Muck (A9) (LRR I, J) Coast Prairie Redox (A16) (LRR F, G, H) Dark Surface (S7) (LRR G) High Plains Depressions (F16) (LRR H outside of MLRA 72 & 73) Reduced Vertic (F18) Red Parent Material (TF2) Other (Explain in Remarks) ³ Indicators of hydrophytic vegetation and
Restrictive Layer (if present): Type: Hydric	Soil Present? Yes X No
Depth (inches) : Remarks:	
HYDROLOGY	
Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Surface Water (A1) Salt Crust (B11) Saturation (A3) Hydrogen Sulfide Odor (C1) Water Marks (B1) Dry Season Water Table (C2) Sediment Deposits (B2) Oxidized Rhizospheres on Living Ro Drift Deposits (B3) (where not tilled) Algal Mat or Crust (B4) Presence of Reduced Iron (C4) Iron Deposits (B5) Thin Muck Surface (C7) Inundation Visible on Aerial Imagery (B7) Other (Explain in Remarks) Water-Stained Leave (B9)	Secondary Indicators (minimum of two required) Sparsely Vegetated Concave Surface (B8) Z Drainage Patterns (B10) Oxidized Rhizospheres on Living Roots (C3) (where tilled) Crayfish Burrows (C8) Saturation Visible of Aerial Imagery (C9) Geomorphic Position (D2) X_FAC-Neutral Test (D5) Frost-Heave Hummocks (D7) (LRR F)
Field Observations:	Wetland Hydrology Present?
Surface Water Present? YesNoXDepth (inches) Water Table Present? YesNoXDepth (inches) Saturation Present? YesNoXDepth (inches) (includes capillary fringe) No	Yes <u>X</u> No
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

Applicant/Commer Unrukum One City/County: Converse County Innedistance: K. LaClair Secion Township, Range: Seci 23.45.34.18.173W State: WY Landform (hillslope, Ierrade, etc.) Depression in drainage: Lact: 105.22.52 Long 42.88 Datum: NAD-83 Soli Map Unit Name: 25.11-headle-Kishnan-Shindle Joams. 253-Usite: Formation of the site typical for this time of year? Yew Sampling Point_WI-43 Are Yournal Circumstances' present? Sampling Point_WI-43 Are Vegetation: Soli	Project/Site: Lud	leman License Area				Sampling Date: 8/7/08
Landom (Nillslop, terrad, etc.) Depression in dminage Local relief (concave, convex, none) Dotum: NAD-33 Soli Map Unit Name 25.11 Description Aza 88 Soli Map Unit Name 25.11 Description Sampling Point Are dimatehydroicgic conditions on the site typical for this time of year? Yes No (fino. explain in Remarks.) No Are Vegetation Are Vegetation Soli or Hydrologynaturally problematic? Yes No No SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc. Hydrolypic Vegetation Present? Yes No SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc. Hydrolypic Vegetation Present? Yes No Summary of intermittent wetlands (WL-43a drough WL-43d) that are diomnected depressions within the same drainage. They range in size from 0.01 aces to 0.12 acres. No Yes No						
Subregion (LRR)LRR HLitet105.592 Long42.886Dutu:::NDC-83 Soli Map Util Name: <u>51:Theediet Kishnes:Shinel Kenner</u> (Sing Buth Insernarks.) Sampling PointWL-43 No lassificationPlusch Sampling PointWL-43 Are Komma Circumstances' present? YesN No Are VegetationSoli or Hydologysignificantly disturbed? YesN No Are VegetationSoli or Hydologysignificantly disturbed? YesN No Are Vegetation Present? YesN No SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc. Hydrophylic Vegetation Present? Yes No is the Sampled Area No Wotiand Hydrology Present? Yes No is the Sampled Area Wotiand Hydrology Present? Yes No Is the Sampled Area Wotiand Hydrology Present? Yes No No Yee Solide Or Linz areas Solide Dominate Mydrologic Present? Yes No Yee Absolute Dominate Mydrologic Present? Yes No Yes Absolute Dominate Mydrologic Present? Yes No						
Soli Mep Unit Name 251-Theadle-Kishona-Shindle Leams 283-Justic Toricichents, sullied NMI classification PUSCh Sampling Point_W1_43 Are dimatehydrologic conditions on the site typical for this time of yea? Yes No		race, etc.): <u>Depression in</u>	n drainage	Local relief		
NWI classificationPUSChSampling Point_WL-43 Are dimatehydrologic conditions on the site typical for this time of yea? Yes No Within a Welland? Yes No Yes No Is the Sampled Area Welland Hydrokoly Present? Yes No Within a Welland? Yes No Item for intermittent wetlands (WL-43a through WL-43d) that are discomected depressions within the same drainage. They range in size Track colspan= colspan="2">Colspan= colspan= colspan= colspan="2" <th< td=""><td>Subregion (LRR): LR</td><td><u>K H</u> 251 Theedle Kishona Shi</td><td> Lat:</td><td>-105.592</td><td></td><td></td></th<>	Subregion (LRR): LR	<u>K H</u> 251 Theedle Kishona Shi	Lat:	-105.592		
Are climatelhydrologic conditions on the site typical for this time of year? Yea No		251-111eeule-Nishona-511	ngie ioams, a	203-05110 1011	NWI class	
Are 'Normal Circumstances' present? Yes X No	Are climate/hvdrologic	conditions on the site typ	ical for this ti	me of vear? Y		
Are VegetationSoil or Hydologynaturally problematic? YesNo Are VegetationSoil or Hydologynaturally problematic? YesNo (If needed, explain any answers in Remarks.) SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc. Hydrophytic Vegetation Present? YesNo Is the Sampled Area Wettand Hydrology Present? YesNo Is the Sampled Area Yes No Is the Sampled Area Yes Absolut by the NRCS. Dominance Test Worksheet: Number of Dominant Species 1						
Are VegetationSoli or Hydrologynatrally problematic? Yes No SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc. Hydrophytic Vegetation Present? Yes No		•				· · ·
Are VegetationSoli or Hydrologynatrally problematic? Yes No SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc. Hydrophytic Vegetation Present? Yes No		0 11				
(ff needed, explain any answers in Remarks.) SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc. Hydrophytic Vegetation Present? Yes_X_No						Yes No_X Yes No_X
SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc. Hydrophytic Vegetation Present? Yes_X_No	/If needed explain any	soli, or Hydrology	natural	y problematic	ę.	
Hydrophylic Vegetation Present? Yes_X_No			an chowir	a complina	noint loca	tions transacts important factures ato
Hydric Soll Present? Yes_X No				ig sampling		ations, transects, important leatures, etc.
Wetland Hydrology Present? Yes_X_No		Yes X		ls	the Sampler	1 Area
Remarks: This is a string of intermittent wetlands (WL-43t) that are disconnected depressions within the same drainage. They range in size from 0.001 acres to 0.125 acres. Soil Unit 263 is listed as hydric by the NRCS. VEGETATION - Use scientific names of plants. Dominants Species 1 Absolute Dominant 2 Absolute Species? 3		esent? Yes X	No			
This is a string of intermittent wethands (WL-43) that are disconnected depressions within the same drainage. They range in size from 0.001 acres to 0.125 acres. Soil Unit 263 is listed as hydric by the NRCS. VEGETATION - Use scientific names of plants. Tee Stratum (Plot size: Absolute Dominate Indicator 1 Mode of the size: Absolute Dominate That Are OBL, FACW, or FAC (excluding FAC-); 2 (A) 2 Image: Colspan="2">Control of Dominant Species 3 Image: Colspan="2">Image: Colspan="2">Colspan="2" 4 Image: Colspan="2" Image: Colspan="2"						
See Countific names of plata is hydric by the NRCS. VEGETATION – Use scientific names of platas. Tree Stratum (Plot size: Absolute Dominance Text Are OBL, FACW, or FAC (excluding FAC-): 2		nittent wetlands (WL-43a th	rough WL-43	d) that are disc	onnected depr	ressions within the same drainage. They range in size
Tree Stratum (Plot size: Absolute %Cover Dominate Species? Indicator Status 1						
Tree Stratum (Plot size: Absolute %Cover Dominate Species? Indicator Status 1	VEGETATION - Us	e scientific names of	plants.			Dominance Test Worksheet:
1 %Cover Species? Status Number of Dominant Species 1 1 1 Total Number of Dominant 2 (a) 3 1 1 Total Number of Dominant 2 (b) 3 1 1 Species Across All Strata: 2 (b) 4 1 1 Percent of Dominant Species 100 (A/B) 1 1 1 Provalence Index Worksheet: 100 (A/B) 2 1 1 Provalence Index Worksheet: 100 (A/B) 3 1 1 Provalence Index Worksheet: 100 (A/B) 3 1 1 Provalence Index Worksheet: 100 (A/B) 3 1 1 Provalence Index is a set and				Dominate	Indicator	
2	<u></u>					Number of Dominant Species
2	1					
3	2	- · · · · · · · · · · · · · · · · · · ·				(excluding FAC-):2 (A)
4						Total Number of Dominant
4 =Total Cover Percent of Dominant Species 1 =Total Cover That are OBL_FACW, or FAC: 100 (A/B) 1 100 (A/B) 2 100 (A/B) 3 100 Prevalence Index Worksheet: 101 100 Prevalence Index Worksheet: 102 100 (A/B) 4 100 Prevalence Index Worksheet: 100 Prevalence Index Worksheet: 100 100 Prevalence Multiple by: 0BL species x 1 = 100 FAC Uspecies x 3 = 100 11 Prevalence Index is 2 = 100 11 100 Y NL 11 100 Y NL 11 100 Y Prevalence Index is 3 0.1 100 Y NL Prevalence Index is 3 0.1 100 Y NL Norphological Adaptations1 (Provide supporting data in Remarks or on a separate sheet) 100 100 100 100 100 100 100 100 100 100 <td></td> <td></td> <td> </td> <td></td> <td></td> <td></td>						
Sapling/Shrub Stratum (Plot size:) That are OBL_FACW, or FAC:100 (A/B) 1 That are OBL_FACW, or FAC:100 (A/B) 2	4					
Selating Stricts I Prevalence Index Worksheet: 1 Image: Strict of the stri				=Total Cover		
2 India % Cover of: Multiple by: 3 India % Cover of: Multiple by: 4 India % Cover of: Multiple by: 4 India % Cover of: Multiple by: 5 India % Cover of: Multiple by: 6 India % FACW species 1 Mbrosia tomentosa 10 Y 1 Mbrosia tomentosa 10 Y 2 Hordown jubatum 10 Y FACW 4 Agropyron smithii 1 N FACU 5 Prevalence Index = B/A =	Sapling/Shrub Str	ratum (Plot size:)				That are OBL, FACW, or FAC: 100 (A/B)
2	1					
3 A A A 4 A A A 5 B B B B 1 Argrogyno smithit 1 N FACU species X 4 =	2					Total % Cover of: Multiple by:
4	3					OBL species x 1 =
5						
Image: stratum (Plot size: 20sf) Image: stratum (Plot size: 20sf				· · · · · · · · · · · · · · · · · · ·		FAC species X 3 =
Herb Stratum (Plot size: 20sf)	5					UPL species x 5 =
Hero Stratum (Plot size: 20sf) I I Prevalence Index = B/A = 1 Ambrosia tomentosa 10 Y NL 1 Ambrosia tomentosa 10 Y NL 2 Hordeum jubatum 10 Y FACW 4 Agropyron smithii 1 N FACU 5 Poa compressa 1 N FACU 6				= I otal Cover		
1 Ambrosia tomentosa 10 Y NL 2 Hordeum jubatum 10 Y FACW 4 Agropyron smithii 1 N FACU 5 Poa compressa 1 N FACU 6 1 N FACU		<u>ot size: 20sf)</u>				
2 Hordeum jubatum 10 Y FACW 4 Agropyron smithii 1 N FACU 5 Poa compressa 1 N FACU 6 1 N FACU 7 1 N FACU 8 9 1 N 9 1 N Prevalence Index is < 3.0 ¹ 9 1 N Prevalence Index is < 3.0 ¹ 10 1 N FACU 10 1 N FACU 10 1 N FACU 10 10 1 N 10 35% =Total Cover 1 N FACU Hydrophytic Vegetation Present? Yes X No 1 N FACU Yes 1 N FACU Yes 10 1 Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. 1 Yes X No 2 1 1 Intext or yes						Prevalence Index = B/A =
4 Agropyron smithii 1 N FACU						
Stratum Image: Second pressa Image: Seco	· · · · · · · · · · · · · · · · · · ·		-			
6 1						
0			1	<u>N</u>	FACU	
8						supporting data in Remarks or on a separate sheet)
9 1 Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. 10 35% =Total Cover 35% =Total Cover Hydrophytic Vegetation Present? 10 Yes X 10 10 10 35% =Total Cover Hydrophytic Vegetation Present? Yes X No 2 10 10 8 Bare Ground in Herb Stratum 65%				 		Problematic Hydrophytic Vegetation ¹ (Explain)
10 be present, unless disturbed or problematic. 35% =Total Cover Woody Vine Stratum (Plot size:) Hydrophytic Vegetation Present? 1 YesX_ No 2 Image: Stratum (Plot Stratum) 8 Bare Ground in Herb Stratum65%						¹ Indicators of hydric soil and watland hydrology must
35% =Total Cover Woody Vine Stratum (Plot size:) 1 2 Bare Ground in Herb Stratum 65%			1			
Woody Vine Stratum (Plot size:) Implifying vegetation Present? 1			2E M	=Total Cover		· · · · · · · · · · · · · · · · · · ·
1	141. 1 10. 41.					
2 =Total Cover % Bare Ground in Herb Stratum65%		um (Plot size:)				
% Bare Ground in Herb Stratum65%	· · ·					-
% Bare Ground in Herb Stratum65%	۷	·		=Total Cover		4
	% Bare Ground in Hor	h Stratum 65%				L.,
Remarks:		5 Guatum <u>05 %</u>	_			
Remarks:						· · · · · · · · · · · · · · · · · · ·
	Remarks:				· · · · · · · · · · · · · · · · · · ·	

December 2009

SOIL Profile Description: (Describe to the depth needed to document the indic Depth Matrix Redox Features	Sampling Point <u>WL-43</u> ator or confirm the absence of indicators.)
(inches) Color (moist) % Color (moist) % Type ¹	Loc ² Texture
0-6" 10YR 4/2 7.5YR 5/8 <2% C	M Silty loam Mottles: fine, few, prominent OXidized root channels in 0-6"
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or	
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise of the statistic (A1)	1 cm Muck (A9) (LRR I, J) Coast Prairie Redox (A16) (LRR F, G, H) Dark Surface (S7) (LRR G) High Plains Depressions (F16) (LRR H outside of MLRA 72 & 73) Reduced Vertic (F18) Red Parent Material (TF2) Other (Explain in Remarks) ³ Indicators of hydrophytic vegetation and
Restrictive Layer (if present): Type:	c Soil Present? Yes <u>X</u> No
Wetland Hydrology Indicators:	
Primary Indicators (minimum of one required; check all that apply) Surface Water (A1) Salt Crust (B11) Saturation (A3) Hydrogen Sulfide Odor (C1) Water Marks (B1) Dry Season Water Table (C2) Sediment Deposits (B2) X_Oxidized Rhizospheres on Living F Drift Deposits (B3) (where not tilled) Algal Mat or Crust (B4) Presence of Reduced Iron (C4) Iron Deposits (B5) Thin Muck Surface (C7) Inundation Visible on Aerial Imagery (B7) Other (Explain in Remarks) Water-Stained Leave (B9)	Secondary Indicators (minimum of two required)Sparsely Vegetated Concave Surface (B8)Drainage Patterns (B10)Oxidized Rhizospheres on Living Roots (C3) (where tilled)Crayfish Burrows (C8)Saturation Visible of Aerial Imagery (C9)Geomorphic Position (D2)FAC-Neutral Test (D5)Frost-Heave Hummocks (D7) (LRR F)
Field Observations:	Wetland Hydrology Present?
Surface Water Present? YesNo_X Depth (inches) Water Table Present? YesNo_X Depth (inches) Saturation Present? YesNo_X Depth (inches) (includes capillary fringe) VesNo_X Depth (inches)	Yes <u>X</u> No
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	



٦.

.

i.

ADDENDUM 3.5-K

WILDLIFE SPECIES LIST

.



Table 3.5-20 BLM Vertebrate Sensitive Species List¹ for the proposed Ludeman Project

Common Name (scientific name)	Primary Nesting Habitat(s)	Observed in Ludeman Permit Area	Observed in Ludeman Survey Area ²
Mammals		r	
Long-eared Myotis (Myotis evotis)	Conifer and deciduous forest, caves and mines	No	No
Fringed Myotis (Myotis thysanodes)	Conifer forests, woodland chaparral, caves and mines	No	No
Spotted Bat (Euderma maculatum)	Cliffs over perennial water, basin-prairie shrub	No	No
Townsend's Big-eared Bat (Corynorhinus townsendii)	Forests, basin-prairie shrub, caves and mines	No	No
White-tailed Prairie Dog (Cynomys leucurus)	Basin-prairie shrub, grasslands	No	No
Black-tailed Prairie Dog (Cynomys ludovicianus)	Short-grass/mid-grass grasslands	Yes	Yes
Swift Fox (Vulpes velox)	Grasslands	No	Yes (road mortality)
Birds			
White-faced Ibis (Plegadis chihi)	Marshes, wet meadows	No	No
Trumpeter Swan (Cygnus buccinator)	Lakes, ponds, rivers	No	No
Bald Eagle (Haliaeetus leucocephalus)	Riparian	No	Yes
Northern Goshawk (Accipiter gentilis)	Conifer and deciduous forests	No	No
Ferruginous Hawk (Buteo regalis)	Basin-prairie shrub, grasslands, rock outcrops	Yes	Yes
Peregrine falcon (Falco peregrinus)	Tall cliffs	No	No
Greater Sage-grouse (Centrocercus urophasianus)	Basin-prairie shrub, mountain-foothill shrub	Yes	No
Long-billed Curlew (Numenius americanus)	Grasslands, plains, foothills, wet meadows	No	No
Mountain Plover (Charadrius montanus)	Short-grass/mid-grass grasslands, basin-prairie shrubs	No	No



Common Name (scientific name)	Primary Nesting Habitat(s)	Observed in Ludeman Permit Area	Observed in Ludeman Survey Area	
Birds - Continued				
Yellow-billed Cuckoo (Coccyzus americanus)	Open woodlands, streamside willow and alder groves	No	No	
Sage Thrasher (Oreoscoptes montanus)	Basin-prairie shrub, mountain-foothill shrub	No	No	
Loggerhead Shrike (Lanius ludovicianus)	Basin-prairie shrub, mountain-foothill shrub	Yes	Yes	
Brewer's Sparrow (Spizella breweri)	Basin-prairie shrub	No	No	
Sage Sparrow (Amphispiza billneata)	Basin-prairie shrub, mountain-foothill shrub	No	No	
Baird's Sparrow (Ammodramus bairdii)	Grasslands, weedy fields	No	No	
Amphibians				
Northern Leopard Frog (Rana pipiens)	Beaver ponds, permanent water in plains and foothills	No	No	

¹ List for Casper Field Office obtained from BLM website (September 2002) with update from BLM ² Survey Area = 1 mile beyond the project area for raptors and grouse; ½-mile for other species.
* Observations during wildlife surveys conducted between February and September 2008.



Table 3.5-21 USFWS Migratory Bird Species of Management Concern (Non-coal) for the proposed Ludeman Project

Common Name ¹ (scientific name)	Primary Nesting Habitat(s)	Occurrence ² in Ludeman Permit Area	Occurrence in Ludeman Survey Area ³	
	Level I Species – Conservati	on Action Needed		
Mountain Plover	Short-grass prairie, shrub-	Not observed	Not observed	
(Charadrius montanus)	steppe	Not observed	INUL OUSEIVED	
Trumpeter Swan	Wetlands	Not observed	Not observed	
(Cygnus buccinator)	wettands		not observed	
Greater Sage-grouse	Shrub-steppe	Observed ⁴	Not observed	
(Centrocercus urophasianus)	Sinub-steppe	Observed		
McCown's Longspur	Short-grass prairie, shrub-	Not observed	Not observed	
(Calcarius mccownii)	steppe	Not observed	INOLOUSEIVEU	
Baird's Sparrow	Short-grass prairie	Not observed	Not observed	
(Ammodramus bairdii)	Short-grass prairie	Not observed	INOU OUSEIVED	
Ferruginous Hawk	Shruh stoppo grasslanda	Observed breader	Observed	
(Buteo regalis)	Shrub-steppe, grasslands	Observed, breeder	Observed	
Brewer's Sparrow	Shrub-steppe,	Not observed	Not observed	
(Spizella breweri)	montane shrublands	Not observed	INOL OUSEIVED	
Wilson's Phalarope	Wetlands	Not observed	Not observed	
(Phalaropus tricolor)	wettallus	not observed	Not observed	
Franklin's Gull	Wetlands	Not observed	Not observed	
(Larus pipixcan)	wetlands	Not observed	Not observed	
Sage Sparrow	Shrub-steppe,	Not observed	Not observed	
(Amphispiza belli)	montane shrublands	not observed	Not observed	
Swainson's Hawk	Plains/Basin riparian,	Observed	Net shaamid	
(Buteo swainsoni)	grasslands	Observed	Not observed	
Long-billed Curlew	Short manainin	Not absorved	NI 4 -1	
(Numenius americanus)	Short-grass prairie	Not observed	Not observed	
Short-eared Owl	Short-grass prairie,	Observed	Not choosed	
(Asio flammeus)	shrub-steppe	Observed	Not observed	
Northern Goshawk	Conifor conor	Not obcomind	Not showing	
(Accipiter gentiles)	Conifer, aspen	Not observed	Not observed	
Peregrine Falcon	Cliffs	NI-4 -h-amod	NL-4 showing d	
(Falco peregrinus)	Cillis	Not observed	Not observed	
Burrowing Owl	Grasslands,	Obecard	Net ak	
(Athene cunicularia)	shrub-steppe	Observed	Not observed	
Forster's Tern	Wetlands	NT-4-1 1	NI-4-1 1	
(Sterna forsteri)	wetlands	Not observed	Not observed	
Bald Eagle	Dingrise	Not al	Obscriet	
(Haliaeetus leucocephalus)	Riparian	Not observed	Observed	
Upland Sandpiper	Short-grass prairie,	NI-4 -1 1	NT 4 -1 1	
(Bartramia longicauda)	shrub-steppe	Not observed	Not observed	



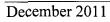
Table 3.5-21 Continued

Common Name ¹ (scientific name)	Primary Nesting Habitat(s)	Occurrence ² in Ludeman Permit Area	Occurrence in Ludeman Survey Area ³	
	Level I Species – C	ontinued	iti et Médiphisi publicity dan antara di seconda di s	
Black Tern (Chlidonia niger)	Wetlands	Not observed	Not observed	
Whooping Crane				
(Grus americana)	Wetlands	Not observed	Not observed	
Piping Plover				
(Charadrius melodus)	Wetlands, aquatic	Not observed	Not observed	
	II Species – Continued Mo	nitoring Recommended		
Calliope Humming bird	Mid-elevation conifers,		In the second	
(Stellula calliope)	montane riparian	Not observed	Not observed	
Lewis Woodpecker	Low elevation conifer,			
(Melanerpes lewis)	plains/basin riparian	Not observed	Not observed	
Cassin's Kingbird	Juniper Woodland			
(Tyrannus vociferans)	Plain/basin riparian	Not observed	Not observed	
Lark Bunting	Shortgrass prairie,	Observed,	01 1	
(Calamospiza melanocorys)	shrub steppe	presumed breeder	Observed	
American White Pelican	Aquatic-rivers, lakes,	Net choused	NI-4 -1	
(Pelecanus erythrorhynchos)	ponds Not observed		Not observed	
William's Sapsucker	Mid-elevation conifer	Not observed	Not observed	
(Sphyrapicus thyroideus)		Not observed	Not observed	
Black-backed Woodpecker	Mid-elevation conifer, Not observed		Not observed	
(Picoides arcticus)	High elevation conifer	Not observed	not observed	
Gray Flycatcher	Juniper woodland,	Not observed	Not observed	
(Empidonax wrightii)	mountain-foothills shrub			
Juniper Titmouse	Juniper woodlands	Not observed	Not observed	
(Baeolophus ridgwayi)	Jumper Woodiands			
Dickcissel	Shortgrass prairie	Not observed	Not observed	
(Spiza americana)		The observed		
Chestnut-collared Longspur	Shortgrass prairie	Not observed	Not observed	
(Calcarius ornatus)			11000000011000	
Harlequin Duck	Montane riparian	Not observed	Not observed	
(Histrionicus histrionicus)				
Snowy Plover	Wetlands	Not observed	Not observed	
(Charadrius alexandrinus)				
Black-chinned Hummingbird	Plains/basin riparian,	Not observed	Not observed	
(Archilochus alexandri)	shrub-steppe			
Rufous Hummingbird	Mid-elevation conifer	Not observed	Not observed	
(Selasphorus rufus)				



Table 3.5-21 Continued

Common Name ¹ (scientific name)	Primary Nesting Habitat(s)	Occurrence ² in Ludeman Permit Area	Occurrence in Ludeman Survey Area ³
	Level II Species – (
Red-naped Sapsucker (Sphyrapicus nuchalis)	Aspen	Not observed	Not observed
AmericanThree-toedWoodpecker(Picoides dorsalis)	Mid-elevation conifer, high elevation conifer	Not observed	Not observed
Willow Flycatcher (Empidonax traillii)	Montane riparian Plains/basin riparian	Not observed	Not observed
Hammond's Flycatcher (Epidonax hammondii)	Higher-elevation confer with aspen, montane riparian	Not observed	Not observed
Codilleran Flycatcher (Empidonax occidentalis)	Montane riparian, mid-elevation conifer	Not observed	Not observed
Pygmy Nuthatch (Sitta pygmaea)	Low-elevation conifer	Not observed	Not observed
Marsh Wren (Cistothorus palustris)	Wetlands	Not observed	Not observed
American Dipper (Cinclus mexicanus)	Montane riparian	Not observed	Not observed
Plumbeous Vireo (Vireo plumbeus)	Mid-elevation conifer, low-elevation conifer	Not observed	Not observed
Townsend's Warbler (Dendroica townsendii)	High-elevation conifer, mid-elevation conifer	Not observed	Not observed
Dusky Flycatcher (Empidonax oberholseri)	Low-elevation conifer, aspen, mountain-foothills shrub	Not observed	Not observed
Western Bluebird (Sialia mexicana)	Juniper woodlands, low-elevation conifer	Not observed	Not observed
Sage Thrasher (Oreoscoptes montanus)	Shrub-steppe	Not observed	Not observed
Grasshopper Sparrow (Ammodramus savannarum)	Short-grass prairie, shrub-steppe	Not observed	Observed
Bobolink (Dolichonyx oryzivorus)	Short-grass prairie, shrub-steppe	Not observed	Not observed
Common Loon (Gavia immer)	Lakes, wetlands	Not observed	Not observed
Black-billed Cuckoo (Coccyzus erythropthalmus)	Plains/basin riparian	Not observed	Not observed



. •



Table 3.5-21 Continued

Common Name ¹ (scientific name)	Primary Nesting Habitat(s)	Occurrence ² in Ludeman Permit Area	Occurrence in Ludeman Survey Area ³		
Level II Species – Continued					
Red-headed Woodpecker (Melanerpes erythrocephalus)	Plains/basin riparian, low-elevation conifer	Not observed	Not observed		
Yellow-billed Cuckoo (Coccyzus americanus)	Plains/basin riparian	Not observed	Not observed		
Eastern Screech Owl (Megascops asio)	Plains/basin riparian	Not observed	Not observed		
Western Screech Owl (Megascops kennicottii)	Plains/basin riparian	Not observed	Not observed		
Great Gray Owl (Strix nebulosa)	Mid-elevation conifer, High-elevation conifer	Not observed	Not observed		
Boreal Owl (Aegolius funereus)	High elevation conifer	Not observed	Not observed		
Broad-tailed Hummingbird (Selasphorus platycercus)	Montane riparian, Plains/basin riparian mid-elevation conifer	Not observed	Not observed		
Western Scrub-Jay (Aphelocoma californica)	Juniper woodlands	Not observed	Not observed		
Loggerhead shrike (Lanius ludovicianus)	Shrub-steppe	Observed	Observed		
Vesper Sparrow (Pooecetes gramineus)	Shrub-steppe	Observed, presumed breeder	Observed		
Lark Sparrow (Chondestes grammacus)	Shrub-steppe	Observed	Not observed		
Golden-crowned Kinglet (Regulus satrapa)	High-elevation conifer	Not observed	Not observed		
McGillivray's Warbler (Oporornis tolmiei)	Montane riparian, Plains/basin riparian	Not observed	Not observed		
Ash-throated Flycatcher (Myiarchus cinerascens)	Juniper woodlands	Not observed	Not observed		
Bushtit (Psaltriparus minimus)	Juniper woodlands	Not observed	Not observed		
Brown Creeper (Certhia americana)	Mid-elevation conifer, high-elevation conifer	Not observed	Not observed		
Merlin (Falco columbarius)	Low-elevation conifer	Not observed	Not observed		
Sprague's Pipit (Anthus spragueii)	Grassland, Plains/Basin riparian, short-grass prairie	Not observed	Not observed		



Common Name ¹ (scientific name)	Primary Nesting Habitat(s)	Occurrence ² in Ludeman Permit Area	Occurrence in Ludeman Survey Area ³
an a	Level II Species –	Continued	
Barn Owl (Tyto alba)	Short-grass prairie, urban	Not observed	Not observed
White-faced Ibis (Plegadis chihi)	Wetland, aquatic	Not observed	Not observed
American Bittern (Botaurus lentiginosus)	Wetland, aquatic	Not observed	Not observed
Common Tern (Sterna hirundo)	Wetland, aquatic	Not observed	Not observed
Purple Martin (Progne subis)	Wetland, aquatic/Basin riparian, montane riparian	Not observed	Not observed

¹ Species are arranged in descending priority within each level, as assigned in the Wyoming Bird Conservation Plan (Cerovski et al. 2001). Level I species require "conservation action". Level II species require only monitoring.

² Observations during baseline wildlife surveys conducted between early February and early September 2008.

³ Survey Area = 1 mile beyond the project area for raptors and grouse; $\frac{1}{2}$ -mile for all other species.

⁴ No sage-grouse leks were found within the survey area (historically or during 2008 surveys). A few grouse were observed during summer and late autumn, but no breeding activity was documented in the area.

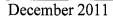




Table 3.5-22 Ludeman Project Wildlife Baseline Report - General Species Lists

POTENTIAL¹ AND OBSERVED MAMMALIAN SPECIES LIST

		Observed In	Recorded
In Common Nomo	Scientific Name	Ludomon Domuit ²	C
<u>Common Name</u> <u>Area³</u>	Scientific Name	Ludeman Permit ²	Survey
<u></u>			
INSECTIVORES			
Masked shrew	Sorex cinereus		
Merriam's shrew	Sorex merriami		
Vagrant shrew	Sorex vagrans		
BATS			
Small-footed myotis	Myotis ciliolabrum		
Long-eared myotis	Myotis evotis		
Northern myotis	Myotis septentrionalis		
Little brown myotis	Myotis lucifugus		
Long-legged myotis	Myotis volans		
Hoary bat	Lasiurus cinereus		
Silver-haired bat	Lasionycteris noctivagans		
Big brown bat	Eptesicus fuscus		
Townsend's big-eared bat	Plecotus townsendii		
HARES AND RABBITS			
Desert cottontail	Sylvilagus audubonii		
Mountain cottontail	Sylvilagus nuttallii		
Cottontail species	Sylvilagus spp.	Х	х
Black-tailed jackrabbit	Lepus californicus		
White-tailed jackrabbit	Lepus townsendii	Х	Х
<u>RODENTS</u>			
Least chipmunk	Tamias minimus		
Thirteen-lined ground	Spermophilus tridecemlineatus	X	X
squirrel	Spermophilus in luecemineallus	Л	А
Black-tailed prairie dog	Cynomys ludovicianus	Х	х
Northern pocket gopher	Thomomys talpoides		
Plains pocket gopher	Geomys bursarius		
Olive-backed pocket mouse	Perognathus fasciatus		
Silky pocket mouse	Perognathus flavus		
Hispid pocket mouse	Perognathus hispidus		
Ord's kangaroo rat	Dipodomys ordii		
Beaver	Castor canadensis		
Western harvest mouse	Reithrodontomys megalotis		
Plains harvest mouse	Reithrodontomys montanus		
White-footed mouse	Peromyscus leucopus		
Deer mouse	Peromyscus maniculatus	Х	
Northern grasshopper mouse	Onychomys leucogaster		
Bushy-tailed woodrat	Neotoma cinerea		
Table 3.5-22 Continued			



Long-tailed vole Prairie vole Meadow vole Sagebrush vole

Microtus longicaudus	
Microtus ochrogaster	
Microtus pennsylvanicus	
Lemmiscus curtatus	



POTENTIAL¹ AND OBSERVED MAMMALIAN SPECIES LIST (continued)

		Observed In	Recorded
In			_
Common Name	Scientific Name	Ludeman Permit ²	Survey
<u>Area³</u>			
RODENTS, cont.			
Muskrat	Ondatra zibethicus		
Norway rat	Rattus norvegicus		
House mouse	Mus musculus		
Meadow jumping mouse	Zapus hudsonius		
Porcupine	Erethizon dorsatum		
1 orcupine	Li etnizon doi satum		
CARNIV <u>ORES</u>			
Coyote	Canis latrans	Х	
Swift fox	Vulpes velox		х
Red fox	Vulpes vulpes		
Gray fox	Urocyon cinereoargenteus		
Raccoon	Procyon lotor		
Ermine	Mustela erminea		
Long-tailed weasel	Mustela frenata		
Black-footed ferret	Mustela nigripes		
Least weasel	Mustela nivalis		
Weasel species	Mustela spp.		
Mink	Mustela vison		
Badger	Taxidea taxus		х
Eastern spotted skunk	Spilogale putorius		
Striped skunk	Mephitis mephitis		
Mountain lion	Felis concolor		
Bobcat	Felis rufus		
INCLUATES			
<u>UNGULATES</u> Mule deer	Odocoileus hemionus	v	v
White-tailed deer		Х	Х
	Odocoileus virginianus	 X	 X
Pronghorn	Antilocapra americana	Λ	Х

¹ POTENTIAL OCCURRENCE--List derived from range and habitat information in Jones et al. (1983), Clark and Stromberg (1987), and Cerovski et al. (2004).

² OBSERVED IN LUDEMAN PERMIT--Species recorded during wildlife baseline studies in 2008.

³ RECORDED IN SURVEY AREA-- Species recorded in one-half mile survey perimeter in 2008.

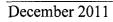


POTENTIAL¹ AND OBSERVED AVIAN SPECIES LIST

Ţ		Observed In	Recorded
In <u>Common Name</u> <u>Area³</u>	Scientific Name	Ludeman Permit ²	Survey
LOONS Common loon	Gavia immer		
<u>GREBES</u> Horned grebe Eared grebe Western grebe	Podiceps auritus Podiceps nigricollis Aechmorphorus occidentalis	 	
Pied-billed grebe	Podilymbus podiceps		
<u>PELICANS</u> White pelican	Pelecanus erythrorhynchos		
<u>CORMORANTS</u> Double-crested cormorant	Phalacrocorax auritus		
HERONS			`
American bittern	Botaurus lentiginosus		
Great blue heron	Ardea herodias	Х	
Black-crowned night heron	Nycticorax nycticorax		
White-faced ibis	Plegadis chihi		
SWANS, GEESE, AND DUCKS			
Tundra swan	Cygnus columbianus		
Trumpeter swan	Cygnus buccinator		
Canada goose	Branta canadensis		
White-fronted goose	Anser albifrons		
Snow goose	Chen caerulescens		
Mallard	Anas platyrhynchos	Х	
Gadwall	Anas strepera	Х	
Pintail	Anas acuta		
Green-winged teal	Anas crecca	Х	
Blue-winged teal	Anas discors		
Cinnamon teal	Anas cyanoptera		
American wigeon	Anas americana	Х	
Northern shoveler	Anas clypeata		Х
Wood duck	Aix sponsa		
Redhead	Aythya americana		
Ring-necked duck	Aythya collaris		
Canvasback	Aythya valisineria		
Greater scaup	Aythya marila		
Lesser scaup	Aythya affinis		
Common goldeneye	Bucephala clangula		



Barrow's goldeneye	Bucephala islandica	
Bufflehead	Bucephala albeola	
Ruddy duck	Oxyura jamaicensis	





POTENTIAL¹ AND OBSERVED AVIAN SPECIES LIST (continued)

Ţ		Observed In	Recorded
In Common Name	Sojontifio Nomo	Ludanan Damu'u ²	C
<u>Area³</u>	Scientific Name	Ludeman Permit ²	Survey
<u>Anda</u>			
SWANS, GEESE, AND DUCKS, c	ont.		
Hooded merganser	Lophodytes cucullatus		
Common merganser	Mergus merganser		
Red-breasted merganser	Mergus serrator		
DIURNAL RAPTORS			
Turkey vulture	Cathartes aura	Х	
Osprey	Pandion haliaetus		
Bald eagle	Haliaeetus leucocephalus		Х
Northern harrier	Circus cyaneus	Х	Х
Sharp-shinned hawk	Accipiter striatus		
Cooper's hawk	Accipiter cooperii		
Northern goshawk	Accipiter gentilis	•	
Red-tailed hawk	Buteo jamaicensis	Х	Х
Swainson's hawk	Buteo swainsoni	х	
Ferruginous hawk	Buteo regalis	Х	Х
Rough-legged hawk	Buteo lagopus		x
Golden eagle	Aquila chrysaetos	Х	x
American kestrel	Falco sparverius		x
Merlin	Falco columbarius		
Peregrine falcon	Falco peregrinus		
Gyrfalcon	Falco rusticolus		
Prairie falcon	Falco mexicanus		
GALLINACEOUS BIRDS			
Sharp-tailed grouse	Pedioecetus phasianellus		
Sage-grouse	Centrocercus urophasianus	Х	
Ring-necked pheasant	Phasianus colchicus		
Gray partridge	Perdix perdix		
Wild turkey	Meleagris gallopavo		
CRANES, RAILS, AND COOTS			
Sandhill crane	Grus canadensis		
Virginia rail	Rallus limicola		
Sora	Porzana carolina		
Yellow rail	Coturnicops noveboracensis		
American coot	Fulica americana		Х
SHOREBIRDS, GULLS, AND TEI	RNS		
American avocet	Recurvirostra americana		
Semipalmated plover	Charadrius semipalmatus		
Killdeer	Charadrius semipumatus Charadrius vociferus	x	X
	Characterias vocijeras	A	Λ



Mountain plover	Charadrius montanus	
Lesser golden plover	Pluvalis dominica	
Black-bellied plover	Pluvalis squatarola	



POTENTIAL¹ AND OBSERVED AVIAN SPECIES LIST (continued)

		Observed In	Recorded
In Common Norro	Saintifa Nama	L	0
<u>Common Name</u> <u>Area³</u>	Scientific Name	Ludeman Permit ²	Survey
Alea			
SHOREBIRDS, GULLS, AND TER	NS, cont.		
Hudsonian godwit	Limosa haemastica		
Marbled godwit	Limosa fedoa		
Whimbrel	Numenius phaeopus		
Long-billed curlew	Numenius americanus		
Upland sandpiper	Bartramia longicauda		
Greater yellowlegs	Tringa melanoleuca		
Lesser yellowlegs	Tringa flavipes		
Solitary sandpiper	Tringa solitaria		
Willet	Catoptrophorus semipalmatus		
Spotted sandpiper	Actitis macularia		
Wilson's phalarope	Steganopus tricolor	Х	
Northern phalarope	Lobipes lobatus		
Common snipe	Gallinago gallinago		
Short-billed dowitcher	Limnodromus griseus		
Long-billed dowitcher	Limnodromus scolopaceus		
Red knot	Calidris canutus		
Sanderling	Calidris alba		
Semipalmated sandpiper	Calidris pusilla		
Western sandpiper	Calidris mauri		
Least sandpiper	Calidris minutilla		
White-rumped sandpiper	Calidris fuscicollis		
Baird's sandpiper	Calidris bairdii		
Pectoral sandpiper	Calidris melanotos		
Stilt sandpiper	Micropalama himantopus		
Buff-breasted sandpiper	Tryngites subruficollis		
Herring gull	Larus argentatus		
California gull	Larus californicus		
Ring-billed gull	Larus delawarensis		
Franklin's gull	Larus pipixcan		
Bonaparte's gull	Larus philadelphia		
Forster's tern	Sterna forsteri		
Caspian tern	Sterna caspia		
Black tern	Childonias niger		
	C		
PIGEONS AND DOVES			
Rock dove	Columba livia		
Mourning dove	Zenaida macroura	Х	Х
CUCKOOS			
Black-billed cuckoo	Coccyzus erythropthalmus		
Yellow-billed cuckoo	Coccyzus erythiopinalmus Coccyzus americanus		
renow onice electo	Coccyzus americanus		



POTENTIAL¹ AND OBSERVED AVIAN SPECIES LIST (continued)

_		Observed In	Recorded
In .			a
Common Name	Scientific Name	Ludeman Permit ²	Survey
<u>Area³</u>			
OWLS			
Barn owl	Tyto alba		
Eastern screech owl	Otus asio		
Long-eared owl	Asio otus		
Short-eared owl	Asio flammeus	Х	
Great horned owl	Bubo virginianus	X	
Snowy owl	Nyctea scandiaca		
Burrowing owl	Athene cunicularia	Х	
Barred owl	Strix varia		
Northern saw-whet owl	Aegolius acadicus		
	negonus ucuneus		
<u>GOATSUCKERS</u>			
Common nighthawk	Chordeiles minor	Х	Х
Common poorwill	Phalaenoptilus nuttallii		
•	*		
<u>SWIFTS</u>			
Chimney swift	Chaetura pelagica		
White-throated swift	Aeronautes saxatalis		
HUMMINGBIRDS			
Broad-tailed hummingbird	Selasphorus platycercus		
Rufous hummingbird	Selasphorus rufus		
KINGFISHERS			
Belted kingfisher	Megaceryle alcyon		
<u>WOODPECKERS</u>			
Lewis' woodpecker	Melanerpes lewis		
Red-headed woodpecker	Melanerpes erythrocephalus		
Yellow-bellied sapsucker	Sphyripicus varius		
Williamson's sapsucker	Sphyripicus thyroideus		
Hairy woodpecker	Picoides villosus		
Downy woodpecker	Picoides pubescens		
Black-backed woodpecker	Picoides arcticus		
Northern flicker	Colaptes auratus		Х
Three-toed woodpecker	Picoides tridactylus		
FLYCATCHERS	-		
Western wood pewee	Contopus sordidulus		
Willow flycatcher	Empidonax traillii		



Least flycatcher	Empidonax minimus		
Dusky flycatcher	Empidonax oberholseri		
Cordilleran flycatcher	Empidonax occidentalis		
Eastern phoebe	Sayornis phoebe		
Say's phoebe	Sayornis saya	X	



-

Table 3.5-22 Continued

POTENTIAL¹ AND OBSERVED AVIAN SPECIES LIST (continued) Observed In

FOIENTIAL AND	DBSERVED AVIAN SPECIES LI	Observed In	Recorded
In			10000000
Common Name	Scientific Name	Ludeman Permit ²	Survey
<u>Area³</u>			
FLYCATCHERS, cont.	-		
Cassin's kingbird	Tyrannus vociferans		
Western kingbird	Tyrannus verticalis	Х	
Eastern kingbird	Tyrannus tyrannus		Х
LARKS			
Horned lark	Eremophila alpestris	Х	Х
	Li emoprina arpesir is		Λ
<u>SWALLOWS</u>			
Tree swallow	Tachycineta bicolor		
Violet-green swallow	Tachycineta thalassina		
Bank swallow	Riparia riparia		
Rough-winged swallow	Stelgidopteryx ruficollis		
Cliff swallow	Hirundo pyrrhonota		
Barn swallow	Hirundo rustica	Х	
Purple martin	Progne subis		
JAYS, MAGPIES, AND CROWS			
Gray jay	Perisoreus canadensis		
Blue jay	Cyanocitta cristata		
Pinyon jay	Gymnorhinus cyanocephalus		
Clark's nutcracker	Nucifraga columbiana		
Black-billed magpie	Pica pica		
Common raven	Corvus corax		
American crow	Corvus brachyrhynchos		Х
<u>CHICKADEE</u>			
Black-capped chickadee	Parus atricapillus		
Mountain chickadee	Parus gambeli		
	J. J		
NUTHATCHES			
Red-breasted nuthatch	Sitta canadensis		
White-breasted nuthatch	Sitta carolinensis		
Pygmy nuthatch	Sitta pygmaea		
Brown creeper	Certhia americana		
WDENIC			
<u>WRENS</u> Rock wren	Salpinatas absolatus	v	
House wren	Salpinctes obsoletus	Х	
TIOUSE WIEII	Troglodytes aedon		
GNATCHATERS AND KINGLETS			
Golden-crowned kinglet	Regulus satrapa		
Ruby-crowned kinglet	Regulus calendula		
	5		



POTENTIAL¹ AND OBSERVED AVIAN SPECIES LIST (continued)

T.		Observed In	Recorded
In <u>Common Name</u>	Scientific Name	Ludeman Permit ²	Survey
<u>Area³</u>			
THRUSHES			
Eastern bluebird	Sialia sialis		
Western bluebird	Sialia mexicana		
Mountain bluebird	Sialia currucoides		
Townsend's solitaire	Myadestes townsendi		
Veery	Catharus fuscescens		
Swainson's thrush	Catharus ustulatus		
Hermit thrush	Catharus guttatus		
American robin	Turdus migratorius	~~=	
MIMIC THRUSHES			
Mockingbird	Mimus polyglottos		
Gray catbird	Dumetella carolinensis		
Brown thrasher	Toxostoma rufum		
Sage thrasher	Oreoscoptes montanus		
<u>PIPITS</u>			
Water pipit	Anthus spinoletta		
Sprague's pipit	Anthus spragueii		
WAYWDICS			
<u>WAXWINGS</u> Bohemian waxwing	Pombusilla comulus		
Cedar waxwing	Bombycilla garrulus Bombycilla cedrorum		
Cedal waxwing	Bombycnia cearorum		
SHRIKES			
Northern shrike	Lanius excubitor		
Loggerhead shrike	Lanius ludovicianus	Х	Х
<u>STARLINGS</u>			
European starling	Sturnus vulgaris		
<u>VIREOS</u>			
Solitary vireo	Vireo solitarius		
Warbling vireo	Vireo gilvus		
Red-eyed vireo	Vireo olivaceus		
	r eo ourueeus		
WARBLERS	TZ		
Tennessee warbler	Vermivora peregrina		
Orange-crowned warbler	Vermivora celata Komivora milanilla		
Nashville warbler	Vermivora ruficapilla		



Yellow warbler	Dendroica petechia	
Magnolia warbler	Dendroica magnolia	
Black-throated blue	Dendroica caerulescens	
Yellow-rumped warbler	Dendroica coronata	
Townsend's warbler	Dendroica townsendi	



POTENTIAL¹ AND OBSERVED AVIAN SPECIES LIST (continued)

T.		Observed In	Recorded
In <u>Common Name</u> <u>Area³</u>	Scientific Name	Ludeman Permit ²	Survey
<u>WARBLERS</u> , cont. Chestnut-sided warbler			
Black-and-white warbler	Dendroica pensylvanica Mniotilta varia		
American redstart	Setophaga ruticilla		
Ovenbird	Seiurus aurocapillus		
Northern waterthrush	Seiurus noveboracensis		
MacGillivray's warbler	Oporornis tolmiei		
Common yellowthroat	Geothlypis trichas		
Hooded warbler	Wilsonia citrina		
Wilson's warbler	Wilsonia pusilla		
Yellow-breasted chat	Icteria virens		
TANAGERS			
Western Tanager	Piranga ludoviciana		
GROSBEAKS AND BUNTINGS			
Rose-breasted grosbeak	Pheucticus ludovicianus		
Black-headed grosbeak	Pheucticus melanocephalus		
Lazuli bunting	Passerina amoena		
Indigo bunting	Passerina cyanea		
Dickcissel	Spiza americana		
Evening grosbeak	Hesperiphona vespertina		
TOWHEES, SPARROWS, JUNCOS,			
Green-tailed towhee Rufous-sided towhee	Papilo chlorurus		
	Pipilo erythrophthalmus		
American tree sparrow Chipping sparrow	Spizella arborea Spizella passerina		
Clay-colored sparrow	Spizella pallida		
Brewer's sparrow	Spizella breweri		
Field sparrow	Spizella pusilla		
Vesper sparrow	Pooecetes gramineus	Х	х
Lark sparrow	Chondestes grammacus	x	
Sage sparrow	Amphispiza belli		
Lark bunting	Calamospiza melanocorys	Х	Х
Savannah sparrow	Passerculus sandwichensis		
Baird's sparrow	Ammodramus bairdii		
Grasshopper sparrow	Ammodramus savannarum		Х
Fox sparrow	Passerela iliaca		
Song sparrow	Melospiza melodia		
Lincoln's sparrow	Melospiza lincolnii		
White-throated sparrow	Zonotrichia albicollis		



White-crowned sparrow	Zonotrichia leucophrys	
Harris' sparrow	Zonotrichia querula	
Dark-eyed junco	Junco hyemalis	



POTENTIAL¹ AND OBSERVED AVIAN SPECIES LIST (continued)

		Observed In	Recorded
In		· · · · · · · · · · · · · · · · · · ·	~
Common Name	Scientific Name	Ludeman Permit ²	Survey
<u>Area³</u>			
TOWHEES, SPARROWS, JUNCOS	AND LONGSPURS, cont.		
McCown's longspur	Calcarius mccownii		
Lapland longspur	Calcarius lapponicus		
Chestnut-collared longspur	Calcarius ornatus		
Snow bunting	Plectrophenax nivalis		
BLACKBIRDS, MEADOWLARKS,	AND ORIOLES		
Bobolink	Dolichonyx oryzivorus		
Red-winged blackbird	Agelaius phoeniceus	Х	Х
Western meadowlark	Sturnella neglecta	Х	Х
Yellow-headed blackbird	Xanthocephalus xanthocephalus		
Rusty blackbird	Euphagus carolinus		
Brewer's blackbird	Euphagus cyanocephalus		
Common grackle	Quiscalus quiscula		
Brown-headed cowbird	Molothrus ater		
Northern oriole	Icterus galbula		
<u>FINCHES</u>			
Rosy finch	Leucosticte arctoa		
Pine grosbeak	Pinicola enucleator		
Purple finch	Carpodacus purpureus		
Cassin's finch	Carpodacus cassinii		
House finch	Carpodacus cassinii		
Red crossbill	Loxia curvirostra		
White-winged crossbill	Loxia leucoptera		
Common redpoll	Carduelis flammea		
Pine siskin	Carduelis pinus		
American goldfinch	Carduelis tristis		
WEAVER FINCHES			
House sparrow	Passer domesticus		

- ¹ POTENTIAL OCCURRENCE--List derived from range and habitat information in Petersen (1990), Stokes and Stokes (1996), and Cerovski et al. (2004). The species listed include those that might pass through the Ludeman Project area or survey area during migration.
- ² OBSERVED IN LUDEMAN PERMIT--Species recorded during wildlife baseline studies in 2008.
- ³ RECORDED IN SURVEY AREA-- Species recorded in one-half or one-mile (raptors, grouse) survey perimeter in 2008.



POTENTIAL¹ AND OBSERVED AMPHIBIAN AND REPTILE SPECIES LIST

T.		Observed In	Recorded
In <u>Common Name</u> <u>Area³</u>	Scientific Name	Ludeman Permit ²	Survey
SALAMANDERS Tiger salamander	<u>Ambystoma tigrinum</u>		
FROGS AND TOADS Northern leopard frog Boreal chorus frog Plains spadefoot Woodhouse's toad Great plains toad	Rana pipiens Pseudacris triseriata Scaphiopus bombifrons Bufo woodhousei Bufo cognatus	x 	x
<u>TURTLES</u> Common snapping turtle Western painted turtle Western spiny softshell	Chelydra serpentina Chrysemys picta Trionyx spiniferus	 	
<u>LIZARDS</u> Northern sagebrush lizard Shorthorned lizard	Sceloporus graciosus Phrymsoma douglassi		
SNAKES Plains hognose snake Eastern yellowbelly racer Smooth green snake Pale milk snake Bullsnake Wandering garter snake Western plains garter snake	Heterodon nasicus Coluber constrictor Opheodrys vernalis Lampropeltis triangulum Pituophis melanoleucas Thamnophis elegans Thamnophis radix Thamnophis sirtalis	 	 X
Prairie rattlesnake	Crotalus viridis		

- ¹ POTENTIAL OCCURRENCE--List derived from range and habitat information in Stebbins (1966) and Baxter and Stone (1980).
- ² OBSERVED IN LUDEMAN PERMIT--Species recorded during wildlife baseline studies in 2008.
- ³ RECORDED IN SURVEY AREA-- Species recorded in one-half mile survey perimeter in 2008.



TABLE OF CONTENTS

3.6 M	eteorology .		
3.6.1		n	
3.6.2		Overview	
3.6	2.1 Tempe	erature	
3.6	2.2 Relativ	ve Humidity	
3.6	2.3 Precip	itation	
3.6	2.4 Wind	Patterns	
3.6	2.5 Coolir	ng, Heating, and Growing Degree Days	
3.6.3	Site Specif	ic Analysis	
3.6	3.1 Tempe	erature	
3.6	3.2 Wind	Patterns	
3.6	3.3 Surrog	ate Site Justification and Specifications	
3.6	3.4 Upper	Atmosphere Characteristics	
3.6	3.5 Bodies	s of Water and Special Terrain Features	
3.6	3.6 Air Qı	ality	
3.6.4	References		

List of Figures

Figure 3.6-1:	NWS and Coal Mine Meteorological Stations	3.6-3
Figure 3.6-2:	Regional Annual Average Minimum Temperatures	3.6-5
Figure 3.6-3:	Regional Annual Average Minimum Temperatures	3.6-6
Figure 3.6-4:	Regional Annual Average Maximum Temperatures	3.6-7
Figure 3.6-5:	GCC (top) and Douglas AP (bottom) Seasonal Diurnal Temperat	ure
	Variations	3.6-8
Figure 3.6-6:	Mean Monthly and Hourly Relative Humidity for Casper Airport	WRDS,
	2007)	3.6-9
Figure 3.6-7:	Regional Annual Average Precipitation	3.6-11
Figure 3.6-8:	NWS Station Monthly Precipitation Averages (NCDC, 2007)	3.6-12
Figure 3.6-9:	NWS Station Monthly Snowfall Averages (NCDC, 2007)	3.6-13
Figure 3.6-10:	Regional Annual Average Snowfall	3.6-14
Figure 3.6-11:	Casper Airport Cooling, Heating, and Growing Degree Days (W	RCĊ
	2007)	3.6-17
Figure 3.6-12:	Douglas AP and GCC Seasonal Average Temperatures	3.6-18
Figure 3.6-13:	Douglas AP Meteorological Summary for 2003 – 2007	3.6-20
Figure 3.6-14:	GCC Meteorological Summary for 1997 – 2006	3.6-21
Figure 3.6-15:	GCC Seasonal Wind Roses	3.6-23
Figure 3.6-16:	Douglas AP Seasonal Wind Roses	3.6-24
Figure 3.6-17:	GCC and Douglas AP Annual Wind Roses	3.6-25



Figure 3.6-18: Monthly (top) and Seasonal (bottom) Wind Speed Averages t	for Douglas
AP and GCC	
Figure 3.6-19: Douglas AP Wind Summary	
Figure 3.6-20: GCC Wind Summary	
Figure 3.6-21: Douglas AP and GCC Wind Speed Frequency Distributions	
Figure 3.6-22: General Project Vicinity and Site Distance	
Figure 3.6-23: Proposed Project Area	
Figure 3.6-24: GCC Mine Area	

.

List of Tables

Yable 3.6-1: Meteorological Stations Included in Climate Analysis 3.6-1	Table 3.6-1:
Cable 3.6-2: Annual and Monthly Average Temperatures for GCC and Douglas AP	Table 3.6-2:
Yable 3.6-3: Douglas AP Monthly Wind Parameters Summary (NCDC, 2007)3.6-15	Table 3.6-3:
Cable 3.6-4: Douglas AP and GCC Max, Min, and Average Seasonal Temps 3.6-19	Table 3.6-4:
Cable 3.6-5: GCC Joint Frequency Distribution for 1997 -2006	Table 3.6-5:
Yable 3.6-6: GCC Monitoring Details 3.6-37	Table 3.6-6:
able 3.6-7: Black Thunder SODAR Results	Table 3.6-7:
Cable 3.6-8: Primary and Secondary Standards for each Criteria of Pollutants 3.6-44	Table 3.6-8:
able 3.6-9: Maximum allowable PSD increments for Class I and Class II Areas 3.6-45	Table 3.6-9:



3.6 METEOROLOGY

3.6.1 Introduction

Meteorological data has been compiled for 10 sites surrounding the proposed Ludeman Project (proposed project) area. Data was acquired through the Western Regional Climate Center (WRCC, 2007) for eight Cooperative Observer Program (COOP) and Automated Surface Observation Stations (ASOS) stations operated by the National Weather Service (NWS) including Casper Airport, Douglas AP (AP), Dull Center 1SE, Glenrock 5 ESE, Kaycee, Lance Creek 3 WNW, Midwest, and Reno. In addition, Glenrock Coal Company (GCC) and Antelope Coal Company (ACC) meteorological data have been obtained through Inter-Mountain Laboratories (IML). The latter two sites are operated in compliance with regulations set forth by the Wyoming Air Quality Division (AQD) for air quality monitoring. IML has maintained the sites and archived the data for nearly 20 years. Table 3.6-1 provides the station id, coordinates (UTM metric), and period of operation for each site.

Name	Agency	x	Y	Z(ft)	Years Operation
Antelope Coal Company	IML	474179	4816180	4675	1986-2007
Glenrock Coal Company	IML	431649	4767610	5674	1996-2007
Casper AP (112)	NWS	380229	4750539	5338	1948-2005
Douglas AP (118)	NWS	468655	4732910	4820	1909-2005
Dull Center ISE (71)	NWS	503239	4806131	4420	1926-2005
Kaycee (58)	NWS	368677	4840739	4660	1900-2005
Lance Creek 3 WNW (77)	NWS	528436	4782869	4340	1962-1984
Midwest (59)	NWS	396362	4806926	4820	1939-2005
Newcastle (67)	NWS	563497	4855516	4314	1952-2005
Reno (68)	NWS	458891	4836243	5080	1963-1983

 Table 3.6-1: Meteorological Stations Included in Climate Analysis

These 10 sites have been analyzed collectively to provide a regional climatic temperature and precipitation analysis that includes the proposed project area. Only the Douglas AP and GCC sites were analyzed for the regional wind summaries. The eight NWS sites have



been incorporated into the snowfall discussion as neither mine site records snowfall data. No on-site meteorological data is available for the proposed project site. Therefore, the combination of the Douglas AP and GCC sites will be substituted as the nearest representative data sets available for the site specific analysis. These two sites exhibit terrain similar to the project area and are located in the same region. Figure 3.6-1 shows the ten sites in relation to the proposed project boundary. As illustrated in the figure, Douglas AP and GCC are the closest available sites with wind data. The closest NWS operated station which continuously records all weather parameters is the Douglas AP site, some 15 miles to the southeast.

A regional overview is presented first. This section includes a discussion of the maximum and minimum temperature, relative humidity, annual precipitation including snowfall estimates, and a brief wind speed and direction summary. GCC and Douglas AP provide the closest wind data for the region. GCC is incorporated into the site specific analysis and a combination of Douglas AP and GCC is analyzed for the regional overview. The last portion of the regional analysis includes a general climate data summary from Casper. No such summary is available for Douglas AP.

A site specific analysis follows the regional overview. Much of this analysis is based on the Douglas AP and GCC meteorological data, with many of the same meteorological parameters listed previously. An in-depth wind analysis summarizes average wind speeds and directions, wind roses, wind speed frequency distributions, and a joint frequency distribution to characterize the wind data for the GCC site by stability class. A seasonal data discussion is included for the temperature and wind parameters. The seasonal classification does not coincide with official calendar seasons; rather, it uses three-month intervals as follows; January – March for winter, April-June for spring, July – September for summer, and October – December for fall. Beyond wind and temperature data, general climate data from the regional evaluation are deemed representative of the proposed project site.



URANIUM ONE USA, INC. NRC License SUA-1341 Amendment Application Ludeman Project Environmental Report

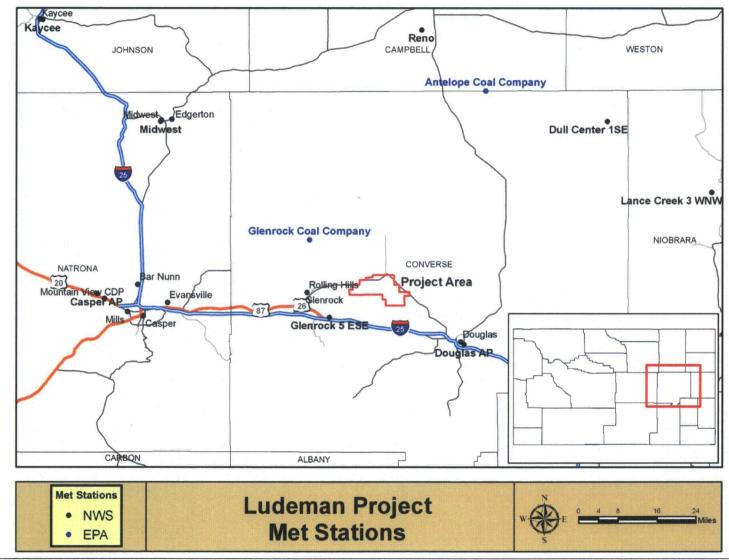


Figure 3.6-1: NWS and Coal Mine Meteorological Stations



3.6.2 Regional Overview

3.6.2.1 Temperature

The annual average temperature for the region is 47° F. Figure 3.6-2 shows monthly average temperatures for the GCC mine site and the Douglas AP site. As illustrated, the two sites exhibit very little difference in range of temperature. Douglas AP tends to be 2° to 4° warmer during the spring and summer months, nearly identical during the fall period, and slightly cooler for the winter months. July shows the highest average monthly temperatures followed by August. December records the lowest average temperatures for the year. Table 3.6-2 compares the monthly average temperatures for the sites. The slight differences in average temperatures are likely attributed to the proximity of the Douglas AP to the North Platte River. GCC lies in dry, rolling hills while Douglas AP is situated in a river valley.

Daily maximum temperatures in the proposed project region average approximately 59° F and daily minimum temperatures average approximately 34° F. July has the highest maximum temperatures with averages near 90° F while the lowest minimum temperatures are observed in January with averages near 10° F. Annual average minimum and maximum temperatures are shown in Figures 3.6-3 and 3.6-4, respectively.

Large diurnal temperature variations are found in the region due in large part to its high altitude and low humidity. Figure 3.6-5 depicts the seasonal diurnal temperature variations for the two sites. The site-specific monthly values are shown in Figure 3.6-2 and in Table 3.6-2. Spring and summer daily variations of 15° to 25° F are common with maximum temperature variations of 30 to 40° F observed during extremely dry periods. Less daily variation is observed during the cooler portions of the year as fall and winter have average variations of 10° to 15° F.

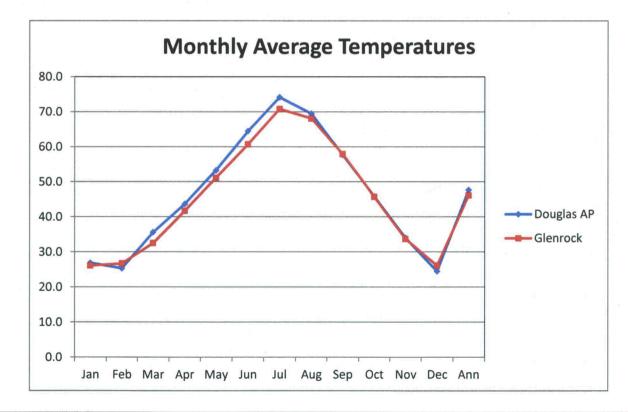
This reduced variation in daily temperature can be attributed to the more stable atmospheric conditions in the region during the fall and winter months. Stable periods have much lower mixing heights and accompanying lapse rates allowing for less temperature variation. The graphs in Figure 3.6-5 also show larger diurnal variations at Douglas AP than at GCC. This may be attributed to the proximity of the site to the airport and the city of Douglas, which may provide an urban heat source which accentuates the daily maximum temperatures.



Table 3.6-2: Annual and Month	ly Average Temperature	s for GCC and Douglas AP

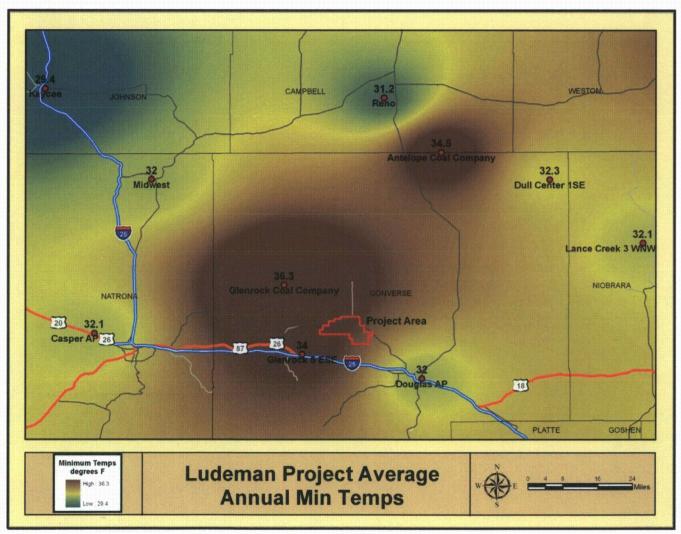
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
Douglas AP	26.9	25.3	35.6	43.7	53.3	64.5	74.2	69.5	57.7	45.8	34.0	24.5	47.7
Glenrock	26.1	26.7	32.5	41.7	51.1	60.7	70.8	68.1	57.9	45.7	33.7	26.1	46.1













URANIUM ONE USA, INC. NRC License SUA-1341 Amendment Application Ludeman Project Environmental Report

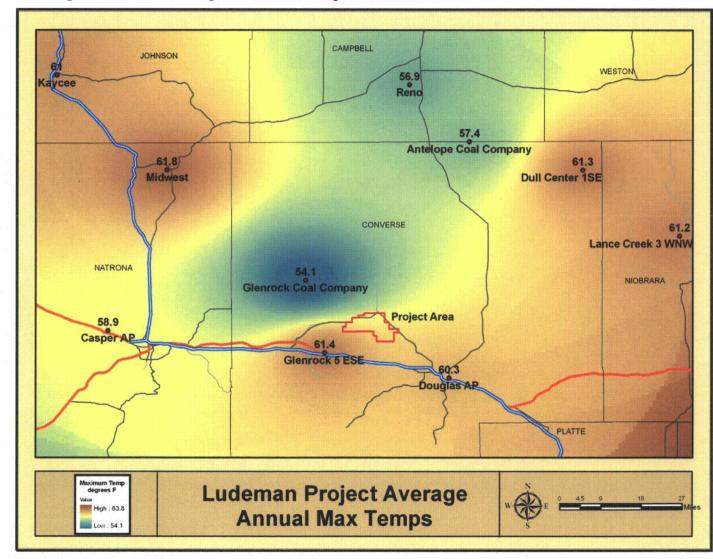
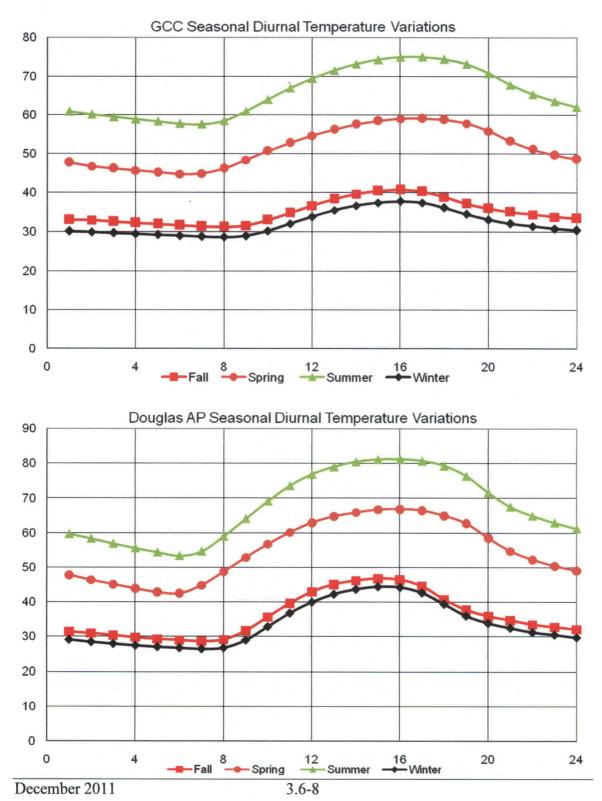
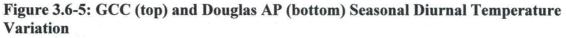


Figure 3.6-4: Regional Annual Average Maximum Temperature

uraniumone ™ investing in our energy



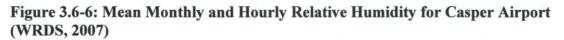


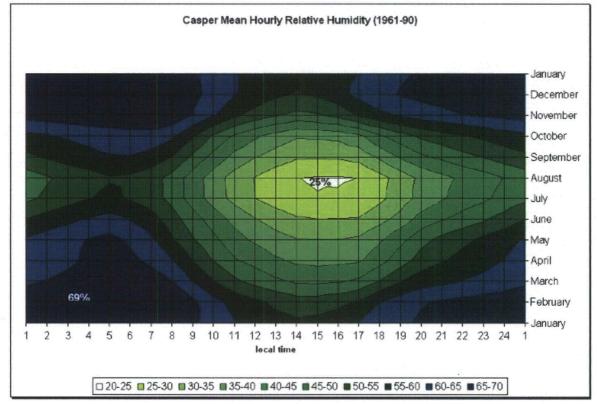


URANIUM ONE USA, INC. NRC License SUA-1341 Amendment Application Ludeman Project Environmental Report

3.6.2.2 Relative Humidity

The Casper Airport is the only site included in the analysis that records relative humidity (dew point) data. The graph in Figure 3.6-6 presents data taken from the Wyoming Climate Atlas (WRDS, 2007). The graph shows the mean hourly relative humidity (percent) by time of day and month. The data show that July has the driest air, followed by August and June. It also shows the winter months of December and January make up the most humid part of the year. The extreme values are stenciled on the graph where 25 percent is the lowest mean hourly value and 69 percent is the highest mean hourly value.





Relative humidity is a temperature based calculation which reflects the fraction of moisture present relative to the amount of moisture for saturated air at that temperature. Relative humidity maximum values occur more frequently in mornings (5:00am) while minimum values typically occur during the afternoon (5:00pm). Average annual readings at the Casper Airport are 70 percent and 43 percent for mornings and afternoons, respectively. Mean monthly afternoon values range from 24 percent in August to 62

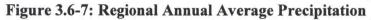


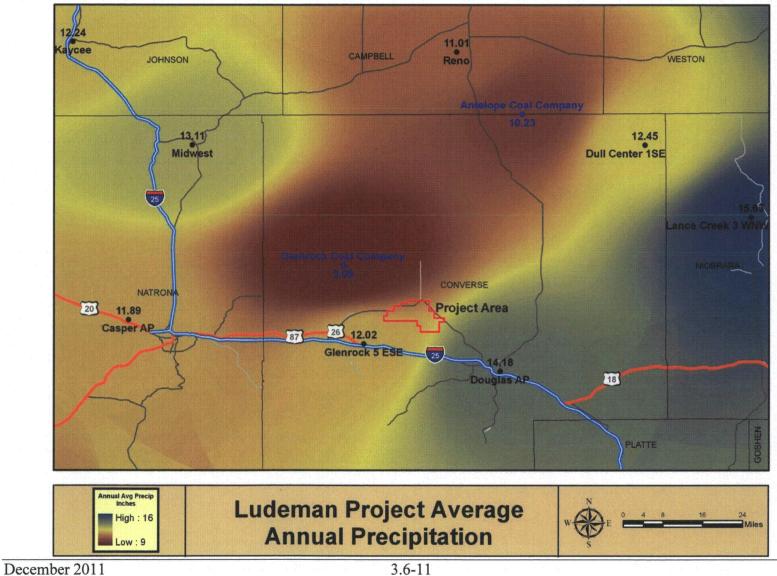
percent in December while morning mean values range from 66 percent in August to 77 percent in May. There is a much greater variation in the afternoon values which coincides with the greater temperature variations.

3.6.2.3 Precipitation

The region is characterized by extremely dry conditions. On average, the region experiences only about 40 to 60 days with measurable (>0.01 in) precipitation (WRCC, 2007). The region of the proposed Ludeman Project has an annual average in the 11- to 12.5-inch category based on interpolating regional values (Figure 3.6-7). Annual averages across the region range from 9 to 13 inches. Spring and early summer (May-July) thunderstorms produce 45 percent of the precipitation. As shown on Figure 3.6-8, which presents average monthly precipitation data from various stations in the region, May is typically the wettest month of the year; all stations average greater than two inches for that month. January, in contrast, is the driest month of the year with precipitation averaging generally one half inch or less. The winter months (Dec-Feb) typically account for only 10 percent of the yearly precipitation totals. A secondary minimum is also evident during August, when atmospheric conditions are more stable and the absence of convective activity limits thunderstorm development.







uraniumone ™ investing in our energy

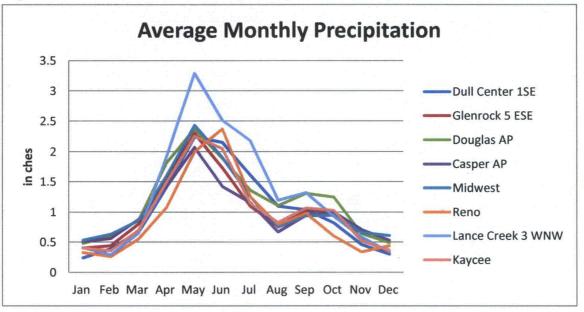


Figure 3.6-8: NWS Station Monthly Precipitation Averages (NCDC, 2007)

Severe weather can occur throughout the region, but is limited on average to four or five severe events per year. These severe weather events are generally associated with hail and damaging wind events. Tornadoes can occur, but have a frequency of less than one tornado per county per year (Martner, 1986).

Major snowstorms (more than five inches/day) are relatively infrequent in the region. The region experiences less than three major snowstorms per year. Casper Airport has the highest annual snowfall of all the sites with an average of nearly 80 inches. This value is in sharp contrast to three other sites having annual averages of 20 to 25 inches (Figure 3.6-9). The discrepancy between the sites can be attributed to Casper's proximity to Casper Mountain. Casper Airport is located at the base of the northern slopes of Casper Mountain and snow events are intensified as a result of orographic lifting. The interpolated values (Figure 3.6-10) show average snowfall of 25 to 40 inches per year in the project vicinity. This value is inconsistent with the Wyoming Climate Atlas (Martner, 1986), which lists snowfall averages for central Converse County at 50 to 60 inches. This difference results from extremely low snowfall values recorded at the Glenrock 5 ESE site, and less than half of the values recorded at the three closest sites. Substantial monthly averages (more than three inches/month) occur at Glenrock 5 ESE during five months of the year and "measurable" averages (greater than one inch/month) occur seven months of the year. Based on these limited data, the timing of snowfall events in the proposed project vicinity can be predicted more reliably than by snowfall amounts.

uraniumone ™ investing in our energy

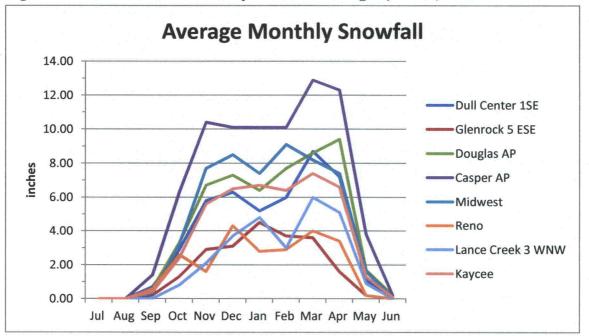
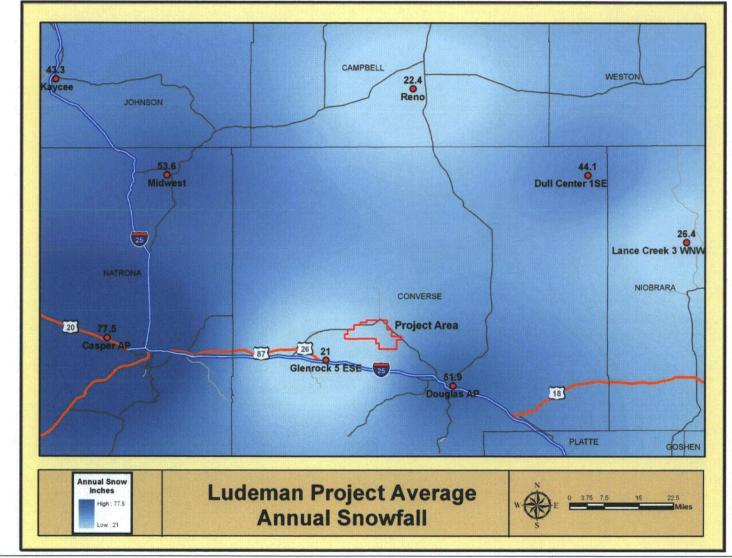


Figure 3.6-9: NWS Station Monthly Snowfall Averages (NCDC, 2007



URANIUM ONE USA, INC. NRC License SUA-1341 Amendment Application Ludeman Project Environmental Report

Figure 3.6-10: Regional Annual Average Snowfall



December 2011

3.6-14



3.6.2.4 Wind Patterns

The Douglas AP site averaged wind speeds of 11.0 mph for the five years included in its climate database. More than 35 percent of the time, the wind direction is from the west to northwest, and accompanying wind speeds are generally fairly high with averages greater than 12 mph nearly 75 percent of the time. Mean monthly average wind speeds from the Douglas AP are lowest in September at 8.6 mph and highest in April at 12.2 mph. Table 3.6-3 shows the monthly average monthly wind speeds and directions along with monthly maximum wind gust speeds. NWS direction data are summarized to the nearest 10 degrees. High wind events are fairly common; gust data from the Douglas AP show every month recording wind gusts greater than 48 mph. The predominant seasonal wind directions are bimodal. Spring and summer show southeast as the predominant direction, with west/northwest winds dominating fall and winter.

Douglas AP Monthly Wind Averages						
	Wind Speed	Wind Direction	Max Wind Gust			
JAN	10.0	NW	53			
FEB	10.6	W	48			
MAR	11.1	W ·	50			
APR	12.2	SE	56			
MAY	10.9	SE	49			
JUN	10.7	W	49			
JUL	9.5	SE	53			
AUG	9.8	SE	54			
SEP	8.6	ESE	55			
OCT	9.4	SE	55			
NOV	10.2	W	56			
DEC	10.5	W	52			
ANN	11.0	W	56			

Table 3.6-3: Douglas AP Monthly	Wind Parameters Summar	y (NCDC, 2007)
		, (,,

3.6.2.5 Cooling, Heating, and Growing Degree Days

Figure 3.6-11 summarizes the monthly cooling, heating, and growing degree days for Casper, Wyoming. The data are assumed to be indicative of the region since the other meteorological parameters for the various sites within the region track closely to the Casper data.



The heating and cooling degree days are included to show deviation of the average daily temperature from a predefined base temperature. In this case, 55° F has been selected as the base temperature. The number of heating degree days is computed by taking the average of the high and low temperature occurring that day and subtracting it from the base temperature. The calculation for growing and cooling degree days is the same, except that the base temperature is subtracted from the average of the high and low temperature for the day. Negative values are disregarded for both calculations.

As expected, the graphs of heating degree days and cooling degree days are inversely related and the number of growing and cooling degree days per month is identical when the same base temperature is chosen. The maximum number of heating degree days occurs in January, at 980 degree days. This coincides with January having the lowest minimum average temperature. Conversely, July registers the most cooling/growing degree days with 492, which also corresponds to July having the highest maximum average temperature.

uraniumone ™

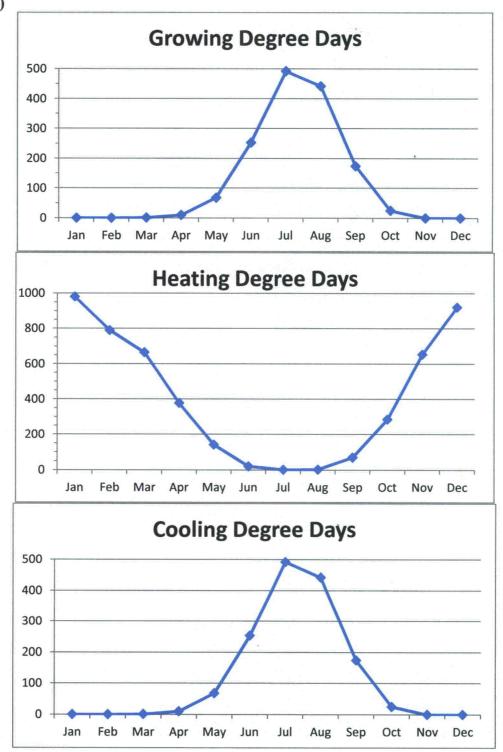


Figure 3.6-11: Casper Airport Cooling, Heating, and Growing Degree Days (WRCC 2007)

uraniumone ™

URANIUM ONE USA, INC. NRC License SUA-1341 Amendment Application Ludeman Project Environmental Report

3.6.3 Site Specific Analysis

The site specific discussion is limited to the meteorological data from the Glenrock Coal (GCC) mine site and the Douglas AP. These two sites were chosen as surrogate sites based on their proximity and topographic similarity to the proposed project site. The area is characterized by high plains, rolling hills and minor ridges. Both sites are included to reflect small meteorological differences between the ridge tops and lower drainages. The vegetation types are mainly confined to native grasses with some sage brush and very sparse woody plants. Each meteorological station is surrounded by rolling hills covered with native grasses, although the Douglas AP site may experience some urban influence.

3.6.3.1 Temperature

Figure 3.6-12 shows the seasonal average temperatures for the Douglas AP and GCC sites, which are nearly identical. The accompanying Table 3.6-4 provides the maximum, minimum and average seasonal temperatures for both sites. Daily average temperatures range from 30° F in the winter to near 70° in the summer.

The annual average project site temperature is projected at 47° F, based on averages of 47.7° F at Douglas AP (Figure 3.6-13) and 46.1° F at GCC (Figure 3.6-14). Maximum temperatures for the two surrogate sites exceed 97° F and minimum temperatures fall below -25° F.

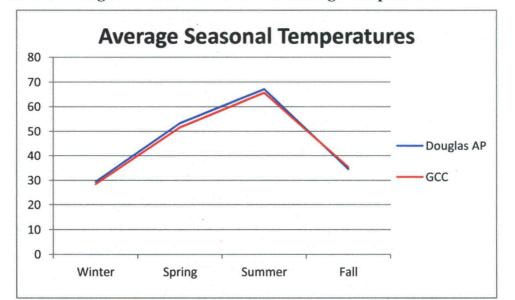


Figure 3.6-12: Douglas AP and GCC Seasonal Average Temperatures



Figure 3.6-13 and Figure 3.6-14 provide meteorological summaries for the two surrogate sites. The averages, maximums, and minimums are specified for each parameter recorded at the site along with the data recovery rate for each. The recovery rates are greater than 90 percent for all parameters at both sites with the exception of sigma theta (standard deviation of wind direction) at GCC which had a recovery rate of 89 percent.

		Douglas AP		GCC			
	Avg	Max	Min	Avg	Max	Min	
Winter	29.5	77	-29	28.5	70	-25	
Spring	53.4	101	10	51.6	92.7	0	
Summer	67.2	104	28	65.7	97.4	21.7	
Fall	34.6	86	-20	35.3	78.7	-18.9	

Table 3.6-4: Douglas AP and GCC Max, Min, and Average Seasonal Temps



Figure 3.6-13: Douglas AP Meteorological Summary for 2003 – 2007

Douglas AP

Meteorological Data Summary

1/1/2003 - 12/31/2007

Hourly Data

	Average/Total	Max	Min
Wind Speed (mph)	11.0	54.1	0.0
Temperature (F)	47.7	104.0	-29.0
Relative Humidity (%)	57.9	100.0	4.0
Precipitation (in)	46.3	2.27	0.0
Bar. Pressure (in Hg)	25.0	25.5	24.4

Predominant wind direction was from the N sector, accounting for 18.2 percent of the possible winds

Data Recovery

Parameter	Possible	Reported	Recovery
	(hours)	(hours)	
Wind Speed	43824	43303	98.81%
Wind Direction	43824	43303	98.81%
Temperature	43824	42433	96.83%
Relative Humidity	43824	43118	98.39%
Precipitation	43824	43340	98.90%
Bar. Pressure	43824	43339	98.89%



Figure 3.6-14: GCC Meteorological Summary for 1997 – 2006 Glenrock Coal Company

Meteorological Data Summary

1/1/1997 - 12/31/2006

Hourly Data

	Average/Total	Max	Min
Wind Speed (mph)	14.8	57.6	0.0
Sigma-Theta (°)	11.0	79.3	0.0
Temperature (F)	46.1	97.4	-25.0
Precipitation (in)	89.92	1.56	0.0

Predominant wind direction was from the W/SW sector, accounting for 20.0% of the possible winds

Data Recovery

Parameter	Possible	Reported	Recovery
	(hours)	(hours)	
Wind Speed	87648	81406	92.88%
Wind Direction	87648	81406	92.88%
Sigma-Theta	87648	78171	89.19%
Temperature	87648	81376	92.84%
Precipitation	87648	82827	94.50%



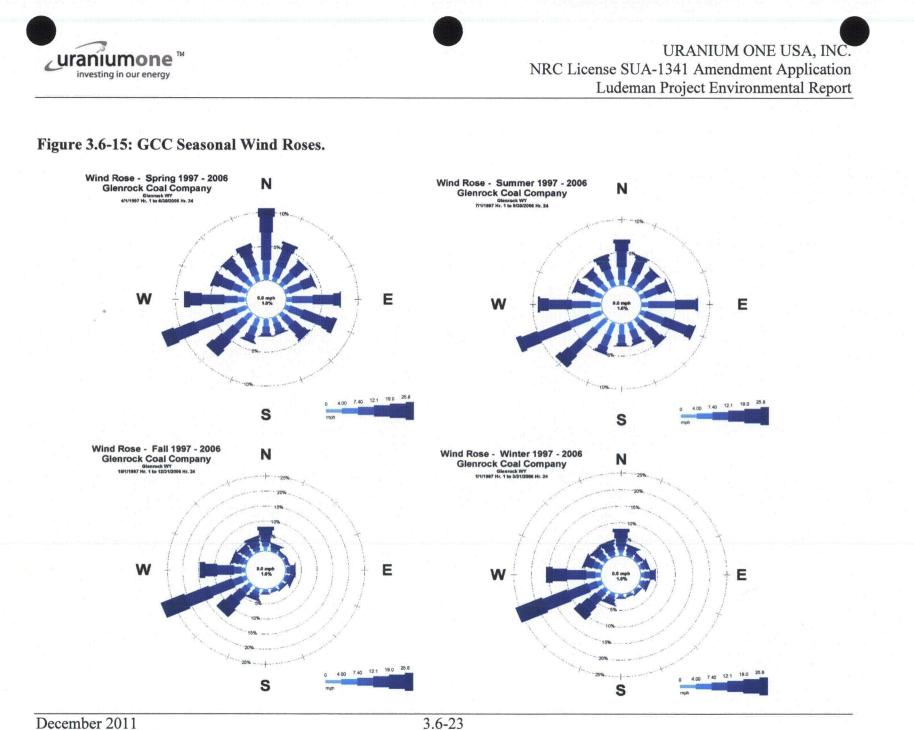
3.6.3.2 Wind Patterns

Figures 3.6-15 through 3.6-17 show the seasonal and annual wind roses for GCC and Douglas AP, respectively. The GCC predominant wind direction is west/southwest and the Douglas AP predominant wind direction is west with secondary northwest and southeast modes. It should be noted there is a northerly component evident in the Douglas AP wind rose. This component is an artifact of the wind sensor's high wind speed starting threshold (note the order of magnitude increase in "calm" winds in comparison to GCC). High pressure located over the southwestern United States produces the strong west/southwesterly winds which frequent the region. Spring experiences the greatest variability in wind direction with secondary modes from the southeast/east and northerly directions. The secondary southeast mode is more evident in the Douglas AP wind roses. The modes are a result of the synoptic scale transition period that occurs during this time. Low pressure regions develop on the lee side of the Rockies bringing southeast/easterly winds during development. As the low pressure systems form and move off with the general atmospheric flow, winds switch to a northerly direction.

The monthly and seasonal wind speeds are summarized in Figure 3.6-18. The graphs show a pronounced difference between the winter and summer averages. GCC experiences substantially higher wind speeds (3-5 mph), but the seasonal changes seem to mirror each other. Late fall and winter time averages are in the upper teens while summer time averages dip into the upper single digits to low teens. Overall, these sites have differences of 3-4 mph from summer to winter months. The two averages provide a good view of the variation that can be experienced between the valley floor and the hilltops.

The average wind speed for GCC is 14.8 mph for the entire 10 year period analyzed and 11.0 mph for the 5 years of Douglas AP data. A closer look at the wind speed, summarized in the Douglas AP and GCC wind summaries (Figure 3.6-19 and Figure 3.6-20), shows the west/southwesterly component average wind speed is 19.4 mph for GCC. The westerly component average for Douglas AP is 17.2 mph. These values suggest that the predominant wind direction is comprised of high, sustained wind speeds. Maximum hourly averages of greater than 50 mph have been recorded at both sites. Figure 3.6-20 shows the cumulative frequency wind speed distributions for Douglas AP and GCC. The graphs provide visual evidence that light wind speeds are a rare occurrence.

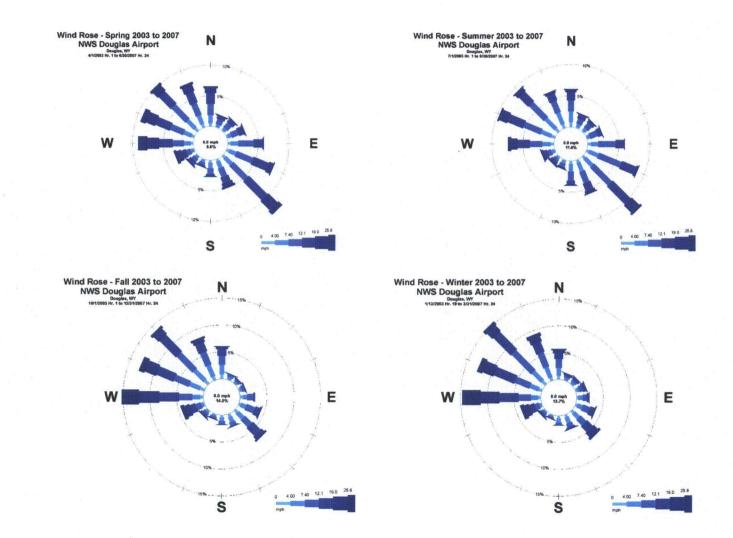
The Joint Frequency Distribution is included for GCC (Table 3.6-5). The distribution shows the frequencies of hourly average wind speed for each direction based on stability class. Seventy percent of all winds at GCC fall into stability class D which represents near neutral to slightly unstable conditions. The light winds which accompany stable environments can be seen by the Stability Class F summary (stable), where GCC has no wind speed averages greater than 6 knots (6.9 mph).





URANIUM ONE USA, INC. NRC License SUA-1341 Amendment Application Ludeman Project Environmental Report

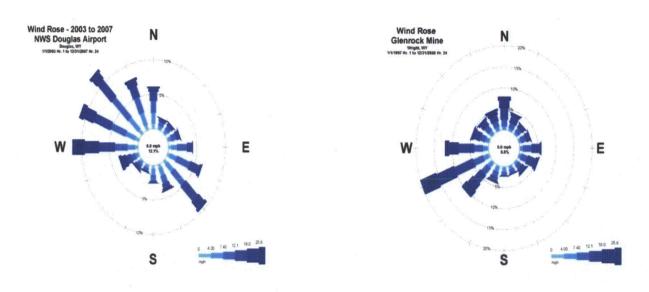
Figure 3.6-16: Douglas AP Seasonal Wind Rose





URANIUM ONE USA, INC. NRC License SUA-1341 Amendment Application Ludeman Project Environmental Report

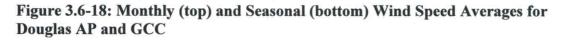
Figure 3.6-17: GCC and Douglas AP Annual Wind Rose

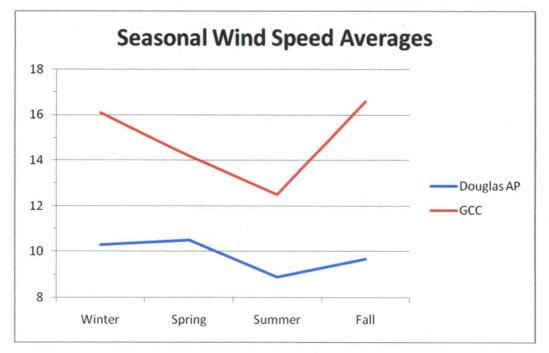


December 2011

3.6-25







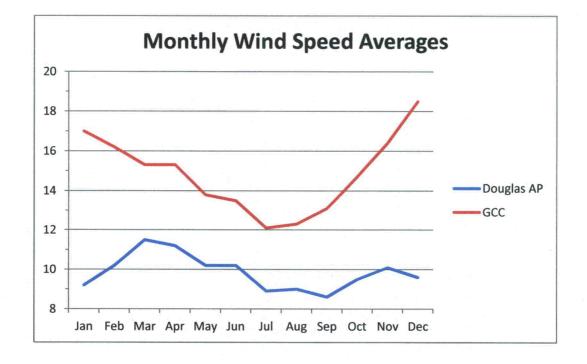




Figure 3.6-19: Douglas AP Wind Summary

Douglas Airport

Wind Data Summary

1/1/2003 - 12/31/2007

Hourly Data

	Average	Max	Min
Wind Speed (mph)	11.03	54.05	3.45
Sigma Theta (º)	-	-	-
Wind Direction		,	
Ň	3.63	39.10	3.45
NNÉ	10.41	40.25	3.45
NE	10.25	33.35	3.45
ENE	10.46	29.90	3.45
Ë	9.54	33.35	3.45
ESE	10.89	35.65	3.45
SE	13.18	37.95	3.45
SSE	10.20	43.70	3.45
S	8.10	29.90	3.45
SSW	9.63	31.05	3.45
SW	11.99	41.40	3.45
WSW	15.98	46.00	3.45
Ŵ	17.19	52.90	3.45
WNW	13.85	54.05	3.45
NW	12.01	41.40	3.45
NNW	11.52	44.85	3.45

Predominant wind direction was from the N sector, accounting for 18.2% of the winds, the average wind direction was 325°.

Data Recovery

	Possible (hours)	Reported (hours)	Recovery	
Wind Speed	43824	43303	98.81%	
Sigma Theta	43824	43340	98.90%	
Wind Direction	43824	43303	98.81%	



Figure 3.6-20: GCC Wind Summary

Glenrock Coal Company :

Wind Data Summary

1/1/1997 - 12/31/2006

Hourly Data

	Average	Max	Min
Wind Speed (mph)	14.82	57.60	0.10
Sigma Theta (º)	10:96	79.30	-
Wind Direction			
Ň	15.36	46.29	0.10
NNE	13.52	38.22	0.10
NE	11.32	30.90	0.10
ENE	11,14	29.80	0.10
E	11.92	37.15	0.10
ESE	13.52	38.80	0.10
SE	12.37	39.44	0.10
SSE	9.05	33.30	0.10
S	8.16	34.50	0.10
SSW	10.99	37.46	0.10
SW	17.09	55.58	0.10
WSW	19.36	57.60	0.10
W	15.89	48.21	0.10
WNW	12.69	39.44	0.10
NW	11.88	38.49	0.30
NNW	14.64	44.07	0.10

Predominant wind direction was from the WSW sector, accounting for 20% of the winds, the average wind direction was 266°.

Data Recovery

	Possible (hours)	Reported (hours)	Recovery
Wind Speed	87648	81406	92.88%
Sigma Theta	87648	78171	89.19%
Wind Direction	87648	81406	92.88%

uraniumone investing in our energy

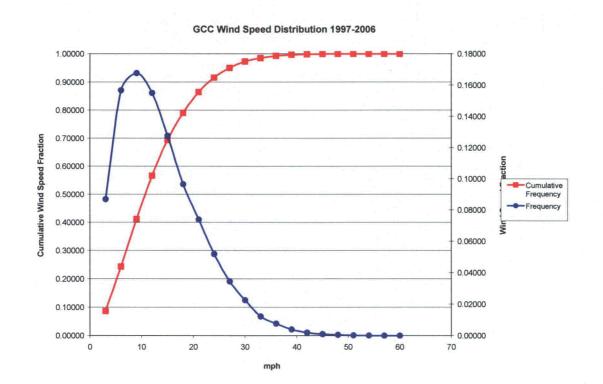
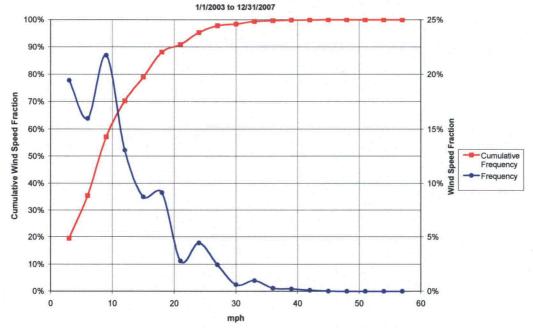


Figure 3.6-21: Douglas AP and GCC Wind Speed Frequency Distributions





3.6-29





Table 3.6-5: GCC Joint Frequency Distribution for 1997 -2006

Glenrock C Science	oal Company		Fr	equency D	istribution			IML	Air
	s, Wyoming	Hourly	Average	Wind Spee	d, Wind Dire	ection and	Sigma	Sheridar	1,
Calm Readi	ngs 334	Total Reading	s 78171	l	Possible Re	adings	87648	Data Capture	89.2%
			From	1/1/1997	' To 12/31	/2006			
Stability C	lass A		W	ind Speed	l (Knots)				
	Direction	0.6 - 3.0	4 - 6	7 - 10	11-16	17 - 21	> 21	Row Total	
	Е	0.00023	0.00148	0.00127	0.00006	0.00001		0.00306	
	ENE	0.00030	0.00117	0.00069	0.00008	0.00001		0.00225	
	ESE	0.00031	0.00122	0.00101	0.00014			0.00269	
	Ν	0.00026	0.00166	0.00159	0.00017	0.00001		0.00369	
	NE	0.00026	0.00136	0.00109	0.00001		0.00001	0.00274	
	NNE	0.00015	0.00116	0.00128	0.00015			0.00275	
	NNW	0.00037	0.00222	0.00127	0.00017	0.00003	0.00001	0.00407	
	NW	0.00046	0.00216	0.00189	0.00040	0.00001	0.00001	0.00493	
	S	0.00026	0.00167	0.00089	0.00022	0.00003		0.00306	
	SE	0.00024	0.00105	0.00093	0.00014			0.00236	
	SSE	0.00027	0.00143	0.00110	0.00010			0.00290	
	SSW	0.00048	0.00207	0.00112	0.00024			0.00391	
	SW	0.00045	0.00230	0.00204	0.00045	0.00001		0.00525	
,	W	0.00045	0.00170	0.00247	0.00069	0.00009	0.00003	0.00542	
	WNW	0.00055	0.00170	0.00182	0.00030	0.00001	0.00001	0.00439	
	WSW	0.00048	0.00216	0.00227	0.00060	0.00006		0.00558	
	Sum	0.00551	0.02649	0.02275	0.00393	0.00028	0.00008	0.05905	





URANIUM ONE USA, INC. NRC License SUA-1341 Amendment Application Ludeman Project Environmental Report

From 1/1/1997 To 12/31/2006

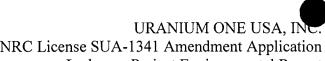
Stability Class B

Wind Speed (Knots)

E 0.00008 0.00026 0.00049 0.00024	0.00107
ENE 0.00005 0.00018 0.00057 0.00009	0.00089
ESE 0.00009 0.00018 0.00084 0.00024	0.00135
N 0.00003 0.00024 0.00095 0.00039 0.00003 0.00008	0.00171
NE 0.00006 0.00012 0.00049 0.00009	0.00076
NNE 0.00003 0.00026 0.00085 0.00019	0.00132
NNW 0.00004 0.00027 0.00110 0.00060 0.00005	0.00207
NW 0.00012 0.00044 0.00094 0.00072 0.00004	0.00225
S 0.00010 0.00037 0.00031 0.00021 0.00001 0.00001	0.00101
SE 0.00006 0.00026 0.00075 0.00030 0.00001	0.00137
SSE 0.00004 0.00039 0.00041 0.00023 0.00001	0.00108
SSW 0.00012 0.00048 0.00066 0.00058 0.00004	0.00186
SW 0.00023 0.00059 0.00116 0.00119 0.00019 0.00005	0.00342
W 0.00017 0.00054 0.00168 0.00177 0.00019 0.00008	0.00443
WNW 0.00014 0.00037 0.00096 0.00100 0.00010	0.00258
WSW 0.00022 0.00051 0.00130 0.00167 0.00021 0.00005	0.00396
Sum 0.00157 0.00545 0.01344 0.00952 0.00087 0.00028	0.03113



Stability Class C



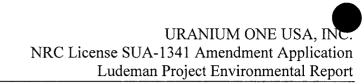
NRC License SUA-1341 Amendment Application Ludeman Project Environmental Report

1/1/1997 To 12/31/2006 From

Wind Speed (Knots)

Direction E	0.6 - 3.0 0.00008	4 - 6 0.00044	7 - 10 0.00087	11-16 0.00081	17 - 21	> 21	Row Total 0.00220
ENE	0.00008	0.00028	0.00062	0.00040		0.00001	0.00139
ESE	0.00003	0.00045	0.00094	0.00132	0.00003		0.00276
Ν	0.00009	0.00032	0.00154	0.00297	0.00135	0.00099	0.00726
NE	0.00003	0.00015	0.00089	0.00044			0.00150
NNE	0.00003	0.00030	0.00099	0.00118	0.00001		0.00251
NNW	0.00006	0.00058	0.00140	0.00161	0.00037	0.00013	0.00415
NW	0.00013	0.00048	0.00131	0.00209	0.00049	0.00009	0.00459
S	0.00010	0.00066	0.00051	0.00042	0.00010	0.00001	0.00181
SE	0.00008	0.00054	0.00117	0.00131	0.00006	0.00001	0.00317
SSE	0.00009	0.00045	0.00062	0.00045	0.00003	0.00001	0.00164
SSW	0.00013	0.00075	0.00104	0.00091	0.00037	0.00006	0.00326
SW	0.00026	0.00091	0.00189	0.00297	0.00143	0.00027	0.00772
W	0.00022	0.00080	0.00164	0.00441	0.00159	0.00035	0.00901
WNW	0.00012	0.00050	0.00121	0.00276	0.00067	0.00015	0.00541
WSW	0.00026	0.00089	0.00247	0.00511	0.00226	0.00059	0.01158
Sum	0.00176	0.00848	0.01910	0.02916	0.00876	0.00269	0.06995





From 1/1/1997 To 12/31/2006

Stability Class D		١	Vind Speed	(Knots)			
Direction	0.6 - 3.0	4 - 6	7 - 10	11-16	17 - 21	> 21	. Row Total
E	0.00033	0.00190	0.00957	0.02189	0.00403	0.00075	0.03848
ENE	0.00033	0.00112	0.00550	0.01107	0.00141	0.00026	0.01970
ESE	0.00027	0.00202	0.00903	0.02149	0.00591	0.00281	0.04154
N	0.00032	0.00258	0.00951	0.02536	0.01484	0.01046	0.06307
NE	0.00014	0.00119	0.00497	0.01015	0.00161	0.00026	0.01832
NNE	0.00013	0.00134	0.00545	0.01611	0.00495	0.00203	0.03000
NNW	0.00040	0.00247	0.00641	0.01381	0.00714	0.00641	0.03664
NW	0.00067	0.00375	0.00723	0.01043	0.00365	0.00175	0.02748
S	0.00040	0.00335	0.00325	0.00166	0.00039	0.00008	0.00912
SE	0.00008	0.00238	0.00567	0.00879	0.00384	0.00119	0.02194
SSE	0.00035	0.00258	0.00353	0.00245	0.00076	0.00022	0.00989
SSW	0.00075	0.00445	0.00579	0.00523	0.00132	0.00078	0.01832
SW	0.00082	0.00561	0.00949	0.01742	0.01382	0.02167	0.06885
W	0.00068	0.00567	0.01377	0.03848	0.02288	0.01382	0.09530
WNW	0.00053	0.00412	0.00763	0.01314	0.00501	0.00244	0.03288
WSW	0.00107	0.00624	0.01566	0.05036	0.04394	0.05395	0.17122
Sum	0.00726	0.05077	0.12247	0.26785	0.13550	0.11888	0.70274





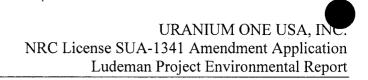
1/1/1997 To 12/31/2006 From

ity Class	E		١	Vind Speed	(Knots)			
Direc	etion	0.6 - 3.0	4 - 6	7 - 10	11-16	17 - 21	> 21	Row Total
E		0.00049	0.00257	0.01188		·		0.01494
ENE		0.00019	0.00164	0.00686				0.00870
ESE		0.00037	0.00159	0.00609				0.00806
N		0.00030	0.00143	0.00313				0.00486
NE		0.00019	0.00153	0.00443				0.00615
NNE		0.00014	0.00141	0.00446				0.00601
NNW		0.00031	0.00184	0.00356				0.00570
NW		0.00028	0.00218	0.00373				0.00619
S		0.00055	0.00425	0.00376				0.00857
SE		0.00026	0.00140	0.00376				0.00542
SSE		0.00039	0.00283	0.00352				0.00673
SSW		0.00082	0.00433	0.00380				0.00895
SW		0.00072	0.00398	0.00420				0.00890
W		0.00060	0.00224	0.00424				0.00708
WNV	V	0.00046	0.00199	0.00265				0.00510
WSW	/	0.00089	0.00298	0.00403				0.00790
Sum		0.00696	0.03820	0.07412				0.11927

Stabili

3.6-34





From 1/1/1997 To 12/31/2006

Stability Class F			W	vind Speed	(Knots)			÷.
Direction		0.6 - 3.0	4 - 6	7 - 10	11-16	17 - 21	> 21	Row Total
Е		0.00045	0.00077					0.00122
ENE		0.00050	0.00067					0.00117
ESE		0.00039	0.00054					0.00093
Ν		0.00033	0.00040					0.00073
NE		0.00036	0.00046					0.00082
NNE		0.00027	0.00050					0.00077
NNW		0.00031	0.00059					0.00090
NW		0.00051	0.00068					0.00119
S		0.00041	0.00067					0.00108
SE		0.00040	0.00053					0.00093
SSE		0.00042	0.00046				•	0.00089
SSW		0.00039	0.00054					0.00093
SW	-	0.00068	0.00060					0.00128
W		0.00072	0.00103					0.00175
WNW		0.00077	0.00077					0.00154
WSW		0.00071	0.00103					0.00173
Sum	0.00762	0.01024					(0.01786

.



3.6.3.3 Surrogate Site Justification and Specifications

The proposed Ludeman facilities will specifically be operated as Satellite facilities and will not be actively performing final processing and drying of uranium. Therefore, airborne release of uranium particulates that could adversely affect on and off-site ambient air quality will not be a factor during the operation of these facilities. Given the operational parameters of these facilities, an on-site meteorological monitoring station is not required to gather baseline meteorological data prior to the start-up of these facilities. Additionally, an on-site meteorological monitoring station will not be required to monitor for possible future dispersion of any particulates of concern emanating from these facilities.

Of the available meteorological monitoring sites, the Glenrock Mine (GCC) meteorology most nearly represents that of the proposed Ludeman Project site. GCC is therefore proposed as the source of meteorological data to be substituted for on-site monitoring. Data from the Douglas AP supplements GCC data, with the intent of providing a lower bound for wind speeds and supporting the general conclusions regarding local meteorology. To illustrate the similarities between the proposed site and GCC, several images from Google Earth are presented. Figure 3.6-22 shows an aerial view of the general area along with the 14-mile distance between the GCC meteorological station and the center of the proposed project area. Figure 3.6-23 shows a closer view of the proposed Ludeman site, while Figure 3.6-24 shows a similar view of the GCC site. Both sites are characterized by rolling hills and drainages covered with grass and sparse shrubs. The nearest mountains are the Laramie Range, approximately 15 to 20 miles south of the proposed project and 25 miles south of the GCC site. The North Platte River runs just south of the southern boundary of the proposed Ludeman Project and 15 miles south of GCC. Effects of the river on the meteorology of these two sites are considered minor. The GCC site is a few hundred feet higher in elevation than the proposed Ludeman Project area.

Table 3.6-6 lists the meteorological instruments employed at the Glenrock Mine (GCC). The site coordinates and elevation are presented, along with instrument models, accuracy specifications, and instrument heights above the ground.

Because of the extensive surface coal mining that has developed over the last 30 years, the Powder River Basin (PRB) airshed is one of the most heavily monitored in the country. Coal production in the PRB grew from a few million tons in 1973 to over 400 million tons in 2006. The Clean Air Act and the Surface Mining Control and Reclamation Act of the 1970's prompted a parallel growth in ambient air quality monitoring throughout the PRB. This has led to over 100 particulate monitoring samplers and more than 20 meteorological monitoring towers, all configured to support air quality permitting, compliance and research objectives.



The monitoring programs at these sites meet the Wyoming Department of Environmental Quality requirements for land and air quality permit compliance. Methods used in collecting and validating these data adhere to EPA's "On-Site Meteorological Program Guidance for Regulatory Modeling Applications." Hourly average values for various parameters are generated by field instruments and recorded by continuous data loggers, all operated and maintained by Inter Mountain Laboratory (IML) Air Science. Data recovery has typically exceeded 95 percent. Depending on the mine, meteorological parameters logged include wind speed, wind direction, sigma theta, ambient temperature, barometric pressure, solar radiation and precipitation. All hourly data are downloaded to IML Air Science's relational database. The database software provides for quality assurance, invalidation of suspect or erroneous data, and various forms of data presentation.

Glenrock (GCC)	10m tower			Lat: 43° 03' 36" Elev. 5,674 Long: -105° 50' 24"		
Parameter	Instrument	Range	Accuracy	Threshold	Instrument Height	
	RM Young		,			
	Wind Monitor		±0.4 mph or			
Wind Speed	AQ	0-112 mph	1% of reading	0.9 mph	10 meters	
	RM Young				-	
	Wind Monitor					
Wind Dir	AQ	0-360°	±3°	1.0 mph	10 meters	
· · · · · · · · · · · · · · · · · · ·	Fenwall			· · · · · · · · · · · · · · · · · · ·		
	Electronics	Temp: -35°-	±0.5° C @			
Temp	Model 107	50° C	given Range		2 meters	
•			±0.5% @ 0.5			
Precip	Met One 8" tip	0 - 8"	in/hr rate		1 meter	

Table 3.6-6: GCC Monitoring Details



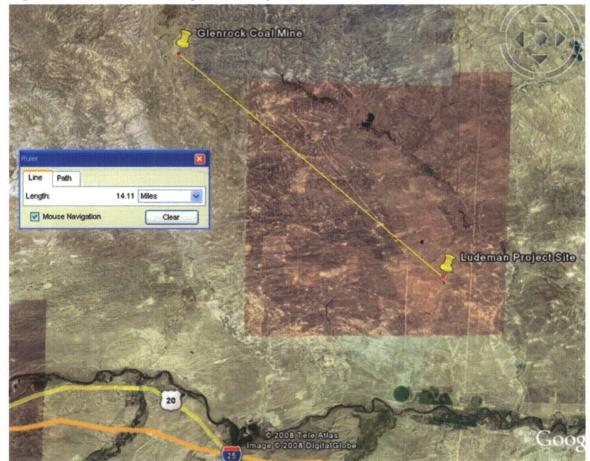
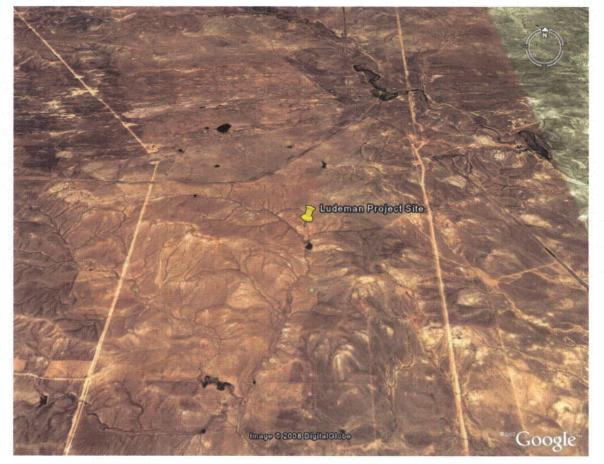


Figure 3.6-22: General Project Vicinity and Site Distance



URANIUM ONE USA, INC. NRC License SUA-1341 Amendment Application Ludeman Project Environmental Report







URANIUM ONE USA, INC. NRC License SUA-1341 Amendment Application Ludeman Project Environmental Report

Figure 3.6-24: GCC Mine Area



3.6.3.4 Upper Atmosphere Characteristics

The nearest upper-air data available from the National Weather Service is from Riverton, Wyoming or Rapid City, South Dakota. In both cases, the large distance from the southern PRB and the proximity to prominent mountain ranges make them ill suited to represent the proposed project site.

The Air Quality Division of the Wyoming Department of Environmental Quality (WDEQ-AQD) has provided statewide mixing heights to be used in dispersion modeling with the Industrial Source Complex (ISC3) model. For modeling purposes, the annual average mixing heights are assigned according to stability class as follows:

Class A	3,450 meters
Class B	2,300 meters



Class C	2,300 meters
Class D	2,300 meters
Class E	10,000 meters
Class F	10,000 meters

Stability classes E and F are given an arbitrarily high number to indicate the absence of a distinct boundary in the upper atmosphere. Based on the exclusive use of these numbers for air quality modeling by mines in the Powder River Basin, all dispersion modeling will use the mixing heights provided by the WDEQ-AQD.

In August of 2000, IML Air Science conducted Sound Detection and Ranging (SODAR) monitoring at the Black Thunder Mine, located approximately 40 miles north-northeast of the proposed Ludeman Project site. The purpose of this monitoring was to support a comprehensive study of NO_x dispersion characteristics following overburden removal and coal blasting events. The SODAR instrument provided 3D wind speeds, wind directions, temperatures, temperature gradients, and other atmospheric parameters as a function of height above the ground. The vertical range of the SODAR was 1,500 meters, with a sounding performed every 15 minutes. Each sounding resulted in a calculated "inversion height / mixing height" (the two terms are used interchangeably by the SODAR system supplier). These mixing heights were downloaded into a database and queried, with results shown in Table 3.6-7. Morning and afternoon time intervals were taken from EPA modeling guidance.

Time Period (Filtered)	Number of Data Points	Average Mixing / Inversion Height
Morning $(2 \text{ am} - 6 \text{ am})$	193	641 meters
Afternoon (12 pm – 4 pm)	152	1,052 meters

Table 3.6-7: Black Thunder SODAR Results

The SODAR definition of mixing height appears somewhat ambiguous, and these measurements were all taken in August. Therefore, they are presented here as an additional data source, but not recommended as direct meteorological inputs to the MILDOS model.

3.6.3.5 Bodies of Water and Special Terrain Features

The North Platte River is the only significant body of water in the vicinity of the proposed project site. Most of the proposed Ludeman project activities would occur in the hills north of the river, minimizing the river's influence on the proposed project site's meteorology. There are no special terrain features that would alter the general



meteorological conditions at either the proposed Ludeman site or the GCC site. Nearby drainages support small, ephemeral streams. The maximum topographic relief throughout this area is a few hundred feet. The GCC site is near the top of a hydrologic divide, contributing to higher wind speeds than those expected at the proposed Ludeman site. This difference has been accounted for by averaging wind speeds at GCC with wind speeds at the Douglas AP.

3.6.3.6 Air Quality

National Ambient Air Quality Standards (NAAQS) exist for sulfur dioxide (SO₂), nitrogen dioxide (NO₂), carbon monoxide (CO), ozone (O₃), lead, and particulate matter small enough to move easily into the lower respiratory tract (particles less than 10 micrometers in aerodynamic diameter, designated Particulate Matter (PM₁₀). The NAAQS are expressed, as pollutant concentrations that are not to be exceeded in the ambient air, that is, in the outdoor air to which the general public has access (40 CFR Part 50.1(e)). Primary NAAQS are designated to protect human health; secondary NAAQS are designated to protect human welfare by safeguarding environmental resources (such as soils, water, plants, and animals) and manufactured materials. Primary and secondary NAAQS are presented in Table 3.6-8.

The air quality in the proposed project region is considered to be very good. The area is sparsely populated and is not heavily developed with major sources of industrial air pollution. The closest air quality monitoring station to the proposed project area is in Gillette, Wyoming at an approximate distance of 88 miles from the project area. This station shows that regional air quality is well within compliance with the NAAOS and Wyoming Ambient Air Quality Standards (WAAQS). In addition to ambient air quality standards, which represents an upper bound on allowable pollutant concentrations, there are also national standards for the Prevention of Significant Deterioration (PSD) of air quality (40 CFR § 51.166). The PSD standards differ from the NAAOS in that the NAAQS provide maximum allowable concentrations of pollutants, while PSD requirements provide maximum allowable increases in concentrations of pollutants for areas already in compliance with the NAAQS. PSD standards are therefore expressed as allowable increments in the atmospheric concentrations of specific pollutants. Allowable PSD increments currently exist for three pollutants: NO₂, SO₂, and PM 10. Increments that is particularly relevant when a major proposed action (involving either a new source or a major modification to an existing source) may degrade air quality without exceeding the NAAQS, as would be the case in an area where the ambient air is considered to be very clean. One set of allowable increments exists for Class II areas, which cover most of the continental United States. A much more stringent set of allowable increments exists for Class I areas, which are special designated areas where the degradation of ambient air quality is severely restricted. Class I areas include certain national parks and monuments, wilderness areas, and other areas as described in 40 CFR § 51.166(e) and 40 CFR Part

December 2011



81:400-437. Maximum allowable PSD increments for Class I and Class II areas are given in Table 3.6-9 A Class I area that is in proximity to the proposed Ludeman facilities is the Thunder Basin National Grasslands. PSD Class I areas receive the highest degree of protection from air pollution. Only small amounts of particulate, consisting of SO₂, and NO₂ air pollutants, are allowed in Class I areas (BLM, 2004c).

The primary new emission source of non-radiological pollutants will be particulate matter with a diameter less than 10 micrometers (PM10) resulting from vehicle traffic within the proposed Ludeman Project Area. Projected activities impacting fugitive dust emissions included ongoing wellfield construction activities, routine site traffic related to operations and maintenance, heavy truck traffic delivering chemicals and material and product shipping, and employee traffic to and from the site. Based on these activities, the projected total PM10 emissions is 18.5 tons per year. This level of emissions is considered quite small relative to surface mines and other industrial operations that generate dust from vehicles and disturbed areas. The larger surface mines in the Powder River Basin show PM10 emissions inventories in the thousands of tons per year. Sections of unpaved county roads can also exceed 18.5 tons per year emission rate by an order of magnitude or more. Atmospheric dispersion modeling typically shows that fugitive PM10 emissions on the order of 15 tons per year results in insignificant impacts to ambient air quality beyond a distance of a few hundred yards from the sources. Significant impact for PM10 is defined as 1.0 µg/m3 or more. The National Ambient Air Quality Standard (NAAQS) for annual average PM10 is 50 µg/m3. Since the estimated 18.5 tons per year of PM 10 fugitive dust emissions is well below the 250 tons per year threshold for PSD review, an analysis to further determine possible impacts to ambient air quality are considered unnecessary.

It is important to note that no control factors were assumed for the emission calculations. Periodic watering or chemical treatment of the unpaved roads will reduce emission factors by half or more.



	Constitution and Constant of Constant of Constant	idard (Health- sed)	Secondary Standard (Welfare based)			
Pollutant	Type of Average	Standard Level Concentration	Type of Average	Standard Level Concentration		
	Annual Arithmetic mean	50 µg/m ³		Same as primary standard		
PM 10	24-hr average not to be exceeded more than once per year on average over 3	150 µg/m ³		Same as primary		
PM _{2.5}	years Spatial and annual arithmetic mean in area	15 μg/m3		standard Same as primary standard		
	98 th percentile of the 24-hr average	65 µg/m3		Same as primary standard		
O_3^a	Maximum daily 1-hr average to be exceeded no more than once per year averaged over 3 consecutive years	0.12 ppm		Same as primary standard		
	3-yr average of the annual fourth highest daily 8-hr average	0.08 ppm		Same as primary standard		
NO ₂	Annual arithmetic mean	0.053 ppm		Same as primary standard		
SO_2	Annual arithmetic mean 24-hr average	0.03 ppm 0.14 ppm	3-hr	0.50 ppm		
со	8-hr (not to be exceeded more than once per year) 1-hr (not to be exceeded more than once per year)	9 ppm 35 ppm		No secondary standard No secondary standard		
Lead	Maximum quarterly average	1.5 µg/m ³	· · · · ·	Same as primary standard		

Table 3.6-8: Primary and Secondary Standards for each Criteria of Pollutants

^a EPA is phasing out the 1-hr, 0.12-ppm standards (primary and secondary) and putting in place the 8-hr, 0.08 ppm standards. However, the 0.12-ppm standards will not be revoked in a given area until that area has achieved 3 consecutives years of air quality data meeting the 1-hr standard.

Table 3.6-9: Maximum allowable PSD increments for Class I and Class II Areas

Pollutant	Average Period	Standard	Basis	Standard Type
NO2	Annual	25 µg/m3		
PM10	24-hr Annual	30 µg/m3	-1	
P 1 V1 10	24-nr Annual	17 µg/m3	-1	PSD Increments
	3-hr	512 μg/m3	-1	for Class I Areas
SO ₂	24-hr Annual	91 µg/m3	-1	
	Annual	20 µg/m3		
				and the second
NO ₂	Annual	2.5 μg/m3		
DM		8 μg/m3	-1	
РМю	24-hr Annual	4 μg/m3	-1	PSD Increments
	3-hr	25 µg/m3	-1	for Class I Areas
SO ₂	24-hr Annual	5 μg/m3	-1	
	Annual	2 µg/m3		



3.6.4 References

Curtis, J. and K. Grimes, 2007: *Wyoming Climate Atlas*. Available: <u>http://www.wrds.uwyo.edu/wrds/wsc/climateatlas/</u> [2007,May 2].

Martner, B.E., 1986: Wyoming Climate Atlas. University of Nebraska Press, Lincoln, NE.

- National Climatic Data Center (NCDC), 2007: Surface Data, Monthly Extremes. Available: <u>http://gis.ncdc.noaa.gov/website/ims-cdo/extmo/viewer.htm?Box=-110.307738654357:41.4493000825986:-102.349767058746:45.2536595444503</u> [2006, July 13].
- Western Region Climate Center (WRCC), 2007: Local Climate Data Summaries. Available: <u>http://www.wrcc.dri.edu/summary/lcd.html</u> [2006, Jan 28].



TABLE OF CONTENTS

3.7 Noise.		
3.7.1 A	fected Environment	
3.7.1.1	Construction Phase	
3.7.1.2	Operation Phase	
3.7.1.3	Groundwater Restoration Phase	
3.7.1.4	Decommissioning and Reclamation Phase	

List of Tables

Table 3.7-1: Relationship Between A-Scale dB Readings and Sounds of Daily Life . 3.7-4



3.7 NOISE

3.7.1 Affected Environment

This section describes the background noise sources within the proposed Ludeman Project (proposed project) area and presents the potential impacts of noise for the surrounding area. Existing noise sources within the proposed project area include county and local road traffic, livestock operations, and wind. Due to the remoteness of the proposed project, low population density of the surrounding area, and lack of noise generated from existing noise sources, the existing noise levels are generally low. As stated in GEIS Section 3.3.7, the estimated ambient noise levels in undeveloped rural and more urban areas of the Wyoming East Uranium Milling Region are 22 to 38 decibels (dBA) (NRC, 2009a). Table 3.7-1 presents noise levels associated with some commonly heard sounds.

Open rangeland is the primary land use within and in the surrounding two-mile area. Other land uses include natural gas transportation facilities. The existing ambient noise in the vicinity of the proposed project is dominated by the traffic noise from State Highways 95 and 93 and surrounding oil and gas operations.

The proposed Leuenberger Satellite facility site is approximately one half mile from the property boundary of the small residential subdivision and approximately one mile from the Leuenberger Ranch house. Assuming that the noise level produced by unshielded machinery at the facility site is 85dB at 50 feet, the sound pressure level attained at the property boundary will be below the level identified by the USEPA as suitable for outdoor areas where human activity takes place (approximately 55 dB). A level of 85 dB is the OSHA threshold at which a hearing conservation program at the plant would be required. Experience at operating ISR facilities verifies that this assumption is conservative and that the average sound pressure levels during construction will be less than 85 dB. After appropriate engineered controls (i.e. the protective enclosure for the equipment) are installed, noise levels will not impact the residences, and are unlikely to approach the levels attained by State Highway 95. Therefore, impact to noise or congestion above ambient background noise within the proposed project area or in the surrounding two-mile area is not anticipated.

Potential impacts from noise at the proposed site could occur during all phases of the ISR facility lifecycle. These impacts would be associated with the operation of equipment such as trucks, bulldozers, and compressors; from traffic due to commuting workers or material and waste shipments; and production unit and central processing plant activities and equipment. The GEIS concluded that the noise impact at an ISR facility could range from small to moderate during all phases four phases of an ISR project, depending on the distance between the nearest resident and the activities occurring at the Satellite facility



(NRC, 2009a). A more detailed discussion of potential noise impacts can be found in Section 4.7 and 5.7 of this ER.

3.7.1.1 Construction Phase

As discussed in Section 4.3.7.1 of the GEIS, potential noise impacts would be greatest during construction of the Satellite facilities because of the heavy equipment involved and given the likelihood that these facilities would be built in rural, previously undeveloped areas where background noises levels are lower. The use of drill rigs, heavy trucks, bulldozers, and other equipment used to construct and operate the production units, drill wells, construct access roads, and build the Satellite facilities would generate noise that would be audible above the undisturbed background noises. Noise would likely be higher during daylight hours when construction is more likely to occur and more noticeable in proximity to operating equipment. Administrative and engineering controls would maintain noise levels in work areas below OSHA regulatory limits and mitigated by use of personnel hearing protection. For individuals living in the vicinity of the site, ambient noise levels would return to background levels at a distance greater than 300m (1,000ft) from the construction activities. Wildlife would be expected to avoid areas where noise-generating activities were occurring.

Additionally, as stated in the GEIS, the traffic noise during construction would be localized, limited to highways in the vicinity of the proposed project and access roads within the proposed project area. Relative short-term increases in noise levels associated with passing traffic would be small for the larger roads, but could be moderate for lightly traveled rural roads. Uranium One will enforce site speed limits to further mitigate traffic noise impacts.

Overall, these types of activities would be small given the distance to the nearest residence is approximately 1.5 miles from the center of the proposed project area and the proposed construction activities.

3.7.1.2 Operation Phase

Section 4.3.7.2 of the GEIS discussed ISR activities that could generate noise. These activities will occur indoors; therefore, offsite noise from operations would be less than previously mentioned construction activities. Production unit equipment (e.g. pumps, compressors) will be contained within structures such as header houses and well head covers reducing the potential for noise to be heard by offsite individuals.

Traffic noise from commuting workers, truck shipments, and facility equipment will be localized, limited to highways in the vicinity of the site, access roads within the site and production unit roads. Relative short-term increases in noise levels associated with



passing traffic would be small for the larger roads, but could be moderate for lightly traveled rural roads. Taking into account the relatively small increase in traffic the potential noise impacts to the proposed project will be small.

Overall, these types of activities would be small given the distance to the nearest residence.

3.7.1.3 Groundwater Restoration Phase

Section 4.7.3.3 of the GEIS states that the general noise levels during aquifer restoration will be similar or less than noise levels during operations. Workplace noise exposure during groundwater restoration will use the same administrative and engineering controls used during operations. Existing operational infrastructure will be used and traffic levels are expected to be the less than during construction and operation phases of the proposed project. Vehicular traffic will be limited to delivery of supplies and staff travel to and from the site; therefore fewer trips will occur during groundwater restoration than operations. Taking into account the relatively small increase in traffic the potential noise impacts to the proposed project will be small.

Overall, these types of activities would be small given the distance to the nearest residence.

3.7.1.4 Decommissioning and Reclamation Phase

Section 4.7.3.4 of the GEIS discusses the potential noise impact from decommissioning activities. Noise levels generated during decommissioning and reclamation will be similar to or less than, noise levels during the construction phase. Decommissioning activities will result in a large but temporary noise impact onsite and potentially just beyond the proposed project boundary. Like the construction phase, noise levels will be higher during daylight hours when decommissioning and reclamation will more than likely occur and will be more noticeable in proximity to the operating equipment. Workplace exposure will be managed using the same administrative and engineering controls implemented for the construction phase. The increase in truck traffic associated with the transfer of solid waste to the Douglas landfill and of 11e.(2) byproduct to a licensed disposal facility will result in a small impact above background noise levels.

Overall, these types of activities would be small given the distance to the nearest residence.



How It Feels	Equivalent Sounds	Decibels	Equivalent Sounds	How It Sounds	
Near permanent damage level	50 hp siren (100 ft)		Jackhammer	135 dB(A)	
from short exposures		130	Chainsaw	Appx 64 times as	
nom sight exposures	Jet Engine (75 ft)		Fire cracker (15 ft)	loud as 75 dB	
Pain to ears	Turbo-fan jet at takeoff power	120		125 dB(A)	
	(100 ft)		Rock and Roll Band	Appx 32 times as	
				loud as 75 dB	
	Scraper loader	110	Unmuffled motor bike	115 dB(A)	
Uncomfortably loud			(2-3 ft)	Appx 16 times as	
	Jet flyover (1000 ft)			loud as 75dB	
		Car horn		105 dB(A)	
Discomfort threshold		100	Unmuffled cycle (25 ft)	Appx 8 times as	
	Noisy newspaper press			loud as 75dB	
			Garbage trucks	95 dB(A)	
Very loud	Air compressor (20 ft)	90	and city buses	Appx 4 times as	
Conversation stops	Power lawnmower		Diesel truck (25 ft) loud		
	Steady flow of freeway traffic			85 dB(A)	
		80	Garbage disposal	Appx 2 times as	
Intolerable for phone use	10-HP outboard		Food blender	loud as 75dB	
	motor	70		75 ID (4)	
Fotos conditores e bassicale ciccal	Automatic dishwasher	70	Muffled jet ski (50 ft)	75 dB(A)	
Extra auditory physiological effects	Vacuum cleaner Window air		Passenger car at		
enecis	conditioner outside (2ft)	60	65 mph (25ft)		
	Window air conditioner in	00	Busy downtown area		
	room			55 dB(A)	
Quiet	Occasional private	50	Normal conversation	Appx 1/4 as loud a	
Quiet	auto at 100 ft	. 50	Normal conversation	75dB	
				45 dB(A)	
Sleep interference	Quiet home during evening	40		Appx 1/8 as loud c	
	·			75dB	
	Bird calls			35 dB(A)	
	Library	30		Appx 1/16 as loud	
				as 75dB	
	Soft whisper (5 ft)		× •		
		20	In a quiet house at		
			midnight		
	Leaves rustling	10			

Table 3.7-1: Relationship Between A-Scale dB Readings and Sounds of Daily Life

Adapted from the ABCs of Our Noise Codes published by Citizens Against Noise, Honolulu, Hawaii



TABLE OF CONTENTS

3.8 Hi	storic and Cultural Resources	
3.8.1	Historic, Archeological, and Cultural Resources	
3.8.2	Tribal Consultation	



3.8 HISTORIC AND CULTURAL RESOURCES

3.8.1 Historic, Archeological, and Cultural Resources

Cultural resources, which are protected under the National Historic Preservation Act (NHPA) of 1966, are non-renewable remains of past human activity. As noted in NUREG-1910 (GEIS Sec. 3.2.8), the Wyoming State Historic Preservation Office (SHPO) administers and is responsible for oversight and compliance with National Register of Historic Places (NRHP or National Register), compliance and review for Section 106 of NHPA, traditional cultural properties review, enforcement of the Native American Graves Protection and Repatriation Act (NAGPRA), and compliance with other federal and state historic preservation laws, regulations and statutes.

This portion of Wyoming appears to have been inhabited by aboriginal hunting and gathering people for more than 13,000 years. Throughout the prehistoric past, the area was used by highly mobile hunters and gatherers who exploited a wide variety of resources. The proposed Ludeman Project (proposed project) is located in the prehistoric cultural sub-area known as the Northwestern Plains. The Northwestern Plains stretch from the central Alberta to southern Wyoming and from western North Dakota to western Montana

A Class III cultural resource inventory of the proposed project was conducted in 2008 (Appendix B) by Ethnoscience, Inc. of Billings Montana. The inventory incorporated 19,888 acres, of which 398 acres are under Bureau of Land Management jurisdiction, 1,485 acres are owned by the State of Wyoming, and 18,005 acres are privately owned. According to NUREG-1569 (Sec. 2.4.1), specific attention should be directed to properties included in or eligible for inclusion in the NRHP.

The investigation identified 47 sites and 59 isolated finds. Three previously recorded prehistoric sites within the proposed project were not found. It is assumed they no longer exist. Historic documents also note the possible presence of an historic telegraph line, but the inventory identified no evidence of this site.

Twenty-four of the sites are prehistoric. All of the existing sites are archaeological. Eighteen of the prehistoric sites contain stone features. Two sites are culture material scatters and six are lithic scatters. Lithic scatters contain evidence of chipped stone tools and/or the debris left behind during the manufacture of chipped stone tools. No other class of artifacts was found. Culture material scatters usually contain chipped stone artifacts, but also contain other types of artifacts (fire cracked rock, bone, manos, pottery). They may also have evidence of hearths or other features. Stone feature sites are defined by the presence of stone rings, cairns, effigies, and alignments. Although other artifacts may exist, the presence of the stone features categorizes this site type.



Twenty-three sites are historic. The historic sites consist of an historic trail, five windmills, five farmsteads, three foundations, three depressions, four culture material scatters, and two stone features. One of the stone features consists of a historically formed rock pile. Its function is unknown. Historic culture material scatters include the debris left behind from human occupation. In the absence of other features, they are often identified as trash scatters. Depressions are holes excavated in the ground. They may represent the remains of basements or other construction activities. Foundations mark the location of buildings. In the absence of culture material scatters, it can be difficult to ascertain whether the buildings were part of a domestic unit or an outbuilding associated with agriculture or ranching. Farmsteads represent the remains of the location where the majority of farming/ranching activities occurred. They often contain evidence of the house and barn. Windmills are structures used to pump water into containers for use by cattle. The Bozeman Trail was used by Euro-American immigrants between 1863 and 1866 in an attempt to avoid Sioux territory.

The Bozeman Trail is listed on the National Register. The ruts associated with this trail in the proposed project are shallow and difficult to see. The setting associated with the Bozeman trail within the proposed project is impacted by the construction of Highway 93, located between 0.5 to 0.25 mile to the east and northeast, a fence line along the highway, and the construction of a dam and stock pond immediately to the east of the trail. These did not exist during the trail's period of significance. As such, the portion of the trail located within the proposed project is no longer able to convey its original character as a frontier trail. Because of the lack of setting and feeling, the segments of the trail within the proposed project are recommended as not contributing to the site's eligibility for listing on the National Register.

The remaining sites were examined to ascertain their eligibility for listing on the National Register. The method used to provide recommendations regarding National Register eligibility closely follows the guidelines established by the Department of the Interior. Of particular importance are National Register Bulletins 15 and 16 (National Park Service [NPS] 1991a and 1991b). According to these bulletins, a property must possess historic significance and integrity to be listed on the National Register. With the exception of windmills, sites identified in the proposed project area consist of archaeological remains. This limits the potential eligibility of sites. Isolated Finds are rarely, if ever, recommended National Register eligible.

Based on the site's historic significance, and surface observations of integrity and soil deposition, 37 of the sites are recommended ineligible for listing on the National Register of Historic Places (National Register). Three additional sites are recommended ineligible based on the results of subsurface testing. The National Register status of the remaining six sites cannot be determined without further investigation.



The Class III Cultural Resource Inventory in Appendix B (Sec 2.4 of the TR) contains information that falls under the confidentiality requirement for archeological resources under the National Historic Preservation Act, Section 304 (16 U.S.C. 470w-3(a)). The report, including Wyoming Cultural Resource Forms, has also been submitted to Wyoming State Historic Preservation Office (WSHPO) for concurrence and the WDEQ-LQD under a separate cover from Ethnoscience. The Wyoming Cultural Resource Forms are not included in Appendix B (Sec. 2.4 of the TR) since these forms were not provided to the client due to disclosure restrictions in the NHPA Section 304. Accordingly, disclosure is specifically exempted by statute as specified in 10 CFR §2.390(a)(3). Therefore, Uranium One requests that all applicable portions of Appendix B remain "CONFIDENTIAL" for the purpose of Public Disclosure of this application. Each page of the protected cultural resource information has been marked as follows:

Confidential Information Submitted under 10 CFR 2.390

The cover page for Appendix B has been marked with a more detailed statement, as follows:

Confidential Information Submitted under 10 CFR 2.390 Disclosure is Limited Under the National Historic Preservation Act, Section 304 (16 U.S.C. 470w-3(a)).

3.8.2 Tribal Consultation

Cultural resources that are considered sensitive and potentially sacred to modern Native American tribes include burials, rock art, rock features and alignments (such as cairns, medicine wheels, and stone circles), Indian trails, and certain religiously significant natural landscapes and features. Some of these resources may be formally designated as traditional cultural places (TCPs) or Indian Sacred Sites. A TCP is a site considered eligible for inclusion on the NRHP because of its association with cultural practices or beliefs of a living community that are (a) rooted in that community's history and (b) important in maintaining the continuing cultural identity of the community (NRHP 2011). As noted in NUREG-1910 (GEIS, Section 3.3.8.4), there are no culturally significant places listed in either the NRHP or state registers within the Wyoming East Uranium Region. The proposed project area lies within this region.

No Native American Heritage sites have been formally identified and recorded to date directly associated with the proposed project area.

Uranium One commits to ongoing monitoring of historic and cultural resources as project development progresses. Mitigation measures proposed to avoid or reduce cultural resource impacts include:



- Consult with Native American governments early in the planning process to identify traditional cultural properties, sacred landscapes, and other issues and concerns regarding the proposed project;
- If resources eligible for listing on the NRHP are present, modify the development plan to avoid disturbance of significant cultural resources;
- Prepare an internal cultural resources management plan, if cultural resources are present in the area of potential effect or if areas with a high potential to contain cultural material have been identified;
- The discovery of cultural artifacts in an operational area shall result in a work stoppage in the vicinity of the find until the resources can be evaluated by a professional archaeologist; and
- The use of existing roads to the maximum extent feasible to avoid additional surface disturbance.



TABLE OF CONTENTS

3.9 Vis	ual and Scenic Resources	
3.9.1	Introduction	
3.9.2	Methods	
3.9.3	Visual Resource Management Classes	
	Ludeman Visual Resource Management Rating	
	Environmental Consequences	
	Mitigation	

List of Figures

Figure 3.9-1:	Negley Subdivision to Leuenberger Plant Line-Of-Site Diagram	3.9-8
Figure 3.9-2:	Highway 95 to North Platte Plant Line-Of-Site Diagram	3.9-9
Figure 3.9-3:	Highway 93 to Peterson Plant Line-Of-Site Diagram	.3.9-10
Figure 3.9-4:	North Platte River to Peterson Plant Line-Of-Site Diagram	.3.9-11

List of Tables

Table 3.9-1:	Determining BLM Visual Resource Inventory Classes	9-3
Table 3.9-2:	Scenic Quality Inventory and Evaluation for the Ludeman Project 3.	9-4



3.9 VISUAL AND SCENIC RESOURCES

3.9.1 Introduction

The proposed Ludeman Project (proposed project) is located predominantly on privately owned land. However, a small portion of the proposed project area is on State owned land and public lands managed by the Bureau of Land Management (BLM). Privately owned land is not managed by any public agency to protect scenic quality. As noted in NUREG-1910 (GEIS Sec. 3.3.9), the BLM Visual Resource Handbook (BLM, 2007 a-c) is utilized the categorize visual/scenic resources. The BLM Casper Field Office is responsible for overseeing activities on public lands within the proposed project in accordance with the Approved Casper Resource Management Plan (BLM 2007). The BLM has inventoried the visual resources of all lands within the boundaries of the Casper Field Office, including private lands, with the Visual Resource Management (VRM) system.

3.9.2 Methods

The VRM system is the basic tool used by the BLM to inventory and manage visual resources on public lands. The VRM inventory process involves rating the visual appeal of a tract of land, measuring public concern for scenic quality, and determining whether the tract of land is visible from travel routes or observation points. The BLM has inventoried the landscape, including non-BLM owned land, within the proposed project area and the surrounding two mile land use review area.

3.9.3 Visual Resource Management Classes

The elements used to determine the visual resource inventory class are the scenic quality, sensitivity levels, variety classes, and distance zones. Each of the elements used to identify the VRM Class (BLM 2007) is defined below:

Scenic Quality - Scenic quality is a measure of the visual appeal of a tract of land. In the visual resource inventory process, public lands are assigned an A, B, or C rating based on the apparent scenic quality, which is determined using seven key factors: landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications. During the rating process, each of these factors is ranked comparatively against similar features within the physiographic province.

Sensitivity Level – A degree or measure of viewer interest in the scenic qualities of the landscape. Factors to consider include 1) type of users; 2) amount of use; 3) public



interest; 4) adjacent land uses; and 5) special areas. Three levels of sensitivity have been defined:

- Sensitivity Level 1 The highest sensitivity level, referring to areas seen from travel routes and use areas with moderate to high use.
- Sensitivity Level 2 An average sensitivity level, referring to areas seen from travel routes and use areas with low to moderate use.
- Sensitivity Level 3 The lowest sensitivity level, referring to areas seen from travel routes and use areas with low use.

Distance Zones – Landscapes are subdivided into three distance zones based on relative visibility from travel routes or observation points. The zones are based on specified distances from the observer, particularly on roads, trails, concentrated-use areas, rivers, etc. The three categories are foreground-middleground, background, and seldom seen.

- Foreground-Middleground The area visible from a travel route, use area, or other observer position to a distance of 3 to 5 miles. The outer boundary of this zone is defined as the point where the texture and form of individual plants are no longer apparent in the landscape and vegetation is apparent only in pattern or outline.
- Background The viewing area of a distance zone that lies beyond the foreground and middleground. This area usually measures from a minimum of 3 to 5 miles to a maximum of about 15 miles from a travel route, use area, or other observer position. Atmospheric conditions in some areas may limit the maximum to about 8 miles or increase it beyond 15 miles.
- Seldom Seen The area is not seen as foreground-middleground or background and is hidden from view by landforms, buildings, other landscape elements, or distance.

The visual resource inventory classes, tabulated in Table 3.9-1, are used to develop visual resource management classes, which are generally assigned by the BLM through the resource management plan process. VRM objectives are developed to protect scenic public lands, especially those lands that receive the greatest amount of public viewing. The following VRM classes are objectives that outline the amount of disturbance an area can tolerate before it no longer meets the visual quality of that class.

- Class I Objective: To preserve the existing character of the landscape. The level of change to the characteristic landscape should be very low and must not attract attention.
- Class II Objective: To retain the existing character of the landscape. The level of change to the characteristic landscape should be low.



- Class III Objective: To partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate.
- Class IV Objective: To provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high.

The Scenic Quality, Sensitivity Level, and Distance Zone inventory levels are combined to assign the VRM Class to inventoried lands as shown in the following matrix:

Visual Sensitivity			High			Medium		Low
Special Areas		I	Ι	Ι	Ι	Ι	Ι	Ι
Scenic Quality	Α	II	II	II	II	II	II	II
	В	II	III	III/IV	III	IV	IV	IV
	С	III	IV	IV	IV	IV	IV	IV
Distance Zones		f/m	b	SS	f/m	b	SS	SS

Table 3.9-1: Determining BLM Visual Resource Inventory Classes

f/m =foreground-middleground

b = background

ss-seldom seen

3.9.4 Ludeman Visual Resource Management Rating

The BLM has inventoried the landscape in the proposed project area and the surrounding two mile area and rated the areas as either VRM Class III or IV. According to NUREG-1910 (GEIS Sec. 3.3.9), the proposed project area does not contain any Class I resources. It goes on to state that the few Class II resources located within the Wyoming East Uranium Region are contained south of Interstate 25. The entire proposed project boundary lies north of Interstate 25.

The scenic quality inventory was based on methods provided in BLM Manual 8410 – Visual Resource Inventory as well as a review of the factors that contribute to the existing VRM Class III and IV inventory for the proposed project. The key factors of landform, vegetation, water, color, influence of adjacent scenery, scarcity and cultural modifications were evaluated and scored according to the rating criteria. The criteria for each key factor ranged from high to moderate to low quality based on the variety of line, form, color, texture and scale of the factor within the landscape. A score was associated with each rating criteria, with a higher score applied to greater complexity and variety for each factor in the landscape. The results of the inventory and the associated score for



each key factor are summarized in Table 3.9-2. Based on guidance provided in NUREG-1569 (NRC 2003), if the visual resource evaluation rating is 19 or less, no further evaluation is required. Based on field reconnaissance conducted in June and August 2008, the total score of the scenic quality inventory for the proposed project area is 11. Therefore, no further evaluation is required for existing scenic resources and any changes to scenic resources from proposed project facilities.

Key Factor	Rating Criteria	Score
Landform	Flat to rolling terrain with some areas of	2
	steeper topography with large gullies cutting	
	up to ridge lines. These areas are interesting	
	but not dominant.	
Vegetation	The majority of the site has very little variety	2
	in vegetation, which consists of grazed	
	grassland with sage and other shrubs. There are	
	a few large trees present on the site which offer	
Water	some variety in form. Water is present and generally not evident as	3
water	viewed from residences and roads except for	3
	Gilbert Lake which is visible from Hwy 93.	
	The WYDOT 2007 traffic count for Hwy 93 at	
	its intersection with HWY 95 was 50 vehicles	
	per day, therefore exposure is minimal.	
Color	Vegetation and soil colors have some subtle	2
	color variations but generally shift from green	
	tones in the spring to tan tones throughout the	
	remainder of the year.	
Influence of adjacent	Adjacent scenery is very similar to the	0
scenery	proposed project area, and provides no variety	
	in line, form, color, and texture.	
Scarcity	Landscape is common for the region.	1
Cultural modifications	Existing modifications consist of oil and gas	1
	production facilities and infrastructure,	
	windmills and solar powered pumps, and one	
	residence. The Bozeman Trail is present on	
	private land near Gilbert Lake but is not visible	
	to the general public.	
	Total Score	11
		11

 Table 3.9-2: Scenic Quality Inventory and Evaluation for the Proposed Project



3.9.5 Environmental Consequences

The visible surface structures proposed for the proposed project include wellhead covers, header houses, electrical distribution lines, booster pump houses and three Satellite facilities. The proposed project will use existing and limited new roads to access the Satellite facilities and each header house.

Each wellhead cover typically consists of a weatherproof structure placed over the well. These covers are approximately three feet high and two feet in diameter. Each header house is a small metal building. A disturbance area around each header house is necessary to provide an adequate area for operations and maintenance vehicles to turn around. Each Satellite IX facility is anticipated to consist of an 80- x 160-foot processing building, associated parking and other infrastructure within an approximate 2-acre area enclosed with security fencing. Two surge ponds each approximately 1.2 acres each will be located near the facility also enclosed with wildlife exclusion fencing. Electric distribution lines will connect header houses and Satellite facilities to existing electric distribution lines. The electrical distribution poles will be approximately 20 feet high and will be wooden so that their natural color harmonizes with the landscape. Road disturbance acreage is calculated assuming approximately seven miles of 25-foot-wide main road and approximately 18 miles of eight-foot-wide, two-tracks for field roads.

Temporary and short-term visual effects during the construction period in each wellfield will result from header house construction, well drilling, and construction of access roads and electric distribution lines. Following completion of wellfield installation, temporarily disturbed areas will be reclaimed. Only long-term effects associated with operations and maintenance will remain following post-construction reclamation.

Long-term effects will result from the addition of structures to the landscape, such as the Satellite facilities and associated structures, header houses, wellhead covers, access roads, and electric distribution lines. Effects from long-term activities will occur over the life of the project. Current photographs of the site and a map of the photograph locations are provided in Addendum 2.4-A of the TR.

The most important visual resource areas include:

- Public views from Highways 93 and 95 and from County Roads 26 and 27 (Leuenberger Road and Tank Farm Road);
- Views from the subdivision adjacent to the northwest project boundary;
- Views from the Leuenberger ranch house;
- Views from the North Platte River; and
- Portions of the Bozeman Trail accessible to the general public.



Wellfields with associated wellheads and header houses will be visible from public roadways, the subdivision, and, potentially from limited portions of the Bozeman Trail. Wellhead covers will be approximately three-feet tall and header houses will be approximately ten-feet high at the eave; both will be painted to blend with the surrounding environment. Within the proposed project area, there are currently three industrial sites visible from the public roadways (Photos 1, 8 & 12 provided in Addendum 2.4-A of the TR). The portions of the industrial sites that are painted to blend with the surrounding environment are not as easily discerned as those painted white or dark brown.

The locations for the three Satellite facilities were chosen to minimize visual and environmental effects within existing topography. The Leuenberger Satellite facility will be the site most visible to the public of the three facilities. Its proposed location in Section 14 (T34N R74W) approximately one-half mile south of Highway 95 will be partially visible from portions of the highway. It will be only partially visible, or not visible at all from the subdivision adjacent to Highway 95. A small bluff is located between the subdivision and the proposed facility site which will partially block the view from the subdivision. Figure 3.9-1 presents a line-of-sight diagram from the subdivision to the proposed Leuenberger facility site. There is currently an industrial building with two outlying tanks within the same section of land (Photo 1) which are located closer, and are more visible to the subdivision than the proposed Satellite facility.

The proposed North Platte Satellite facility site is located in Section 10 (T34N R73W) at an elevation of 5320 feet. There is a hill to the east of the North Platte facility site with an approximate top elevation of 5372 feet. The hill will partially block the view of the facility from Highway 93 and the Bozeman Trail which is approximately one mile northeast of the facility site. There are hills to the northwest of the North Platte facility site with a maximum elevation of approximately 5340 feet which will limit the view of the facility from sections of Highway 95. Figure 3.9-2 presents a line-of-sight diagram from Highway 95 to the proposed North Platte facility site.

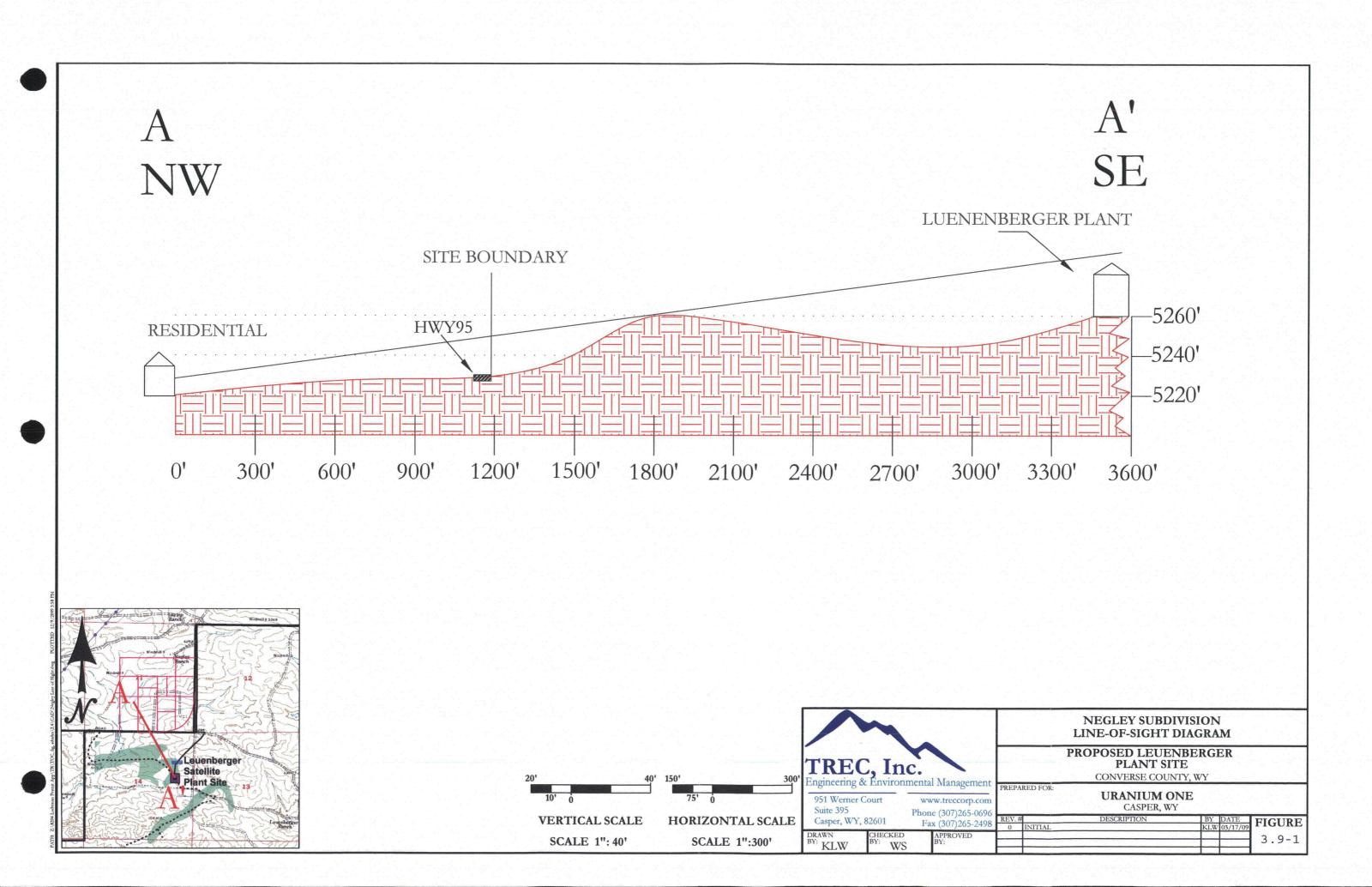
The proposed Peterson Satellite facility is located in Section 26 (T34N R73W) at an elevation of approximately 5110 feet. The facility site will be on top of a bluff and approximately two miles north of the North Platte River which is at an elevation of approximately 4900 feet. The distance combined with the elevation difference should effectively shield the facility from view. The facility is approximately 1.25 miles north of Tank Farm Road. Tank Farm Road is at an elevation of approximately 4910-feet. As with the river, the distance and the difference in elevation should blur the view of the facility. Figure 3.9-3 and 3.9-4 present line-of-sight diagrams from Highway 93 and from the North Platte River to the proposed Peterson Satellite facility site.

The views from the Leuenberger ranch house should not be affected. The closest wellfield will be just over one-half mile west of the ranch house. A hill exists between the

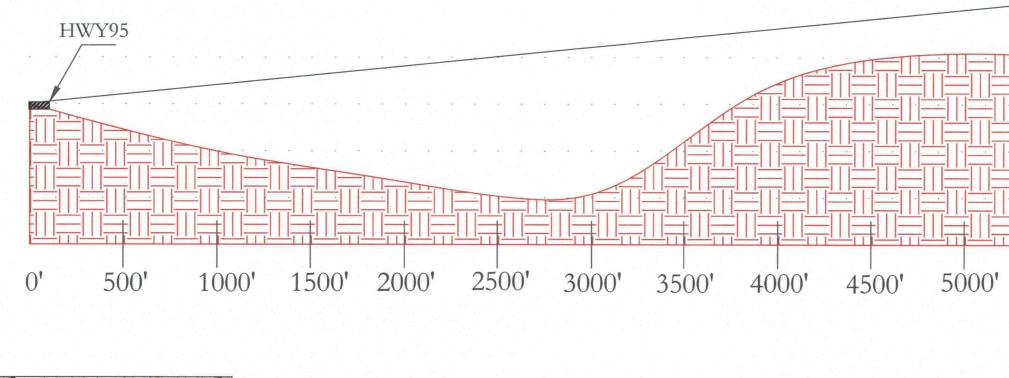


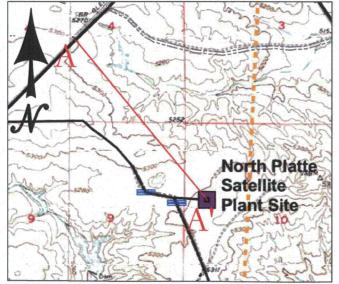
ranch house and the proposed wellfield which will shield the view of the wellfield. The next closest wellfield is approximately 1.5 miles to the southeast. The rolling topography between the wellfield and the ranch house will shield the view of the wellfield.

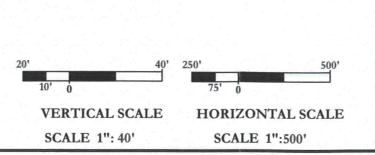
Despite the low scenic quality rating, minimal public lands within the proposed project area, and low traffic counts for existing roadways, Uranium One has and intends to continue to implement measures to lessen the visual impact from the proposed project. With the implementation of mitigative measures described below, effects to visual and scenic resources as a result of the construction and operation of the proposed project are expected to be negligible.

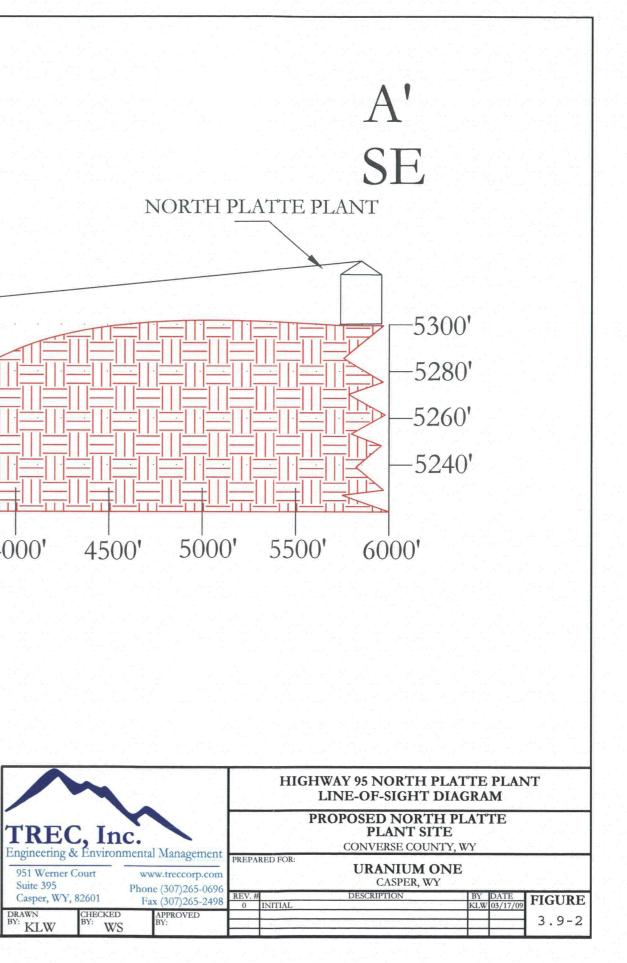


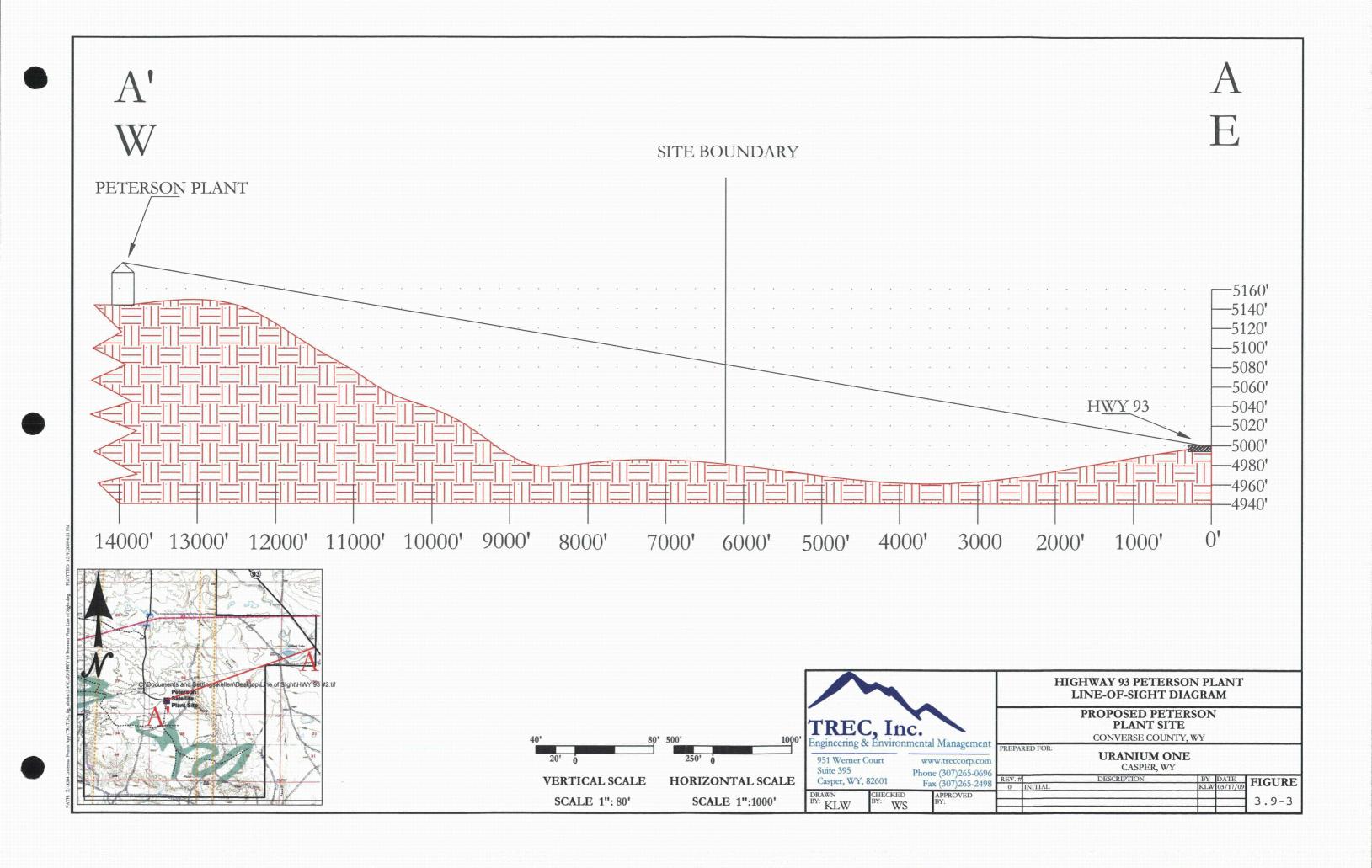
A NW

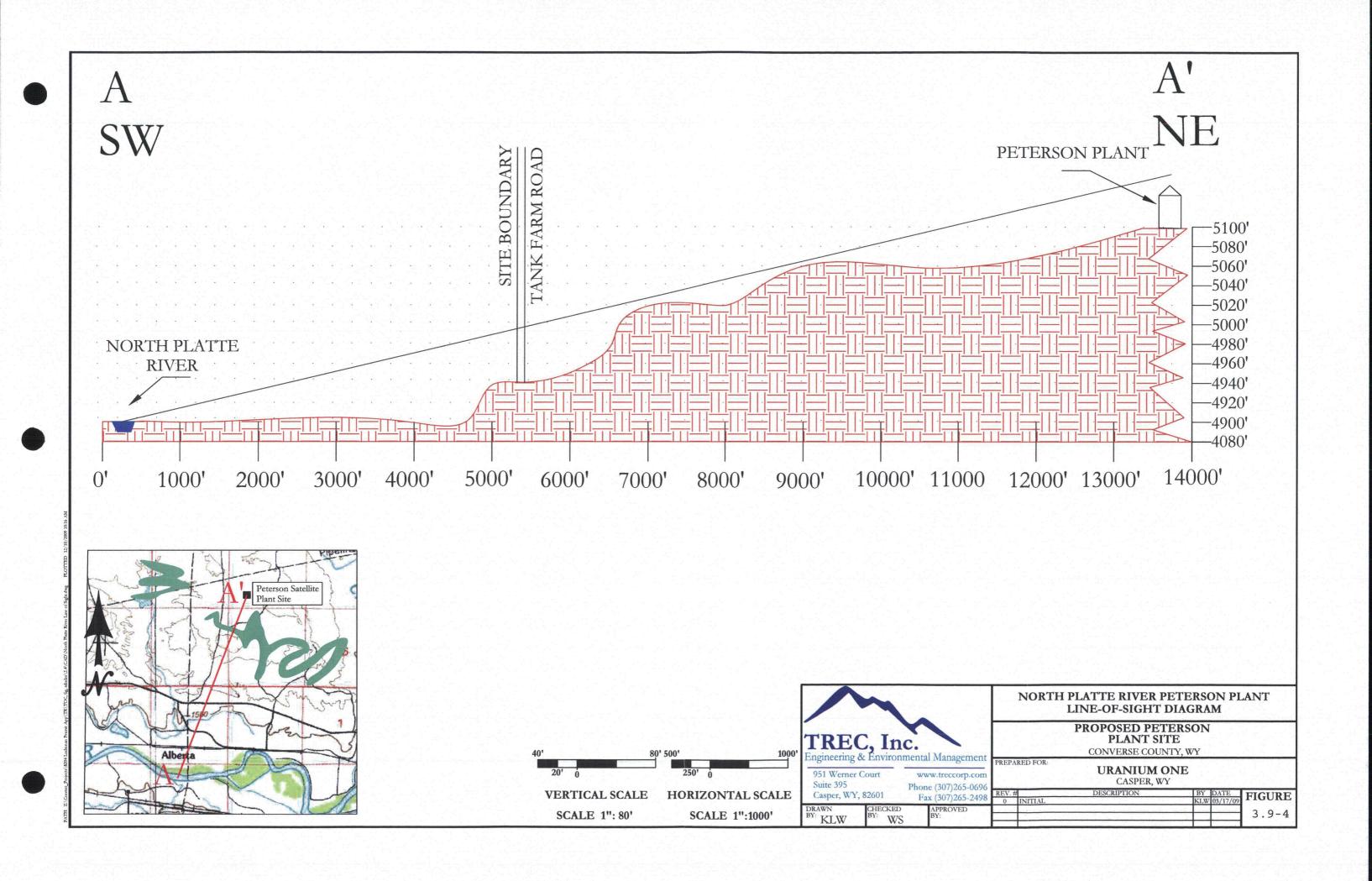














3.9.6 Mitigation

Mitigation measures are meant to minimize adverse contrasts of proposed project facilities with the existing landscape. The measures should be applied to all facilities, even those that meet VRM objectives. Mitigation would enable proposed project facilities to harmonize with the surrounding landscape to the extent feasible.

As discussed above, if the visual resource evaluation rating of a proposed project area is 19 or less, no further evaluation is required as noted in NUREG-1569. Based on field reconnaissance conducted in June and August 2008, the total score of the scenic quality inventory for the proposed project is 11. Therefore, no further evaluation of existing scenic resources and any changes to scenic resources from proposed project facilities are required. However, Uranium One intends to continue to adopt measures to lessen the visual impact of the proposed project.

Uranium One's additional measures are meant to minimize adverse contrasts of proposed facilities with the existing landscape. All installed above-ground wellheads and structures will be painted with low reflectivity paint in colors that harmonize with the surrounding landscape. In addition, several design techniques will be implemented to minimize the visual contrasts. Those methods include reducing unnecessary disturbance by using the same trench for multiple utilities, reducing the area of temporary disturbance by designating equipment parking areas during construction, and following areas of existing disturbance when considering utility placement. To the extent possible, topographic features will be used to screen plant facilities and roads from public view. Roads may be aligned with the contours of the topography, although this measure may result in a greater area of disturbance. Construction debris will be removed from new construction areas as soon as possible and temporarily disturbed areas will be reclaimed as soon as possible following construction.

In general, resource protection measures proposed for erosion control, road construction, rehabilitation and re-vegetation, and wildlife protection would mitigate effects to visual quality.

December 2011



TABLE OF CONTENTS

economics	
emography	3.10-1
Population Characteristics	3.10-4
Population Projections	3.10-7
Major Economic Sectors	3.10-12
valuation of Socioeconomic Impacts of the Proposed Operation	3.10-16
Operations Workforce	3.10-19
6	
4.2.1 Native American Populations in Wyoming	3.10-24
4.2.2 Hispanic Populations in Wyoming	3.10-28
4.2.3 Basques in Wyoming	
Environmental Justice Conclusions	3.10-39
	mography Regional Population Population Characteristics Population Projections Seasonal Population and Visitors Schools Sectorial Population bcal Socioeconomic Characteristics Major Economic Sectors Housing Temporary Housing valuation of Socioeconomic Impacts of the Proposed Operation Construction Operations Workforce Effects to Housing Effects to Services Effects to Traffic nvironmental Justice Geographic Unit of Analysis Minority Populations 4.2.1 Native American Populations in Wyoming

List of Figures

Figure 3.10-1:	Significant Population Centers within an 80-km Radius (50 miles) of the
	Proposed Project
Figure 3.10-2:	Environmetnal Justice Study Area for the proposed project
Figure 3.10-3:	Percentage of Native Americans in the Proposed Project Study Area
	(Based on Census Records)
Figure 3.10-4:	Percentage of Hispanics Living in the Proposed Project Study Area (Based
	on Census Records)
Figure 3.10-5:	Percentage Of Househoulds Living in Poverty in the proposed project
	Study Area (Based on Census Records)
Figure 3.10-6:	Location of Day Cares, Schools and Amusement Areas where Children
_	are Likely to Congregate in the proposed project Study Area

.



List of Tables

Table 3.10-1:	1980-2007 Historical and Current Population Change for Counties and
	Communities within the 80-km Radius of the proposed project 3.10-3
Table 3.10-2:	2007 Population Estimates by Age and Sex for Wyoming and the Counties
	within the 80-km Radius of the Proposed Project
Table 3.10-3:	2005-2025 Population Projections for Wyoming and the Counties within
	the 80-km Radius of the Proposed Project
Table 3.10-4:	2000 Population within the 80-km Radius of the Proposed Project. 3.10-11
Table 3.10-5:	2006 Annual Average Labor Force Characteristics and Employment in
	Economic Sectors for State of Wyoming for Converse and Natrona
	Counties
Table 3.10-6:	2007 Housing Characteristics for Converse and Natrona Counties 3.10-15



3.10 SOCIOECONOMICS

Information presented in this section concerns those demographic and social characteristics of the counties and communities that may be affected by the proposed Ludeman Project (proposed project).

NUREG-1569 obliges consideration of population data within a 50-mile (80-km) radius from the proposed project area's approximate center. The area within an 80-kilometer (km) (50-mile) radius of the proposed project includes portions of eight counties in northeastern Wyoming (Albany, Campbell, Carbon, Converse, Johnson, Natrona, Niobrara, and Platte Counties), as shown on Figure 3.10-1. The proposed project is located in central Converse County. The nearest communities are Rolling Hills, a small Converse County incorporated town located west on State Highway 95, Glenrock (west on State Highway 95) and Douglas (southeast on State Highway 93).

Historical and current population trends in counties and communities within an 80-km distance of the proposed project are shown in Table 3.10-1, which summarizes past growth trends in the counties relative to state population trends between 1980 and 2007. Between 1980 and 1990, all counties and towns in the area lost population, with the exception of Campbell and Albany Counties. In the 1990s, all places in the 80-km Survey Area increased in population with the exception of Carbon County, Niobrara County, and the towns of Lost Springs (in eastern Converse County) and Edgerton and Midwest (in Natrona County). The greatest percentage increase for counties between 2000 and 2007 occurred in Campbell County (20 percent increase) and Johnson County (15.1 percent increase), and during this time period Converse and Natrona Counties exceeded state growth. Among municipalities, Casper area towns had the highest percentage increases between 2000 and 2007. Bar Nunn grew by 81.6 percent and Mills grew by 20.9 percent. Niobrara County, Platte County, and Carbon County lost population during this same time period, as did the town of Glendo.

uraniumone ™ investing in our energy

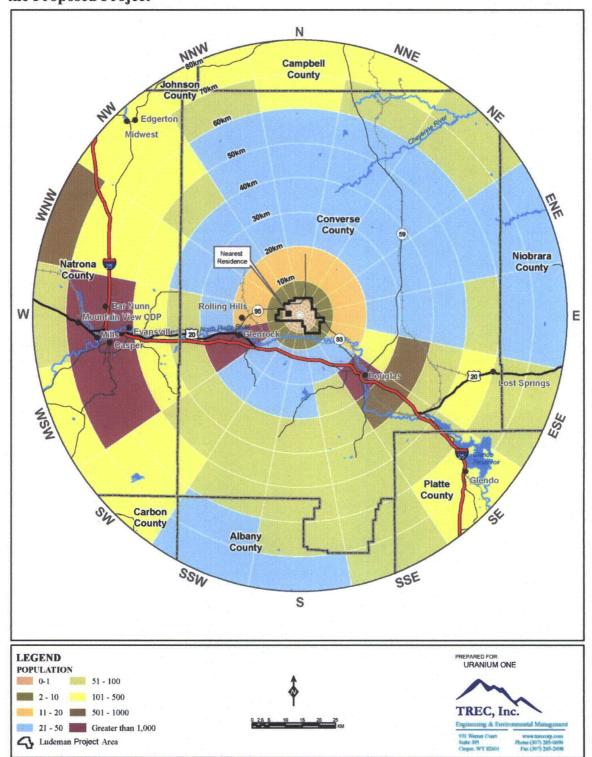


Figure 3.10-1: Significant Population Centers within an 80-km Radius (50 miles) of the Proposed Project

December 2011

3.10-2



Table 3.10-1: 1980-2007 Historical and Current Population Change for Counties and Communities within the 80-km Radius of the Proposed Project

			Percent Change							
								1980/	1990/	2000/
State/County/City	1980	1990	2000	2002	2004	2006	2007	1990	2000	2007
State of Wyoming	469,557	453,588	493,782	497,204	503,258	512,757	522,830	-3.4	8.9	5.9
Albany County	29,062	30,797	32,014	32,275	32,725	32,497	32,227	6.0	4.0	0.7
Campbell County	24,367	29,370	33,698	36,142	36,629	38,934	40,433	20.5	14.7	20.0
Carbon County	21,896	16,659	15,639	15,244	15,215	15,165	15,486	-23.9	-6 .1	-1.0
Converse County	14,069	11,128	12,052	12,352	12,501	12,866	12,868	-20.9	8.3	6.8
Glenrock	2,736	2,153	2,231	2,254	2,253	2,331	2,371	-21.3	3.6	6.3
Douglas	6,030	5,076	5,288	5,340	5,375	5,541	5,675	-15.8	4.2	7.3
Lost Springs	9	4	1	1	1	1	1	-55.6	-75.0	0.0
Rolling Hills	-	330	449	452	450	492	498		36.1	10.9
Johnson County	6,700	6,145	7,075	7,354	7,525	7,820	8,142	-8.3	15.1	15.1
Natrona County	71,856	61,226	66,533	67,381	68,692	70,252	71,750	-14.8	8.7	7.8
Bar Nunn	-	835	936	953	1,133	1,523	1,700	-	12.1	81.6
Casper	51,016	46,742	49,644	50,121	50,994	51,965	53,003	-8.4	6.2	6.8
Edgerton	510	247	169	170	170	173	175	-51.6	-31.6	3.6
Evansville	2,335	1,403	2,255	2,280	2,294	2,308	2,329	-39.9	60.7	3.3
Midwest	638	495	408	410	424	427	432	-22.4	-17.6	5.9
Mills	2,139	1,574	2,591	3,036	3,071	3,095	3,133	-26.4	64.6	20.9
Niobrara County	2,924	2,499	2,407	2,247	2,248	2,212	2,262	-14.5	-3.7	-6.0
Platte County	11,975	8,145	8,807	8,706	8,581	8,454	8,396	-32.0	8.1	-4.7
Glendo	367	195	229	227	228	222	219	-46.9	17.4	-4.4



3.10.1.1 Population Characteristics

The 2007 population estimates by age and sex for counties within 80-km of the proposed project are shown in Table 3.10-2. With the exception of Albany County (which includes the University of Wyoming in Laramie), the 40- to 64-year age group (which includes the 'baby boom' cohort) comprises between 33 to 39 percent of the population in each of the counties. According to the Wyoming Economic and Demographic Forecast: 2005 to 2014 (Wyoming Department of Administration and Information, 2005), the early baby boom population in Wyoming is one of the highest in the nation as a result of the in-migration of workers during the oil boom years in the late 1970s and early 1980s. In contrast, the population in the 27- to 42-year age group is relatively low because there was a high net out-migration (outflow greater than inflow) in this age group between 1995 and 2000 as young adults left the state during a declining economy. The aging population is expected to affect the economy through changes in the labor supply as baby boomers reach retirement age and are replaced by fewer new workers. The older population would also require different types of goods and services, requiring a shift in local economic sectors to accommodate the changing demographics.

In 2007, 95.7 percent of the total eight-county population of 191,564 was classified as white. Persons of two or more races comprised 1.3 percent of the total population, Native American comprised 1.2 percent, and all other racial categories accounted for one percent or less of the total population. The racial characteristics of the eight-county area were similar to the racial characteristics of the state, with the exception that the state has a slightly higher Native American population (2.5 percent) (U.S. Census Bureau, Population Division, Release Date May 1, 2008).

Table 3.10-2: 2007 Population Estimates by Age and Sex for Wyoming and the Counties within the 80-km Radius of the Proposed Project

Area	Age	Male	Female	Total	Total Percent Breakdown
	Under 5	18,432	17,458	35,890	6.9
	5-19	53,985	50,034	104,019	19.9
	20 - 39	73,362	67,001	140,363	26.8
	40 - 64	90,279	88,378	178,657	34.2
	65+	28,987	34,914	63,901	12.2
State of Wyoming	Total	265,045	257,785	522,830	100.0
	Under 5	935	910	1,845	5.7
	5-19	3,412	2,943	6,355	19.7
	20 - 39	7,335	5,995	13,330	41.4
	40 - 64	3,937	4,032	7,969	24.7
	65+	1,296	1,432	2728	8.5
Albany County	Total	16,915	15,312	32,227	100.0
	Under 5	1,623	1,593	3,216	8.0
	5-19	4,516	4,139	8,655	21.4
	20 - 39	6,268	5,713	11,981	29.6
	40 - 64	7,383	6,886	14,269	35.3
	65+	1,069	1,243	· 2312	5.7
Campbell County	Total	20,859	19,574	40,433	100.0
	Under 5	525	482	1,007	6.5
	5-19	1,481	1,280	2,761	17.8
	20 - 39	2,169	1,638	3,807	24.6
	40 - 64	3,201	2,777	5,978	38.6
	65+	938	995	1933	12.5
Carbon County	Total	8,314	7,172	15,486	100.0
	Under 5	427	383	810	6.3
	5-19	1,346	1,192	2,538	19.7
	20 - 39	1,525	1,569	3,094	24.0
	40 - 64	2,428	2,381	4,809	37.4
	65+	744	873	1617	12.6
Converse County	Total	6,470	6,398	12,868	100.0
	Under 5	220	211	431	5.3
	5-19	720	729	1449	17.8
	20 - 39	998	932	1930	23.7
	40 - 64	1,392	1,467	2,859	. 35.1
	65+	700	773	1473	18.1
Johnson County	Total	4,030	4,112	8,142	100.0
	Under 5	2,549	2,504	5,053	7.0

December 2011



Area	Age	Male	Female	Total	Total Percent Breakdown
Natrona County	5-19	7,510	7,037	14,547	20.3
	20 - 39	9,789	9,648	19,437	27.1
	40 - 64	11,931	11,874	23,805	33.2
	65+	3,852	5,056	8,908	12.4
	Total	35,631	36,119	71,750	100.0
	Under 5	45	52	97	4.3
	5-19	207	177	384	17.0
	20 - 39	224	265	489	21.6
	40 - 64	416	403	819	36.2
	.65+	216	257	473	20.9
Niobrara County	Total	1,108	1,154	2,262	100.0
	Under 5	221	202	423	5.0
	5-19	764	722	1486	17.7
	20 - 39	· 942	907	1849	22.0
	40 - 64	1,550	1,549	3,099	36.9
	65+	715	824	1539	18.3
Platte County	Total	4,192	4,204	8,396	100.0



3.10.1.2 Population Projections

The projected populations for selected years by county within the 80-km radius of the proposed project are shown in Table 3.10-3. The population forecasts are developed by the Wyoming Department of Administration and Information, Economic Analysis Division, based on historic trends of demographic and economic variables. Those counties that have experienced growth in the recent past are projected to continue to increase and those that are in decline are projected to continue to decline for another few years and then will begin to stabilize. Campbell and Johnson counties are anticipated to continue significant population increases between 2000 and 2030. Campbell County (78 percent projected population increase) and Johnson County (59 percent) will outpace the overall growth of Wyoming (26 percent) between 2000 and 2030. Natrona County (29 percent) and Converse County (24 percent) are projected to have growth rates similar to the state. Albany and Carbon Counties are projected to increase by less than 10 percent between 2000 and 2030, and Niobrara and Platte Counties are projected to lose population.

Table 3.10-3: 2005-2025	Population	Projections	for	Wyoming	and	the	Counties
within the 80-km Radius	of the propos	sed Ludemaı	n Pro	oject	·		

	Census	Projected	Projected	Projected	Projected	Projected	Projected
Area	2000	2005	2010	2015	2020	2025	2030
State of Wyoming	493,782	506,541	539,740	560,000	578,730	598,100	621,160
Albany County	32,014	32,556	32,250	32,040	31,880	32,300	32,870
Campbell County	33,698	37,053	43,440	47,800	52,130	55,800	59,990
Carbon County	15,639	15,051	16,160	16,810	17,230	17,140	17,120
Converse County	12,052	12,459	13,240	13,650	14,020	14,440	14,930
Johnson County	7,075	7,651	8,640	9,330	9,990	10,560	11,220
Natrona County	66,533	69,478	74,050	76,920	79,650	82,360	85,540
Niobrara County	2,407	2,228	2,310	2,340	2,330	2,330	2,340
Platte County	8,807	8,485	8,290	8,060	7,840	7,880	7,960



3.10.1.3 Seasonal Population and Visitors

The proposed project consists of private and public lands in central Converse County. The surrounding area within an 80-km (50-mile) radius contains mostly private land, as well as federal and state lands, which provide open space for a variety of dispersed outdoor recreation opportunities. There are a number of recreation sites on public lands within the 80-km radius. Recreation opportunities offered by the private sector consist of community facilities in urban areas and the infrastructure of tourist services and facilities.

The nearest site that would be a destination for tourists to the proposed project is the Bozeman Trail, which crosses the proposed project depicted in Figure 3.1-2. It is, however, located primarily on private lands within the proposed project area. The few public land parcels that it crosses within the proposed project area are not adjacent to public road rights-of-way. The next closest site is Fort Fetterman Historic Site, approximately 4.5 miles from the proposed project. The site is open only during the summer months (Memorial Day to Labor Day). In 2007, 11,441 people visited the site during that period. Glendo State Park (and reservoir), located approximately 40 miles south of the proposed project, is one of the most visited state park sites in Wyoming. In 2007, 64,326 persons used the Park in the month of June alone. The Edness Kimball Wilkins State Park (approximately five miles east of Casper) had a total of 14,705 visitors in June 2007 (Wyoming Department of State Parks 2007).

The most significant population variable in the area is neither seasonal nor related to visitors. Across Wyoming, the influx of workers has created local population increases that are difficult to track with traditional methods. Many workers are not local residents; they live somewhere else and commute to Wyoming in shifts (e.g., ten days on, ten days off). While working in Wyoming, they could be living in rental units, housing units owned by the company they work for, RV parks, on-site facilities (e.g., "workers camps" at the work site) and in hotels. Census population numbers for a place include only people who identify that place as their primary residence and do not include others who list their primary residence elsewhere (such as the "shift-labor" workers described above). As a result, the total of all permanent and part-time residents living in a place at any time could be significantly higher than the census count. Unfortunately, there is no standardized mechanism for counting part-time residents. To address this issue, the Wyoming Department of Employment Research and Planning has begun to track workers with a driver's license from another state. Quarterly information between 2001 and 2005 indicates that the number of these workers was on the rise in Converse County. The highest number during the 2001 to 2005 period was 759 workers in the second quarter of 2005. Natrona County's records show similar increases, but much larger numbers, with a peak of 6,352 workers with out-of-state drivers' licenses in the third guarter of 2005. Campbell County numbers have fluctuated, dipping to a low of 1,913 workers in the first quarter of 2003 and peaking at 4,721 in fourth quarter of 2005 (Wyoming Department of Employment 2008). In the ten-year economic forecast released in July 2007, the



Wyoming Economic Analysis mining workers to settle in Wyoming, and projected the trend to continue (Wyoming Department of Administration and Information, 2007). The multiplier effect of mining industry activity results in upward movement in job growth in other industries such as construction, wholesale trade, transportation, etc. and some non-resident workers in those sectors may also be moving to live in Wyoming. Statewide, however, net migration to Wyoming lags behind job growth in the state and many non-resident workers continue to commute in shifts to Wyoming.

3.10.1.4 Schools

The proposed project is located in Converse County, about halfway between the county's two school districts; District No. 1 in Douglas and District No. 2 in Glenrock. The closest community with a public school system is Glenrock, about 12 miles from the proposed project. Douglas schools are approximately 15 miles from the proposed project. Schools in the Casper area and in Glendo are located within 50 highway miles.

Fall 2008 enrollment in Converse School District No. 1 was 1,685 students. The schools in Douglas are slightly over capacity in grades K-2. The District is constructing a new facility and when completed, it will provide capacity for an additional 350 students in grades K-5. The Middle School and High School could accommodate a total of approximately 250 additional students. District No. 1 also includes four rural schools with a total of 30 students, and could accommodate up to 90 students total (Espeland 2008).

School District No. 2 has all of its K-12 facilities in Glenrock. Fall 2008 enrollment was 702 students. All of the existing facilities are under capacity and could collectively handle up to 200 additional students. The District is currently doing some remodeling, but no new construction is underway or planned (Stillwell 2008). The school district eliminated one older elementary school facility and replaced it with a new facility which opened in January 2008. The old elementary school building is being used as a recreational center and remains in school district ownership (Shore 2009).

Natrona County has one school district with a total of approximately 11,500 students. There are more than 30 public and private elementary and secondary schools (Office of Federal and State Materials 2008). The District is currently constructing a new elementary facility in Casper, which will increase total capacity by an additional 425 students (Antrim 2008).



3.10.1.5 Sectorial Population

Existing population within the 80-km radius centered on the proposed project was estimated for 16 compass sectors, by concentric circles of 1-, 2-, 3-, 4-, 5-, 10-, 20-, 30-, 40-, 50-, 60-, 70- and 80-km from the center of the proposed project, for a total of 208 sectors. Sectorial population was estimated using the U.S. Census 2000 boundary and demographic information for block groups within the United States, and population estimates for 2007 distributed by Environmental Systems Research Institute on the ESRI[®] Data & Maps 9.3 DVD. Subtotals by sector and compass points, as well as the total population, are shown in Table 3.10-4.

ArcGIS® Desktop Geographic Information System (GIS) was used to extract data from U.S. Census 2007 population estimates for Census Tract Block Groups located wholly or partially within the 80-km radius from the approximate center of the proposed project. To assign a population to each sector, a percentage area of each sector within one or more block groups was calculated for all of the block groups. The total 2007 population within the 80-km radius from the center of the proposed project estimated by this method was 81,230.



						Radi	us in Kilom	eters						
Sector	0-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	Total
N	0	0	0	0	0	3	13	. 22	32	40	49	123	223	505
NNE	0	0	0	0	0	3	13	22	32	40	49	68	144	371
NE	0	0	0	0	0	3	13	22	32	40	49	59	64	282
ENE	. 0	0	0	0	0	3	13	22	32	40	49	45	36	240
E	0	0	0	0	0	3	13	22	32	40	52	34	37	233
ESE	0	0	0	0	0	3	15	489	979	79	101	80	67	1,813
SE	0	0	0	0	0	4	23	4,899	667	82	96	113	130	6,014
SSE	0	0	0	0	0	6	23	52	57	82	99	94	90	503
S	0	0	0	0	0	5	23	38	57	80	66	69	41	379
SSW	0	0	0	0	0	6	23	38	53	67	67	37	38	329
SW	0	0	0	0	0	5	22	38	53	77	136	170	122	623
WSW	0	0	0	0	0	3	1,677	1,087	59	132	1,537	1,246	207	5,948
W	0	0	0	1 ¹	0	3	13	28	73	174	45,129	15,800	75	61,295
WNW	0	0	0	0	0	3	13	22	46	161	210	433	545	1,433
NW	0	0	0	0	0	3	13	22	32	66	160	239	304	839
NNW	0	0	0	0	0	3	13	. 22	32	40	49	83	178	420
Total	0	0	0	0	0	59	1,923	6,845	2,268	1,240	47,898	18,693	2,301	81,227

Table 3.10-4: 2000 Population within the 80-km Radius of the Proposed Ludeman Project

¹ This number based on site reconnaissance. There is one person living at the one residence within the proposed Ludeman Project.

Notes: Current population living between the project boundary and 80-km of the mine site were estimated using 2007 census block data. Field reconnaissance was conducted in 2008 to verify data collected within the project boundary. See Section 3.10.1.6. for a detailed description of the methodology.



3.10.2 Local Socioeconomic Characteristics

3.10.2.1 Major Economic Sectors

The proposed project is located in Converse County. However, social and economic characteristics are also described for Natrona County because communities there, primarily the City of Casper, provide a relatively large resident labor force for mineral extraction and construction industries in northeast and central Wyoming. Table 3.10-5 summarizes unemployment rates and employment in Converse and Natrona Counties.

The economies of Converse County and Natrona County depend on the energy sector, primarily those that are mineral-based. The largest private sector employer in Converse County is mining, which includes uranium extraction, oil and gas extraction, crude, petroleum-natural gas, oil and gas field service, and nonmetallic minerals as defined by the U.S. Bureau of Labor Statistics.

A report prepared by the Wyoming Department of Employment, Research and Planning analyzes labor supply in Wyoming by place of residence. The analysis concluded that a portion of the available labor pool in Wyoming consists of non-residents. According to the report, the construction sector is one of the industries most dependent upon seasonal and short-term workers.

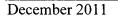
Table 3.10-5 also shows the labor force characteristics in Converse and Natrona Counties in 2006. In general, unemployment rates were highest in the early 1990s and have decreased overall by 2006 because of renewed energy development in northeastern Wyoming. Annual fluctuations in unemployment rates are driven primarily by short-term changes in production due to changing prices for energy resources (such as oil and gas, uranium, etc.).

Per capita personal income is the income that is received by persons from all sources, including wages and other income over the course of one year. In 2006, personal income in Converse County was \$29,566, compared to state per capita income of \$32,316. The county ranks 14th in per capita annual income out of 23 counties in the state. Natrona County had a higher per capita income of \$35,599, and ranked second in the state. Most of the Wyoming counties with the highest per capita personal incomes have strong mineral development economic sectors (Wyoming Department of Employment Research and Planning, 2008).

Table 3.10-5: 2006 Annual Average Labor Force Characteristics and Employment in Economic Sectors for State of Wyoming for Converse and Natrona Counties

	State of V	Vyoming	Convers	e County	Natron	a County
Labor Force		-	7,195	-	41,103	-
Employment		-	6,943	-	39,760	-
Unemployment		-	252	-	1,343	· -
Unemployment Rate	3.6%	-	3.1%		3.3%	-
Total employment	376,249	100.00%	7,516	100.00%	52,464	100.00%
Farm employment	11,970	3.18%	439	5.84%	429	0.82%
Non-farm employment	364,279	96.82%	7,077	94.16%	52,035	99.18%
Forestry, fishing, related activities, and other	2,695	0.72%	84	0.0111762	(D)	-
Mining (uranium extraction, oil and gas extraction, crude, petroleum-natural gas, oil and gas service, nonmetallic minerals)	29,359	7.80%	873	11.62%	- 5,348	10.19%
Utilities	2,390	0.64%	(D)	-	(D)	-
Construction	33,986	9.03%	633	8.42%	4,036	7.69%
Manufacturing	11,791	3.13%	128	1.70%	2,143	4.08%
Wholesale trade	9,338	2.48%	(D)	-	2,767	5.27%
Retail trade	41,074	10.92%	758	10.09%	6,482	12.36%
Transportation and warehousing	13,925	3.70%	498	6.63%	(D)	-
Information	5,037	1.34%	86	1.14%	664	1.27%
Finance and insurance	11,858	3.15%	204	2.71%	1,867	3.56%
Real estate and rental and leasing	15,219	4.04%	273	3.63%	2,416	4.61%
Professional and technical services	16,757	4.45%	217	2.89%	2,462	4.69%
Management of companies and enterprises	1045	0.28%	(D)	-	107	0.20%
Administrative and waste services	11,948	3.18%	(D)	-	2,229	4.25%
Educational services	3,117	0.83%	(D)	-	342	0.65%
Health care and social assistance	26,714	7.10%	(D)	-	5,744	10.95%
Arts, entertainment, and recreation	6,602	1.75%	110	1.46%	939	1.79%
Accommodation and food services	32,540	8.65%	576	7.66%	3,559	6.78%
Other services, except public administration	20,363	5.41%	406	5.40%	3,252	6.20%
Federal, civilian	7,321	1.95%	56	0.75%	659	1.26%
Military	6,113	1.62%	76	1.01%	420	0.80%
State and local	55,087	14.64%	1258	16.74%	4830	9.21%
State government	14,312	3.80%	128	1.70%	737	1.40%
Local government	40,775	10.84%	1130	15.03%	4093	7.80%
Total employment	376,249	100.00%	7,516	100.00%	52,464	100.00%

(D) = Not shown to avoid disclosure of confidential information, but the estimates for this item are included in the totals. - = Not Available





3.10.2.2 Housing

The nearest communities are Rolling Hills, about eight miles from the proposed project, Glenrock (12 miles), and Douglas (15 miles). According to the U.S. Census 2000 (the most recent year for which housing data were available for communities), there were 142 housing units in Rolling Hills. Of these, 123 were owner-occupied, 12 were renter-occupied, and eight were vacant (5.6 percent) (U.S. Census Bureau, Census 2000).

Of 2,385 total housing units in Douglas in 2000, 1,433 were owner-occupied and 685 were renter-occupied. A total of 267 (11.2 percent) were vacant. The decennial census information does not track the condition of housing units, and some vacant housing may be unsuitable for habitation. Of 1,131 housing units in Glenrock in 2000, 645 were owner occupied and 280 were renter-occupied. A total of 206 (18.2 percent) were vacant (U.S. Census Bureau, Census 2000).

In Natrona County, there were 119 housing units in Edgerton, of which 74 units were occupied. The number of occupied rental units was 17. The vacancy rate was 37.8 percent. In nearby Midwest, 149 of the total 228 housing units were occupied. There were 32 renter-occupied and 79 vacant housing units.

It is likely that vacancy rates within 50 miles of the proposed project will decrease as a result of insufficient housing stock and increasing in-migration of workers for employment in ongoing mineral resource development. A rental vacancy survey summarized in the Wyoming Community Development Authority report (2008) shows that rental vacancy rates in Natrona County decreased to 1.07 percent in 2007 (Table 3.10-6) and in Converse County were at 0.47 percent. The influx of population in these counties as a result of economic growth stimulated by coal bed methane gas and coal production has outstripped the available housing supply.

Rural areas in the counties are sparsely populated, so that most of the housing units characterized in Table 3.10-6 are located within the communities of Douglas, Glenrock, Rolling Hills (Converse County), Casper and surrounding communities (Natrona County). Table 3.10-6 also includes the total number of housing units in the counties, but focuses on rental characteristics because most of the labor force that would originate from outside of Converse and Natrona Counties would likely reside in rental units and other temporary lodging.

The Wyoming Housing Database Partnership (composed of the Wyoming Community Development Authority and other public and private entities) forecasts an increase of 4,296 households in Converse County from 4,694 in 2000 to 8,990 in 2030. The number of renters in Converse County is projected to increase from 1,219 in 2000 to 1,996 in 2030. In Natrona County, the number of households is projected to increase by 19,567,

December 2011



from 26,819 in 2000 to 46,386 by 2030. The number of renters is expected to increase from 8,079 in 2000 to 11,804 in 2030 (Wyoming Housing Database Partnership, 2008).

3.10.2.3 Temporary Housing

Temporary housing options in the vicinity of the proposed project include hotels, motels, and campgrounds. Vacancy rates are not currently available for temporary accommodations in Wyoming Counties. Available local motels/hotels/cabin establishments in the region generally have low vacancy rates during hunting seasons. There is also a high level of occupancy by the energy resource industry workers. Many motels and recreational vehicle (RV) campgrounds in the region provide accommodation for long-term visits by the week or month.

The temporary lodgings closest to the proposed project are in Glenrock and Douglas. Accommodations in Glenrock include an RV Park and one hotel. In Douglas, there are a total of 364 rooms in seven hotels/motels, and 107 sites at two RV/camping facilities. The Casper area has over 300 sites at five different RV/Camping facilities and over 2,000 rooms at 26 area hotels/motels. Glendo has three motels with a total of 24 rooms (State of Wyoming Tourism, 2008).

Table 3.10-6: 2007 Housing Characteristics for Converse and Natrona Counties

	Converse County	Natrona County
Type of Unit	Number of Units	Number of Units
Housing Unit Estimate ¹	5,894	31,047
Rental Housing Costs ²		
Apartments	\$474	\$542
House	\$596	\$945
Mobile Home	\$496	\$525
Rental Vacancy ³		
Total Units	424	4,117
Vacant Units	2	44
Vacancy Rate	0.47%	1.07%

1 - Intercensal estimate for July 2007

2 - Second half 2007

3 - Rental vacancy survey conducted in December 2007



3.10.3 Evaluation of Potential Socioeconomic Impacts of the Proposed Operation

3.10.3.1 Construction

Construction of Satellite facilities and wellfields are staggered over the life of the proposed project as is decommissioning. During most years there is concurrent construction and operations or decommissioning and operations and in some years all three activities (Refer to Figure 9-1 of the TR). Decommissioning activities will also employ workers from the construction trades because of the tear-down, earth-moving and other processes involving large equipment.

In the first year, project development will be construction only and will create approximately 65 jobs directly related to construction activities. There will be on-site construction work through the seventh year of the project (in 2018) with annual average direct employment fluctuating between 38 and 65 jobs, then a two-year period with no construction. Satellite facility decommissioning (also considered as construction for analysis purposes) occurs in the 10th, 12th, and 14th years of the proposed project (in 2021, 2023, and 2025) with an estimated 25 annual average jobs.

Based on local experience, an estimated 50 percent of the peak year construction/decommissioning workforce would be persons already living in Converse County and Natrona County. Other workers may come from outside the local area and will either re-locate for the term of the project or will be long-distance commuters working for extended shifts (e.g., 10 days on, 10 days off).

Construction and decommissioning would cause a moderate impact to the local economy, resulting from the purchases of goods and services directly related to construction activities and increased demand for housing and other services. Impacts to community services such as roads, housing, schools and energy costs would be minor in the nearby towns of Rolling Hills (a small town located west of the proposed project on State Highway 95), Glenrock (west on State Highway 95), Douglas (southeast on State Highway 93), and Casper (the nearest regional economic hub).

3.10.3.2 Operations Workforce

The directly employed operations workforce will grow from approximately 14 persons in the second year of operations to approximately 48 during the peak work years. The peak includes a period when all three Satellite facilities and multiple wellfields would be actively operating the peak operations period is transient and not permanent (lasting approximately three years with average annual direct employment at 44-48 jobs). It is assumed that the majority of operations personnel would be generated from the Casper, Glenrock, and Douglas area or would be temporary personnel from outside the area. It is



not known how many of the permanent required operations workforce would be hired from outside of Converse and Natrona Counties.

3.10.3.3 Effects to Housing

At its peak levels of employment, the proposed project is estimated to produce approximately 164 total jobs in Wyoming. This includes jobs created directly or indirectly by the project or induced by related household expenditures. Many of the jobs will be ongoing over the life of the project (such as the number of persons directly employed by the operator or its contractors for ongoing construction). Others will be tied to specific phases, such as construction or decommissioning, and will be shorter-term rather than on-going. As a result, the total number of jobs is estimated to fluctuate from year to year.

Compared to the rest of the nation, unemployment rates are low in Converse and Natrona Counties, the area most likely to be affected by the increased number of jobs and associated housing demand. These counties are however beginning to feel the effects of the national recession. In June 2009, the unemployment rate in Converse County was 5.2 percent (compared to 2.8 percent in June 2008) and 6.1 percent in Natrona County (compared to 3.0 percent in June 2008). In June 2009, the national unemployment rate was 9.5 percent. The average unemployment rate between July 2008 and June 2009 was 7.6 percent in the nation, but it remained below 4 percent in Converse and Natrona Counties. It is anticipated that Converse and Natrona Counties will continue to have lower unemployment rates than the state and the nation. In part due to the relatively lower unemployment in the local area and the small population base, it is assumed that the supply of available workers is limited locally and that many (and possibly most) of the employees needed to fill the projected new local jobs will come from outside Converse and Natrona Counties.

At the peak of direct employment numbers (in 2016), the proposed project would account for approximately 96 new jobs. Assuming each new job resulted in a separate demand for housing, 96 housing units would be needed. Homeowner vacancy rates were 2.3 percent in Converse County and 1.5 percent in Natrona County, according to the 2000 census (the most recent for which such census data are available at the county level). In a multiple listing service (MLS) internet web search on March 26, 2009, there were 420 listings for houses priced at \$300,000 or less in Glenrock (27), Douglas (36), and Casper (357). In July 2007, Converse County had an estimated two vacant units out of 424 total rental units (.47 percent rental vacancy rate) and Natrona County had 44 vacant rental units (1.07 percent rental vacancy rate). The lack of available rental units in Converse County was reported in the Douglas Budget on November 26, 2008. Many people who desire rental units have been staying in hotels/motels for weeks and months at a time.



Based on these data, there would be adequate supply of houses available for sale for needs associated with direct employment from the proposed project and a very limited supply of rental units. It is assumed that the supply of houses for sale that are in good "move-in" condition and in desirable areas may be less than the total number of houses for sale, but with more than 400 available (as of March 2009), there would be sufficient numbers for the estimated 96 new homes needed for direct employment numbers. Some of the employees will likely be hired from the existing local labor pool and therefore 96 homes may overestimate housing demand from direct employment. Based on current trends, it is anticipated that at least some workers will continue to have a residence outside of Converse and Natrona Counties and will be commuting long distance for shift work. While on site they would likely be staying in rentals or hotels/motels. Unless additional rental units are created, this will exacerbate the existing tight rental market.

The total of all new direct, indirect, and induced jobs estimated by the IMPLAN analysis (refer to Section 9.0 of the TR) are for the state of Wyoming, not just Converse and Natrona Counties. If all 164 new direct, indirect, and induced jobs (at the peak of total employment in 2016) were in Converse and Natrona Counties, there would be adequate housing stock to purchase (based on the March 2009 homes for sale), but rental housing would be inadequate and put additional strains on hotels and motels.

3.10.3.4 Effects to Services

The estimated total of 164 direct, indirect, and induced jobs of the peak employment year for the proposed project would result in a total population increase of 397 persons, based on average household size in Wyoming of 2.42 in 2006 (U.S. Census estimate) and assuming that all of the jobs are filled with persons not already living in Wyoming.

Although the IMPLAN analysis study area was for the entire state of Wyoming, for purposes of analyzing the impacts to schools and other public services, all 164 jobs were projected to result in population increases to Converse and Natrona Counties. This overestimates the likely potential for impacts for those two counties. The addition of 397 persons would be an increase of less than one percent to the total combined 2007 estimated population of 84,618 for Converse and Natrona Counties.

Children between the ages of five and 19 constituted approximately 20 percent of total estimated population in Converse and Natrona Counties in 2007. Using 20 percent as the ratio for school age children, there would be approximately 79 school age children anticipated from the projected increase in employment.

Converse School District No. 1 in Douglas was adding new facilities in 2008-2009 and was anticipating it could handle 350 additional students in grades K-5 and 250 additional students in Middle and High School. Converse School District #2 in Glenrock was under



capacity in 2008 and would be able to increase enrollment by another 200 students without additional expansion (other than what has already been planned or recently completed). The Natrona County School District (primarily in the Casper area) has approximately 11,500 students.

A total increase of less than one percent to the total population of Converse and Natrona County is not likely to create a significant impact on other public services such as fire, police, water, and utilities.

3.10.3.5 Effects to Traffic

The primary transportation route to the proposed project from nearby communities is on State Highway 95, which connects the project area to the community of Glenrock along Interstate 25 to the west and State Highway 93, which connects to Douglas to the east. The City of Casper is located approximately 36 miles west of the project area on State Highways 95 and Interstate 25. The Town of Douglas is approximately 18 miles southeast on State Highway 93, and also lies along the Interstate 25 corridor. In 2007 the Annual Average Daily Traffic counts along the 18-mile segment of State Highway 95 between Glenrock and the State Highway 93 junction is 50 vehicles (WYDOT, personal communication, October 23, 2008). Several private access roads extend south from State Highway 95 to access existing agricultural, residential, and oil and gas facilities in the proposed project area. The Annual Average Daily Traffic counts at the intersection of State Highway 95 and County Road 26 (Leuenberger Lane, used to access residential and ranch facilities) is 260.

The highest levels of project-related traffic would be from the operations workforce, and assuming there would be an average of one employee per vehicle, per one-way vehicle trip, there could be an increase of 5.4 percent in daily traffic along the highway. This 5.4 percent (10.8 percent for two trips per day) increase is well below the 25 percent threshold generally used for predicting significant effects to a transportation system.

Equipment needed for construction and installation of the proposed facility would include heavy equipment (cranes, bulldozers, graders, trackhoes, trenchers, and front-end loaders), and heavy-and light-duty trucks. It is anticipated that heavy equipment will be transported primarily to the site during off-peak traffic hours.

3.10.4 Environmental Justice

Executive Order 12898 directs each Federal agency to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority populations and low-income populations in



the United States..." (EO 12898, February 11, 1994). Historically, Environmental Justice grew out of a religion-based social movement in response to a documented disproportionate number of toxic waste dumps and other "locally unwanted/unacceptable land use (LULU)" placed disproportionally within minority and low-income neighborhoods, particularly in urban centers (Bullard 1999). Proponents of Environmental Justice characterize it as the search for geographic/distributive and social equity.

Geographic/distributive equity refers to the distribution of facilities on a nondiscriminatory basis (i.e., equitable siting decisions). The basic tenet is that burdens and benefits would be fairly balanced. Although the location of uranium mines is geologically determined, this does not exclude agencies from considering distributive equity (Ali and Abhrendt 2001:6). The social and environmental costs of siting a facility in a particular location needs to be balanced by the inhabitants of that location receiving commensurate benefits from the facility (Bullard 1999; FIWG 2001; Harris and Harper 1999; Suagee 1999). From the perspective of distributive equity, the employment opportunities and infrastructure development should be distributed to all affected populations in direct proportion to the effects they will absorb.

Social equity refers to the influence of social factors such as ethnicity, class, culture, lifestyles and political power on environmental decision-making and implementing mitigation.

There is a racial divide in the way the U.S. government cleans up toxic waste sites and punishes polluters. White communities see faster action, better results and stiffer penalties than communities where blacks, Hispanics and other minorities live. This unequal protection often occurs whether the community is wealthy or poor (Lavelle and Coyle 1992 in Bullard 1999)

Again, the main tenet of environmental justice is that burdens and benefits should be balanced. Executive Order 12898 requires regulators to take into consideration whether minority communities are sharing equally with the majority in the benefits and burdens associated with an undertaking.

Several factors can be used to measure Environmental Justice in terms of the characteristics of the populations that will be affected by the proposed action. Populations are described in terms of risk factors. Significant variables that can affect both benefits and burdens of particular actions include:

<u>Population Location</u> – Effects on communities vary with the distance from the project (EPA 1988d:8). Those communities located nearest a project may benefit from increased economic potential. However, they are also the most likely to feel the effects of the burdens associated with an undertaking.

<u>Population Size/Density</u> – Very small populations commonly have smaller resource and economic bases. Therefore, a change in either of these spheres is more likely to affect the communities when compared to the population at large. In very small populations, the proportion of the group affected compared to the populations at large tends to be much higher.

<u>Population Income</u> – Individuals living in poverty (defined in 2008 as \$21,200 for a family of four) have fewer economic resources, often have less access to the political system, and less ability to move under hazardous conditions than their wealthier counterparts. If they are in poor health or have a poor nutritional status, they may be more sensitive to chemical or physical impacts as well (FIWG 2001:34).

<u>Cultural Ties to the Land</u> – In some communities, like "Oil Patch" communities, the need for mobility is the norm. People are routinely transferred from one oilfield to another. These technological nomads carry their community structure with them. Consequently, project effects that result in a change in residence are often not seen as a burden. In other communities, such as reservations, or where family farming and ranching is the major economic strategy, ties to a particular location extend over several generations and have intrinsic value. Study related effects that result in leaving the community might be viewed as a severe hardship.

Participation in Cultural Systems Sensitive to Environmental Change – Populations dependent on subsistence hunting, fishing and gathering may experience disproportionally high and adverse effects from projects related to natural resources (EPA 1988d:13, 49; CEQ 1997:28; Lapachin and Tano 2001). Natural resources such as minerals that are not predominantly used by the general population may be important source of consumption, economy, cultural use and/or recreation for minority and/or low-income communities (EPA 1988d:49; CEQ 1997:28).

<u>Age of Populations</u> – Populations with a higher proportion of school age children will have different infrastructure needs than those with a higher proportion of senior citizens. Furthermore, children may suffer disproportionally from environmental health risks, and safety risks. Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks* (1997) emphasizes the importance of this factor. Because children may suffer disproportionately from environmental health and safety risks, the Executive Order is meant to ensure federal agencies take into consideration the effects of undertakings on children and that policies and programs address these risks.

3.10.4.1 Geographic Unit of Analysis

Based on Nuclear Regulatory Commission recommendations, an 80-km (50-mi) radius around the proposed project area in Converse County, Wyoming was selected as the



geographic unit of analysis for the Environmental Justice Study Area (EJ Study Area). It includes all of Converse County, the northern portion of Carbon, Albany and Platte Counties, a portion of western Niobrara County, a portion of eastern Natrona County including the city of Casper, the extreme southeastern corner of Johnson County and a portion of southern Campbell County (Figure 3.10-2). "Because ISL well fields can cover large geographic areas, (the Nuclear Regulatory Commission) decided to evaluate demographic and socioeconomic data within at least an 80-km (50-mi) radius of existing or potential facilities" (Nuclear Regulatory Commission 2008:2:6.3).



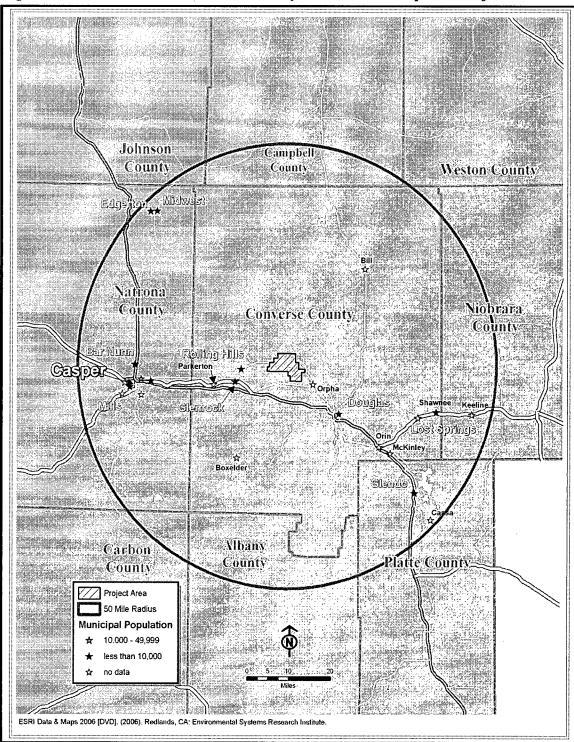


Figure 3.10-2: Environmental Justice Study Area for the Proposed Project



3.10.4.2 Minority Populations

The cultural history of Wyoming suggests three potential minority groups may exist within the EJ Study Area for the proposed project. They consist of Native Americans, Hispanics and Basques.

3.10.4.2.1 Native American Populations in Wyoming

Historically, several Indian populations occupied the subject EJ study Area, including the Arapaho, the Cheyenne, and the Teton Sioux. The earliest suspected occupants were the Eastern Shoshone. By the mid 1500s, the Shoshone occupied areas south and west of the Wind River Range in Wyoming (Hewes 1961:54; Trenhom and Carley 1965:17). In the 16th century, the Shoshone broke into separate groups. Those that ranged in Wyoming and Montana formed the Eastern Shoshone, while those who moved to the south into Colorado became known as the Comanche (Kehoe 1981:287). In the 1720s, the Eastern Shoshone received Spanish horses from the Comanche. With horses, the Shoshone dominated the High Plains and may have extended their territory as far east as South Dakota by the 1750s. There, people who had guns and horses of their own, stopped them. In the late 1700s, small pox and warfare devastated the Eastern Shoshone, forcing them to contract their territory to the west (Sturtevant 1986:517-518).

The Arapaho were the next tribe to dominate the area. The earliest records indicate the Arapaho were originally a sedentary people living in the Red River valley of northern Minnesota. In the 1600s, they moved westward into the High Plains, possibly because of pressure from the Cheyenne and Sioux (Wood and Liberty 1980:285). By the early 1700s, they split into two populations. The northern population became known as the Gros Ventre. The southern population is known as the Arapaho. They moved into the subject EJ Study Area in the mid-1700s, possibly filling the void caused by the contraction of the Shoshone (Deaver 1986: Fowler 1986:15-17).

In 1805, the Kiowa joined them. Based on Kiowa and Shoshone traditions, the Kiowa originated in the Yellowstone Park area (Kehoe 1981:288-289; Levy 2001; Mayhall 1971:6-10). In the 1700s, a group of Kiowa left, and, with the help of the Crow, became adept Plains hunters and gatherers. The Kiowa eventually made their way to the Black Hills, which they made their homeland, until the arrival of the Cheyenne and Sioux (Hyde 1959:152; Kehoe 1981:289). By 1805, the Kiowa were occupying the area near the North Platte River (Levi 2001).

In the 1700s, the Cheyenne began moving from the headwaters of the Mississippi River southwest toward the Dakotas (Weist 1977:14-16). By 1780, the Cheyenne had moved into the Black Hills area, which they occupied with the Arapaho in the early 1800s (Hewes 1961:52; Weist 1977:25). By 1806 the Cheyenne and Arapaho formed an



alliance (Bial 2004). In 1811, they lived as far north as the North Platte River, possibly including the proposed project study area.

In the early 1800s, the Teton Sioux also began moving into the region. Although Sioux presence in Montana and Wyoming occurred as early as 1801, they started making strong inroads by the 1820s. As they continued to move west, they encountered the combined forces of the Cheyenne and Arapaho, which kept them from moving into western Wyoming.

After the discovery of gold in California in 1848, gold seekers flooded the region on their way to the gold fields. In Wyoming, 20,000 immigrants followed the Oregon Trail, located just a few miles south of the subject EJ Study Area. As they traveled through the region, they depleted game and spread diseases. The Cheyenne withdrew from the Platte River region. They also gave up their animosities with the Sioux to form an alliance to attempt to repel the invaders. Through their long-standing alliance with the Cheyenne, the Arapaho also developed an uneasy truce with the Sioux. Conflict with the immigrants became routine.

In an effort to resolve the conflict, the U.S. government held a treaty conference at Horse Creek near Fort Laramie in 1851. Ten thousand Plains Indians, including Cheyenne, Arapaho, and Sioux, attended the meeting. After the meeting, the tribes agreed to honor established territorial boundaries and live in peace with one another (Malone and Roeder 1976:88). The treaty also established the legal basis of the Oregon Trail and provided for the establishment of Fort Laramie (DeMallie 2001:795). The subject EJ Study Area is located in what was defined to be part of Sioux territory.

The peace was tenuous at best and attacks on both immigrants and intertribal warfare continued. The battle nearest the project area occurred near present-day Casper, Wyoming, in 1856. Tensions increased in the 1860s when a new wave of gold seekers rushed through Indian Territory. Nearly all the tribes objected to these new incursions into their lands. The tribes viewed the new wave of immigrants as a pestilence that needed remedy. The tribes were determined to keep whites off their lands. As a result, skirmishes became more frequent, and became an increasing threat to commerce, travel, and settlement (Thompson 1968:101-102). The military was called upon to protect American interests. To support and protect Americans, the military began establishing forts across the west (Thompson 1968:107-108).

Indian anger and resolve soared as a result of two incidences. First, in 1862, the Santee, faced with a decreasing land base and starvation, rose against whites in Minnesota. After the uprising was quelled, 29 Sioux were hanged, and others either imprisoned or chased into the Dakotas (Carley 1976; Utley 1993:57). Second was November 29, 1864, the infamous Chivington, or Sand Creek Massacre. On that day, a force of Colorado Volunteers led by Colonel John Chivington attacked a camp of Chevenne and Northern



Arapaho, despite their flying both an American flag and a white flag of peace. The attack ended with the torture, death, and mutilation of 137 (Weist 1977:53) to 500 (Trenholm and Carley 1964:277) people, the majority of which were women and children (Stands in Timber and Liberty 1972:168-170; Weist 1977:49-53).

Because of the events at Sand Creek, the alliance between the Sioux, Cheyenne, and Northern Arapaho was strengthened. By January they were on the attack in the Central Plains (Weist 1977:53). In the spring, bands of Cheyenne, Brule, and Northern Arapaho moved north, joining the Oglala under Red Cloud and Old Man Afraid of His Horse in the Tongue River area (Weist 1977:54). Further north, Sitting Bull took the offensive (Utley 1993:71).

Although the U.S. government attempted to obtain peace via the 1868 Laramie Treaty, it too was unsuccessful. In the winter of 1875, the U.S. ordered all Indians to return to their reservations by January of 1876. If they did not, the government would consider them hostile and would use military force to send them back to their reservations (Bradley 1991:105; Grinnell 1985:328). As the military began moving in, battles ensued. On June 25, 1876, the combined forces of Northern Arapaho, Cheyenne and Sioux forces defeated the U.S. military at Little Big Horn. This would be the last Indian victory.

The military campaign continued into 1877. The Northern Arapaho agreed to act as scouts for the military in return for a promise that they could stay in Wyoming. Grant allowed the Northern Arapaho to stay at the Eastern Shoshone Wind River Reservation in 1878. The Northern Cheyenne were sent to the Southern Cheyenne reservation, but were eventually given their own reservation in Montana. The Sioux were deported to South Dakota. Once they were situated on the reservations, the government strictly regulated their movements, and the subject EJ Study Area was virtually abandoned. Native American access to the EJ Study Area was restricted until they were given U.S. citizen status in 1924.

Based on American Community Survey data of 2006, Native Americans comprise 2.5 percent of Wyoming's population. Native Americans are concentrated in Fremont County, particularly the Wind River Reservation, situated to the north and west of the subject EJ Study Area. The Wind River Reservation is home to approximately 7,400 Northern Arapaho Indians and 4,200 Eastern Shoshone Indians.

An examination of the 2000 census block records indicate Native Americans represent 20 percent or more of the population in 14 blocks, and 50 percent or more of the population in 8 blocks (Figure 3.10-3). Within census blocks where Native Americans represent 50 to 100 percent of the population, a maximum of 18 individuals are present. This appears to represent individuals, or a small number of families.

uraniumone investing in our energy

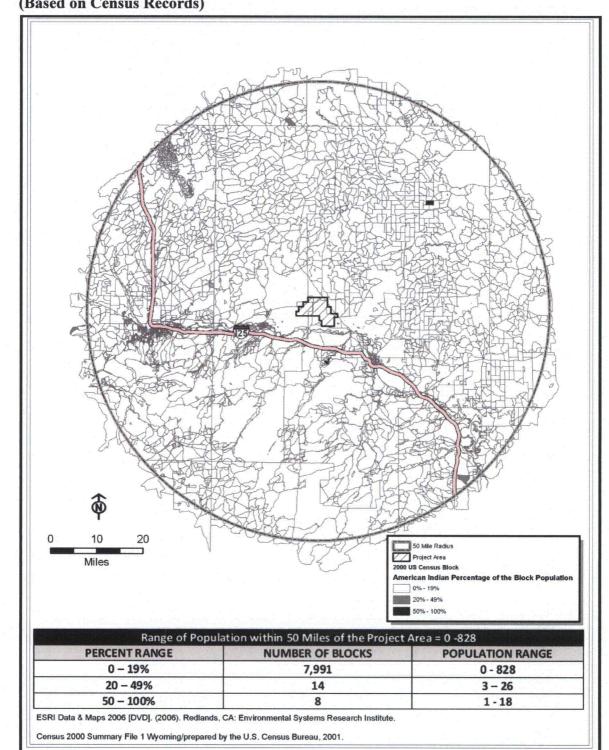


Figure 3.10-3: Percentage of Native Americans in the proposed project study area (Based on Census Records)

December 2011



3.10.4.2.2 Hispanic Populations in Wyoming

Hispanics have a long history in Wyoming, and may have been the earliest non-Native American population to enter the area now known as Wyoming. Between 1700 and 1821, the only record of Hispanic presence in Wyoming is local Indians' possession of Spanish trade items, such as armor and swords. However, Spanish buffalo hunters, known as *ciboleros*, probably entered the area during this period (Rios-Bustamente (2001).

Between 1821 and 1848, Spanish fur trappers and traders associated with the American Fur Company moved into the area. Spanish speaking entrepreneurs routinely interacted with the American and French Canadian trappers operating in the area. For example, Jim Bridger joined with Luis Vasquez to purchase the site of Fort Bridger as a Mexican land grant (Alter 1962; Rios-Bustamente 2001). In 1845 and 1846, Jim Bridger brought New Mexico sheep to his fort and hired Mexican sheepherders to take care of them. Thus began the historic influx of Mexican/Mexican-American sheepherders into southern Wyoming. Hispanic sheepherders living in the state tended to live in southern Wyoming, with the majority centered near Rawlins. Others were found in the area between Cokeville (Lincoln County) and Douglas (Converse County) [Arnold 1997].

From 1870 to 1890, several hundred Mexicans and Hispanics moved into Wyoming to work as cowboys and railroad track laborers. Mexican cowboys, called *vaqueros*, also entered the area with cattle drives from Texas and possibly from Oregon, and Idaho. Local ranchers also employed the *vaqueros* (Rios-Bustamente 2001). Hispanics also worked as muleskinners and teamsters, supplying the needs of American military posts, early towns, and mining camps. They also worked as sheepherders and may have been artisans and shop owners in Cheyenne and Laramie (Rio-Bustamente 2001).

Later Mexican immigration into Wyoming is tied to major political upheavals in Mexico and economic fluctuations in the U.S., as well as Mexico. Between 1900 and 1930 approximately one tenth of the population of Mexico immigrated to the U.S. (Grajeda 1998; McWilliams 1968, Rios-Bustamente 2001). Immigrants sought to remedy horrible living conditions in Mexico by moving north where the economy was growing and there was a ready market for cheap labor (Grajeda 1998). In addition to sheepherding, Hispanics worked as railroad workers, agricultural contract workers, coal miners, and oilfield hands (Arnold 1997). This flexible job strategy was highly adaptive to fluctuations in the lamb and wool market in the nineteenth century.

In 1897, the U.S. Congress passed a 75 percent import tax on sugar. This stimulated the U.S. sugar beet industry. Sugar beet acreage tripled between 1900 and 1906. By 1920, the Great Plains, including Wyoming, provided 64 percent of the sugar beets in the U.S. The labor needs generated by the rapid growth of the sugar beet industry "were met by the regular and methodical recruiting of Mexican agricultural workers" (Grajeda 1998:2;



Hewitt 1982; Redwine 1982). In 1915, the Great Western Sugar Company brought 500 workers into its Colorado, Wyoming, Montana, and Nebraska sugar beet operations. By 1920, they had brought in 13,000 Mexicans, and by 1926, the Mexican population was up to 14,500 (Grajeda 1998). In Lovell and other Wyoming towns, the Great Western Sugar Company built housing and camps for Mexican workers. This laid the pattern for future segregation of Mexican populations in Wyoming (Hewitt 1982; Redwine 1979). The primary sugar beet production acreages in 1939 included one area in southwestern Converse County that extended into Platte County and an area in Johnson County that extended northwest from Buffalo (Hewitt 1982:24).

The expanding railroad industry also heavily recruited Mexican workers in the early 1900s. These workers first lived in boxcars and tents, forming ethnic enclaves that eventually became the barrios, or Spanish-speaking neighborhoods, throughout the Southwest and Great Plains of the U.S. As early as 1906, some of these workers were moving into Wyoming (Grajeda 1998; McWilliams 1968). By the 1920s, Mexican railroad workers and their families lived in railroad camps across the railroad tracks from the Anglo communities in Cheyenne, Laramie, Casper, Evansville, Douglas, Rawlins, and Rock Springs. During this period, *de facto* segregation became the norm and Mexicans could usually only buy supplies from company or ranch stores. Businesses on the Anglo side of town were closed to them (Rios-Bustamente 2001:5-6).

This episode of Mexican immigration came to a halt with the depressions of 1921 and ^a 1929. When jobs became scarce, they were no longer welcome. Over 400,000 of the Mexican immigrants were deported back to Mexico in the 1930s. In 1931, 138,519 were forcefully repatriated (Grajeda 1998; Hoffman 1974).

During WWII, Wyoming, along with the rest of the Great Plains, experienced a severe agricultural labor shortage. Once again, Mexican nationals were in high demand. Wyoming farmers and local draft boards supported the Farm Labor Transportation Program, commonly known as the *Bracero* Program. In August of 1942, the U.S. government agreed to ensure that temporary Mexican workers, *braceros*, had adequate pay, living conditions and full protection under federal law so that they were not subject to discriminatory practices. In return, the Mexican government agreed to support the U.S.'s war effort by facilitating the importation of temporary workers (Hewitt 1982; Hurt 2008; Yeung and Del Hart 2004). In Wyoming, *braceros* were employed primarily in the sugar beet fields where they were paid by the acre. Their wages were around \$9.50-\$11 for blocking and thinning, \$3 for the first hoeing, and \$2 for subsequent cultivation (Hurt 2008:220). Others worked for the railroad, particularly in Laramie (Hewitt 1982). By 1944, 990 *braceros* were working in Wyoming alongside thousands of Mexicans and Mexican-Americans (Hewitt 1982; Redwine 1979; Rios-Bustamente 2001:2).

Although the *braceros*, as well as the Mexicans and Mexican-Americans, were needed by the farmers in Wyoming, they were resented and routinely suffered discrimination.



Stores, barbershops, and restaurants regularly refused them entry. Movie theatres and churches that did allow entry were most often segregated. *Braceros* and other Hispanics including Mexican-Americans were paid less than Anglo workers for the same jobs. Complaints eventually reached the Mexican consulate and Mexico soon threatened to block the importation of *braceros* to Wyoming. As a result, the Farm Service Bureau pressured local merchants to provide the *braceros* services. The Governor of Wyoming lobbied the mayors of various towns to pressure merchants to change their policies (Hewitt 1982; Redwine 1979). The sugar companies began to provide segregated entertainment options for the *braceros* in Wyoming. (Hewitt 1982:21-22; Hurt 2008:121).

During the war, the Mexican-Americans lived in poverty and experienced segregation and hostility across the Great Plains, particularly in Wyoming (Hewitt 1982; Hurt 2008). Between 1930 and 1950, segregation was typical of Worland, Torrington, Rock Springs, Rawlins, and Laramie (Rios-Bustamente 2001). To all intents and purposes, segregation continued in Wyoming at least until the 1970s (Olden 2007).

In the 1960s social conditions began to slowly change. Segregation lessened and more Hispanics gained access to high school and university education. The Chicano (Mexican American civil rights) movement came into Wyoming via Colorado and was active in Cheyenne, Laramie, Casper, Rawlins, Lovell, and Rock Springs. A Chicano Studies Department was created at the University of Wyoming in 1998 (Coronado 2001; Olden 2007; Rios-Bustamente 2001).

Today, there are people of Mexican and other Hispanic descent scattered throughout Wyoming. Wyoming's total Hispanic population in 2007 was 39,477 or 8 percent of Wyoming's population. This is an increase from 6.9 percent in 2006 and 6.4 percent in 2000 (Kaiser 2007). Most of this population is of Mexican descent (72 percent) and is American born (78 percent) (Grieco 2003; PHC 2006). Historically, cohesive Mexican-American communities tend to be found in the southern half of the state where they are associated with the historic development of the sheep industry, the expanding railroads, and, to a lesser degree, the development of coal mining and oilfields. The Hispanic population of Wyoming is also geographically associated with sugar beet production. Sugar beet farming was widespread in Wyoming and includes one area at least partially covered by the subject EJ Study area. In 1939, an area in northern Platte County that extended into southeastern Converse County was a "primary sugar beet production area" (Hewitt (1982:24). This area continues to be important today (USDA NASS 2007:83-84). Currently, Hispanic populations are decreasing in southern and eastern Wyoming by ten to 11 percent, and increasing in northwestern Wyoming where expanding tourism is providing well-paying service jobs (USBC 2006b).

The slightly higher percentage of Hispanics in Douglas, the county seat of Converse County, is most likely tied to the historic and continuing importance of sheep production



in the county as well as sugar beet production in northern Platte County and southeastern Converse County. In addition, Douglas was created in the 1870s by the extension of the Fremont, Elkhorn and Missouri Valley Railroad through central Wyoming (http://www.cityofdouglaswy.com). With the railroad came Mexican and Mexican-American railroad workers.

The Hispanic populations of the U.S. in general and Wyoming in particular appear to be somewhat larger, younger, and tend to have lower incomes relative to the general population. Nationally, they are over-represented in farming, fishing and forestry, construction and maintenance, as well as production and transportation-related occupations (USBC 2006a). In Wyoming, based on 2000 census data, Hispanics, which made up 6.5 percent of Wyoming's population in 2000 (U.S. Census 2000), are over-represented in the service sector, where they make up 8.4 percent of the workers; the farming, fishing and forestry sector, where they make up 9.7 percent of the workers; and construction and maintenance, as well as transportation-related occupations, where they make up seven percent and 7.3 percent respectively of the workers (USBC 2000c).

An examination of the 2000 census block records indicates Hispanics represent 20 percent or more of the population in 157 census blocks, and 50 percent or more of the population in 35 blocks (Figure 3.10-4). Within census blocks where Hispanics represent 50 to 100 percent of the population, houses contain between one and 19 individuals. This appears to represent individuals or a small number of families.



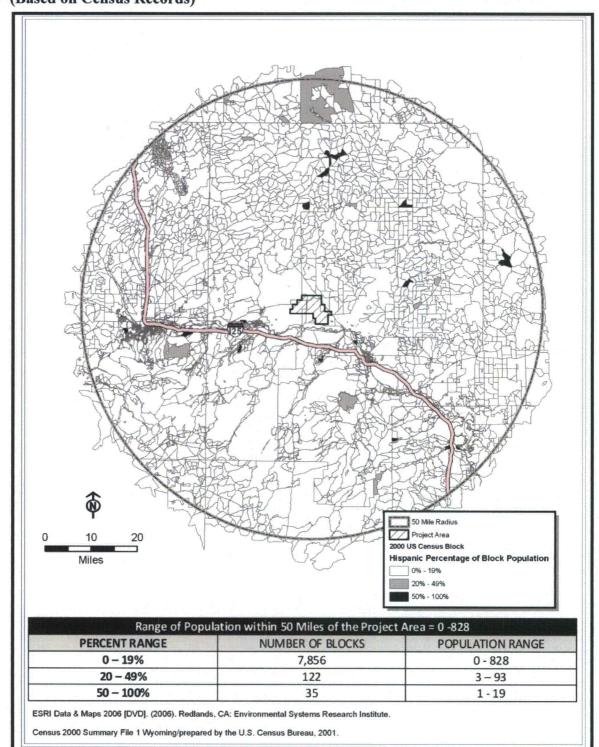


Figure 3.10-4: Percentage of Hispanics Living in the Proposed Project Study Area (Based on Census Records)



3.10.4.2.3 Basques in Wyoming

The Basques of Wyoming are descended from peoples who occupy parts of north-central Spain and southwestern France. The Esponda brothers are typically credited to be the first Basques to arrive in Wyoming. In 1902, the brothers arrived from California for work at the Healy and Patterson Sheep Ranch, the largest sheep operation in northern Wyoming at that time. Within four years, the Esponda brothers began buying their own land and recruited several fellow Basques from their old home village to work with them. However, most Basque sheepherders in Wyoming – like most sheep operators in the United States – did not own large ranches. Instead, they relied on open rangelands to support their herds (Castelli 1970; Iberlin 1981; Iberlin and Romtvedt 1995; Zubiri 2006).

This changed in the 1930s when the United States passed a series of laws that defined the national forest and national park systems and placed them under direct federal control. Within these newly defined lands, access to high-country pastures and summer ranges was prohibited in the national parks and restricted to U.S. citizens who owned ranch property in the National Forests. This excluded Basque sheep men from large sections of their former range. In 1934, Congress passed the Taylor Grazing Act, which brought the remaining rangeland under direct federal control and created what would become the Bureau of Land Management. As with earlier legislation, the Taylor Grazing Act excluded alien, landless grazers from using the public domain. This effectively "banished the itinerant sheepman from the western scene and converted herding into a low-paid, dead-end occupation rather than an avenue of opportunity for an entrepreneur aspiring to build his own sheep outfit" (Lane and Douglass 1985:2).

From the 1930s to the 1970s, most Basques in Wyoming were hired by Euro-Americanand Basque-owned sheep operations. They eventually developed a reputation as being hard working, honest and reliable. During WWII, there was a shortage of herders in the American west. Western sheep operators successfully lobbied congress to change immigration quotas so more Basque herders could be recruited. They also sent representatives to the Basque homeland to recruit these workers. The number of Basque herders in the American west fluctuated with episodic changes in U.S. immigration policies, economic fluctuations in the sheep industry caused by overgrazing, changes in sheep and wool prices, and the slow economic recovery of Spain after World War II and the Spanish Civil War (Lane and Douglass 1985; Laxalt 1986; Zubiri 2006).

Currently, two of the largest Basque sheep operations in Wyoming are the John Iberlin operation in Buffalo and the widespread Warren Livestock operation. The CEO of Warren Livestock, and Director of the Wyoming Department of Agriculture, Paul Etchepare, is of Basque descent (Zubiri 2006:494). In the Rock Springs area, the same Basque families that controlled sheep operations in the early 1900s are still there. They



are members of the Rock Springs Grazing Association, which has a formal cooperative partnership with the Bureau of Land Management and the Union Pacific. This partnership gives them access to a 400 square mile range along both sides of the railroad to the east of Rock Springs (Zubiri 2006:496).

As with other farming and ranching communities in the region, the Basque have strong long-term ties to the region. Access to suitable water to support herds is critical to the maintenance of the agricultural population's continuing ties to the land. Further, maintaining these ties is an irrevocable and irreplaceable foundation of the lifestyle that their families have chosen and maintained over multiple generations (Nuclear Regulatory Commission 2007). In addition "grazing also represents irreplaceable environmental and social values, contributing to the preservation of open spaces, the scenic vistas and visual beauty of the area and the traditional image of this historic landscape of Wyoming and the West" (Etchepare 2008).

Although Basque descendents are scattered throughout Wyoming, Basque communities, who maintain a strong sense of group cohesion, tend to be found largely in southwestern Wyoming. One community is centered near Buffalo, where Basques are a well-recognized group and the other Buffalo residents are knowledgeable about the culture. Another center is in the Rock Springs/Green River area. However, these Basques are more isolated and struggle to maintain their traditions (Zubiri 2006: 494). There are no recognized Basque communities in the subject EJ study area.

Low Income Groups in the Study Area

To assess the presence of low income groups in the proposed project area, the Nuclear Regulatory Commission examined U.S. Census-based income measures in the eight counties covered in part or whole by the area of potential effect (NRC 2008). The measures used included median household income, median family income, per capita income, families below poverty level, and individuals below poverty level. All data came from 1999 and 2000.

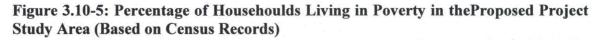
Only Albany County stands out as having an identifiable low-income population. Albany County had the highest percentage (21 percent) of individuals living below the poverty level in 2000, almost three times the state rate of eight percent. It is estimated that 18.2 percent (15.5 to 20.8 at the 90 percent confidence level) of Albany County's population lived below the poverty level in 2005 as compared to 10.6 percent for Wyoming as a whole. In 2007, the rate was estimated at 16.2 percent in Albany County, as compared to 9.5 percent for Wyoming as a whole (USBC 2008).

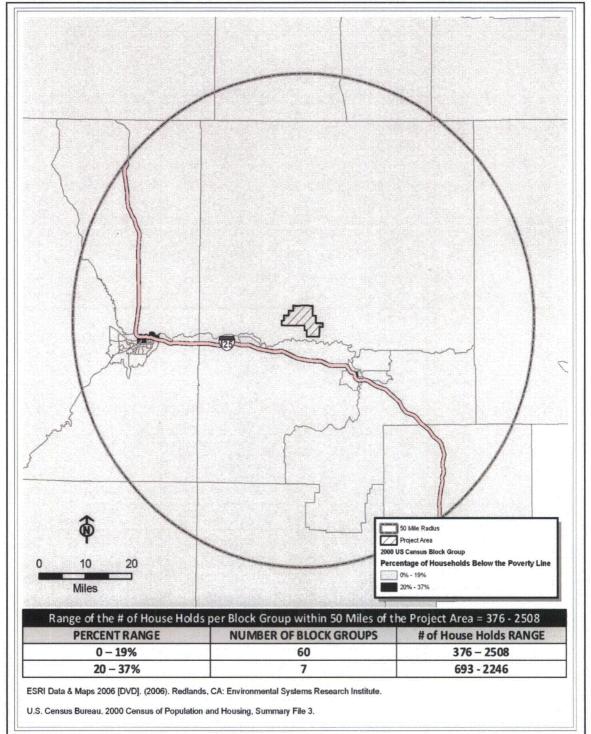
An examination of the 2000 census records indicates there are seven census blocks within the study area where low-income population is 20 percent or greater (Figure 3.10-5). Most of the blocks occur in Casper, located 30 miles from the subject EJ Study Area; one



block is located in Glendo, located 10 miles from the subject EJ Study Area. The percentage of low-income individuals never exceeds 37 percent within the study area.

uraniumone investing in our energy







Children in the Study Area

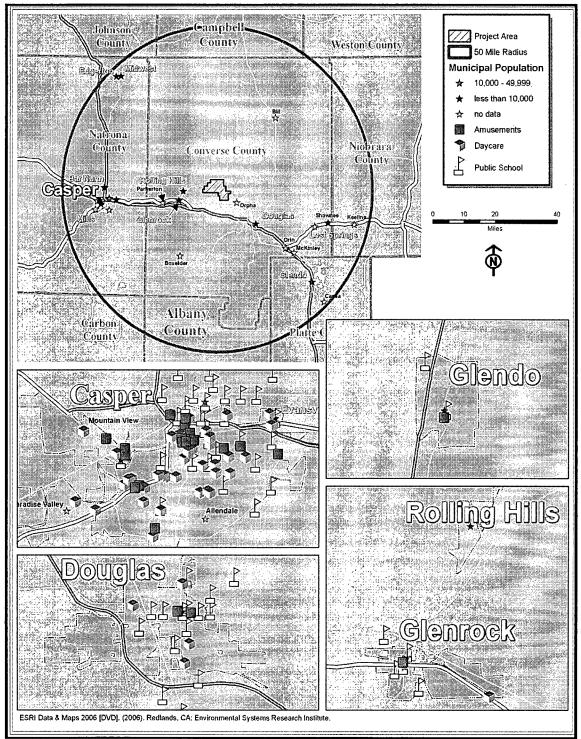
To assess areas potentially affected by the implementation of the proposed actions, this section identifies those places where the numbers of children may be disproportionately high (e.g., schools, childcare centers, parks, amusement areas, etc).

There are 68 schools within 50 miles of the subject EJ Study Area (Figure 3.10-6). Of these, 39 are elementary schools, 22 are middle schools, and seven are high schools. Between August and May, a combined 16,285 students attend these schools. A smaller number of students attend schools in the summer. All of the schools are integrated within towns or communities. The nearest school to the subject EJ Study Area is located 7.8 miles away, in Glenrock Wyoming. There are also 41 preschools and/or day cares within 50 miles of the project area. As with the schools, they are located within towns. Again, the closest is located in Glenrock (http://www.sdvc.uwyo.edu/clearinghouse/ society.html).

Other areas where children are likely to congregate are parks, swimming pools, theatres, movie theaters, bowling alleys, amusement centers, and arcades. There are three swimming pools (one in Casper and two in Douglas); nine theatres (one in Douglas and the rest in Casper), 44 parks (one in Glendo and the rest in Casper), one skating rink in Casper, and six bowling alleys (three in Casper, and one each in Douglas, Glenrock and Mountain View). There are also four identified amusement centers and arcades in Casper, 30 miles from the subject EJ study area.



Figure 3.10-6: Location of Day Cares, Schools and Amusement Areas where Children are Likely to Congregate in the Proposed Project Study Area





3.10.4.3 Environmental Justice Conclusions

In compliance with Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, ethnicity and poverty status in the vicinity of the proposed actions have been examined and compared to city, regional, state, and national data to determine if any minority or low-income communities could potentially be disproportionately affected by implementation of the proposed action. Similarly, in compliance with Executive Order 13045 – Protection of Children from Environmental Health Risks and Safety Risks, the distribution of children and locations where numbers of children may be disproportionately high in the vicinity of the proposed actions was determined to ensure that environmental risks and safety risks to children are addressed.

Three criteria must be met for impacts to minority/low income communities to be considered significant. First, there must be one or more populations within the region of influence. Second, there must be adverse (or significant) impacts from the proposed action. Finally, the population under investigation must bear a disproportionate burden of those adverse impacts. If any of these criteria are not met, then impacts with respect to environmental justice or protection of children are not significant.

According to the environmental justice guidance provided by the Nuclear Regulatory Commission, "percentage differences greater than 20 percentage points may be considered significant, and if either the minority or low-income population percentage in the radius of influence exceeds 50 percent, environmental justice should be considered in greater detail" (Nuclear Regulatory Commission 2008:6.3). An examination of census blocks indicates there are several areas within the EJ Study Area for the proposed Ludeman Uranium Project that contains a concentration of minority populations over 40 percent. However, these localities are scattered throughout the study area, and generally consist of only one or a few households. The EJ Study Area will not disproportionately affect minorities or low-income communities.



3.10.5 References

- Antrim, Mark. Associate Director of Buildings, Natrona County School District. 2008. Personal communication. Phone conversation with Anne Cossitt in August 2008.
- Espeland, Dan. Converse School District No. 1 Superintendent. 2008. Personal communication. Phone conversation with Anne Cossitt in August 2008.
- Office of Federal and State Materials and Environmental Management Programs. 2008. Draft Generic EIS for In-Situ Leach Uranium Milling Facilities. [Web Page] http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1910
- Shore, Lynn. Converse School District No.2. 2009. Personal communication. Phone conversation with Anne Cossitt in January 2009.

State of Wyoming Tourism. 2008. Location of Hotels, Motels, Campgrounds and RV Parks. [Web Page]. <u>http://www.wyomingtourism.org/planning/stay/</u> Accessed August 2008.

- Stillwell, Glendene. Converse School District No.2. 2008. Personal communication. Phone conversation with Anne Cossitt in August 2008.
- U.S. Census Bureau, Census 2000. Table DP-1. Profile of General Demographic Characteristics. For various counties. [Web Page] <u>http://eadiv.state.wy.us/</u>. Accessed August 2008.
- U.S. Census Bureau. 2008. Annual Estimates of the Population by Sex, Race, and Hispanic Origin for Wyoming: April 1, 2000 to July 1, 2007. (as released by Wyoming Department of Administration and Information. [Web Page] <u>http://eadiv.state.wy.us/</u>. Accessed August 2008.
- Wyoming Department of Administration and Information. 2005. Economic Analysis Division. Economic and Demographic Forecast: 2005 to 2014.
- Wyoming Department of Administration and Information. 2007. Wyoming Economic and Demographic Forecast: 2007 to 2016. [Web Page] <u>http://eadiv.state.wy.us/wef/wef.html</u>. Accessed August 2008.
- Wyoming Department of Administration and Information. 2008 [Web Page] Various tables. <u>http://eadiv.state.wy.us/</u>. Accessed August 2008.



- Wyoming Department of Education. 2008. [Web Site] <u>http://www.k12.wy.us</u>. Accessed August 2008.
- Wyoming Department of Employment Research and Planning. 2008 County Fact Sheets. [Web Page] <u>http://doe.state.wy.us/LMI/county.htm</u>. Accessed August 2008.
- Wyoming Department of Employment. 2008. Statewide and County Inflow Figures and Tables by State of Origin. [Web Page] <u>http://doe.state.wy.us/lmi/commute.htm</u>. Accessed August 2008.
- Wyoming Department of State Parks and Cultural Resources. 2008. [Web Page] <u>http://wyoparks.state.wy.us/PlanningDocs/VisitorUse/2007/index.asp</u> Accessed October 2008.
- Wyoming Housing Database Partnership. 2008. A Profile of Wyoming Demographics, Economics, and Housing Semiannual Report Ending December 31, 2007. [Web Page] <u>http://www.wyomingcda.com/files/Profile07b_Vol_I_FNL.pdf</u> Accessed August 2008.

Table 3.10-1 Source:

1980 -2000: Decennial Census; Estimates 2001-2007: Population Division, U.S. Census Bureau, Release Date: July 10, 2008

Table 3.10-2 Source:

Population Division, U.S. Census Bureau, Release Date May 1, 2008

Table 3.10-3 Source:

Wyoming Department of Administration and Information, Economic Analysis Division, July 2008.

Table 3.10-5 Sources:

Labor Force, Employment, Unemployment and Unemployment Rate: Wyoming Department of Employment Research and Planning 2008

Employment by Industry: U.S. Bureau of Economic Analysis 2008

 Table 3.10-6 Source: Wyoming Housing Database Partnership 2008

References for Section 2.3.4 Environmental Justice

- ANA (Alliance for Nuclear Accountability) 2008 (23 November) ANA Press Release: 3000+ Organizations and Individuals Urge President Bush "Protect Most Vulnerable from Radiation Exposure." <u>http://www.ananuclear.org</u>.
- Ali, A. and L. Behrendt 2001 Mining and Indigenous Rights. *Cultural Survival Quarterly* 25(1): 6-8.

Alter, J. C. 1962 Jim Bridger. University of Oklahoma Press, Norman.

Arnold, P. 1997 Wyoming's Hispanic Sheepherders. Annals of Wyoming 69(1):29-34.

Bial, Raymond 2004 The Arapaho. Benchmark Books, New York, NY.

- Bradley, C. C., Jr. 1991 *The Handsome People: A History of the Crow Indians and the Whites.* Council for Indian Education.
- Brooks, R., S. Khatiwada, J. Vargas and M. McGurry 2008 The U. S. Census Bureau and American Community Survey: Advantages, Uses, and Limitations. South Dakota State University, Rural Life Census Data Center, Newsletter 3:1-3.
- Bullard, R. D. 1999 Leveling the Playing Field Through Environmental Justice. 23VT.L Rev 453.
- Carley, Kenneth 1976 The Sioux Uprising of 1862. The Minnesota Historical Society, St. Paul, MN.
- Castelli, J. R. 1990 Basques in the Western United States: A Functional Approach to Determination of Cultural Presence in the Geographic Landscape. University of Colorado, PH.D Dissertation.
- CEQ (Council on Environmental Quality) 1997 Environmental Justice: Guidance under the National Environmental Policy Act. (<u>http://www.whitehouse.gov/CEQ</u>).
- Coronado, J. 2001 Chicanos in Rawlins, 1950-2001. Annals of Wyoming 2001 73(2):10-14.
- Deaver, Sherri 1986 American Indian Religious Freedom Act (AIRFA) Background Data. Ethnoscience for the Bureau of Land Management, Montana State Office, Billings, MT.
- DeMallie, R.J. 2001 Teton. In *Plains*, Part 2, edited by R. J. DeMallie, pp 794-820. *Handbook of North American Indians:* Vol.13, William C. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.

Douglass, W. A. 1985 Ethnic Categorization in the 1980 U.S. Census: The Basque Example." Government Publications Review (1985) 12: 289-296.

1991 Inventing an Ethnic Identity: the First Basque Festival. In Basques of the Pacific Northwest edited by R. W. Etulain, pp. 79-85. Idaho State University Press, Pocatello, Id.: 79-85.

1992 Basques in the American West. In To Build in a New Land, Ethnic Landscapes in North America edited by Allen G. Noble, 379-395. Baltimore and London: The Johns Hopkins University Press, 1992

1996 Basque American Identity: Past Perspectives and Future Projects. In Changes in the American West, Exploring the Human Dimension edited by S. Tchudi, pp. 183-199) University of Nevada Press, Reno.

2000 Interstitial culture, virtual ethnicity and hyphenated Basque identity in the new millennium. Nevada Historical Quarterly 43-2.

- Douglass, W. A. and J. Bilbao 1975 Amikanuak: Basques in the New World. University of Nevada Press, Reno.
- Echeverria, J. 1999 Home Away from Home: A History of Basque Boardinghouses. University of Nevada, Reno.
- EPA 1988d Final Guidance for Incorporating Environmental Justice concerns in EPA's. NEPA Compliance Analyses
- Etchecopar, A. C. 2007 The North American Basque Organizations: From a Basque American Identity to a Diasporic Identity. EuskoSare.webarchive
- Etchepare, J. (Director Wyoming Department of Agriculture) 2008 Letter of July 18, 2008 to Mr. Tom Foertsch, geologist of the BLM Casper Field Office.
- FIWG (Federal Interagency Working Group) 2001 American Indian & Alaskan Native Environmental Justice Roundtable, Albuquerque, NM, August 3-4, 2000. Final Report. Medical University of South Carolina Press.
- Fowler, C. S. 1986 Subsistence. In Handbook of North American Indians Vol. 11: Great Basin, edited by W. L. D'Azevedo, pp. 64-98. Smithsonian Institution, Washington, DC.

- Grajeda, R. F. 1998 Mexicans in Nebraska. Nebraska State Historical Society web site. This article is an edited and shortened of the chapter written for Broken Hoops and Plains People, Nebraska Curriculum Development Center.
- Grieco, E 2003 Foreign-Born Hispanics in the United States Migration Information Service. <u>www.migrationinformation.org</u>.
- Grinnell, G. B. 1985 The Fighting Cheyennes. University of Oklahoma Press, Norman, OK.
- Hallberg, C. 1991 Ethnicity in Wyoming. Annals of Wyoming 63 (Fall), pp. 136-139.
- Harris, S. and B. Harper 1999 Environmental Justice in Indian Country: Using Equity Assessments to Evaluate Impacts to Trust Resources, Watersheds and Ecocultural Landscapes. Paper presented at Environmental Justice: Strengthening the Bridge between Tribal Governments and Indigenous Communities, Economic Development and Sustainable Communities. Conference sponsored by EPA and Medical University of South Carolina, June 11, 1999, Hilton Head, South Carolina.
- Hewes, G. 1961 Early Tribal Migration in the Northern Great Plains. *Plains* Archaeological Conference Newsletter 1:49-61.
- Hewitt, W. L. 1982 Mexican Workers in Wyoming During World War II: Necessity, Discrimination and Protest. Annals of Wyoming 54(Spring):20-33.
- Hoffman, A. 1974 Unwanted Mexican Americans in the Great Depression: Repatriation Pressures, 1929-1939. University of Arizona Press, Tucson.
- Hurt, R. D. 2008 The Great Plains during World War II. University of Nebraska Press, Lincoln.
- Hyde, George E. 1959 Indians of the High Plains: From the Prehistoric Period to the Coming of Europeans. University of Oklahoma Press, Norman, OK.

Iberlin, D. 1981 The Basque Web. The Buffalo Bulletin, Buffalo, WY.

Iberlin, D. and D. Romtvedt 1995 Buffalotarrak. Red Hills Publication, Buffalo, WY.

IEER (Institute for Energy and Energy and Environmental Research) 2006 Statement of Arjun Makhijani on the Report Science for the Vulnerable and the Campaign to Include Women, Children, and Future Generations in Environmental Health



Standards. Nation Press Club Press Conference, Washington, D.C. 19 October 2006.

- Kaiser (Henry J. Kaiser Family Foundation) 2007 State Health Facts. www.statehealthfacts.org
- Kehoe, A. 1981 North American Indians: A Comprehensive Account. Prentice-Hall, Englewood Cliffs, NJ.
- Lane, R. H. and W. A. Douglass 1985 Basque Sheep Herders of the American West, A Photographic Documentary. University of Nevada Press, Reno, NV.
- Lapachin, L and M. L. Tano 2001 Developing the Taxonomy of Community Risk Variables Under the "No Net Risk Gain Model" to Satisfy Quality of Life Objectives During Federal Facility Environmental Cleanup Efforts. Presented at Waste Management 2001 Symposia. Session 67: Social Science Foundations of Public Participation: Methods and Processes.
- Laxalt, R. 1986 Sweet Promised Land. University of Nevada Press, Reno. (reprint of original 1957 edition by Harper & Row, New York).
- Levy, Jerrold E. 2001 Kiowa. In *Plains*, Parat 2, edited by R. J. DeMallie, pp. 907-925. Handbook of North American Indians, Vol. 13, William C. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.
- McWilliams, Carey 1968 North From Mexico: The Spanish-Speaking Peoples of the United States. Greenwood Press, NY.
- Mallea-Olaetxe, J. 2000 Speaking Through the Aspens: Basque Tree Carvings in California and Nevada. University of Nevada, Reno.

2003 Shooting From the Lip: Bertolariak Ipar Amerikqan: Improvised Basque Verse Singing. NABO (North American Basque Association), Reno, NV..

2007 A Basque Historian's Dilemma. Buber's Basque Page. http://wwwbuber.net/Basque/features/Guest Columns/jmo40228.php.

Malone, Michael P. and Richard B. Roeder 1976 *Montana: A History of Two Centuries.* University of Washington Press, Seattle, WA.

Mayhall, M. P. 1971 The Kiowas. University of Oklahoma Press, Norman, OK.



NRC (U.S. Nuclear Regulatory Commission) 2003 Policy Statement on the Treatment of Environmental Justice Matters in NRC Regulatory and Licensing Actions. FR 68(214):62642-62645.

2004 Policy Statement on the Treatment of Environmental Justice Matters in NRC Regulatory and Licensing Actions. FR 69(163):52040-520408.

2006 Environmental Assessment for the Addition of the Reynolds Ranch Mining Area to Power Resources, Inc.'s Smith Ranch/Highlands Uranium project Converse County Wyoming. Source Material License No. Sua-1548 Docket No. 40-8964.

2007 Public GEIS Scoping Meeting, Official Transcript of Proceedings: Casper, Wyoming, Tuesday, August 7, 2007. Recorded by Ann Riley and Associates, LTD, Court Reporter.

2008 Generic Environmental Impact Statement for In-Situ Leach Uranium Milling Facilities. Draft Report for Comment Published July 2008.

- Olden, D. 2007 The Hispano-Americano Women's Club and the Laramie Woman's Club: A Glimpse into Intercultural Relationships in Laramie, Wyoming, 1950-1970. Annals of Wyoming" 79(3/4):14-28.
- PHC (Pew Hispanic Center) 2006 Demographic Profile of Hispanics in Wyoming, 2006. http://pewhispanic.org/states/?stateid=WY
- Poremba, G. A. and S. Yotter 1998 Northwest will face environmental justice issues. The Seattle Daily Journal of Commerce. <u>Http://www.djc.com/special/enviro98/10043978.htm</u>.
- Redwine, A. 1979 Lovell's Mexican Colony. Annals of Wyoming 51(2):26-35.
- Rio, D. 2003 Robert Laxalt: A Basque Pioneer in the American Literary West. American Studies International 41(3):60-82.

Rios-Bustamente, A. 2001 Wyoming's Mexican Hispanic History. Annals of Wyoming 73(2):2-10.

Stands-In-Timber, J. and M. Liberty 1972 Cheyenne Memories. University of Nebraska Press, Lincoln, NE.

Sturtevant, W. C. 1986 Handbook of North American Indians: Great Basin, Vol. 11. Smithsonian Institution, Washington, DC.



- Suagee, D. B. 1999 The Indian Country Environmental Justice Clinic: From Vision to Reality. 23 Vt. L. Rev. 567.
- Thompson, E. N. 1968 Fort Union Trading Post. Historic Structures Report, Part II. Historical Data Section. National Technical Information Service, Document PB-203 901. U.S. Department of Commerce, Washington, D.C.
- Trenholm, V. C. and M. Carley 1965 *The Shoshonis: Sentinels of the Rockies.* University of Oklahoma Press, Norman, OK.

USBC (United States Bureau of the Census) 1886 Compendium of the Tenth Census (June 1, 1880). GPO, Washington, DC.

1892 Compendium of the Eleventh Census 1890: Part 1-Population.). GPO, Washington, DC.

1913 Thirteenth Census of the United States Taken in the Year 1910: Vol. III: Population.). GPO, Washington, DC.

1990a CP-2-52 Social and Economic Characteristics Wyoming. www.census.gov.

1990b CP-S-1-2 Detailed Ancestry Groups for States. <u>www.census.gov</u>.

1998 CPH-L-149 Selected Characteristics for Persons of Basque Ancestry. <u>www.census.gov.</u>

2000a GCT-PH1. Population, Housing Units, Area, and Density: 2000. www.census.gov. Data Set: Census 2000 Summary File 1 (SF 1) 100-Percent Data. <u>www.census.gov</u>.

2000b SF-1 Wyoming, Counties, Cities and Places: 2000. Data Set: Census 2000 Summary File 1 (SF 1) 100-Percent Data. <u>www.census.gov</u>.

2000c Occupation by Sex by Race for the Employed Civilian Population 16 Years and Over: Wyoming. eadiv.state.wy.us/demog_data/pop2000/State_Occ_SR.htm

2005a American Community Survey 2005 Technical Document. http://www.higheredinfo.org/analyses/2005%20ACS%20Technical%20Issues.doc

2005b (?)About the ACS: Test Sites and Counties http://www.census.gov/acs/www/SBasics/county02.htm

2006a Hispanics in the US. www.census.gov/population/www/socdemo/hispanic/files/ 2006b Using Data



from the 2005 American Community Survey. www.census.gov/acs/www/UseData/advance_copy_user_guide.pdf.

- U.S. Census 2000 Population Statistics, State of Montana, County of Carbon.
- USDA NASS 2008 Wyoming Agricultural Statistics. Wyoming Field Office, USDA NASS.
- Utley, R. M. 1993 *The Lance and the Shield: The Life and Times of Sitting Bull.* Henry Holt and Company, New York, NY.
- Vobejda, B. 1993 Agriculture No Longer Counts; In a Milestone of Sorts, U.S. to Drop Farm Resident Census. The Washington Post; Oct 9, 1993.
- Weist, T. 1977 A *History of the Cheyenne People*. Montana Council for Indian Education, Billings, MT.
- Wood, W. R., and M. Liberty (editors) 1980 Anthropology of the Great Plains. University of Nebraska Press, Lincoln, NE.
- Yeung, M and E. Hu Del-Hart 2004 Hispanic Americans. In Encyclopedia of the Great Plains, edited by D. J. Wishart, pp. 345-351, University of Nebraska Press, Lincoln.
- Zubiri, N. 2006 A Travel Guide to Basque America. Second Edition, University of Nevada Press, Reno, NV.



TABLE OF CONTENTS

3.11 Pu	blic and Occupational Health	
	Background Exposure to Ionizing Radiation	
	Occupational Health and Safety	
	Summary of Health Effects Studies	
3.11.4	References	

List of Figures

List of Addenda

Addendum 3.11-A: Incident Rates of Nonfatal Occupational Injuries and Illnesses by Industry and Case Type



3.11 PUBLIC AND OCCUPATIONAL HEALTH

This section describes existing public and occupational health conditions related to the proposed project area. A discussion of exposures to populations and individuals is presented with a focus on topics related to the intended use of the site.

3.11.1 Background Exposure to Ionizing Radiation

Everyone is exposed to a certain level of background radiation. As defined by 10 CFR part 20, *background radiation* means radiation from cosmic sources; naturally occurring radioactive material, including radon (except as a decay product of source or special nuclear material); and global fallout as it exists in the environment from the testing of nuclear explosive devices or from past nuclear accidents such as Chernobyl that contribute to background radiation and are not under the control of the licensee. *Background radiation* does not include radiation from source, byproduct, or special nuclear materials regulated by the commission. The largest individual natural source is ²²²radon. These natural radiation sources are commonly referred to as natural background radiation.

According to NUREG 1910, (GEIS Section 3.3-60), the average U.S. citizen receives 3 mSv per year from background radiation sources and 0.6 mSv per year from man-made sources for an annual total of 3.6 mSv/yr. Those manmade sources include radiation from medical procedures, consumer products and services (e.g., airline travel) and occupational sources

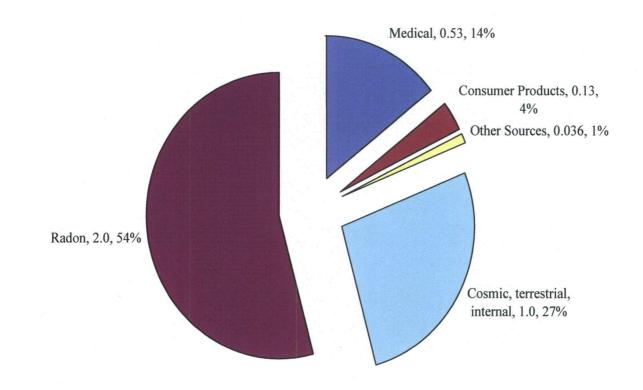
Levels of natural or background radiation can vary greatly from one location to the next. In general, people residing in Wyoming are exposed to more natural background radiation because of higher levels of cosmic radiation at higher altitudes and more terrestrial radiation from soils enriched in naturally occurring uranium. This naturally occurring uranium in the soil also results in a higher exposure to radon gas. Background sources of radiation at the proposed project site are extensively characterized in Section 6 of this ER

Man-made radiation consists of contributions from medical procedures (including nuclear medicine), occupational exposure, consumer products and industrial activities. Of the man-made sources, medical computed tomography accounts for 24 percent of the total exposure. Within the other categories, occupational exposure and industrial activities contribute less than 0.1%. The nuclear fuel cycle, which includes ISR, is among the lowest contributors to annual dose at less than 0.03%.



Shown in the Figure 3.11-1 are the average annual radiation doses received per capita in the United States from naturally occurring and manmade sources of radioactivity. The total yearly dose is approximately 0.0036 Sv (i.e., 3.6 mSv or 360 mrem).

Figure 3.11-1: Annual Background Radiation Doses in the United States (Source, mSv per year, Percent of Total)



The discussion so far has described average doses in the U.S. However, background radiation exposure can vary considerably from place to place within the U.S. and over areas within a region. Natural variation occurs due to effects from elevation (higher cosmic radiation exposure occurs at higher elevations), higher levels of naturally occurring radioactive elements in soil and water in mineralized areas (e.g., igneous formations in the Rocky Mountains) and other factors like local geology and chemistry. Because background radiation varies significantly across the U.S., it follows that population exposure varies accordingly



²²²Radon and thoron are ubiquitous in nature and are found everywhere in outdoor and indoor air. Thoron is generally present in far lower levels than radon; the potential annual average dose in the U.S. from thoron is estimated to be 0.1 mSv, far below that of radon at about 2.0 mSv. (NCRP 2009) Because radon, albeit small may still be the largest source of *potential* radiological exposure at ISR sites, potential exposure to radon will be discussed in more detail.

In addition to variations in annual averages in a region, outdoor radon concentration varies regionally and in localized areas diurnally, temporally and geographically, depending upon its emanation rate from upwind soil and its transport through the atmosphere. The amount of radon in the soil or bedrock depends on the type, porosity, and moisture content. Areas exhibiting types of soils or bedrock such as granite and limestone have higher natural uranium levels which therefore result in higher radon levels than those with other types of soils or bedrock (NCRP 2009).

Outdoor radon concentrations, in fact, do not present a significant health hazard to workers or public; rather it is indoor concentrations and the daughters can grow into equilibrium that pose the potential threat. Doses from sources in the general environment (such as terrestrial radiation, cosmic radiation, and naturally occurring radon) are not included in the dose calculation for compliance with exposure limits in 10 CFR 20, even if these sources are from technologically enhanced naturally occurring radioactive material (TENORM), such as preexisting radioactive residues from prior uranium mining operations (ISR GEIS, pp. 3.2-81). As part of developing license application for a uranium recovery facility, NRC requires an applicant to conduct a radiological assessment to determine the impact from ISR uranium recovery.

As discussed in Section 4.12.2, the maximum total effective dose equivalent (TEDE) calculated by MILDOS-AREA for the proposed project is 0.8 mrem/yr. This dose is located at the northwest property boundary and is a 1.9 percent of the regulatory dose limit. The closest resident to the proposed project showed an estimated TEDE of 1.1 mrem/yr, which is 1.1 percent of the regulatory dose limit to the general public from NRC-licensed operations of 100 mrem/yr.

Expressed another way, the maximum radiological effect of the Ludeman operation would be to increase the TEDE of continental population by 0.000098 percent.

3.11.2 Occupational Health and Safety

Occupational health and safety risks to future ISR workers and members of the public allowed access to the control areas from exposure to radiation are regulated by the NRC, mainly through the Radiation Protection Standards contained in 10 CFR 20 (Subpart C, 20.1201 and Subpart D, 20.1301(b))). In addition to annual radiation dose limits, these



regulations incorporate the principal of maintaining doses as low as reasonably achievable (ALARA) such as through the use of proper worker safety training, using engineering and administrative controls to prevent or minimize radiation exposures and effluents, and the measurement and monitoring of radiation doses and effluents.

The ALARA principle takes into consideration the purpose of the licensed activity and its benefits, weighs the associated costs and benefits to reduce radiation doses as appropriate (including selecting the most cost-effective and efficient technology for reducing doses), and quantifies the net benefits for each considered option to reduce radiation doses or exposures to other non-threshold hazardous materials (e.g., chemicals) used at an ISR facility. Radiation safety measures are required for protecting workers and minimizing worker doses at uranium ISR facilities, ensuring that radiation doses are less than the occupational limits and are maintained ALARA. The proposed project will be required to conduct annual ALARA audits to ensure procedures in place have the maximum reasonably achievable effect on exposure reduction.

Also of concern with respect to occupational health and safety are industrial hazards and exposure to non-radioactive chemicals and other industrial hazards, which for an ISR operation can include normal industrial airborne emissions associated with service equipment (e.g., vehicles), fugitive dust from access roads and wellfield activities, electricity and power tools, slips/trips/falls and various chemicals used in the in-situ extraction process. Industrial safety and the use of chemicals at the proposed project site are regulated by the Wyoming Occupational Health and Safety Act, Title 27, Labor and Employment, Chapter 11, Occupational Health and Safety. More specific discussion regarding non-radioacdtive chemicals and accident impact is described in Sec. 4.12 of this ER.

Addendum 3.11-A contains the incident rates of nonfatal occupational injuries and illnesses by industry and case type in the State of Wyoming for 2006. The incident rate is calculated using the following formula:

$\left(\frac{N}{EH}\right) \times 200,000$

Where:

Ν	=	number of injuries and illnesses
EH	=	total hours worked by all employees during a calendar year
200,000	=	base for 100 equivalent full-time workers

The incident rates for mining are contained under NAICS code 21 and include mining, and support activities for mining. ISR operations would be included in metal/nonmetal mining Class since Wyoming defines ISR applications as "mining".



3.11.3 Summary of Health Effects Studies

Although there do not appear to be "health effects studies" in the open literature specifically related to ISR operations in Wyoming and no health effects studies reported in the literature specific to Converse County (likely due to the sparse population and generally low level of industrial development), there are numerous studies in the literature focusing on the potential health impacts to the public living near uranium recovery activities for many years.

These studies have generally concluded that no additional effects have been observed when compared to the health status of other similar populations not living nearby. A few sources providing the scientific evidence that supports this very important point include:

- U.S. Department of Health and Human Services, Public Health Services, Agency for Toxic Substance and Disease Registry, *Toxicological Profile for Uranium*, 1999. Chapter 1: Public Health Statement for Uranium, Section 1.5: How Can Uranium Effect My Health? "No human cancer of any type has ever been seen as a result of exposure to natural or depleted uranium."
- Cancer and Noncancer Mortality in Populations Living Near Uranium and Vanadium Mining and Milling Operations in Montrose County, Colorado, 1950 -2000. Boice, JD, Mumma, MT et al. Journal of Radiation Research, 167:711-726; 2007: "The absence of elevated mortality rates of cancer in Montrose County over a period of 51 years suggests that the historical milling and mining operations did not adversely affect the health of Montrose County residents"
- Cancer Mortality in a Texas County with Prior Uranium Mining and Milling Activities, 1950 – 2001. Boice, JD, Mumma, M et al. Journal of Radiological Protection, 23:247 – 262; 2003 – "No unusual patterns of cancer mortality could be seen in Karnes County over a period of 50 years suggesting that the uranium mining and milling operations had not increased cancer rates among residents."



3.11.4 References

National Council on Radiation Protection and Measurement, Report No. 160: Ionizing Radiation Exposure of the Population of the Unites States, ISBN 13: 978-0-929600-98-7, 2009.



ADDENDUM 3.11-A

INCIDENT RATES OF NONFATAL OCCUPATIONAL INJURIES AND ILLNESSES BY INDUSTRY

December 2011

Addendum 3.11-A-1



Table 10. Incidence rates¹ and numbers of nonfatal occupational injuries by industry, 2008

Industry ²	NAICS	2008 Average annual	Incidence rates	Numbers	Percent relative standard error		
industry	code ³	employment ⁴ (000's)		(000's)	Incidence rates	Numbers	
All industries including State and local government ⁵		275.2	4.7	11.2	5	4	
Private industry ⁵		222.1	4.5	8.9	6	4	
Goods-producing ⁵		67.8	4.3	3.1	7	6	
Natural resources and mining ^{5.6}		29.3	2.9	1.0	8	7	
Agriculture, forestry, fishing and hunting ⁵	11	1.1	6.0	(°)	23	9	
Mining ⁶	21	28.2	2.8	0.9	8	8	
oil and gas extraction	211	4.5	-				
Oil and gas extraction	2111	4.5	-				
Oil and gas extraction	21111	4.5	-		-	-	
lining (except oil and gas) ⁷	212	9.5	2.0	(⁹)	(¹⁰)	(¹⁰)	
Coal mining ⁷	2121	6.6	0.9	(9)	(¹⁰)	(¹⁰)	
Nonmetallic mineral mining and quarrying ⁷	2123	2.7	4.2	(9)	(¹⁰)	(¹⁰)	
upport activities for mining	213	14.2	3.0	0.5	. 8	8	
Support activities for mining	2131	14.2	3.0	0.5	8	8	
Support activities for mining	21311	14.2	3.0	0.5	8	8	
Drilling oil and gas wells	213111	3.2	4.4	(⁹)	5	5	
Support activities for oil and gas operations	213112	10.5	2.7	(°)	11	11	
Construction		28.6	5.2	1.5	10	7	
Construction	23	28.6	5.2	1.5	10	7	
enstruction of buildings	236	5.1	8.5	(°)	17	17	
Residential building construction	2361	3.3	9.6	(°)	24	24	
Nonresidential building construction	2362	1.8	6.6	(°)	12	13	
eavy and civil engineering construction	237	9.8	3.9	0.5	16	13	
pecialty trade contractors	238	13.6	5.4	0.6	16	10	





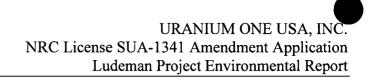
1

See footnotes at end of table.

Table 10. Incidence rates¹ and numbers of nonfatal occupational injuries by industry, 2008 - Continued

Industry ²	NAICS	2008 Average annual employment ⁴ (000's)	Incidence rates	Numbers (000's)	Percent relative standard error		
industry	∙ code ³				Incidence rates	Numbers	
Foundation, structure, and building exterior contractors	2381	2.8	11.7	(9)	19	18	
Building equipment contractors	2382	5.5	6.7	(⁹)	12	10	
Electrical contractors	23821	2.8	6.0	(°)	14	14	
Plumbing, heating, and air-conditioning contractors	23822	2.3	9.0	(°) ·	15	14	
Building finishing contractors	2383	1.7	(")	(°)	(11)	(11)	
Manufacturing		10.0	6.7	0.6	20	21	
Manufacturing	31-33	10.0	6.7	0.6	20	21	
Food manufacturing	311	0.7	10.5	(°)	9	8	
Nood product manufacturing	321	0.5	9.4	(")	2	3	
Printing and related support activities	323		-				
Petroleum and coal products manufacturing	324	1.1	3.9	(")	2	2	
Plastics and rubber products manufacturing	326	0.5	11.1	(⁹)	17	14	
Furniture and related product manufacturing	337	0.3	(°)	(°)	36	51	
Service-providing		154.2	4.6	5.8	8	6	
Trade, transportation, and utilities ⁸		53.2	5.3	2.5	5	4	
Wholesale trade	42	9.0	5.7	0.5	11	11	
Verchant wholesalers, durable goods	423	5.7	5.8	(°)	12	12	
Machinery, equipment, and supplies merchant wholesalers	4238	4.0	5.5	(⁹)	13	14	
Verchant wholesalers, nondurable goods	424	2.8	6.2	(°)	22	23	
Retail trade	44-45	32.3	5.1	1.3	5	4	
Notor vehicle and parts dealers	441	4.7	5.7	(⁹)	12	12	
Building material and garden equipment and supplies dealers	444	3.0	6.9	(°)	12	12	
Food and beverage stores	445	4.6	• 4.2	(°)	16	17	
Health and personal care stores	446	1.0	(⁹)	ີ່ເຈົ້າ	37	37	
Gasoline stations	447	4.1	4.2	(ອ)	15	14	





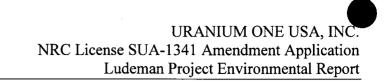
Clothing and clothing accessories stores	448	1.5	(⁹)	(°)	(¹)	(1)
General merchandise stores	452	6.6	8.1	(⁹)	3	4

See footnotes at end of table.

Table 10. Incidence rates¹ and numbers of nonfatal occupational injuries by industry, 2008 -- Continued

Wyoming							
Industry ²	NAICS code ³	2008 Average annual employment ⁴	Incidence rates	Numbers (000's)	Percent relative standard error		
		(000's)			Incidence rates	Numbers	
· · · · · · · · · · · · · · · · ·					1		
[•] Transportation and warehousing ⁸	48-49	9.5	5.8	0.7	13	12	
Rail transportation ⁸	482		3.5	(⁹)	(¹⁰)	(¹⁰)	
Couriers and messengers	492	0.7	17.5	(°)	16	15	
Utilities	[~] 22	2.5	3.1	(°)	5	5	
Utilities	221	2.5	3.1	(°)	5	5	
Electric power generation, transmission and distribution	2211	2.1	.2.8	(⁹)	6	6	
Information		3.9	2.8	(°)	18	19	
Information	51	3.9	2.8	(⁹)	18	19	
Motion picture and sound recording industries	512	0.5	(⁹)	(⁹)	(11)	(11)	
Telecommunications	517	.1.4	3.7	(⁹)	18	18	
Financial activities		11.6	-		-	-	
Finance and insurance	52	7.2	-		-		
Insurance carriers and related activities	524	2.0	(")	(°)	· 23	24	
Real estate and rental and leasing	53	4.4	3.0	(9)	25	26	
Rental and leasing services	532	2.3	3.5	(°)	15	15	
Professional and business services		19.0	2.1	(°)	25	25	
Administrative and support and waste management and remediation services	56	8.2	3.8	(⁹)	30	31	





Waste management and remediation services	562	0.8	5.5	(°)	26	25
Education and health services		23.2	5.7	1.0	7	7
	,					

See footnotes at end of table.

Table 10. Incidence rates¹ and numbers of nonfatal occupational injuries by industry, 2008 - Continued

wyoming							
industry ²	NAICS	2008 Average annual	Incidence rates	Numbers	Percent relative standard error		
	code ³	employment ⁴ (000's)		(000's)	Incidence rates.	Numbers	
Educational services	61	1.5	6.3	(⁹)	4	11	
Health care and social assistance	62	21.7	5.6	1.0	8	7	
ospitals	622	3.1	9.6	(⁹)	(11)	(11)	
ursing and residential care facilities	623	4.5	11.0	(°)	7	7	
ocial assistance	624	6.0	3.9	(⁹)	13	12	
Leisure and hospitality			-		-	-	
Arts, entertainment, and recreation	71	3.6	1.3	(9)	31	25	
Accommodation and food services	72		-				
ccommodation	721	12.0	4.7	0.5	23	20	
Traveler accommodation	7211	11.0	4.5	(9)	24	21	
Drinking places (alcoholic beverages)	7224	2.1	(°)	(°)	(11)	(11)	
Other services			-		-		
Other services, except public administration	81			'			
Commercial and industrial machinery and equipment (except automotive and electronic) repair and maintenance							
	8113	1.8	(°)	(°)	(11)	(11)	
State and local government		53.2	5.4	2.4	5	4	



.

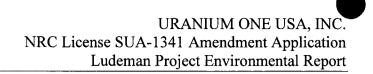
State government	12.7	3.6	0.5	7	6
Service-providing	12.7	3.6	0.5	7	6
Professional and business services	-	(°)	(°)	(11)	(11)
Education and health services	-	4.9	(⁹)	1	1

See footnotes at end of table.

Table 10. Incidence rates¹ and numbers of nonfatal occupational injuries by industry, 2008 - Continued

Industry ²	NAICS	2008 Average annual	Incidence rates	Numbers	Percent relative	Percent relative standard error	
	code ³	employment⁴ (000's)	incidence rates	(000's)	Incidence rates	Numbers	
Educational services	61	-	3.6	(9)	2	2	
Educational services	611		3.6	(⁹)	2	2	
Colleges, universities, and professional schools	6113		3.6	(°)	2	2	
Health care and social assistance	62		9.8	(°)	(11)	(11)	
Nursing and residential care facilities	623		9.8	(°)	(11)	(11)	
Public administration		8.2	3.0	(°)	11	11	
Public administration	92	8.2	3.0	(°)	11	11	
Executive, legislative, and other general government support	921	0.8	3.6	(°)	8	9	
Justice, public order, and safety activities	922		5.5	(°)	16	14	
Justice, public order, and safety activities	9221		5.5	(°)	16	14	
Courts	92211	0.3	(°)	(°)	(11)	(")	
Correctional institutions	92214	0.6	6.7	(⁹)	3	3	
Parole offices and probation offices	92215	0.2	(⁹)	(°)	12	13	
Administration of human resource programs	923	1.9					
Administration of human resource programs	9231	1.9	-			-	
Administration of education programs	92311	0.2	(⁹)	(")	12	13	
Administration of environmental quality programs	924	1.1	2.9	(⁹)	23	20	
Administration of environmental quality programs	9241	1.1	2.9	(⁹)	23	20	



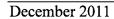


Administration of air and water resource and solid waste management programs	92611	0.4 0.6 0.3 0.2	(⁹) 4.4 (⁹) (⁹)	(^a) (^a) (^a)	7 22 13 (¹¹)	7 22 10 (¹¹)
Local government		40.5	6.1	1.9	. 5	5
Goods-producing ⁵		0.1	(⁹)	(°)	10	11
Natural resources and mining ^{5,6}			(⁹)	(°)	10	11

See footnotes at end of table.

Table 10. Incidence rates¹ and numbers of nonfatal occupational injuries by industry, 2008 -- Continued

Industry ²	NAICS	ิ สภาแล่ ไ	Incidence rates	Numbers	Percent relative standard error		
indusu y	code ³		incidence rates	(000's)	Incidence rates	Numbers	
Service-providing		40.4	6.1	1.9	5	5	
Trade, transportation, and utilities [®]		0.4	9.2	(°)	17	13	
Transportation and warehousing ⁸	48-49	0.2	12.4	(")	1	з	
Utilities	22	0.1	(°)	(°)	30	31	
Utilities	221	0.1	(°)	(°)	30	31	
Information		0.7	(°).	(°)	60	59	
Information	51	0.7	(°)	(°)	60	59	
Other information services	519	0.7	(°)	(°)	60	59	
Other information services	5191	0.7	(°)	(°)	60	59	
Libraries and archives	51912	0.7	(°)	(°)	60	59	
Financial activities		0.1	(9)	(⁹)	2	6	
Professional and business services		0.1	(°)	(°)	37	40	





Administrative and support and waste management and remediation services	56	-	(⁹)	(°)	37	40
Education and health services		28.2	5.2	1.1	5	6
Educational services	61	21.0	4.1	0.6	7	10
Educational services	611	21.0	4.1	0.6	7	10
Elementary and secondary schools	6111	18.3	4.5	0.5	8	10
Junior colleges	6112	2.7	2.4	(°)	(11)	(11)
Health care and social assistance	62	7.2	7.5	0.5	8	8
Hospitals	622	6.2	7.6	(°)	9	8

See footnotes at end of table.

Table 10. Incidence rates¹ and numbers of nonfatal occupational injuries by industry, 2008 - Continued

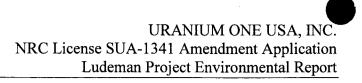
Wyoming

code employment ⁴ (000's) (000's) Incidence rates Number Leisure and hospitality 0.2 (⁹) (⁹) 12 (¹¹) Other services 0.3 (⁹) (⁹) 20 1 Public administration 10.5 8.1 0.8 9 1 Public administration 92 10.5 8.1 0.8 9 1	Industry ²	NAICS	2008 Average annual	Incidence rates	Numbers	Percent relative standard error		
Other services 0.3 (°) (°) 20 1 Public administration 10.5 8.1 0.8 9 1 Public administration 92 10.5 8.1 0.8 9 1		code ³	employment ⁴	incidence rates	(000's)	Incidence rates	Numbers	
Other services 0.3 (°) (°) 20 1 Public administration 10.5 8.1 0.8 9 1 Public administration 92 10.5 8.1 0.8 9 1					÷			
Public administration 10.5 8.1 0.8 9 1 Public administration 92 10.5 8.1 0.8 9 1	Leisure and hospitality		0.2	(°)	(⁹)	12	(11)	
Public administration 92 10.5 8.1 0.8 9 1	Other services		0.3	(°)	(9)	20	14	
	Public administration		10.5	8.1	0.8	9	10	
	Public administration	92	10.5	.8.1	0.8	9	10	
	Executive, legislative, and other general government support	921	9.1	8.3	0.7	10	10	
Justice, public order, and safety activities	Justice, public order, and safety activities	922	0.1			·		
Justice, public order, and safety activities	Justice, public order, and safety activities	9221	0.1	~			-	
Fire protection	Fire protection	92216	0.1					
Administration of environmental quality programs 924 0.5 (⁹) 14 2	Administration of environmental quality programs	924	0.5	(°)	(°)	14	21	

See footnotes at end of table.

Table 10. Incidence rates¹ and numbers of nonfatal occupational injuries by industry, 2008 -- Continued





industry ²	NAICS	2008 Average annual	Incidence rates	Numbers	Percent relative	standard error
	code ³	employment ⁴ (000's)		(000's)	Incidence rates	Numbers
Administration of environmental quality programs	92412	0.5 0.5 0.4	(⁹) (⁹) –	([°]) ([°]) 	14 15 	21 21 -

 $^1\,$ Incidence rates represent the number of injuries per 100 full-time workers and were calculated as: (N/EH) $\times\,200,000$ where

N	= number of injuries
EH	= total hours worked by all employees during the calendar year
200,000	= base for 100 equivalent fuil-time workers
	(working 40 hours per week, 50 weeks per year).

² Totals include data for industries not shown separately.

³ North American Industry Classification System 2002 Edition

⁴ Employment is expressed as an annual average and is derived primarily from the BLS-State Quarterly Census of Employment and Wages.

⁵ Excludes farms with fewer than 11 employees.

⁶ Data for mining (Sector 21 in the *North American Industry Classification System* – United States, 2002) include establishments not governed by the Mine Safety and Health Administration (MSHA) rules and reporting, such as those in oil and gas extraction and related support activities. Data for mining operators in coal, metal, and nonmetal mining are provided to BLS by the Mine Safety and Health Administration, U.S. Department of Labor. Independent mining contractors are excluded from the coal, metal, and nonmetal

mining industries. These data do not reflect the changes the Occupational Safety and Health Administration made to its recordkeeping requirements effective January 1, 2002; therefore estimates for these industries are not comparable to estimates in other industries.

⁷ Data for mining operators in this industry are provided to BLS by the Mine Safety and Health Administration, U.S. Department of Labor. Independent mining contractors are excluded. These data do not reflect the changes the Occupational Safety and Health Administration made to its recordkeeping requirements effective January 1, 2002; therefore estimates for these industries are not comparable to estimates in other industries.

⁸ Data for employers in rail transportation are provided to BLS by the Federal Railroad Administration, U.S. Department of Transportation.

⁹ Data too small to be displayed.

¹⁰ Relative standard errors were not calculated for mining, except oil and gas (NAICS 212), and rail transportation (NAICS 482).

¹¹ Relative standard error less than 0.5.

NOTE: Because of rounding, components may not add to totals. Dash indicates data do not meet publication guidelines.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, Survey of Occupational Injuries and Illnesses, in cooperation with participating State agencies.



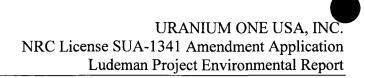


Table 11. Incidence rates¹ of nonfatal occupational injuries and illnesses by industry sector and selected case types, 2008-2008

Wyoming

	Cases with days away from work, job transfer, or restriction								Other recordable cases						
Industry Sector ²		i oral recordable cases		Total			Cases with days away from work ^e			Cases with job transfer or restriction			Other recordable cases		
	2006	2007	2008	2006	2007	2009	2006	2007	2008	2006	2007	2008	2006	2007	2008
All Industries including State and local government	-		. 4.8			2.2	-		1.7			0.5	-	-	2
Private industry ²	4.8 4.8 3.5	4.6 4.6 3.1	4.6 4.4 3.0	2.4 2.7 2.2	2.3 2.5 1.8	2.2 2.5 1.7	1.9 2.1 1.5	1.8 2.1 1.3	1.6 1.8 1.0	0.5 0.6 0.7	0.5 0.5 0.5	0.5 0.6 0.7	2.4 2.1 1.3	2.3 2.1 1.3	1
Agriculture, forestry, fishing and hunting ³	7.7 3.3 6.1	6.1 3.0 5.1	6.0 2.9 5.3	2.9 2.2 3.5	3.1 1.7 2.7	2.6 1.7 3.0	2.3 1.4 3.1	2.4 1.2 2.4	1.6 1.0 2.5	 0.7 0.4	0.5	 0.7 0.4	4.8 1.2 2.6	3.0 1.3 2.5	
Manufacturing	6.3 4.8 5.7	8.6 4.6 5.5	7.0 4.7 5.3	2.5 2.2 3.1	4.8 2.2 3.0	· 3.9 2.0 2.9	2.0 1.7 2.2	3.8 1.7 2.2	2.8 1.5 2.1	0.5 0.5 0.9	 0.5 0.8	0.5 0.8	3.7 2.6 2.8	3.8 2.4 2.5	
Wholesale trade	4.5 5.3 8.0	5.3 5.4 6.2	5.8 5.1 5.9	1.8 2.7 5.5	2.4 2.9 3.9	2.B 2.7 4.1	1.5 1.7 4 2	1.8 2.0 3.3	2.3 1.5 3.5	0.3 0.9 1 3	0.6 0.9 0.6	0.4 1.1 0.6	2.6 2.6 2.5	2.9 2.5 2.3	
UtiBlies . Information . Financial activities .	4.4 2.7 1.4	3.2 2.6	9.3 2.8	1,4 1,5 0,7	0.9 0.9	1.0 1.2 0.5	1.1 1.2 0.6	0.7 0.8	0.7 0.8 0.3	-	-		3.0 1.2 0.8	23	
Professional and business services Education and health services	2.4 6.3	2.3 6.4	2.2 5.8	1.4 2.5	1.5 2.6	1.1 2.3	1.3 2.2	1.2 2.3	0.9 1.8	0.2 0.3	 0.4	 0.5	1.0 3.8	0.8	
Educational services	4.6 6.4 5.1	3.7 6.6 4.7	6.8 5.7 	3.1 2.5 1.8	1.4 . 2.7 2.0	 2.4 	2.8 2.1 1.4	1.4 2.3 -	 1.9 	 0.3 0.4	 0.4 0.5	0.5	 4.0 3.3	2.3 3.8 2.7	
Other services, except public administration	4.7	_	- 5.4	0.9	-		0.7	-	 1.8		-	-	Э.В 	·	
Staté government		_	3.7 6.2			1.8	-	-	1.5 1.9	-	-	0.2 0.2		-	

 1 Incidence rates represent the number of injuries and illnesses per 100 full-time workers and were calculated as: (N/EH) x 200,000 where

N = number of injuries and illnesses

EH = total hours worked by all employees during the calendar year

- 200,000 = base for 100 equivalent full-time workers
 - (working 40 hours per week, 50 weeks per year).
- ² North American Industry Classification System , 2002 Edition
- ³ Excludes farms with fewer than 11 employees.

⁴ Data for mining (Sector 21 in the North American Industry Classification System, 2002 edition) include establishments not governed by the Mine Safety and Health Administration (MSHA) rules and reporting, such as those in oil and gas extraction and related support activities. Data for mining operators in coal, metal, and nonmetal mining are provided to BLS by the Mine Safety and Health Administration, U.S. Department of Labor. Independent mining contractors are excluded from the coal, metal, and nonmetal mining industries. These data do not reflect the changes

 $\mathsf{OSHA}\xspace$ made to its record keeping requirements effective January 1, 2002; therefore

estimates for these industries are not comparable to estimates in other industries. ⁶ Data for employers in railroad transportation are provided to BLS by the Federal

e ana for employers in ramoa o transportation are provided to i

Railroad Administration, U.S. Department of Transportation. * Days-away-from-work cases include those that result in days away from

work with or without restricted work activity.

⁷ Data too small to be displayed.

Late to contain to be unsprayed.

NOTE: Because of rounding, components may not add to totals. Dash indicates data do not meet publication guidelines.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, Survey of Occupational Injuries and Illnesses, in cooperation with participating State agencies.



TABLE OF CONTENTS

3.12 Waste Management	
	Wastes
	Liquid Wastes
• •	
-	Solid Wastes

uraniumone ™ investing in our energy

3.12 WASTE MANAGEMENT

This section describes the existing sources of waste within the proposed project area and the current waste management practices. There is no discussion of wastes generated by the proposed Ludeman Project (proposed project) as these activities have not occurred pending licensing approval by the NRC. Proposed waste management practices and potential waste management impacts resulting from the proposed project operations are provided in Section 4.13 of this ER. As described in other sections of this ER, including 4.13 and 5.11, wastes are separated into two base categories with several subcategories under each base category. These base categories for the purposes of this document are 11e.(2) byproduct wastes, and non 11e.(2) wastes.

11e.(2) byproduct wastes are defined in NUREG 1910, Vol. 1., page 2-23 as "waste generated by extraction or concentration of uranium or thorium processed ores as defined under Section 11e.(2) of the Atomic Energy Act." Wastes classified as 11e.(2) may be either liquid or solid in nature.

As there are no licensed uranium recovery activities currently under way on the proposed project property, no wastes categorized as 11e.(2) are being generated or currently exist on site since this is a proposed action for a new facility. All materials classified as 11e.(2) generated by Leuenberger pilot production facility during their operation on the site have been properly removed as evidenced by the NRC's sign off on facility closure.

All wastes currently generated on site are classified as non 11e.(2) wastes. These wastes are both liquid and solid in nature. Waste categories that are generated on site currently are as follows:

- Liquid Wastes
 - Domestic Liquid Septic wastes from existing ranch facilities;
 - Wastes qualifying for the Conditionally Exempt Small Quantity Generator or Exploration and Production exemptions under WDEQ solid and hazardous waste regulations; and
- Solid Wastes
 - Municipal Solid Wastes generated from ranching, livestock, and oil & gas operations;
 - Wastes qualifying for the Conditionally Exempt Small Quantity Generator or Exploration and Production exemptions under WDEQ solid and hazardous waste regulations; and

Within the proposed project area, existing land uses include: transportation, livestock grazing, and wildlife habitat. The activities associated with these land uses generate little



waste. Management of this waste is governed by Converse County and WDEQ/SHWD. WDEQ/SHWD maintains a list of recognized hazardous wastes according to characteristics of ignitability, corrosivity, reactivity, and toxicity (WDEQ/SHWD 2008), in addition to regulating the disposal of non-hazardous solid wastes.

3.12.1 Non 11e.(2) Liquid Wastes

3.12.1.1 Domestic Liquid Septic Wastes

The overall generation of septic wastes by land use activities on the proposed project area is minimal due to the lack of occupied residences within the proposed project boundary. The overall impact of the past generation of this waste type should be nearly non-existent in regard to its potential impact to the activities of the proposed project.

3.12.1.2 Hazardous and CESQG Liquid Wastes

Small quantities of hazardous and Conditionally Exempt Small Quantity Generator (CESQG) liquid wastes are likely generated on or near the proposed project area. Hazardous wastes associated with ranching activities are likely to include used oils, spent solvents, herbicides, and pesticides and have the potential to be classified as hazardous wastes under WDEQ/SHWD and USEPA regulations. The actual quantity generated at the proposed project is likely to be minimal.

3.12.2 Non 11e.(2) Solid Wastes

3.12.2.1 Municipal Solid Wastes

Agricultural operations within the proposed project area produce very limited quantities of miscellaneous trash. Some of this may be disposed off-site in small landfills near the proposed project area. No such landfills have been identified within the proposed project area. According to the WDEQ Office of Outreach and Environmental Assistance (OOEA), small landfills are not subject to Wyoming rules and regulations for landfills as long as they are used only to dispose of wastes generated in association with an individual's farming or ranching operations (WDEQ/OOEA 2010). Other waste associated with farming and ranching operations is disposed in the nearest solid waste disposal facility, which is a landfill in Gillette approximately 52 road miles north.



3.12.2.2 Hazardous and CESQG Solid Wastes

Small quantities of hazardous and Conditionally Exempt Small Quantity Generator (CESQG) solid wastes are likely generated on or near the proposed project area. The actual quantity generated at the proposed project location by ranching activities is likely to be very small and likely to include oily rags and sludges.